NATIONAL EMERGENCY OFFICE OF THE MINISTRY
OF THE INTERIOR
AND PUBLIC SECURITY (ONEMI), REPUBLIC OF CHILE

INSTITUTIONAL STRENGTHENING OF ONEMI FOR CAPACITY DEVELOPMENT IN DISASTER RISK REDUCTION PROJECT

PROJECT COMPLETION REPORT

ANNEX (2/3)

(ANNEX 5-3)

FEBRUARY 2022

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

ORIENTAL CONSULTANTS GLOBAL CO., LTD.
OYO CORPORATION

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ANNEX

Page

ANNEX 5: Products Produced by the Project

ANNEX 5-3

Report of Knowledge Management System of ONEMI for DRR

FINAL REPORT OF OUTPUT 2

Knowledge Management System of ONEMI for DRR

Institutional Strengthening of ONEMI for
Capacity Development in Disaster Risk Reduction Project

Table of Contents

Part 0　Summary of the Output 2 Final Report

In 2018, a bilateral project (Chile - Japan) called “Institutional Strengthening of ONEMI for Capacity Development in Disaster Risk Reduction” was initiated.

This project seeks to strengthen ONEMI's management and capabilities in the areas of training, management and dissemination of knowledge, with the purpose of positioning the organization as a Latin American reference in disaster risk management, thereby strengthening not only the institution itself, but also the National Civil Protection System, in particular, local governments and the communities themselves in Integrated Risk Management with a view to building safer and more resilient communities in the face of disaster risk.

In order to accomplish the above, the following was established:

Overall goal	ONEMI's capacity is strengthened to promote the implementation of the Sendai Framework for Disaster Risk Reduction (DRR)
Project Purpose	ONEMI's function is strengthened to promote DRR.
Results	
Output 1	Priority works of ONEMI are established as the national DRR organization.
Output 2	Concept design and its strategy of the Knowledge Management System are developed.
Output 3	Mechanism of human resources and capacity development for DRR is established at the Civil Protection Academy and Community Prevention Department of ONEMI.

This chapter is about Output 2, where the conceptual design of the Knowledge Management System (KMS) is developed, whose main function is to manage knowledge for DRR obtained by ONEMI entities derived from their actions, which will be available to users related to DRR.

Among other aspects, the processes of the functions identified in the KMS are defined, such as: Administration (validation and management of knowledge), Processing of essential functions (Historical Memory, Lessons Learned, Human Resource Development, Network Development, and Research and Development), Storage (repository and control and maintenance), and Transfer of knowledge (availability and exhibition), all of the above, conceived in the context of the National Civil Protection System currently in force. With this background, the organizational structure of ONEMI was analyzed and the relationships of the KMS with the other systems of this organization were identified, which allows proposing a solution to insert the KMS in this structure.

A strategy for implementing the KMS at ONEMI was also presented, and the considerations that are deemed advisable for the success of this task were proposed. The roadmap, with an approximate duration of 18 months, incorporates those activities that allow shaping the KMS, defining the administrative aspects that are indispensable for the formalization of the project, as well as those functions that will be rooted in the creation of the knowledge management unit (Knowledge Management Unit), and finally in the implementation of the system's functions.

In addition, some important aspects regarding the KMS raw material, which is knowledge, are discussed, indicating some criteria on the treatment of information (classification, sources, prioritization, among others) and on the most important issues of the KMS. To help the proper ordering and access of the information received and processed, a technical document is provided to improve ONEMI's Repository System, where the accumulation of knowledge developed in the KMS process is located.

Output 2 provides structured and processed knowledge to achieve disaster risk reduction for the benefit of all organizations related to these matters as well as for the population in general, at national, regional, provincial and communal levels.

Part 1 Introduction

1. Activities related to KMS under the Project

The purpose of the KMS is to collect information on natural disasters and Disaster Risk Reduction (DRR), which is used in the promotion of DRR at the national, regional/provincial, municipal, and community levels in Chile. The activities related to Output 2 consists of three activities mentioned in Table 1.1.1Table . Activity 2-1 developed the concept design, roadmap, and action plan for ONEMI to establish KMS. Activity 2-2 proposed the classification of information targeted in KMS and prioritized information to be collected by ONEMI for KMS. Finally, Activity 2-3 developed the guidelines for KMS which will be used by ONEMI to operate and improve KMS. This last activity also developed the technical document to improve ONEMI Repository system for the accumulation of knowledge developed in the process of KMS.

Table 1.1.1 Activities related to Output 2

Activity 2-1	To decide the concept and implementation of Knowledge Management System for preparing a concept design related to topics to be studies, i.e., human resource training, memory of historical episodes, lessons learned analysis and research reports, as well as to develop a road map directing to the System opening.
Activity 2-2	To identify the actual status in Chile of collection, accumulation, organization, and utilization carried out by ONEMI about the information, knowledge, and experiences related to hazards, disasters, and risk reduction, and to specify that information, knowledge, and experience that ONEMI is responsible to manage.
Activity 2-3	Based on the result from activity 2-2 above, to discuss methods of information collection and its utilization (e.g., awareness raising for communities, indicated of the Sendai Framework for DRR, White paper in DRR, training programs at Civil Protection Academy, and others).

2. Importance of Knowledge Management System for Disaster Risk Reduction

Sendai Framework for Disaster Risk Reduction 2015-2030 was adopted as the first major agreement of the post-2015 development agenda, four priorities for actions as described below.

Priority 1. Understanding disaster risk

Disaster Risk Management should be based on an understanding of disaster risk in all its dimensions of vulnerability, capacity, exposure of people and assets, hazard characteristics and the environment. Such knowledge can be used for risk assessment, prevention, mitigation, preparedness and response.

Priority 2. Strengthening disaster risk governance to manage disaster risk

Disaster risk governance at the national, regional and global levels is very important for prevention, mitigation, preparedness, response, recovery and rehabilitation. It fosters collaboration and partnership.

Priority 3. Investing in Disaster Risk Reduction for resilience

Public and private investment in prevention and DRR through structural and non-structural measures are essential to enhance the economic, social, health and cultural resilience of people, communities, countries and their assets, as well as the environment.

Priority 4. Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction

The growth of disaster risk means there is a need to strengthen disaster preparedness for response, take action in anticipation of events, and ensure capacities are in place for effective response and recovery at all levels. The recovery, rehabilitation and reconstruction phase is a critical opportunity to build back better, including through integrating disaster risk reduction into development measures.

To achieve these priorities effectively, it is suggested to review pre- and post- conditions in case of past disasters and to review the current status of implementation of DRR measures in order to consider the future perspective of DRR and its implementation.

In general, experience, lessons, data, knowledge, information, etc., are retained and produced by related organizations and individual people. It means related organizations and people like municipalities and community need to find necessary information by themselves due to the lack of an integrated information source. To accelerate DRR and achieve SFDRR, knowledge and related information on DRR should be integrated in the platform for easy acquisition and effective utilization.

3. Review of Issues on Knowledge Management

3.1. Definition of Knowledge, Information, Data, Experience, and Lessons

According to the Knowledge Management Tools (2018a), data, information, and knowledge are defined as below.

Data: Facts and figures which relay something specific, but which are not organized in any way, and which provide no further information regarding patterns, context, etc.

Information: For data to become information, it must be contextualized, categorized, calculated and condensed. Information thus paints a bigger picture; it is data with relevance and purpose.

Knowledge: Knowledge is closely linked to doing and implies know-how and understanding. The knowledge possessed by each individual is a product of his experience and encompasses the norms by which he evaluates new inputs from his surroundings. Knowledge is a fluid mix of framed experience, values, contextual information, expert insight, and grounded intuition that provides an environment and framework for evaluating and incorporating new experiences and information. It originates and is applied in the mind of the knowers. In organizations it often becomes embedded not only in documents or repositories, but also in organizational routines, practices and norms.

When we consider DRR, we often use the terms “experience” and “lessons”. As mentioned above, knowledge is the product of experiences. Therefore, experiences are considered as the basis of knowledge. Lessons are a part of knowledge since the lessons is generally considered as the know-how and future perspectives.

3.2. Types of Knowledge: Explicit Knowledge and Tacit knowledge

According to the Knowledge Management Tools (2018b), “Knowledge” is regarded as “Explicit Knowledge” and “Tacit Knowledge”. The following are the explanations of explicit knowledge and tacit knowledge.

Explicit knowledge

This type of knowledge is formalized and codified and is sometimes referred to as know-what. It is therefore fairly easy to identify, store, and retrieve. This is the type of knowledge most easily handled by KMS, which are very effective at facilitating the storage, retrieval, and modification of documents and texts.

From a managerial perspective, the greatest challenge with explicit knowledge is similar to information. It involves ensuring that people have access to what they need; that important knowledge is stored; and that the knowledge is reviewed, updated, or discarded.

Many theoreticians regard explicit knowledge as being less important. It is considered simpler in nature and cannot contain the rich experience-based know-how that can generate lasting

competitive advantage.

Although this is changing to some limited degree, knowledge management initiatives driven by technology have often had the flaw of focusing almost exclusively on this type of knowledge. As discussed previously, in fields such as IT there is often a lack of a more sophisticated definition. This has therefore created many products labeled as knowledge management systems, which in actual facts are/were nothing more than information and explicit knowledge management software.

Tacit Knowledge

It is sometimes referred to as know-how and refers to intuitive, hard to define knowledge that is largely experience based. Because of this, tacit knowledge is often context dependent and personal in nature. It is hard to communicate and deeply rooted in action, commitment, and involvement.

Tacit knowledge is also regarded as being the most valuable source of knowledge, and the most likely to lead to breakthroughs in the organization.

It is difficult to handle this type of knowledge. An IT system relies on codification, which is something that is difficult/impossible for the tacit knowledge holder.

Tacit knowledge is found in: the minds of human stakeholders. It includes cultural beliefs, values, attitudes, mental models, etc., as well as skills, capabilities and expertise.

3.3. SECI Model as Knowledge Management Model

SECI model was developed by Ikujiro Nonaka and Hirotaka Takeuchi (1995), which is the core framework of knowledge. SECI is the abbreviation of Socialization, Externalization, Combination, and Internalization. The terms Socialization, Externalization, Combination, and Internalization are defined as below.

Socialization:

Socialization is the process from tacit-to-tacit knowledge to transfer and share tacit knowledge. Socialization can be done through face-to-face communication, experiencing, etc. A kind of socialization activities is collection of information, experiences, etc. (tact knowledge) which has the possibility to be utilized for DRR.

Externalization:

In the process of externalization, tacit knowledge is converted to explicit knowledge which is concrete concepts, charts, images and written documents. Under the KMS concept, externalization is the process and opportunity for materialization of tact knowledge to explicit knowledge in order to share with other people.

Combination:

In this process, the explicit knowledge is combined with other types of explicit knowledge in order to make new explicit knowledge. Through the combination of sets of tacit knowledge, KMS can

prepare new tacit knowledge in materials for implementation and application.

Internalization:

In this process, explicit knowledge is changed to tacit knowledge through knowledge receiving and its application. The tacit knowledge obtained from the application of explicit knowledge can be individual's and organization's knowledge. Implementation and application of the materials developed in the "Combination" process produce new experienced-based and/or evidenced-based knowledge, which can be utilized for the next Socialization process.

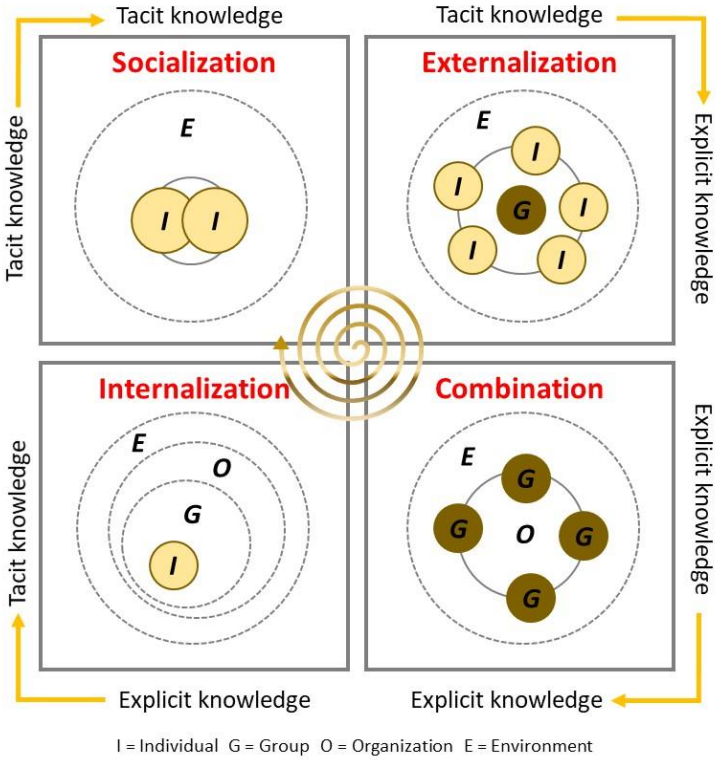

Figure 1.3.1 SECI Model

3.4. Consideration for KMS

KMS is the comprehensive system on collecting information, development of knowledge and utilization of knowledge. It is necessary to differentiate between information and knowledge because information is converted into knowledge.

According to SECI Model process, invisible information and experiences needs to be externalized as the knowledge and the experiences of utilization of knowledge needs to be developed as a new knowledge.

4. Overview of this document

4.1. Purpose of this document

This document is used and referred by ONEMI to establish, operate, and enhance KMS. This document provides the following:

- Concept design of KMS
- Structure within ONEMI for KMS and relationship between KMS and SINAPRED in Chile
- Process of establishing KMS
- Information to be converted into knowledge under the KMS
- Important issues for the improvement of KMS.

4.2. Structure of this document

This document consists of the following four parts.

- Part 1: Introduction
- Part 2: Concept design of KMS
- Part 3: Implementation Strategy, Roadmap, and Action Plan
- Part 4: Guidelines for Collecting and Utilization of Disaster Related Information

The timing of the use of each part is shown in Figure 1.4.1. To establish KMS, Part 2 and 3 will be used. Part 2 also indicates the process and operation of converting information into knowledge and transferring knowledge. Part 3 is used during establishing and operating KMS for nationwide dissemination of KMS.

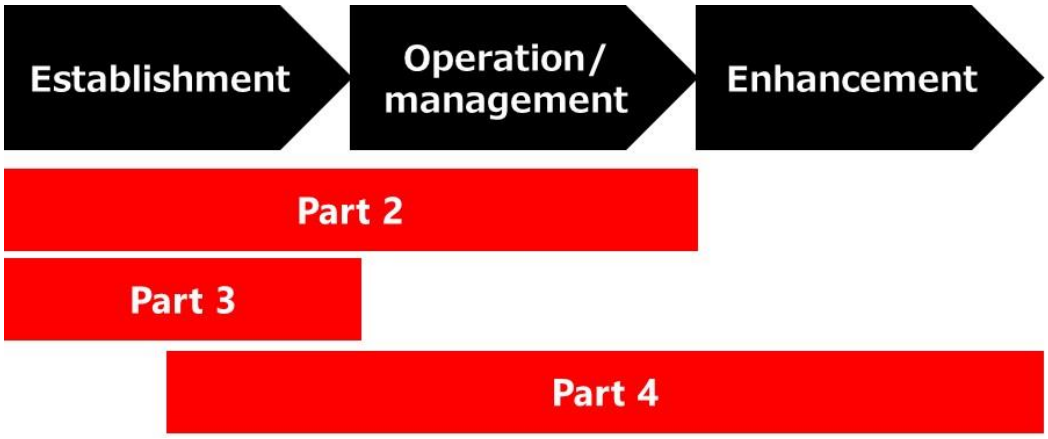

Figure 1.4.1 Timing of the use of each part

5. Reference

- Nonaka I. and Takeuchi H. (1995) The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation, Oxford Univ Press
- Knowledge Management Tools (2018a) Defining Knowledge, Information, Data, accessed in http://www.knowledge-management-tools.net/knowledge-information-data.php
- Knowledge Management Tools (2018) The Different Types of Knowledge, accessed in http://www.knowledge-management-tools.net/different-types-of-knowledge.php
- UNDRR (2015) Sendai Framework for Disaster Risk Reduction, accessed in https://www.ifrc.org/docs/IDRL/Sendai_Framework_for_Disaster_Risk_Reduction_2015-2030.pdf

Part 2 Conceptual Design of the ONEMI Knowledge Management System (KMS) for Disaster Risk Reduction (DRR)

1. General description of the KMS

The KMS is an organizational system that belongs to ONEMI. This System was designed to manage the useful knowledge for DRR, obtained from the external environment and / or from the fulfillment of its essential functions, in order to make it available to organizations, both internal and external to ONEMI, that require such knowledge for their action based on DRR.

In effect, the Knowledge Management System main function consists of managing the knowledge for DRR obtained by the ONEMI's entities, derived from their own actions, making it available to users committed to DRR.

The operation of the Knowledge Management System, that is represented in Figure 2.1.1, is based on the "knowledge" it receives from the ONEMI's entities. Once it is processed by its functions, it transfers that "available knowledge" to the users of the KMS, which in turn, may be the ONEMI's own entities that need to use it as information to generate new knowledge, producing a virtuous circle.

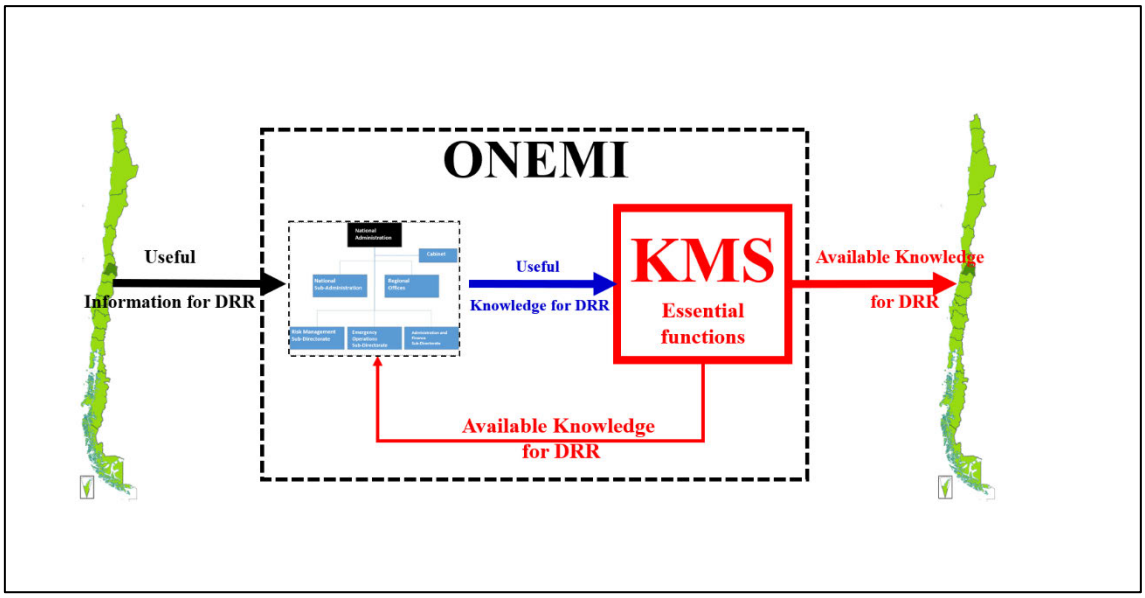

Figure 2.1.1 General diagram of the KMS.

The ONEMI’s entities involved in DRM send reports to the KMS containing specific “knowledge” regarding DRR. This knowledge is obtained as a result of the execution of its essential processes, and it is considered necessary to be managed by the KMS in order to make it available to users engaged in DRR.

These "Knowledge Reports (KR)" sent by the ONEMI’s entities are the inputs for the KMS.

After the KMS receives a KR, a validation stage begins where a knowledge management specialist verifies that the knowledge submitted by the ONEMI’s entities meets the previously defined requirements to be qualified as valid knowledge to be entered and managed by the System. Surely, this activity must be carried out in close coordination with the entity that sent the KR.

As soon as the KR is accepted by the KMS, a processing stage is initiated, in order to verify that the knowledge contained in the report requires it to be processed by one or more of the specific functions associated with knowledge management, namely, Lessons Learned, Human Resource Development, Research and Development, Network Development and Historical Memory. Each of these processes produce a specific report of its own function.

Once the processing activities have been carried out, both the KR and the reports of the specific sub-processes of the functions associated with knowledge management are stored in a database or in the Repository of the KMS, accompanying the evidence that is attached in each case.

Subsequently, the knowledge processed by the System is transferred to the users or stakeholders, through the most suitable information channels. Additionally, a knowledge management specialist from the KMS defines whether it needs to be exhibited and the most convenient mean of doing so.

Carrying out the above activities, the knowledge for DRR is available to users or stakeholders in the different formats that are required, such as, digital files, documentary files, videos, films, photographs, objects, and so forth.

In addition, this knowledge is available both digitally and in other formats, and it is controlled and maintained by the KMS in order to verify its validity and content regarding the usefulness for DRR. Thus, the reuse of knowledge is maintained by users or stakeholders.

2. Systemic approach of the KMS[1]

For the purpose of this work, the definition of "system" from the Royal Spanish Academy Dictionary will be used, that is, "a set of things that are related to each other in an orderly manner contributing to a certain object".

It can also be pointed out that each of the parts that a system contains can be considered as a subsystem, that is, a set of parts and interrelationships that are structurally and functionally within a larger system, and that has its own characteristics. Therefore, subsystems are smaller systems within larger systems. The concepts of suprasystem, system and subsystem implicitly carry the idea of recursion. In this sense, the general properties of the three elements are similar.

The main characteristics of the systems are as follows.

- The whole is greater than the sum of the parts.
- The whole determines the nature of the parts.
- The parts are dynamically interrelated and interdependent on each other.

In general, the main elements of a system are as follows.

- Its input current: The systems, through their input current, receive the energy necessary for their operation and maintenance from the environment. Energy means material, financial, human and information resources.
- Its conversion process: The energy that the system receives from its environment, through the input current, is used for the operation of the processes that allow it to achieve the products or services to fulfill the purpose or objective of the system. The resources are processed by the different subsystems by means of partial transformation functions, to achieve the sub-products, which, processed in turn, in an integrated way, allow the development of the final products of the system.
- Its output current: The output current is equivalent to the products or services that the system delivers to the environment.
- The feedback communication: Feedback communication is the information that indicates how the system is doing in pursuit of its objectives. This information is reintroduced to the system in order to conduct the necessary corrections to be made to achieve its objective. From this point of view, it is a control mechanism built into the system to ensure the achievement of the goals.

[1] George Wilhelm Friedrich Hegel (1770-1831), Bertalanffy, Ludwig Von and others. General Theory of Systems.

Consequently, the systemic approach will be directed towards the definition of the KMS, as an organizational element, considering the organism as a whole, with the characteristics of synergy[2], recursion [3]and entropy[4], in addition to the definition of its larger organizational system (ONEMI) and its subsystems components.

2.1. ONEMI as an organizational system

The National Emergency Office (ONEMI) is a technical body of the State established in the Decree Law No. 369, 1974, dependent on the Ministry of the Interior and Public Security. ONEMI is in charge of planning and coordinating public and private resources for prevention and attention to emergencies and disasters of natural origin or caused by human action, providing to the ministries, provincial governor's offices, governorates, municipalities and Civil Protection bodies at the national, regional, provincial and communal level, models and permanent management plans for the prevention and management of emergencies, disasters and catastrophes.

Moreover, in order to comply with its legal mandate, ONEMI will be responsible for mobilizing, within the parameters established by the State, the resources available from both the public and private spheres, to avoid or mitigate the potential impact of a risk, emergency or catastrophe situation (www.onemi.cl).

To fulfill its mission, ONEMI has human, material and budgetary resources, organized by a functional structure, regulated by the Organic and Functioning Regulations (OFR), which allow the achievement of its essential objectives.

Therefore, ONEMI can be considered as an organizational system, as it possesses the characteristics for this purpose, such as:

- It is an organization that has a set of people with appropriate means that work regulated by rules to achieve a specific purpose.
- It has a common goal that is its mission.
- It belongs to a larger organization.
- It has norms that regulate its operation (Decree Law No. 369, 1974, OFR, among others).
- It has a functional structure determined by dependent organizations.

[2] Synergy: When the sum of the parts is different from the whole and to explain the global behavior of an object, it is necessary to analyze and study all its parts and the relationships between them.

[3] Recursion: For the purposes of this study, we are going to understand that a synergistic object is a "system", which is composed of parts with characteristics such that they are in turn synergistic objects. The system is inserted in another superior one (suprasystem) and can be decomposed in other minor ones (subsystems).

[4] Entropy: The tendency to reach its most probable state, which in the case of social systems is chaos and disorganization. The change from ordered states to more disordered ones is a definite and measurable quantity.

- Dependent organizations are dynamically interrelated and interdependent on each other.

As a result, ONEMI is an organizational system that can be defined with a systemic approach, describing its essential purposes, its essential functions, its main relationships with the suprasystem to which it belongs, its subsystems and the main relationships between the component subsystems.
In Appendix 5.1 of this document, the ONEMI organizational system and the main relationships with the National Civil Protection System (NCPS) are described in detail.
From the analysis of the documents that allow the identification of the essential elements of the ONEMI System and the context in which it operates, it can be concluded that the essence of the organizational system under study is contemplated in its establishing decree, Decree Law No. 369, 1974, of the Ministry of the Interior and in Decree No. 509, 1983, of the Ministry of the Interior that approves the regulations for the application of Decree Law 369, 1974.
Additionally, these fundamental concepts have been ratified in the following documents.

- National Policy for Disaster Risk Management (Decree No. 1.512, 2016, of the Ministry of the Interior and Public Security)
- National Civil Protection Plan (Decree No. 156, 2002, of the Ministry of the Interior; Under-secretariat of the Interior)
- National Strategic Plan for Disaster Risk Management 2015-2018 (Exempt Decree No. 3.453, 2016, of the Ministry of the Interior and Public Security)
- Organic and Functioning Regulations of ONEMI (Exempt Resolution No. 44 dated January 15, 2018, National Director of ONEMI)
- Strategic Plan ONEMI 2019 – 2023

Therefore, after analyzing the documents, and for the purpose of this work, the mission of the ONEMI Strategic Plan 2019 – 2023, published on the ONEMI website, will be used as the essential purpose of the ONEMI System, according to the following text:
"*To Plan, coordinate, organize, advise and supervise the activities of the National Civil Protection System to reduce disaster risk through mitigation, preparedness, warning, response and rehabilitation in order to reduce the loss of life, economic impacts, environmental effects, and to protect livelihoods, contributing to sustainable development.*"
Based on the organizational structure defined by ONEMI in its Organic and Functioning Regulations for the fulfillment of its mission and functions, the following subsystems of the ONEMI System have been identified, as shown in Figure 2.2.1.

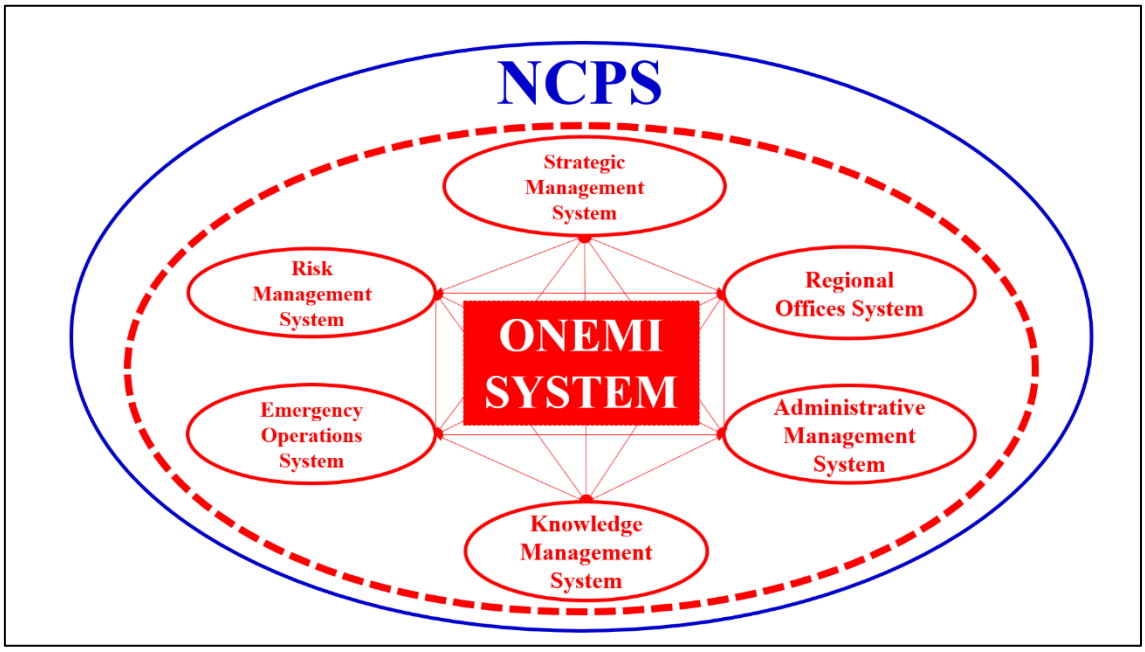

Figure 2.2.1 Component subsystems of the ONEMI System

2.1.1. Strategic Management System (SMS)

The essential purpose of the Strategic Management System is to plan, organize, direct, control and coordinate the execution of actions and the use of resources to achieve the objectives established to fulfill the mission of the ONEMI System.

It is mainly associated with the following functions.

- Strategic planning
- Strategic organization
- Strategic direction
- Strategic control
- Strategic coordination
- Management coordination of Regional Offices
- Management of the National Civil Protection System

In addition, it performs the following management support functions.

- Legal advice
- Internal audit
- Communications
- Broadcasting
- Project management
- Research and development

- Technical and executive secretariat of the Committees for Disaster Risk Management

2.1.2. Regional Offices System (ROS)

The essential purpose of the Regional Offices System is to plan, coordinate and execute activities aimed at prevention, mitigation, warning, response and rehabilitation required by the Civil Protection System in the presence of hazards and emergency situations, disasters and catastrophes at regional, provincial and communal level.

Its actions are mainly associated with specific functions at the regional, provincial and communal level, such as the following.

- Mitigation, Preparedness, Response and Recovery, at regional level
- DRM at regional, provincial and communal level
- Obtaining information related to the phases of Mitigation, Preparedness, Response and Recovery, at regional, provincial and communal level, and submit it to the SMS, RMS and EOS systems, depending on the specific topic, for the transformation of this information into useful knowledge for DRR
- Technical and Executive Secretariat of the DRM Committees, at regional level.
- Proposal of DRM instruments, at regional level
- Management of the National Early Warning System, at regional level

In addition, it performs the following management support functions at regional, provincial and communal level.

- Education, training and coaching in DRR issues
- Broadcasting of information and instructions for DRR

2.1.3. Risk Management System (RMS)

The essential purpose of the Risk Management System is to plan, organize, direct, control and coordinate the actions and resources related to the risk cycle phases of prevention, mitigation and preparedness, which allow the development of capacities for DRR.

It is mainly associated with the following essential functions.

- Mitigation
- Preparedness
- Obtaining information related to the Mitigation and Preparedness phases, and the transformation of this information into useful knowledge for DRR
- Knowledge management for DRR, at the ONEMI System level

2.1.4. Emergency Operations System (EOS)

The essential purpose of the Emergency Management System is to plan, organize, direct, control and coordinate actions and resources related to the risk cycle phases of response and recovery from risk and/or emergency situations.

It is mainly associated with the following functions.

- Response
- Recovery
- Obtaining information related to the Response and Recovery phases, and the transformation of this information into useful knowledge for DRR.
- Management of the National Early Warning System.

In addition, it performs the following management support functions.

- Supply
- Information and communications technology
- Finance

2.1.5. Administrative Management System (AMS)

The essential purpose of the Administrative System is to plan, organize, direct, control and coordinate the actions and resources that allow compliance with the legal regulations associated with the General Bases of the State Administration and the Bases of the administrative procedures that govern the acts of the organs of the State Administration.

It is mainly associated with the following functions.

- Information and Citizen Services Office
- Reception, Coordination and Dispatch of Documents Office
- General services
- Budget
- Accounting
- Treasury
- People management
- People development
- Remuneration

2.1.6. Knowledge Management System (KMS).

The essential purpose of the Knowledge System is to manage and transfer knowledge in disaster risk reduction, through the recovery and broadcasting of historical memory and lessons learned, along with the training of human resources, so that institutions, communities and individuals strengthen the

preventive culture.

It is mainly associated with the following functions.

- Knowledge Administration Function
  - Knowledge Validation Sub-Function
  - Operation Management of the KMS Sub-Function
- Knowledge Processing Function
  - Lessons Learned Sub-Function
  - Historical Memory Sub-Function
  - Human Resource Development Sub-Function
  - Research and Development Sub-Function
  - Network Development Sub-Function
- Knowledge Storage Function
  - Repository Sub-Function
  - Control and Maintenance of the Repository Sub-Function
- Knowledge Transfer Function
  - Knowledge Availability Sub-Function
  - Knowledge Exhibition Sub-Function

In addition, the ONEMI system can be graphed at two levels, as shown in Figure 2.2.2.

- Strategic Level, composed of:
  - Strategic Management System
- Operational Level, composed of the following systems:
  - Regional Offices System
  - Risk Management System
  - Emergency Operations System
  - Administrative Management System
  - Knowledge Management System

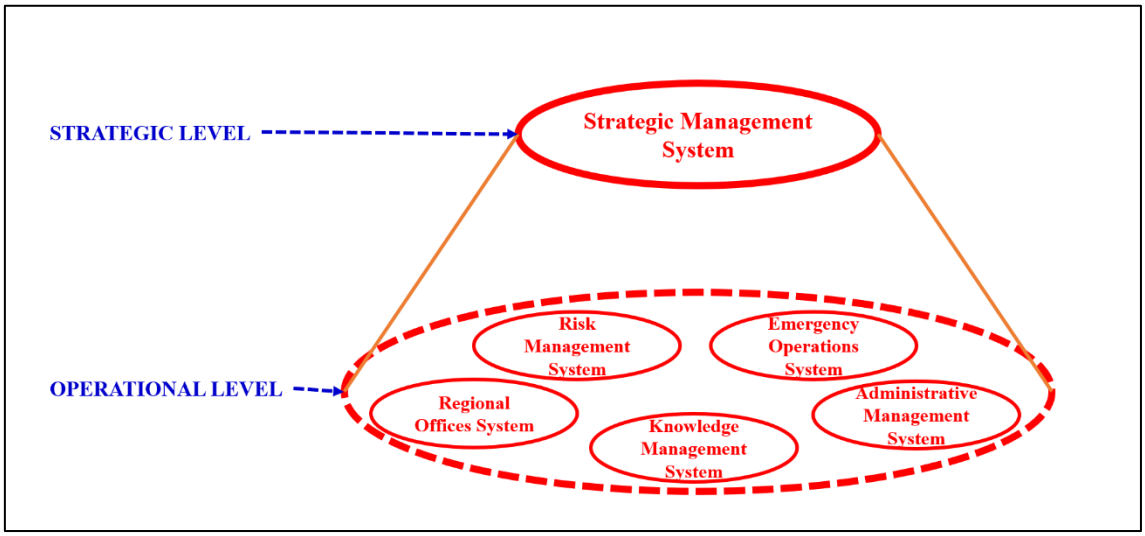

Figure 2.2.2 Component subsystems of the ONEMI System by levels

2.2. Description of the main relationships between the Knowledge Management System and other subsystems of the ONEMI System

The identification and description of the relationships will be conducted from the Knowledge Management System approach with respect to the other subsystems that form the ONEMI system, as shown in Figure 2.2.3.

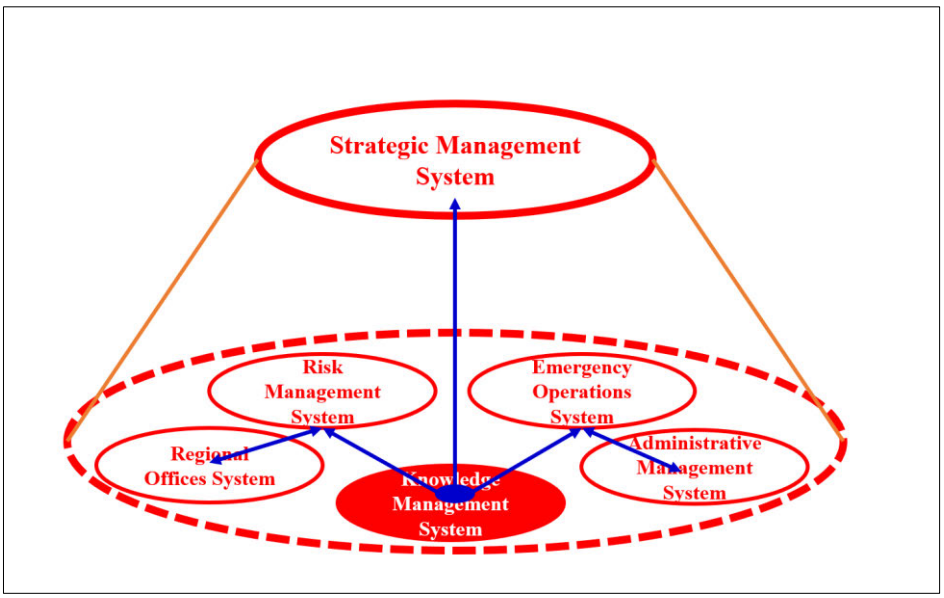

Figure 2.2.3 Approach to the relationships of the Knowledge Management System

Specifically, the areas of knowledge that will be identified are the ones referred, in general, to DRM and, specifically, DRR, that the Knowledge Management System expects to receive as input from the other component systems of the ONEMI System, derived from the essential purpose and the main specific functions of each system. In addition, the areas of knowledge that the Knowledge Management System makes available to each of the other component systems of the ONEMI System will be identified.

For the purpose of identifying the relationships between the KMS and the other systems of the ONEMI System, it should be taken into consideration that the main purpose of the KMS is to manage the "knowledge" referred to DRR that it is received from the other systems, so once it is processed by its essential functions, it transfers to its users, including ONEMI's own systems.

Consequently, the KMS receives reports with "useful knowledge for DRR" from the SMS, RMS and EOS systems related to the topics of their respective functions and which, in the opinion of the specialists, should be processed by the KMS and made available to stakeholders. The KMS processes the knowledge and enters it into the Repository. In addition, through efficient access to the Repository and/or to the means and places of exhibition, the KMS transfers the "available knowledge for DRR" to the same systems for its use and reprocessing, as shown in Figure 2.2.4.

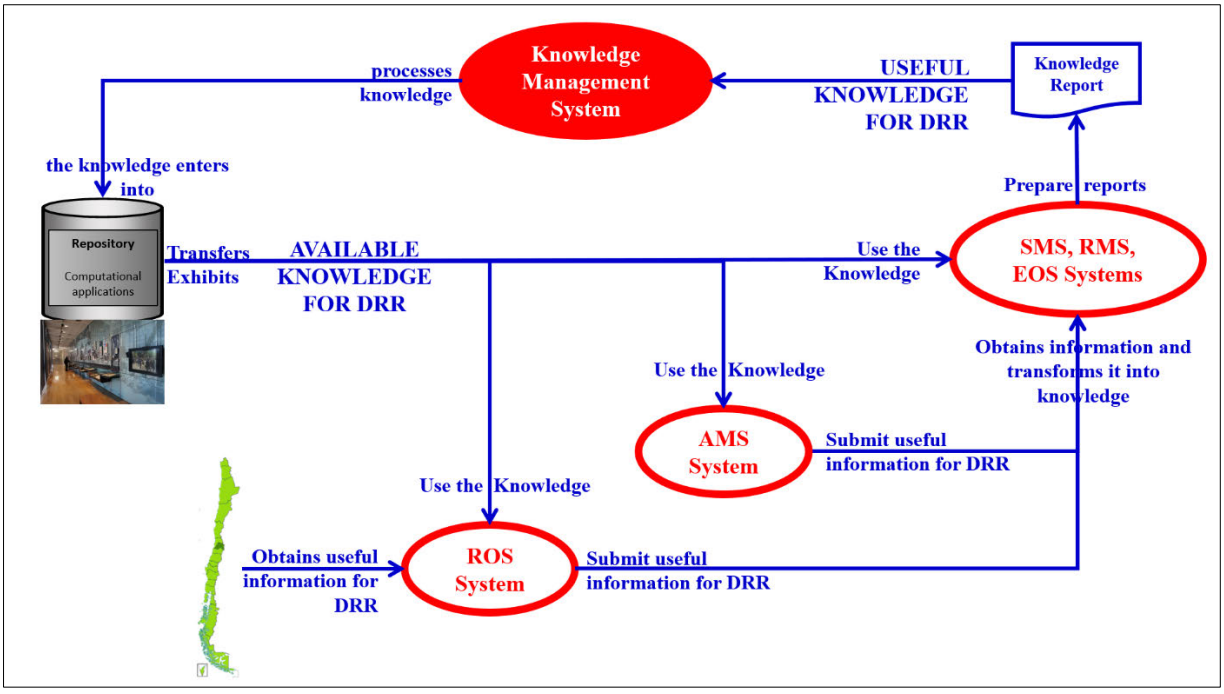

Figure 2.2.4 Relationships of the Knowledge Management System

In the case of the ROS and AMS systems, although in the DRR area they do not interact directly with the KMS, they can be related through the SMS, RMS and EOS systems, providing information from

their specific areas that they consider to be of interest for DRR.

2.2.1. Relationships between the KMS and the SMS, within the scope of the DRR specific functions.

In the area of DRR, the following relationships of the Knowledge Management System with the Strategic Management System have been identified.

- The SMS delivers to the KMS, to be processed and transferred to its stakeholders, reports containing useful knowledge for DRR related to specific topics of its essential purpose, such as the following.
    - The regulatory framework for Disaster Risk Management in force
    - The National Policy for Disaster Risk Management in force
    - The Disaster Risk Management instruments in force, such as:
        - National Civil Protection Plan
        - National Strategic Plan for Disaster Risk Reduction
        - National Emergency Plan
        - Procedures for the elaboration, application and monitoring of the Provincial and Communal Plans for Disaster Risk Reduction
        - Procedures for the elaboration, implementation and monitoring of the Provincial and Communal Emergency Plans
    - The coordination of the National Civil Protection System
    - The Technical and Executive Secretariat of the Committees for Disaster Risk Management
    - The management of the National Early Warning System
    - The education, training, and coaching in DRR issues regarding the National Civil Protection System
    - The communications and broadcasting of DRR topics regarding the National Civil Protection System
    - The project management related to DRR topics
    - The research and development related to DRR issues
- In turn, the KMS makes available to the SMS the useful knowledge for DRR related to all the phases of the risk cycle, through efficient access to the Repository of the KMS and/or to the means and places of exhibition.

2.2.2. Relationships between the KMS and the RMS, within the scope of the DRR specific functions

In the area of DRR, the following relationships of the Knowledge Management System with the Risk Management System have been identified:

- The RMS delivers to the KMS reports containing useful knowledge for DRR related to specific topics of its essential purpose, to be processed and transferred to its stakeholders, such as the following.
    - Mitigation Phase, which includes measures aimed at reducing existing risks, avoiding the generation of new risks and limiting the adverse impacts or damage caused by hazards
    - Preparedness Phase, which involves the capacities and skills that are developed to anticipate, respond and recover in a timely and effective manner, from the impacts of imminent or present emergencies
    - Alert, which constitutes a stage of the Preparedness Phase, and a state of permanent monitoring and attention. At the same time, it will be a state declared when the probable and near occurrence of an adverse event is noticed, in order to take precautions and disseminate them.
    - Education, training and coaching in DRR issues
- In turn, the KMS makes available to the RMS the useful knowledge for DRR related to all the phases of the risk cycle, through efficient access to the Repository of the KMS and/or to the means and places of exhibition.

2.2.3. Relationships between the KMS and the EOS, within the scope of the DRR specific functions.

In the area of DRR, the following relations of the Knowledge Management System with the Emergency Operations System have been identified.

- The EOS delivers to the KMS reports containing useful knowledge for DRR related to specific topics of its essential purpose, to be processed and transferred to its stakeholders, such as the following.
    - Response Phase, which corresponds to emergency response activities that are conducted immediately after the event occurs. The objective of these activities is to save lives, reduce the impact on the affected community and reduce losses.
    - Recovery Phase, which are the actions aimed at reestablishing normal living conditions through the stages of rehabilitation and reconstruction of the affected area, avoiding the reproduction of pre-existing risk conditions. Thus, the stages in the Recovery Phase are as follows:

        - Rehabilitation, consisting of the short-term recovery of basic services and the beginning of the repair of physical, social and economic damage in the affected area, during the transition period between the completion of response actions and the beginning of reconstruction actions
        - Reconstruction, consisting of the medium- and long-term repair or replacement of damaged infrastructure and the restoration or improvement of production systems
- In turn, the KMS makes available to the EOS the useful knowledge for DRR related to all the phases of the risk cycle, through efficient access to the Repository of the KMS and/or to the means and places of exhibition.

2.2.4. Relationships between the KMS and the ROS, within the scope of the DRR specific functions

In the area of DRR, this system has the important function of obtaining information regarding events related to disasters, from the municipalities, provinces and regions, as well as, of submitting said information to the other systems (SMS, RMS and EOS) to be transformed into knowledge. From these systems, the information can be sent to the KMS for processing, through knowledge reports.

In this context, the following relationships between the Knowledge Management System and the Regional Offices System, through the SMS, RMS and EOS systems, have been identified:

- The ROS obtains information on disaster events from the communes, provinces and regions, and sends it to the SMS, RMS and EOS systems, depending on the specific issues respectively. The systems transform the information into knowledge and send it to the KMS to be processed and transferred to its stakeholders, through reports containing useful knowledge for DRR. The ROS obtains information related to specific topics of its essential purpose, such as the following:
    - The phases of the risk cycle (Mitigation, Preparedness, Response and Recovery) at the regional, provincial and communal levels
    - The Technical and Executive Secretariat of the Committees for Disaster Risk Management, at the regional level
    - The Disaster Risk Management instruments, at the regional level
    - The National Early Warning System, at the regional level
    - The education, training, and coaching in DRR issues, at the regional level
    - The broadcasting of information and instructions for DRR, at the regional level
- In turn, the KMS makes available to the ROS the useful knowledge for DRR related to all the phases of the risk cycle, through efficient access to the Repository of the KMS and/or to the means and places of exhibition.

2.2.5. Relationships between the KMS and the AMS, in the scope of the DRR specific functions

In the case of the AMS, this system, due to its functions in the administrative area, does not have a direct relation with the KMS regarding DRR issues. However, in case there is a need to send information from that area, that it is considered convenient to be processed by the KMS, it should be done through the other systems (SMS, RMS and EOS), depending on the specific area that deals with the information.

In turn, the KMS makes available to the AMS the useful knowledge for DRR related to all the phases of the risk cycle, through efficient access to the Repository of the KMS and/or to the means and places of exhibition.

3. KMS operating model

The operation of an organizational system is determined by the set of processes that are required to be conducted to achieve the products defined in the specific functions established in the essential purposes of the System. In turn, processes are the set of activities and tasks that must be performed to transform inputs into products.

Therefore, the operating model of the KMS will be determined based on three elements.

- The process-based approach of the KMS
- The functional systemic approach of the KMS
- The Expanded model of the operation of the KMS

3.1. Process approach of the KMS

The principle of the "process-based approach" maintains that an outcome is most efficiently achieved when activities and resources are managed as a process.

For the purpose of this work, the definition of process, established by ISO 9001:2015 will be used, that is, a set of mutually related or interacting activities, which transform input elements into results.

In this context, the KMS will receive input elements and conduct activities with those elements to transform them into output elements.

Specifically, and in this approach, the following phases are visualized for the ONEMI's KMS as shown in Figure 2.3.1.

- System entry: The input that enters into the KMS is useful knowledge for DRR, which comes from the result of the transformation of information into knowledge in each of the ONEMI's functional systems.
- Process: Within the KMS, the activities of administration, processing, storage and transfer of the available knowledge for DRR will be conducted.
- System output: As a result of the development of the main activities of the KMS, the knowledge regarding DRR is available to users, in the form and means that they require.
- Reuse of knowledge: The available knowledge is reprocessed by the users as information and it is transformed into knowledge, starting again the virtuous process of DRR knowledge management.

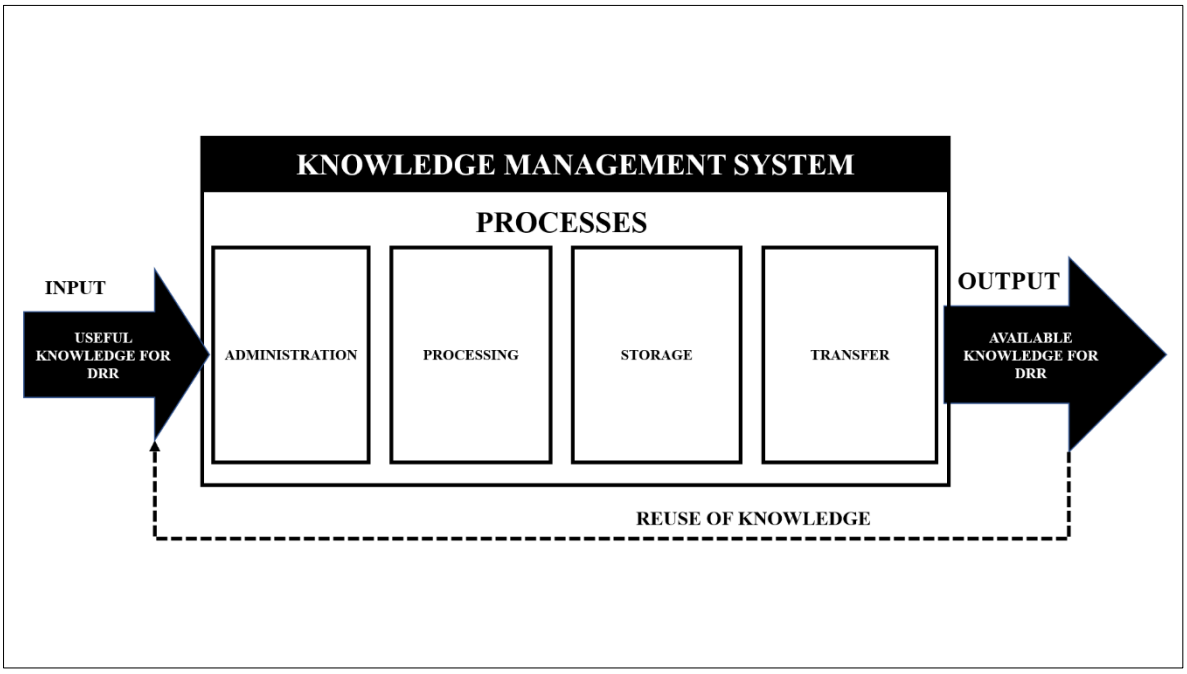

Figure 2.3.1 Process approach of the ONEMI's KMS operating model

3.2. Functional systemic approach of the KMS

Applying the concept of recursion of the systems, the KMS belongs to a larger system which, in this case, is the ONEMI System.

Under the same concept of recursion, the KMS is formed by subsystems with similar characteristics of a larger system, based on main functions.

To determine the component systems of the KMS, the functions of the process approach of the KMS operating model were taken into consideration. In turn, each component system of the KMS is formed by subsystems based on the specific functions required to achieve the KMS products.

Therefore, the systems and subsystems of the KMS that were identified were the following, as shown in Figure 2.3.2.

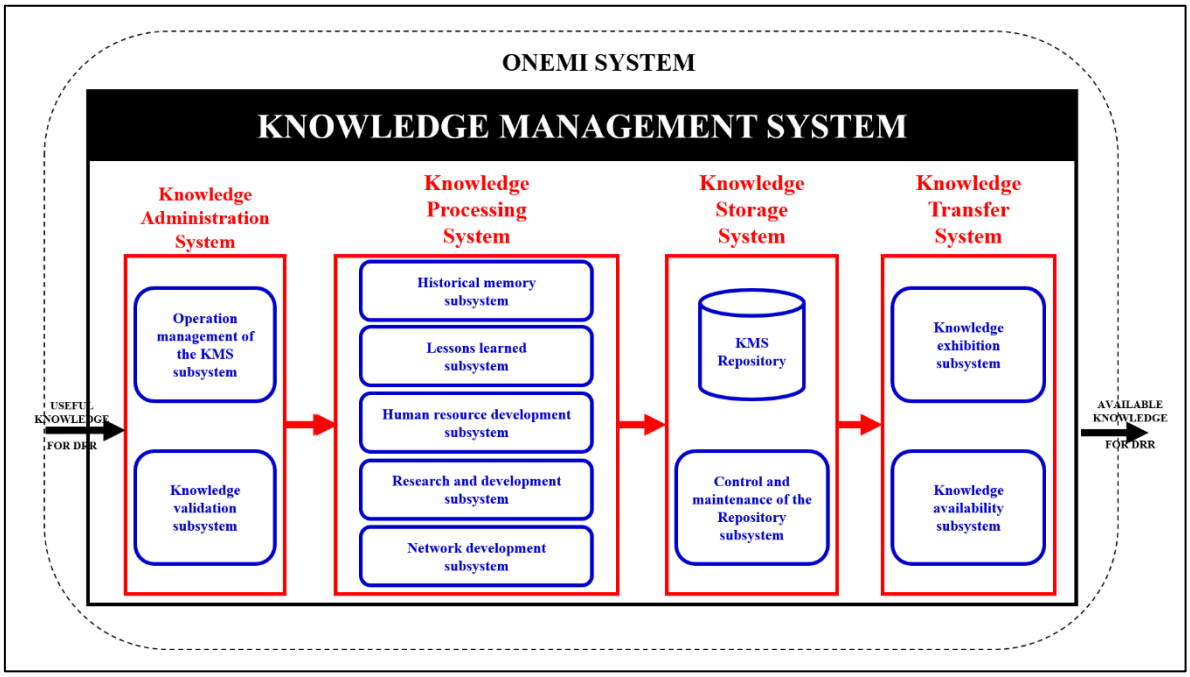

Figure 2.3.2 Component systems of the KMS

- "Knowledge administration" system
  - "Operation management of the KMS" subsystem
  - "Knowledge validation" Subsystem
- "Knowledge processing" system
  - "Historical Memory" subsystem
  - "Lessons Learned" subsystem
  - "Human Resource development" subsystem
  - "Research and Development" subsystem
  - "Network Development" subsystem
- "Knowledge storage" system
  - "Repository" subsystem
  - "Control and maintenance of the Repository" subsystem
- "Knowledge transfer" system
  - "Knowledge Exhibition" subsystem
  - "Knowledge Availability" subsystem

The operation of the KMS with a functional systemic approach is described below.

The KMS receives, as input from the ONEMI's functional systems, reports containing specific "knowledge" regarding DRR, which in the expert judgment of each ONEMI entity, it is estimated to be known by users of the KMS for DRR in their respective areas. This knowledge is obtained as a

product of the execution of the fundamental processes of each entity.

Knowledge reports are received by the "Knowledge Administration" System, through the “Knowledge Validation” Subsystem, where it is verified that the knowledge submitted by the ONEMI’s entities complies with the previously defined requirements, to be qualified as valid knowledge and to be entered and managed by the KMS. This activity must be carried out in close coordination with the entity that sent the knowledge.

Once the knowledge has been validated, the "Knowledge Administration" System sends the received report to the "Knowledge Processing" System to be processed by one or more of the subsystems that form it (Historical Memory subsystem, Lessons Learned subsystem, Human Resource Development subsystem, Research and Development subsystem and Network Development subsystem).

Each of the subsystems develops the activities of its own area, being able to interact with each other, through the "Knowledge Administration" system, which fulfills the function of coordination between the subsystems.

Each of these subsystems prepares a specific report on its function, which is entered into the Repository System, " Knowledge Storage " of the KMS.

The "Knowledge Storage" System is the set of elements (computer applications and equipment, connectivity equipment and programs, administrative procedures and others) that, incorporating information and communications technologies (ICTs), support the integrated operation of the component subsystems of the KMS, allowing to enter, process, store and distribute the knowledge required by users of the KMS regarding DRR.

In addition, the “Knowledge Storage” System has a “Control and Maintenance of the Repository” Subsystem that allows the subsystems to keep the stored knowledge updated and, in turn, verify its validity over time with respect to its usefulness for DRR. In this way, a reusable knowledge is maintained by users or stakeholders.

The "Knowledge Storage" System provides the "Knowledge Transfer" System with the technological elements and stored content that allow transferring to users or stakeholders the knowledge processed and entered by the Subsystems.

The "Knowledge Transfer" System must define the form and channels that best suit the different users or stakeholders through the "Knowledge Availability" Subsystem, for example: web systems, digital files, documentary files, videos, films, photographs, objects and other elements. In addition, through the “Knowledge Exhibition” Subsystem, it must be defined whether it needs to be exhibited and the most convenient means of doing so.

Because of the operation of its systems, the KMS transfers available knowledge to its users or stakeholders to be used in disaster risk reduction actions.

3.3. Operation diagram of the KMS

Considering that the operating model was designed based on the main functions of the KMS, there is a direct relationship between the KMS systems and these main functions, as well as a direct relationship between the subsystems and the KMS processes.

Therefore, the operation of the KMS is determined by the processes that are identified in the main functions of the System, according to the following details, as represented in Figure 2.3.3.

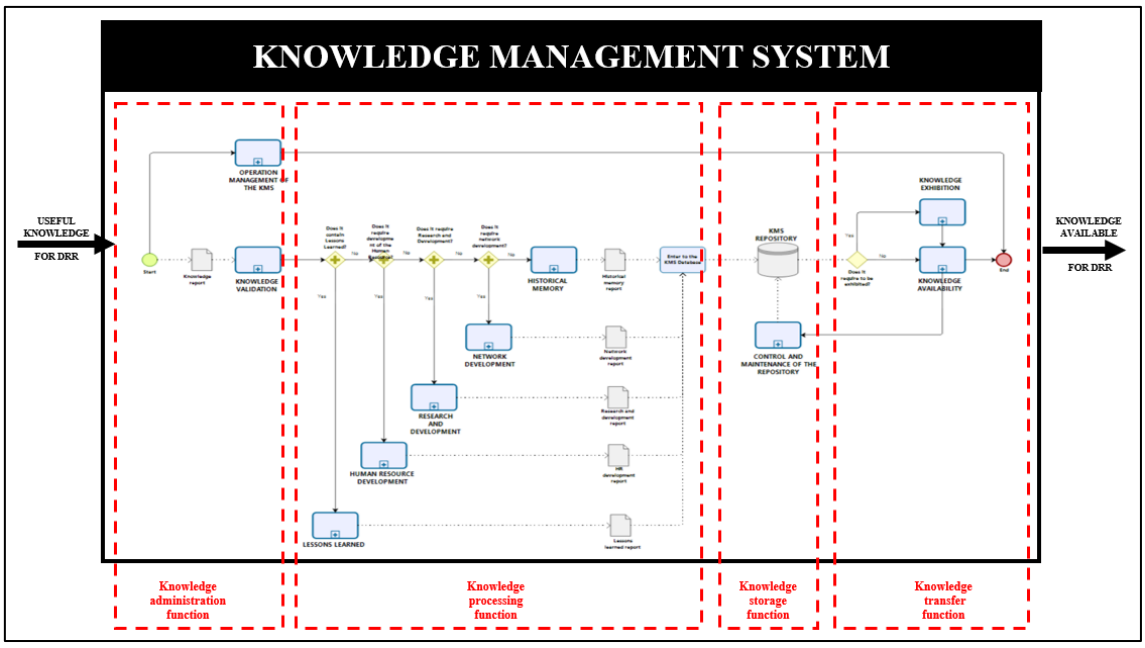

Figure 2.3.3 Processes of the main functions of the KMS

3.3.1. "Knowledge Administration" function

The essential purpose of the "Knowledge Administration" function is to ensure that the knowledge that is entered and processed in the System complies with the requirements defined by ONEMI regarding being useful for DRR.

In addition, the "Knowledge Administration" function is in charge of achieving the proper functioning of the system, becoming the key element to achieve compliance with the objectives of the KMS, in terms of planning, organization, direction, control and coordination of the execution of activities and the use of resources, in all aspects related to the functions of processing, storage and transfer of knowledge of the KMS.

To fulfill its essential purpose, the "Knowledge Administration" function performs the following processes.

3.3.1.1 “Management of the operation of the KMS” process

The essential purpose of this process is to obtain an integrated vision of the performance of the set of competencies and activities that correspond to the main functions of the System, as well as to establish the strategic planning, organization, direction, control and coordination of the same, in perfect harmony with what it is established for the strategic management of ONEMI.

Figure 2.3.4 represents the process " Management of the Operation of the KMS" within the context of the "Knowledge administration" function of the KMS operation scheme.

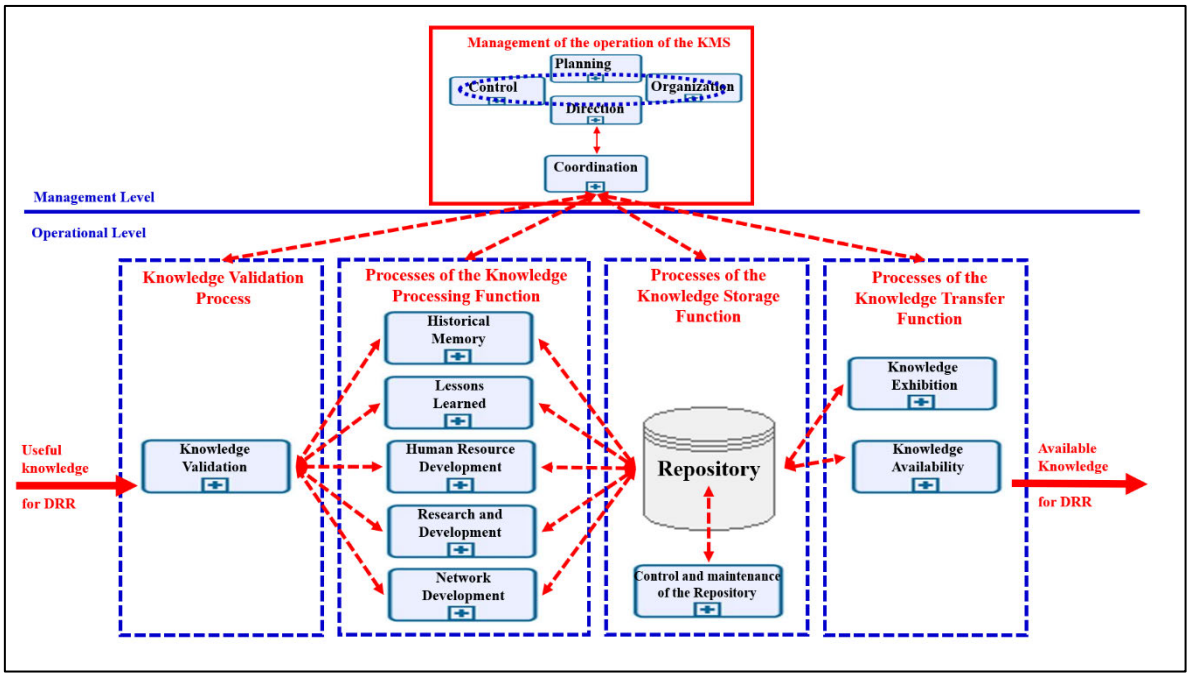

Figure 2.3.4 Diagram of the “Management of the Operation of the KMS” process

3.3.1.2 “Knowledge Validation” process

The essential purpose of this "Knowledge Validation" process is to review the knowledge reports sent by ONEMI’s entities, verifying that they meet the requirements defined to be managed by the KMS.

The activities conducted by the "knowledge validation" process are represented in the diagram in Figure 2.3.5.

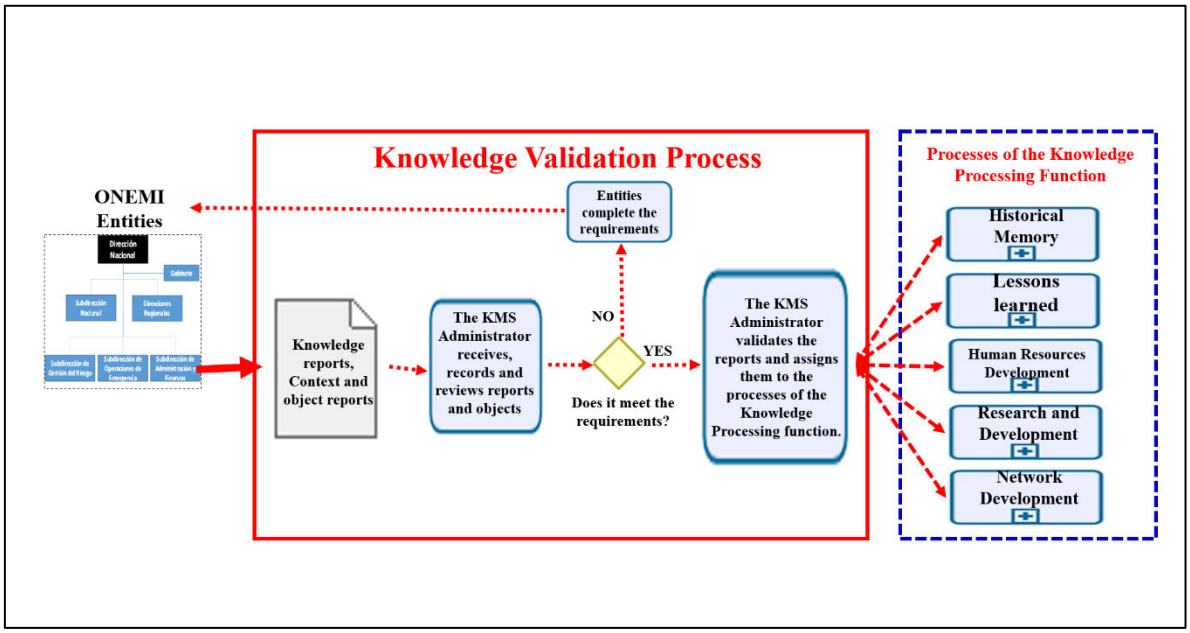

Figure 2.3.5 Diagram of the "Knowledge Validation" process

3.3.2. "Knowledge Processing" function

The essential purpose of the "Knowledge Processing" function is to process the knowledge reports validated by the System Administrator by executing the following processes:

3.3.2.1. "Historical Memory" process

The essential purpose of the "Historical Memory" process is to produce as a final product a Historical Memory Report (HMR) for DRR, which must be entered into the KMS Repository in order to be available for the KMS stakeholders.

The activities conducted by the "Historical Memory" process are represented in the flow diagram of Figure 2.3.6.

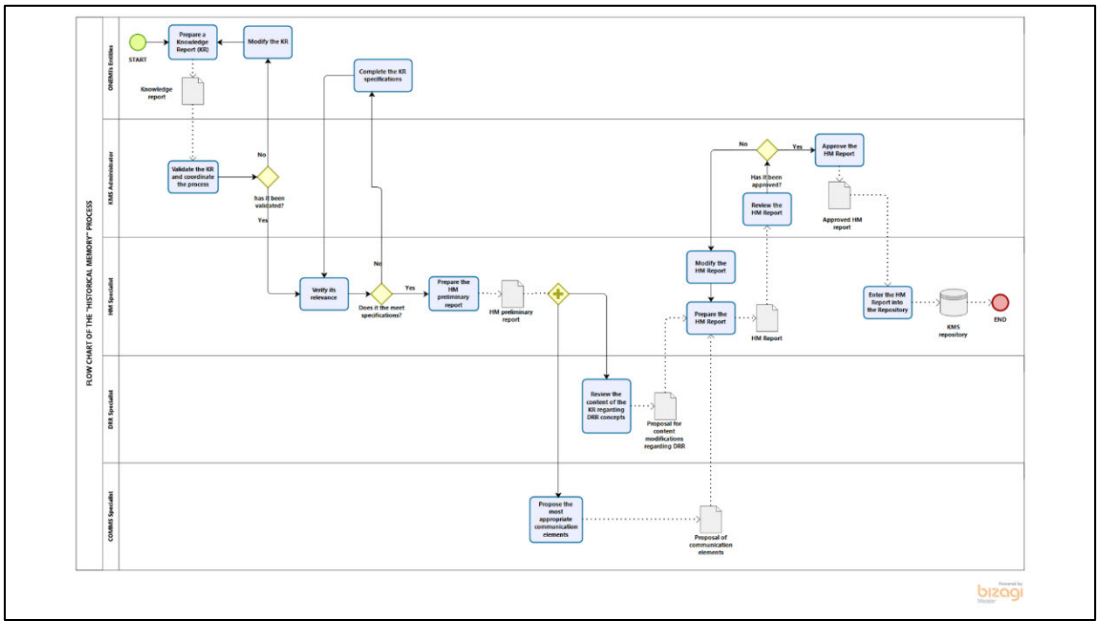

Figure 2.3.6 Flow diagram of the "Historical Memory" process

3.3.2.2 "Lessons Learned" process

The essential purpose of the "Lessons Learned" process is to produce as a final product a Lessons Learned Report (LLR) for DRR, which must be entered into the KMS Repository in order to be available for the KMS stakeholders.

The activities conducted by the “Lessons Learned” process are represented in the flow diagram of Figure 2.3.7.

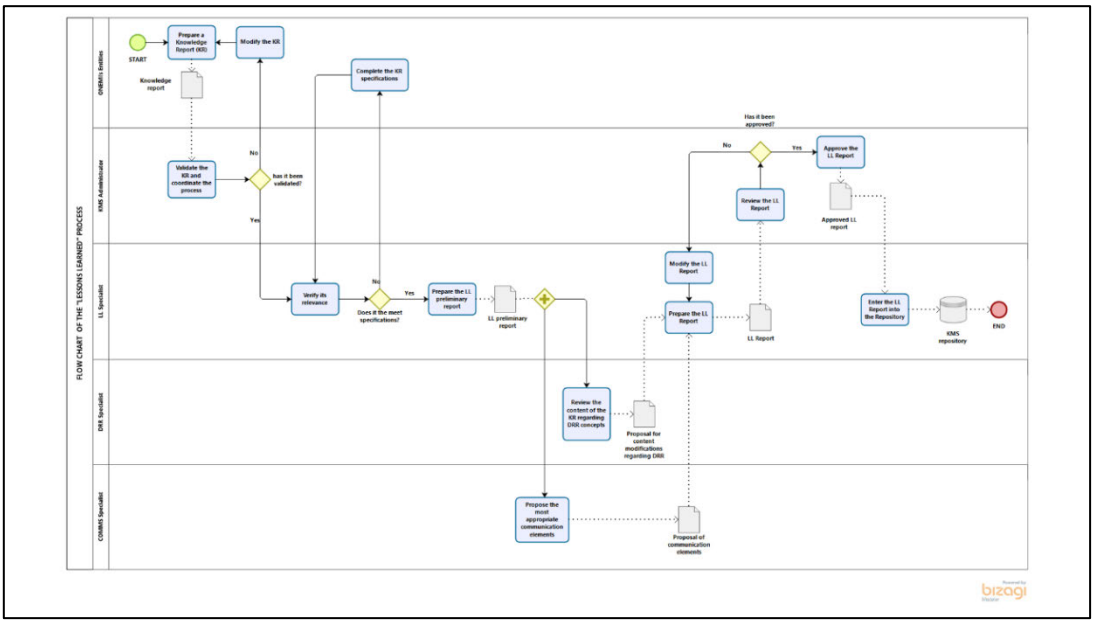

Figure 2.3.7 Flowchart of the "Lessons Learned" process

3.3.2.3 "Human Resource Development" process

The essential purpose of the "Human Resource Development" process is to produce as a final product a Human Resource Development Report (HRDR) for DRR, which must be entered into the KMS Repository in order to be available for KMS stakeholders.

The activities conducted by the "Human Resource Development" process are represented in the flow diagram of Figure 2.3.8.

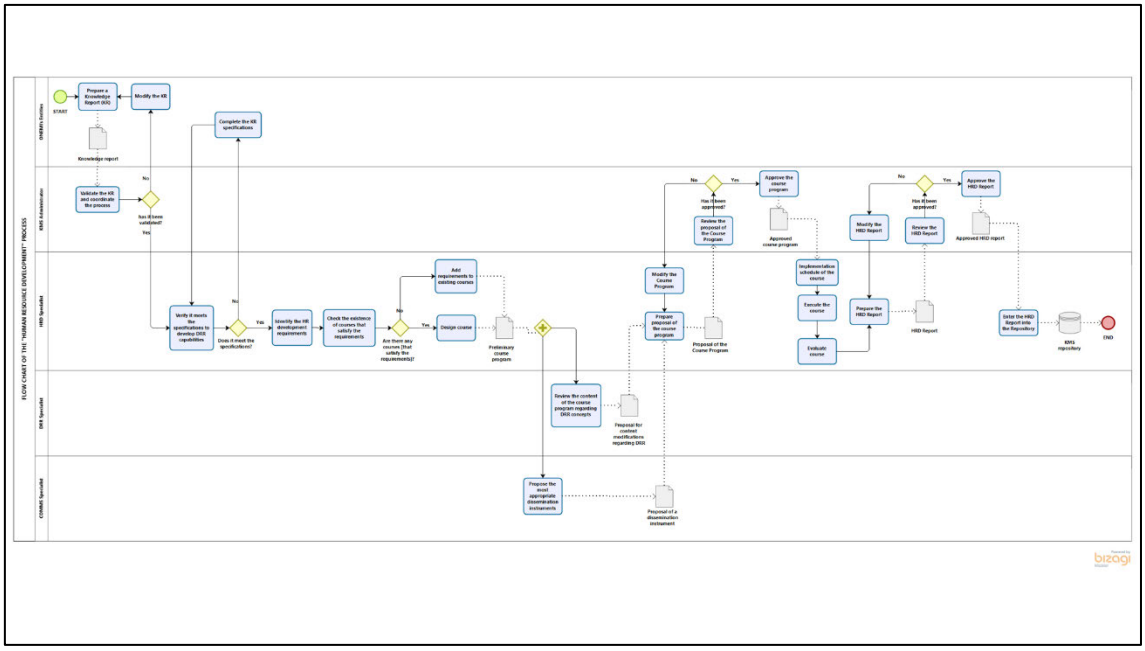

Figure 2.3.8 Flow diagram of the "Human Resource Development" process

3.3.2.4 "Research and Development" process

The essential purpose of the "Research and Development" process is to produce as a final product a Research and Development Report (RDR) for DRR, which must be entered into the KMS Repository in order to be available for KMS stakeholders.

The activities conducted by the “Research and Development” process are represented in the flow diagram in Figure 2.3.9.

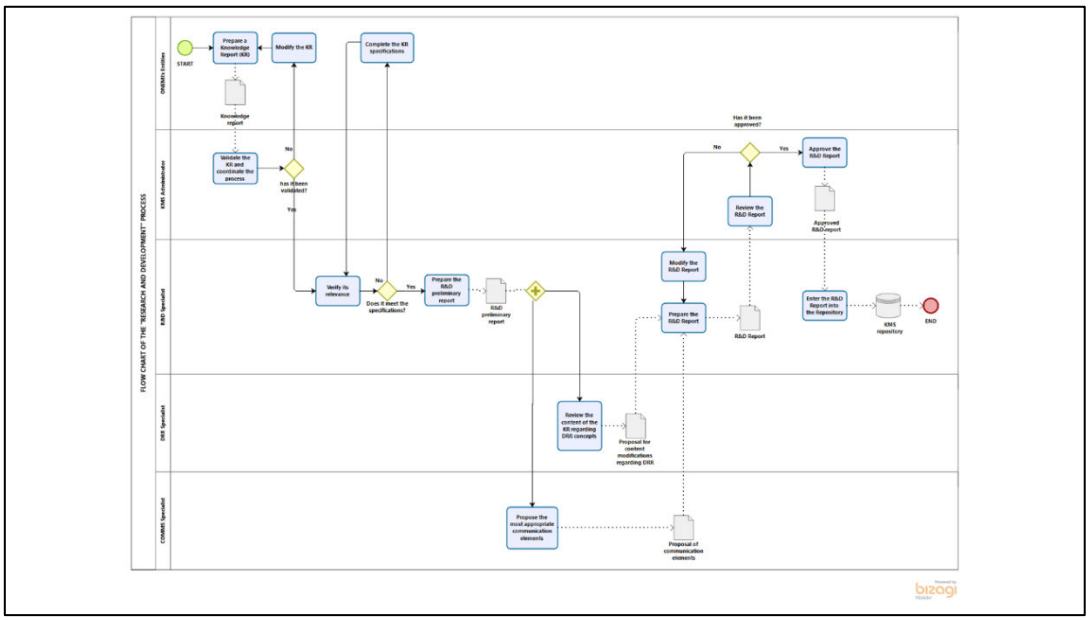

Figure 2.3.9 Flow diagram of the "Research and Development" process

3.3.2.5 "Network Development" process

The essential purpose of the "Network Development" process is to prepare as a final product a Network Development Report (NDR) for DRR, which must be entered into the KMS Repository in order to be available for KMS stakeholders.

The activities conducted by the "Network Development" process are represented in the flow diagram of Figure 2.3.10.

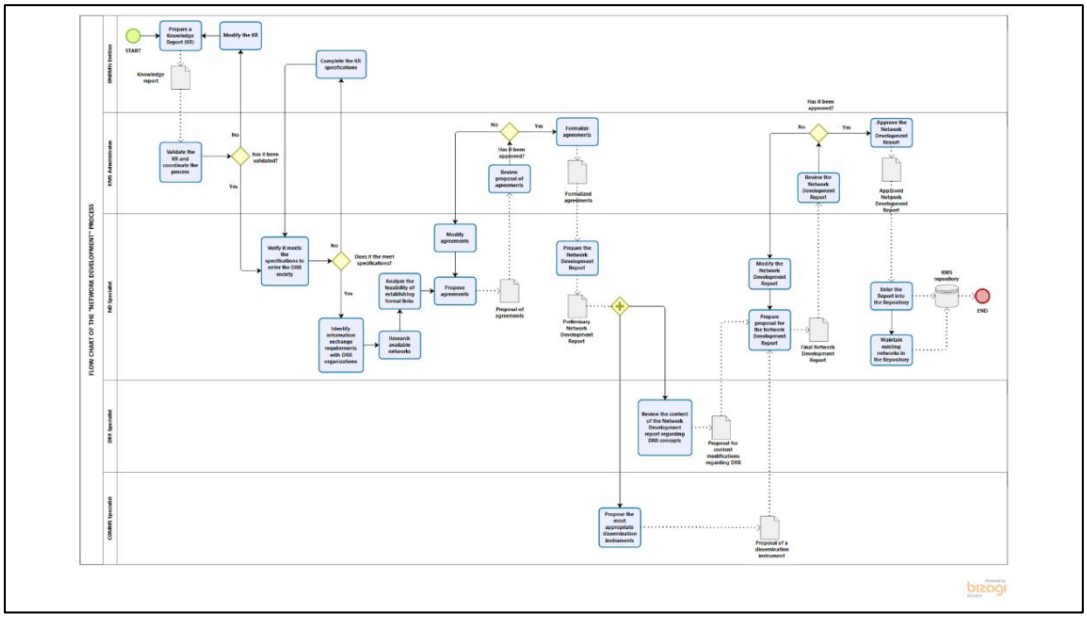

Figure 2.3.10 Flow diagram of the "Network Development" process

3.3.3. "Knowledge Storage" function

The "Knowledge Storage" function is related to the development of computer applications and databases that allow gathering and storing the relevant information generated as a result of the execution of the processes of the main functions of the KMS.

The technical specifications, both for the computer applications and for the databases required, should be defined on the basis of the functional specifications formulated for each of the main functions of the KMS.

3.3.3.1. KMS Repository

The concept of "KMS Repository" is to be understood as an information system consisting of a set of administrative procedures, processes, computer applications and technological support that allows collecting, preparing, storing, retrieving and presenting the relevant knowledge resulting from the main processes of ONEMI's Knowledge Management System for Disaster Risk Reduction.

In this context, the essential purpose of the Repository is to provide the IT support required for the functioning of the essential processes of the KMS, under a common operational environment of ONEMI's technological platform, as shown in Figure 2.3.11.

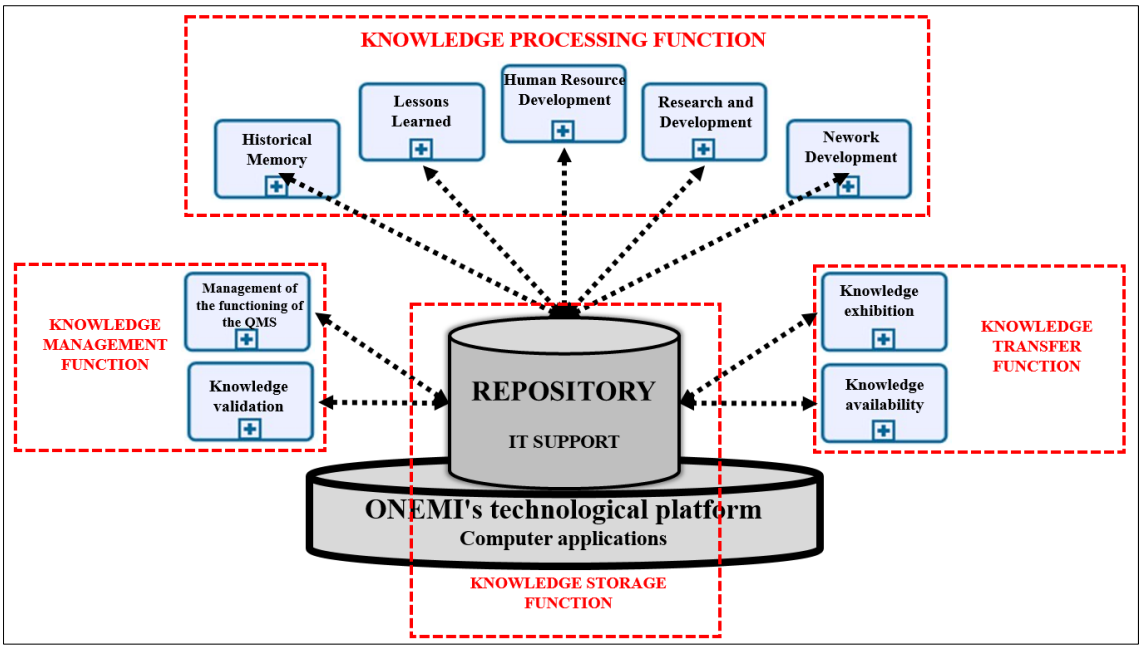

Figure 2.3.11 IT support as an essential purpose of the KMS repository

3.3.3.2. "Control and Maintenance of the Repository" process

The purpose of this stage is to regularly review and update the knowledge content stored in the Repository's functional databases, as changes or innovations occur, as well as to perform management

control by generating statistics on the use of the knowledge made available to the stakeholders, in order to estimate the contributions of the system's knowledge management. The scheme is shown in Figure 2.3.12.

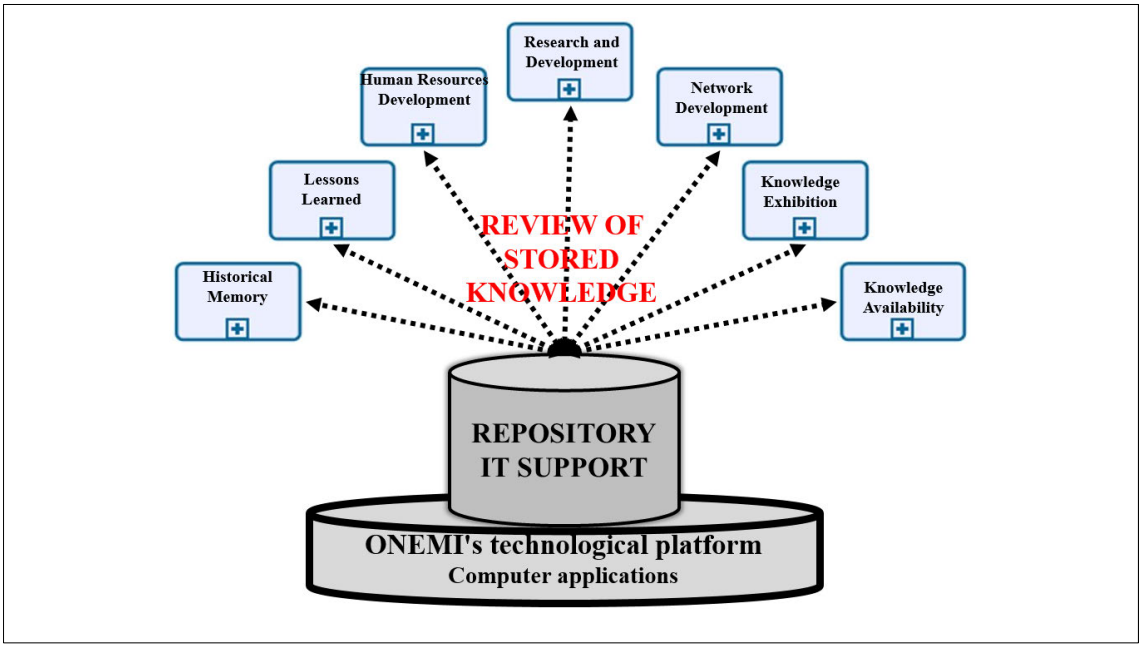

Figure 2.3.12 Diagram of the process "Control and Maintenance of the KMS Repository"

Those responsible for the main processes of the KMS (Historical Memory, Lessons Learned, Human Resource Development, Research and Development, Network Development, Knowledge Exhibition and Knowledge Availability) must periodically review the knowledge stored in the computer applications of their respective functional areas, in order to detect errors, obsolescence, need to complete information, make knowledge interrelationships or other modifications required to update the knowledge available to KMS users.

3.3.4. "Knowledge Transfer" function

The essential purpose of the "Knowledge Transfer" function is to transfer the available knowledge stored in the Repository to the users or stakeholders of the KMS, so that it can be used in disaster risk reduction actions.

The "Knowledge Transfer" function should define the form and means that best suit the different users or stakeholders, such as, for example, web systems, digital files, documentary files, videos, films, photographs, objects and other elements. It should also define whether the available knowledge needs to be exhibited and the most convenient means to do so.

To fulfill its essential purpose, the "Knowledge Transfer" function performs the "Knowledge Availability" and "Knowledge Exhibition" processes.

3.3.4.1. "Knowledge Availability" process

The essential purpose of the "Knowledge Availability" process is to facilitate access to the knowledge stored in the Repository to the users or stakeholders of the KMS, as well as, to promote and encourage the use of this available knowledge in Disaster Risk Reduction actions.

To fulfill its essential purpose, the "Knowledge Availability" process performs the following activities, which are represented in the scheme of Figure 2.3.13.

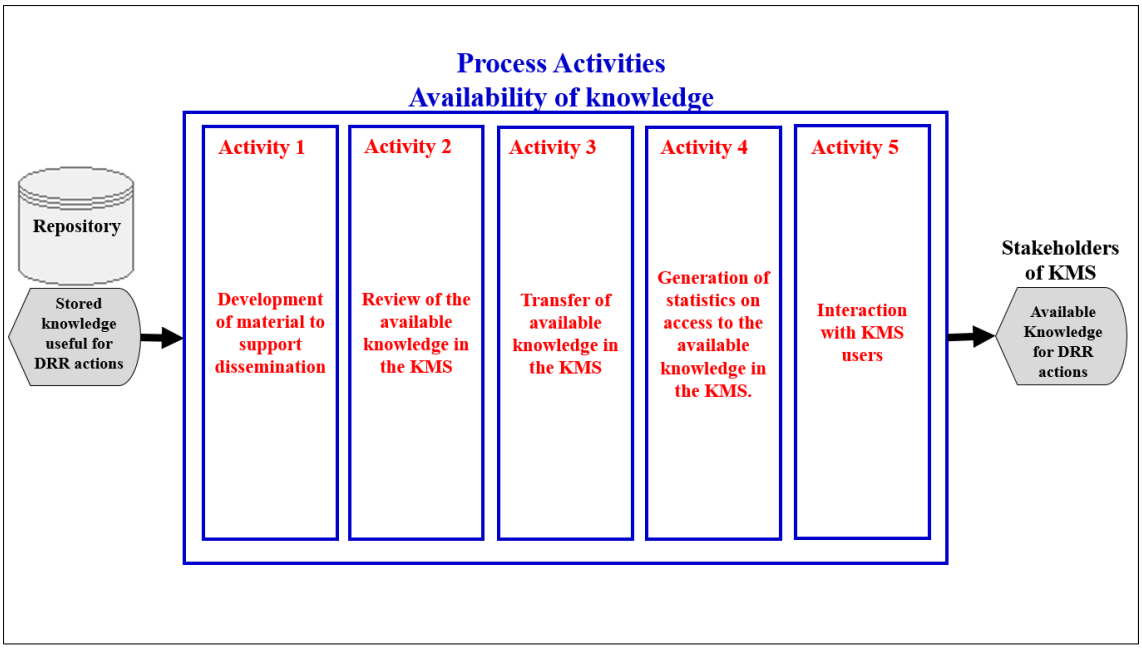

Figure 2.3.13 Main activities of the "Knowledge Availability" process

3.3.4.2. "Knowledge Exhibition" process

The essential purpose of the "Exhibition" process is to preserve, communicate, and exhibit, for purposes of study, education, and contemplation, the sets and collections of elements with historical value and of interest for DRR, which allow transmitting to the stakeholders of the KMS the experience and lessons learned from the events that occurred, also fulfilling the objective of remembering a specific aspect of the disaster by preserving some vestige of it.

In this context, places, images and artifacts are considered, which reproduce interpretations of past history and at the same time contribute to the transformation of memories through the ritual repetition of symbols, discourses and aesthetics, which allow to provoke the memory and thus preserve a fragment of the past. This serves as a tool for educating the population.

To fulfill its essential purpose, the EXHS must perform the following tasks, which are depicted in the schematic in Figure 2.3.14:

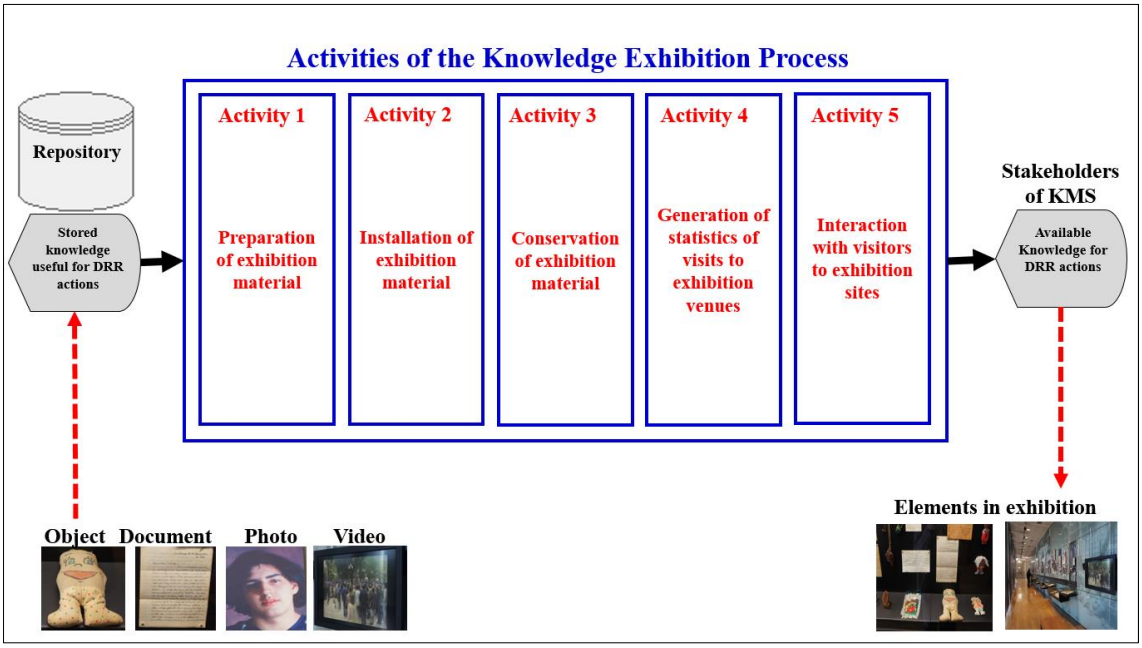

Figure 2.3.14 Main activities of the "Knowledge Exhibition" process

In Appendix 5.1 of this document, the functions and processes of the KMS operating model are described in detail.

In addition, in the development of the conceptual design of the Knowledge Management System, the application of the activities of the Historical Memory process was considered to 4 disaster events that occurred in Chile, selected from a list prepared by the JET Team during the development of the project. Appendix 5.2 of this document describes the result of applying the Historical Memory process.

3.4 Expanded model of the operation of the KMS

As a way to contextualize the KMS within the scope of ONEMI and the National Civil Protection System, an expanded model diagram was developed, which will be shown based on the process approach of the KMS operating model, as shown in the Figure 2.3.15, and it will focus on incorporating the process of generating useful knowledge inputs for DRR that must be conducted by ONEMI's entities, in their capacity as internal suppliers of the KMS:

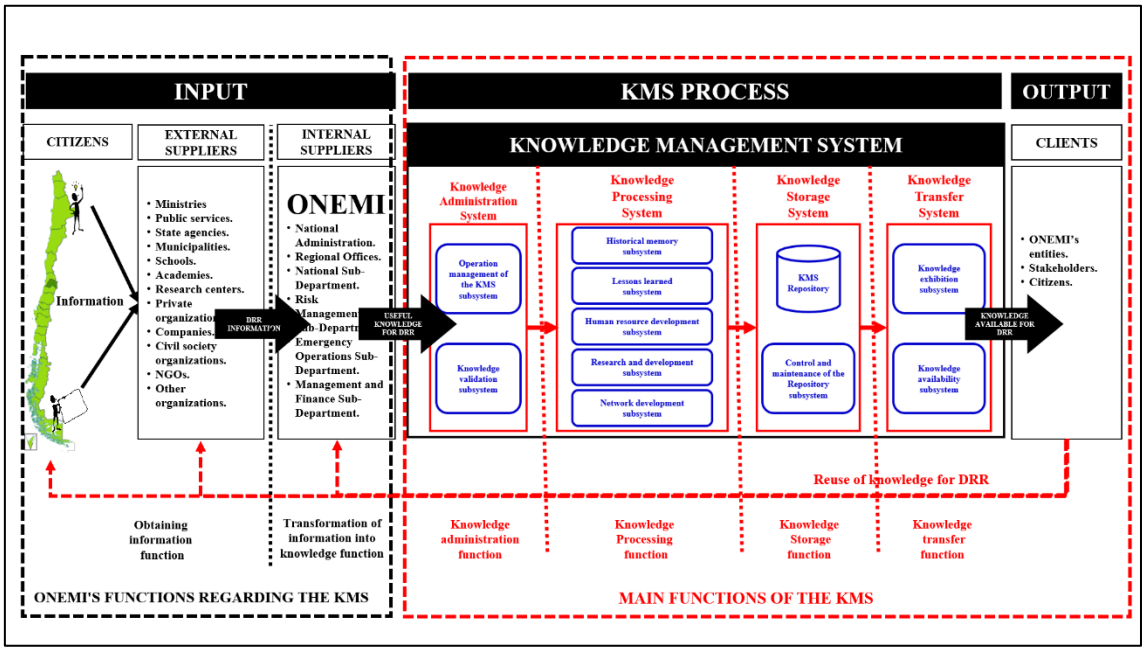

Figure 2.3.15 Expanded model of the operation of the KMS

These ONEMI's entities receive information from their external providers through different means, both from state and private organizations, municipalities and others, as well as from the population of any part of the country, regarding the events of disasters that have occurred.

The ONEMI's entities conduct the process of transforming the information received from their external providers into useful knowledge for DRR and, in the opinion of the specialists, qualified as necessary to be processed by the KMS.

The function of obtaining information regarding disaster events that have occurred and the function of transforming said information into useful knowledge for DRR are functions of ONEMI's scope of action; although, they were not considered as functions of the KMS. Nevertheless, they are very important for the KMS since they provide the main input for its operation.

The inputs of the KMS are the "knowledge reports" that are received from internal providers, that is, from ONEMI's entities.

As a product of the processes of the specific functions, the KMS provides users or stakeholders with available knowledge that, as defined by ONEMI's specialized entities, can be used for DRR. Additionally, this available knowledge can be reused by both internal providers and external providers, in order to generate new information and new knowledge for DRR, initiating the virtuous circle of knowledge management.

Moreover, the operation diagram of the KMS can be represented within the expanded model in the context of the actions of ONEMI and the National Civil Protection System, as shown in Figure 2.3.16:

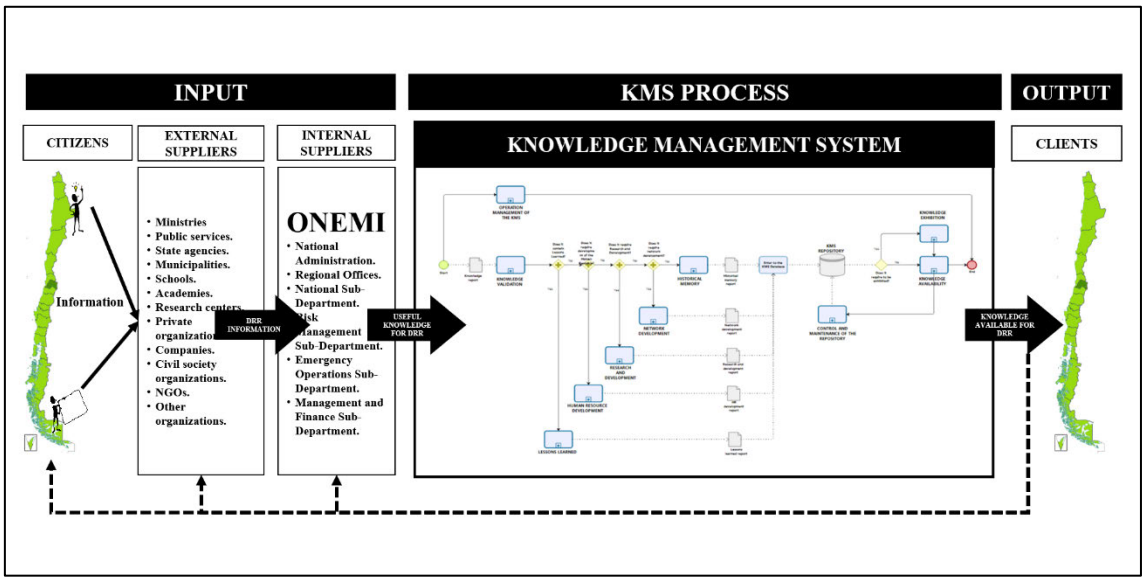

Figure 2.3.16 The operation diagram of the KMS in the extended model

4. Organizational design of the KMS

4.1. Organizational design concept[5]

The concept of "Organizational design or redesign" falls within the "organization" function of an entity's management system. Specifically, within the concept of organizational analysis, which is the process by which managers construct, evaluate or modify the formal organization of an entity in order to facilitate the performance of the tasks and activities necessary to achieve the objectives established to meet with the mission.

To understand the concept of organizational design in a better way, the following considerations should be considered.

- Organizational design is a management process: The organization's management has the ability to make decisions about certain aspects of its operation, with a clear purpose of influencing it.
- The content of the organizational design is to act on the formal organization: Managers have design parameters or variables that constitute basic elements of the formal organization to influence its operation.
- Organizational design is developed on a specific context: It is conditioned by the existing context and necessarily guided by the objectives and strategies of the organization.
- The purpose of the organizational design is organizational efficacy and efficiency: Facilitate the achievement of the mission and objectives of the organization (Efficacy), as well as allow them to be obtained with the least possible use of resources (Efficiency).
- Organizational design is a dynamic process: The activity includes the construction, evaluation and modification of the formal organization over time.

The usefulness of properly designing or redesigning an organization lies in the following ideas:

- It constitutes a mechanism of influence that allows management to change the behavior models of an organization, being able to have a great impact on its operation.
- A proper design can be one of the key factors in the long-term success of the organization by providing it with a competitive advantage.
- It introduces rationality into the organization, so that a properly designed organization tends to be more efficient for the following reasons:
    - The lines of authority and responsibility are clearly identified.
    - The organization differentiates its activities in such a way that they are executed effectively and efficiently thanks to the division of labor introduced.

[5] Organizational design of the company, J.M. De la FUENTE and others

- The communication process is efficiently built, so that the information needed by decision makers is provided with accuracy, efficiency and promptness.
- The formal structure allows deviations in behavior and, in fact, recognizes the need for the informal structure.
- The structure allows adequate decentralization and complexity so that the organization can respond to contingencies in the environment.
- Effective structures help reduce or eliminate situations in which a task or function important to the achievement of objectives is not performed, or is performed by more than one internal unit to the detriment of efficiency.

Organizational design involves trying to establish relationships and create a more appropriate structure that allows achieving the established objectives.

As a consequence of this design process, the formal organization appears aiming at facilitating the resolution of problems and improving the results of the operation of the entity, which must be established in the Organic and Functioning Regulations (OFR).

Organizational design seeks to achieve coherence between the mission or essential purpose, the organizational structure and the processes, as shown in figure 2.4.1.

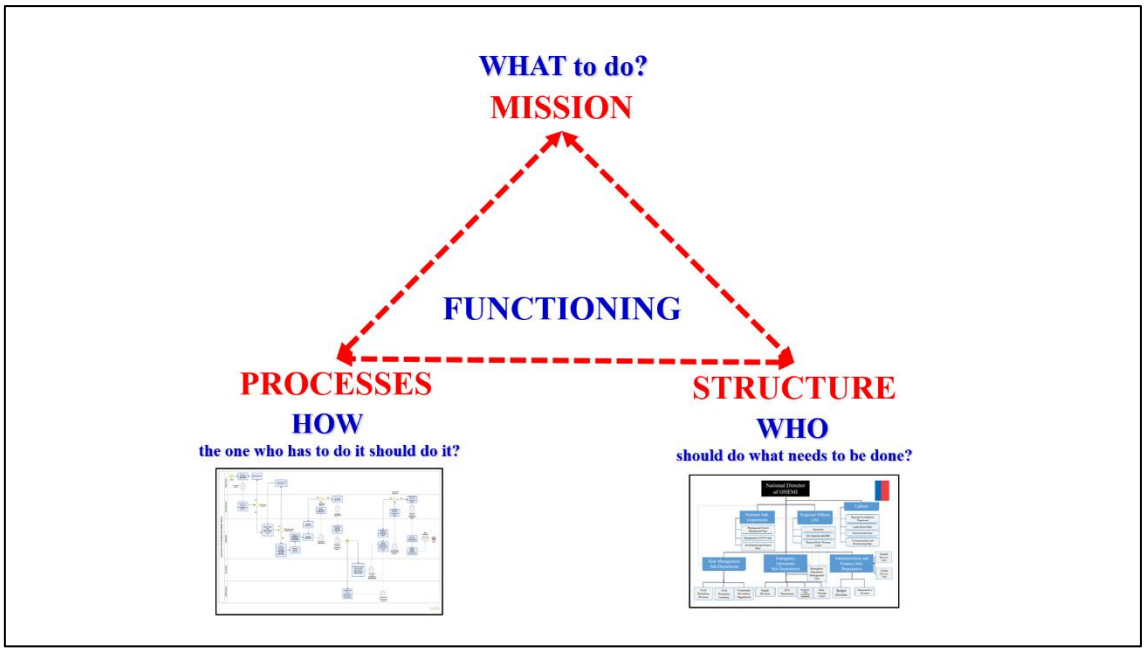

Figure 2.4.1 Coherence between the mission, structure and processes

- The “what to do”, that is, the fundamental missions and tasks of the organization.
- The “who should do what needs to be done”, that is, the organizational structure and the

missions of the dependent units.

- The “how the one who has to do it should do it”, that is, the processes and procedures.

4.2. Mission and fundamental tasks of the KMS[6]

The mission is the fundamental statement that gives the organization its constitutive character and, consequently, its action.

The text of the mission must be written in a generic way focused on the essential purpose of the entity. The mission must be established by the corresponding upper level and the text that is written for each of the subordinate units; whatever the level in the organizational structure, it must meet the requirements of correctness, clarity, accuracy, conciseness and permanence.

For the mission to be well defined, it must meet three criteria:

- Inclusion: this criterion is concerned with ensuring that the mission of the organization is oriented towards carrying out the mission of the upper level, that is, that it contributes to it.
- Complementarity: this reinforces and completes the other missions of its level, generating a strong relationship of interdependence between the different bodies that form the organization, this requires that the performance of the work of some depends largely on the result of the work of others. These dependency relationships are part of an extensive network of activities, which are verified in the processes, which collect the internal client - provider relationships that exist between the different missions distributed in the subordinate organizations.
- Coherence: this criterion is what ensures that the entire process of deploying and distributing the mission into the missions for subordinate entities is conducted in a coordinated manner throughout the organization, ensuring that said missions are aligned with the direction set by the upper level to fulfill the mission of said organization.

The specific functions or fundamental tasks of the entity are understood as elements that allow establishing the specific scope of the mission.

The essential purpose of the Knowledge Management System is to manage the knowledge for disaster risk reduction that the ONEMI’s entities acquire and that are derived from their actions to make it available for users committed to DRR.

The operation of the KMS is based, initially, on the "knowledge" it receives from ONEMI’s entities, so that once it has been processed for its essential functions, it transfers that "available knowledge" to the users of the System, who in turn, might be ONEMI's own entities that require to use said knowledge as information to generate new knowledge, producing a virtuous circle.

Consequently, the Knowledge Management System has been assigned with the following mission:

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[6] STRATEGIC PLANNING IN PUBLIC SERVICES, Methodological Guide Series, Interministerial Committee for Modernization of Public Management, 1996. STRATEGIC ADMINISTRATION TEXTS AND CASES, Thompson and Strickland. Mc Graw Hill, 2003

To manage and transfer knowledge on DRR through the recovery and dissemination of historical memory and lessons learned, together with the training of human resources, so that institutions, communities and people strengthen the preventive culture.

Additionally, the fundamental tasks are the following:

- Ensure that the knowledge that is entered and processed in the System complies with the requirements defined by ONEMI regarding being useful for DRR
- Process the knowledge entered and validated by the System, through the execution of the "Historical Memory", "Lessons Learned", "Human Resource Development", "Research and Development" and "Network Development" processes
- Provide computer support to collect, prepare, store, retrieve and present relevant knowledge for disaster risk reduction
- Transfer to the users or stakeholders of the KMS the available knowledge that is processed and stored in the System, with the purpose that it can be used in disaster risk reduction actions

4.3. Role identification of the processes of the KMS functions

From the description of the processes conducted In Appendix 5.2 of Part 2 of this document, the following roles of the processes of the KMS functions were identified:

- **KMS Administrator (ADM)**: Knowledge management specialist
- **Head of the ONEMI Entity (HENT)**: Person of an ONEMI entity that is responsible for preparing the Knowledge Reports, Context Reports and interacting with the KMS regarding the format and its content
- **Historical Memory Specialist (HMS)**: Person who has the competencies to prepare Historical Memory Reports (HMR) and who is responsible for the processing of the HMR, from the verification of its relevance to its entry into the Repository
- **Lessons Learned Specialist (LLS)**: Person who has the competencies to prepare Lessons Learned Reports (LLR) and who is responsible for the processing of the LLR, from the verification of its relevance to its entry into the Repository
- **Human Resource Development Specialist (HRDS)**: Person who has the competencies to prepare Human Resource Development Reports (HRDR) and who is responsible for the processing of the HRDR, from the verification of its relevance to its entry into the Repository
- **Research and Development Specialist (RDS)**: Person who has the competencies to prepare Research and Development Reports (RDR) and who is responsible for the processing of the RDR, from the verification of its relevance to its entry into the Repository
- **Network Development Specialist (NDS)**: Person who has the competencies to prepare Network Development Reports (NDR) and who is responsible for the processing of the NDR,

from the verification of its relevance to its entry into the Repository

- **Disaster Risk Reduction Specialist (DRRS)**: Person who has the competencies in DRR and who is responsible for reviewing the content of the Knowledge reports and context reports, regarding the DRR concepts used in ONEMI
- **Responsible for the Repository (RREP)**: Person who has the competencies in managing computer systems, making use of information and communication technologies (ICTs), and who is responsible for the operation of the Repository, in order to provide the computer support required for the execution of the processes of the Knowledge Management System, under a common operational environment of the ONEMI technological platform
- **Exhibition Specialist (EXHS)**: Person who has the competencies in techniques and practices related to the operation of exhibition places of elements with historical value and of interest to DRR
- **Communications Specialist (COMMSS)**: Person who has the competencies in communication strategies and techniques

4.4. Assignment of the roles of the KMS processes to the ONEMI's entities

The assignment of roles to the ONEMI's entities was proposed based on the affinity of the tasks of the roles with the missions of the entities established in the ONEMI's Organic and Functioning Regulations dated January 8, 2018.

The distribution of the roles to the entities of ONEMI's upper structure was proposed according to the following:

- The Civil Protection Division of the Risk Management Sub-Department assumes the integral administration of the KMS, through the creation of the "Knowledge Management Unit" and focusing on the following roles:
    - KMS Administrator
    - Historical Memory Specialist
    - Lessons Learned Specialist
    - Disaster Risk Reduction Specialist
    - Repository Manager
- The Civil Protection Academy of the Risk Management Sub-Department assumes the role of the Human Resources Development Specialist.
- The Communications and Broadcasting Department of the Cabinet under the National Administration assumes the following roles:
    - Exhibition Specialist
    - Communications Specialist

- The Development and Projects Department of the National Sub-Department assumes the role of Research and Development Specialist
- The National Civil Protection System Management Department of the National Sub-Department assumes the role of the Network Development Specialist
- Each entity of the upper structure (National Department through the Cabinet, Regional Offices, National Sub-Department, Risk Management Sub-Department, Emergency Operations Sub-Department and Administration and Finance Sub-Department) must designate a position that assumes the role of the Head of the ONEMI Entity

Each role can participate in one or more of the processes of the essential functions, performing the tasks that were defined in the respective procedures, generating, in the set of all the roles, the operation of the ONEMI's KMS that will allow to fulfill its essential purpose of transferring the DRR knowledge obtained by ONEMI to the stakeholders of the System.

Appendix 5.4 of this document details the distribution of the roles to the entities of the upper structure of ONEMI.

5. Appendices of Part 2

5.1. Appendix "ONEMI's organizational system and the main relationships with the National Civil Protection System"

5.1.1. Description of the main relationships of the ONEMI System with the National Civil Protection System

Understanding ONEMI as an organizational system and applying the concept of recursion of the systems, we can infer that the ONEMI System belongs to a suprasystem and it is formed of smaller systems or subsystems, as represented in Figure 2.5.1.1.

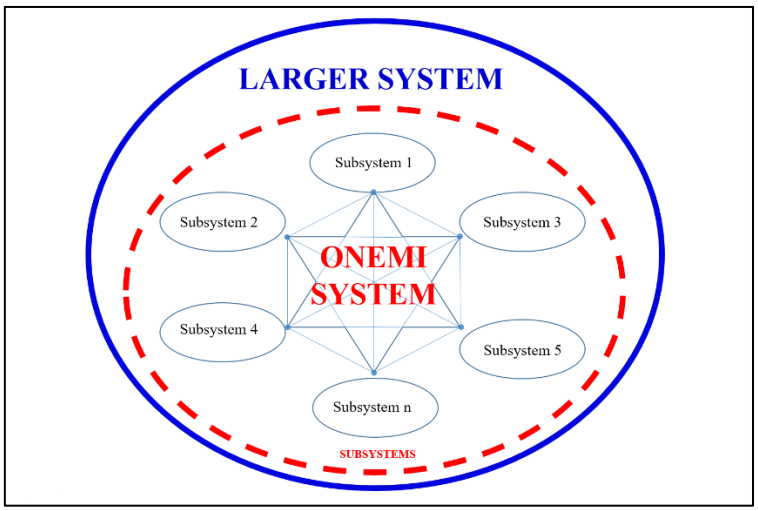


Figure 2.5.1.1 Concept of recursion of the ONEMI System

The Decree Law No. 369, 1974, establishes the National Emergency Office, dependent on the Ministry of the Interior and Public Security, as shown in Figure 2.5.1.2.

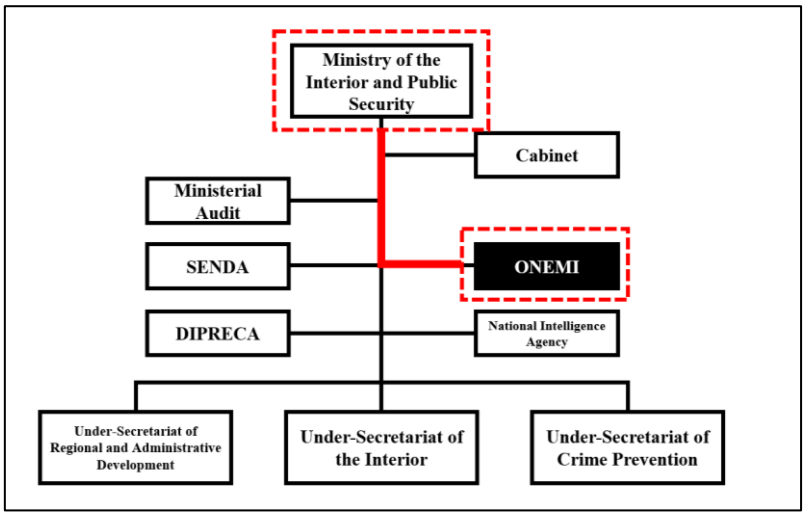


Figure 2.5.1.2 ONEMI's organic units

According to the foregoing and from an administrative point of view, the Ministry of the Interior and Public Security can be considered as a subsystem or larger administrative system of the ONEMI System.

However, from the point of view of its essential purpose, the ONEMI System is related to two specific areas of action:

- Disaster Risk Management (DRM);
- The National Civil Protection System (NCPS) .

In this context and from a DRM technical point of view, the ONEMI System can be considered as an integral part of the National Civil Protection System, as represented in Figure 2.5.1.3.

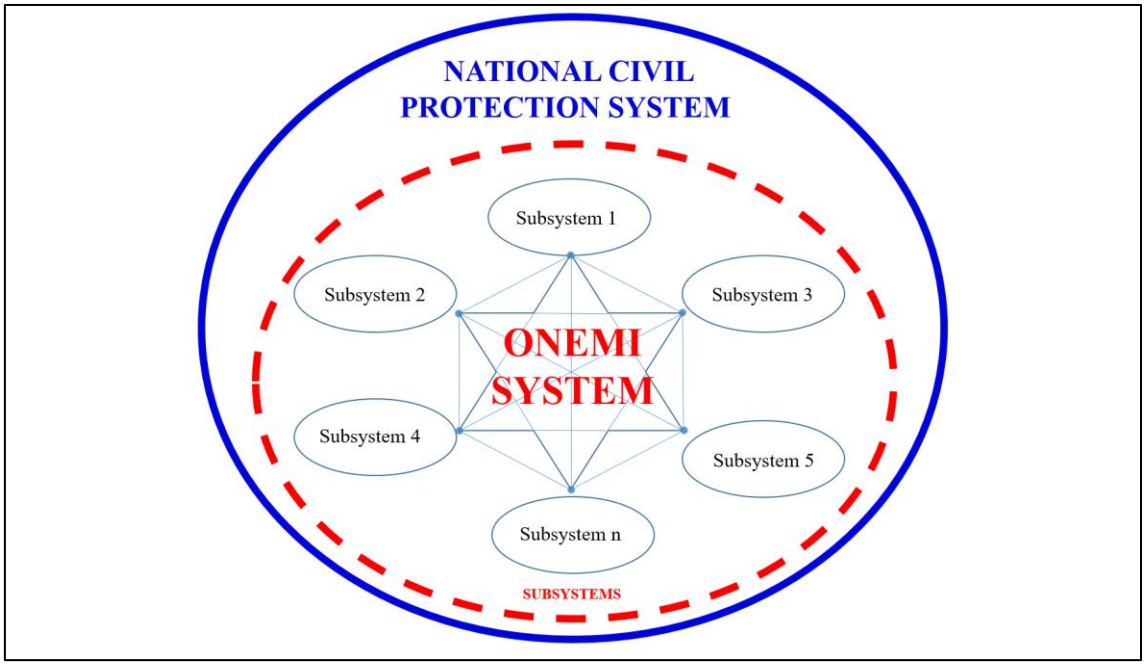


Figure 2.5.1.3 The National Civil Protection System as a suprasystem of the ONEMI System

5.1.1.1. Regarding Disaster Risk Management (DRM)[7]

Disaster Risk Management is the continuous process of the formulation, execution, monitoring and evaluation of policies, plans, programs, regulations, instruments, standards, measures and permanent actions for the knowledge and strategies of disaster risk reduction with the purpose of avoiding the generation of new disaster risks, preventing new disaster risks, reducing existing disaster risks and managing residual risk. It will also consider, in addition to the organization and management of

[7] Documents provided by the ONEMI team (National Policy for Disaster Risk Management, National Civil Protection Plan, National Strategic Plan for Disaster Risk Management, Guidelines Plan for Disaster Risk Management, among others).

resources, the powers and attributions that make possible to face the various aspects of emergencies and the administration of the various phases of the disaster risk cycle, thereby contributing to the strengthening of resilience and reduction of disaster losses.

DRM must respond to the reality of a given jurisdictional area, interrelating hazards, vulnerabilities and capacities as a basis for guiding action in mitigation, preparation, response and rehabilitation, as a participatory and continuous process over time, of permanent review and improvement, constituting the bases for future reconstruction.

The structure for DRM is conducted at each jurisdictional level: communal, provincial, regional or county.

5.1.1.1.1. Concepts related to DRM.

- Hazard: Physical and / or natural event, potentially harmful, human activity and / or phenomenon that can cause death, injury or other health impacts, as well as damage to property, loss of livelihoods and services, social and economic disruption or environmental damage.
- Vulnerability: Conditions determined by physical, social and environmental factors or processes, which increase the susceptibility and exposure of a community to the negative impact of hazards.
- Capacity: For DRM purposes, it will be understood as that aptitude and potential that an individual, organization, entity or institution possesses, of a public or private nature, derived from the competencies, abilities, skills and training of its human resources and specialized materials, which allow the effective and efficient development of certain functions, activities or actions that are necessary and advantageous to contribute to disaster risk reduction throughout the risk cycle.
- Disaster: A serious disruption in the functioning of a community or society that causes a large number of deaths, as well as material, economic and environmental losses and impacts that exceed the capacity of the affected community or society to cope with the situation through the use of their own resources.
- Emergency: Serious disruption, or its imminence, on the functioning of a community due to the manifestation of hazard of natural, biological or anthropic origin, which interacts with the conditions of exposure, vulnerability and capacity, causing one or more of the following impacts: human, material, economic and / or environmental.
- Disaster Risk Reduction (DRR): The concept and practice of reducing disaster risk through systematic efforts aimed at analyzing and managing the causal factors of disasters, including reducing the degree of exposure to hazards, decreasing the vulnerability of people and property, management of soils and the environment, and improved preparedness for adverse

events.

- Resilience: The ability of a system and its components, a community or a society exposed to hazards, to anticipate, resist, absorb, adapt, transform and recover from its effects in a comprehensive, timely and efficient manner, in particular through the improvement and restoration of its basic structures and functions through DRM.

5.1.1.1.2. Disaster Risk Cycle

The actions conducted in the disaster risk cycle of a destructive event are framed in four phases: Mitigation, Preparedness, Response and Recovery.

- Mitigation Phase: It includes the measures aimed at reducing existing risks, avoiding the generation of new risks and limiting the adverse impacts or damages produced by hazards.
- Preparedness Phase: It involves the capacities and skills that are developed to anticipate, respond and recover, in a timely and effective manner, from the impacts of imminent or present emergencies. Alert constitutes a stage of the Preparation Phase, and it will consist of a state of permanent monitoring and attention. At the same time, it will be a declared state when the probable and near occurrence of an adverse event is noticed, in order to take precautions and disseminate them.
- Response Phase: It corresponds to the activities of emergency care, which are conducted immediately after the event has occurred. These activities aim to save lives, reduce the impact on the affected community and reduce losses.
- Recovery Phase: These are the actions that aim to restoring normal living conditions through the stages of rehabilitation and reconstruction of the affected area, avoiding the reproduction of pre-existing risk conditions. Thus, the stages in the Recovery Phase are as follows:
    - Rehabilitation: It consists of the short-term recovery of basic services and the beginning of the repair of physical, social and economic damage to the affected area, during the transition period between the completion of the response actions and the beginning of the reconstruction actions.
    - Reconstruction: It consists of the repair or replacement, in the medium and long term, of the damaged infrastructure, and the restoration or improvement of production systems.

5.1.1.2 National Civil Protection System (NCPS)[8]

5.1.1.2.1 Institutionality for Civil Protection

The Political Constitution of Chile establishes in its first article: *"It is the duty of the State, to protect*

[8] National Policy for Disaster Risk Management, National Civil Protection Plan, National Strategic Plan for Disaster Risk Management, Guidelines Plan for Disaster Risk Management.

the National Security and to give protection to the population and the family", therefore, civil protection is a primary responsibility. In this context, the State has granted powers and attributions to different bodies of the State administration, of different levels, nature and jurisdictional context, through legal provisions issued in different periods, structuring a "National Civil Protection System", which tends to achieve the effective participation of the nation to improve prevention and response capabilities against destructive or potentially destructive events, of varied origin and effects.

Civil Protection is understood as the action of protection, guarding and support to the normal performance of the members of society, including all the permanent measures directed to that purpose, which among others include, on the one hand, those destined to prevent, reduce, attend and/or repair the damages to people and goods that could cause catastrophic events, product of the action of the nature and/or the man; and on the other hand, to cooperate to the sustainable development of the community.

Civil Protection in Chile is currently regulated by the Supreme Decree (I) No. 156 dated March 12, 2002, approving the National Civil Protection Plan.

The National Civil Protection Plan is the indicative matrix document for the functioning of NCPS where the model that Chile should have for DRR from prevention to recovery is determined and described.

This model is characterized by its systemic approach, orienting the vertical and horizontal integration of the participants in the system with a strong coordination between the different sectors that form the NCPS (Ministries, Services, SEREMIAS, Armed Forces, Municipalities, Private organizations, and more), focusing on a set of plans, both in preventive and response actions, from the National to the communal level.

The NCPS uses the political-administrative division for its functioning, replicating itself at the communal, provincial and regional level, based on two fundamental principles:

- Mutual help
- Staggered use of resources

These principles mean that the local level is the first to respond to an emergency with the available capacities in its jurisdictional area, employing also, if necessary, the capacities of neighboring localities. In case they are not sufficient, the requests escalate to higher political-administrative levels until they reach the national level, which must provide the necessary capacities to face the declared emergency.

All of the above is supported by the corresponding planning already mentioned among the different sectors, at the same levels and between levels. The planning includes both preventive and response actions.

From an organic point of view, the coordinator of the NCPS at the national level is ONEMI, which has delegations that advise the Intendant at the regional level on decision-making regarding DRR

actions. The provincial level lacks a similar body to advise the Governor in the same way.

Regarding the communal level, the organic law of Municipalities (Law No. 18.695) states that these corporations may conduct directly, or with other bodies of the State Administration, functions related to risk prevention and provision of emergency aid, within the national and regional plans that regulate the respective activity.

5.1.1.2.2. Structure of the National Civil Protection System

The NCPS is understood as a system integrated by organizations, services and institutions, both from the public and private sector, including voluntary entities and the organized community, under the coordination of ONEMI. In this System, all the bodies maintain their own structure and have full freedom to adapt their organization, with the objective of achieving maximum efficiency in the fulfillment of their task: prevention, mitigation, preparation, response and rehabilitation in the face of a destructive event, each one with its specialized human and technical resources, in a coordinated manner, as appropriate.

The actions of the NCPS are executed and developed in the subsystems at the communal, provincial, regional and national level, and each of these is led by its respective political authority of the responsible body at each level, as shown in Figure 2.5.1.4.

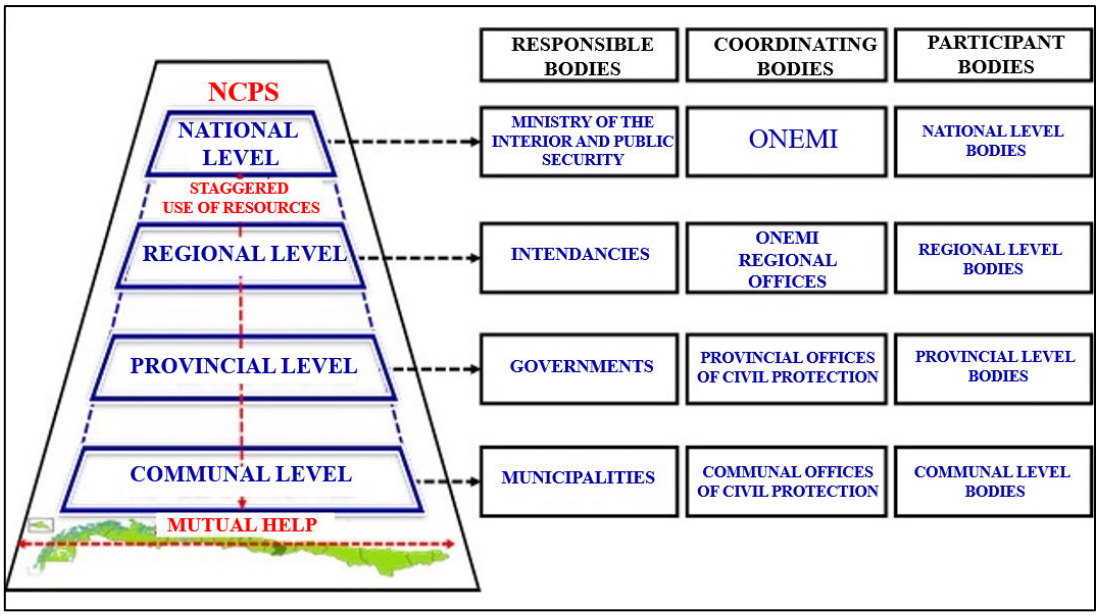


Figure 2.5.1.4 Structure of the National Civil Protection System

5.1.1.2.3. Structure for management in Civil Protection

According to the provisions of Chapter V of the National civil protection plan, the NCPS works in coordination for efficient and effective actions, with the bodies or institutions in a given jurisdictional

area. This working team is called the Civil Protection Committee and should be composed of public and private institutions and bodies that, by legal mandate, competence or interest, can contribute to the management of civil protection.

5.1.1.2.3.1. The structure of the Committee for Disaster Risk Management at national level

A new formed Committee will be the highest body in charge of the planning and coordination of the NCPS at national level, as shown in Figure 2.5.1.5.

The following authorities, of the agencies that form the NCPS, will be permanent members of the National Committee for DRM.

- The Minister of the Interior and Public Security, who will preside over it
- The Minister of National Defense
- The Minister of Finance
- The Minister of Education
- The Minister of Public Works
- The Minister of Health
- The Minister of Housing and Urban Planning
- The Minister of Transportation and Communications
- The Minister of Energy
- The Minister of Environment
- The Undersecretary of the Interior
- The Chairman of the Joint Chiefs of Staff
- The National Director of ONEMI of the Ministry of the Interior and Public Security, who will act as the Technical and Executive Secretary
- The Managing Director of the Chilean Police, in the Response and Recovery Phases
- The Managing Director of the Criminal Investigation Police of Chile, in the Response and Recovery Phases
- The president of the National board of fire fighters
- In addition, the Minister of the Interior and Public Security may summon, at the proposal of the National Director of ONEMI, other Ministries and agencies with the technical skills that are strictly necessary to address the emergency

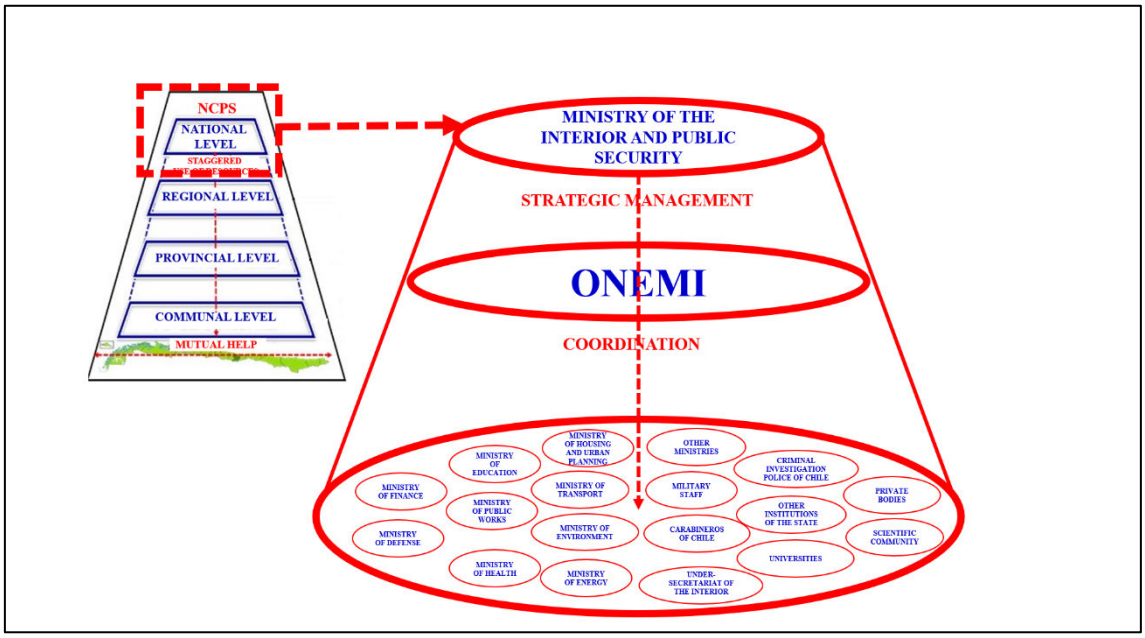


Figure 2.5.1.5 Structure of the Committee for DRM at national level

5.1.1.2.3.2. Structure of the Committee for Disaster Risk Management at regional level

In each of the regions of the Country a Committee is formed. This Committee will be the highest organization that will be in charge of the planning and coordination of the NCPS at regional level, as shown in Figure 2.5.1.6. The following authorities, of the agencies that form the NCPS, will be permanent members of the Regional Committee for DRM.

- The Regional Intendant, who will preside over it
- The Regional Director of ONEMI, who will act as the Technical and Executive Secretary
- The Regional Governor
- The Regional Ministerial Secretaries of the respective region of those ministers that form the National Committee
- A Military authority designated by the Minister of National Defense
- A Representative of the Forces of Order and Public Security that, for these effects, it is designated by the Minister of the Interior and Public Security
- In addition, the Regional Intendant may summon other entities and agencies, to address relevant issues regarding DRM, with the technical skills that are strictly necessary to address the emergency

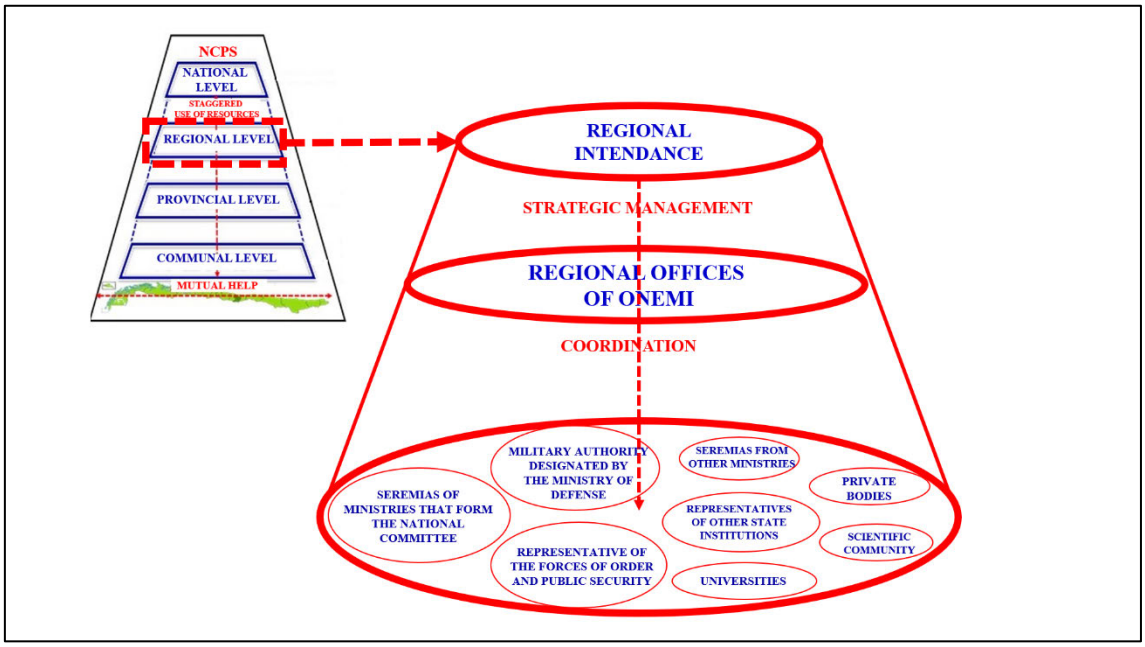


Figure 2.5.1.6 Structure of the Committee for DRM at regional level

5.1.1.2.3.3. Structure of the Committee for Disaster Risk Management at provincial level

In each of the provinces of the Country a Committee is formed. This Committee will be the highest level that will be in charge of the planning and coordination of the NCPS at Provincial level, as shown in Figure 2.5.1.7. The following authorities, of the agencies that form the NCPS, will be permanent members of the Provincial Committee for DRM.

- The Provincial Governor, who will preside over it
- The Provincial Director of Disaster Risk Management, or anyone who has been entrusted with said function, who will act as the Technical and Executive Secretary
- Representatives of the Regional Ministerial Secretariats of the respective region, of those ministers that form the National Committee, or a representative designated by the respective Minister of the services of its dependency that are essential for Disaster Risk Management
- A Military authority designated by the Minister of National Defense
- A representative of the Forces of Order and Public Security that, for these effects, is designated by the Minister of the Interior and Public Security
- In addition, the Provincial Governor may summon other entities and agencies, to address relevant issues regarding DRM, with the technical skills that are strictly necessary to address the emergency

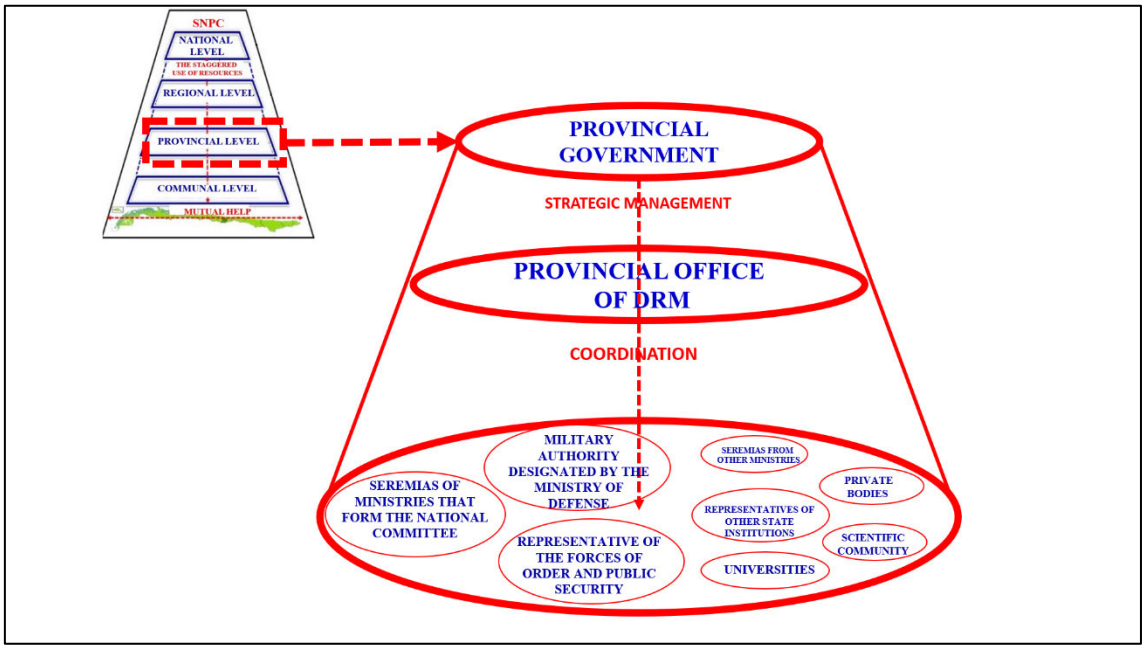


Figure 2.5.1.7 Structure of the Committee for DRM at provincial level

5.1.1.2.3.4. Structure of the Committee for Disaster Risk Management at communal level

In each of the communes of the Country a Committee is formed. This Committee will be the highest level that will be in charge of the planning and coordination of the NCPS at Communal level, as represented in Figure 2.5.1.8. The following authorities, of the organizations that form the NCPS, will be permanent members of the Communal Committee for DRM.

- The Mayor, who will preside over it
- The Communal Director of Disaster Risk Management of the commune, or the person who has been entrusted with said function, who will act as the Technical and Executive Secretary
- The Authority or Authorities of the Forces of Order and Public Security of the commune
- In addition, the Mayor may summon other entities and agencies, to address relevant issues regarding DRM, with the technical skills that are strictly necessary to address the emergency

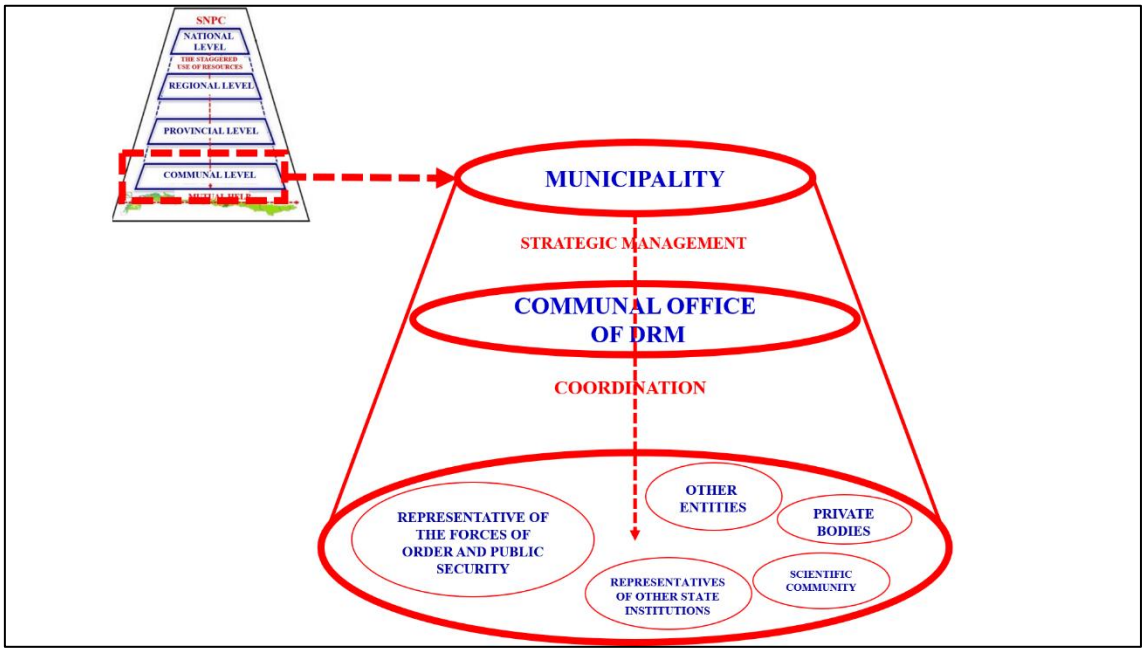


Figure 2.5.1.8 Structure of the Committee for DRM at communal level

5.1.1.2.4. Disaster Risk Management Instruments[9]

As established in the Sendai Framework for Disaster Risk Reduction 2015-2030 to which, as a country, we are assigned to, and in order to maintain in the phases of the risk cycle the coordination and technical coherence of all the instruments that comprise it, it is necessary to have a guiding management instrument and its products as defined below, in accordance with scopes and objectives.

For a correct interpretation of the management instruments, that is, for the appropriate application of these instruments, "general – strategic" instruments will prevail over "particular – operational" ones, and those of national level above regional level, regional level above provincial ones and the latter above the communal ones.

The structure of the DRM instruments is represented in Figure 2.5.1.9.

The National Policy for Disaster Risk Reduction is an instrument that guides actions and political decisions, from a comprehensive perspective of DRM, to achieve continuous improvement of its administration, contributing to sustainable development of the country in the short, medium and long term.

The DRM Plans are the instruments that include planning for DRR and emergency response, which allow, at all levels of the System, to materialize what is established in the National Policy.

[9] National Strategic Plan for Disaster Risk Management, Guidelines Plan for Disaster Risk Management.

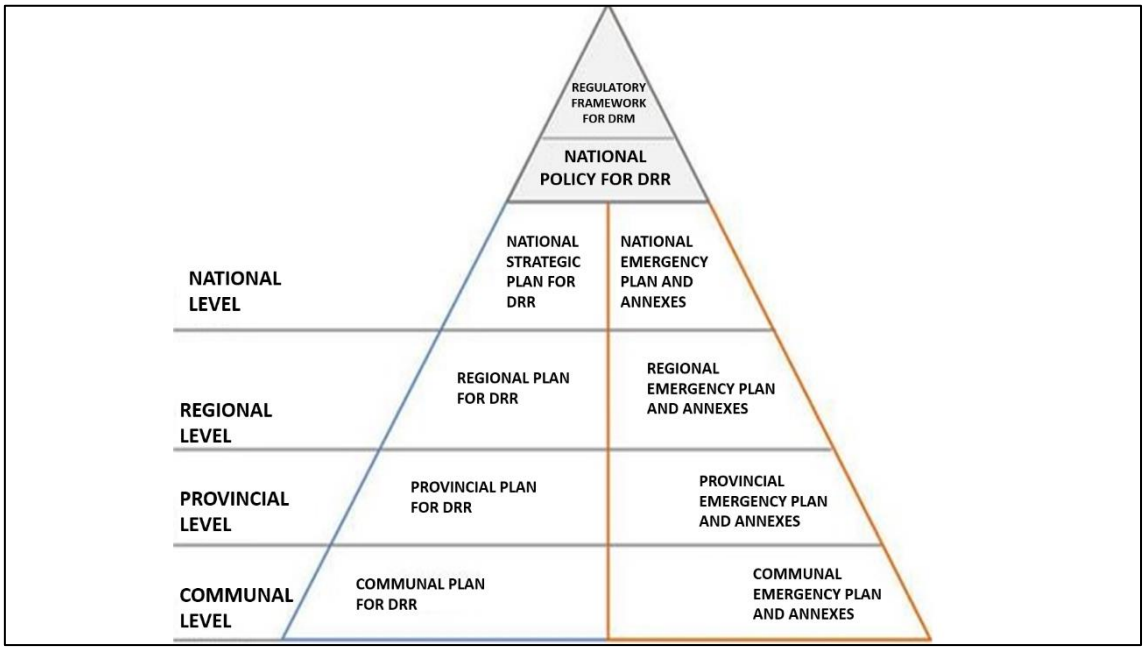


Figure 2.5.1.9 Hierarchical diagram of the instruments for DRM

5.1.2. Identification of the relationships of the ONEMI System with the National Civil Protection System

To identify the relationships of the ONEMI System with the National Civil Protection System, the functions assigned to ONEMI by the normative documents associated to DRM will be considered, specifically the following.

- The National Policy for Disaster Risk Management
- National Civil Protection Plan
- National Strategic Plan for Disaster Risk Management
- Decree establishing ONEMI
- Regulations for the application of Decree Law 369, 1974
- Organic and Functioning Regulations (OFR) of ONEMI
- Guidelines Plan for Disaster Risk Management

Therefore, from the aforementioned normative documents, the following main relationships of the ONEMI System with the National Civil Protection System can be identified.

5.1.2.1. Coordination of the National Civil Protection System

The Decree establishing ONEMI and the regulations for its application assign to the Service during situations of catastrophes or public calamities, a coordination role of the activities of any public or private body that has adequate resources for the solution of problems derived from emergencies, at the national level.

The National Civil Protection Plan assigns to ONEMI the coordination of a system formed by organizations, services and institutions, both from the public and private sector, including voluntary entities and the organized community responsible for civil protection. Civil protection is understood as the protection of people, their property and the environment in the face of a situation of collective risk, of natural origin or generated by human activity. The mission of civil protection encompasses prevention, such as suppression of the event; mitigation, to minimize the impact of a destructive event; adequate preparation, through concrete response plans; and training and clear information, to respond effectively and efficiently when an emergency or disaster has not been avoided.

The National Policy for Disaster Risk Management recognizes ONEMI as a public service, centralized and dependent on the Ministry of the Interior, becoming the coordinating and referring body of the actions to be carried out in matters of civil protection.

In turn, both the Policy and the National Strategic Plan for Disaster Risk Management, in the Strategic Axis "Institutional Strengthening", assign responsibility to ONEMI for the coordination of the National Platform for DRR, as the advisory and consultative body for DRR matters.

Consequently, from the analysis of the normative documents it can be deduced that the ONEMI System is the coordinating body of the National Civil Protection System, at all levels (national, regional, provincial and communal).

5.1.2.2. Technical and Executive Secretariat of the Committees for Disaster Risk Management[10]

The Guidelines Plan for Disaster Risk Management establishes that there will be a National Committee for DRM, which will be the highest body that will be in charge of the planning and coordination of the System at national level.

The National Director of ONEMI will act as the Technical and Executive Secretary of the National Committee for DRM, proposing meetings, ensuring the execution of the respective plans, preparing the programs with the subjects to be discussed and delivering the corresponding minutes.

The ONEMI Regional Directors will act as Technical and Executive Secretaries of the Regional Committees for DRM, proposing meetings, ensuring the execution of the respective plans, preparing the programs with the subjects to be discussed and delivering the corresponding minutes.

At provincial and communal level, the respective committees for DRM will operate with their Technical and Executive Secretariats. The respective committees will be coordinated by the Technical and Executive Secretaries of the respective Regional Committees for DRM.

As a consequence, the ONEMI System works as a Technical and Executive Secretariat of the Committees for DRM at national and regional level, and also as the coordinator of the Technical and Executive Secretariats of the committees at provincial and communal level.

[10] Guidelines Plan for Disaster Risk Management, ONEMI, June 20, 2018.

5.1.2.3. Proposal of Disaster Risk Management instruments[11]

ONEMI, understood as an organizational system, is responsible for conducting the following activities regarding the DRM instruments of the NCPS.

- Propose to the National Committee for DRM, the National Policy for Disaster Risk Management, for its presentation and subsequent approval by the President of the Republic
- Propose to the National Committee for DRM, the National Strategic Plan for Disaster Risk Reduction, defining strategic objectives, actions, goals, deadlines and responsibilities that allow the materialization of what is established in the National Policy in all phases of the disaster risk cycle. The National Strategic Plan will be reviewed by ONEMI at least every two years.
- Propose to the Regional Committees for Disaster Risk Management, through the Regional Director, the Regional Plans for Disaster Risk Reduction, ensuring the proper application and monitoring of said plans. The Regional plans will be reviewed by ONEMI at least every two years.
- Establish procedures for the preparation, application and monitoring of Provincial and Communal Plans for DRR
- Propose to the National Committee for Disaster Risk Management the National Emergency Plan, a management instrument that contemplates the coordination and operation of the National Civil Protection System at national level, for the use of available capacities in the Response Phase. The National Emergency Plan will be reviewed by ONEMI at least every two years.
- Propose to the Regional Committees for Disaster Risk Management, through the Regional Director, the Regional Emergency Plans, ensuring the proper application and monitoring of said plans. The Regional plans will be reviewed by ONEMI at least every two years.
- Establish procedures for the preparation, application and monitoring of Provincial and Communal Emergency Plans

Therefore, the role of the ONEMI System is to propose the DRM instruments of the NCPS.

5.1.2.4. Management of the National Early Warning System[12]

The Organic and Functioning Regulations of ONEMI, Article 8, letter e.-, establishes for the National Director of ONEMI the function of developing and maintaining an early warning system that allows to warn the population and organizations in general on the actions to follow in the event of an earthquake or the possible activation of an event that endangers the lives of people, their property, the

[11] Guidelines Plan for Disaster Risk Management, ONEMI, June 20, 2018.

[12] Organic and Functioning Regulations of ONEMI, dated January 8, 2018.

environment and infrastructure in general.

For this, ONEMI has a National Early Warning Center and, at least, one Regional Early Warning Center for each Region, which must constantly monitor the possibilities of risks, based on the information obtained through the System, especially that of technical organizations. In accordance with the foregoing, ONEMI must declare alert states, based on the procedures established for such purposes, and disseminate them to the population in a timely, clear and sufficient manner.

Consequently, ONEMI as an organizational system has the responsibility to manage the National Early Warning System of the NCPS. The National Early Warning System is understood as the set of capacities needed to generate and disseminate warning information that is timely, clear and sufficient, so that people, communities and organizations exposed to any hazard will be prepared and act appropriately and with sufficient notice in order to reduce the possibility of loss or damage.

5.1.2.5. Education, training and coaching in DRR[13]

The Organic and Functioning Regulations of ONEMI, Article 8, letter i.-, establishes for the National Director of ONEMI the function of developing and maintaining a national system of education and training for the NCPS in all those matters related to DRR.

In turn, Article 72 assigns the following fundamental tasks of the Risk Management Sub-Department.

- To develop, promote and coordinate initiatives and actions, both internal and external, in terms of prevention and mitigation of disaster risk, and the preparation of the response to emergencies
- To coordinate, develop and provide training programs and training to all segments of the National Civil Protection System, according to their specific role in the management of civil protection, in order to contribute to the reduction of vulnerabilities and the development of a culture of prevention.
- To develop and implement programs that generate and strengthen capacities in the community and in the actors of the National Civil Protection System, in order to increase preparedness for risks and disasters

In addition, Article 83 assigns to the Civil Protection Academy the mission to coordinate, develop and provide education, training and coaching programs to all the segments of the National Civil Protection System, according to its specific role in comprehensive risk management, in order to contribute to the reduction of vulnerabilities and the development of a culture of prevention.

Therefore, the ONEMI System is the entity in charge of education, training and coaching in DRR issues regarding the NCPS.

[13] Organic and Functioning Regulations of ONEMI, dated January 8, 2018.

5.1.2.6. Broadcasting of information and instructions for DRR[14]

The Regulation for the application of the Decree establishing ONEMI, Article 32, establishes that it corresponds to the National Emergency Office to disseminate the information and instructions that are necessary or convenient for the fulfillment of the purposes of the Service, to deliver them to the media, and to publicize plans, programs and projects aimed at preventing or solving situations of catastrophes and public calamities.

In turn, the Organic and Functioning Regulations of ONEMI, Article 8, letter h.-, establishes for the National Director of ONEMI the function of developing and maintaining a redundant and robust communication system that allows to safeguard the security of the information in the presence of earthquakes, catastrophes or emergencies in general.

Additionally, Article 22, of the OFR, assigns to the Communications and Broadcasting Department the mission of providing communicational advice to the National Director. It also assigns the planning, designing and broadcasting to the community prevention and response actions developed by competent bodies of the National Administration of ONEMI and the Regional Offices, aimed at strengthening the resilience and security measures of the population in the presence of possible emergency situations, as well as developing and promoting the communicational strategy required by the institution before, during and after an emergency situation and catastrophes.

Consequently, the ONEMI System is the entity in charge of communications and broadcasting of DRR issues regarding the NCPS.

5.1.3. Description of the component subsystems of the ONEMI System

The identification of the component subsystems of the ONEMI system will be based on 2 related elements that determine the organization of the ONEMI institution.

- The functions of the ONEMI System that are deduced from the text of its essential purpose
- The organizational structure defined by ONEMI in its Organic and Functioning Regulations, for the fulfillment of its essential purpose

5.1.3.1. Identification of the functions of the ONEMI System.

The concept of function is defined, for the purpose of this study, as a set of related activities, characterized by a common knowledge, related to an area or field of action of an organizational system, which allows the system to achieve its established essential purpose.

For the purpose of this study, the mission of the ONEMI Strategic Plan 2019 – 2023, published on the ONEMI website, will be used as the essential purpose of the ONEMI System, according to the following text.

[14] Regulation for the application of the Decree establishing ONEMI (Decree 509, 1983, of the Ministry of the Interior). Organic and Functioning Regulations of ONEMI.

"*To Plan, coordinate, organize, advise and supervise the activities of the National Civil Protection System to reduce disaster risk through mitigation, preparedness, warning, response and rehabilitation in order to reduce the loss of life, economic impacts, environmental effects and to protect livelihoods, contributing to a sustainable development.*"

The following functions can be deduced from the essential purpose of the ONEMI System.

5.1.3.1.1 Functions related to Strategic Management

The verbs used to define the actions of the ONEMI System (to plan, coordinate, organize, advise and supervise...) are related to the management systemic approach.

Management can be conceived as the execution of all activities related to the functions of general administration, with the capacity to predict the degree of satisfaction of a desired future and make pertinent decisions for that future to occur. Therefore, modern management requires the development of these activities, using methodologies and tools of information and communications technology.

For the purpose of this document, management has been defined as the action of "planning, organizing, directing, controlling and coordinating the execution of actions and the use of resources to achieve the objectives established to fulfill the mission of an entity".

The functions of management are:

- planning (what to do)
- organizing (how to do it)
- directing (doing it)
- controlling (checking)
- coordinating (essence of management)

Management functions represent a dynamic, indivisible and uninterrupted circular process of activities applied to the various areas of the entity and to the entity as a whole.

In other words, management involves determining the objectives to be achieved in a given period to fulfill the mission, determining the actions that need to be taken to achieve these objectives, prioritizing them and establishing their sequence, as well as identifying the available resources and assigning them to the actions according to their prioritization.

In addition, the organization must be adjusted so that it can develop the actions planned to achieve the objectives, in terms of missions and fundamental tasks of the dependent entities, structure, job positions, integration of personnel, competencies, etc.

Having established what to do and who should do it, the organization is in position to conduct what is planned with an adequate organization. To do this, managers must direct, coordinate and guide the execution of the work to achieve the goals established for each objective.

During the execution of the tasks, it must be verified that what is being executed corresponds to what

was planned and thus, provide feedback to the administrative process of management.

Therefore, management can be conceived as a system, which has different subsystems associated with the functions of planning, organizing, directing, controlling and coordinating that interact between each other.

Consequently, from the text of the essential purpose, it can be deduced that the ONEMI System has the following functions.

- Strategic planning Function
- Strategic organization Function
- Strategic direction Function
- Strategic control Function
- Strategic coordination Function
- Management coordination of Regional Offices Function.
- Legal advice Function.
- Internal audit Function.
- Communications Function.
- Broadcasting Function.
- Project management Function.
- Research and development Function.

5.1.3.1.2 Functions related to DRM

The text of the essential purpose states that the ONEMI System is directly related to DRM actions, specifically, with the functions of the Disaster Risk Cycle.

The actions conducted in the disaster risk cycle of a destructive event are framed in four phases: Mitigation, Preparedness, Response and Recovery.

- Mitigation Phase: It includes the measures aimed at reducing existing risks, avoiding the generation of new risks and limiting the adverse impacts or damages produced by hazards.
- Preparedness Phase: It involves the capacities and skills that are developed to anticipate, respond and recover, in a timely and effective manner, the impacts of imminent or present emergencies. Alert constitutes a stage of the Preparation Phase and it will consist of a state of permanent monitoring and attention. At the same time, it will be a declared state when the probable and near occurrence of an adverse event is noticed, in order to take precautions and disseminate them.
- Response Phase: It corresponds to the activities of emergency care, which are conducted immediately after the event has occurred. These activities aim to save lives, reduce the impact on the affected community and reduce losses.
- Recovery Phase: These are the actions that aim to restoring normal living conditions through

the stages of rehabilitation and reconstruction of the affected area, avoiding the reproduction of pre-existing risk conditions. Thus, the stages in the Recovery Phase are as follows.

- Rehabilitation: It consists of the short-term recovery of basic services and the beginning of the repair of physical, social and economic damage to the affected area, during the transition period between the completion of the response actions and the beginning of the reconstruction actions.
- Reconstruction: It consists of the repair or replacement, in the medium and long term, of the damaged infrastructure, and the restoration or improvement of production systems.

In addition, ONEMI has 16 Regional Offices responsible for managing activities related to DRM, specifically, the functions of the Disaster Risk Cycle, at regional, provincial and communal level, according to the following detail.

- Regional Office of Arica y Parinacota Region
- Regional Office of Tarapacá Region
- Regional Office of Antofagasta Region
- Regional Office of Atacama Region
- Regional Office of Coquimbo Region
- Regional Office of Valparaíso Region
- Regional Office of Metropolitan Region
- Regional Office of Libertador Gral. Bernardo O`Higgins Region
- Regional Office of Maule Region
- Regional Office of Ñuble Region
- Regional Office of Biobío Region
- Regional Office of Araucanía Region
- Regional Office of Los Ríos Region
- Regional Office of Los Lagos Region
- Regional Office of Aysén del Gral. Carlos Ibáñez del Campo Region
- Regional Office of Magallanes Region and Chilean Antarctica

These Regional Offices are coordinated at the central level by the National Administration, through the Regional Coordination Department of the Cabinet.

Additionally, ONEMI is developing a Knowledge Management System. The purpose of this System is to manage and transfer DRR knowledge to institutions, communities, and individuals to strengthen the preventive culture.

Consequently, from the information presented previously, it can be deduced that the ONEMI System has the following functions associated with the disaster risk cycle.

- Mitigation Function

- Preparedness Function
- Response Function
- Recovery Function
- DRM function, at regional, provincial and communal level
- Knowledge Management for DRR function

5.1.3.1.3. Functions related to the National Civil Protection System (NCPS)

The text of the essential purpose states that the ONEMI System must manage the activities of the NCPS (to plan, coordinate, organize, advise and supervise the activities of the National Civil Protection System to reduce the risk of disasters ...).

Therefore, the following functions can be deduced from the relationship between the ONEMI System and the NCPS.

- Management of the National Civil Protection System Function
- Technical and Executive Secretariat of the Committees for Disaster Risk Management Function
- Proposal of DRM instruments Function
- Management of the National Early Warning System Function
- Education, training, and coaching in DRR issues Function
- Broadcasting of information and instructions for DRR

5.1.3.1.4. Functions related to ONEMI in its capacity as public service

Both the Decree establishing ONEMI (Decree Law No. 369, 1974, of the Ministry of the Interior) and the Regulations for the application of the Decree Law 369, 1974 (Decree No. 509, 1983, of the Ministry of the Interior) define ONEMI as a public service under the Ministry of the Interior. Therefore, ONEMI transfers that capacity to the ONEMI System.

Consequently, the ONEMI System, in order to fulfill its essential purpose, must comply with the legal regulations associated with the General Bases of the State Administration and the Bases of Administrative Procedures that govern the acts of the organs of the State Administration.

In this context, the following management support functions are identified:

- Information and Citizen Services Office Function.
- Reception, Coordination and Dispatch of Documents Office Function.
- General Services Function.
- Budget Function.
- Accounting Function.
- Treasury Function.
- Finance Function.

- People Management Function.
- People Development Function.
- Remuneration Function.
- Supply Function.
- Communications and Information Technology Function.

5.1.4. Relationship between ONEMI's organizational structure and the functions of the ONEMI System

To establish the relationships of the essential functions of the ONEMI System, the ONEMI's organization chart established by the current OFR, approved by the Exempt Resolution No. 44 dated January 15, 2018, by the National Director of ONEMI, shown in Figure 2.5.1.10, will be used.

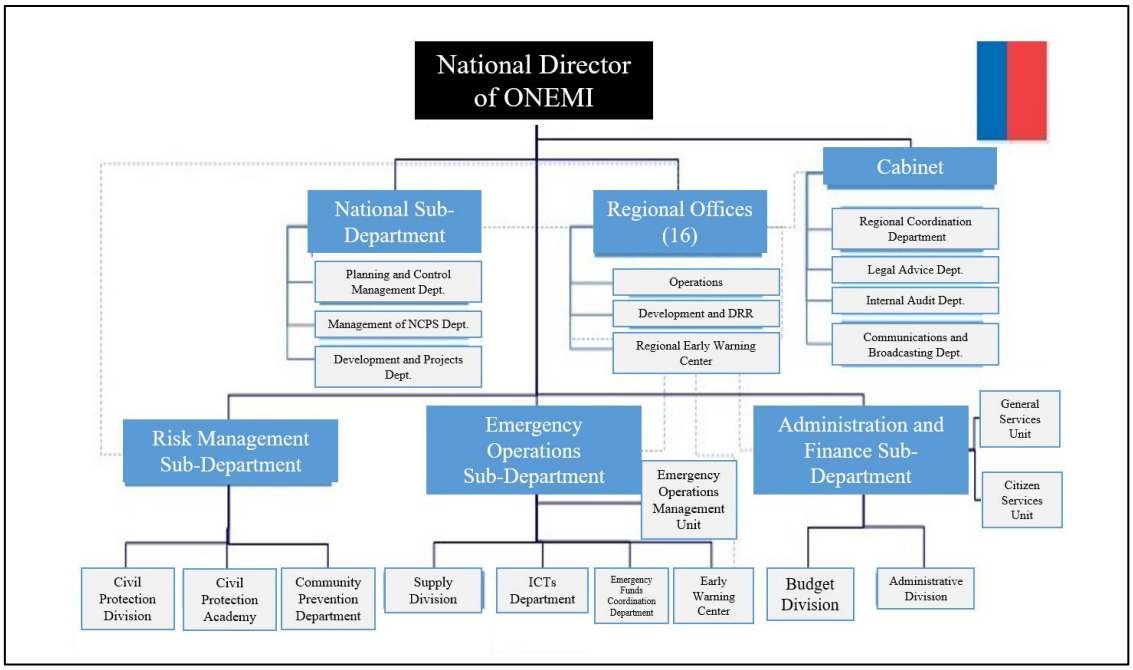


Figure 2.5.1.10 ONEMI's organization chart

The relationship will be established based on the affinity of the missions of the ONEMI's entities, according to the organization chart, with the functions of the ONEMI System.

ENTITY	MISION	ESSENTIAL FUNCTIONS
National Administration.	To advise, coordinate and evaluate the actions of the State for the prevention and response to emergencies and disasters, through information systems and	• Strategic planning function • Strategic organization function • Strategic direction

ENTITY	MISION	ESSENTIAL FUNCTIONS
	management models, in order to manage risks and contribute to the improvement of the citizens' quality of life.	function • Strategic control function • Strategic coordination function
Cabinet.	To collaborate directly with the National Director of ONEMI in matters of the service that are related to its functions, and in administrative and representative aspects that correspond to it, as well as to ensure the effective and efficient operation of different roles of advice, control, broadcasting and support to the functions of the National Director.	• Management coordination of Regional Offices function. • Legal advice function. • Internal audit function. • Communications function. • Broadcasting function.
National Sub-Department.	To plan, organize, direct and control the activities and tasks related to ONEMI's strategic planning, as well as the formulation and development of initiatives and projects derived from it, to promote institutional development. In addition, it will be responsible for organizing, directing and controlling the necessary actions for the adequate inter-institutional coordination of ONEMI at national and international levels through the platforms and mechanisms established for these purposes.	• Strategic planning function • Strategic organization function • Strategic direction function • Strategic control function • Strategic coordination function • Management of the National Civil Protection System function. • Project management function. • Research and development function.
Regional Offices.	To plan, coordinate and execute activities aimed at prevention, mitigation, warning, response and rehabilitation required by the Civil Protection System in the presence of hazards and emergency situations, disasters and catastrophes; in order to protect people, their property and environment at regional, provincial and communal level, through permanent Disaster Risk Management.	• Mitigation function. • Preparedness function. • Response function. • Recovery function. • DRM function, at regional, provincial and communal level. • Technical and Executive Secretariat of the Committees for Disaster Risk Management function, at regional level. • Proposal of DRM instruments function, at

ENTITY	MISION	ESSENTIAL FUNCTIONS
		regional level. • Management of the National Early Warning System function, at regional level. • Education, training and coaching in DRR issues function, at regional level. • Broadcasting of information and instructions for DRR function, at regional level. • Knowledge management for DRR function, at regional level.
Risk Management Sub-Department.	To plan, organize, direct and control actions and resources related to prevention, mitigation and preparedness, in order to develop capacities to reduce risk for people, their property, existing infrastructure and the environment.	• Mitigation function. • Preparedness function. • Knowledge management for DRR function. • Education, training and coaching in DRR issues function.
Civil Protection Division.	To develop, promote and coordinate initiatives and actions, both internal and external, in terms of prevention and mitigation of disaster risk, and emergency response preparedness.	• Mitigation function. • Preparedness Function. • Knowledge management for DRR function.
Civil Protection Academy.	To coordinate, develop and provide education, training and coaching programs to all segments of the National Civil Protection System, according to their specific role in comprehensive risk management, in order to contribute to the reduction of vulnerabilities and the development of a culture of prevention.	• Education, training and coaching in DRR issues function. • Knowledge management for DRR function.
Community Prevention Department.	To design and implement prevention and preparedness programs and actions aimed at the community, promoting the strengthening of capacities and the incorporation of the community and the actors of the National Civil Protection System in Disaster Risk Management, particularly in the	• Mitigation function. • Preparedness function. • Knowledge management for DRR function. • Education, training and coaching in DRR issues.

ENTITY		MISION	ESSENTIAL FUNCTIONS
		preventive phase.	
Emergency Operations Sub-Department.		To plan, organize, direct and control the functions and tasks carried out by the units under its responsibility, related to: warning, monitoring of risk situations and/or emergencies, emergency response and operational continuity of the systems and technological platforms used by ONEMI to support its operation.	• Response function. • Recovery function. • Knowledge management for DRR function. • Supply function. • Information and communications technology function. • Finance function. • Management of the National Early Warning System function.
	Emergency Operations Management Unit.	To support the planning and control processes of the assigned and/or defined objectives and tasks. During emergencies, support in the field of coordination, operations and information.	• Response function. • Recovery function. • Knowledge management for DRR function.
	Supply Division.	To provide goods, services and required infrastructure at the National level, through reliable logistical supply processes that facilitate continuous improvement and minimize response time in the presence of emergencies, disasters or catastrophes.	• Supply function.
	ICT Department.	To design, plan, coordinate, manage and secure ONEMI's information and communications technology-based infrastructures and services to ensure ONEMI's operational continuity at central and regional level.	• Information and communications technology function.
	Emergency Funds Coordination Department.	To evaluate, technically validate and manage resource requests of financial nature and/or aid items, in order to acquire the requested elements and obtain resources for payment to suppliers.	• Finance function
	National Early Warning Center.	To permanently and systematically monitor the evolution of hazard manifestations, vulnerability conditions and occurrences of destructive events, based on the information provided by ONEMI's Regional Early Warning Centers	• Management of the National Early Warning System Function.

ENTITY		MISION	ESSENTIAL FUNCTIONS
		and the Civil Protection System agencies, to collect, evaluate and disseminate in a timely manner valid information available on risk or emergency situations that may affect people, their property and/or the environment at any point in the National territory.	
Administration and Finance Sub-department.		To act as an advisor to the National Director, in order to ensure the optimal provision, allocation and administration of the human, physical and financial resources required by the National Emergency Office to fulfill its institutional mission.	• Information and Citizen Services Office function • Reception, Coordination and Dispatch of Documents Office function • General Services function • Budget function • Accounting function • Treasury function • Finance function • People Management function • People Development function • Remuneration function
	Citizen Services Unit.	To provide the internal and external public with information services in an efficient manner with respectful treatment, guiding them to all the necessary mechanisms available in the institution, to resolve their doubts, queries and/or requests according to the nature of their requirements.	• Information and Citizen Services Office function
	Reception, Coordination and Dispatch of Documents Office.	To be an effective institutional support, in the management and conservation of all the documents. This office must deal with the reception, classification, distribution, archiving and monitoring (if applicable) of the information that enters the institution, providing it at the required time.	• Reception, Coordination and Dispatch of Documents Office function
	Information and Citizen Services Office (ICO).	To guarantee the right of all people, without discrimination of any kind, to be informed, suggest, claim and / or congratulate the National Emergency Office and / or	• Information and Citizen Services Office function.

ENTITY		MISION	ESSENTIAL FUNCTIONS
		the National Civil Protection System.	
	General Services Function.	To plan and execute actions related to the maintenance and conservation of ONEMI's central office, supporting in turn the maintenance and conservation of the regional offices, as well as, all the infrastructure assigned to the institution, ensuring the correct administration of the physical inventory of the service's assets, adopting the necessary measures for their preservation and custody.	• General Services function.
	Budget Division.	To support the fulfillment of the Institutional mission and its strategic objectives through the transparent and efficient administration, control and execution of the fiscal resources assigned to ONEMI, based on the instructions for the execution of the Law and the Regulations of the General Accounting System of the Nation.	• Budget function • Accounting function • Treasury function • Finance function
	Administrative Division.	To design and propose to the Administration and Finance Sub-Director the policies, human resources strategies and registration of all administrative acts of the Service; as well as to manage the subsystems available for its execution, with the purpose of ensuring the development of people management processes, in order to achieve high levels of efficiency and timeliness in the performance of the functions of the Institution.	• People Management function. • People Development function. • Remuneration function.

5.1.5. ONEMI System and its component subsystems

Based on the organizational structure defined by ONEMI in its Organic and Functioning Regulations for the fulfillment of its mission and functions, the following subsystems of the ONEMI System have been identified, as shown in Figure 2.5.1.11.

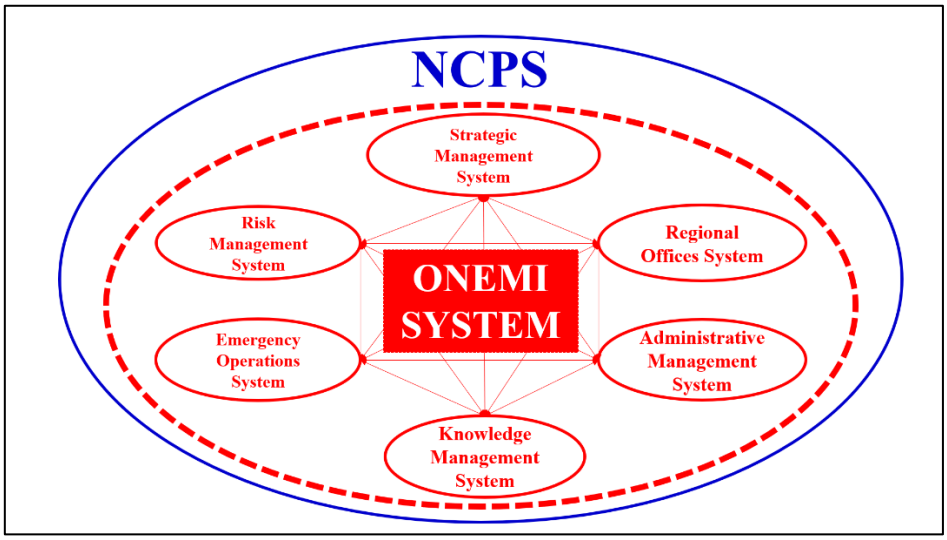


Figure 2.5.1.11 Component subsystems of the ONEMI System

5.1.5.1. Strategic Management System (SMS)

The essential purpose of the Strategic Management System is to plan, organize, direct, control and coordinate the execution of actions and the use of resources to achieve the objectives established to fulfill the mission of the ONEMI System.

It is mainly associated with the following functions:

- Strategic planning.
- Strategic organization.
- Strategic direction.
- Strategic control.
- Strategic coordination.
- Management coordination of Regional Offices.
- Management of the National Civil Protection System.

In addition, it performs the following management support functions.

- Legal advice.
- Internal audit.
- Communications.
- Broadcasting.
- Project management.
- Research and development.
- Technical and Executive Secretariat of the Committees for Disaster Risk Management.

5.1.5.2. Regional Offices System (ROS)

The essential purpose of the Regional Offices System is to plan, coordinate and execute activities aimed at prevention, mitigation, warning, response and rehabilitation required by the Civil Protection System in the presence of hazards and emergency situations, disasters and catastrophes at regional, provincial and communal levels.

Its actions are mainly associated with specific functions at the regional, provincial and communal levels, such as the following.

- Mitigation, Preparedness, Response and Recovery, at the regional level
- DRM at regional, provincial and communal levels
- Obtaining information related to the phases of Mitigation, Preparedness, Response and Recovery, at regional, provincial and communal levels, and submit it to the SMS, RMS and EOS systems, depending on the topic, for the transformation of this information into useful knowledge for DRR
- Technical and Executive Secretariat of the DRM Committees, at the regional level
- Proposal of DRM instruments, at the regional level
- Management of the National Early Warning System, at the regional level

In addition, it performs the following management support functions at regional, provincial and communal levels.

- Education, training and coaching in DRR issues
- Broadcasting of information and instructions for DRR

5.1.5.3. Risk Management System (RMS)

The essential purpose of the Risk Management System is to plan, organize, direct, control and coordinate actions and resources related to the risk cycle phases of prevention, mitigation and preparedness, which allow the development of capacities for disaster risk reduction.

It is mainly associated with the following essential functions.

- Mitigation
- Preparedness
- Obtaining information related to the Mitigation and Preparedness phases, and the transformation of this information into useful knowledge for DRR
- Knowledge management for DRR, at the ONEMI System level

5.1.5.4. Emergency Operations System (EOS)

The essential purpose of the Emergency Management System is to plan, organize, direct, control and coordinate actions and resources related to the risk cycle phases of response and recovery from risk and/or emergency situations.

It is mainly associated with the following functions.

- Response
- Recovery
- Obtaining information related to the Response and Recovery phases, and the transformation of this information into useful knowledge for DRR
- Management of the National Early Warning System

In addition, it performs the following management support functions.

- Supply
- Information and communications technology
- Finance

5.1.5.5. Administrative Management System (AMS)

The essential purpose of the Administrative System is to plan, organize, direct, control and coordinate the actions and resources that allow compliance with the legal regulations associated with the General Bases of the State Administration and the Bases of the administrative procedures that govern the acts of the organs of the State Administration.

It is mainly associated with the following functions.

- Information and Citizen Services Office
- Reception, Coordination and Dispatch of Documents Office
- General services
- Budget
- Accounting
- Treasury
- People management
- People development
- Remuneration

5.1.5.6. Knowledge Management System (KMS)

The essential purpose of the Knowledge Management System is to manage and transfer knowledge in Disaster Risk Reduction, through the recovery and broadcasting of historical memory and lessons learned, along with the training of human resources, so that institutions, communities and individuals strengthen the preventive culture.

It is mainly associated with the following functions:

- Knowledge Administration Function
    - Knowledge Validation Sub-Function
    - Operation Management of the KMS Sub-Function

- Knowledge Processing Function
  - Lessons Learned Sub-Function
  - Historical Memory Sub-Function
  - Human Resource Development Sub-Function
  - Research and Development Sub-Function
  - Network Development Sub-Function
- Knowledge Storage Function
  - Repository Sub-Function
  - Control and Maintenance of the Repository Sub-Function
- Knowledge Transfer Function
  - Knowledge Availability Sub-Function
  - Knowledge Exhibition Sub-Function

In addition, the ONEMI system can be graphed at two levels, as shown in Figure 2.5.1.12:

- Strategic Level, composed of:
  - Strategic Management System
- Operational Level, composed of the following systems:
  - Regional Offices System
  - Risk Management System
  - Emergency Operations System
  - Administrative Management System
  - Knowledge Management System

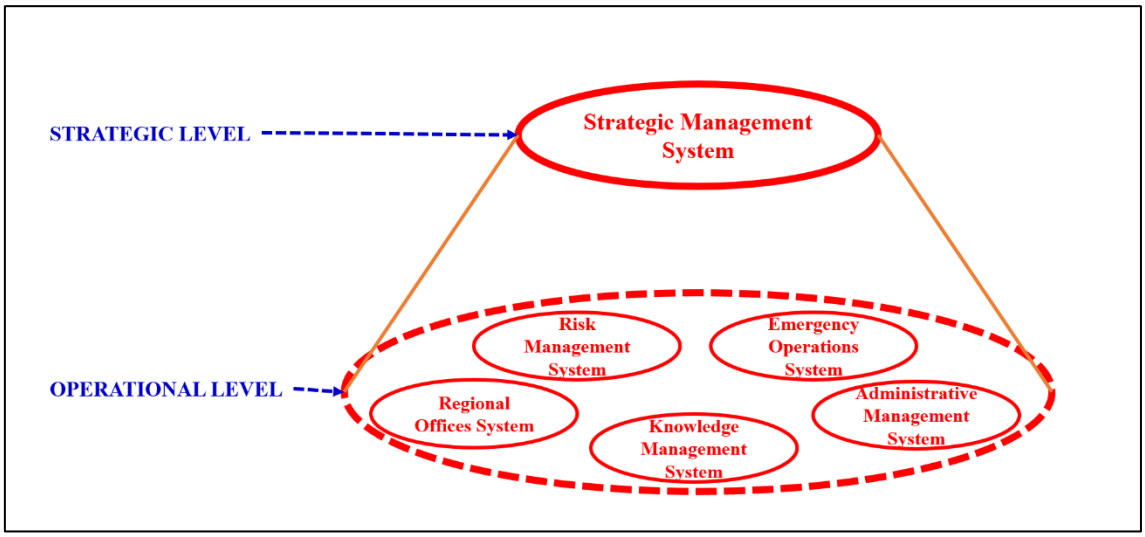


Figure 2.5.1.12 Component subsystems of the ONEMI System by levels

5.1.6. Relationship of the subsystems of the ONEMI System with the organic structure

Considering the essential functions of the subsystems of the ONEMI System, a correspondence can be established with the missions of the entities of ONEMI's upper structure.

5.1.6.1. Strategic Management System

The Strategic Management System of the ONEMI System has a direct correspondence with the missions of the following entities of ONEMI's upper structure, as shown in Figure 2.5.1.13.

- National Administration
- Cabinet
- National Sub-Department

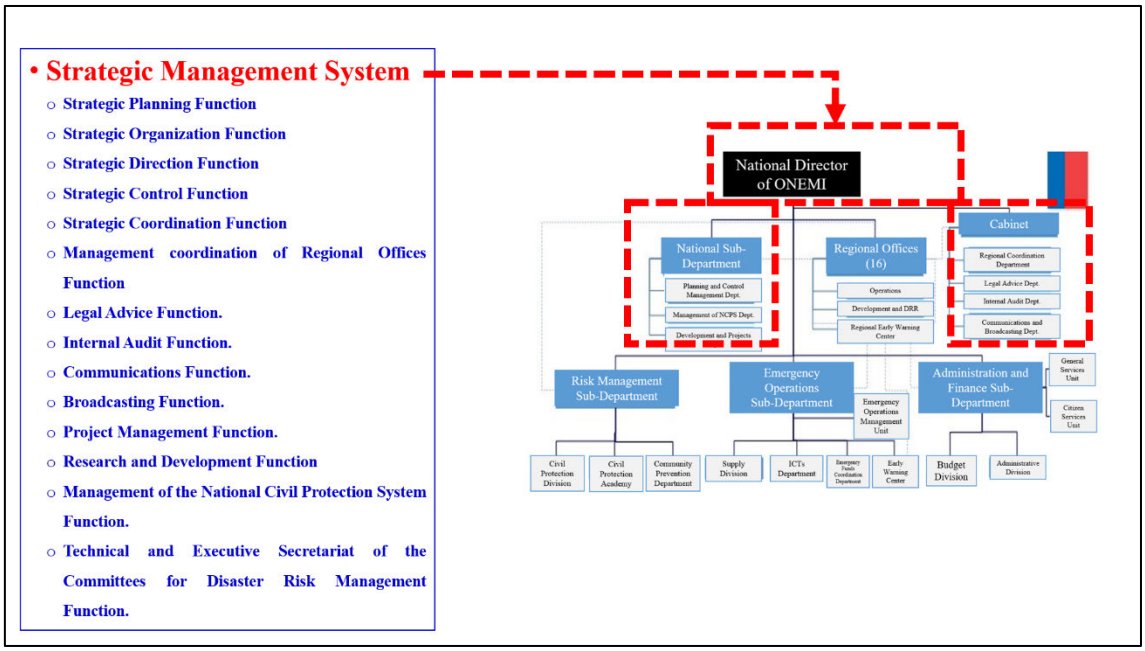


Figure 2.5.1.13 Relationship of the Strategic Management System with the ONEMI Structure

5.1.6.2. Regional Offices System

The Regional Offices System of the ONEMI System has a direct correspondence with the missions of the 16 Regional Offices of ONEMI's upper structure, as shown in Figure 2.5.1.14.

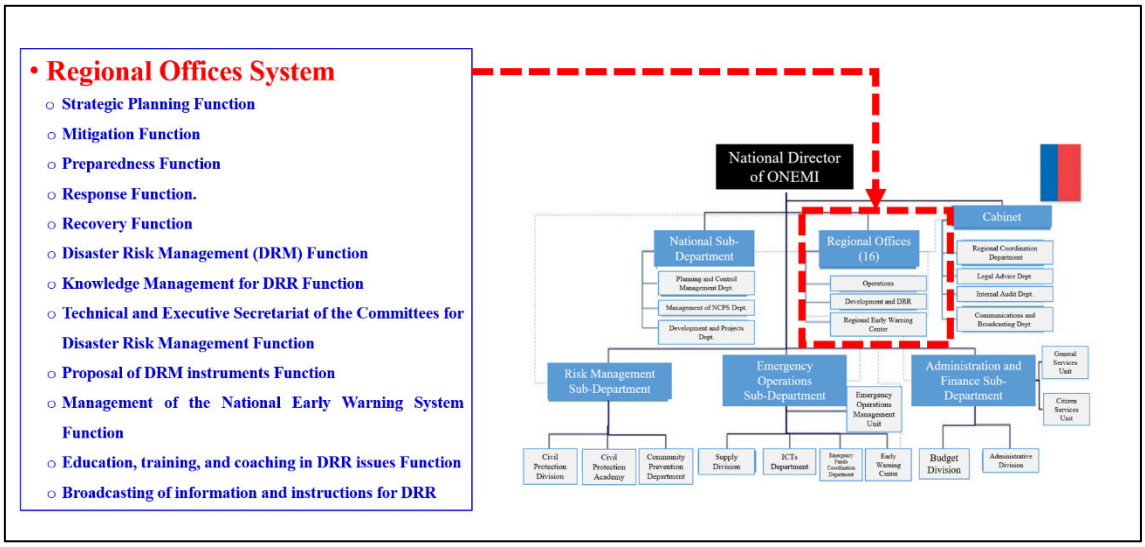


Figure 2.5.1.14 Relationship of the Regional Offices System with the ONEMI Structure

5.1.6.3. Risk Management System

The Risk Management System of the ONEMI System has a direct correspondence with the missions of the Risk Management Sub-Department of ONEMI's upper structure, as shown in Figure 2.5.1.15.

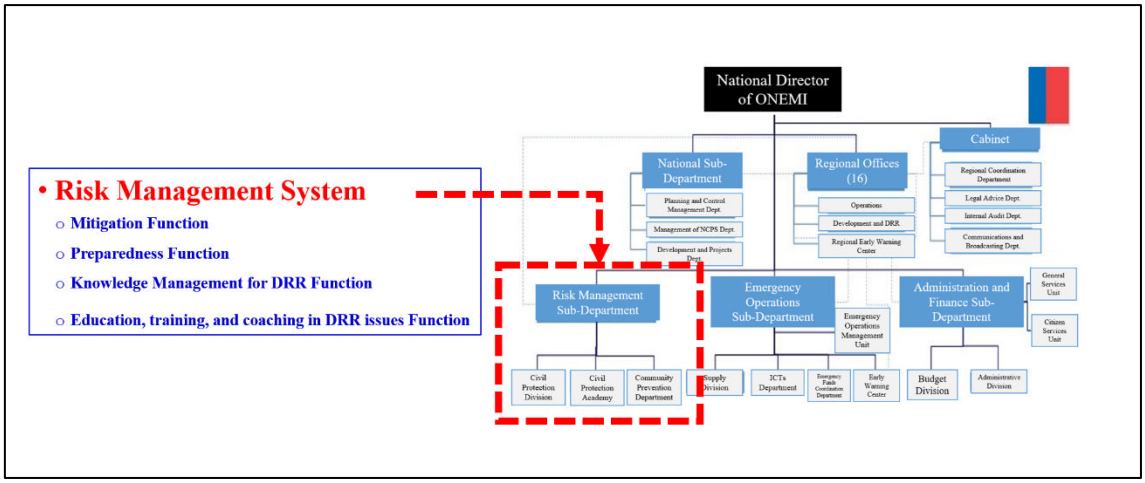


Figure 2.5.1.15 Relationship of the Risk Management System with the ONEMI Structure

5.1.6.4. Emergency Operations System

The Emergency Operations System of the ONEMI System has a direct correspondence with the missions of the Emergency Operations Sub-Department of ONEMI's upper structure, as shown in Figure 2.5.1.16.

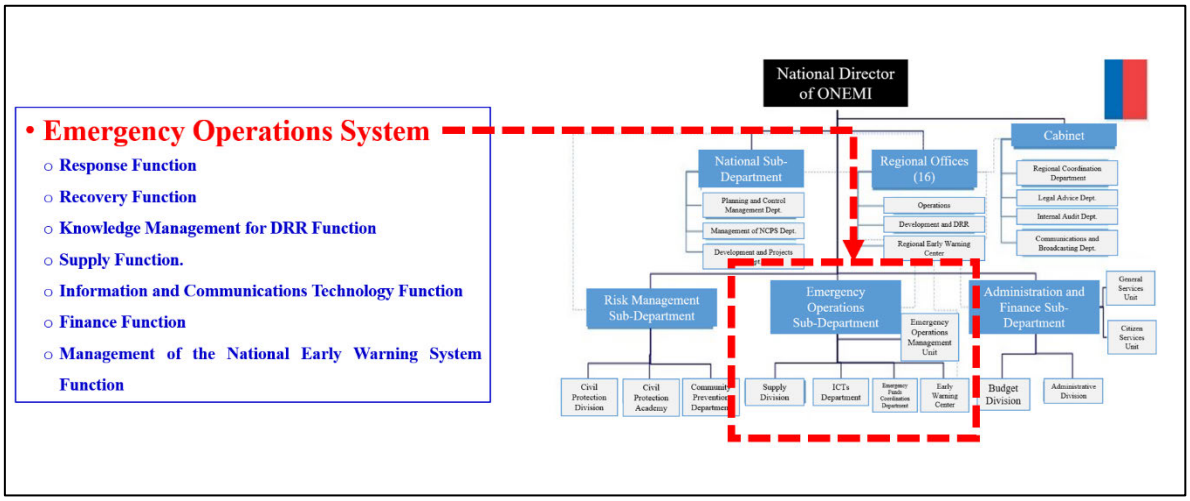


Figure 2.5.1.16 Relationship of the Emergency Operations System with the ONEMI Structure

5.1.6.5. Administration and Finance System

The Administration and Finance System of the ONEMI System has a direct correspondence with the missions of the Administration and Finance Sub-Department of ONEMI's upper structure, as shown in Figure 2.5.1.17.

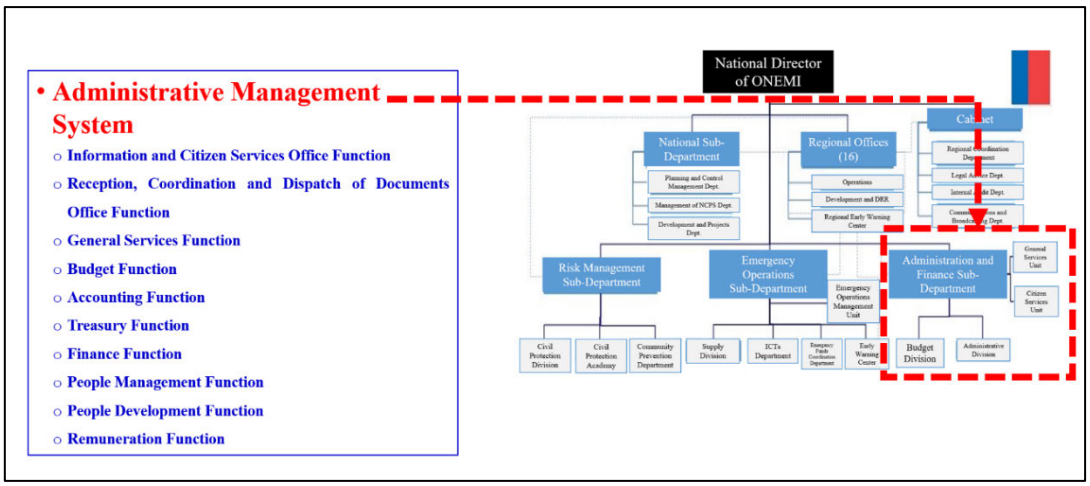


Figure 2.5.1.17 Relationship of the Administration and Finance System with the ONEMI Structure

5.1.6.6. Knowledge Management System

Although the Knowledge Management System is not represented in the structure, since it is in the design stage, its essential purpose can be deduced from the correspondence with the missions of all the entities of ONEMI's upper structure, as shown in Figure 2.5.1.18.

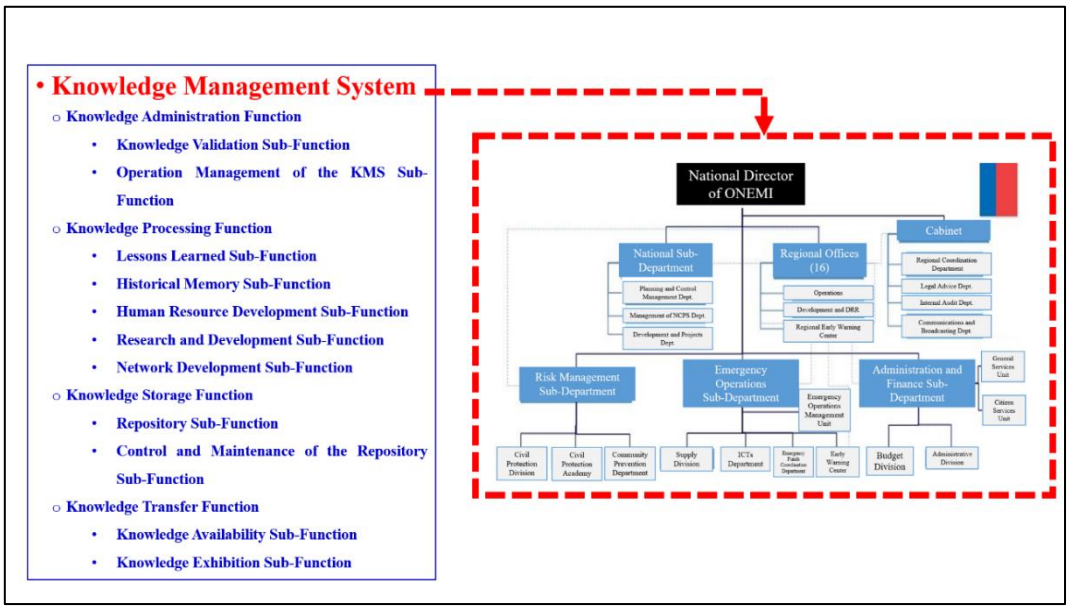


Figure 2.5.1.18 Relationship of the Knowledge Management System with the ONEMI Structure

5.2. Appendix “Description of the functions of the KMS operating model”

5.2.1. Description of the "Knowledge Administration" function

The essential purpose of the "Knowledge Administration" function is to ensure that the knowledge that is entered and processed in the System complies with the requirements defined by ONEMI regarding being useful for DRR.

In addition, the "Knowledge Administration" function is in charge of achieving the proper functioning of the system, becoming the key element to achieve compliance with the objectives of the KMS, in terms of planning, organization, direction, control and coordination of the execution of activities and the use of resources, in all aspects related to the functions of processing, storage and transfer of knowledge of the KMS.

To fulfill its essential purpose, the “Knowledge Administration” function performs the “Knowledge validation” and “operation management of the KMS” processes, which are represented in the diagram in Figure 2.5.2.1, within the context of the KMS operation scheme.

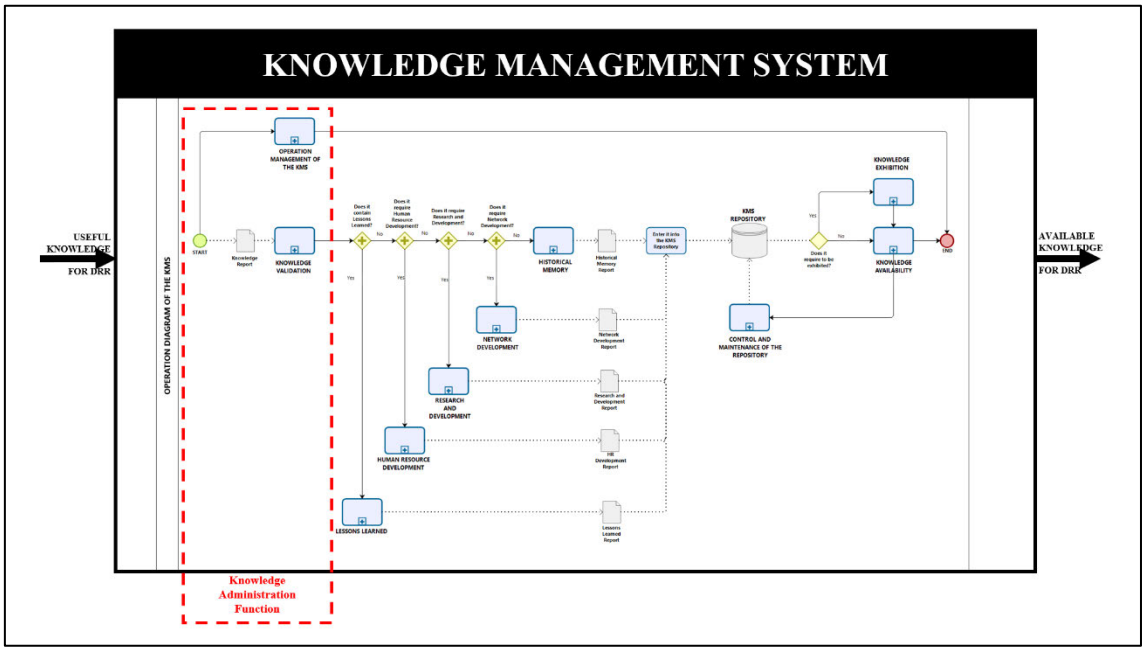


Figure 2.5.2.1 The "Knowledge Administration" function in the context of the KMS operation scheme

5.2.1.1. “Operation management of the KMS” Process

The essential purpose of this process is to obtain an integrated vision of the performance of the set of competencies and activities that correspond to the main functions of the System, as well as to establish the strategic planning, organization, direction, control and coordination of the same, in perfect harmony with what it is established for the strategic management of ONEMI.

Figure 2.5.2.2 represents the process "Operation management of the KMS" within the context of the "Knowledge administration" function of the KMS operation scheme.

Management is a process that tends to achieve a predetermined objective, which implies that all the activities and tasks carried out must be oriented towards the same goal, in a coordinated and harmonious way.

The functions of management are: planning (what to do); organization (how to do it); direction (doing it); control (checking). Coordination is the essence of management.

Consequently, we can conceive management as a system consisting of various subsystems associated with the functions of planning, organization, direction, that interact with each other in coordination (management level).

On the other hand, the operation of the KMS is determined by the set of processes that are conducted to achieve the products established in their essential purpose (Operational level).

The diagram of the process "Operation management of the KMS" is represented in Figure 2.5.2.3.

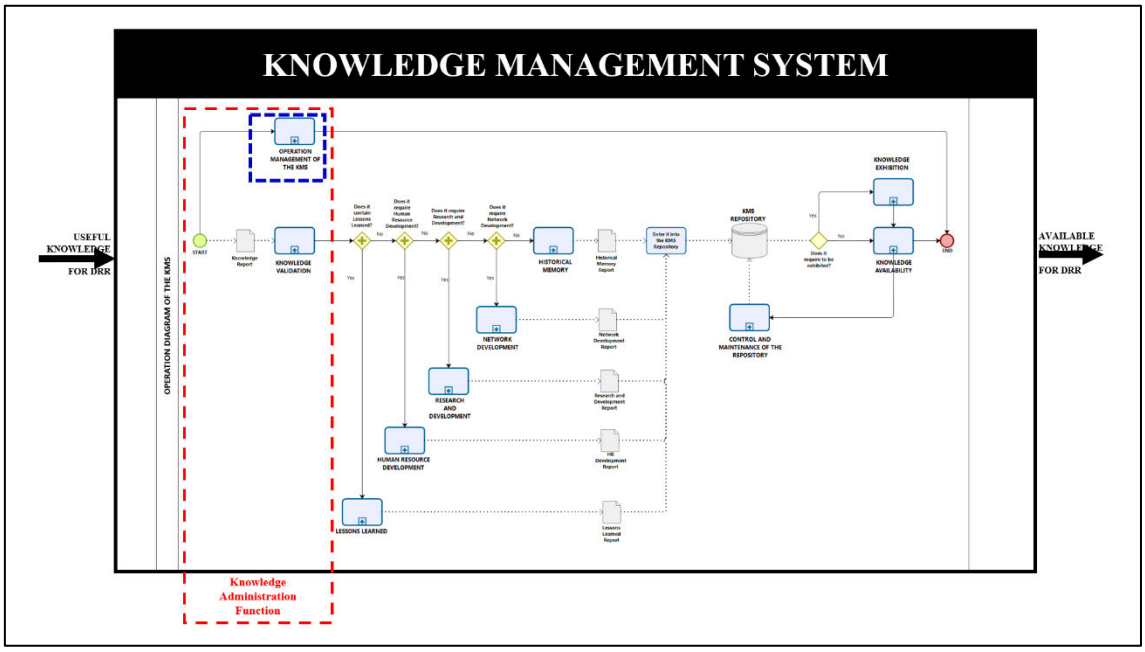


Figure 2.5.2.2 "Operation management of the KMS" process within the context of the "Knowledge administration" function of the KMS operation scheme

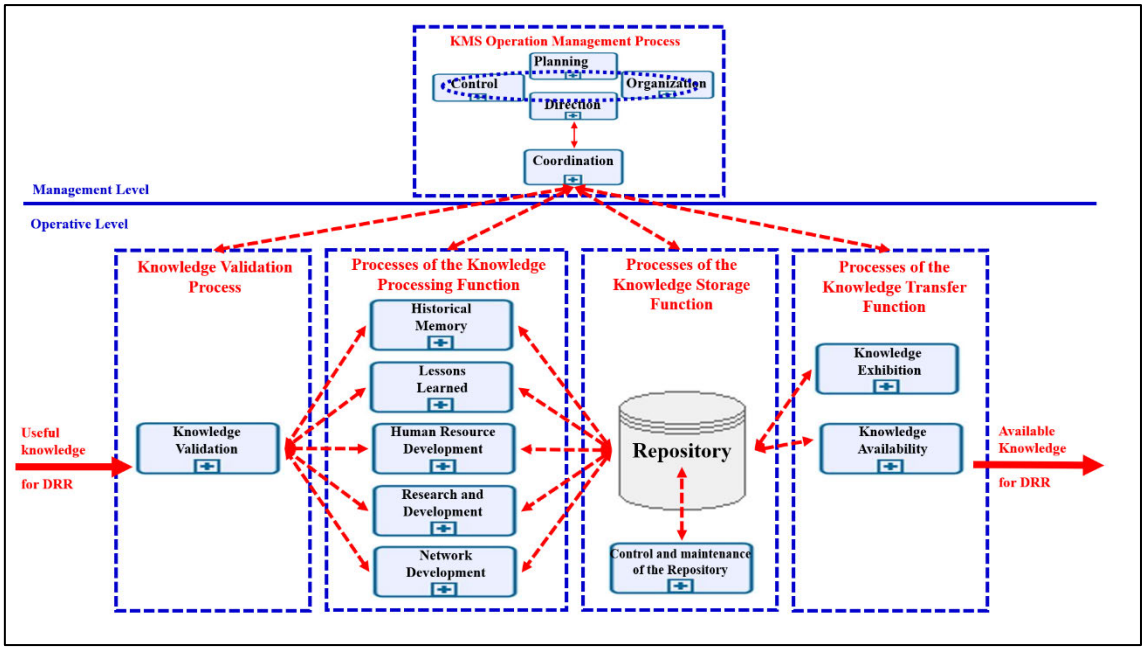


Figure 2.5.2.3 Diagram of the “Operation management of the KMS” process

In the "Operation management of the KMS" process, the role of the **Administrator of the KMS** (ADM), a specialist in knowledge management, is to be in charge of the fulfillment of the following functions.

- Planning: To determine the objectives that are required to be achieved in a given period, to fulfill the essential purpose of the KMS. In addition, it must determine the actions that need to be carried out to achieve these objectives, prioritize them, establish their sequence and those responsible for their execution. Also, it must identify the available resources and assign them to the actions according to their prioritization.
- Organization: To determine the necessary activities and roles within the KMS, distributing them in accordance with the best functional relationships, clearly defining the authority, responsibilities and duties of each one and assigning them to positions and individuals within the organizational structure of ONEMI.
- Direction: To direct the execution of the scheduled activities in the Planning function, using the roles assigned to the positions within the ONEMI organizational structure. The concept of "direction" constitutes the implementation of the plan, ensuring that all the personnel in charge of fulfilling the roles of the KMS intend to achieve certain objectives, in concordance with the plans and organizational structure of ONEMI.
- Control: To conduct the measurements that are necessary to verify the progress achieved in accordance with the defined goals, the objectives established in the plan and the operation of the processes defined in the system and, based on this, adopt the corrective measures accordingly.
- Coordination: To ensure the harmonious operation of the KMS, through the coordination of the management functions.

For the specific case of the KMS, management implies determining the objectives that are required to be achieved in a given period, in order to fulfill the essential purpose of the System, to make useful knowledge for DRR available to users, establishing the actions that need to be carried out to achieve these objectives, prioritize them, define their sequence, identify the available resources and assign them to the actions according to their prioritization.

In addition, ONEMI's organization must be adjusted in terms of roles, positions, integration of personnel, competencies, etc., so that the planned actions can be conducted to benefit the achievement of the objectives.

Organizing is determining the necessary tasks to achieve the objective, assigning them to an organic structure, establishing the authority and assigning responsibilities to the people who will be in charge of these tasks.

The roles defined for the operation of the KMS must correspond to the positions of the ONEMI organic structure, considering that in those cases in which tasks are assigned to existing positions, the corresponding profile must be analyzed and, if not, define the profile that best suits the roles to be fulfilled.

Having established what to do and who should do it, the KMS is able to conduct what is planned by having adequate organization. For this, the person responsible for managing the operation of the KMS must direct, coordinate and guide the execution of the works that allow achieving the goals established for each objective.

During the execution of the tasks, it must be verified that what is being executed corresponds to what is planned (in relation to the goals of each objective) and thus provide feedback on the administrative process of the management of the KMS, as well as verify compliance with the processes of the main functions defined for the system (depending on the goals or standards of each process). It is vitally important to conduct the measurements that are necessary to verify the progress achieved based on the defined goals, the objectives established in the plan and the operation of the processes defined in the system and, based on this, adopt the corrective measures accordingly.

Consequently, the person responsible for managing the operation of the System will, as a main responsibility, ensure the coordinated and harmonious operation of the KMS, through management functions, from the reception of validated knowledge, the processing of knowledge by the main functions (Historical Memory, Lessons Learned, Human Resource Development, Research and Development and Network Development), the storage, control and maintenance of knowledge in the computer applications of the repository, until the exhibition and availability of the knowledge for the respective stakeholder of the system as a final product.

For the above, the complementary background information that is required for its processing must be coordinated with the generators of knowledge.

- Identify the function or functions that are relevant to process the knowledge received and process the document within the system.
- Coordinate between the functions the exchange of information that is required.
- Interact with other ONEMI's systems that allow complementing the information for proper processing.
- Manage the information in the Repository, having special concern regarding:
    - Entry of the reports processed in each function.
    - Availability of hardware, software and networks required by the system.
    - Availability of information for users of the system, which has the approval of the person responsible for managing the operation of the KMS.
    - Keep the Repository updated.
- Adopt measures to ensure the adequate use of the system's feedback process.
- Manage interactions with internal and external bodies to the system, accordingly.
- Direct the maintenance and control of the system.
- Manage digital files, documentation, personnel, administrative aspects and the organization of work in general, within a systemic dynamic to distribute knowledge, meeting the needs of

the internal and external environments of the system.

- It is important that the system highlights the inevitable relationship between knowledge management, information management, technology management, organizational culture and human resource management as fundamental elements for the process to be efficient.

For knowledge retention, there are three fundamental sub-processes:

- Select, from the multiple events experienced by the organization, the people and the processes that must be retained due to their value.
- Save the experience appropriately.
- Ensure that the organizational memory is constantly updated.

5.2.1.2. "Knowledge Validation" Process

The essential purpose of this "Knowledge Validation" process is to review the knowledge reports sent by ONEMI's entities, verifying that they meet the requirements defined to be managed by the KMS. Figure 2.5.2.4 represents the "Knowledge validation" process within the context of the "Knowledge administration" function of the KMS operation scheme.

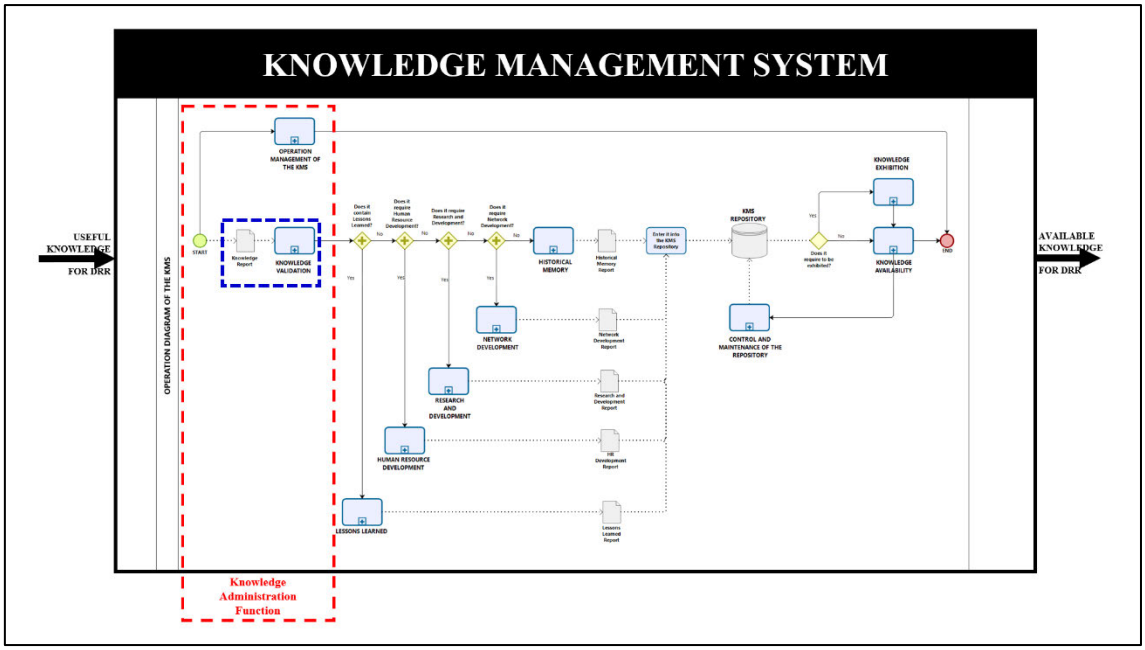


Figure 2.5.2.4 The "Knowledge Validation" process within the context of the "Knowledge administration" function of the KMS operation scheme

The activities conducted by the "knowledge validation" process are represented in the diagram in Figure 2.5.2.5.

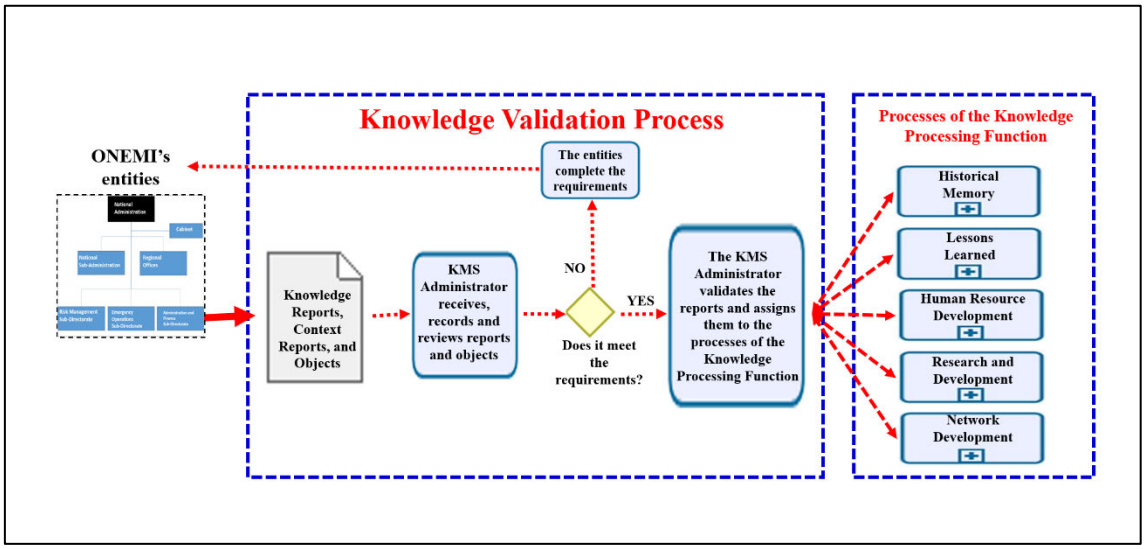


Figure 2.5.2.5 Diagram of the "Knowledge validation" process

The following roles participate in this "Knowledge Validation" process:

- **KMS Administrator (ADM),** Knowledge Management Specialist.
- **Head of the ONEMI Entity (HENT),** person of an ONEMI entity that is responsible for preparing the Knowledge Reports, Context Reports and interacting with the KMS regarding the format of the reports and their content.
- **Exhibition Specialist (EXHS),** person who has the competencies in techniques and practices related to the operation of exhibition rooms of elements with historical value and of interest for DRR.

The "Knowledge Validation" process begins with the receipt of a knowledge report that has been prepared by the HENT of the ONEMI's organic entities that, in the opinion of the experts of the respective functional areas, it is considered as qualified to be managed by ONEMI's KMS for DRR.
The ADM proceeds to verify that it complies with the requirements related to the context in which the knowledge is generated, its comparison with other elements, prediction of consequences, search for connections and conversation with other knowledge bearers.
For this, the ADM, who must define and keep updated the requirements that must be met by both the Knowledge Reports issued by the entities and the specifications of the main functions, hold working meetings with those responsible for these functions and their specialists, to establish the details of the specific requirements of each function, which must finally be protocolized by the ADM.
With this information, the entities can prepare their knowledge reports to be entered into the KMS. It will be the ADM's task to conduct training for ONEMI's entities, in order to achieve an adequate interpretation and application of the requirements.

If the knowledge submitted by the entities meets the requirements to be managed by the KMS, the ADM proceeds to assign them to the processes of the Knowledge Processing function (Historical Memory, Lessons Learned, Human Resource Development, Research and Development, and Network Development) that corresponds to processing and is entered into the Repository. This assignment is based on the purpose for which these processes were created.

If the knowledge submitted by the entities does not meet the requirements to be managed by the KMS, the ADM proceeds to return it to the entity that generated it to be completed and reprocessed.

Specifically, in this Knowledge validation process, the EXHS advises the ADM in the validation of the elements and their associated context reports, proposing the conditions, means and places of exhibition.

5.2.2. Description of the "Knowledge Processing" function

The "Knowledge Processing" function performs the following processes, which are represented in the diagram in Figure 2.5.2.6, within the context of the KMS operation scheme.

- "Historical Memory" process. This process is defined to maintain a record of the DRR related events of the different types of disaster risks that occur at a national level.
- "Lessons Learned" process. This process is defined to draw conclusions that come from the analysis of the positive or negative experiences that occur in the development of a process, operation, system or project and that are considered to be taken into account for the future as a result of learning from experience.
- "Human Resource Development" process. This process is defined to develop capacities in DRR through the training of people at different levels (internal and external), either by taking advantage of existing courses or by designing programs that solve a raised need.
- "Research and Development" process. This process is concerned with seeking responses to DRR requirements that are presented in ONEMI's entities. For this, respective research projects are prepared.
- "Network Development" process. This process is defined to satisfy a specific requirement formulated by an entity regarding a need to have the capacity to be inserted in the knowledge society of disaster risk reduction, creating connections that promote the exchange of knowledge and alliances that allow linking with national and international organizations.

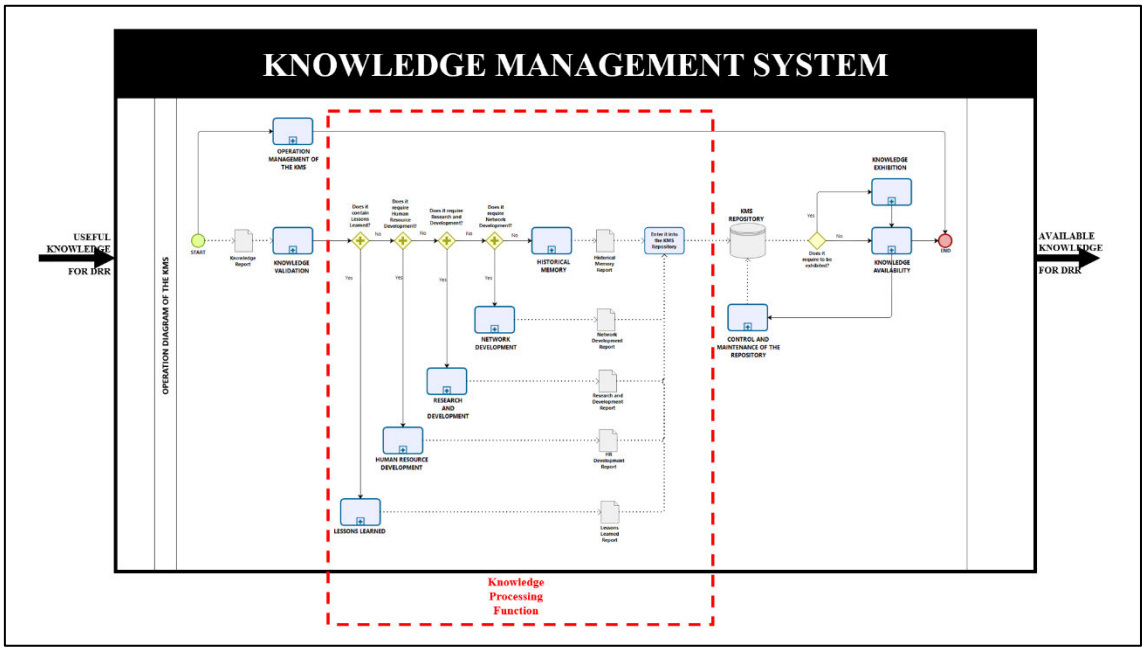


Figure 2.5.2.6 The "Knowledge Processing" function in the context of the KMS operation scheme

The description of the "Knowledge Processing" function of the KMS will be made from the logical sequence of the activities of the processes considered in this function, indicating in each case the essential purpose of the process, its graphic representation by means of an elaborated flow diagram in the BIZAGI BPM application and the description of each process flow diagram.

Flowcharting is defined as a method to graphically describe a process through the use of symbols, lines and simple words, demonstrating the tasks and their sequence in the process.

The objectives of a flow chart are:

- Represent a process graphically
- Relate the tasks and activities of a process
- Indicate the entities involved in a process
- Show the documents that support and record the information
- Highlight the decision centers

Flow charts are key elements to understand the processes of an entity and thus improve the quality of products and services. Its preparation must precede the preparation of the procedures and work instructions of the processes, allowing people to know and identify the tasks and relationships within the process, recognizing the internal customer-supplier concept.

Flow diagrams are methods; therefore, their usefulness does not come from only documenting a process, but from permanently analyzing it in order to achieve sufficient knowledge to define and improve it.

Diagrams also allow streamlining processes, that is, to make them more effective and less expensive.

In the design of the flow diagrams for this stage, the activities associated with each process will be defined, according to the template in Figure 2.5.2.7, in which the roles that these activities should execute are identified.

During the design of the processes, different roles were identified, which will later be assigned to positions within the organizational structure of ONEMI's entities. Also, competencies will be developed so that the personnel of these entities fulfill the specific role they are assigned to.

Figure 2.5.2.7 Template for the diagramming of the processes of the "Knowledge processing" function

For the diagramming of the activities of the processes, the symbology based on the notation of the BIZAGI BPM application will be used, which is shown in the following table:

SYMBOL	DESCRIPTION
	It represents an entity participating in the process, and inside of it, the elements of the process are graphed.
	It represents a process involving more than one entity, and inside of them, the elements of the process are graphed.
	It represents the beginning of a process.

	It represents the end of a process.
	It represents a task included in a process.
	It represents a subprocess that contains other tasks inside.
	It represents a decision within a process. The flow can take more than one alternative path.
	It represents a decision within a process that also provides a mechanism to create and synchronize flows in parallel.
	It represents a document with information as a result of a process task.
	It represents a data repository that allows to update or consult the stored information.
	It represents the sequence in which tasks are executed in the process.
	It represents a flow between a task and a document.

5.2.2.1. "Historical Memory" Process

The essential purpose of the "Historical Memory" process is to produce as a final product a Historical Memory Report (HMR) for DRR, which must be entered into the KMS Repository in order to be available for KMS stakeholders.

This HMR is produced through a set of successive tasks, based on a Knowledge Report (KR) that provides the "Knowledge Validation" process as input. This input is prepared by ONEMI's entities in their respective areas of action and validated by the KMS Administrator.

The sequence of this process approach is shown in Figure 2.5.2.8.

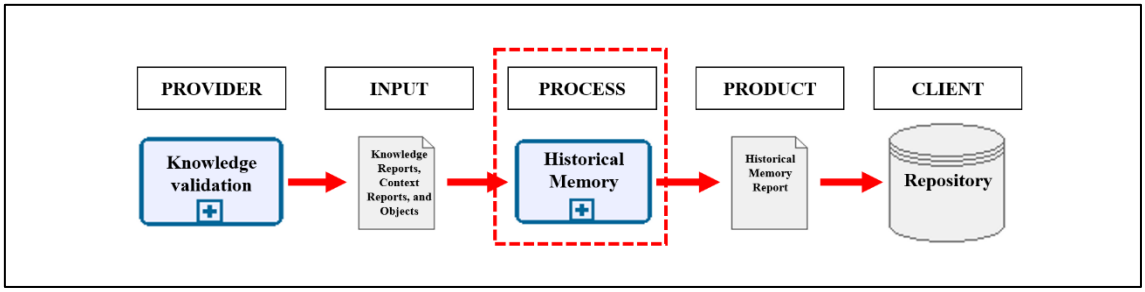


Figure 2.5.2.8 "Historical Memory" process approach

The following roles participate in this "Historical Memory" process.

- **KMS Administrator (ADM)**, knowledge management specialist
- **Head of the ONEMI Entity (HENT)**, person from an ONEMI entity who is responsible for preparing the Knowledge Reports, Context Reports and interacting with the KMS regarding the format of the reports and their content
- **Historical Memory Specialist (HMS)**, person who has the competencies to prepare Historical Memory Reports (HMR) and who is responsible for the processing of the HMR, from the verification of its relevance to its entry into the Repository
- **Disaster Risk Reduction Specialist (DRRS)**, person who has the competencies in DRR and who is responsible for reviewing the content of the Knowledge reports and context reports, regarding the DRR concepts used in ONEMI
- **Communications Specialist (COMMSS)**, person who has the competencies in communication strategies and techniques

5.2.2.1.1. Diagramming of the "Historical Memory" process

The activities conducted by the "Historical Memory" process are represented in the flow diagram of Figure 2.5.2.9.

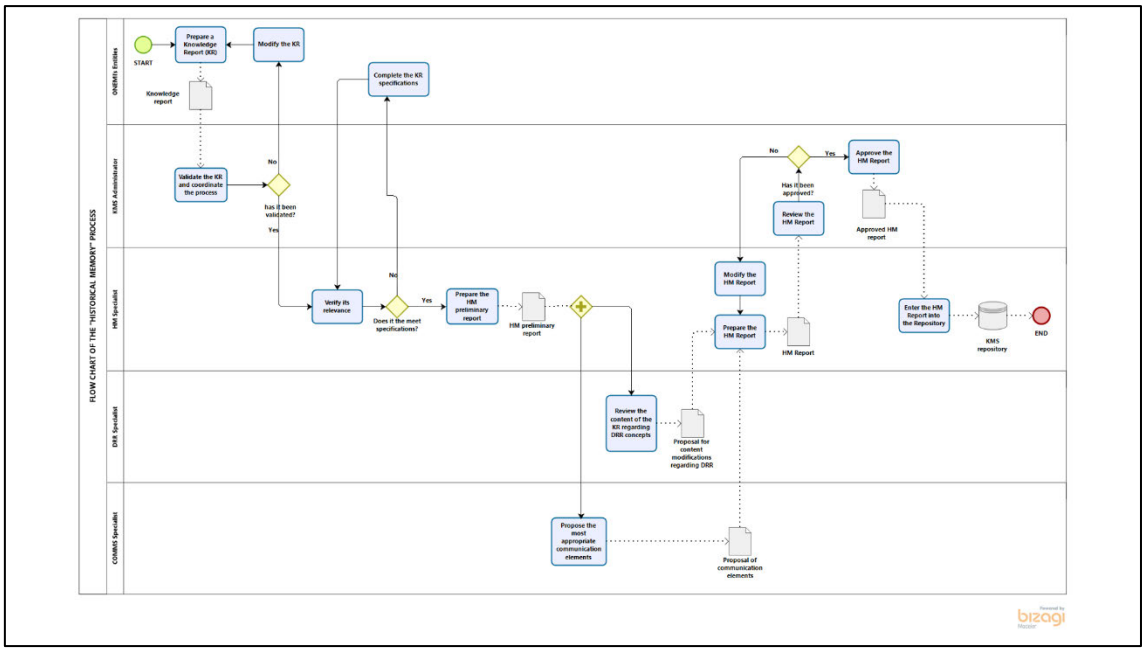


Figure 2.5.2.9 Flow diagram of the "Historical Memory" process

5.2.2.1.2. Description of the "Historical Memory" process

The "Historical Memory" process is executed according to the following sequence of tasks:

- The process begins when an ONEMI entity prepares a Knowledge Report (KR), complying with the requirements defined by the ADM, sending it to the ADM through the HENT.
- The ADM verifies that the KR qualifies to be managed by the KMS. In addition, it needs to be processed by the Historical Memory process. The ADM, within his functions, must define and keep updated the requirements that must be met by both the Knowledge Reports issued by the ONEMI's entities and the specifications of the main functions (Historical Memory, Lessons Learned, Human Resource Development, Research and Development, and Network Development) to be managed by the KMS. Both the entities in their respective areas of action and the specialists of the main functions of the KMS must participate in the elaboration of these requirements. All of the above is to be coordinated by the ADM. Furthermore, the ADM must train those responsible for preparing the KR of the entities regarding the interpretation and application of the requirements.
- If the KR is not validated, the ADM returns it to the entity to be modified.
- The HENT makes the modifications and forwards the KR to the ADM.
- If the KR is validated and requires to be processed as a historical memory, the ADM forwards it to the HMS for processing.
- The HMS verifies that the Knowledge Report received qualifies as a historical memory and that it has the necessary background information to record the event, such as, for example:
    - Be associated with official documents regarding DRM (Disaster Risk Management Instrument or Status Report on the situation of events).
    - Identify the types of disasters that occurred ordered by date.
    - Describe the historical moment that society is living in the identified disaster, with respect to forms of relationship with the social environment, forms of understanding nature and humanity, development models and particular forms of management and protection of inhabitants.
    - Collect information and elements that are available in ONEMI, related to the corresponding KR.
    - Organize what is described above so that all the information can be stored and analyzed to then define the means of diffusion of each topic. At this point, the purpose of said dissemination is established, considering, for example, the following:
        - Inform: Simple and low-budget format. Mass message.
        - Educate: Interactive exhibition format, using multimedia material.
        - Recreation: Monuments that are linked to the city through tourism, in order to entertain and recreate the community, both local and visitor. Provide dynamic spaces for social interaction, commercial activity in the city, among others.

        - Spirituality: Provide spaces for prayer and reflection that allow the spontaneous manifestation of visitors. It must directly evoke the disaster, using meaningful ruins or remnants of the losses.
    - Define a system to incorporate new background information that appear in time with respect to each event.
- If the HMS concludes that the KR does not contain the main specifications to be processed, it requests the entity responsible for the KR to complete the background information that will allow the creation of a Historical Memory Report that is useful for DRR.
- The HENT completes the main specifications and forwards it to the ADM.
- If the HMS concludes that the KR meets the main specifications, the specialist prepares a preliminary Historical Memory Report (HMR), using the Form from point 5.2.2.1.3 of this document.
- The HMS sends the preliminary HMR to the COMMSS to propose the most appropriate communication elements to the context and content of the Historical Memory report in progress, such as, for example, dissemination instrument, receiver, message, communication channel, among others. The COMMSS prepares a proposal of communication elements and sends it to the HMS so it can be considered in the preparation of the final Historical Memory Report.
- In parallel, the HMS sends the preliminary Historical Memory Report to the DRRS so he can review the coherence of the contents of the report with respect to the DRR concepts used in ONEMI. The DRRS prepares a proposal with the modifications that are identified and sends it to the HMS to be considered in the preparation of the Final Historical Memory Report.
- The HMS prepares a HMR proposal, taking into consideration the Preliminary Report, the proposal of communication elements and the proposal with the modifications regarding the DRR concepts, to send it to the ADM for its review.
- The ADM reviews the proposal for the Historical Memory Final Report.
- If it is not approved, the ADM returns it to the HMS for modification according to the guidelines the specialist deems appropriate.
- The HMS makes the modifications according to the guidance of the ADM and forwards the HMR to the ADM.
- If approved, the ADM returns the HMR to the HMS to be formalized and entered into the KMS Repository.
- The HMS enters the HMR into the KMS Repository in order to make it available for KMS Stakeholders.
- End of the process.

5.2.2.1.3. Form for the Historical Memory Report

To prepare the Historical Memory Report, the following form will be used:

DATA	DESCRIPTION
HM Code	Numbering according to the agreed format that unequivocally identifies a Historical Memory Report (HMR).
HM Title	Phrase with which a HMR can be identified or searched.
KR Reference	Indication of the KR Code of the Knowledge Report (KR) that is related to the HMR.
KR Entity	ONEMI entity that issued the KR.
KR Registration date	Date DD / MM / YY that the entry of the KR was registered to be processed by the Historical Memory process.
Phases of the Disaster Risk Cycle	Indication of the phases of the Disaster Risk Cycle related to the HMR (Mitigation, Preparedness, Response and Recovery).
Types of disaster risk	Indication of the type of disaster risk that is estimated to be associated with the HMR for DRR purposes (earthquakes, tsunamis, volcanic eruptions, floods, overflows, mudslides, mass removal, strong winds, heavy sea, snowfalls, avalanches, lightning strikes, hailstorms, structural fires, forest fires, hazardous materials, among others)
HMR Statement	Clear and complete description of each event, defining: • Start date of the event. • End date of the event. • Communes, provinces and regions affected. • Specific information of each type of disaster risk.
Purpose of dissemination	Definition of the purpose of dissemination, such as: • Inform. • Educate. • Recreation. • Spirituality. • Others.
Preliminary HMR date	Date DD / MM / YY that the preliminary HMR was prepared.
Communication Proposal	Proposal of the most appropriate communication elements to the context, content and purpose of dissemination of the HMR in progress.

Communication date	Date DD / MM / YY that the communication proposal was sent to the HMS.
DRR Review Date	Date DD / MM / YY that the revision of the content of the preliminary HMR was conducted, regarding the use of terms associated with DRR used formally in ONEMI.
HMR Date	Date DD / MM / YY that the ADM approved the final HMR.
HMR Entry date	Date DD / MM / YY the approved HMR was entered into the KMS Repository.

5.2.2.2. "Lessons Learned" process

The essential purpose of the "Lessons Learned" process is to produce as a final product a Lessons Learned Report (LLR) for DRR, which must be entered into the KMS Repository in order to be available for KMS stakeholders.

This LLR is produced by means of a set of successive tasks, based on a Knowledge Report (KR) that provides the “Knowledge Validation” process as input. This input is prepared by ONEMI’s entities in their respective areas of action and validated by the KMS Administrator.

The sequence of this process approach is shown in Figure 2.5.2.10.

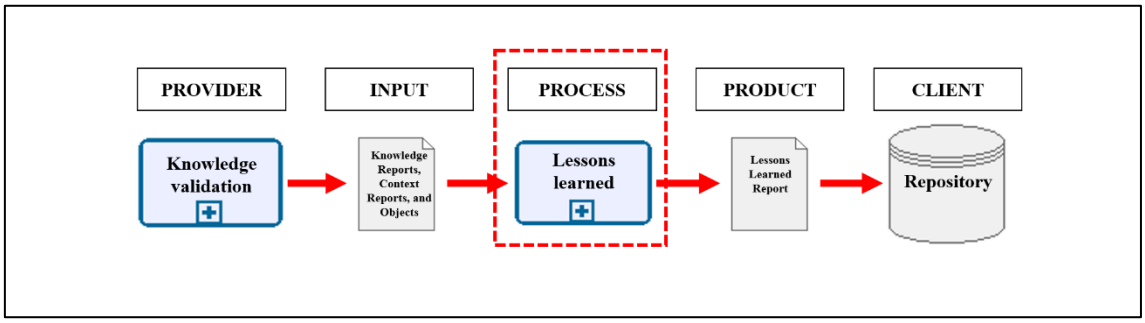


Figure 2.5.2.10 "Lessons Llearned" process approach

The following roles participate in this "Lessons Learned" process.

- **KMS Administrator (ADM)**, knowledge management specialist
- **Head of the ONEMI Entity (HENT)**, person from an ONEMI entity who is responsible for preparing the Knowledge Reports, Context Reports and interacting with the KMS regarding the format of the reports and their content.
- **Lessons Learned Specialist (LLS)**, person who has the competencies to prepare Lessons Learned Reports (LLR) and who is responsible for the processing of the LLR, from the verification of its relevance to its entry into the Repository

- **Disaster Risk Reduction Specialist (DRRS)**, person who has the competencies in DRR and who is responsible for reviewing the content of the Knowledge reports and context reports, regarding the DRR concepts used in ONEMI
- **Communications Specialist (COMMSS)**, person who has the competencies in communication strategies and techniques

5.2.2.2.1. Diagramming of the "Lessons Learned" process

The activities conducted by the “Lessons Learned” process are represented in the flow diagram of Figure 2.5.2.11.

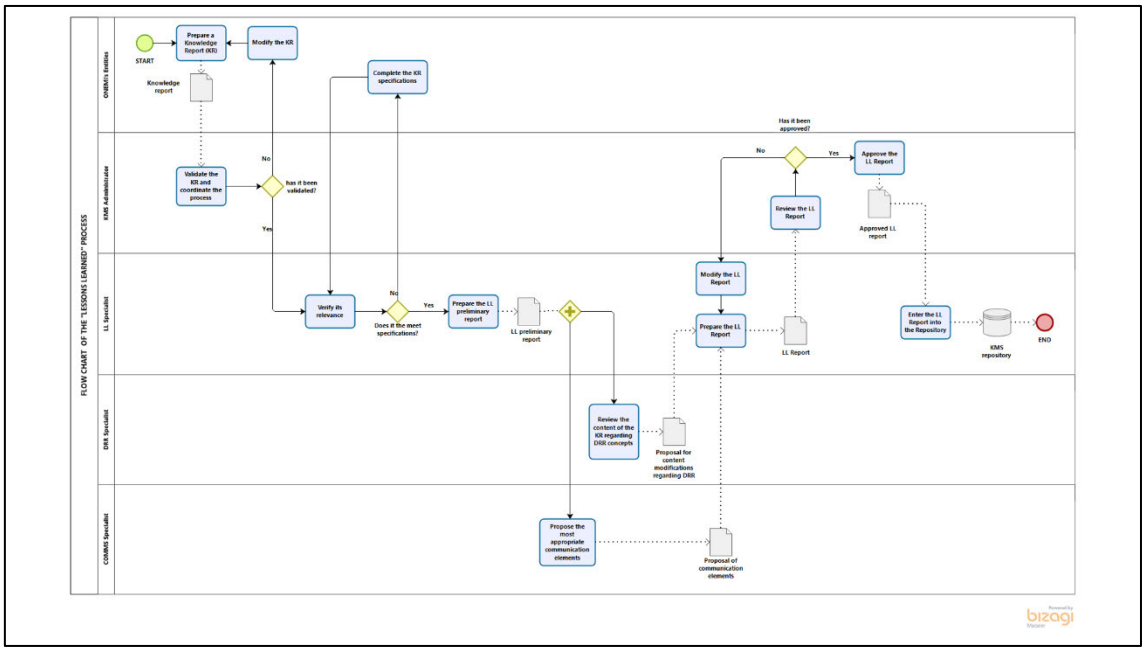


Figure 2.5.2.11 Flowchart of the "Lessons Learned" process

5.2.2.2.2. Description of the "Lessons Learned" process

The "Lessons Learned" process is executed according to the following sequence of tasks.

- The process begins when an ONEMI entity prepares a Knowledge Report (KR) and sends it to the ADM, complying with the requirements defined by the ADM
- The ADM verifies that the KR qualifies to be managed by the KMS and, in addition, it requires it to be processed by the Lessons Learned process. The ADM, within his functions, must define and keep updated the requirements that must be met by both the Knowledge Reports issued by the entities and the specifications of the main functions (Historical Memory, Lessons Learned, Human Resource Development, Research and Development, and Network Development) to be managed by the KMS. Both the entities in their respective areas of action

and the specialists of the main functions of the KMS must participate in the elaboration of these requirements. All of the above is coordinated by the ADM. In addition, the ADM must train those responsible for preparing the KR of the entities regarding the interpretation and application of the requirements.

- If the KR is not validated, the ADM returns it to the entity to be modified
- The entity makes the modifications and forwards the KR to the ADM
- If the KR is validated and requires to be processed as a lesson learned, the ADM forwards it to the LLS for processing.
- The LLS verifies the relevance of the Knowledge Report received regarding compliance with the specifications defined by the ADM to be managed as a LL, taking into account, at least, the following considerations.
    - Lessons learned are conclusions that result from the analysis of the causes of success and failure in the development of a process, operation, system or project and that are considered to be taken into account for the future as a result of learning from experience. In addition, these lessons are a type of knowledge used for organizational behavior changes and decision-making, which can be elaborated from personal or organizational experiences.
    - Lessons learned contribute to converting tacit knowledge (the one found in the mind and derived from the experience of people), into explicit knowledge (the one contained in documents, electronic files or objects), facilitating its dissemination.
    - Lessons learned represent a process of identification and transmission of knowledge that come from positive or negative experience, which generate a change in behavior, a new approach or a new skill. The contribution of value that really lets us learn from experiences, whether their own or others, positive or not, is to reproduce the learned success or avoid repeating mistakes, which can cost a lot in the organization.
    - For Lessons learned to be relevant and useful, they must be:
        - Applicable, because they have real or potential impact on operations or processes.
        - Valid, because they are based on true facts.
        - Significant, because they identify processes or decisions that reduce or eliminate failures or reinforce a positive result.
    - It is important that the LL development exercise consider the following recommendations to reach its maximum usefulness:
        - Lessons Learned must be clear, complete, and meaningful to DRR. LL should be enunciated in an orderly way and with a logical sense. The enunciation exercise of a LL is formed of three elements:

        - The description of the conditions, causes or factors that triggered the situation in which the lesson learned originates;
        - A verb that relates the conditions to the effects (generate, lead, influence, allow, hinder, facilitate, etc.) and
        - The description of the result, consequence or effect - positive or negative - of the situation. The three elements of the statement can be combined, the important thing is to present the conditions that generated an effect, from which a lesson learned emerged.
    - Lessons learned must consider the level of specificity of the conditions in which they develop. Since lessons learned can be subscribed to a specific context, it is important to explain how particular the conditions were in which the lesson was identified. Usually, the lessons that are identified in contexts with relatively homogeneous conditions are those that turn out to be replicable in a wider range of events.
- If the LLS concludes that the KR does not contain all the main specifications to be processed as a lesson learned, it requests the entity responsible for the KR to complete the background information that allow to form a LL that is useful for DRR.
- The HENT completes the main essential specifications and forwards the report to the LLS.
- If the LLS concludes that the KR meets the main specifications, he prepares a preliminary LL Report using the Form in point 5.2.2.2.3 of this document.
- The LLS sends the preliminary LL Report to the COMMSS to propose the most appropriate communication elements for the context and content of the lesson learned in progress, such as, for example, dissemination instrument, receiver, message, communication channel, among others. The COMMSS prepares a proposal of communication elements and sends it to the LLS to be considered in the preparation of the final LL Report.
- In parallel, the LLS submits the LL Preliminary Report to the DRRS to review the coherence of the contents of the report with respect to the DRR concepts used in ONEMI. The DRRS prepares a proposal with the modifications that are identified and sends it to the LLS so they can be considered in the preparation of the final LL Report.
- The LLS prepares a LLR proposal, taking into consideration the Preliminary Report, the proposal of communication elements and the proposal with the modifications regarding the DRR concepts and sends it to the ADM for its review.
- The ADM reviews the LLR proposal.
- If it is not approved, the ADM returns the LLR to the LLS for modification according to the guidelines the specialist deems appropriate.
- If approved, the ADM returns the LLR to the LLS to be formalized and entered into the KMS

Repository.

- The LLS enters the LLR approved by the ADM into the KMS Repository to make it available for KMS Stakeholders.
- End of the process.

5.2.2.2.3. Form for the Lessons Learned Report

To prepare the Lessons Learned Report, the following form will be used.

DATA	DESCRIPTION
LL Code	Numbering according to a defined format that uniquely identifies a LL Report.
LL Title	Phrase with which a LL can be identified or searched.
KR Reference	Indication of the KR Code of the Knowledge Report (KR) that is related to the lesson learned (LL).
KR Entity	ONEMI entity that issued the KR.
KR Registration Date	Date DD / MM / YY that the entry of the KR was registered to be processed by the Lesson Learned process.
LL Problem statement	Clear and complete description of the conditions, causes or factors that triggered the situation in which the LL originates.
LL Solution statement	Clear and complete description of the result, consequence or effect - positive or negative - of the situation.
Phases of the Disaster Risk Cycle	Indication of the phases of the Disaster Risk Cycle where it is estimated that the LL can be used or applied for DRR (Mitigation, Preparedness, Response and Recovery).
DRM Instruments	Indication of the Disaster Risk Management Instruments that are related to the LL. (Regulatory framework for DRR, National policy for DRR, National strategic plan for DRR, National emergency plan, Regional plan for DRR, Regional emergency plan, Provincial plan for DRR, Provincial emergency plan, Communal plan for DRR, Communal Emergency Plan, among others)
Types of disaster risk	Indication of the type of disaster risk that is estimated to be associated with the LL for DRR purposes (earthquakes, tsunamis, volcanic eruptions, droughts, floods, overflows, mudslides, mass removal, strong winds, heavy sea, snowfalls, avalanches, lightning strikes, hailstorms, structural fires, forest fires, hazardous materials, among others)
Preliminary LL	Date DD / MM / YY that the preliminary LL Report was prepared.

Date	
Communication Proposal	Proposal of the most appropriate communication elements to the context and content of the LL in progress.
Communication Date	Date DD / MM / YY that the communication proposal was sent to the LLS.
DRR Review Date	Date DD / MM / YY that the content of the preliminary LL Report was revised, regarding the use of terms associated with DRR used formally in ONEMI.
LL Date	Date DD / MM / YY the ADM approved the final LL Report.
LL Entry date	Date DD / MM / YY that the LLR approved by the ADM was entered into the KMS Repository.

5.2.2.3. "Human Resource Development" Process

The essential purpose of the "Human Resource Development" process is to produce as a final product a Human Resource Development Report (HRDR) for DRR, which must be entered into the KMS Repository in order to be available for KMS stakeholders.

This HRDR is produced through a set of successive tasks, based on a Knowledge Report (KR) that provides the “Knowledge validation” process as input. This input is prepared by the ONEMI’s entities in their respective areas of action and validated by the KMS Administrator.

The sequence of this process approach is shown in Figure 2.5.2.12.

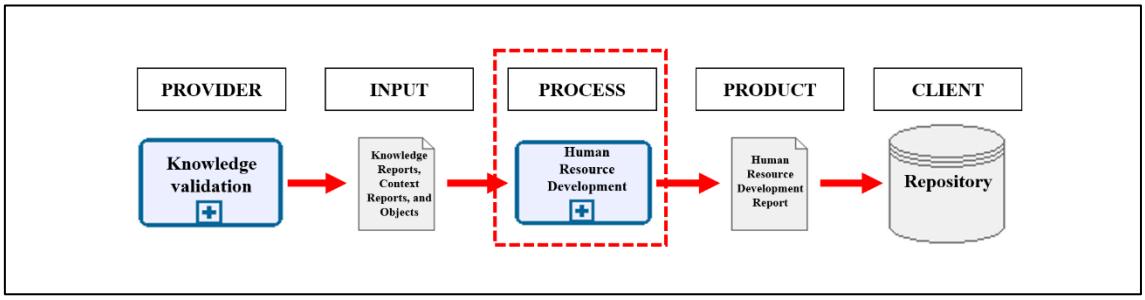


Figure 2.5.2.12 "Human Resource Development" process approach

The following roles participate in this "Human Resource Development" process.

- **KMS Administrator (ADM)**, knowledge management specialist
- **Head of the ONEMI Entity (HENT)**, person from an ONEMI entity who is responsible for preparing the Knowledge Reports, Context Reports and interacting with the KMS regarding the format of the reports and their content
- **Human Resource Development Specialist (HRDS),** person who has the competencies to

prepare Human Resource Development Reports (HRDR) and who is responsible for the processing of the HRDR, from the verification of its relevance to its entry into the Repository.

- **Disaster Risk Reduction Specialist (DRRS)**, person who has the competencies in DRR and who is responsible for reviewing the content of the Knowledge reports and context reports, regarding the DRR concepts used in ONEMI
- **Communications Specialist (COMMSS)**, person who has the competencies in communication strategies and techniques

5.2.2.3.1. Diagramming of the "Human Resource Development" process

The activities conducted by the "Human Resource Development" process are represented in the flow diagram of Figure 2.5.2.13.

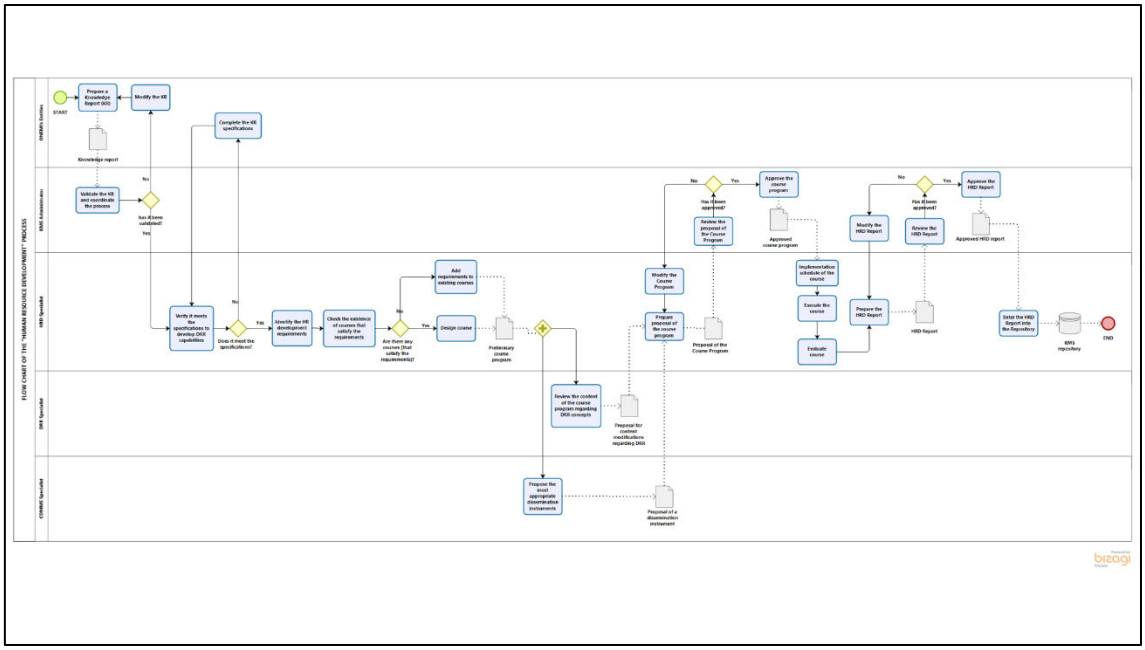


Figure 2.5.2.13 Flow diagram of the "Human Resource Development" process

5.2.2.3.2. Description of the "Human Resource Development" process

The "Human Resource Development" process is executed according to the following sequence of tasks.

- The process begins when an ONEMI entity prepares a Knowledge Report (KR) complying with the established requirements and sends it to the ADM, with the intention of being managed by the KMS.
- The ADM validates that the KR meets the requirements to be managed by the KMS and, in addition, it requires the KR to be processed by the Human Resource Development process. The ADM, within his functions, must define and keep updated the requirements that must be

met by both the Knowledge Reports issued by the entities and the specifications of the main functions (Historical Memory, Lessons Learned, Human Resource Development, Research and Development, and Network Development) to be managed by the KMS. Both ONEMI's entities in their respective areas of action and the specialists from the main functions of the KMS must participate in the elaboration of these requirements. All of the above is coordinated by the ADM. In addition, the ADM must train those responsible for preparing the KR of the entities regarding the interpretation and application of the aforementioned requirements.

- If the KR is not validated, the ADM returns it to the entity, indicating the need to modify the Report.
- The entity makes the modifications and forwards the KR to the ADM.
- If the KR is validated, and it is required to determine actions that allow developing capacities in DRR through the training of people, the ADM refers it to the HRDS for processing. In addition, he coordinates the interaction needs between the entities and the HRDS during the development of the process.
- The HRDS verifies that the Knowledge Report received complies with the specifications regarding the Human Resource Development process and that it has the background information to determine the actions that allow developing capacities in DRR through the training of people.
- If the HRDS concludes that the KR does not contain the main specifications to be processed, it requests the entity responsible for the KR to complete the background information that will allow the creation of a Human Resource Development Report that is useful for DRR.
- The entity completes the main essential specifications and forwards the report to the HRDS.
- If the HRDS concludes that the KR meets the main specifications to be processed by the Human Resource Development process, he identifies the specific DRR capacity development requirement formulated by the entity.
- In addition, the HRDS verifies if the requirement identified in the KR is considered in an existing course program. In the present work, a course will be understood as a type of formal education in the area of DRR, which is not necessarily registered within the traditional and official curricula that are part of a career. It can also be conducted temporarily, not to obtain a degree, but to fulfill the needs of developing capacities in people.
- If the requirement is considered or closely related to an existing course, the HRDS adds or complements the specific requirement to the existing course program.
- If the requirement is not considered in any existing course, the HRDS designs the preliminary course program based on the identified requirements, according to the scheme in Figure 2.5.2.14, which must contain the objective of the course, the graduate profile, the curriculum map and the admission profile.

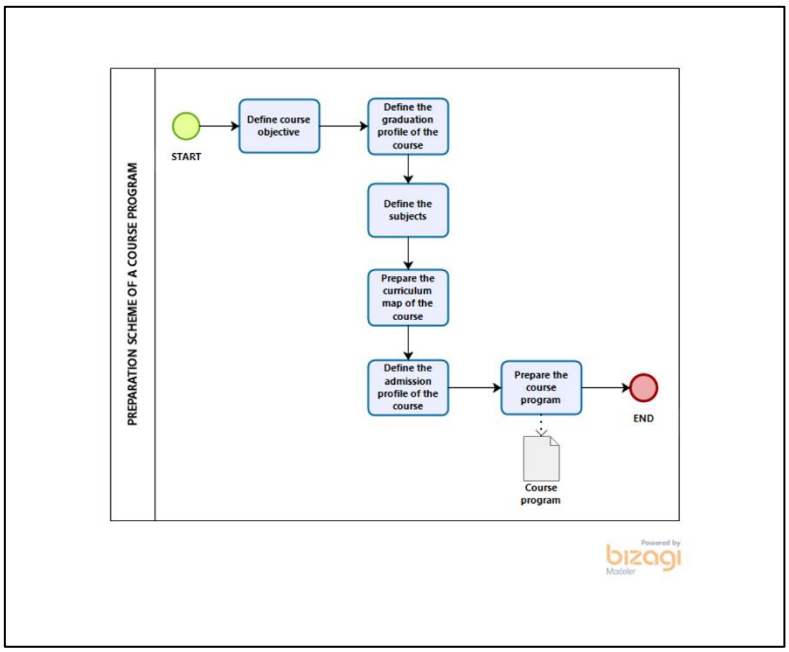


Figure 2.5.2.14 Scheme for the elaboration of a course program

- The HRDS sends the preliminary course program to the COMMSS so he can propose the most appropriate communication elements to the context and requirements, such as, for example, dissemination instrument, receiver, message, communication channel, among others. The COMMSS prepares a proposal of the communication elements and sends it to the HRDS so they can be considered in the final program of the course.
- In parallel, the HRDS sends the preliminary course program to the DRRS to review the coherence of the contents of the report with respect to the DRR concepts used in ONEMI.
- The DRRS prepares a proposal with the modifications that are identified and sends the report to the HRDS so it can be considered in the final program of the course.
- The HRDS prepares a Final Course Program proposal, taking into consideration the preliminary program, the proposal of communication elements and the proposal with the modifications regarding the DRR concepts and sends the report to the ADM for its review.
- The ADM reviews the Final Course Program proposal.
- If it is not approved, the ADM returns it to the HRDS for its modification according to the guidelines the specialist deems appropriate.
- The HRDS makes the modifications according to the ADM guidelines and forwards the final course program proposal to the ADM.
- If the ADM approves the course program, he returns it to the HRDS so that the execution of the course can be scheduled according to its program and through the most appropriate means

of dissemination to each of the users determined by the human resource development requirements.

- In addition, the course must be evaluated in terms of its expected effectiveness in the development of human resources according to the initial requirements and, if necessary, reformulate the program with the improvements that are identified.
- Finally, the HRDS prepares a proposal for the Human Resource Development Report (HRDR) with the actions conducted regarding the execution and evaluation of the course, using the Form from point 5.2.2.3.3 of this document.
- The ADM reviews the HRDR proposal.
- If it is not approved, the ADM returns the HRDR to the HRDS for its modification according to the guidelines the specialist deems appropriate.
- If approved, the ADM returns the HRDR to the HRDS to be formalized and entered into the KMS Repository.
- The HRDS enters the HRDR approved by ADM into the KMS Repository to make it available for KMS Stakeholders.
- End of the process.

5.2.2.3.3. Form for the Human Resource Development Report

To prepare the Human Resource Development Report, the following form will be used.

DATA	DESCRIPTION
Identification of the requirement	• Name: The requirement is individualized, with a name that adequately represents it. • Brief description of the origin of the requirement that allows to identify the context and therefore the problem to be solved. • It must also indicate: o Target audience specifying the organization to which they belong. o Number of students. o Place or places of origin of the students. o Expected result of the course. o Estimated number of hours for the course.
Analysis of the availability of the courses	• Conclusion on course availability to satisfy the requirement or the need to program a specific one for this requirement.
Course	Course objective

scheduling	The objective of the course must answer the following questions: • What do I want the students to know or do at the end of the course? • Why do I want them to learn this? • Why is it going to be useful? The objective statement must contain, at least, the following elements: • Verb: Level of knowledge or skill consistent with what is expected of students to be able to do at the end of the course. Each objective must have only one verb. To select a suitable verb, you can use Bloom's taxonomy. • Content: What students are expected to learn in terms of subjects, which must be measurable. • Context: Specific situation that frames the content, generally given by the discipline. <u>Graduate profile</u> It constitutes the referential element and guide for the construction of the course program. It is expressed in competencies that describe what the graduate will be able to do at the end of the educational program and it indicates the knowledge, skills, attitudes and values involved in the performances. <u>Curriculum Map</u> It is the skeleton of the course. It contains the subjects that will be developed in the course, which allow identifying the sequence and the corresponding prerequisites. In addition, the professional profile of the instructors must be defined. <u>Admission profile</u> It corresponds to the requirements of an applicant to successfully pass the subjects that form the curriculum map.
Definition of the modality in which the course will be taught	If it is executed with ONEMI's means: • Identification of instructors or teachers, according to the characteristics of the subjects contained in the course program. • Planning for program development by the teacher or the instructor. • Prepare support material for the program. • Prepare written or digital tools to provide them to students. • Prepare evaluation instruments. • Define course entrance behavior. • Disseminate to potential students. If it is executed by third parties:

	• Review the entities that are in a position to conduct the course and request a proposal based on the course requirements. • Select the entity, define aspects such as subjects to be discussed, modality, allotted time, costs, place, etc. • Prepare and sign the respective contracts. • Define course entrance behavior.
Phases of the Disaster Risk Cycle	Indication of the phases of the Disaster Risk Cycle where it is estimated that the course will develop capacities in DRR through the training of people (Mitigation, Preparedness, Response and Recovery).
DRM Instruments	Indication of the Disaster Risk Management Instruments that are related to the development of the course (Regulatory framework for DRR, National policy for DRR, National strategic plan for DRR, National emergency plan, Regional plan for DRR, Regional emergency plan, Provincial plan for DRR, Provincial emergency plan, Communal plan for DRR, Community Emergency Plan, among others).
Types of disaster risk	Indication of the type of disaster risk that is estimated to be associated with the development of the course (earthquakes, tsunamis, volcanic eruptions, droughts, floods, overflows, mudslides, mass removal, strong winds, heavy sea, snowfalls, avalanches, lightning strikes, hailstorms, heat and cold waves, structural fires, forest fires, hazardous materials, among others).
Communication channel	• The proposed communication channels are specified. • Selected communication channels are indicated. • Disseminate to potential students. • The result of the course call is indicated (number of applicants, if applicable).
Course effectiveness	The academic results of the students are indicated. Subsequently, accordingly to each period and / or deadline, the results are indicated based on the expected learning of the course objectives.
Conclusions and recommendations	From the aforementioned background information, identify conclusions and raise proposals that are considered adequate.

5.2.2.4. "Research and Development" process

The essential purpose of the "Research and Development" process is to produce as a final product a Research and Development Report (RDR) for DRR, which must be entered into the KMS Repository in order to be available for KMS stakeholders.

This RDR is produced through a set of successive tasks, based on a Knowledge Report (KR) that

provides the "Knowledge validation" process as input. This input is prepared by ONEMI's entities in their respective areas of action and validated by the KMS Administrator.

The sequence of this process approach is shown in Figure 2.5.2.15.

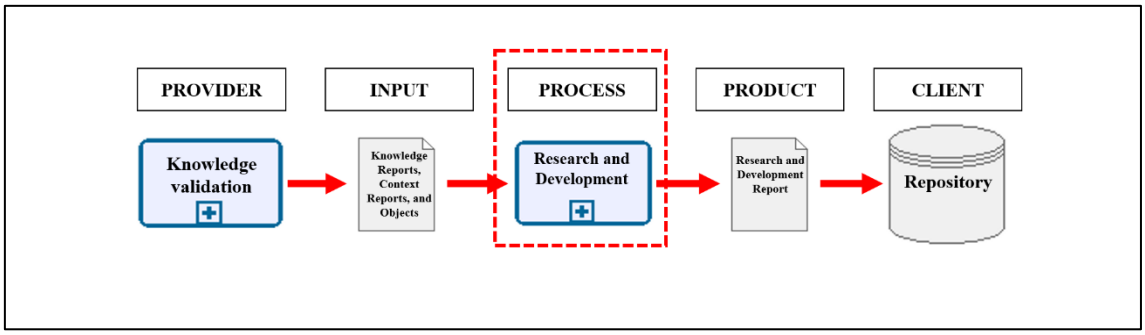


Figure 2.5.2.15 "Research and Development" process approach

The following roles participate in this "Research and Development" process.

- **KMS Administrator (ADM)**, knowledge management specialist.
- **Head of the ONEMI Entity (HENT)**, person from an ONEMI entity who is responsible for preparing the Knowledge Reports, Context Reports and interacting with the KMS regarding the format of the reports and their content.
- **Research and Development Specialist (RDS),** person who has the competencies to prepare Research and Development Reports (RDR) and who is responsible for the processing of the RDR, from the verification of its relevance to its entry into the Repository.
- **Disaster Risk Reduction Specialist (DRRS)**, person who has the competencies in DRR and who is responsible for reviewing the content of the Knowledge reports and context reports, regarding the DRR concepts used in ONEMI.
- **Communications Specialist (COMMSS)**, person who has the competencies in communication strategies and techniques.

5.2.2.4.1. Diagramming of the "Research and Development" process

The activities conducted by the "Research and Development" process are represented in the flow diagram in Figure 2.5.2.16.

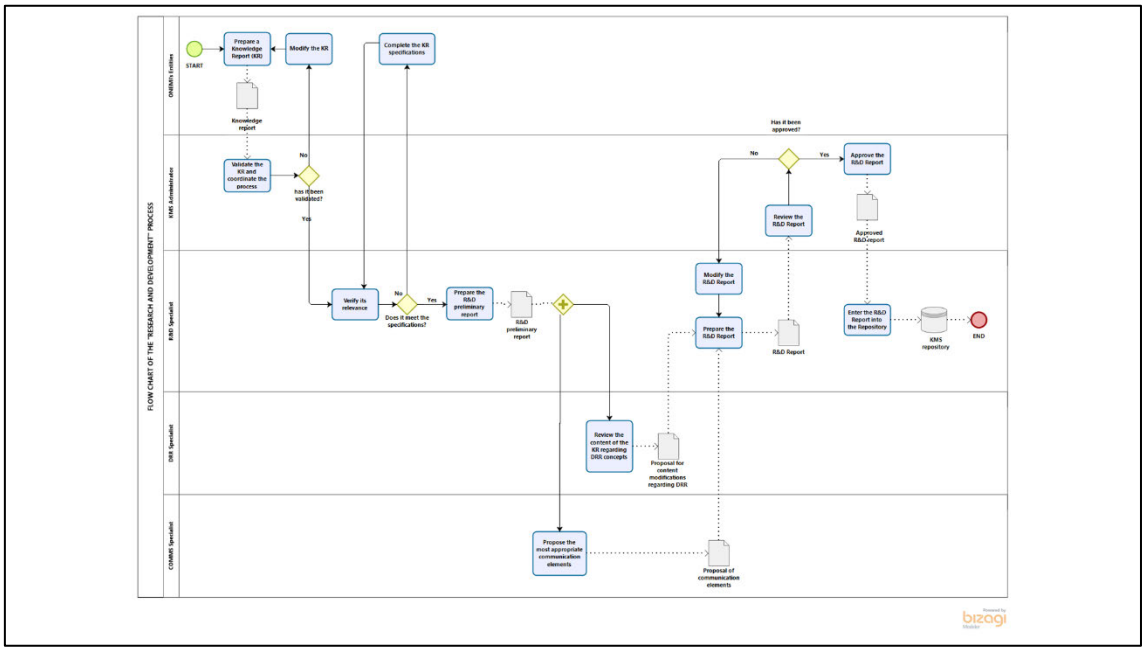


Figure 2.5.2.16 Flow diagram of the "Research and Development" process

5.2.2.4.2. Description of the "Research and Development" process.

The "Research and Development" process is executed according to the following sequence of tasks.

- The process begins when an ONEMI entity prepares a Knowledge Report (KR) and sends it to the ADM to be managed by the KMS, complying with the requirements defined by the ADM.
- The ADM validates that the KR meets the requirements so it can be managed by the KMS and, in addition, it also needs to be processed by the Research and Development process. The ADM, within his functions, must define and keep updated the requirements that must be met by both the Knowledge Reports issued by the entities and the specifications of the main functions (Historical Memory, Lessons Learned, Human Resource Development, Research and Development, and Network Development) to be managed by the KMS. Both ONEMI's entities in their respective areas of action and the specialists from the main functions of the KMS must participate in the elaboration of these requirements. All of the above is coordinated by the ADM. In addition, the ADM must train those responsible for preparing the KR of the entities regarding the interpretation and application of the requirements.
- If the KR is not validated, the ADM returns it to the entity, indicating the need to modify the Report.
- The entity makes the modifications and forwards the KR to the ADM.
- If the KR is validated and needs to be processed by the Research and Development process, the ADM refers it to the RDS for processing. In addition, he coordinates the interaction needs

between ONEMI's entities and the RDS during the development of the process.

- The RDS verifies that the Knowledge Report received meets the specifications to create connections with investigative organizations, and that it has the necessary background information to process it.
- If the RDS concludes that the KR does not contain the main specifications to be processed, it requests the entity responsible for the KR to complete the background information that allows it to define a research thesis that is useful for the DRR.
- The entity completes the main specifications and forwards the report to the RDS.
- The RDS proceeds to define a research thesis that is useful for DRR and sends it to the DRRS to review the content of the thesis regarding the DRR concepts used in ONEMI.
- The DRRS reviews the statement of the thesis and, if applicable, the specialist proposes modifications.
- The RDS completes the thesis considering the referential costs and the feasibility of financing, prepares a research thesis proposal and submit it to the ADM for approval.
- The ADM reviews the research thesis proposal.
- If the ADM does not approve the research thesis proposal, he returns it to the RDS to complete the missing information.
- The RDS modifies the thesis proposal according to the ADM guidelines.
- If the ADM approves the research thesis, he sends it to the RDS for further processing.
- The RDS proceeds to identify the research centers that have human and material infrastructure to conduct the research.
- Additionally, the RDS carries out the bidding process, in terms of:
    - Prepare the terms of reference.
    - Request the corresponding proposal of each center.
    - Prepare and formalize the respective contractual documents.
- In addition, the RDS monitors the research process, receives the corresponding study reports for approval by the ONEMI's authorities and defines a system to incorporate new information that appears over time regarding each event.
- With this background information, the RDS prepares a preliminary Research Report, using the Form of point 5.2.2.4.3 of this document.
- The RDS sends the Preliminary Research Report to the COMMSS to propose the most appropriate communication elements to the context and content of the research report in progress, such as, for example, dissemination instrument, receiver, message, communication channel, among others.
- The COMMSS prepares a proposal of communication elements and sends it to the RDS so they can be considered in the preparation of the Final Investigation Report.

- In parallel, the RDS sends the Preliminary Research Report to the DRRS to review the coherence of the contents of the report with respect to the DRR concepts used in ONEMI.
- The DRRS prepares a proposal with the modifications that are identified and sends the report to the RDS so it can be considered in the preparation of the Final Investigation Report.
- The RDS prepares a Research Report proposal, taking into consideration the Preliminary Report, the proposal of the communication elements and the proposal with the modifications regarding the DRR concepts and sends it to the ADM for its review.
- The ADM reviews the proposal for the Final Research Report.
- If it is not approved, the ADM returns it to the RDS for modifications according to the guidelines the specialist deems appropriate.
- The RDS makes the modifications according to the ADM guidelines and forwards the Research Report to the ADM.
- If approved, the ADM returns the Report to the RDS so it can be formalized and entered into the KMS Repository.
- The RDS enters the Research and Development Report into the KMS Repository to make it available for the KMS Stakeholders.
- End of the process.

5.2.2.4.3. Form for the Research and Development Report

To prepare the Research and Development Report, the following form will be used.

DATA	DESCRIPTION
R&D Code	Numbering according to a defined format that unequivocally identifies a Research and Development Report.
R&D Title	Phrase with which research can be identified or searched.
KR Reference	Indication of the KR Code of the Knowledge Report (KR) that is related to the research.
KR Entity	ONEMI entity that issued the KR proposing the research.
KR Registration date	Date DD / MM / YY that the KR entry was registered to be processed by the Research and development process.
Phases of the Disaster Risk Cycle	Indication of the phases of the Disaster Risk Cycle where it is estimated that the results of the research can be used or applied for DRR (Mitigation, Preparedness, Response and Recovery).
DRM Instruments	Indication of the Disaster Risk Management Instruments that are related to the research (Regulatory framework for DRR, National policy for DRR, National strategic plan for DRR, National emergency plan, Regional plan for

	DRR, Regional emergency plan, Provincial plan for DRR, Provincial emergency plan, Community plan for DRR, communal emergency plan, among others).
Types of disaster risk	Indication of the type of disaster risk that is estimated to be associated with the DRR research (earthquakes, tsunamis, volcanic eruptions, droughts, floods, overflows, mudslides, mass removal, strong winds, heavy sea, snowfalls, avalanches, lightning strikes, hailstorms, heat and cold waves, structural fires, forest fires, hazardous materials, among others)
Description of the requirement to be solved	• Brief description of the situation in which the requirement is generated. • Problem Statement. • Justification of the research. It is necessary to emphasize that identifying a problem means having adequate knowledge of the existing situation, an aspect that must be supported by figures, documents and other elements that offer a solid and verifiable diagnosis. As a tool, "Ishikawa's diagram" or the "problem tree analysis" can be useful.
Research description	• Research title: It must express the content and scope of the work. It is a concise statement about the main topic, and it must identify the real variables or the theoretical aspects under investigation, as well as the relationship between them, synthesizing the main idea of the writing. Once the research is completed, keywords will allow labeling, organizing and storing the document in databases, constituting a way to make it accessible to other researchers. • General objective and specific objectives of the research: They are the study guides. They must be present throughout the development of the research, and they must be congruent with each other. They must be expressed in a clear, direct and measurable way, to guide the research process, and be achievable. They must be stated in the infinitive form, and not less than one and not more than three verbs. The objectives are fed by the variables, and must be described before. • Brief explanation of the expected results of the research (use value): Given the characteristics of the problem, it is indicated what the solution provided by the research is expected to contain. • Preliminary estimate of research costs: This value is obtained as a result of an analysis of researchers who have work experience on the subject.

	• Information collected on the research topic: Synthesis of the information collected by the proposing body and / or by the research and development function, attached the respective endorsements. • Preparation of the terms of reference: The terms of reference will be the basis for the call for bids or request for participation of research organizations or researchers. In general, they should contain aspects such as: o Background information o General objective and specific objectives of the research o Products and reports to be delivered o Duration of service o Resources and facilities to be provided by the contracting entity. o Costs and remuneration o Selection / evaluation criteria (when applicable). o Confidentiality of the information o Annexes
Selection of those responsible for the research	• Analysis of research centers, universities, or individual researchers who are in position to assume responsibility for the research. • Call for bids or request for proposals to those identified in the previous list. • Select and define a person responsible for the research. • For the selection it is advisable to prepare a matrix that allows to give greater objectivity to the selection, as an example: Selection criteria: Selection criteria are the conditions that must be satisfied by the best alternative. Weighting: It corresponds to the relative importance of each criterion expressed as percentage, considering that the sum of the weights must equal 100%. Alternatives: They are the possible people in charge of the research (Research Centers, Universities, Researchers, and so on). Each alternative is evaluated with a mark on a scale from 1 to 7. This mark multiplied by the weighting divided by 100 allows to obtain points. The alternative that obtains the most points corresponds to the best alternative solution.
Costs and Financing	• Estimated costs by research specialists. Given the background information described above, it is feasible for specialists to make an adequate estimate of the costs that certain research

	requires. Funding sources may come from the resources considered for this item in the corresponding Budget Law. In this case, said estimate must be analyzed in the context of the projects presented and the available resources, which will require the corresponding prioritization. In the absence of a research budget, resources can be obtained from other sources, such as research funds from state organizations (regional, provincial or communal funds). This estimate will be especially important to request resources from sources outside ONEMI. • Analysis of financing alternatives. Once the costs have been defined, the analysis of the financing sources is considered to be with the participation of the central bodies of ONEMI, since their search and subsequent processing requires the assistance of the corresponding authorities. • Actions that make it possible to define and commit resources for research. If the financing source corresponds to budgetary funds, indicate. o Document that approves the funds o Amount o Assignment description If there are other organizations involved in financing the research, indicate: o Unique Tax Number and full name of the body. If there are third parties involved in the research (Natural Person or Legal Person), indicate. In the case of a legal entity o Business name and Unique Tax Number o Contact (Name, email, website) o Contribution to the investigation In the case of a natural person: o Unique Tax Number and full name o Contribution to the investigation Include CV of each research participant, whether natural person or legal person.
Research contract	Detail the main aspects of the contract, at least the following: • Responsible for the investigation. • Objectives. • Deliverable deadlines and final product.

Research project program	Indicate. • Activity • Responsible • Cost • Execution time
Control and monitoring	By means of standardized instruments, for the control and monitoring of projects, we can mention the “S-Curve” or “progress curve” which represents the actual progress compared to the planned, in an accumulated period to date; and the “Gantt Chart” which allows you to visualize the current and programmed situation. Based on the progress status, the analysis of the progress state of the project must be indicated. Indicate the corrective measures applied, accordingly. At the end, the final result of the contract fulfillment and the degree of the fulfillment of the research objectives must be considered.
Use value of the product	At this point, a record of the expected result of the research, degree of satisfaction with said result and recommendations to continue with other projects is made.
Communication channel	• The proposed communication channels are specified. • Selected communication channels are indicated.
Conclusions and recommendations	From the aforementioned background information, identify conclusions and raise proposals that are considered adequate.

5.2.2.5. "Network Development" process

The essential purpose of the "Network Development" process is to prepare as a final product a Network Development Report (NDR) for DRR, which must be entered into the KMS Repository in order to be available for the KMS stakeholders.

This NDR is produced through a set of successive tasks, based on a Knowledge Report (KR) that provides the “Knowledge validation” process as input. This input is prepared by ONEMI’s entities in their respective areas of action and it is validated by the KMS Administrator.

The sequence of this process approach is shown in Figure 2.5.2.17.

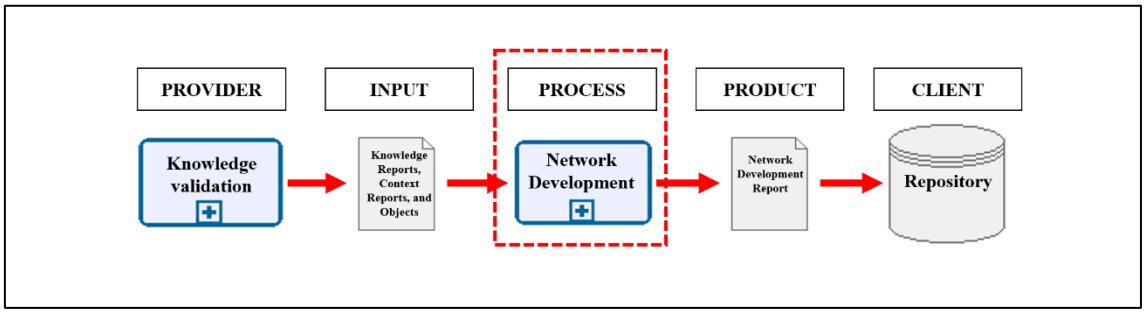


Figure 2.5.2.17 "Network Development" process approach

The following roles participate in this "Network Development" process.

- **KMS Administrator (ADM)**, knowledge management specialist
- **Head of the ONEMI Entity (HENT)**, person from an ONEMI entity who is responsible for preparing the Knowledge Reports, Context Reports and interacting with the KMS regarding the format of the reports and their content
- **Network Development Specialist (NDS),** person who has the competencies to prepare Network Development Reports (NDR) and who is responsible for the processing of the NDR, from the verification of its relevance to its entry into the Repository
- **Disaster Risk Reduction Specialist (DRRS)**, person who has the competencies in DRR and who is responsible for reviewing the content of the Knowledge reports and context reports, regarding the DRR concepts used in ONEMI
- **Communications Specialist (COMMSS)**, person who has the competencies in communication strategies and techniques

5.2.2.5.1. Diagramming of the "Network Development" process

The activities conducted by the "Network Development" process are represented in the flow diagram of Figure 2.5.2.18.

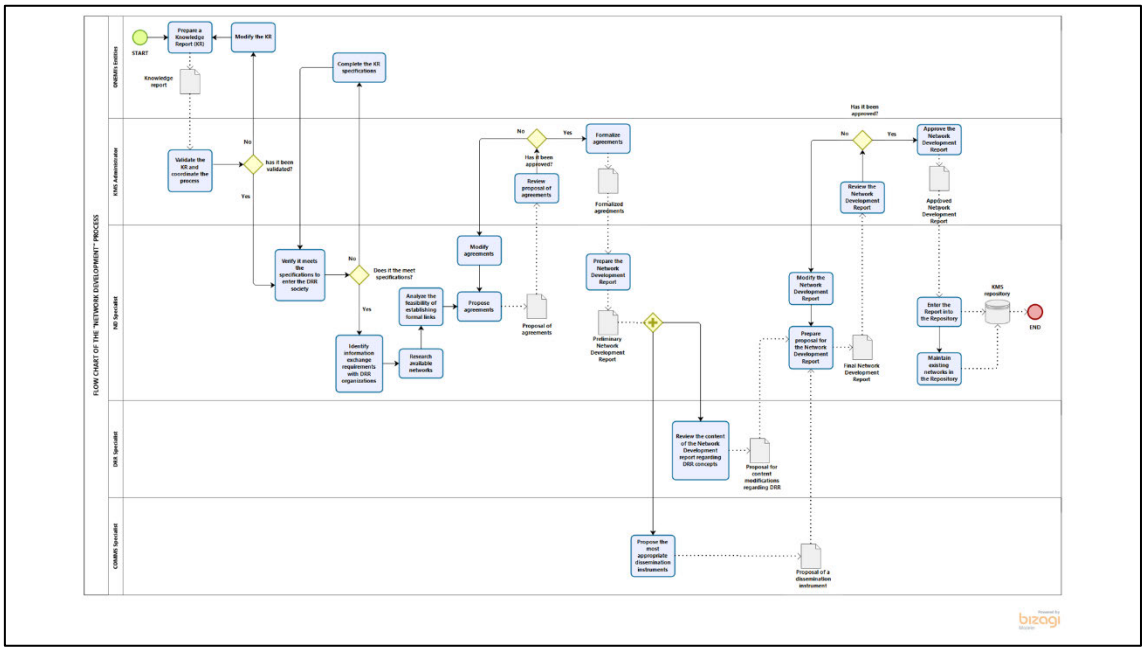


Figure 2.5.2.18 Flow diagram of the "Network Development" process

5.2.2.5.2. Description of the "Network Development" process

The "Network Development" process is executed according to the following sequence of tasks.

- The process begins when an ONEMI entity prepares a Knowledge Report (KR) and sends it to the ADM so it can be managed by the KMS, complying with the requirements defined by the ADM.
- The ADM validates that the KR meets the requirements to be managed by the KMS and, in addition, it requires it to be processed by the Network Development process. The ADM, within his functions, must define and keep updated the requirements that must be met by both the Knowledge Reports issued by the entities and the specifications of the main functions (Historical Memory, Lessons Learned, Human Resource Development, Research and Development, and Network Development) to be managed by the KMS. Both the entities in their respective areas of action and the specialists of the main functions of the KMS must participate in the preparation of these requirements. All of the above is coordinated by the ADM. In addition, the ADM must train those responsible for preparing the KR of the entities regarding the interpretation and application of the requirements.
- If the KR is not validated, the ADM returns it to the entity, indicating the need to modify the Report.
- The entity makes the modifications and forwards the KR to the ADM.
- If the KR is validated, and it is required to be inserted into the knowledge society of disaster risk reduction, the ADM refers it to the NDS for processing. In addition, the ADM coordinates

the interaction needs between ONEMI's entities and the NDS during the development of the process.

- The NDS verifies that the Knowledge Report received complies with the specifications referred to the Network Development process.
- If the NDS concludes that the KR does not contain all the main specifications to be processed, he requests the entity responsible for the KR to complete the background information that will allow the creation of a Network Development Report that is useful for DRR.
- The entity completes the main specifications and forwards the report to the NDS.
- If the NDS concludes that the KR meets the main specifications to be processed by the Network Development process, he identifies the specific requirement formulated by the entity regarding a need to have it inserted into the knowledge society of DRR, creating connections that promote the exchange of knowledge and alliances that allow linking with national and international organizations.
- In addition, the NDS reviews the network registry in order to verify if the requirement can be satisfied by some of the current agreements.
- If the specialist finds an agreement in force that satisfies the requirement, he informs the entity and the ADM and closes the request without preparing a Network Development Report, ending the process.
- If the requirement cannot be satisfied by some of the agreements in force, the NDS investigates the networks available at the national and global levels, analyzing the need to establish formal links and applying selection models based on variables with their respective weightings. In addition, the specialist must identify the resources required for its satisfaction and, in case the financing is within the budget, conduct the procedures that allocate said resources.
- If necessary, the NDS proposes to the ADM the agreements that are required.
- The ADM reviews the proposed agreements.
- If the agreements are not approved, the ADM returns them to the NDS to make the modifications according to the guidelines.
- The NDS makes the modifications and forwards them to the ADM for review.
- If the agreements are approved, the ADM formalizes them and returns them to the NDS.
- Based on the formalized agreements, the NDS prepares the preliminary Network Development Report (NDR), using the Form of point 5.2.2.5.3 of this document.
- The NDS sends the preliminary NDR to the COMMSS to propose the most appropriate communication elements to the context and requirements, such as, for example, dissemination instrument, receiver, message, communication channel, among others.
- The COMMSS prepares a proposal of the communication elements and sends it to the NDS

so they can be considered in the Final Report.

- In parallel, the NDS refers the NDR to the DRRS to review the coherence of the contents of the report with respect to the DRR concepts used in ONEMI.
- The DRRS prepares a proposal with the modifications that are identified and sends it to the NDS so it can be considered in the Final Report.
- The NDS prepares a proposal for the final Network Development Report, taking into consideration the preliminary report, the proposal of communication elements and the proposal with the modifications regarding the DRR concepts and sends it to the ADM for its review.
- The ADM reviews the proposal of the final Network Development Report.
- If it is not approved, the ADM returns it to the NDS for modification according to the guidelines the specialist deems appropriate.
- The NDS makes the modifications according to the ADM guidelines and forwards the final NDR proposal to the ADM.
- If approved, the ADM returns the NDR to the NDS to be entered into the KMS Repository.
- The NDS enters the NDR approved by the ADM to the KMS Repository, in order to make it available for KMS Stakeholders.
- In addition, the NDS carries out the following activities related to the maintenance of the existing networks in the Repository.
    - Maintain an updated registry of the networks available in the KMS, with at least the following data:
        - Network name
        - Scope of action of the network
        - Postal address, city and country of the Network
        - Name, telephone and email of the contact person for the Network
        - Name, telephone and email of the contact person for ONEMI's KMS
        - Date DD / MM / YY of the start of the contract
        - Date DD / MM / YY of the end of the contract
        - Summary of the conditions established in the contract and a link to the digitized document
        - Access protocol
        - Contract restrictions
    - Verify the adequate dissemination within the system about the available networks
    - Measure and evaluate the use value of existing networks, particularly those that imply a cost for the system
    - Review existing contracts and agreements in order to identify the need to expand or

modify them when required

- Register in the Repository the maintenance actions carried out on the existing networks

- End of the process

5.2.2.5.3. Form for the Network Development Report

To prepare the Network Development Report, the following form will be used.

DATA	DESCRIPTION
ND Code	Numbering according to a defined format that unequivocally identifies a Network Development Report.
ND Title	Phrase with which a Network Development Report can be identified or searched.
KR Reference	Indication of the Knowledge Report (KR) Code that is related to a network requirement.
KR Entity	ONEMI entity that issued the KR proposing the network requirement.
KR Registration date	Date DD / MM / YY that the entry of the KR was registered to be processed by the Network Development process.
Identification of the network requirement	• Name: The requirement is individualized, with a name that adequately represents it. • Brief description of the requirement that allows to identify its context and therefore the problem to be solved, as well as the use value of the information that the networks must contain.
Phases of the Disaster Risk Cycle	Indication of the phases of the Disaster Risk Cycle where it is estimated that the requirement for network development is related (Mitigation, Preparation, Response and Recovery).
DRM Instruments	Indication of Disaster Risk Management Instruments that are related to the requirement for network development (Regulatory framework for DRR, National policy for DRR, National strategic plan for DRR, National emergency plan, Regional plan for DRR, Regional emergency plan, Provincial plan for DRR, Provincial emergency plan, Community plan for DRR, Community Emergency Plan, among others).
Types of disaster risk	Indication of the type of disaster risk that is estimated to be associated with the network development requirement (earthquakes, tsunamis, volcanic eruptions, droughts, floods, overflows, mudslides, mass removal,

	strong winds, heavy sea, snowfalls, avalanches, lightning strikes, hailstorms, heat and cold waves, structural fires, forest fires, hazardous materials, among others).
Preliminary NDR Date	Date DD / MM / YY that the preliminary Network Development Report was prepared.
Communication Proposal	Proposal of the most appropriate communication elements to the context and content of the NDR in progress.
Communication Date	Date DD / MM / YY that the Communication Proposal was sent to the NDS.
DRR Review Date	Date DD / MM / YY that the revision of the content of the preliminary NDR was conducted, regarding the use of terms associated with DRR used formally in ONEMI.
NDR Date	Date DD / MM / YY the ADM approved the final Network Development Report.
NDR Admission date	Date DD / MM / YY that the NDR approved by the ADM was entered into the KMS Repository.
Network Identification	• Name: The legal name of the contracted Network is indicated. • Scope of action: The essential purpose and thematic areas of the Network are indicated. • Address: The postal address, city and country of the Network are indicated. • Network Contact: The contact information for the Network is indicated (Name, telephone and email). • ONEMI contact: The details of the contact person for the KMS are indicated (Name, telephone and email).
Identification of the contract	• Date DD / MM / YY of the start of the contract. • Validity: Date DD / MM / YY of the end of the contract. • Terms of the contract: Summary of the conditions established in the contract and a link to the digitized document. • Access protocol for the use of the established conditions in the contract (Access permissions, passwords, procedures for the use of available information, others). • Contract restrictions.
NETWORK maintenance	• Date DD / MM / YY of the last maintenance of the Network Registry conducted by the NDS.

	• Maintenance actions: Summary of maintenance actions, use value assessments and contract revisions conducted in the last maintenance of the Network registry.

5.2.3. Description of the "Knowledge Transfer" function

The essential purpose of the "Knowledge Transfer" function is to transfer the available knowledge stored in the Repository to the users or stakeholders of the KMS, so that it can be used in disaster risk reduction actions.

The "Knowledge Transfer" function should define the form and channels that best suit the different users or stakeholders, such as, for example, web systems, digital files, documentary files, videos, films, photographs, objects and other elements. It should also define whether the available knowledge needs to be exhibited and the most convenient means to do so.

To fulfill its essential purpose, the "Knowledge transfer" function performs the "Knowledge Availability" and "Knowledge Exhibition" processes, which are represented in the scheme of Figure 2.5.2.19, within the context of the KMS operation scheme:

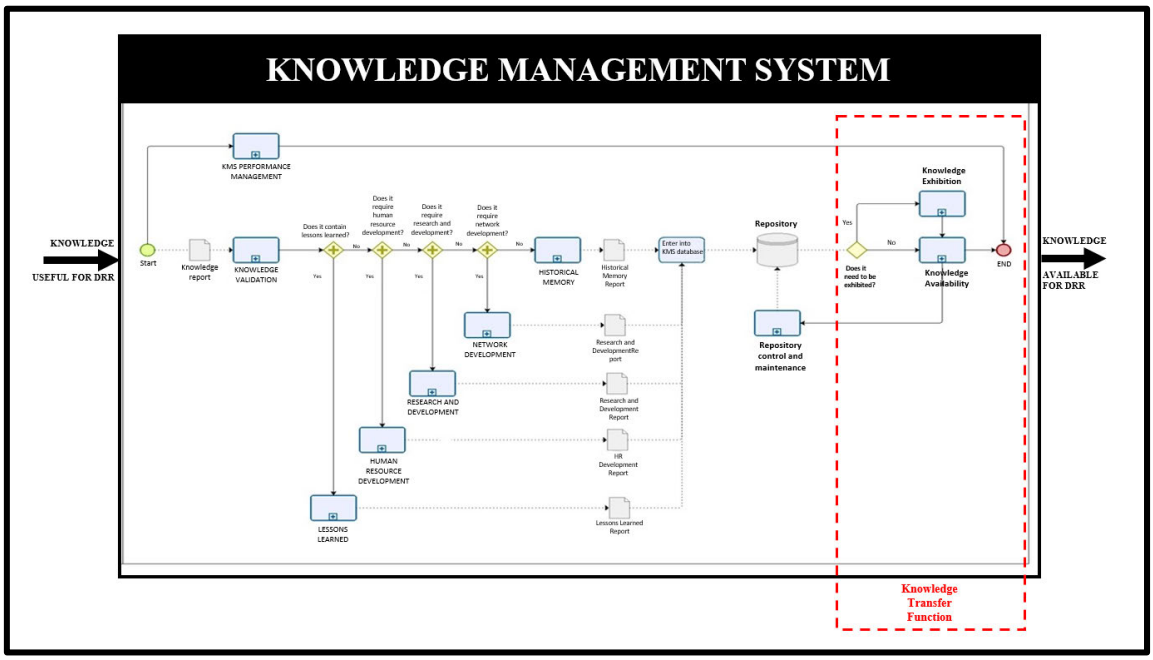


Figure 2.5.2.19 The "Knowledge Transfer" function in the context of the KMS operation scheme

5.2.3.1. "Knowledge Availability" process

The essential purpose of the "Knowledge Availability" process is to facilitate access to the knowledge stored in the Repository to the users or stakeholders of the KMS, as well as, to promote and encourage the use of this available knowledge in Disaster Risk Reduction actions.

As a product of the processing of the knowledge reports, the specific functions of the KMS (Historical Memory, Lessons Learned, Human Resource Development, Research and Development, and Network Development) enter their respective specific reports into the KMS Repository.

Once the knowledge is entered into the Repository, it is processed by computer applications, performing the tasks of converting, editing, selecting, analyzing, and synthesizing the knowledge generated, and thus making it available as useful knowledge for DRR for those who access the System. The Repository creates a memory bank to store knowledge for later use according to pre-established criteria. To obtain effective knowledge management, knowledge platforms, intranets, portals, scenarios, among other information, tools should be created with the objective of encouraging individuals to consume and increase their knowledge.

According to its essential purpose, the "Knowledge Availability" process should manage the distribution of knowledge stored in the computer applications of the Repository, making use of material to support dissemination and information and communication technologies (ICTs), in order to make available to users or stakeholders of the KMS, the available knowledge useful for DRR.

The sequence of this process approach is represented in Figure 2.5.2.20.

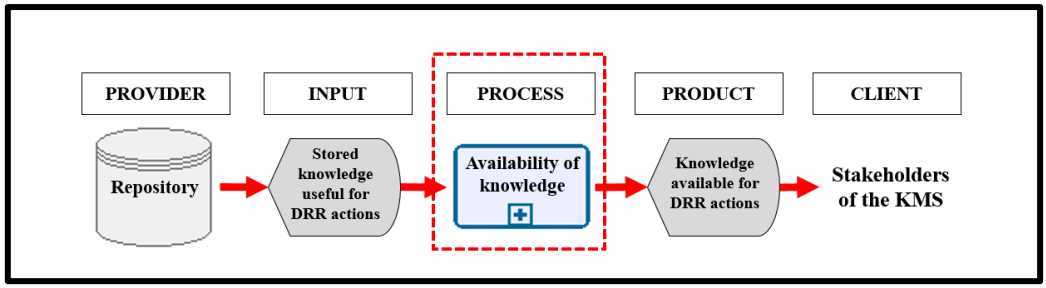


Figure 2.5.2.20 "Knowledge Availability" process approach

In this "Knowledge Availability" process, the following role is mainly involved.

- **COMMSS: Communications specialist,** a person with skills in communications strategies and techniques and who is responsible for managing the transfer of available knowledge on DRR of the KMS to the users or stakeholders of the system

The "Knowledge Availability" process is the efficient link between the useful knowledge for DRR generated by ONEMI entities, processed by the specific functions of the KMS and stored in the Repository, and the users or stakeholders of the System that require new knowledge for DRR actions of their competence.

To fulfill its essential purpose, the "Knowledge Availability" process performs the following activities, which are represented in the scheme of Figure 2.5.2.21.

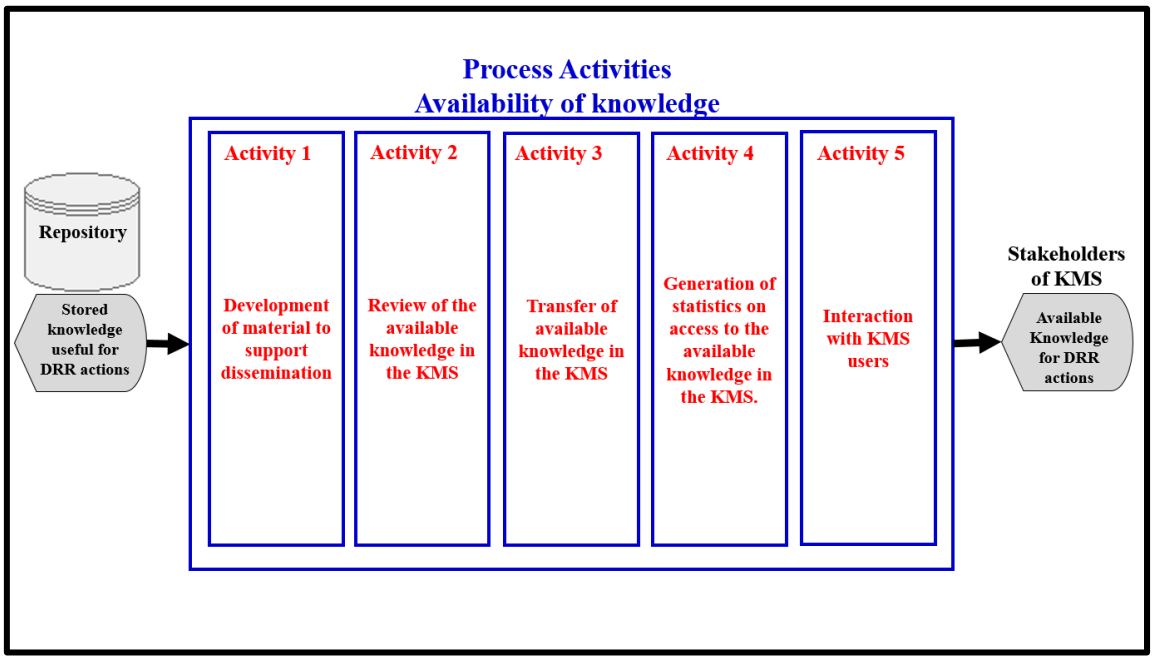


Figure 2.5.2.21 Main activities of the "Knowledge Availability" process

5.2.3.1.1. Activity "Development of material to support dissemination"

The essential purpose of this activity is to elaborate the support material defined in each of the processes of the specific functions of the KMS. Dissemination support material shall be understood as all the elements that facilitate the dissemination of the knowledge available in the repository and the transfer of this knowledge to the users or stakeholders of the KMS, such as films, photographs, videos, training material, magazines, brochures, documents, and others.

As explained in the development of the specific functions of the KMS (Historical Memory, Lessons Learned, Human Resources Development, Research and Development, and Network Development), in each of its processes it is indicated that each function should consider the proposals to carry out the corresponding dissemination, which allows constituting support to DRR. In the repository there will be the reports that each specific function has processed and stored, which are the raw materials for the construction of support material.

With this input, the COMMSS analyzes the background to define the formation of a working group with the specialists required for each case. These specialists may be internal and/or external and must include those who worked on the subject in the report of the function.

The working group studies the solution(s) to satisfy the requirement, selecting the solution or combination of solutions that will provide the most efficient response to the requirement.

From the aforementioned study, the working group prepares the design of the selected solution, defining in detail the media to be used (video, film, audio, text, leaflets, magazines, brochures, etc.), as well as the description of the creation and development process to produce the new object or

communication media for use by stakeholders.

The Working Group prepares the design implementation planning and the respective costs, time and means to implement it. This planning is submitted for approval to the ONEMI administrative authority, who manages the necessary resources.

Once the ONEMI authorities have successfully processed the aforementioned management, the construction of the material specified in the selected solution proceeds. At this stage, internal and external means are considered, contracts are drawn up and the corresponding acquisitions are made.

Once construction is complete, this material is submitted to the KMS Administrator, who authorizes its entry into the repository, thus making it available to stakeholders.

To fulfill its essential purpose, the COMMSS must perform the following tasks, which are represented in the diagram in Figure 2.5.2.22:

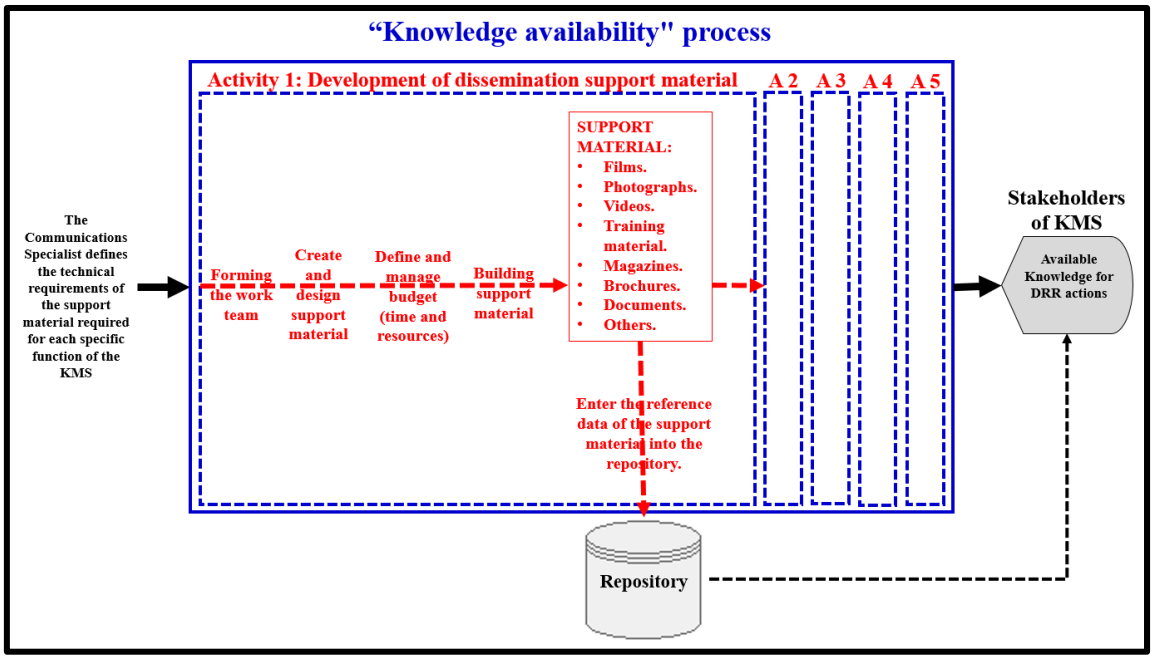


Figure 2.5.2.22 Tasks of the Activity "Development of material to support dissemination"

- Form a work team to define the specific requirements needed to design, budget, build and implement the support materials. This team will be made up, on a temporary basis, of personnel from different specialties, according to the type of support material to be developed.
- Create and design the support material, complying with the specific technical requirements defined by the work team. The design of the support material must be elaborated by the work team and approved by the COMMSS.
- The design approved by the COMMSS must be budgeted in the form of a project, in terms of human, material and economic resources and development time. This budget must contain

the proposed sources of financing for the economic and management resources of the project. The budget prepared by the work team must be submitted by the COMMSS to the KMS Administrator for approval.

- Once the budget has been approved by the KMS Administrator, the COMMSS should manage the resources to build and implement support materials, according to their type and specific requirements. The products of this task (films, photographs, videos, training materials, magazines, brochures, documents, and others) must be implemented and used in the dissemination of knowledge.
- Likewise, the technical reference data of the support materials constructed must be entered into the repository to facilitate access to users and stakeholders of the KMS.

5.2.3.1.2. Activity "Review of the available knowledge in the KMS"

The essential purpose of this activity is to review the knowledge that is available in the Repository and the functioning of the dissemination support materials, in order to ensure an acceptable quality of the knowledge stored in the System that remains available to users.

To fulfill its essential purpose, the COMMSS must perform the following tasks, which are represented in the diagram in Figure 2.5.2.23.

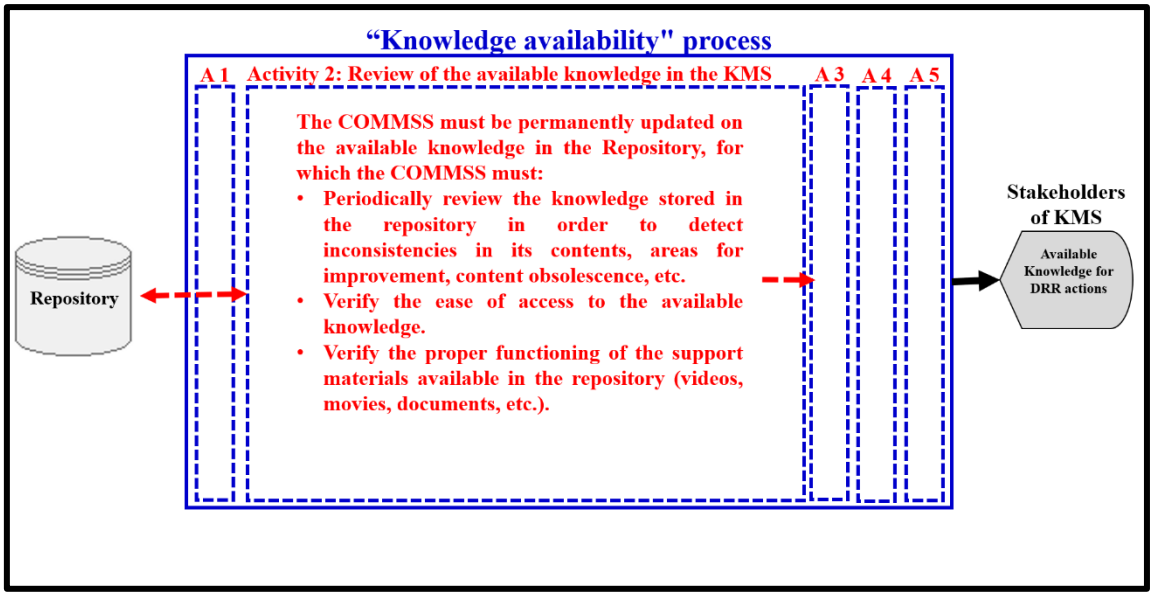


Figure 2.5.2.23 Tasks of Activity "Review of the available knowledge in the KMS"

- The COMMSS must be kept permanently updated on the content of the knowledge stored in the computer applications of the KMS Repository. All the material contained in the Repository has been qualified prior to its entry into the system; however, it is necessary to

verify the consistency of its contents, the validity of the information available, and areas for improvement, among others. In this context, the participation of the members of the working group is essential in order to make the best use of the potential generated by the different views of the different specialists that make up the group.

- Periodically review the knowledge stored in the Repository and the support materials for dissemination, in order to detect inconsistencies and obsolescence of contents, define areas for improvement and needs for complementation of background information for specific knowledge, etc.
- Verify the access facilities to the available knowledge defined for KMS users, such as, for example, access to computer applications, links to specific documents, links to support materials, user access codes, search functions, among other elements that ensure and improve access to users, as well as allow identifying and proposing improvements to achieve:
    - A system with which users can interact easily, comfortably and securely
    - Usability as a desirable quality attribute, in terms of ease of learning, flexibility (user information exchange system), ease of use (with which the user makes use of the tool, with fewer or more natural steps to their specific training)
- Verify that all support materials available in the repository (films, photographs, videos, training materials, magazines, brochures, documents, and others) work properly or are available when users require them.
- All of the above is done with the aim of continuously improving the quality of the content of the System and achieving greater usability of the knowledge available in the Repository by users and stakeholders of the KMS.

5.2.3.1.3. Activity "Transfer of available knowledge in the KMS"

The essential purpose of this activity is to promote the transfer of knowledge stored in the KMS Repository to the users or stakeholders of the System and to encourage them to make use of such knowledge available for DRR.

To fulfill its essential purpose, the COMMSS should perform the following tasks that are represented in the scheme of Figure 2.5.2.24, through the use of communication means and information and communication technologies.

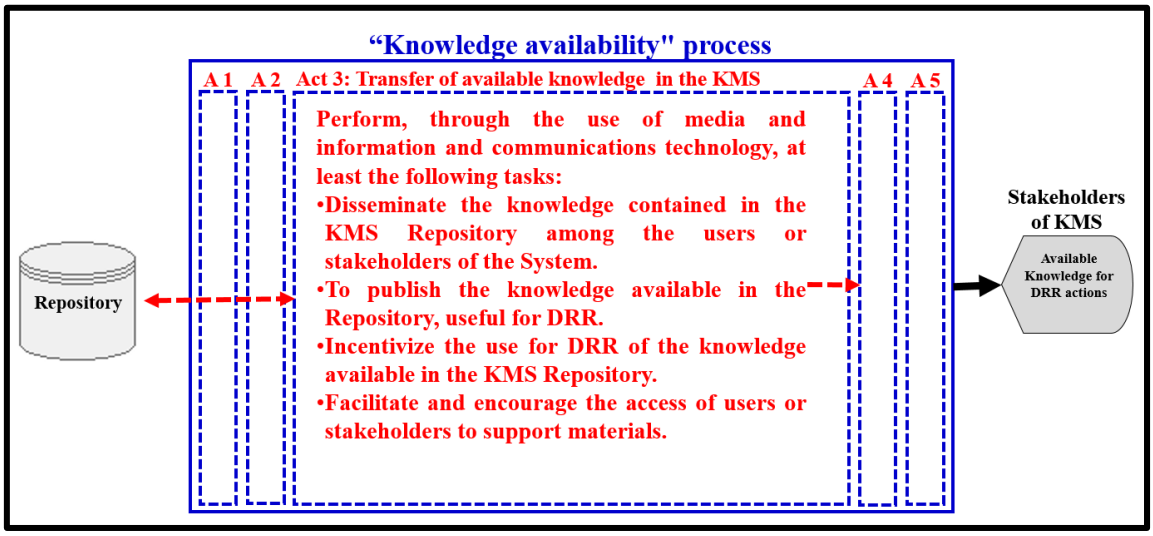


Figure 2.5.2.24 Tasks of the Activity "Transfer of knowledge available in the KMS"

- Disseminate the knowledge contained in the KMS Repository among the System's users or stakeholders, using media such as television, radio, telephones, social networks, in order to make users aware of the type of knowledge contained in the Repository
- Publish the knowledge available in the Repository, useful for DRR, in newspapers, brochures, specialized magazines, in order to make the available knowledge known
- Encourage the use for DRR of the knowledge available in the KMS Repository, using the media, making proposals to specific users so that they are motivated to access the content of the Repository to learn about the topics of their areas of interest
- Facilitate and encourage access by users or stakeholders to support materials (films, photographs, videos, training materials, magazines, brochures, documents, etc.)
- Elaborate an action plan that establishes objectives to encourage the use of the knowledge available in the Repository by the different types of users or stakeholders, grouping them according to their characteristics of use of the information

5.2.3.1.4. Activity "Generation of statistics on access to the available knowledge in the KMS"

The essential purpose of this activity is to measure the interactions of the System's stakeholders with the knowledge available in ONEMI's KMS Repository, in order to provide statistical data that will allow the KMS Administrator to develop the management control process according to the indicators defined.

The measurements referred to the value of use of the different information contained in the Repository allow analyzing the interest of the users of the System in topics related to DRR, in order to adopt corrective measures in those cases where it is warranted.

To fulfill its essential purpose, the COMMSS must perform the following tasks, which are depicted in the schematic in Figure 2.5.2.25.

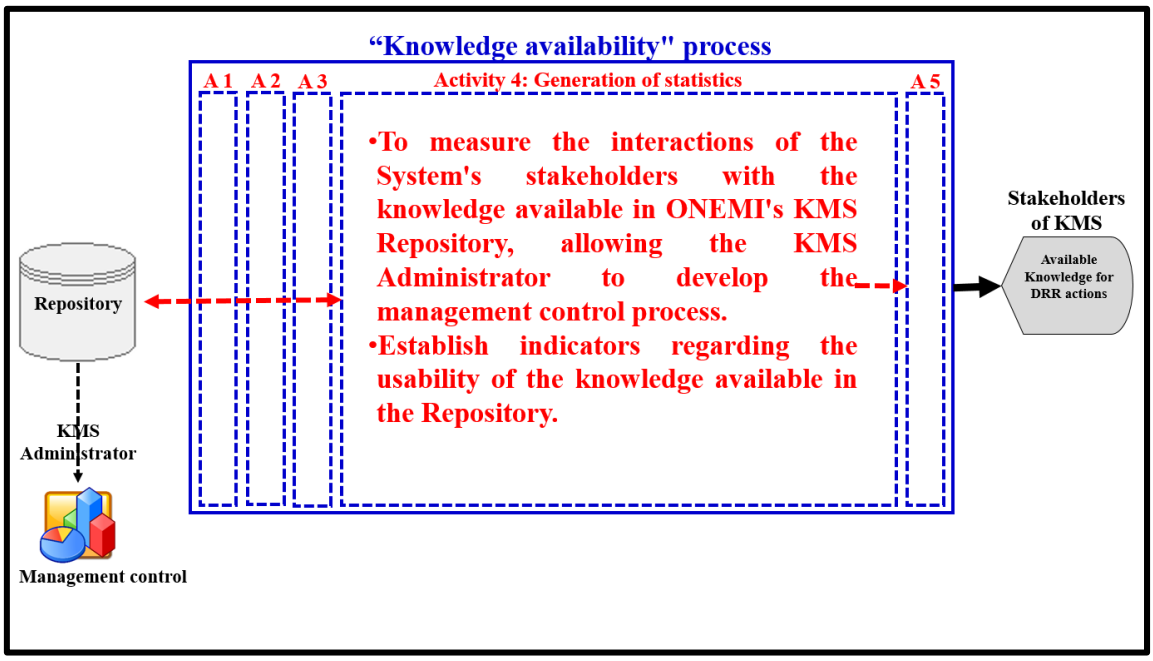


Figure 2.5.2.25 Tasks of the Activity "Generation of statistics on access to the available knowledge".

- Perform measurements that relate, among other aspects, to:
    - Effectiveness, which refers to the precision with which the user achieves a specific objective.
    - Efficiency, which is the quality of being able to meet these objectives without wasting resources and doing it in a good way.
    - User satisfaction, which refers to the user's positive attitude towards the system due to the absence of discomfort.
    - The context of use, which refers to the environment in which the interaction between the user and the system takes place.
- Establish indicators regarding the usability of the knowledge available in the Repository, such as, for example:
    - Number of visits to certain knowledge.
    - Number of visits to files of an essential function.
    - Requests to incorporate topics of interest to the user or requests to complement the content of a topic.
    - Number of errors in the system background detected by users.

- Delay time in responding to user requests.
- Number of requests to remove issues from the KMS and response time.
- Number of improvements to established procedures as a result of background information obtained from the system.
- Number of measures disseminated in the system successfully applied and tested in real or simulated practical exercises.
- Fulfillment of the objectives set on the use of the Repository.
- Queries by type of disaster risk (earthquakes, tsunamis, volcanic eruptions, droughts, floods, landslides, alluvium, mass removal, strong winds, tidal waves, snowstorms, avalanches, lightning strikes, hailstorms, heat and cold waves, structural fires, forest fires, hazardous materials, etc.).

5.2.3.1.5. Activity "Interaction with KMS users"

The essential purpose of this activity is to interact with the users of the KMS in order to obtain their opinion regarding the quality, timeliness and value of use of the knowledge available in the System, in order to achieve continuous improvement of the processes of the specific functions of the KMS, in form and substance of its products.

To fulfill its essential purpose, the COMMSS must perform the following tasks, which are depicted in the schematic in Figure 2.5.2.26.

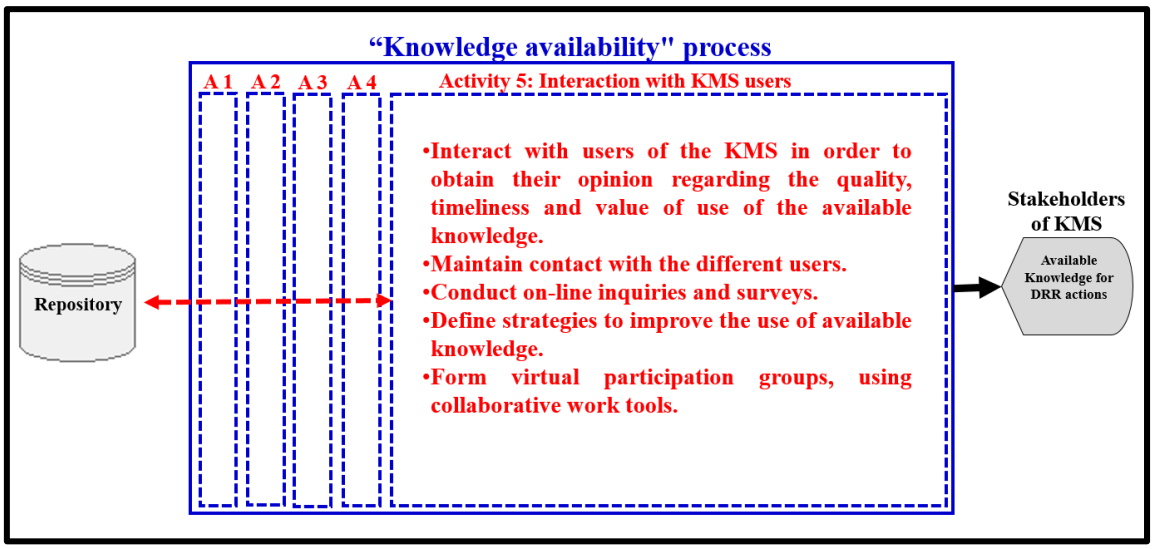


Figure 2.5.2.26 Tasks of Activity "Interaction with KMS users"

- Maintain contact with the different users, or potential users, directly, in order to obtain feedback on their opinions regarding the degree of satisfaction with the knowledge available

in the System to comply with their respective objectives regarding DRR. Users are understood as members of the KMS (participants of the specific functions), members of ONEMI at the national and regional level, provincial and municipal leaders, public and private organizations, and citizens in general, among others.

- Conduct online consultations with the system and surveys aimed at the different stakeholders, in a focused manner, in order to:
    - Know the value of use of the KMS, with respect to the requirements not satisfied by the System
    - Identify and then promote the KMS in areas that have not used the available information
- Define strategies to improve the use of the knowledge available in the KMS, based on available information, particularly statistics and interaction with users
- Form virtual participation groups, using collaborative work tools, with ONEMI agencies, government agencies, civil organizations and the general public, to discuss specific topics related to the functioning of the KMS, such as, for example:
    - Strengths and weaknesses of the actual performance of the system
    - Degree of satisfaction with the information contained in the system
    - Applicability of solutions formulated
    - How the new needs raised were addressed
- With the products of this interaction with the users, the COMMSS prepares reports to the KMS Administrator that allow them to arrange the studies and definitions of solutions to the problems raised.

5.2.3.2. "Knowledge Exhibition" process

The essential purpose of the "Exhibition" process is to preserve, communicate, and exhibit, for purposes of study, education, and contemplation, the sets and collections of elements with historical value and of interest for DRR, which allow transmitting to the stakeholders of the KMS the experience and lessons learned from the events that occurred, also fulfilling the objective of remembering a specific aspect of the disaster by preserving some vestige of it.

In this context, places, images and artifacts are considered, which reproduce interpretations of past history and at the same time contribute to the transformation of memories through the ritual repetition of symbols, discourses and aesthetics, which allow to provoke the memory and thus preserve a fragment of the past. This serves as a tool for educating the population.

The sequence of this process approach is represented in Figure 2.5.2.27.

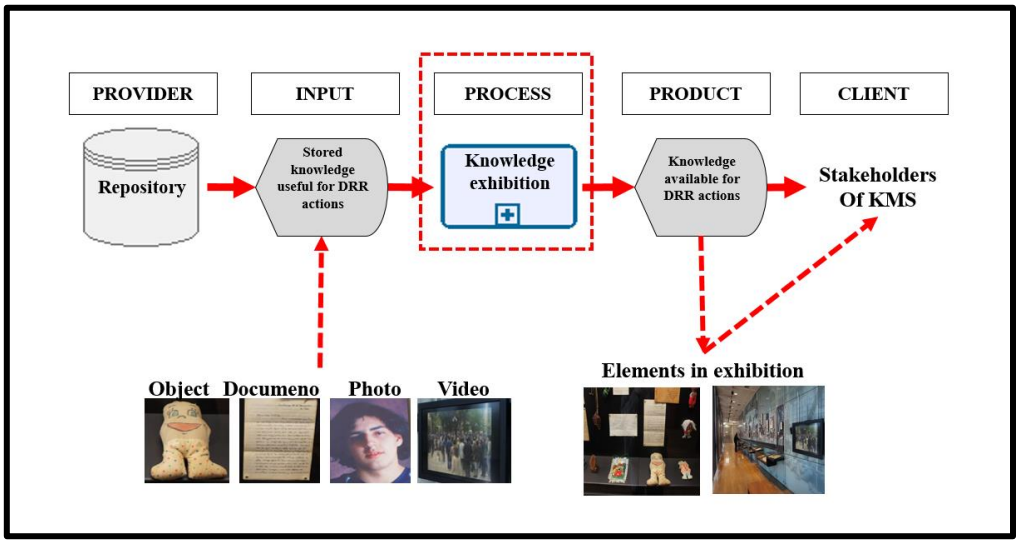


Figure 2.5.2.27 "Knowledge Exhibition" process approach

ONEMI entities obtain information related to events associated with Disaster Risk Management from their external providers (State Institutions, private organizations, municipalities and others, as well as from the population of any part of the country), and may receive annexed to this information any element that, in their judgment, requires to be exhibited according to the conditions, means and places to be defined.

If any material proposed for exhibition is attached to the Knowledge Report, the entity must prepare an additional report, for each item, describing the factual context and rationale for the importance of exhibiting the material.

As a product of the processing of the knowledge reports, the KMS functions enter their respective specific reports in the KMS Repository. In these specific reports should be added the elements that need to be displayed and their respective context reports.

Once the knowledge is entered into the repository, it is processed by the computer applications, performing the tasks of converting, editing, selecting, analyzing, and synthesizing the knowledge generated, and thus making it available as useful knowledge for DRR for those who access the system.

The elements that require exhibition, will be delivered to the "Knowledge Exhibition" process to be prepared and installed, according to the conditions, means and places to be defined, being available for the users' visits.

In order to transfer this knowledge to the KMS stakeholders, the "Knowledge Exhibition" process must deliver to the "Knowledge Availability" process, the specific information referred to the conditions, means and places of exhibition.

The following roles are involved in this "Knowledge Exhibition" process:

- **EXHS: Exhibition specialist,** a person who has skills in techniques and practices related to

the operation of exhibition rooms of elements with historical value and of interest for DRR.

- **ADM: KMS Administrator**, knowledge management specialist who receives the KR submitted by the ONEMI Entity, validates it as knowledge and forwards it to the specific functions of the KMS for processing. Specifically in this process, the ADM validates and determines, in coordination with the EXHS, the elements and their associated context reports that should be exposed in the conditions, media and exhibition places to be defined. In addition, the ADM is in charge of coordinating the required interactions between the person in charge of the ONEMI entity that prepared the KR and the specialists of the different functions of the process.

The "Knowledge Exhibition" process is the efficient link between the knowledge obtained from the elements with historical value collected from the events that occurred in disasters and the stakeholders of the KMS that need to use such knowledge for DRR actions.

For the exhibition, spaces such as memorials or other infrastructure for this purpose, existing at the national, regional, provincial or communal level, can be considered. Regarding their location, it is estimated that they have a greater effect when they are located in the area where the event occurred, which does not preclude having representations at the central level of the country.

Adequate use of existing capacities is especially advisable, such as, for example, the facilities of the National Cultural Heritage Service, availability of museums in Municipalities or other facilities that serve these purposes.

Another aspect to keep in mind is the purpose of the exhibition, which is shown in the following table:

Purpose of the exhibition	Description
Inform	A simple format with a massive message is used.
Educate	Exhibition format, preferably interactive, using multimedia material.
Leisure	Monuments that are linked to the city through tourism, in order to entertain and recreate the community, both local and visitors. It provides dynamic spaces for social interaction, commercial activity of the city, among others.
Spirituality	Provide spaces for prayer and reflection that allow for spontaneous manifestation by visitors. It should directly evoke the disaster, using ruins or significant remnants of the losses.

To fulfill its essential purpose, the EXHS must perform the following tasks, which are depicted in the schematic in Figure 2.5.2.28.

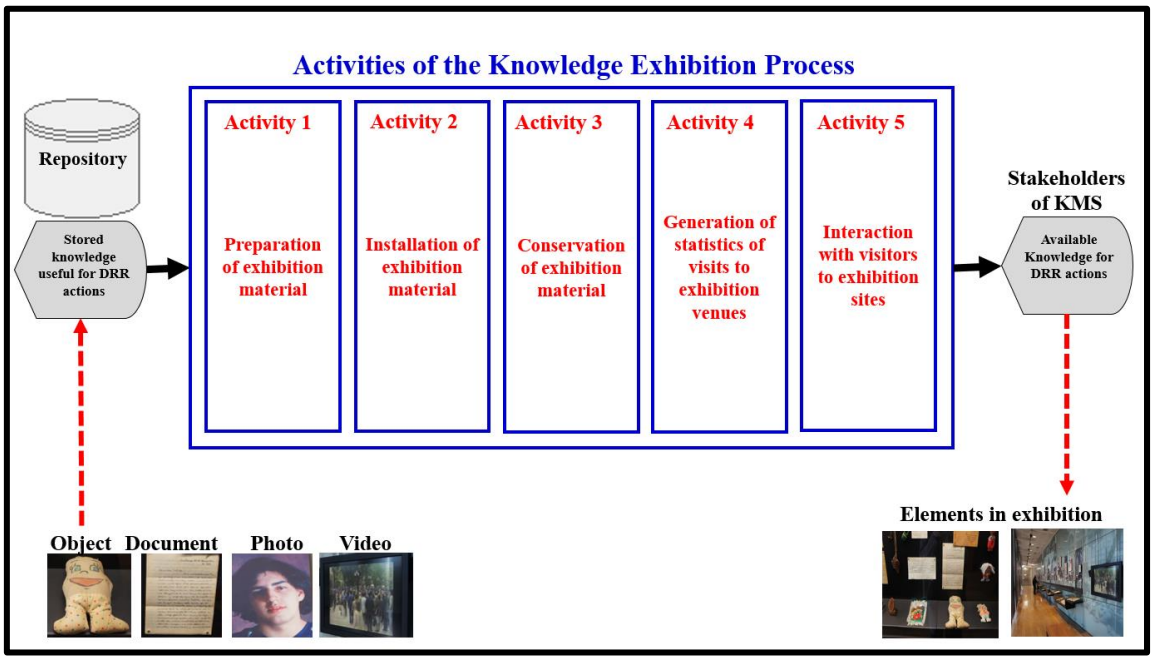


Figure 2.5.2.28 Main activities of the "Knowledge Exhibition" process

5.2.3.2.1. "Preparation of exhibition material" activity

The essential purpose of this process is to receive, adapt and transfer to the exhibition sites the elements validated by the ADM to be exhibited in the conditions, media and exhibition sites.

ONEMI's entities send to the Knowledge Management Function the Reports with the background information that they consider should be managed by the KMS. These reports may have attached elements that they propose to be exhibited in places where they can be visited by the KMS stakeholders. The ADM analyzes these reports and, if validated, forwards them to the essential functions for processing.

As explained in the development of the specific functions of the KMS (Historical Memory, Lessons Learned, Human Resource Development, Research and Development, and Network Development), each of its processes indicates that each function must consider the proposals for the corresponding dissemination, which will make it possible to constitute an exhibition material. In the Repository will be the reports that each specific function has processed and stored, which are the raw material for the construction of the exhibition material.

Specifically, in the case of items for exhibition, the ADM must determine, in coordination with the ONEMI entities and with the advice of the EXHS, the conditions, means and places for exhibition.

Having defined the above, the ADM delivers the elements for exhibition to the EXHS.

To fulfill the essential purpose of this stage, the EXHS must perform the following tasks, which are represented in the diagram in figure 2.5.2.29:

Figure 2.5.2.29 Tasks of Activity "Preparation of exhibition material"

- Advise the KMS Administrator, the ONEMI entities and the specialists of the specific functions of the KMS in the definition of the elements to be exhibited, in the most appropriate conditions, media and places according to the Context Report of each material, applying the techniques of conception and realization of an exhibition and of the operation of the exhibition sites
- Receive and analyze the elements that the ADM has decided should be presented, with the purpose of budgeting in project form the human, material and economic resources and the development time required to adapt them to be exhibited. This budget must contain the proposed sources of financing for the economic resources and management of the project. The budget prepared must be submitted by the EXHS to the KMS Administrator for approval.
- Once the budget has been approved by the KMS Administrator, the EXHS must manage the resources to provide the objects, artifacts or remains with complementary information, contextualization and interpretation tools, according to the Context Report and its specific requirements
- Transfer the elements duly prepared to be exhibited (films, photographs, videos, documents, and others) to the established exhibition sites

5.2.3.2.2. "Installation of exhibition material" activity

The essential purpose of this activity is to place in the exhibition premises the elements that were arranged to be presented, in the established conditions, means and places of exhibition, so that they

can be visited by the stakeholders of the KMS.

The main objective of the exhibition is the conception, design and execution of exhibits primarily based on the principles of didactics, i.e., its aim is to provide the objects, artifacts or remains of materials on exhibition with complementary information, contextualization and interpretation tools so that the greatest possible number of visitors can integrate them into their network of knowledge.

To fulfill its essential purpose of this stage, the EXHS must perform the following tasks, which are depicted in the schematic in Figure 2.5.2.30.

Figure 2.5.2.30 Tasks of Activity "Installation of exhibition material"

- For the purpose of this project, an exhibition site will be understood as a space where objects, artifacts, or remnants of materials that contain useful knowledge for DRR are preserved, studied, learned, and disseminated.
- The installation of the elements to be exhibited must be carried out by applying a set of techniques and practices related to the operation of the exhibition room, such as, for example, the techniques for the conception and realization of an exhibition. The physical layout of an exhibition must take into account both the preventive conservation requirements of the objects and their arrangement and presentation.
- The technical or scientific (architecture, restoration of works, among others) and artistic (scenography, lighting, among others) professions must be taken into consideration when setting up exhibition sites. The elements that support the exhibition are the showcases, walls that house the works, graphic, audiovisual and interactive pieces, lighting systems and all

those resources that support and implement the narrative of the context that the exhibition intends to transmit.

- The EXHS must inform the "Availability of Knowledge" process that the elements are on display in the manner and place defined so that they can be visited by interested parties.

5.2.3.2.3. "Conservation of exhibition material" activity

The essential purpose of this activity is to permanently maintain the state of conservation of the objects, artifacts, or remnants of materials on display at the exhibition sites.

To fulfill its essential purpose of this stage, the EXHS must perform the following tasks that are represented in the schematic in Figure 2.5.2.31.

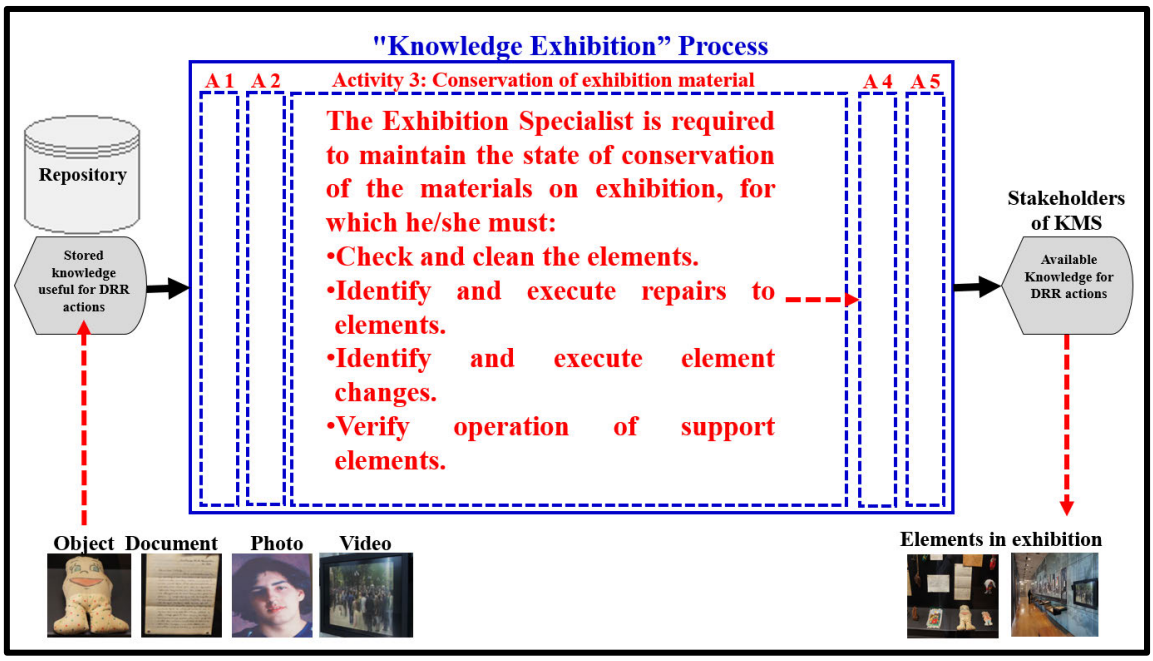


Figure 2.5.2.31 Tasks of the Activity "Conservation of exhibition material"

- Review and clean the objects, artifacts or remains of materials installed in the exhibition places, such as showcases, walls, graphic rooms, among other support elements, in order to preserve the story of the context that the exhibition intends to convey
- Identify deteriorated material and carry out the required repairs, both of the material on display and of the showcases, walls, graphic rooms, among other support elements for the exhibition
- Identify and execute the changes of elements, both of the material on display and of the showcases, walls, graphic rooms, among other support elements for the exhibition, either due to non-repairable deterioration, technical obsolescence and/or modification of the context that

justifies their removal from the exhibition site

- Verify the operation of exhibition support elements, such as audiovisual and interactive exhibition rooms, lighting systems, among others

5.2.3.2.4. "Generation of statistics on visits to exhibition sites" activity

The essential purpose of this activity is to measure the visits of the System's stakeholders to the exhibition sites, in order to provide statistical data that will allow the KMS Administrator to develop the management control process in accordance with the indicators that will be defined.

The measurements referred to the visits to the exhibition sites will allow analyzing the interest of the users of the system in topics related to DRR, in order to adopt corrective measures in those cases that warrant it.

To fulfill its essential purpose, the EXHS should perform the following tasks that are represented in the scheme of Figure 2.5.2.32.

Figure 2.5.2.32 Tasks of Activity "Generation of statistics on visits to exhibition sites"

- Perform measurements that relate among other aspects:
    - Number of visits by periods
    - Number of visitors by geographic zones and/or exhibition sites
    - Visitor profile
    - Themes or elements that have achieved greater or lesser interest from visitors
    - Quality and conservation of the objects, artifacts, documents and other elements

exhibited

- Visitors' level of understanding of the complementary information, contextualization and interpretation tools that are added to the objects, artifacts, documents and other elements on exhibition

- Establish indicators regarding visits to exhibition sites and the knowledge available at such sites, such as, for example:
  - Level of satisfaction regarding the topics or objects exhibited by type of disaster risk (earthquakes, tsunamis, volcanic eruptions, droughts, floods, overflows, alluvium, mass removal, strong winds, tidal waves, snowstorms, avalanches, lightning strikes, hailstorms, heat and cold waves, structural fires, forest fires, hazardous materials, among others)
  - Level of satisfaction with respect to the facilities of the exhibition sites (signage, accessibility, cleanliness, lighting, ease of circulation, among others)
  - Number of errors in the system background detected by visitors
  - Delay time in responses to visitor requests
  - Number of requests to remove topics or elements from the exhibition sites and response time
  - Compliance with the objectives set for visits to the exhibition sites

5.2.3.2.5. "Interaction with visitors of the exhibition sites" activity

The essential purpose of this activity is to make contact with visitors, in order to obtain their opinion regarding the quality, timeliness and value of use of the knowledge available at the exhibition sites, through the objects, artifacts, documents and other items on display, in order to achieve continuous improvement of the processes of the essential functions of the KMS, in form and substance of its products.

To fulfill its essential purpose, the EXHS must perform the following tasks, which are depicted in the schematic in Figure 2.5.2.33.

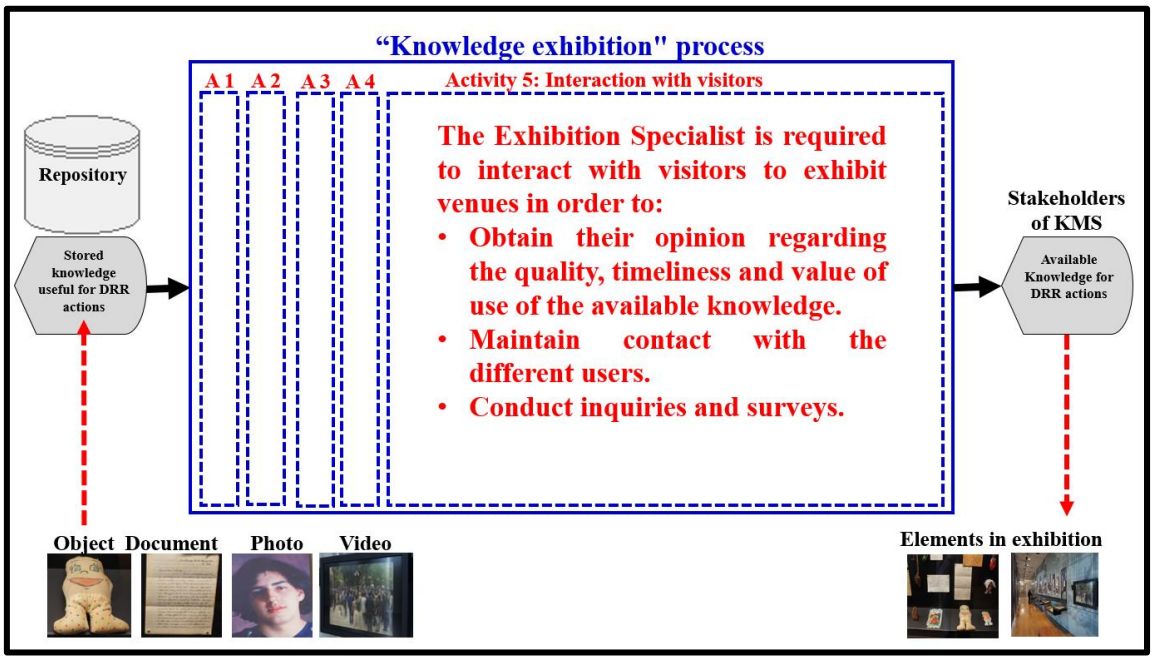


Figure 2.5.2.33 Tasks of the Activity "Interaction with visitors of the exhibition sites"

- Maintain contact with different visitors, or potential visitors, directly, in order to obtain feedback on their opinions regarding the degree of satisfaction with the knowledge available at the exhibition sites, through objects, artifacts, documents, and other elements on display, to meet their respective objectives regarding DRR. Potential visitors are understood as members of the KMS (participants of the essential functions), members of ONEMI at the national and regional level, provincial and municipal leaders, public and private organizations, and citizens in general, among others.
- Conduct online consultations with the system and surveys aimed at the different stakeholders, in a focused manner, in order to:
    - Know the value of use of the exhibition sites, with respect to the requirements not satisfied by the System
    - Identify and then promote exhibition sites in areas that have not been utilized with the information available
- Define strategies to improve the use of the knowledge available at the exhibition sites, based on available information, particularly statistics and interaction with visitors
- Form virtual participation groups, using collaborative work tools, with ONEMI agencies, government agencies, civil organizations, and the general public, to discuss specific issues related to the operation of the exhibition sites, such as, for example:
    - Strengths and weaknesses of the operation of the exhibition sites
    - Degree of satisfaction with the information contained in the objects, artifacts,

documents and other items on display

- Improvements in the facilities and exhibition media
- New requirements of interest to KMS stakeholders

- With the products of this interaction with the users, the EXHS prepares reports to the KMS Administrator that allow him to arrange the studies and definitions of solutions to the problems raised.

5.2.4. Description of the "Knowledge Storage" function

The "Knowledge Storage" function is related to the development of computer applications and databases that allow gathering and storing the relevant information generated as a result of the execution of the processes of the main functions of the KMS.

The technical specifications, both for the computer applications and for the databases required, should be defined on the basis of the functional specifications formulated for each of the main functions of the KMS.

The description of the "Knowledge Storage" function is framed in the context of the KMS functional model and will be done according to the following detail in Figure 2.5.2.34.

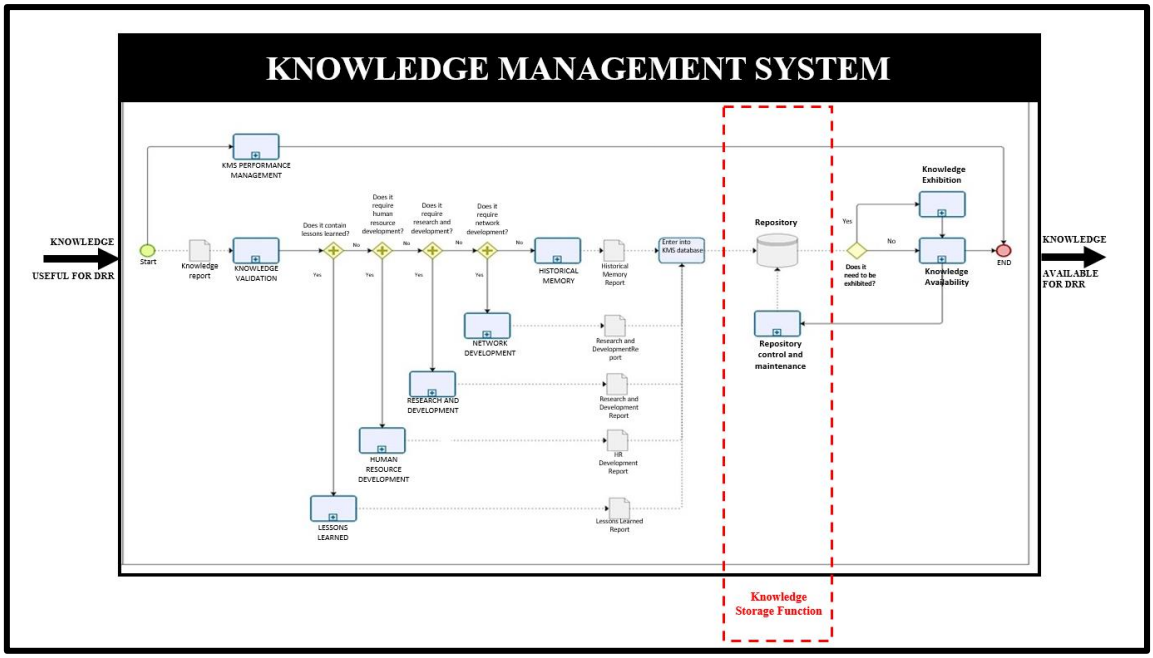


Figure 2.5.2.34 The "Knowledge Storage" function in the context of the KMS operation scheme

5.2.4.1. Description of the "KMS Repository”

The concept of "KMS Repository" is to be understood as an information system consisting of a set of administrative procedures, processes, computer applications and technological support that allows collecting, preparing, storing, retrieving and presenting the relevant knowledge resulting from the main processes of ONEMI's Knowledge Management System for disaster risk reduction.

In this context and bearing in mind that ONEMI has a robust and functioning institutional information system, it is deemed convenient to consider the KMS Repository as a constituent part of ONEMI's Information System, making use of the information and communication technology resources in operation, such as the following topics of interest that should be considered for the development of an information system.

- Software platform: development environment, licenses, programming language, database engine, etc.
- Equipment platform: Computer equipment, printers, peripherals, servers, etc.
- Network platform: Connectivity equipment and software
- Electrical power supply: Phases, cables, plugs, conduits, protections, grounding meshes, etc.
- Information security platform: Provide adequate security for the handling of information through computers
- Technical support: Maintenance capacity, guarantees, after-sales services, etc.

Of these aspects, the essential element is the software platform, since it establishes the development environment that interacts directly with the end user, materializing the support of the computer applications to the tasks and activities of the KMS work processes. Once the computer application is designed according to the logic of the processes, the hardware platform, the data transmission system, the power supply, the technical support and the information security are established, according to the operational requirements established for the system.

In this context, the essential purpose of the repository is to provide the IT support required for the functioning of the essential processes of the KMS, under a common operational environment of ONEMI's technological platform, as shown in Figure 2.5.2.35.

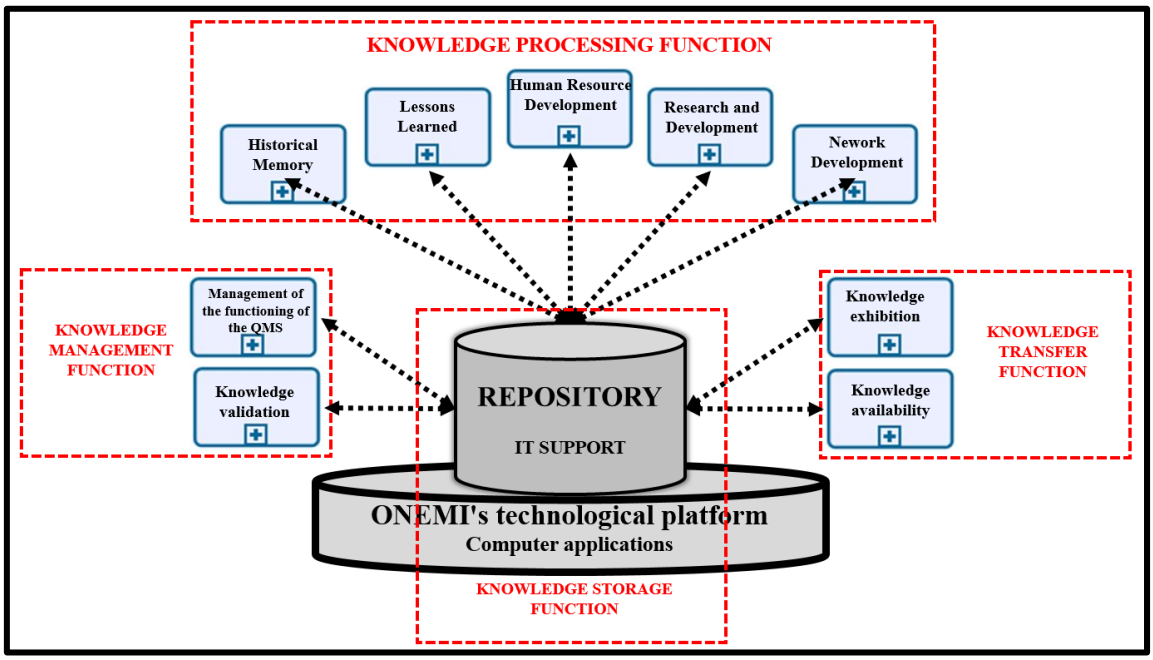


Figure 2.5.2.35 IT support as an essential purpose of the KMS repository

Notwithstanding the above, some considerations for the design of the Repository are presented as follows.

- The repository must be oriented to facilitate the integrated operation of the essential processes of the KMS, that is, the processes "Knowledge validation", "Management of the operation of the KMS", "Historical Memory", "Lessons Learned", "Human Resources Development", "Research and Development", "Network Development", "Knowledge Exhibition" and "Knowledge Availability".
- It should allow storing knowledge, documents or other objects of interest generated by the KMS through knowledge reports and context reports of its essential processes.
- In case documentary files, objects or other elements are required, they must be properly indexed, synthesized, evaluated and interrelated.
- It must facilitate the recovery and distribution of knowledge, either through the exhibition of objects, documentary archives and others, as well as making the stored knowledge available to stakeholders through the processes of Knowledge Availability and Knowledge Exhibition.
- They must be independent of the people who operate them and flexible to technological changes.
- They must be independent of the amount of knowledge they store, allowing its modular growth.

Likewise, in order to be usable and generate advantages to users or stakeholders, knowledge must have

the following basic characteristics.

- Complete: It must have all the elements that allow users or stakeholders to analyze and process it.
- Reliable: It must come from a truthful and credible source.
- Secure: It must be properly protected.
- Timely: It must reach each user in time for it to be used.

5.2.4.2. Description of the basic functionalities of the "Repository.

To fulfill its essential purpose of providing the IT support required for the operation of the essential processes of the KMS, the repository must perform the following basic functions, which are depicted in Figure 2.5.2.36.

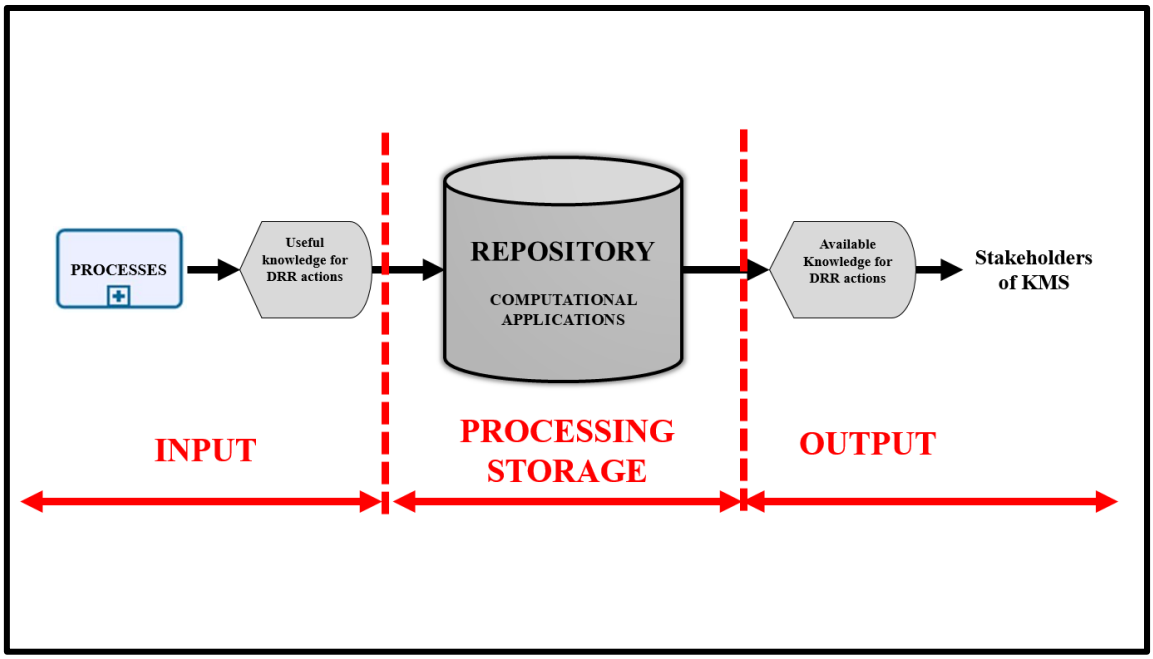


Figure 2.5.2.36 Basic functions of the KMS repository

- Knowledge input: This is the function of capturing knowledge from the environment. Specifically, the "KMS Repository" computer system receives as inputs the specific reports generated by the Historical Memory, Lessons Learned, Human Resources Development, Research and Development and Network Development processes. These reports are prepared by the specific processes by processing the knowledge reports and context reports received from the "Knowledge Validation" process.
- Knowledge processing: It is the work done with knowledge through the main functions of the KMS, according to the requirements defined in the computational applications. Here,

computation makes its great contribution by converting, editing, selecting, analyzing and synthesizing the generated knowledge.

- Knowledge storage: It is the function of creating a memory bank to store knowledge for later use according to pre-established criteria.
- Knowledge output: It is the function of making available to stakeholders all types of knowledge available and stored in the Repository's computer applications, making use of Information and Communication Technologies (ICTs), as well as using the most appropriate exhibition channels in the case of objects or other elements.

A more technical approach to the functions of the Repository is described through the IT support to the KMS processes.

- “Knowledge input" function, through the entry of knowledge to the KMS by ONEMI Entities for validation by the KMS Administrator, provides IT support to the following processes.
    - "Knowledge validation"
    - "Management of KMS performance"
- The "Knowledge Processing" function, through the entry and processing of specific function reports, provides IT support to the following processes.
    - "Historical Memory"
    - "Lessons Learned"
    - "Human Resource Development"
    - "Research and Development"
    - "Network Development"
- The “Knowledge Storage" function, through the Repository's computational applications
- Function "Knowledge output", computer support to the following processes.
    - "Knowledge Exhibition"
    - "Knowledge Availability"

5.2.4.3. "Repository" functional requirements

The functional requirements are statements of the functions to be performed by the Repository to provide IT support to ONEMI's KMS for the execution of its main processes.

5.2.4.3.1. Estimation of the requirements of the "Knowledge Input" Repository Function

The "Knowledge Entry" function, through the entry of knowledge into the KMS by ONEMI Entities for validation by the KMS Administrator, provides IT support to the following processes.

- "Knowledge validation"
- "Management of KMS performance"

5.2.4.3.1.1. "Knowledge validation" process

The KMS starts with the entry of knowledge into the system. This knowledge is generated in ONEMI's organizational units (National Administration, National Sub-Department, Regional Offices, Cabinet, Risk Management Sub-Department, Emergency Operations Sub-Department, Administration and Finance Sub-Department), which are the ones that have the information they handle in their usual processes and have specialist staff that can transform this information into knowledge and make it available to the KMS to be managed and transferred to the system's stakeholders.

In this context, the Repository should consider the following functional requirements.

- Allow ONEMI Entities to enter the knowledge reports that, according to technical criteria, they consider should be managed by the KMS to be made available to the stakeholders of the system for disaster risk reduction
- Allow ONEMI Entities to consult the computer applications, in order to access the knowledge already available in the Repository at the time of executing the processes of transforming information into knowledge for DRR

In addition, the Repository must provide support to the "Knowledge Validation" process in the execution of its activities susceptible to be supported by information technology, which begin with the receipt of a knowledge report that has been processed by ONEMI's entities, which in the opinion of the experts of the respective functional areas, consider that it qualifies to be managed by ONEMI's KMS for DRR.

The Administrator proceeds to verify that the knowledge complies with the requirements referred to:

- Context in which knowledge is generated
- Comparison with other elements
- Prediction of consequences
- Search for connections
- Conversation with other knowledge carriers

If the knowledge submitted by the entities meets the requirements to be managed by the KMS, the Administrator proceeds to assign it to the essential functions (Historical Memory, Lessons Learned, Human Resources Development, Research and Development and Network Development) to be processed and entered into the Repository.

If the knowledge submitted by the entities does not meet the requirements to be managed by the KMS, the Administrator proceeds to return it to the entity that generated it to be completed and reprocessed.

5.2.4.3.1.2. "Management of the operation of the KMS" function

The Repository must provide support to the "Knowledge Management" process in the execution of its activities that can be supported by information technology, which in the specific case of the KMS, performance management involves determining the objectives to be achieved in a given period to

fulfill the essential purpose of the KMS, determining the actions that need to be executed to achieve these objectives, prioritizing them and establishing their sequence, identifying the available resources and assigning them to the actions according to their prioritization.

Likewise, the organization must be adjusted so that it can develop the actions foreseen to achieve the objectives, in terms of roles, positions, personnel integration, competencies, etc.

To organize is to determine the tasks necessary to achieve the objective, establishing the authority and assigning responsibilities to the people who will be in charge of these tasks.

Having established what to do and who should do it, the KMS is in a position to carry out what is planned, having an adequate organization. To this end, the KMS administrator must direct, coordinate and guide the execution of the work to achieve the goals established for each objective.

During the execution of the tasks, it must be verified that what is being executed corresponds to what was planned and thus, provide feedback to the administrative process of the KMS management.

Consequently, the Administrator will have as a main responsibility ensuring the coordinated and harmonious functioning of the KMS, through the management functions, from the reception of validated knowledge, the processing of knowledge by the specific functions (Historical Memory, Lessons Learned, Human Resource Development, Research and Development and Network Development), the storage, control and maintenance of knowledge in the computer applications of the Repository, to the exhibition and availability of knowledge to the respective stakeholders of the system as a final product.

For this purpose, it must coordinate with the generators of knowledge, i.e., ONEMI entities, the complementary background information required for processing.

- Identify the function(s) that are relevant to process the received knowledge and process the document within the system
- Coordinate the exchange of required information among the functions
- Interact with other ONEMI systems that allow complementing the information for its adequate processing
- Manage the information in the Repository, having special concern regarding
    - Entry of the reports processed in each function
    - Availability of hardware, software and networks required by the system
    - Availability of information for system users
    - Maintain the repository updates
    - Adopt measures to ensure adequate use of the system's feedback process.
- Manage the interactions with internal and external organizations, as required by each case
- Direct the maintenance and control of the system
- Manage digital files, documentation, personnel, administrative aspects and the organization of work in general, within a systemic dynamic to distribute knowledge, satisfying the needs

of the internal and external environment of the system

- It is important that the system emphasizes the inevitable relationship between knowledge management, information management, technology management, organizational culture and human resource management as fundamental elements for the process to be efficient.

For knowledge retention, there are three fundamental sub-processes:

- Select, from the multiple events that the organization experiences, the people and processes that should be retained because of their value
- Store the experience in an appropriate form
- Ensure that the organizational memory is constantly updated

In this context, the Repository should consider the following functional requirements.

- Allow the Administrator to receive the knowledge reports entered by ONEMI entities for validation
- Provide IT support for tasks or activities that can be automated by applying information technology in the "Knowledge validation" process
- Provide IT support to the tasks or activities that can be automated by applying information technology of the process "Management of the functioning of the KMS"
- Assign the knowledge reports to the specific functions of the KMS that, in its expert judgment, should be processed by each of them
- Allow the Administrator to consult the computer applications, in order to access the knowledge already available in the Repository at the time of executing the management processes of the KMS operation

5.2.4.3.2. Estimation of the requirements of the "Knowledge Processing" Repository Function

The "Knowledge Processing" function of the Repository must provide support to the specific processes of Historical Memory, Lessons Learned, Human Resource Development, Research and Development and Network Development, in the execution of their activities that can be supported by information technology, whose main activities are diagrammed and described in the respective flow charts.

In this context, the Repository should consider the following functional requirements.

- Enable those responsible for each of the functions of the KMS to receive the knowledge reports assigned by the Administrator for the specific processing of each functional area
- Provide IT support for tasks or activities that can be automated by applying information technology in the "Historical Memory" process
- Provide IT support for tasks or activities that can be automated by applying information technology of the "Lessons Learned" process
- Provide IT support for the tasks or activities that can be automated by applying information

technology of the "Human Resources Development" process

- Provide IT support for tasks or activities that can be automated by applying information technology from the "Research and Development" process
- Provide IT support for tasks or activities that can be automated by applying information technology of the "Network Development" process
- Allow each of the process managers to enter the reports resulting from their specific processes into the repository
- Allow each of the process managers to consult the computer applications, in order to access the knowledge already available in the repository at the time of executing the management processes of the KMS operation

5.2.4.3.3. Estimation of the requirements of the "Knowledge Storage" Repository Function

The "Knowledge Storage" function is related to the development of computer applications and relational databases to gather and store the relevant information generated as a result of the execution of the processes of the main functions of the KMS.

The technical specifications, both for the computer applications and for the relational databases required, must be defined based on the functional specifications formulated for each of the main functions of the KMS.

5.2.4.3.4. Estimation of the requirements of the "Knowledge Output" Repository Function

The "Knowledge Output" function of the Repository must provide support to the following processes in the execution of their activities that can be supported by information technology.

- “Knowledge Availability" process
- “Knowledge Exhibition" process

This function is fundamental for the functioning of the KMS, since it makes available to stakeholders all types of knowledge available and stored in the computer applications of the Repository, making use of information and communication technologies (ICTs), as well as using the most appropriate exhibition channels in the case of objects or other elements.

In this context, the Repository should consider the following functional requirements.

- Provide IT support for tasks or activities that can be automated by applying information technology in the "Knowledge Exhibition" process
- Support informatically the tasks or activities susceptible to be automated by applying information technology of the "Knowledge Availability" process
- Allow each one of those responsible for the "Knowledge Exhibition" and "Knowledge Availability" processes to consult the computational applications, in order to access the knowledge already available in the Repository at the moment of executing their specific

processes

5.2.4.4. Description of the process "Control and maintenance of the KMS Repository"

The purpose of this stage is to regularly review and update the knowledge content stored in the Repository's functional databases, as changes or innovations occur, as well as to perform management control by generating statistics on the use of the knowledge made available to the stakeholders, in order to estimate the contributions of the system's knowledge management. The scheme is shown in Figure 2.5.2.37.

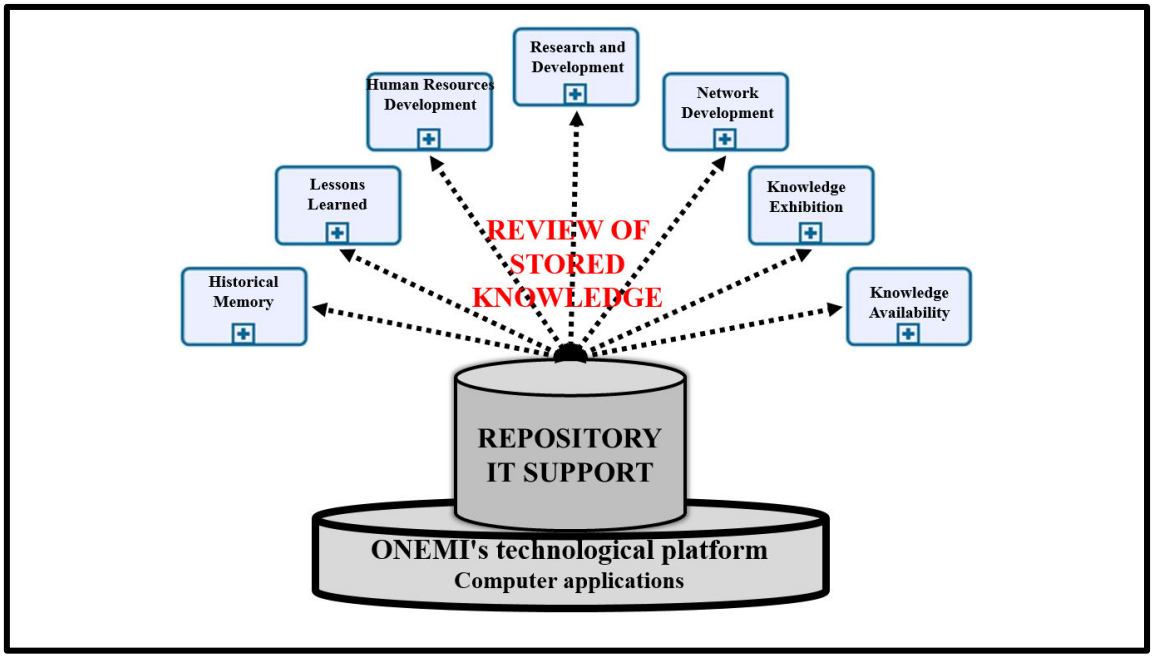


Figure 2.5.2.37 Diagram of the process "Control and maintenance of the KMS repository"

Those responsible for the main processes of the KMS (Historical Memory, Lessons Learned, Human Resource Development, Research and Development, Network Development, Knowledge Exhibition and Knowledge Availability) must periodically review the knowledge stored in the computer applications of their respective functional areas, in order to detect errors, obsolescence, need to complete information, make knowledge interrelationships or other modifications required to update the knowledge available to KMS users.

With this process of maintaining the knowledge previously captured, processed and stored, the reuse of knowledge by the stakeholders is achieved.

The role of ONEMI's KMS Administrator will be to formulate management indicators to measure the most significant aspects of the main objectives of the KMS.

The management indicators are a tool that helps to maintain a permanent evaluation of the results of

the processes. In addition, they make it possible to see the impact of the actions taken and to apply the necessary corrections.

5.3. Appendix "Application of the Historical Memory process"

5.3.1. The Historical Memory process

This process "Historical Memory", which is considered to apply to the 3 selected elements, is defined to keep a record of events related to DRR of the different types of disaster risks that occur at the national level.

The essential purpose of the "Historical Memory" process is to elaborate as a final product a Historical Memory Report (HMR) for the DRR, which must be entered into the KMS Repository in order to be available to KMS stakeholders.

This HMR is produced through a set of successive tasks, based on a Knowledge Report (KR) provided as input by the "Knowledge Validation" process. This input is prepared by ONEMI entities in their respective areas of action and validated by the KMS Administrator.

5.3.1.1. Approach to the "Historical Memory" process

The sequence of this process approach is depicted in Figure 2.5.3.1.

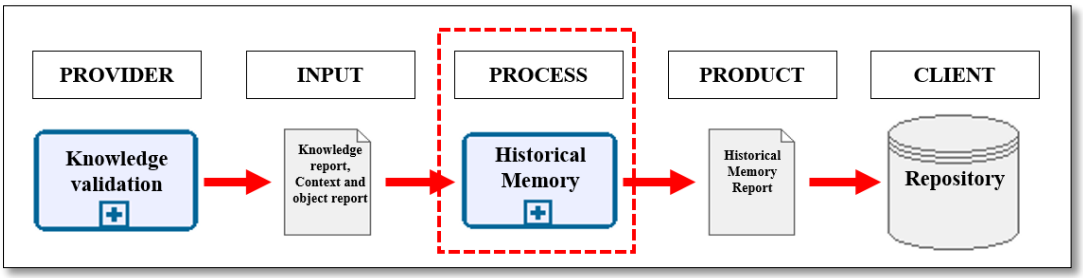


Figure 2.5.3.1 "Historical Memory" process approach

Figure 2.5.3.2 specifies the input, tasks and output of the Historical Memory process.

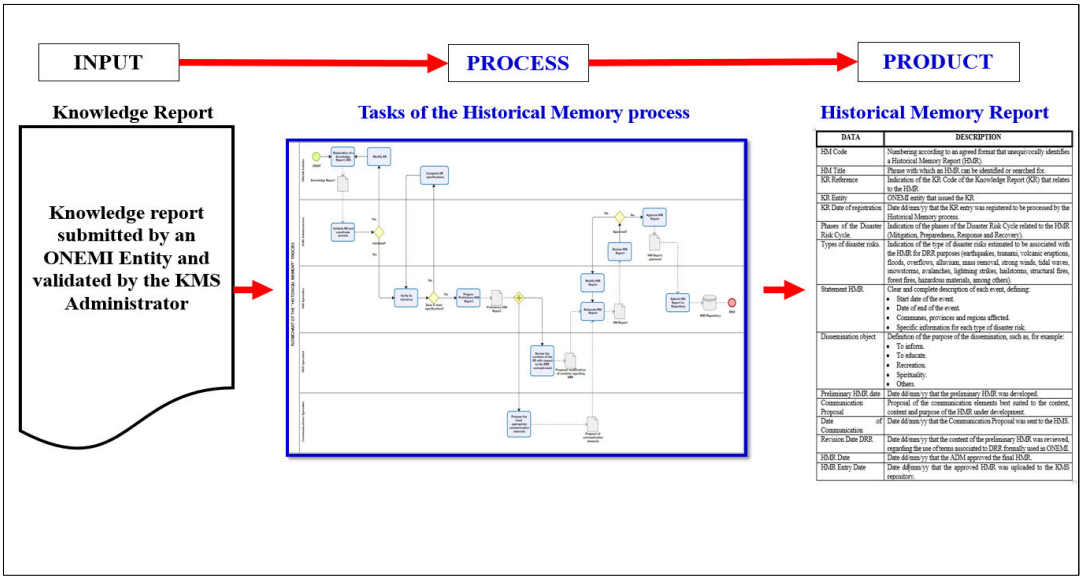


Figure 2.5.3.2 Input, tasks and output of the Historical Memory process

The following roles are involved in this "Historical Memory" process, which, in the design of the KMS, were proposed to be assigned to the ONEMI entities indicated in the following table.

ROLE	ROLE DESCRIPTION	ENTITY
KMS Administrator (ADM)	Specialist in knowledge management.	Knowledge Management Unit, created under the Civil Protection Division of the Risk Management Sub-Directorate.
Head of the ONEMI Entity (HENT)	Person from an ONEMI entity who is responsible for preparing Knowledge Reports, Context Reports and interacting with the KMS regarding the format of the reports and their content.	Entities of ONEMI's superior structure.
Historical Memory Specialist (HMS)	Person who has the skills to prepare Historical Memory Reports (HMR) and who is responsible for processing the HMR, from the verification of its relevance to its entry into the Repository.	Knowledge Management Unit, created under the Civil Protection Division of the Risk Management Sub-Directorate.
Disaster Risk Reduction Specialist (DRRS)	Person with DRR competencies and who is responsible for reviewing the content of the Knowledge reports and context	Knowledge Management Unit, created under the Civil Protection Division of the

	reports, regarding the DRR concepts used in ONEMI.	Risk Management Sub-Directorate.
Communications Specialist (COMMSS)	Person with competencies in communications strategies and techniques.	Communications Unit of the Cabinet's Communications and Broadcasting Department.

5.3.1.2. Flowchart of the "Historical Memory" process

The tasks performed by the "Historical Memory" process are represented in the flowchart in Figure 2.5.3.3.

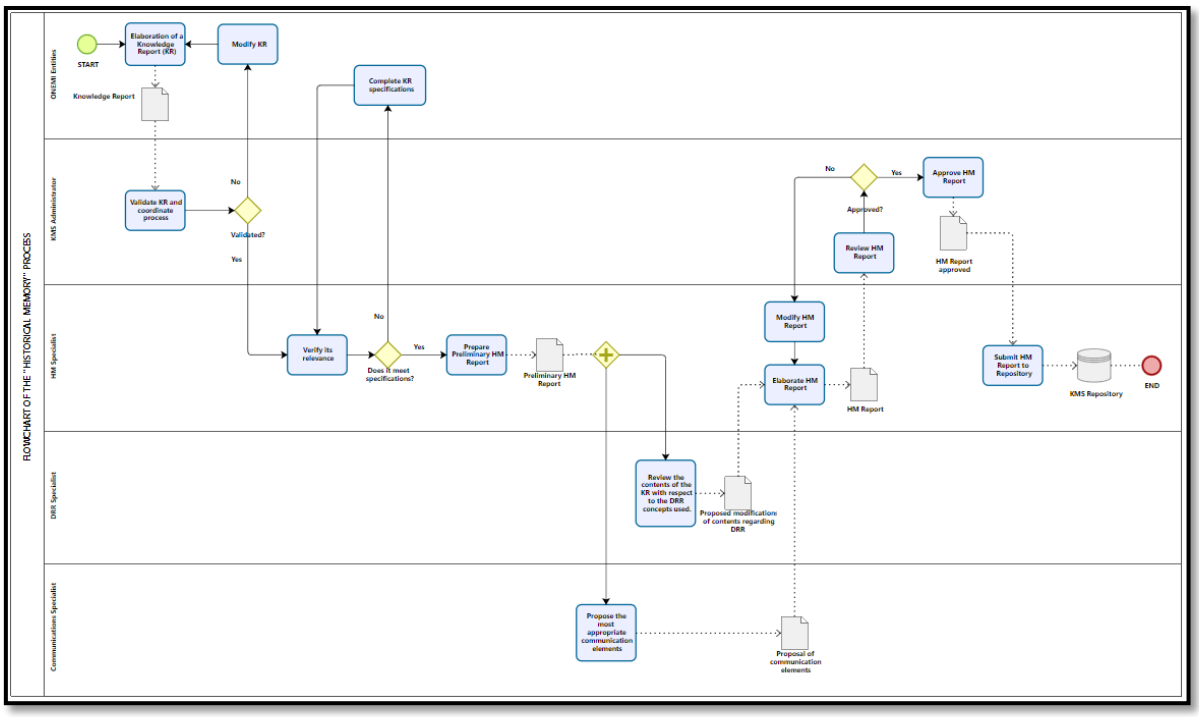


Figure 2.5.3.3 Flowchart of the "Historical Memory" process

5.3.1.3. Description of the "Historical Memory" process

The "Historical Memory" process is executed according to the following sequence of tasks.

- The process starts when an ONEMI entity prepares a Knowledge Report (KR), complying with the requirements defined by the ADM, and sends it to the ADM through the HENT.
- The ADM verifies that the KR qualifies to be managed by the KMS and that, in addition, it needs to be processed by the Historical Memory process. The ADM, within its

functions, must define and keep updated the requirements that both the Knowledge Reports issued by ONEMI entities and the specifications of the main functions (Historical Memory, Lessons Learned, Human Resource Development, Research and Development and Network Development) must meet in order to be managed by the KMS. Both the entities in their respective areas of action and the specialists of the main functions of the KMS must participate in the development of these requirements. All of the above is coordinated by the ADM. Likewise, the ADM must train those responsible for preparing the entities' KRs on the interpretation and application of the requirements.

- If the KR is not validated, the ADM returns it to the entity to be modified.
- The HENT makes the modifications and forwards the KR to the ADM.
- If the KR is validated and requires processing as a historical memory, the ADM forwards it to the HMS for processing.
- The HMS verifies that the Knowledge Report received qualifies as a historical memory and has the necessary background to record the event, such as:
    - Be associated with official documents regarding DRM (Disaster Risk Management Tool or Event Status Report)
    - Identify the types of disasters that occurred, sorted by date
    - Describe the historical moment that society is living in the identified disaster, with respect to its forms of relationship with the social environment, with its forms of understanding nature and humanity, with its development models and with its particular forms of management and protection of its inhabitants
    - Gather information and elements that are available at ONEMI, related to the corresponding KR
    - Organize the above in such a way that they can be stored and analyzed in order to define the means of dissemination for each topic. At this point, the purpose of such dissemination is established, considering, for example, the following:
        - Inform: Simple and low-budget format. Massive message
        - Educate: Interactive exhibition format, using multimedia material
        - Recreation: Monuments that are linked to the city through tourism, in order to entertain and recreate the community, both local and visitors. Provide dynamic spaces for social interaction, commercial activity in the city, among others
        - Spirituality: Provide spaces for prayer and reflection that allow the spontaneous manifestation of visitors. It should directly evoke the disaster, using ruins or significant remains of the losses.
    - Define a system for incorporating new information on each event as it arises over time

- If the HMS concludes that the KR does not contain the main specifications to be processed, it requests the entity responsible for the KR to complete the background information that will allow it to form a Historical Memory Report that is useful for the DRR.
- The HENT completes the main specifications and forwards it to the ADM.
- If the HMS concludes that the KR meets the main specifications, it prepares a preliminary Historical Memory Report (HMR), using the Form in point 5.3.1.4 of this document.
- The HMS sends the preliminary HMR to the COMMSS to propose the most appropriate communication elements for the context and content of the Historical Memory report under development, such as, for example, dissemination instrument, recipient, message, communication channel, among others. The COMMSS prepares a proposal of communication elements and sends it to the HMS to be considered in the elaboration of the final Historical Memory Report.
- In parallel, the HMS sends the preliminary Historical Memory Report to the DRRS to review the coherence of the contents of the report with respect to the DRR concepts used in ONEMI. The DRRS prepares a proposal with the modifications identified and forwards it to the HMS to be considered in the preparation of the final Historical Memory Report.
- The HMS prepares an HMR proposal, taking into consideration the Preliminary Report, the proposal of communication elements and the proposal with the modifications regarding DRR concepts and forwards it to the ADM for review.
- If not approved, the ADM returns it to the HMR for modification according to guidance he/she deems appropriate.
- The HMS makes the modifications according to the ADM's guidelines and forwards the HMR to the ADM.
- If approved, the ADM returns the HMR to the HMS to be formalized and entered into the KMS Repository.
- The HMS enters the HMR into the KMS Repository to be made available to KMS Stakeholders.
- End of the process.

5.3.1.4. Historical Memory Report Form

The following form will be used to prepare the Historical Memory Report.

DATA	DESCRIPTION
HM Code	Numbering according to an agreed format that unequivocally identifies a Historical Memory Report (HMR).
HM Title	Phrase with which an HMR can be identified or searched for.
KR Reference	Indication of the KR Code of the Knowledge Report (KR) that relates to the HMR
KR Entity	ONEMI entity that issued the KR
KR Date of registration	Date DD / MM / YY that the KR entry was registered to be processed by the Historical Memory process.
Phases of the Disaster Risk Cycle.	Indication of the phases of the Disaster Risk Cycle related to the HMR (Mitigation, Preparedness, Response and Recovery).
Types of disaster risks.	Indication of the type of disaster risks estimated to be associated with the HMR for DRR purposes (earthquakes, tsunami, volcanic eruptions, floods, overflows, alluvium, mass removal, strong winds, tidal waves, snowstorms, avalanches, lightning strikes, hailstorms, structural fires, forest fires, hazardous materials, among others).
Statement HMR	Clear and complete description of each event, defining: • Start date of the event. • Date of end of the event. • Communes, provinces and regions affected. • Specific information for each type of disaster risk.
Dissemination object	Definition of the purpose of the dissemination, such as, for example: • To inform. • To educate. • Recreation. • Spirituality. • Others.
Communication type	Communication elements most appropriate to the context, content and object of dissemination of the HMR in progress
HMR Date	Date DD / MM / YY that the ADM approved the final HMR.
HMR Entry Date	Date DD / MM / YY that the approved HMR was uploaded to the KMS repository.

5.3.2. Application of the Historical Memory process

The application of the Historical Memory process to the selected event will be carried out in two successive stages according to the following detail, as shown in Figure 2.5.3.4:

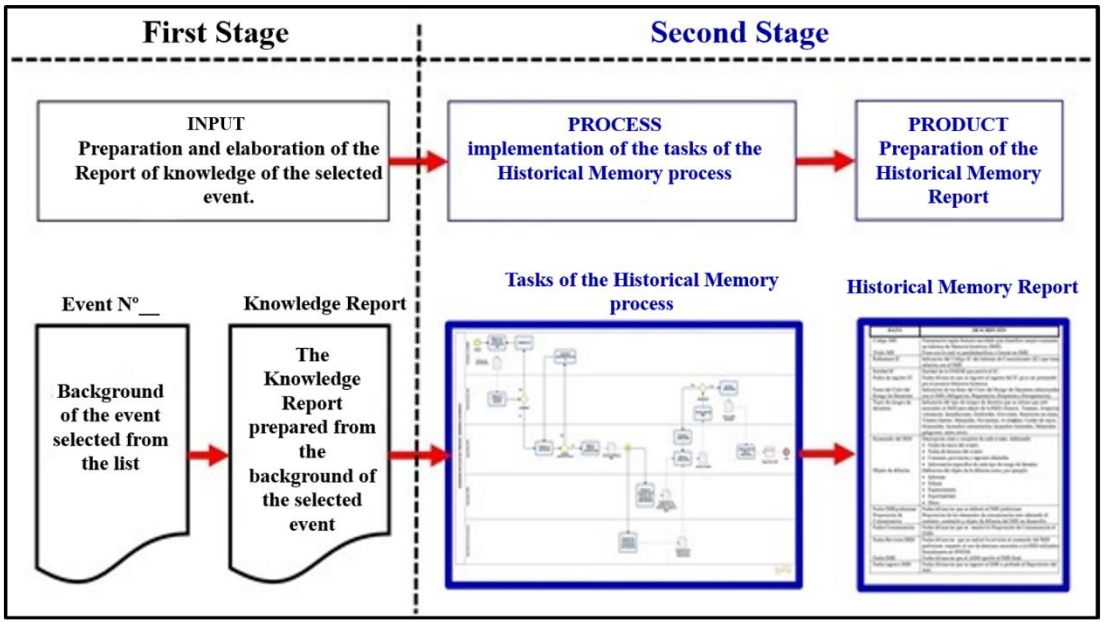


Figure 2.5.3.4 Stages of the application of the Historical Memory process to the selected event

- First stage: Preparation of the input

This stage corresponds to the preparation of the main input of the "Historical Memory" process, specifically to the preparation of the "Knowledge Report" of the selected event.

This Knowledge Report is a document that should be prepared by the person responsible for the ONEMI entity (HENT) and forwarded to the KMS for processing, in the format and according to the requirements defined by the KMS Administrator, as established in the System design. In addition, the Administrator must validate that the Report complies with these requirements and must forward it to the Historical Memory process for its specific processing to that function.

Considering that the requirements of the Report have not been defined in the design of the KMS and for the purpose of this work, both the format and the content of the Knowledge Report of the event will be prepared by the Consultancy, based on the background provided by the selected event and completing the missing background by means of fictitious data.

With the preparation of this document, the System ensures that the KMS receives "useful knowledge for DRR" processed by an ONEMI entity, based on data or information from an event that has occurred. In the same way, the system ensures that the Historical Memory process receives as main input a Knowledge Report validated by the KMS Administrator.

- Second stage: Application of the "Historical Memory" process

In this stage, the main tasks of the "Historical Memory" process described in point 2.3 of this document

are applied, according to the following detail:

- Record the entry of the Knowledge Report into the "Historical Memory" process
- Verify that the Knowledge Report received qualifies as a historical memory and that it has the necessary background information to process the event. Likewise, the missing background information must be completed with fictitious data, in coherence with the existing data in the Knowledge Report received.
- Prepare the preliminary Historical Memory Report (HMR)
- Send the Preliminary Historical Memory Report to the COMMSS to propose the most appropriate communication elements for the context and content of the Historical Memory report under development and to the DRRS to review the coherence of the contents of the report with respect to the DRR concepts used in ONEMI
- Prepare an HMR proposal, taking into consideration the Preliminary Report, the proposal of communication elements, and the proposal with the modifications regarding DRR concepts, and send it to the ADM for review
- Review the HMR proposal by the ADM
- Prepare the final Historical Memory Report
- Approve the final Historical Memory Report

5.3.2.1. Application of the Historical Memory process to element N ° 1

- For the purpose of this work, the following first element was selected: Number: 1, mentioned for this work as "Statistical Report 2018".Reference: The item is referenced to the document called **"ONEMI Annual Statistical Report 2018, Period from January 1 to December 31, 2018, ONEMI Institutional Statistical System"**, which is available in the ONEMI Repository.
- Type of material: Institutional report that has been published in the ONEMI digital repository since August 30, 2019.
- Entity responsible for the document: Analysis, Studies and Climate Change Unit of the Civil Protection Division of ONEMI.

5.3.2.1.1. First stage: Preparation of the KR-1 Knowledge Report

This first stage consists of preparing and validating the main input of the Historical Memory process which, for the purpose of this work, we will call the "KR-1 Knowledge Report".

This document should be prepared by the responsible person (HENT) of the Analysis, Studies and

Climate Change Unit of the Civil Protection Division of ONEMI, based on the reference document called " **ONEMI Annual Statistical Report 2018, Period from January 1 to December 31, 2018, ONEMI Institutional Statistical System**.", as shown in Figure 2.5.3.5:

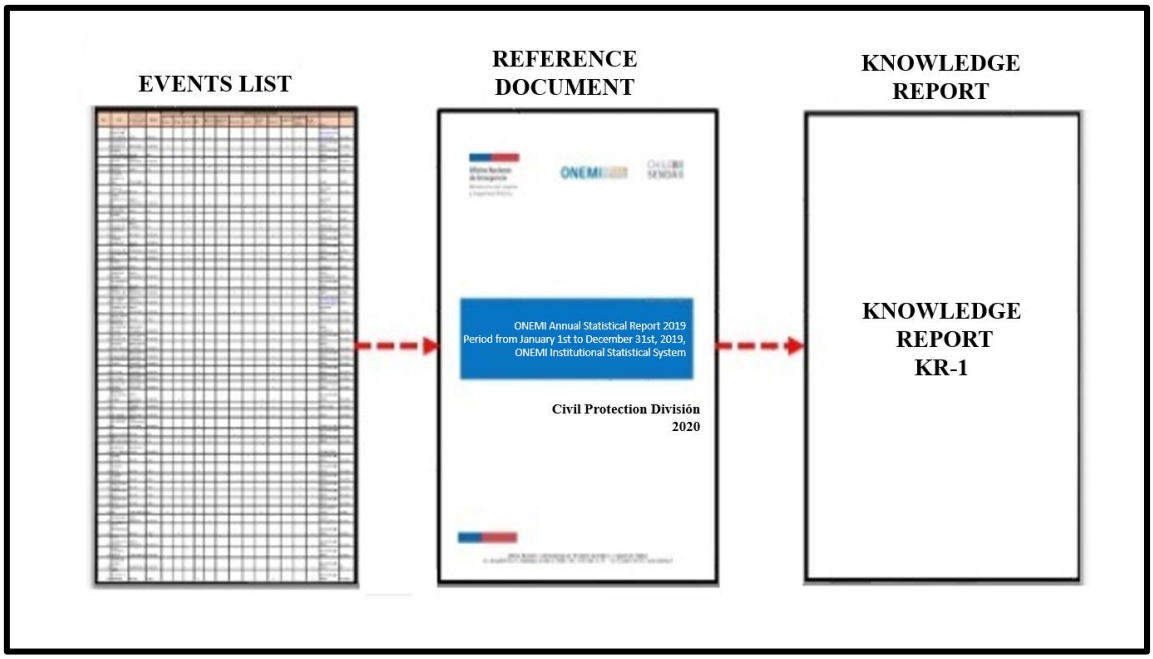


Figure 2.5.3.5 Preparation of the KR-1 Knowledge Report

Likewise, the KMS Administrator shall ensure that the Knowledge Report complies with the defined requirements, validate it and forward it to the Historical Memory process.
For the purpose of this work, the following format shall be used for the Knowledge Report, considering the data of the reference document and completed with fictitious data when necessary.

KNOWLEDGE REPORT			
REF: Data extracted from the reference document FD: Factual datum		**REF**	**FD**
KR Code	KR-1		x
Responsible entity	Analysis, Studies and Climate Change Unit of ONEMI's Civil Protection Division.	x	
Date of elaboration	April 19, 2021		x
KR object	Submits for processing by the KMS the "ONEMI Annual Statistical Report 2018, Period from January 1 to December 31, 2018, ONEMI Institutional Statistical System", dated August 30,	x	

	2019. This document is an annual statistical report that describes and graphs the consolidated information for the period from January 1st to December 31st, 2018, of the activities, programs, courses, multisectoral instances and managements carried out by ONEMI, through its 16 Regional Offices and the competent areas of the central level, as well as the emergencies that occurred and the impacts generated to people and homes during this period. The record of events with implications on people, their property or the environment at different territorial levels will allow determining temporal and spatial trends of impact and recurrence, in order to project prevention and mitigation actions with the objective of minimizing the potential effects of the events that affect our territory. In this way, the data becomes an essential tool for the definition of public policies related to DRM and Civil Protection.		
Subject	Civil Protection, Emergencies, Disasters, Prevention, Preparedness, Statistics and Disaster Risk Management.	x	
Date entered into the KMS	April 21, 2021		x
Date validated by ADM	April 23, 2021		x
Date entered into the Historical Memory process	April 23, 2021		x

5.3.2.1.2. Second stage: Application of the "Historical Memory" process to the KR-1 Knowledge Report

In this second stage, the main tasks of the "Historical Memory" process procedure are applied until the Historical Memory Report is ready to be entered into the KMS Repository, as shown in Figure 2.5.3.6:

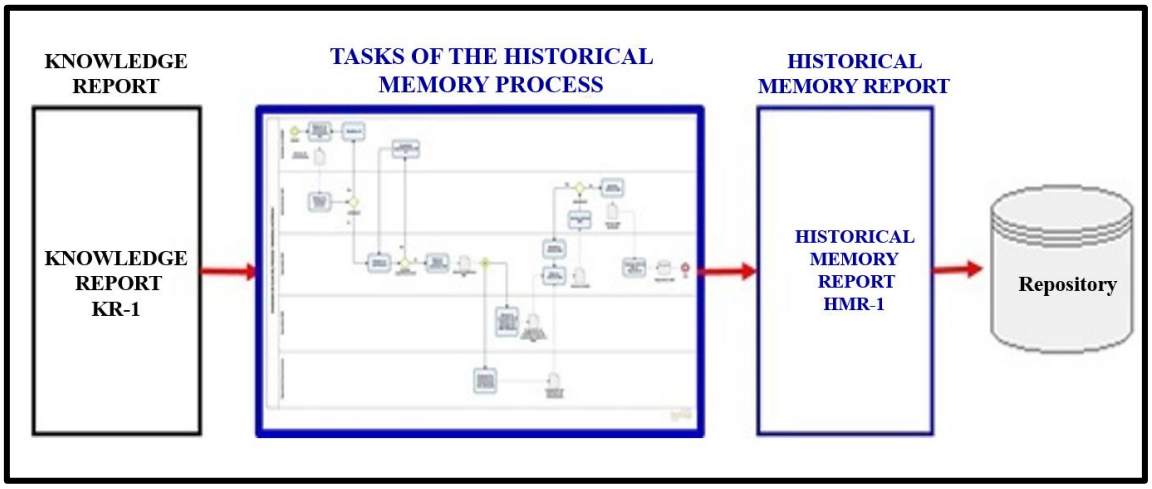


Figure 2.5.3.6 Application of the tasks of the "Historical Memory" process

Once the KR-1 Knowledge Report is received, the Historical Memory Specialist (HMS) of the Knowledge Management Unit shall execute the following tasks of the process:

- Verify that the KR-1 Knowledge Report qualifies as a historical memory and that it has the necessary background to process the event
- Prepare the preliminary Historical Memory Report (HMR)
- Forward the preliminary Historical Memory Report, both to the Communications Specialist of the Communications Unit of the Communications and Dissemination Department of the Cabinet to propose the most appropriate communication elements to the context and content of the HMR under development and to the Disaster Risk Reduction Specialist of the Knowledge Management Unit to review the consistency of the contents of the report with respect to the DRR concepts used in ONEMI

With the background information provided by the Communications Specialist and the Disaster Risk Reduction Specialist, the HMS prepares a proposal for the Historical Memory Report, according to the following table, and forwards it to the ADM for review.

After reviewing the HMR proposal and making any required modifications, the KMS Administrator approves the Historical Memory Report and forwards it to the Historical Memory Specialist to be entered into the KMS Repository.

Finally, the Historical Memory Specialist enters the Historical Memory Report HMR-1 into the KMS Repository, making it available to KMS users or stakeholders.

HISTORICAL MEMORY REPORT			
REF: Data extracted from the reference document FD: Factual datum		**REF**	**DF**
HM Code	HMR-1		x
HM Title	ONEMI Annual Statistical Report 2018.	x	
KR Reference	KR-1		x
KR Entity	Analysis, Studies and Climate Change Unit of ONEMI's Civil Protection Division.	x	
KR Record Date	April 23, 2021		x
Phases of the Disaster Risk Cycle	Mitigation, Preparedness.	x	
Subjects	Civil protection, Emergencies, Disasters, Prevention, Preparedness, Statistics, Disaster Risk Management.	x	
Types of disaster risks.	Earthquakes, Tsunami, Volcanic eruptions, Floods, Overflows, Landslides, High winds, Storm surges, Snowstorms, Avalanches, Lightning strikes, Hailstorms, Structural fires, Forest fires, Hazardous materials.	x	
HMR Statement	"ONEMI Annual Statistical Report 2018, Period from January 1st to December 31st, 2018, ONEMI Institutional Statistical System", dated August 30, 2019. This document is an annual statistical report that describes and graphs the consolidated information for the period from January 1st to December 31st, 2018, of the activities, programs, courses, multisectoral instances and managements carried out by ONEMI, through its 16 Regional Offices and the competent areas of the central level, as well as the emergencies that occurred and the impacts generated to people and homes during this period. The DRM, in addition to including statistics on events and impacts on people, property and the environment, incorporates variables associated with prevention, mitigation and preparedness aimed at reducing disaster risk. For this reason, since 2016 the areas of the Central level, which are providers of statistical information on DRM within ONEMI are part of the Institutional Statistical System. The work carried out before the occurrence of an event, in the	x	

	prevention phase of the Risk Management Cycle, such as activities aimed at training, preparing and coaching members of the national civil protection system, including the population, are fundamental within Disaster Risk Management (DRM), since they increase the knowledge and capacities of the communities, based on the set of activities developed to reduce the impact of events, both natural and anthropogenic, and strengthen the capacities of the communities. The recording of events with implications for people, their property or the environment at different territorial levels will make it possible to determine temporal and spatial trends of impact and recurrence, in order to plan prevention and mitigation actions with the aim of minimizing the potential effects of the events that affect our territory. In this way, the data becomes an essential tool for the definition of public policies related to DRM and Civil Protection. This document considers the following topics: • Prevention statistics o Civil protection academy o Micro-zoning of risks and resources (community participation) o Comprehensive School Safety Plan o Drills and simulations o Community Response Teams Program o National platform for Disaster Risk Reduction o Technical boards o Emergency operations committees o Underlying risk factors o Plan management o Dissemination and institutional communication • National impact statistics • Statistics on the management and administration of emergency resources • National alert system statistics • Statistics of impacts by events at the regional level • Major emergencies in 2018		

	• Analysis and evaluation of ONEMI's disaster risk management.		
Object of dissemination	• Inform • Educate		x
Type of communication	The "ONEMI Annual Statistical Report 2018, Period from January 1st to December 31st, 2018, ONEMI Institutional Statistical System," dated August 30, 2019, will be made available to KMS stakeholders as a digitized document.		x
Date HMR	April 30, 2021		x
Date of entry HMR	April 30, 2021		x

5.3.2.2. Application of the Historical Memory process to element N ° 2

For the purpose of this work, the following second element was selected.

- Number: 2, referred to as "Tsunami 2010. Iloca, Maule Region"
- Reference: Item 2 is referenced to the Archive of the Municipality of Licantén. However, and as a basic assumption to complete the background, the Wikipedia document "**Annex: Tsunami of the 2010 Chilean earthquake**", which is available on the Internet, was considered as a reference

  In addition, interviews with two people were added to the reference, where they shared their experiences during the tsunami in the Iloca area, Maule Region, on February 27, 2010.

  Also, a video was added with amateur recordings captured during the destructive phenomenon, where you can see the shocking images of the tsunami of the 2010 Chile earthquake in different affected locations.

  - Type of material: Digital material available on the Internet
  - Entity responsible for preparing the document: For the purposes of this work, the Advisory assumes responsibility for the Civil Protection Division of ONEMI.

5.3.2.2.1. First stage: Preparation of the KR-2 Knowledge Report

This first stage consists of preparing and validating the main input of the Historical Memory process which, for the purpose of this work, we will call the "KR-2 Knowledge Report".

This document should be prepared by the responsible person (HENT) of the Civil Protection Division of ONEMI, based on the information received from external organizations (municipalities in the area, people and organizations) which, for the purpose of this work, will be the Municipality of Licantén, considering the information available in its archives and also the information available on the Internet related to the selected event, as shown in Figure 2.5.3.7.

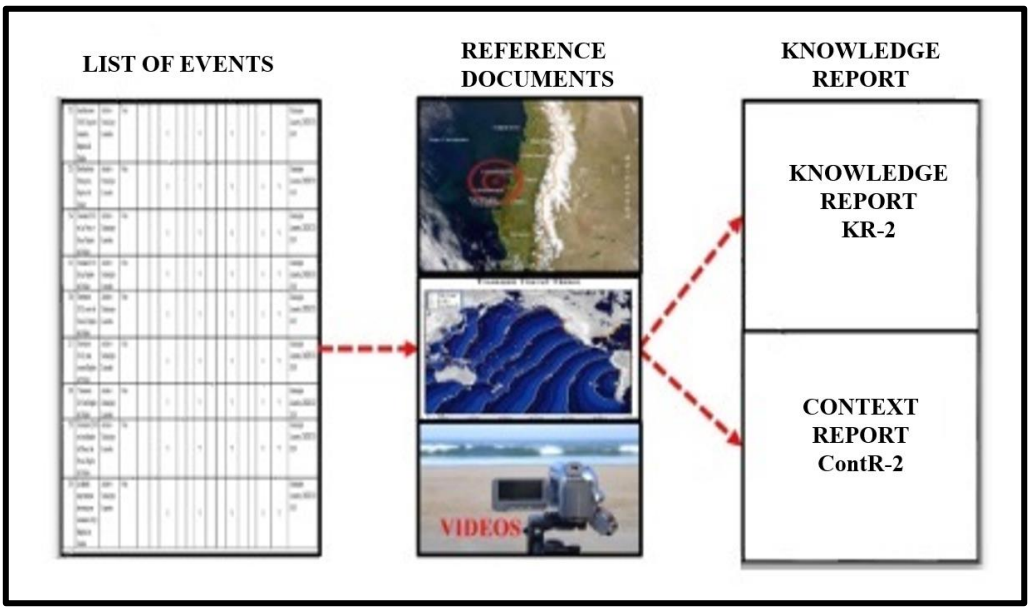


Figure 2.5.3.7 Elaboration of the KR-2 Knowledge Report

Likewise, the KMS Administrator must ensure that the Knowledge Report complies with the defined requirements, validate it and forward it to the Historical Memory process.

For the case of element 2, two videos of interviews conducted with people who participated in the event were added as a reference, therefore, the corresponding context report should be considered.

For the purpose of this work, the following formats will be used for the Knowledge Report and the corresponding Context Report, considering the data from the reference documents and completed with fictitious data when necessary.

KNOWLEDGE REPORT			
REF: Data extracted from the reference document FD: Fictional datum		**REF**	**DF**
KR Code	KR-2		x
Responsible entity	ONEMI Civil Protection Division.		x
Date of elaboration	May 19, 2021		x
KR object	The information related to the Tsunami of the Chilean earthquake of 2010, which occurred in the town of Iloca, Maule Region, is sent to be processed by the KMS. According to the above, the Advisory assumed that the Municipality of Licantén		x

	sent to the Civil Protection Division of ONEMI the information related to the Tsunami that affected the area of Iloca, which, for the purpose of this work, will be extracted from the following link: https://es.wikipedia.org/wiki/Anexo:Tsunami_del_terremoto_de_Chile_de_2010 In addition, the Advisory assumed as a basic assumption that for the purposes of this work, the Municipality of Licantén added as background information in its files, the videos with the interviews conducted with Ms. Erica Vilches and Ms. Pía Riquelme, which are available in the following Link: https://repositoriodigital.onemi.gov.cl/handle/123456789/4174 https://repositoriodigital.onemi.gov.cl/handle/123456789/4175		
Subject	Disasters, Earthquake, Tsunami.	x	
Date entered into the KMS	May 21, 2021		x
Date validated by ADM	May 23, 2021		x
Date entered into the Historical Memory process	May 23, 2021		x

CONTEXT REPORT			
REF: Data extracted from the reference document FD: Fictional datum		**REF**	**DF**
ContR Code	ContR-2		x
KR Reference	KR-2		x
Responsible entity	ONEMI Civil Protection Division.		x
Date of elaboration	May 19, 2021		x
ContR Object	The Municipality of Licantén added as background information that it had in its files, the videos with the interviews with Mrs. Erica Vilches and Mrs. Pía Riquelme, in which they relate their experiences during the earthquake and subsequent tsunami that occurred on February 27, 2021, in the town of Iloca.		x

	https://repositoriodigital.onemi.gov.cl/handle/123456789/4174 https://repositoriodigital.onemi.gov.cl/handle/123456789/4175 In addition, a video was added with amateur recordings captured during the destructive phenomenon, where you can see the shocking images of the 2010 Chile earthquake tsunami in different affected locations. https://youtu.be/N_9LxTnq0es		
Materia	Disasters, Earthquake, Tsunami.	x	
KMS entry date	May 21, 2021		x
ADM validation date	May 23, 2021		x
Date of entry into the Historical memory process	May 23, 2021		x

5.3.2.2.2. Second stage: Application of the "Historical Memory" process to the KR-2 Knowledge Report

In this second stage, the main tasks of the "Historical Memory" process procedure are applied until the Historical Memory Report is ready to be entered into the KMS Repository, as shown in Figure 2.5.3.8.

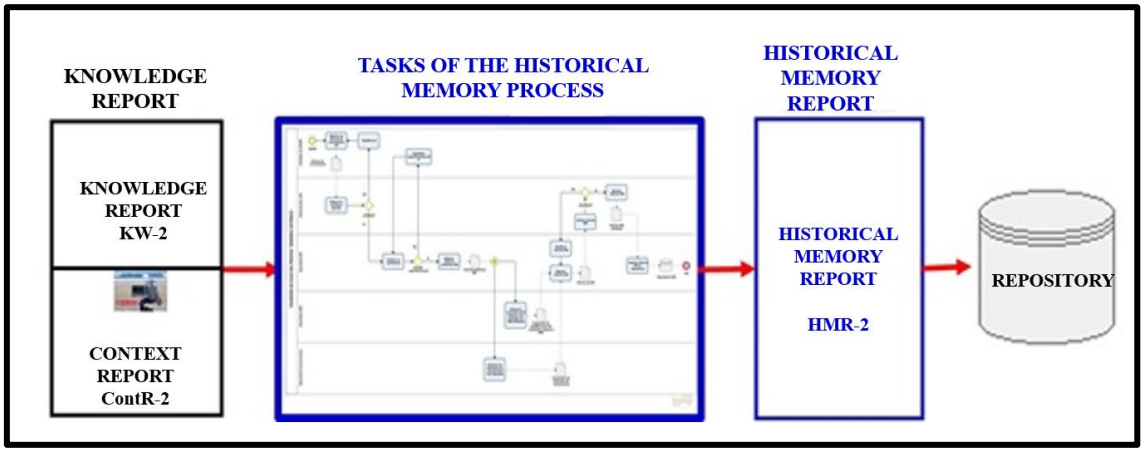


Figure 2.5.3.8 Application of the tasks of the "Historical Memory" process to the KR-2 Knowledge Report and the ContR-2 Context Report

Once the KR-2 Knowledge Report and the ContR-2 Context Report have been received, the Historical

Memory Specialist (HMS) of the Knowledge Management Unit shall execute the following tasks of the process.

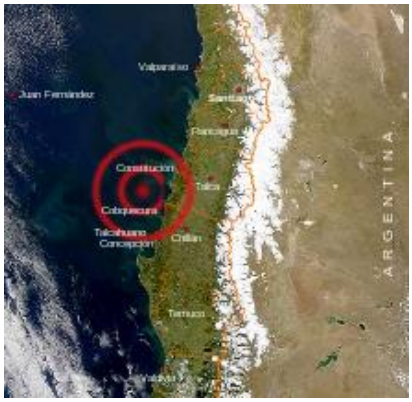
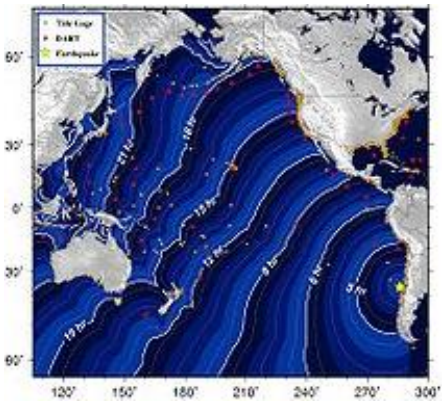
- Verify that the KR-2 Knowledge Report qualifies as a historical memory and has the necessary background to process the event
- Prepare the preliminary Historical Memory Report (HMR)
- Forward the preliminary Historical Memory Report, both to the Communications Specialist of the Communications Unit of the Communications and Dissemination Department of the Cabinet to propose the most appropriate communication elements to the context and content of the HMR under development and to the Disaster Risk Reduction Specialist of the Knowledge Management Unit to review the consistency of the contents of the report with respect to the DRR concepts used in ONEMI

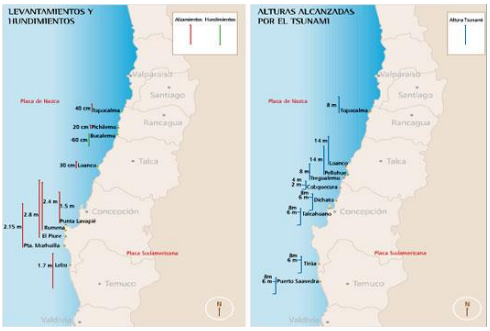
With the background information provided by the Communications Specialist and the Disaster Risk Reduction Specialist, the HMS prepares a proposal for the Historical Memory Report, according to the following table, and forwards it to the ADM for review.

Once the HMR proposal has been reviewed and any required modifications have been made, the Historical Memory Report is approved by the KMS Administrator and forwarded to the Historical Memory Specialist to be entered into the KMS Repository.

Finally, the Historical Memory Specialist enters the Historical Memory Report HMR-2 into the KMS Repository, making it available to KMS users or stakeholders.

HISTORICAL MEMORY REPORT			
REF: Data extracted from the reference document FD: Fictional datum		**REF**	**DF**
Code HM	HMR-2		x
Title HM	Tsunami of the 2010 Chile earthquake, affecting the town of Iloca, Maule Region.	x	
Reference KR	KR-2		x
KR Entity	Civil Protection Division of ONEMI.		x
Date of registration KR	May 23, 2021		x
Phases of the Disaster Risk Cycle	Mitigation, Preparedness, Response and Recovery.	x	
Subjects	Disasters, earthquake, tsunami.	x	
Types of	Earthquake, Tsunami.	x	

disaster risks.			
HMR Statement	The Chilean earthquake of 2010 was a strong earthquake that occurred at 3:34:17 local time (UTC-3) on February 27, 2010, reaching a magnitude of 8.8 - 9.0 MW according to the U.S. Geological Survey. The epicenter was located on the coast in front of the town of Cobquecura, approximately 150 kilometers northwest of Concepción and 63 kilometers southwest of Cauquenes, at a depth of 47.4 kilometers below the earth's crust. The earthquake, which lasted about ninety seconds, mainly affected the Chilean regions of Valparaíso, Metropolitan Santiago, O'Higgins, Maule, Biobío, La Araucanía and Los Ríos. Nearly 500 thousand homes were severely damaged and an estimated 2 million people were affected, in the worst natural tragedy experienced in Chile since 1960.   A strong tsunami hit the Chilean coast as a result of the earthquake, destroying several towns already devastated by the impact of the earthquake. The Juan Fernandez archipelago, despite not feeling the earthquake, was impacted by the tidal waves that devastated its only town, San Juan Bautista, on Robinson Crusoe Island. The tsunami warning generated for the Pacific Ocean was subsequently extended to 53 countries located throughout most of its basin, reaching Peru, Ecuador, Colombia, Panama, Costa Rica, Antarctica, New Zealand, French Polynesia and the coasts of Hawaii.	x	

	 The geographic traces of the cataclysm and tsunami  The Municipality of Licantén added as background information that it had in its files, the videos with the interviews made to Mrs. Erica Vilches and Mrs. Pía Riquelme, in which they relate their experiences suffered during the earthquake and subsequent tsunami which occurred on February 27, 2021, in the town of Iloca, which are available in the following links: https://repositoriodigital.onemi.gov.cl/handle/123456789/4174 https://repositoriodigital.onemi.gov.cl/handle/123456789/4175 In addition, the following video was added with amateur recordings captured during the destructive phenomenon, where you can see the shocking images of the 2010 Chile earthquake tsunami in different affected locations: https://youtu.be/N_9LxTnq0es		
Object of dissemination	• Inform • Educate • Spirituality		x
Type of	The videos of the interviews with Erica Vilches and Pía Riquelme, as well as the		x

communication	video of the amateurs captured during the destructive phenomenon, will be made available to stakeholders through the corresponding links.		
Date HMR	May 31, 2021		x
Date of entry HMR	May 31, 2021		x

5.3.2.3. Application of the Historical Memory process to element N ° 3

For the purposes of this work, the following third element was selected.

- Number: 3, mentioned as "**Flood in Macul Ravine- RM**"
- Reference: Item 3 is referenced in a press video, produced by the Teletrece news program in May 1993, which is available on the Internet. However, and as a basic assumption to complete the background, the Wikipedia document "**Flood in Macul Ravine** ", which is available on the Internet, was also considered as a reference
- Type of material: Digital material available on the Internet
- Entity responsible for preparing the document: For the purposes of this work, the Advisory Office assumes as responsible the Civil Protection Division of ONEMI

5.3.2.3.1. First Stage: Preparation of the KR-3 Knowledge Report

This first stage consists of preparing and validating the main input of the Historical Memory process which, for the purpose of this work, we will call the "KR-3 Knowledge Report".

This document should be prepared by the person in charge (HENT) of ONEMI's Civil Protection Division, based on the information received from external organizations (municipalities in the area, individuals and organizations) which, for the purpose of this work, will be the Chilean open television channel **Canal 13**, considering the information in its archives and also the information available on the Internet related to the selected event, as shown in Figure 2.5.3.9.

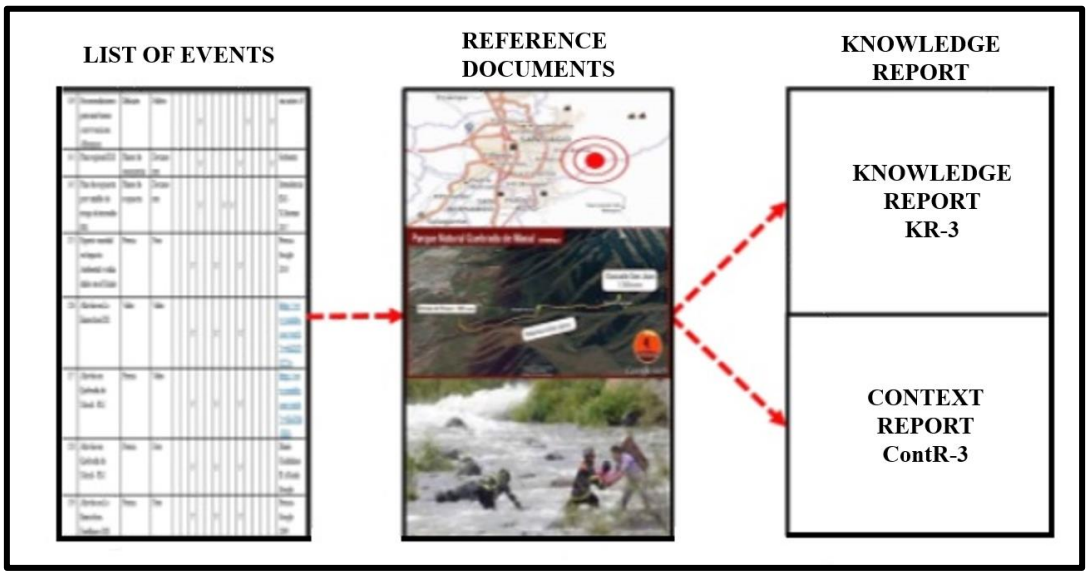


Figure 2.5.3.9 Elaboration of the KR-3 Knowledge Report

Likewise, the KMS Administrator must ensure that the Knowledge Report complies with the defined requirements, validate it and forward it to the Historical Memory process.

In the case of this element 3, the press video produced by the Teletrece news program in May 1993 was added as a reference, therefore, the corresponding Context Report must be considered.

For the purpose of this work, the following formats will be used for the Knowledge Report and for the corresponding Context Report, considering the data of the reference documents and completed with fictitious data when necessary.

KNOWLEDGE REPORT			
REF: Data extracted from the reference document FD: Fictional datum		**REF**	**DF**
KR Code	KR-3		x
Responsible entity	ONEMI Civil Protection Division.		x
Date of elaboration	May 19, 2021		x
KR object	It refers for processing by the KMS the information related to the flood that occurred in the Macul Ravine, city of Santiago, Metropolitan Region. According to the above, the Advisory assumed that the Chilean open television channel **Canal 13** sent to the Civil Protection Division of ONEMI the background information on		x

	the flood that affected the Macul Ravine, which, for the purpose of this work, will be extracted from the following link: https://es.wikipedia.org/wiki/Aluvi%C3%B3n_de_la_Quebrada_de_Macul In addition, the Advisory assumed as a basic assumption that for the purposes of this work, Canal 13 added as background information in its files, the press video "Flood of the Macul Ravine", produced by the news program Teletrece in May 1993, which is available at the following link: https://www.youtube.com/watch?v=ZmJMh-SIkJs		
Subject	Disaster, alluvium, flood.	x	
Date entered into the KMS	May 21, 2021		x
Date validated by ADM	May 23, 2021		x
Date entered into the Historical Memory process	May 23, 2021		x

CONTEXT REPORT			
REF: Data extracted from the reference document FD: Fictional datum		**REF**	**DF**
ContR Code	ContR-3		x
KR Reference	KR-3		x
Responsible entity	ONEMI Civil Protection Division.		x
Date of elaboration	May 19, 2021		x
ContR object	Channel 13 added as background information that it had in its archives, the press video "Flood of the Macul Ravine", produced by the Teletrece news program in May 1993, which shows as a digital graphic record the force of the flood and the consequences in the affected areas. https://www.youtube.com/watch?v=ZmJMh-SIkJs		x

Subject	Disasters, alluvium, flood.	x	
Date entered into the KMS	May 21, 2021		x
Date validated by ADM	May 23, 2021		x
Date entered into the Historical Memory process	May 23, 2021		x

5.3.2.3.2. Second stage: Application of the "Historical Memory" process to the KR-3 Knowledge Report

In this second stage, the main tasks of the "Historical Memory" process procedure are applied until the Historical Memory Report is ready to be entered into the KMS Repository, as shown in Figure 2.5.3.10.

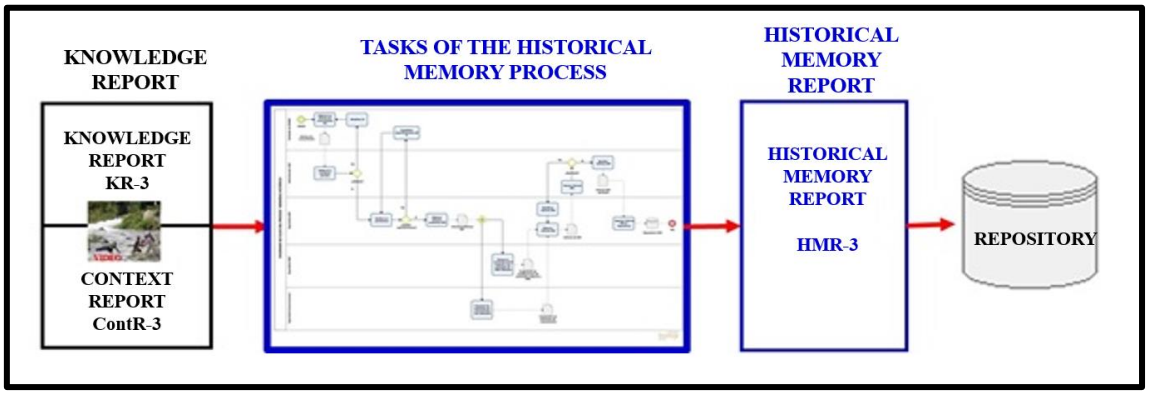


Figure 2.5.3.10 Application of the tasks of the "Historical Memory" process to the KR-3 Knowledge Report and the ContR-3 Context Report

Once the Knowledge Report KR-3 and the Context Report ContR-3 have been received, the Historical Memory Specialist (HMS) of the Knowledge Management Unit shall execute the following tasks of the process.

- Verify that the KR-3 Knowledge Report qualifies as a historical memory and has the necessary background to process the event
- Prepare the preliminary Historical Memory Report (HMR)

- Forward the preliminary Historical Memory Report, both to the Communications Specialist of the Communications Unit of the Communications and Broadcasting Department of the Cabinet to propose the most appropriate communication elements to the context and content of the HMR under development and to the Disaster Risk Reduction Specialist of the Knowledge Management Unit to review the consistency of the contents of the report with respect to the DRR concepts used in ONEMI

With the background information provided by the Communications Specialist and the Disaster Risk Reduction Specialist, the HMS prepares a proposal for the Historical Memory Report, according to the following table, and forwards it to the ADM for review.

Once the HMR proposal has been reviewed and any required modifications have been made, the Historical Memory Report is approved by the KMS Administrator and forwarded to the Historical Memory Specialist to be entered into the KMS Repository.

Finally, the Historical Memory Specialist enters the Historical Memory Report HMR-3 into the KMS Repository, making it available to KMS users or stakeholders.

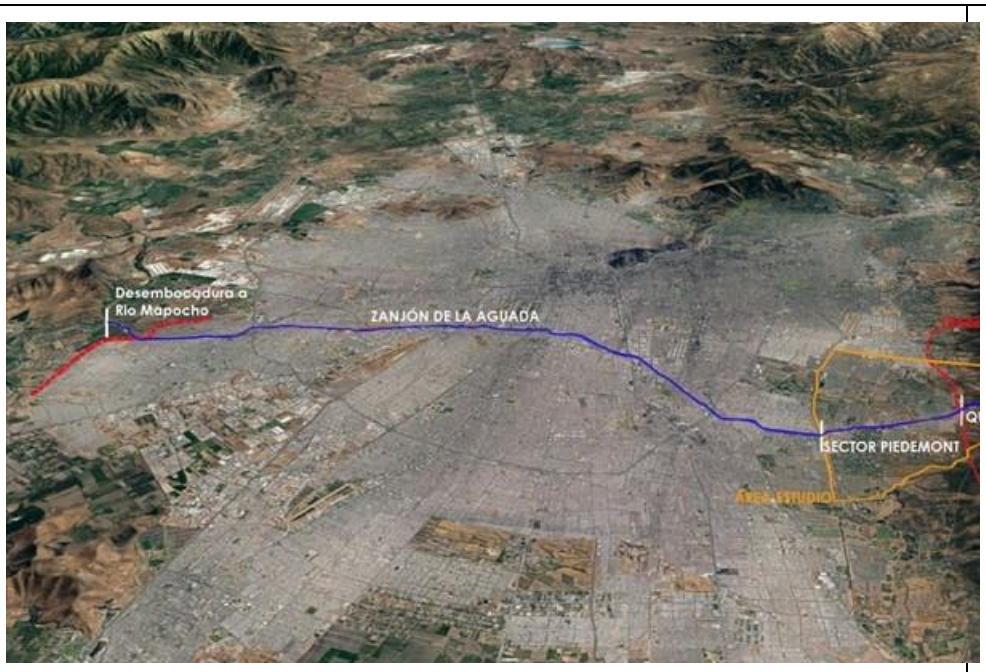
HISTORICAL MEMORY REPORT			
REF: Data extracted from the reference document FD: Fictional datum		**REF**	**DF**
HM Code	HMR-3		x
HM Title	Flood in the Macul Ravine, city of Santiago, Metropolitan Region.	x	
KR Reference	KR-3		x
KR Entity	ONEMI Civil Protection Division.		x
KR Date of registration	May 23, 2021		x
Phases of the Disaster Risk Cycle	Response and Recovery.	x	
Subjects	Disasters, alluvium, floods, overflows.	x	
Types of disaster risks.	Floods, overflows.	x	
HMR Statement	The Flood in the Macul Ravine occurred on May 3, 1993, at 10:33 (UTC-4 local time) in a pre-mountain ravine located in the municipalities of Peñalolén and La Florida in the city of Santiago, Chile. This flood left 26 people dead and 8 missing, in addition	x	

to 32,646 people affected.

The causes of the phenomenon are estimated to be that during May 1993, strong storms affected the regions between Coquimbo and Maule, which caused:

- High altitude precipitation, with temperatures above 15°C, melted the snow, causing debris to fall (alluvium)
- High altitude urbanization that caused deforestation, soil compaction and waterproofing, etc.
- The steep slope of the Macul Ravine favored the fall of sediments
- Dirty channels and natural channels for rainwater runoff used for other purposes

The alluvium followed the course of the Macul ravine, destroying all settlements along its course. It caused the San Carlos and Las Perdices canals to overflow, as well as the Zanjón de la Aguada and flooded the surrounding towns.



The catastrophe left 26 people dead, 85 injured and 8 missing. Materially, 32,654 people were affected and 3,486 were sheltered. A total of 307 houses were destroyed in the sector and another 5,610 were damaged.

To prevent the occurrence of a similar event, a construction exclusion zone was created in a radius near the creek and its bed. In November 1994, seven settling pools were built at the beginning of the ravine, which are maintained and monitored by the Ministry of Public Works during periods of heavy rainfall.

Macul ravine and the park of the same name, built in the construction exclusion zone.

Decanting pools in the Macul ravine

Monolith commemorating those who died in "Las Perdices" during the flooding of the Macul Ravine

Channel 13 added as background information that it had in its archives, the press video "Flood of the Macul Ravine", produced by the Teletrece news program in May 1993, which shows a digital graphic record of the force of the flood and the consequences in the affected areas.

https://www.youtube.com/watch?v=ZmJMh-SIkJs

Object of dissemination	• Inform • Educate • Spirituality		x
Type of communication	The Press video "Flood of the Macul Ravine, produced by the Teletrece news program in May 1993, will be made available to stakeholders through the corresponding link.		x
Date HMR	May 31, 2021		x
Date of entry HMR	May 31, 2021		x

5.3.2.4. Application of the Historical Memory process to element N ° 4

- For the purposes of this work, the following fourth element was selected: Number: 4, mentioned as "**Forest Fire/Maule**"
- Reference: Item 4 is referenced to Press background information found in Google 2017. Specifically, the Wikipedia document "**Forest Fires in Chile 2017**", which is available on the Internet, was taken as a reference and, as a basic assumption to complete the background, it was considered that CONAF generated this information to be processed by ONEMI and subsequently entered into the KMS Repository as knowledge available for DRR.
- Type of material: Digital material available on the Internet
- Entity responsible for preparing the document: For the purpose of this work, the Advisory assumes as responsible the Civil Protection Division of ONEMI.

5.3.2.4.1 First Stage: Preparation of the KR-4 Knowledge Report

This first stage consists of preparing and validating the main input of the Historical Memory process that, for the purposes of this work, we will call “KR-4 Knowledge Report”. This document should be prepared by the person in charge (HENT) of ONEMI's Civil Protection Division, based on the information received from external organizations (municipalities in the area, individuals and organizations) which, for the purpose of this work, will be the National Forestry Corporation, considering the information in its files and, in addition, the information available on the Internet related to the selected event, as shown in Figure 2.5.3.11:

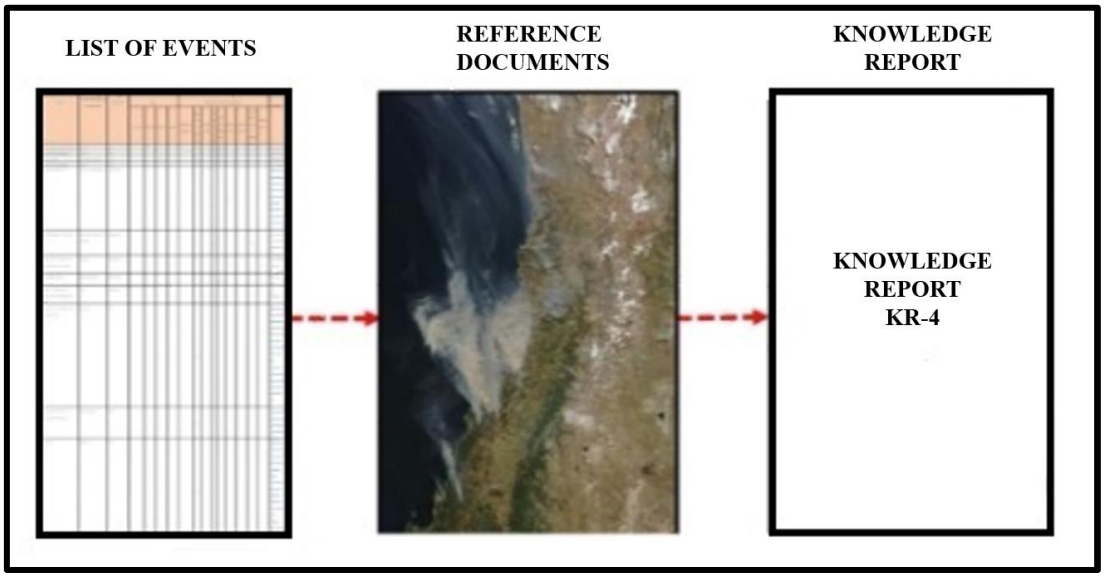


Figure 2.5.3.11 Elaboration of the KR-4 Knowledge Report

Likewise, the KMS Administrator shall ensure that the Knowledge Report complies with the defined requirements, validate it and forward it to the Historical Memory process.

For the purpose of this work, the following format shall be used for the Knowledge Report, considering the data of the reference documents and completed with fictitious data when necessary:

KNOWLEDGE REPORT			
REF: Data extracted from the reference document FD: Fictional datum		**REF**	**DF**
KR Code	KR-4.		x
Responsible entity	División de Protección Civil de ONEMI.		x
Date of elaboration	May 19, 2021		x
KR object	It submits for processing by the KMS the background information on the forest fires that occurred in Chile during 2017. According to the above, the Advisory assumed that the National Forestry Corporation sent to the Civil Protection Division of ONEMI this information, which, for the purpose of this work, will be extracted from the following link: https://es.wikipedia.org/wiki/Incendios_forestales_en_Chile_de_2017		x
Subject	Disaster, forest fires.	x	

Date entered into the KMS	May 21, 2021		x
Date validated by ADM	May 23, 2021		x
Date entered into the Historical Memory process	May 23, 2021		x

5.3.2.4.2. Application of the "Historical Memory" process to the KR-4 Knowledge Report

In this second stage, the main tasks of the "Historical Memory" process procedure are applied until the Historical Memory Report is ready to be entered into the KMS Repository, as shown in Figure 2.5.3.12.

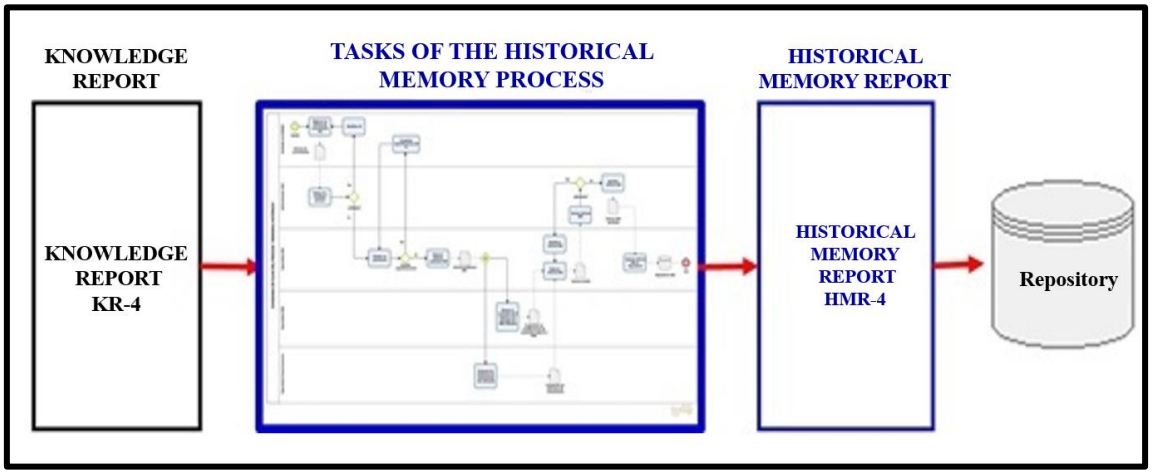


Figure 2.5.3.12 Application of the tasks of the "Historical Memory" process to the KR-4 Knowledge Report

Once the KR-4 Knowledge Report is received, the Historical Memory Specialist (HMS) of the Knowledge Management Unit shall execute the following tasks of the process.

- Verify that the KR-4 Knowledge Report qualifies as a historical memory and has the necessary background to process the event
- Prepare the preliminary Historical Memory Report (HMR)
- Forward the preliminary Historical Memory Report, both to the Communications Specialist of the Communications Unit of the Communications and Broadcasting Department of the Cabinet to propose the most appropriate communication elements to

the context and content of the HMR under development and to the Disaster Risk Reduction Specialist of the Knowledge Management Unit to review the consistency of the contents of the report with respect to the DRR concepts used in ONEMI

With the background information provided by the Communications Specialist and the Disaster Risk Reduction Specialist, the HMS prepares a proposal for the Historical Memory Report, according to the following table, and forwards it to the ADM for review.

Once the HMR proposal has been reviewed and any required modifications have been made, the Historical Memory Report is approved by the KMS Administrator and forwarded to the Historical Memory Specialist to be entered into the KMS Repository.

Finally, the Historical Memory Specialist enters the Historical Memory Report HMR-4 into the KMS Repository, making it available to KMS users or stakeholders.

HISTORICAL MEMORY REPORT			
REF: Data extracted from the reference document FD: Fictional datum		**REF**	**DF**
HM Code	HMR-4		x
HM Title	Forest fires that occurred in Chile during 2017.	x	
KR Reference	KR-4		x
KR Entity	Civil Protection Division of ONEMI.		x
Date of registration KR	May 23, 2021		x
Phases of the Disaster Risk Cycle	Response and Recovery.	x	
Subjects	Disasters, Forest Fires.	x	
Types of disaster risks.	Forest fires.	x	
HMR Statement	Forest fires in Chile in 2017 were a series of fires generated in multiple hotspots in central and southern Chile, between the regions of Coquimbo and Los Lagos, with greater intensity in the regions of O'Higgins, Maule and Biobío. In addition to distant outbreaks in the southern region of Magallanes, during January and February 2017.	x	

The different outbreaks had an unprecedented extension, which could be explained by the convergence of high wind speed, high temperatures after successive heat waves, low humidity and the difficult geography of the affected sectors.

Although there were different causes in the various fire outbreaks, most of them had their origin in anthropogenic causes, following the historical trend of fires registered in the country by the National Forestry Corporation.

The spread of the fire was enhanced by the weather conditions granted by the summer season in Chile, which have been called the "30-30-30 factor", with temperatures above 30 degrees Celsius, low air humidity (around 30%) and winds of 30 kilometers per hour. At the end of January 2017, the Chilean Meteorological Directorate recorded a heat wave that marked historic temperatures, such as the highest temperature recorded in Santiago during the month of January and the highest since 1912 (37.4 °C), and absolute maximums recorded in the cities of Curicó (37.3 °C), Chillán (41.5 °C) and Los Ángeles (42.2 °C). On January 26, 2017, the highest temperature in the history of Chile was recorded: 44.9 degrees in Quillón.

The main focuses are as follows:

- The fire called "Las Máquinas" affected the municipalities of Empedrado, Constitución and Cauquenes in the Maule Region and is considered the largest fire in Chile's recent history, with 183,946 hectares consumed.
- The "Nilahue Barahona" fire, which affected Pumanque, Marchigüe, Pichilemu, La Estrella and Litueche, in the coastal drylands of the provinces of Colchagua and Cardenal Caro, consumed around 20,000 hectares in its first 48 hours. As of January 25, it had consumed a total of 49,156 hectares, making it the second largest and most devastating fire on record in Chile, surpassing the one that in 1999 which consumed 25,389 hectares in the town of La Rufina. The Chilean Government announced the extinction of the fire on January 27, leaving a total of 50,000 hectares consumed.
- In the early morning of January 26, 2017, the town of Santa Olga, in the commune of Constitución, was affected by a fire that destroyed it practically in its entirety, affecting a thousand homes, in addition to other facilities such as the fire station and the local bus terminal being consumed. In the afternoon of the same day, the fire approached Gran Concepción and sectors of Florida, which were severely affected.
- In the case of the Biobío Region, the fire that occurred in the commune of Florida called "Incendio San Antonio" consumed 31,930 hectares and was declared controlled by National Forestry Corporation on February 6, 2017. Together with the Chaimávida fire, it was the largest fire in the region.

As a result of the fires, there were ten fatalities due to firefighting; accidents or serious health problems directly caused by the disaster; and four deaths due to indirect causes.

Fires in the municipalities of Florida and Hualqui (Biobío region) on Thursday, January 26.

Helicopter fighting fire and burned property in Curacaví (Metropolitan Region), January 25, 2017.

Forest fire in Pirque (Metropolitan Region), on January 21, 2017.

Firefighters at the Santa Olga fires (Maule Region), January 28.

Fires in the fields adjacent to Talcamávida (Biobío Region).

	 Burned native forest in Chiguayante. The Chilean Government declared the Provinces of Colchagua and Cardenal Caro in the O'Higgins Region, and the Communes of Cauquenes and Vichuquén in the Maule Region "disaster affected zone" and "disaster zone" with a State of Constitutional Exception (specifically, "state of catastrophe") on January 21; The following day the measure was extended to the communes of Licantén and Hualañé in the Maule Region, and to the commune of Bulnes in the Biobío Region. On January 23, the state of catastrophe was extended to the entire Maule Region. The Government of Chile, together with the National Forestry Corporation, contracted at the end of January 2017, the Sikorsky S-64 Skycrane helicopter, which has the capacity to launch 10 thousand liters of water and can suck water from any type of source.		
Object of dissemination	• Inform. • Educate.		x
Type of communication	Specific and complementary background information on this event will be made available to stakeholders through the following link: https://es.wikipedia.org/wiki/Incendios_forestales_en_Chile_de_2017		x
HMR Date	May 31, 2021		x
Date of entry of the HMR	May 31, 2021		x

5.4. Appendix "Distribution of roles to the entities of the superior structure of ONEMI"

5.4.1. Civil Protection Division.

In the Civil Protection Division of the Risk Management Sub-Department, it is proposed to create the Knowledge Management Unit (UGC in Spanish), as shown in Figure 2.5.4.1, whose main task will be to materialize the operation of ONEMI's Knowledge Management System for disaster risk reduction, according to the essential purpose defined for the System.

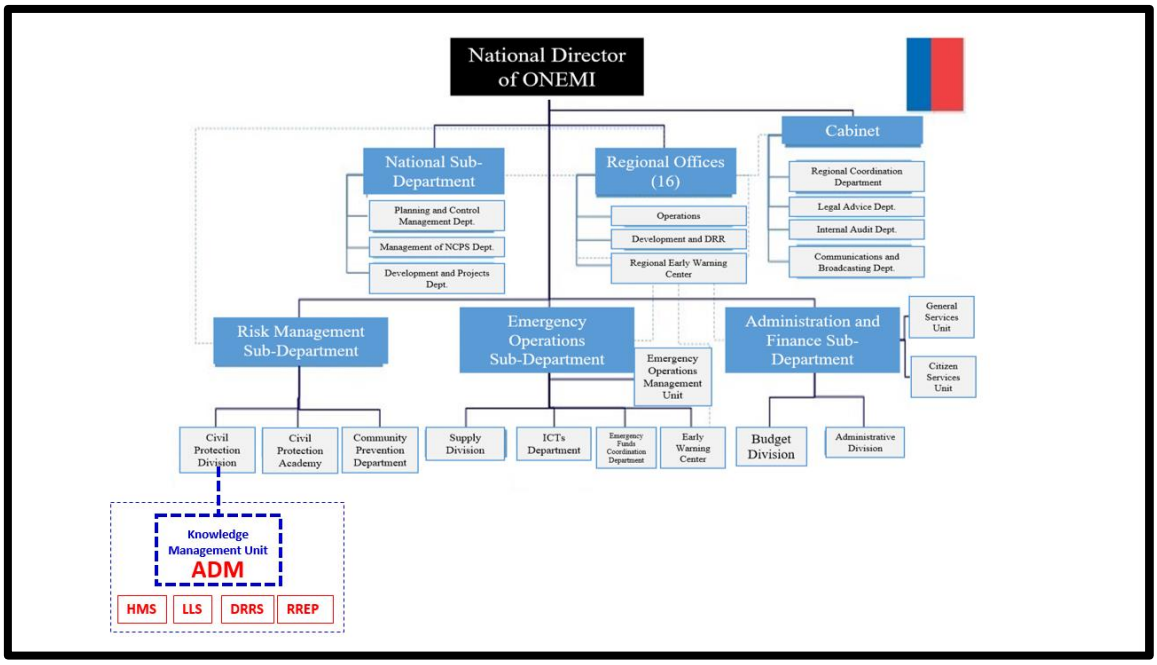


Figure 2.5.4.1 Knowledge Management Unit in the ONEMI Structure

Indeed, the main function of the Knowledge Management System, by definition, is to manage the knowledge for Disaster Risk Reduction (DRR) acquired by ONEMI entities derived from their actions and make it available to users committed to DRR.

ONEMI entities obtain from their external suppliers (state institutions, private organizations, municipalities, and others, as well as from the population of any part of the country) information related to events associated with Disaster Risk Management and may receive annexed to this information some element that, in the judgment of the suppliers, will be required to be exhibited according to the conditions, means, and places that are defined.

Each ONEMI entity must carry out a process of transforming the information received into useful knowledge for DRR. In addition, if in the Knowledge Report is attached some material proposed for exhibition, within this transformation process, an additional report should be prepared for each element, describing the context of the facts and the grounds that assign the importance of exhibiting this material.

The tasks of obtaining information from suppliers and transforming this information into useful knowledge for DRR are processes that do not belong to the KMS, but are very important for the System, since they provide the main input for its operation.

The processes of the KMS begin when the entities send to the KMS, through a report, the knowledge in DRR and the elements that require to be exhibited, with the purpose of being managed by the System, making them available to users committed to DRR and exhibited in the places that are defined, when appropriate.

The System receives the Knowledge Report and the elements that need to be exhibited with their respective context reports and performs the validation of the knowledge, through the interaction with ONEMI's entities.

If the knowledge received is validated, the System Administrator arranges for the processing of the reports by the different essential functions of the KMS (Historical Memory, Lessons Learned, Human Resource Development, Research and Development and Network Development).

As a product of the processing of the knowledge reports, the essential functions enter their respective specific reports in the KMS repository. In these specific reports should be added the elements that need to be displayed and their respective context reports.

Once the knowledge is entered into the Repository, it is processed by the computer applications, performing the tasks of converting, editing, selecting, analyzing, and synthesizing the knowledge generated, and thus making it available as useful knowledge for DRR for those who access the System. The Repository creates a memory bank to store knowledge for later use, according to pre-established criteria.

To obtain an effective knowledge management, the technological platforms, intranets, portals, among other IT tools provided by the Repository, should be used to transfer the knowledge available in ONEMI's KMS to the stakeholders, in order to encourage its use for disaster risk reduction.

The elements that need to be exhibited will be delivered to the Exhibit function to be prepared and installed, according to the conditions, means and places to be defined, being available for user visits.

The general process of the operation of the KMS described above will be the main responsibility of the Knowledge Management Unit, which is in the process of being created.

Accordingly, the following mission is proposed for the Knowledge Management Unit:

"To plan, organize, direct, control and coordinate the operation of ONEMI's Knowledge Management System for disaster risk reduction".

This mission should be incorporated as a fundamental task in the organization of the Civil Protection Division of ONEMI's Risk Management Sub-Department.

In order to fulfill its essential purpose, the Head of the Knowledge Management Unit will exercise a "management command" over the positions that perform the roles that are directly assigned to their

Unit, and must plan, organize, direct, control and coordinate the execution of activities and the use of resources to achieve the specific tasks established to fulfill its mission.

Likewise, the Head of the Knowledge Management Unit shall exercise a "matrix technical coordination" over the positions that perform the roles assigned to other ONEMI units, and shall support the managers of these entities in the execution of activities and the use of resources to achieve the specific tasks established in the KMS processes in which the respective roles participate.

In addition, the Head of the Knowledge Management Unit shall propose the fundamental tasks for the subordinate entities that he defines and the respective positions to assume the following roles of the KMS:

5.4.1.1. KMS Administrator (ADM)

This role is associated to the Function "Knowledge Management" of the ONEMI's KMS Operating Model for DRR, as shown in Figure 2.5.4.2., being responsible for executing, at the management level, the processes of the Function "Management of KMS operation" (Planning, organization, direction, control and coordination) and, at the operational level, the processes of the Function "Knowledge validation", duly described in the design of the KMS operating model. However, the Administrator, being responsible for the integral functioning of the KMS, is related to all the processes of the KMS.

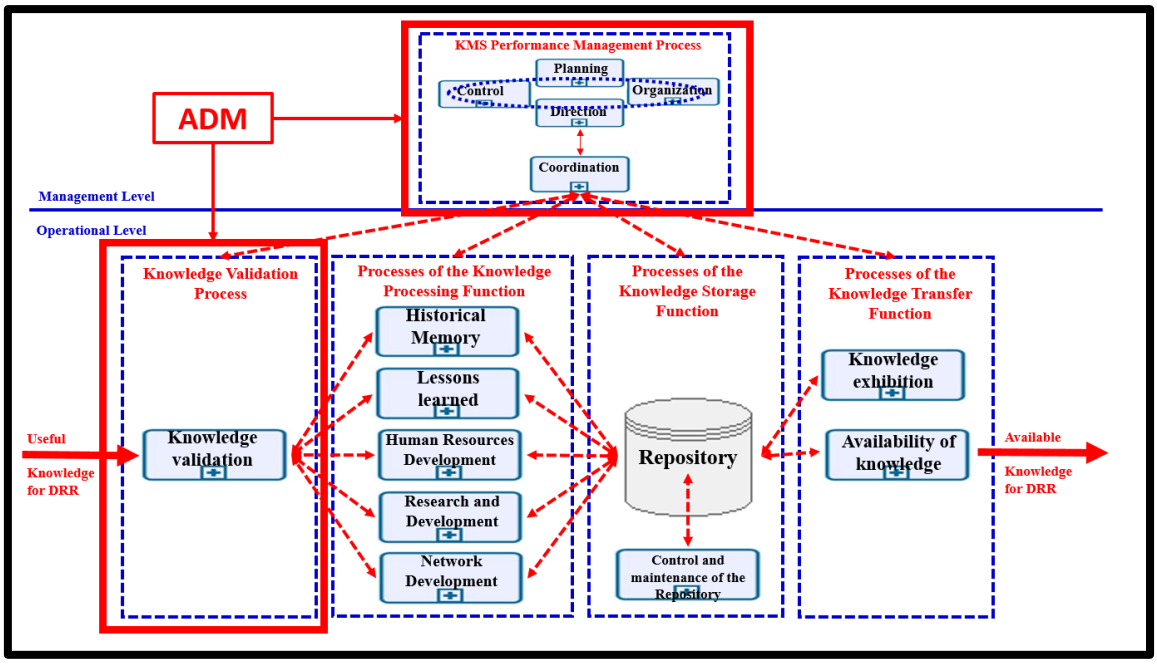


Figure 2.5.4.2 KMS Administrator Role in the KMS Operating Model

It is proposed that the role of KMS Administrator be assumed by the Head of the Knowledge Management Unit, who must fulfill the following specific tasks in the context of the operation of the

KMS:

- In the KMS Performance Management Process.
    - Obtain an integrated vision of the performance of the set of competencies and functions that correspond to the system
    - Determine the objectives to be achieved in a given period, in order to fulfill the essential purpose of the KMS. It must also determine the actions that need to be taken to achieve these objectives, prioritize them, establish their sequence and those responsible for their execution. It must also identify the available resources and allocate them to the actions according to their prioritization.
    - Determine the necessary activities and roles within the KMS, distributing them according to the best functional relationships, clearly defining the authority, responsibilities and duties of each one and assigning them to positions and individuals within ONEMI's organizational structure
    - Direct the execution of the activities programmed in the Planning process, using the roles assigned to the positions within ONEMI's organizational structure
    - Carry out the necessary measurements to verify the progress achieved according to the defined goals, the objectives established in the plan and the functioning of the processes defined in the system and based on this, adopt the corrective measures that each case deserves
    - Ensure the harmonious operation of the KMS, in all aspects related to validation, processing, storage and transfer of knowledge, through the coordination of management functions
- In the Knowledge Validation Process.
    - Define and keep updated the requirements that both the knowledge reports and context reports issued by ONEMI entities and the specifications of the essential functions (Lessons Learned, Historical Memory, Human Resource Development, Research and Development, Network Development) must comply with in order to be managed by the KMS. Also, train the heads of ONEMI entities in the preparation of knowledge reports and context reports, regarding the interpretation and application of the requirements
    - Provide guidance to the Head of the ONEMI Entity to submit to the KMS for processing the knowledge reports and context reports with their objects that have been processed by ONEMI's organic entities
    - Receive and register the knowledge reports and context reports with their objects that have been processed by ONEMI's organic entities that, in the opinion of the experts of the respective functional areas, are deemed to qualify to be managed by the KMS

    - Verify that the knowledge reports and context reports with their objects that have been submitted by ONEMI's organic entities comply with the requirements to be managed by the KMS
    - Return to the entities that generated them, the knowledge reports and context reports that do not comply with the requirements, to be completed
    - Validate or reject the knowledge reports and context reports with their objects that have been submitted by ONEMI's organic entities
    - Assign to the essential functions (Lessons Learned, Human Resource Development, Research and Development, Network Development and Historical Memory) the knowledge reports and context reports with their objects that have been submitted by ONEMI's organic entities to be processed and entered into the Repository
    - Coordinate and facilitate the interaction of the specialists of the essential functions of the KMS with those responsible for the ONEMI entities, for the processing of the reports
- In the Historical Memory Process
    - Review and approve the Historical Memory Report proposed by the Historical Memory Specialist
- In the Lessons Learned Process
    - Review and approve the Lessons Learned Report proposed by the Lessons Learned Specialist
- In the Human Resources Development Process
    - Review and approve the Final Course Program Report proposed by the Human Resource Development Specialist
    - Review and approve the Human Resource Development Specialist's proposed Human Resource Development Report
- In the Research and Development Process
    - Review and approve the research thesis, forward it to the Research and Development Specialist for further processing
    - Conduct the bidding process, together with the Research and Development Specialist, regarding:
        - Elaborate the terms of reference
        - Request the corresponding proposal from each center
        - Prepare and formalize the respective contractual documents
    - Review and approve the Research and Development Report proposed by the Research and Development Specialist
- In the Network Development Process

    - To review and formalize the proposal of agreements or covenants
    - Review and approve the Network Development Report proposed by the Network Development Specialist
- In the Exhibition Process
    - Coordinate with the Exhibition Specialist, the reception and analysis of the elements to be presented, in order to budget in project form the human, material and economic resources and the development time required to be exhibited
    - Receive, from the Exhibition Specialist, the statistical data of the measurements of the visits of the KMS stakeholders to the exhibition sites, in order to develop the management control process according to the indicators to be defined
- In the Knowledge Availability Process
    - Review and approve the budget prepared by the Communications Specialist, in project form, in terms of human, material and economic resources and development time, to build and implement the support materials, according to the specific requirements
    - Coordinate with the Communications Specialist the management of resources to build and implement the support materials
- Regarding the Repository
    - Coordinate and control the fulfillment of the essential purpose of the Repository Function of providing the IT support required for the operation of the essential processes of the Knowledge Management System, under a common operational environment of ONEMI's technological platform

5.4.1.2. Historical Memory Specialist (HMS)

This role is associated with the "Historical Memory" process of the "Knowledge Processing" Function of the ONEMI KMS Operating Model for DRR, as shown in Figure 2.5.4.3, being responsible for preparing the Historical Memory Reports (HMR) and processing the HMR, from the verification of its relevance to its entry into the Repository.

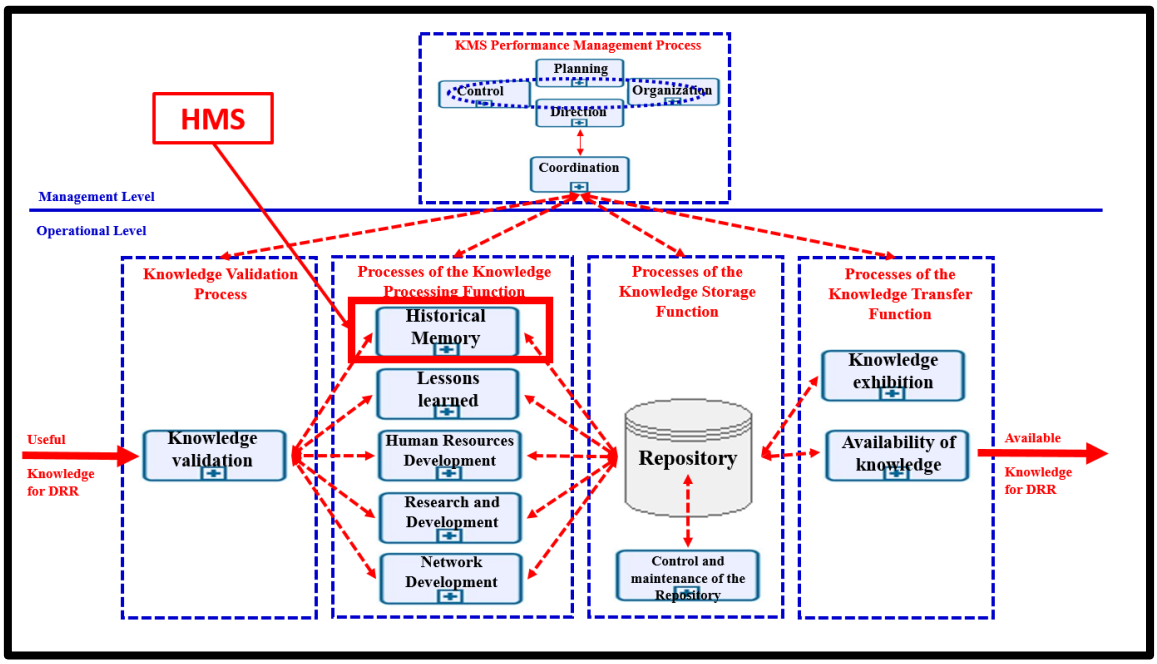


Figure 2.5.4.3 Role of Historical Memory Specialist in the KMS Operating Model

A position should be established in the Knowledge Management Unit to assume this role.

In the context of the operation of the KMS, the HMS is responsible for executing the following tasks.

- Receive and verify the relevance of the Knowledge Reports assigned by the ADM, in terms of compliance with the essential specifications defined to be managed as Historical Memory
- If the Knowledge Report does not contain all the main essential specifications to be processed as Historical Memory, request the entity responsible for the report to complete the background information
- Process the Knowledge Report assigned by the ADM and prepare a preliminary Historical Memory Report
- Send the Historical Memory Report to the Dissemination Specialist to propose the communication elements and, in parallel, to the DRR Specialist to review the consistency of the contents of the report with respect to the DRR concepts used in ONEMI
- Prepare and submit to the ADM for review, a proposal for the Historical Memory Report, taking into consideration the preliminary report, the proposal of communication elements and the proposal with the modifications regarding DRR concepts
- Submit the Historical Memory Report approved by the ADM to the KMS Repository so that it is available to the KMS Stakeholders

5.4.1.3. Lessons Learned Specialist (LLS)

This role is associated to the "Lessons Learned" process of the "Knowledge Processing" Function of

the ONEMI KMS Operating Model for DRR, as shown in Figure 2.5.4.4, being responsible for preparing the Lessons Learned Reports (LLR) and processing them, from the verification of their relevance to their entry into the Repository.

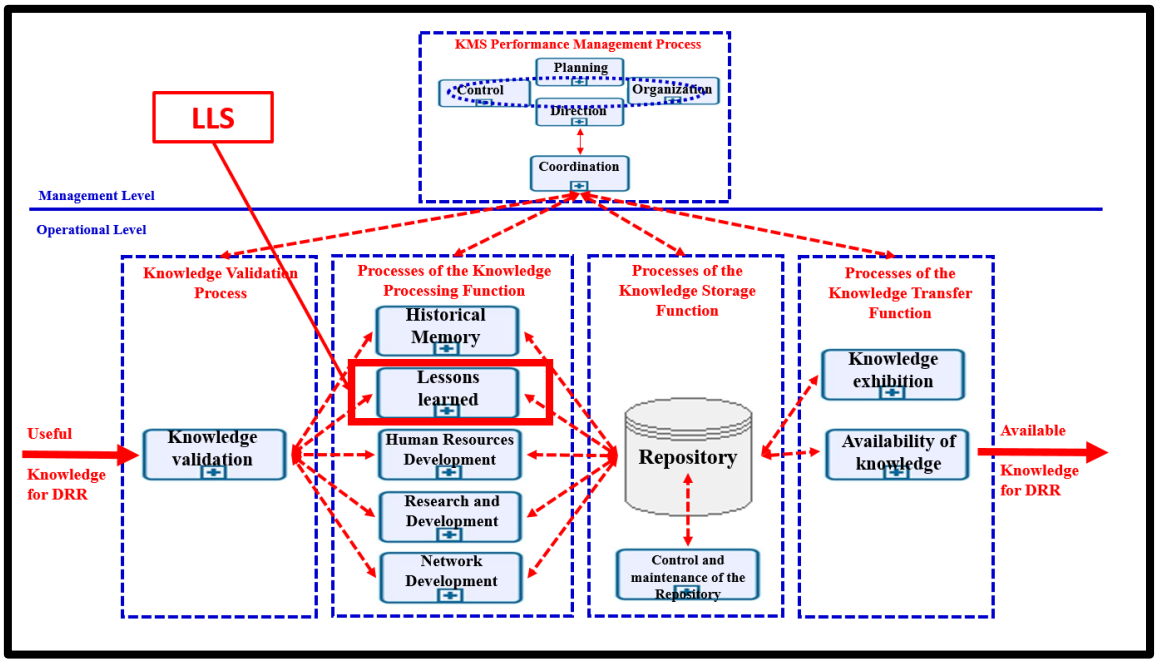


Figure 2.5.4.4 Role of Lessons Learned Specialist in the KMS Operating Model

A position should be established in the Knowledge Management Unit to assume this role.

In the context of the operation of the KMS, the LLS is responsible for executing the following tasks.

- Receive and verify the relevance of the Knowledge Reports assigned by the ADM, in terms of compliance with the essential specifications defined to be managed as Lessons Learned
- If the Knowledge Report does not contain all the main essential specifications to be processed as Lessons Learned, request the entity responsible for the report to complete the background information
- Process the Knowledge Report assigned by the ADM and prepare a preliminary Lessons Learned Report
- Send the Lessons Learned Report to the Dissemination Specialist to propose the communication elements and, in parallel, to the DRR Specialist to review the consistency of the contents of the report with respect to the DRR concepts used in ONEMI
- Prepare and submit to the ADM for review, a proposal for a Lessons Learned Report, taking into consideration the preliminary report, the proposal of communication elements, and the proposal with the modifications regarding DRR concepts
- Enter the Lessons Learned Report approved by the ADM to the KMS Repository in order to

make it available to the KMS Stakeholders.

5.4.1.4. Disaster Risk Reduction Specialist (DRRS)

This role is associated to the processes of the "Knowledge Management" and "Knowledge Processing" Functions of the ONEMI KMS Operating Model for DRR, as shown in Figure 2.5.4.5, being responsible for reviewing the content of the Knowledge reports and context reports submitted by ONEMI entities during the Knowledge Validation process. Likewise, it should support the processes of the other functions of the KMS (Historical Memory, Lessons Learned, Research and Development, Network Development, Exhibition and Availability of Knowledge), regarding the appropriate use of the DRR concepts defined in ONEMI

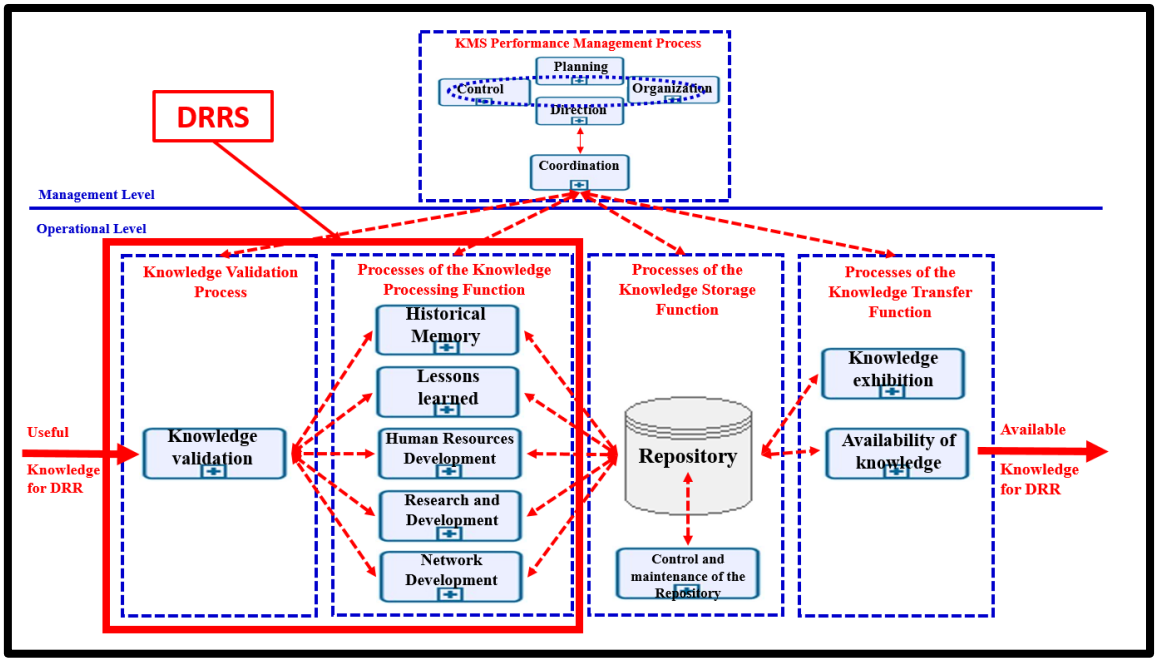


Figure 2.5.4.5 Role of Disaster Risk Reduction Specialist in the KMS Operating Model

A position should be established in the Knowledge Management Unit to assume this role.

In the context of the operation of the KMS, the DRRS is responsible for executing the following tasks.

- Prepare a proposal with the modifications of the contents of the preliminary reports of the processes of the essential functions, with respect to the DRR concepts used in ONEMI and send it to the specialists of the respective functions to be considered in the preparation of the Final Report
- Review the research thesis statement of the Research and Development function process with respect to the DRR concepts used in ONEMI and, if appropriate, propose modifications

5.4.1.5. Responsible for the Repository (RREP)

This role is associated with the processes of operation, control and maintenance of the Repository of the "Knowledge Storage" Function of ONEMI's KMS Operating Model for DRR, as shown in Figure 2.5.4.6, being responsible for managing the IT support required by the essential processes of the KMS, duly described in the design of the KMS operating model, under a common operational environment of ONEMI's technological platform.

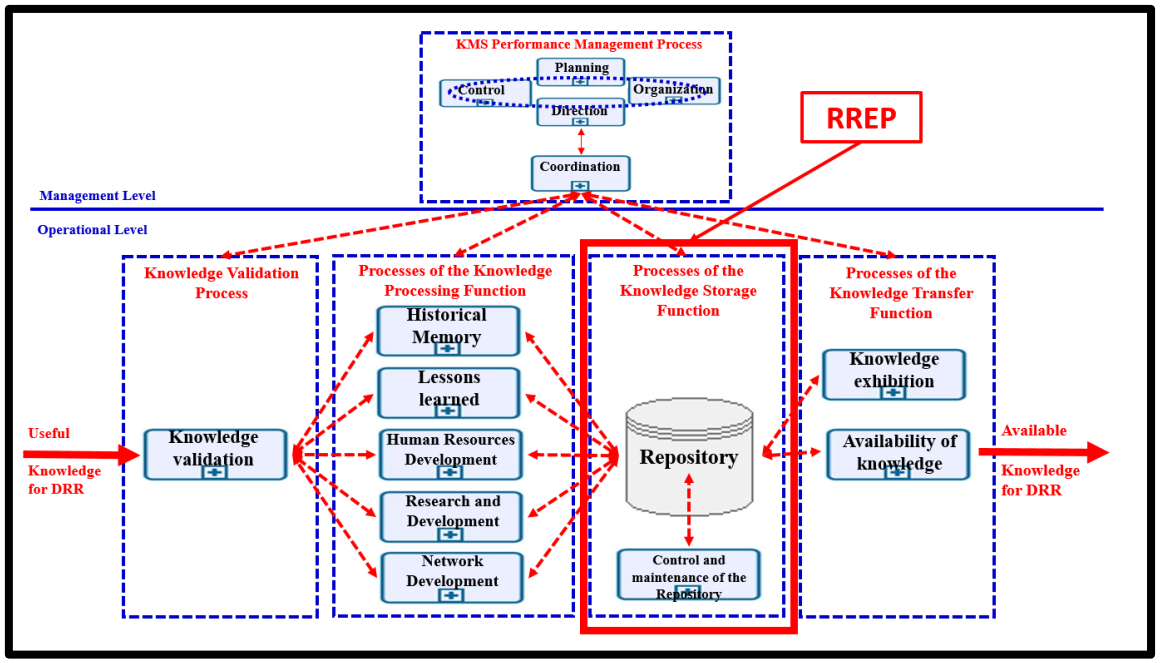


Figure 2.5.4.6 Role of Responsible for the Repository in the KMS operating model

A position should be established in the Knowledge Management Unit to assume this role.

In the context of the operation of the KMS, the RREP is responsible for managing the IT support required by the essential processes of the KMS, performing the following technical functions.

- Obtainment: It is the function of capturing the knowledge of the environment. Specifically, the computer subsystem "KMS Repository" receives as inputs the knowledge reports generated by the sub-processes Historical Memory, Lessons Learned, Human Resources Development, Research and Development and Network Development.
- Processing: This is the work done with knowledge through the essential functions of the KMS, according to the requirements defined in the computational applications. Here, computing makes its great contribution by converting, editing, selecting, analyzing and synthesizing the knowledge generated.
- Storage: It is the function of creating a memory bank to store knowledge for later use according to pre-established criteria.

- Distribution: It is the function of making available to stakeholders all types of knowledge available and stored in the Repository's computational applications, making use of information and communication technologies (ICTs), as well as using the most appropriate exhibition channels in the case of objects or other elements.

5.4.2. Civil Protection Academy

The proposal considers placing the role of Human Resource Development Specialist (HRDS) in the Civil Protection Academy of the Risk Management Sub-Department due to the affinity of its essential purpose with the mission of that entity, as shown in Figure 2.5.4.7.

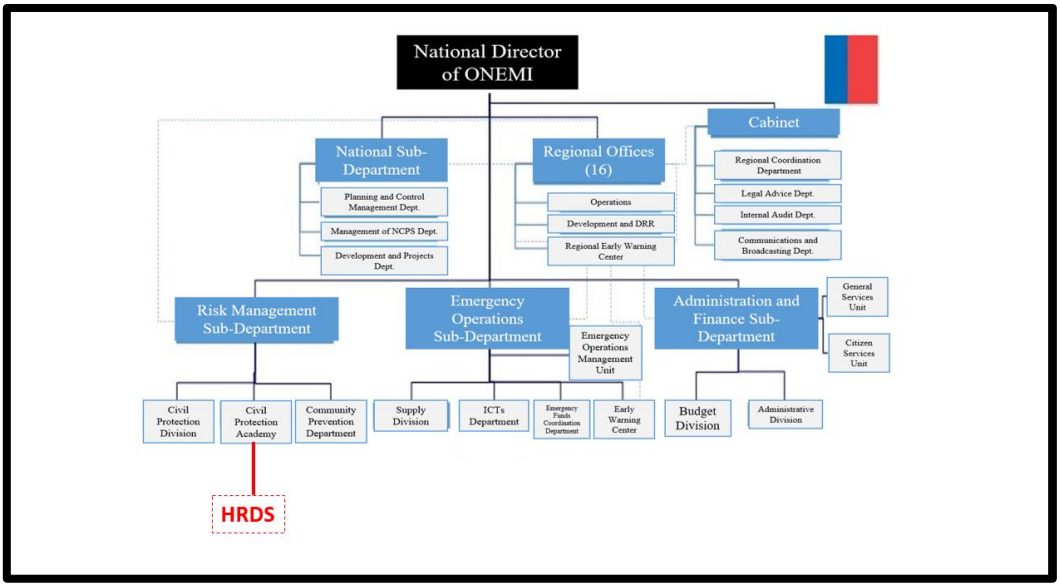


Figure 2.5.4.7 Role of Human Resource Development Specialist in ONEMI's Structure

This role must comply with the specific tasks of the "Human Resources Development" process, which is associated with the "Knowledge Processing" function of ONEMI's KMS operating model for DRR, as shown in Figure 2.5.4.8.

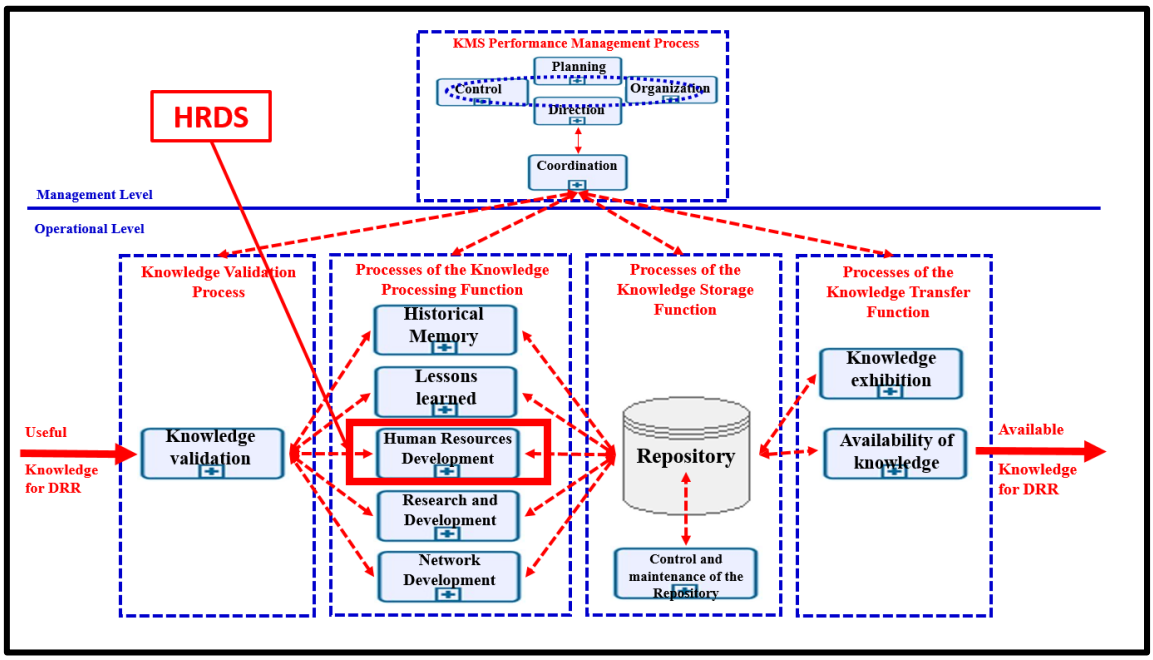


Figure 2.5.4.8 Role of Human Resource Development Specialist in the KMS Operating Model

The Head of the Civil Protection Academy shall designate a position within their entity to perform the role of "Human Resource Development Specialist" of the KMS, being responsible for the preparation of the Human Resource Development Reports (HRDR) and their processing, from the verification of their relevance to their entry into the KMS Repository.

In the context of the operation of the KMS, the HRDS is responsible for executing the following tasks.

- Verify that the Knowledge Report received complies with the specifications referred to in the Human Resource Development function and has the background to determine the actions that allow developing DRR capacities through training of people
- If the Knowledge Report does not contain all the main essential specifications to be processed as Human Resource Development, request the entity responsible for the report to complete the background information
- Process the Knowledge Report assigned by the ADM
- Verify if the requirement identified in the Knowledge Report is addressed in an existing course syllabus
- If the requirement is considered or is closely related to an existing course, add or supplement the specific requirement to the existing course syllabus
- If the requirement is not considered in any existing course, design the preliminary course syllabus based on the identified requirements, which should contain the course objective, exit profile, curriculum and entry profile
- Send the preliminary program of the course to the Dissemination Specialist to propose the

communication elements and, in parallel, to the DRR Specialist to review the coherence of the program contents with respect to the DRR concepts used in ONEMI

- Prepare and submit to the ADM for review, a proposal of the final course program, taking into consideration the preliminary program, the proposal of communication elements, and the proposal with the modifications regarding DRR concepts
- Schedule the execution of the course according to its program and through the most appropriate means of dissemination to each of the users determined by the requirements of human resource development
- Evaluate the course in terms of its expected effectiveness in human resource development according to the initial requirements and, if necessary, reformulate the program with the improvements identified
- Prepare and submit to the ADM for review, a proposed Human Resource Development Report with the actions taken with respect to the execution and evaluation of the course
- Enter the Human Resource Development Report approved by the ADM to the KMS Repository in order to make it available to the KMS Stakeholders

Consequently, the following text is proposed for the specific task to be fulfilled by the role of Human Resource Development Specialist, which should be incorporated as a fundamental task in the organization of the Civil Protection Academy:

"To execute the tasks defined in the Human Resource Development process of ONEMI's Knowledge Management System".

The Head of the Civil Protection Academy will maintain management command over the position that fulfills this role.

The Head of the Knowledge Management Unit shall exercise a "matrix technical coordination" action over the position that performs this role, providing technical support to the Head of the Civil Protection Academy, in the execution of activities and the use of resources to achieve the specific tasks established in the process of "Human Resources Development" of the KMS.

5.4.3. Communications and Broadcasting Department

The proposal considers that the Cabinet's Communications and Broadcasting Department should assume the roles of Exhibition Specialist and Communications Specialist because of the affinity of its essential purpose with the mission of that entity, as shown in Figure 2.5.4.9.

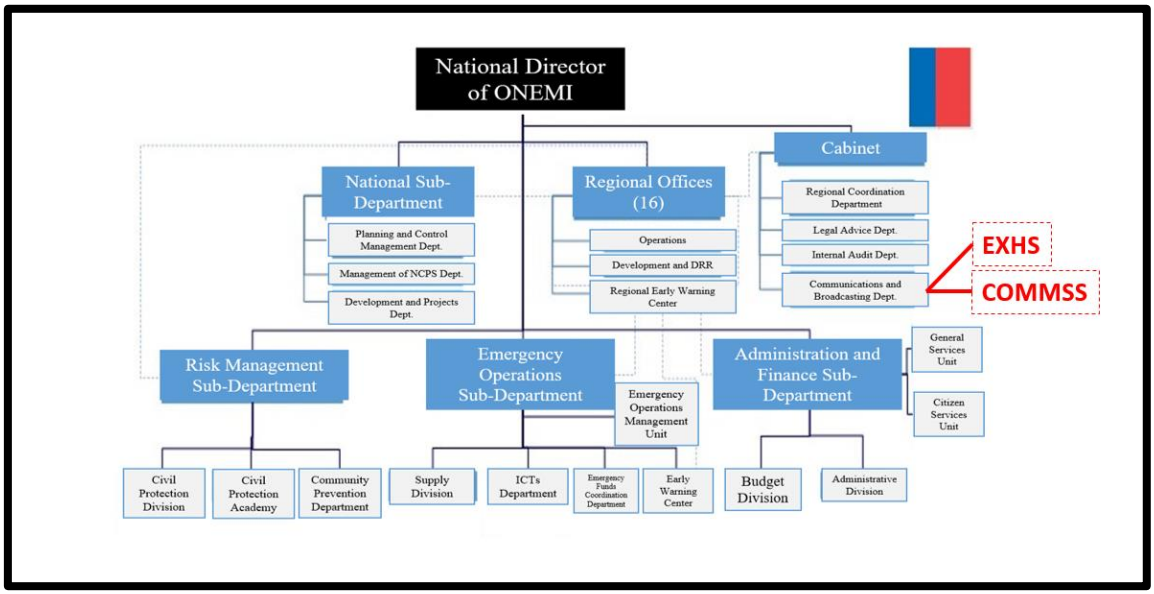


Figure 2.5.4.9 Roles Exhibition Specialist and Communications Specialist in the ONEMI Structure

5.4.3.1. Exhibition Specialist (EXHS)

This role must fulfill the specific tasks of the "Knowledge Exhibition" process that is associated with the "Knowledge Transfer" Function of the ONEMI KMS Operation Model for DRR, as shown in Figure 2.5.4.10.

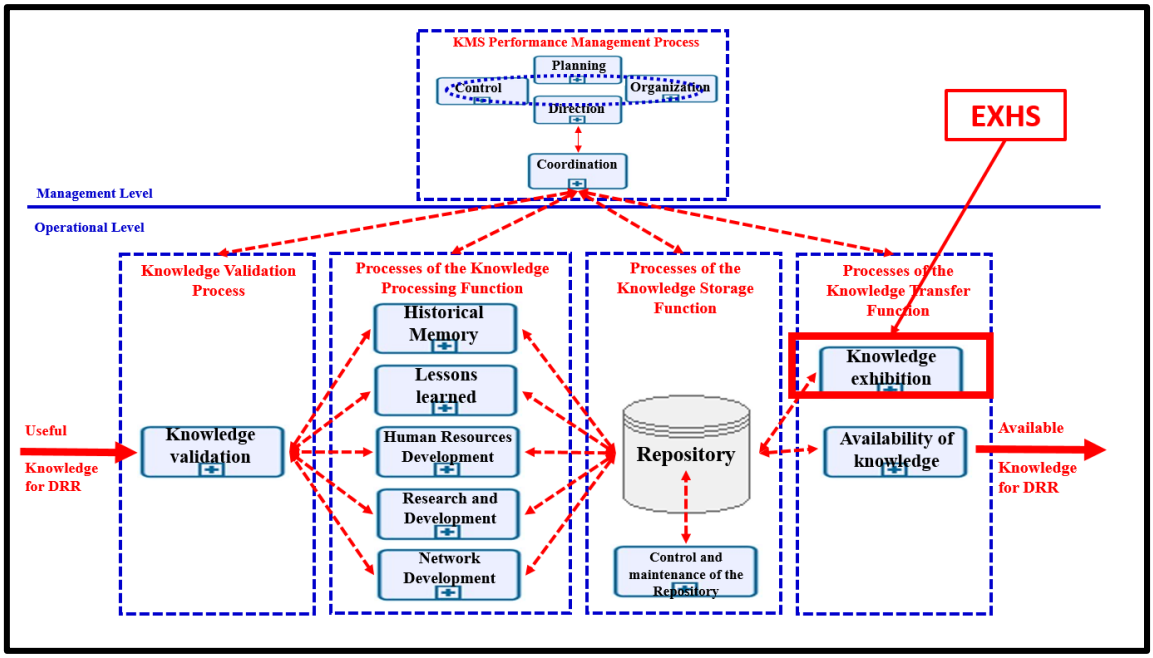


Figure 2.5.4.10 Role of Exhibition Specialist in the KMS Operating Model

The Head of the Communications and Broadcasting Department should designate a position in their entity to perform the role of "Exhibition Specialist" of the KMS, being responsible for preserving, communicating, and exhibiting, for purposes of study, education, and contemplation, sets and collections of elements with historical value and of interest for DRR, which allow transmitting to the stakeholders of the KMS the experience and lessons learned from the events that occurred, also fulfilling the objective of remembering a specific aspect of the disaster by preserving some vestige of it.

In the context of the operation of the KMS, the EXHS is responsible for executing the following tasks.

- Advise the KMS Administrator, the ONEMI entities and the specialists of the essential functions of the SGC in the definition of the elements to be exhibited, in the most appropriate conditions, media and places according to the context Report of each material
- Receive and analyze the elements that the ADM has decided should be presented, in order to budget in project form the human, material and economic resources and the development time required to adapt them to be exhibited
- Manage the resources to provide the objects, artifacts or remains with complementary information, contextualization and interpretation tools, according to the context report and its specific requirements
- Move the elements duly prepared to be exhibited (films, photographs, videos, documents, and others) to the established exhibition sites
- Place the elements that were arranged to be exhibited in the exhibition areas, in the established conditions, media and exhibition places, so that they can be visited by the stakeholders of the KMS
- Check and clean the objects, artifacts or remains of materials installed in the exhibition places, such as showcases, walls, graphic rooms, among other support elements, in order to preserve the story of the context that the exhibition intends to convey
- Identify deteriorated material and carry out the required repairs, both of the material on display and of the showcases, walls, graphic rooms, among other support elements for the exhibition
- Identify and execute changes of elements, both of the material on display and of the showcases, walls, graphic rooms, among other support elements for the exhibition, either due to non-repairable deterioration, technical obsolescence and/or modification of the context that justifies their removal from the exhibition site
- Verify the operation of the exhibition support elements, such as audiovisual and interactive exhibition rooms, lighting systems, among others
- Measure the visits of the System's stakeholders to the exhibition sites, in order to provide statistical data that will allow the KMS Administrator to develop the management control

process in accordance with the indicators to be defined

- Make contact with visitors, in order to obtain their opinion regarding the quality, timeliness and value of use of the knowledge available at the exhibition sites, through the objects, artifacts, documents and other items on display, in order to achieve continuous improvement of the processes of the essential functions of the KMS, in form and substance of its products
- Deliver to the Knowledge Availability Function, the specific information referred to the conditions, means and places of exhibition, in order to transfer this knowledge to the KMS stakeholders

Consequently, the following text is proposed for the specific task to be fulfilled by the role of Exhibition Specialist, which should be incorporated as a fundamental task in the organization of the Communications and Broadcasting Department of the Cabinet.

"To execute the tasks defined in the Exhibition process of the ONEMI's Knowledge Management System ".

The Head of the Communications and Dissemination Department shall maintain management command over the position that fulfills this role.

The Head of the Knowledge Management Unit shall exercise a "matrix technical coordination" action over the position that performs this role, providing technical support to the Head of the Communication and Broadcasting Department, in the execution of activities and the use of resources to achieve the specific tasks established in the "Exhibition" process of the KMS.

5.4.3.2. Communications Specialist (COMMSS)

This role should comply with the specific tasks of the "Knowledge Availability" process, which is associated with the "Knowledge transfer" function of the ONEMI KMS operating model for DRR, as shown in Figure 2.5.4.11.

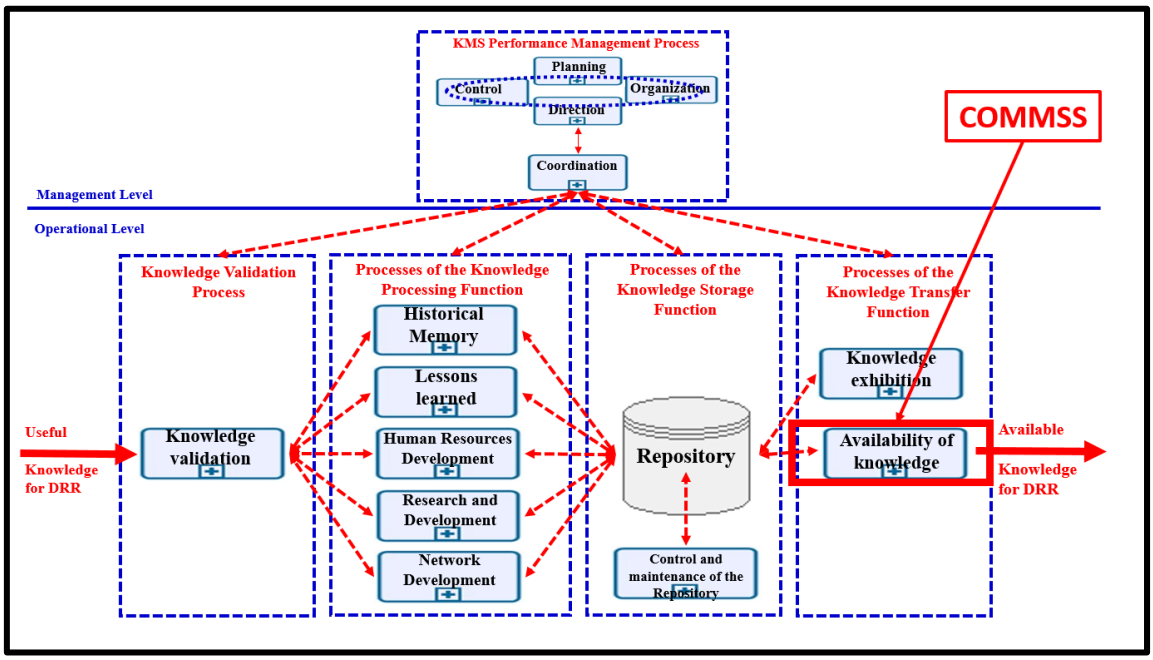


Figure 2.5.4.11 Role of Communications Specialist in the KMS Operating Model

The Head of the Communication and Broadcasting Department shall designate a position within their entity to play the role of "Communications Specialist" of the KMS, being responsible for facilitating access to the knowledge stored in the Repository to KMS users or stakeholders, as well as promoting and encouraging the use of this available knowledge for Disaster Risk Reduction actions.

In the context of the operation of the KMS, the COMMSS is responsible for executing the following tasks.

- Form a work team to define the specific requirements needed to design, budget, build and implement the support materials required to make DRR knowledge available to KMS users (films, photographs, videos, training materials, magazines, brochures, documents, and others)
- Create and design the support material, complying with the specific technical requirements defined by the work team
- Budget in the form of a project, in terms of human, material and economic resources and development time, the design of the support material
- Submit the budget prepared by the work team to the KMS Administrator for approval
- Manage the resources to build and implement the support materials, according to their type and specific requirements
- Enter into the KMS repository the technical reference data of the support materials built to facilitate access to users and stakeholders
- Periodically review the knowledge stored in the repository and the support materials for dissemination, in order to detect inconsistencies and obsolescence of content, define areas for

improvement and the need to supplement background information for specific knowledge, etc.

- Verify the access facilities to the available knowledge defined for users of the KMS, such as, for example, access to computer applications, links to specific documents, links to support materials, user passwords, search functions, among other elements that ensure and improve access to users
- Verify that all support materials available in the repository (films, photographs, videos, training materials, magazines, brochures, documents, and others) work properly or are available when users require them
- Strive for continuous improvement of the quality of the content of the System and to achieve greater usability of the knowledge available in the Repository by users and stakeholders of the KMS
- Disseminate the knowledge contained in the KMS Repository among users or stakeholders
- Publish the knowledge available in the repository, useful for DRR, in newspapers, brochures, specialized magazines, in order to make the available knowledge known
- Encourage the use for DRR of the knowledge available in the KMS Repository
- Facilitate and encourage the access of users or stakeholders to support materials (films, photographs, videos, training materials, magazines, brochures, documents, and others)
- Prepare an action plan that establishes objectives to encourage the use of the knowledge available in the repository by the different types of users or stakeholders, grouping them according to their characteristics of use of the information
- Measure the interactions of the System's stakeholders with the knowledge available in ONEMI's KMS Repository, in order to provide statistical data that allow the KMS Administrator to develop the management control process according to the defined indicators
- Interact with the users of the KMS in order to obtain their opinion regarding the quality, timeliness and value of use of the knowledge available in the System, in order to achieve continuous improvement of the processes of the essential functions of the KMS, in form and substance of its products

Accordingly, the following text is proposed for the specific task to be fulfilled by the role of Communications Specialist, which should be incorporated as a fundamental task in the organization of the Communication and Broadcasting Department of the Cabinet.

"To execute the tasks defined in the Knowledge Availability process of ONEMI's Knowledge Management System".

The Head of the Communication and Broadcasting Department shall maintain management command over the position that fulfills this role.

The Head of the Knowledge Management Unit shall exercise a "matrix technical coordination" action over the position that performs this role, providing technical support to the Head of the Communication and Broadcasting Department, in the execution of activities and the use of resources to achieve the specific tasks established in the process of "Availability of knowledge" of the KMS.

5.4.4. Development and Projects Department

The proposal considers placing the role of Research and Development Specialist (RDS) in the Development and Projects Department of the National Administration due to the affinity of its essential purpose with the mission of that entity, as shown in Figure 2.5.4.12.

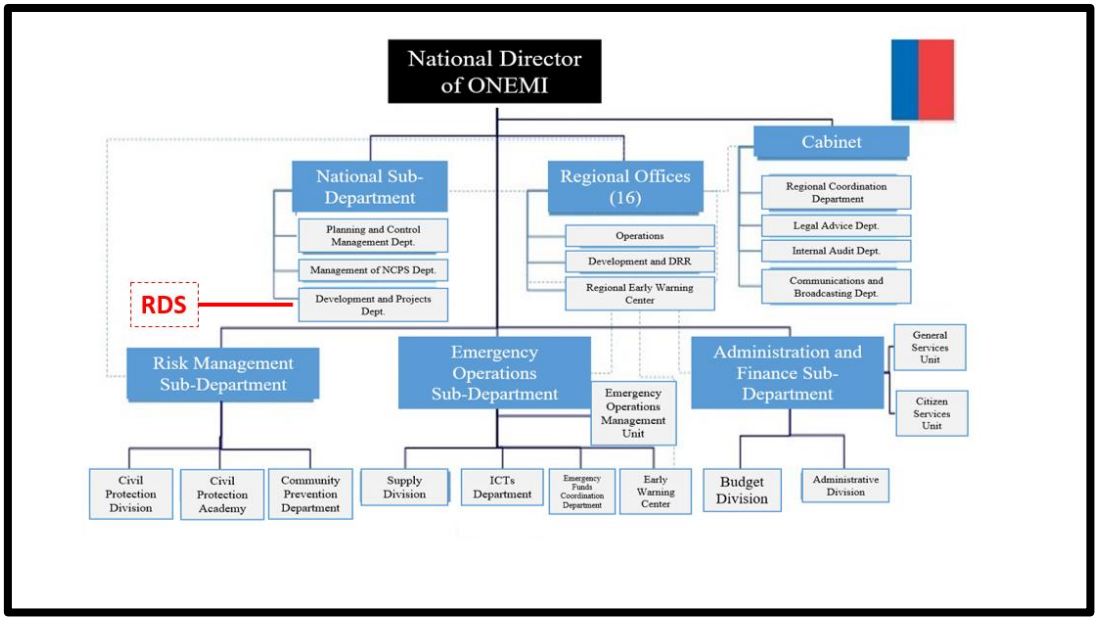


Figure 2.5.4.12 Role of Research and Development Specialist in ONEMI's Structure

This role should comply with the specific tasks of the "Research and Development" process, which is associated with the "Knowledge Processing" function of ONEMI's KMS operating model for DRR, as shown in Figure 2.5.4.13.

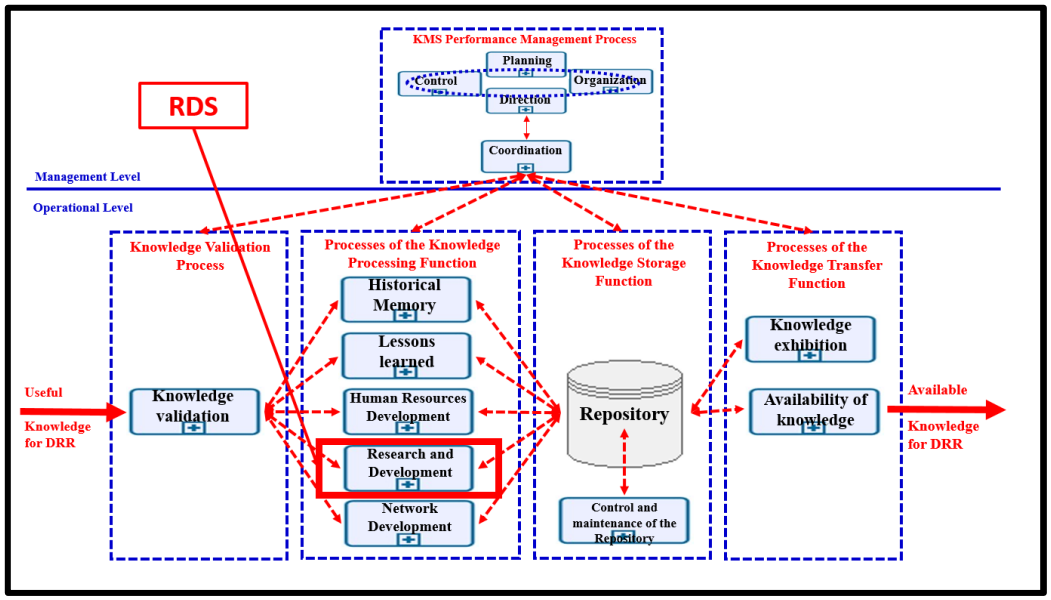


Figure 2.5.4.13 Role of Research and Development Specialist in the KMS Operating Model

The Head of the Development and Projects Department shall designate a position within his entity to perform the role of "Research and Development Specialist" of the KMS, being responsible for the preparation of Research and Development Reports (RDR) and their processing, from the verification of their relevance to their entry into the KMS Repository.

In the context of the functioning of the KMS, the RDS is responsible for executing the following tasks.

- Verify the relevance of the Knowledge Reports assigned by the ADM, in terms of compliance with the essential specifications defined to be managed as Research and Development
- If the Knowledge Report does not contain all the main essential specifications to be processed as Research and Development, request the entity responsible for the report to complete the background information
- Process the Knowledge Report assigned by the ADM
- Define a research thesis that is useful for DRR and send it to the DRR Specialist to review the content of the thesis regarding the DRR concepts used in ONEMI
- Complete the thesis considering reference costs and financing feasibility, and elaborate a research thesis proposal that forwards it to the ADM for approval
- Proceed to identify research centers that have the human and material infrastructure to carry out the research
- Advise the ADM in the bidding process, regarding
    - Prepare the terms of reference
    - Request the corresponding proposal from each center
    - Prepare and formalize the respective contractual documents

- Follow up on the investigation process and ensure that the corresponding study reports are received for approval by ONEMI authorities and define a system for incorporating new information on each event as it arises over time
- Prepare a Preliminary Research Report.
- Send the Research and Development Report to the Dissemination Specialist to propose the communication elements and, in parallel, to the DRR Specialist to review the coherence of the contents of the report with respect to the DRR concepts used in ONEMI
- Prepare and submit to the ADM for review, a proposal for the Research and Development Report, taking into consideration the preliminary Report, the proposal of communication elements and the proposal with the modifications regarding DRR concepts
- Enter the Research and Development Report approved by the ADM to the KMS Repository in order to make it available to the KMS Stakeholders

Consequently, the following text is proposed for the specific task to be fulfilled by the Research and Development Specialist role, which should be incorporated as a fundamental task to the organization of the Development and Projects Department of the National Administration.

"To execute the tasks defined in the Research and Development process of ONEMI's Knowledge Management System".

The Head of the Development and Projects Department will maintain management command over the position that fulfills this role.

The Head of the Knowledge Management Unit shall exercise a "matrix technical coordination" action over the position that performs this role, providing technical support to the Head of the Development and Projects Department, in the execution of activities and the use of resources to achieve the specific tasks established in the "Research and Development" process of the KMS.

5.4.5. Management Department of the National Civil Protection System

The proposal considers placing the role of Network Development Specialist (NDS) in the Management Department of the National Civil Protection System of the National Sub-Department due to the affinity of its essential purpose with the mission of that entity, as shown in Figure 2.5.4.14.

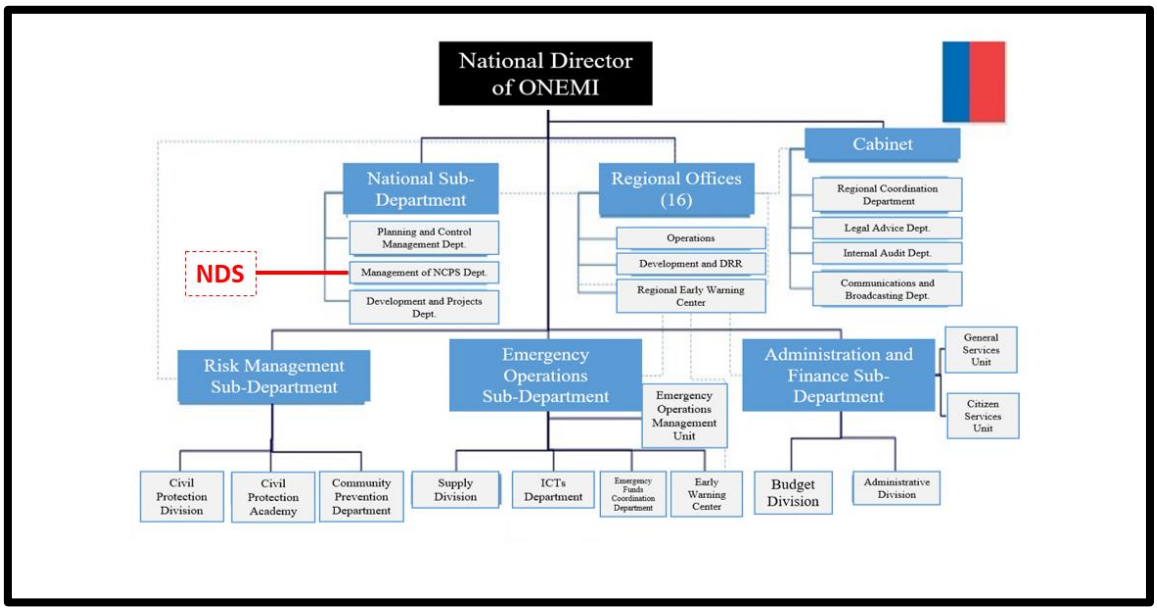


Figure 2.5.4.14 Role of Network Development Specialist in the ONEMI Structure

This role should comply with the specific tasks of the "Network Development" process, which is associated to the "Knowledge Processing" function of ONEMI's KMS operating model for DRR, as shown in Figure 2.5.4.15.

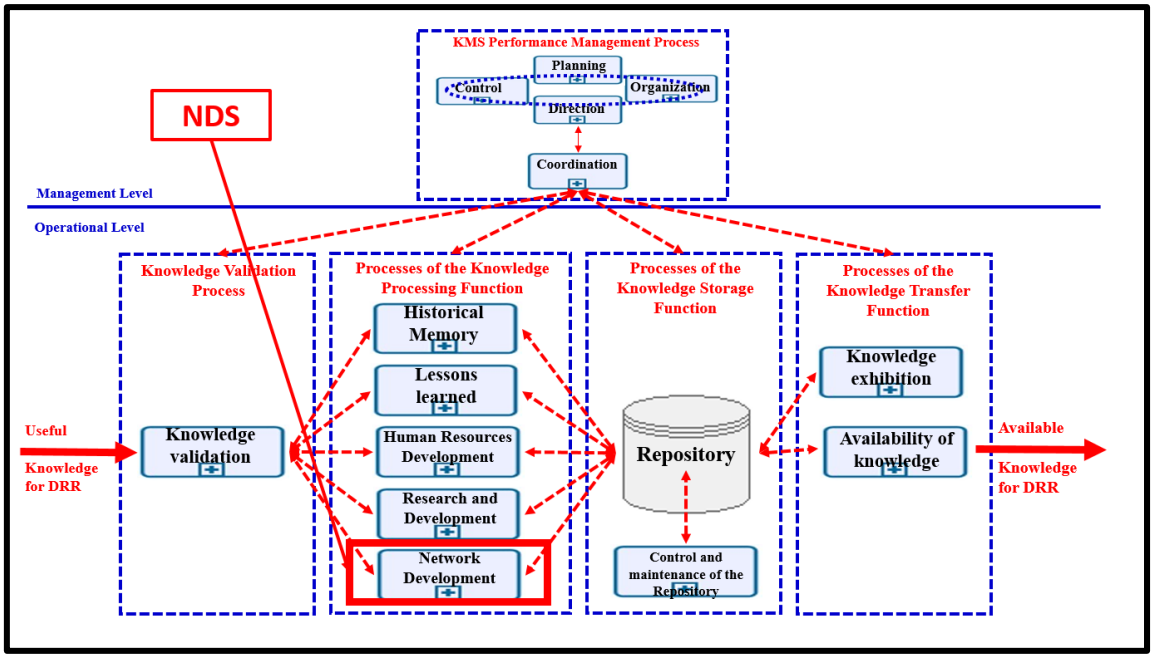


Figure 2.5.4.15 Role of Network Development Specialist in the KMS Operating Model

The Head of the Management Department of the National Civil Protection System shall designate a position within their entity to perform the role of "Network Development Specialist" (NDS) of the KMS, being responsible for the preparation of the Network Development Reports (NDR) and their processing, from the verification of their relevance to their entry into the KMS Repository.
In the context of the functioning of the KMS, the NDS is responsible for executing the following tasks.

- Verify the relevance of the Knowledge Reports assigned by the ADM, in terms of compliance with the essential specifications related to the Network Development function
- If the Knowledge Report does not contain all the main essential specifications to be processed as Network Development, request the entity responsible for the report to complete the background
- Identify the specific requirement formulated by the ONEMI Entity, regarding a need to have the capacity to insert itself in the knowledge society of disaster risk reduction, generating bridges that promote the exchange of knowledge and alliances that allow linking with national and international organizations
- Review the network registry to verify if the requirement can be satisfied by any of the agreements in force
- If the NDS finds any agreement in force that satisfies the requirement, the NDS informs the Entity and the ADM and closes the requirement without preparing a Network Development Report, thus ending the process
- If the requirement cannot be satisfied by any of the agreements or conventions in force, the Network Development Specialist investigates the networks available at the national and global levels, analyzes the need to establish formal links, applying selection models based on variables with their respective weightings. They must also identify the resources required for their satisfaction and, if they are within the budget, take the necessary steps to allocate them.
- If necessary, propose to the ADM the required agreements or arrangements
- Prepare a preliminary Network Development Report
- Send the preliminary Network Development Report to the Dissemination Specialist to propose the communication elements and, in parallel, to the DRR Specialist to review the coherence of the contents of the report with respect to the DRR concepts used in ONEMI
- Prepare and submit to the ADM for review, the final Network Development Report proposal, taking into consideration the Preliminary Report, the proposal of communication elements and the proposal with the modifications regarding DRR concepts
- Enter the Network Development Report approved by the ADM to the KMS Repository in order to make it available to the KMS Stakeholders

Consequently, the following text is proposed for the specific task to be fulfilled by the role of Network

Development Specialist, which should be incorporated as a fundamental task to the organization of the National Civil Protection System Management Department of the National Sub-Department:

"To execute the tasks defined in the Network Development process of the ONEMI's Knowledge Management System".

The Head of the National Civil Protection System Management Department will maintain management command over the position that fulfills this role.

The Head of the Knowledge Management Unit shall exercise a "matrix technical coordination" action over the position that performs this role, providing technical support to the Head of the National Civil Protection System Management Department, in the execution of activities and the use of resources to achieve the specific tasks established in the "Network Development" process of the KMS.

5.4.6. Entities of ONEMI's Higher Structure

The proposal considers that each entity of the higher structure (National Administration through the Cabinet, Regional Offices, National Sub-Department, Risk Management Sub-Department, Emergency Operations Sub-Department and Administration and Finance Sub-Department) should designate a position that assumes the role of Head of the ONEMI Entity (HENT), as shown in Figure 2.5.4.16.

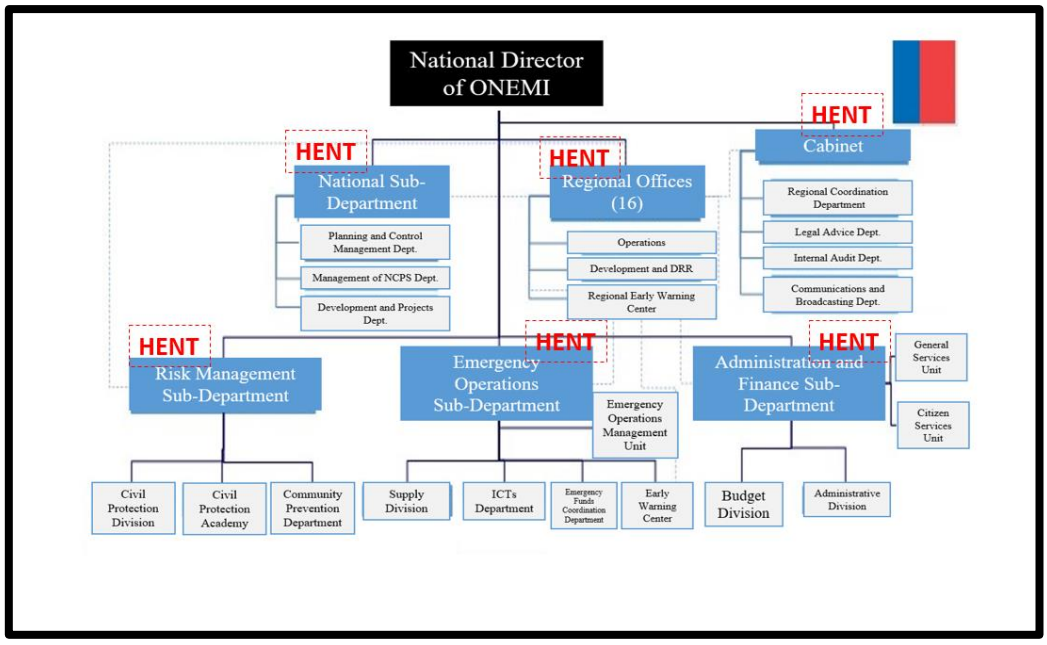


Figure 2.5.4.16 Role of the Head of the ONEMI Entity in the ONEMI Structure

This role is directly associated with the "Knowledge Validation" process of the "Knowledge Management" Function, as shown in Figure 2.5.4.17, as well as it interacts with the processes of the essential functions (Historical Memory, Lessons Learned, Human Resource Development, Research

and Development, and Network Development) of the "Knowledge Processing" Function of the ONEMI KMS Operating Model for DRR.

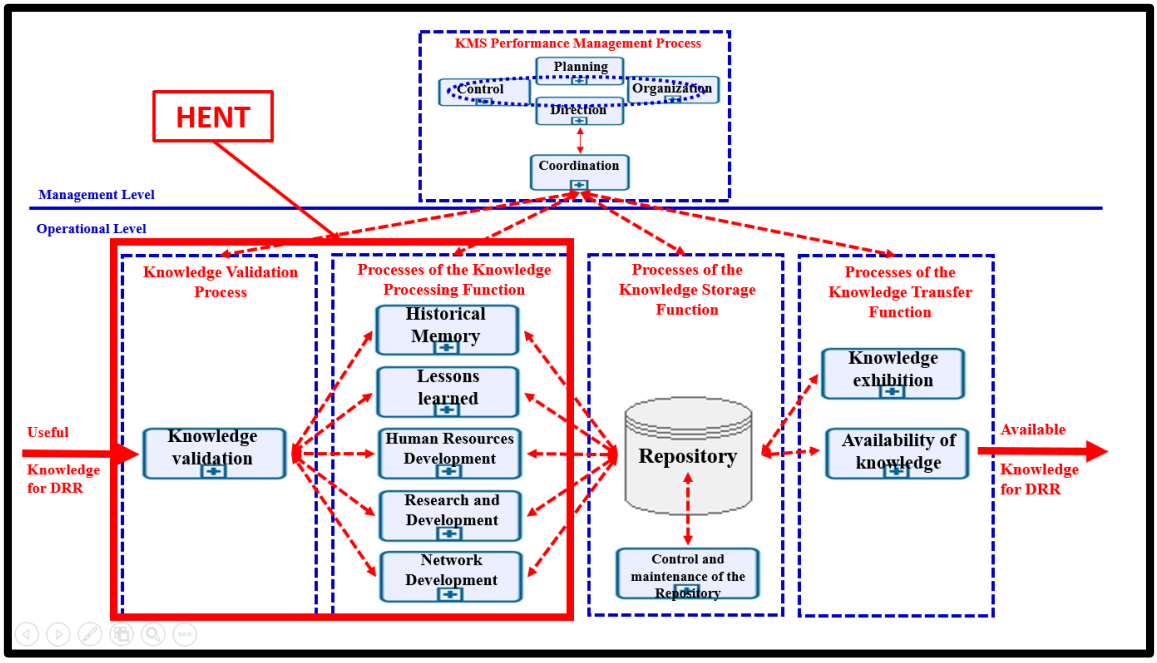


Figure 2.5.4.17 Role of the Head of the ONEMI Entity in the KMS Operating Model

This role is performed by a person from each of the entities of ONEMI's higher structure, who is responsible for preparing the Knowledge Reports, Context Reports and interacting with the KMS regarding the format and content.

In the context of the functioning of the KMS, the HENT is responsible for executing the following tasks:

- Prepare and submit for management by the KMS, the knowledge reports and context reports with their objects that have been processed by ONEMI's organic entities
- Complete and resubmit, if applicable, the background of knowledge reports and context reports with their objects, which have been returned by the KMS or the specialists of the essential functions
- Interact with the processes of the essential functions (Historical Memory, Lessons Learned, Human Resource Development, Research and Development and Network Development) in order to provide background information required to prepare the Reports of the specific functions

Consequently, the following text is proposed for the specific task to be fulfilled by each role of Entity Responsible, which should be incorporated as a fundamental task to the organization of the respective

entities of ONEMI's higher structure.

"To prepare the Knowledge Reports and Context Reports that the unit requires to submit to the KMS to be managed as useful knowledge for disaster risk reduction."

The Heads of the entities of ONEMI's superior structure will maintain the management command over the positions that fulfill this role.

The Head of the Knowledge Management Unit shall exercise a "matrix technical coordination" action over the positions that perform this role, providing technical support to the Heads of the entities of ONEMI's superior structure, in the execution of the activities and the use of the resources that allow achieving the specific tasks established in the KMS processes in which they participate.

Part 3 Implementation Strategy, Roadmap, and Action Plan

1. Strategy for the implementation of the KMS at ONEMI

1.1. The Knowledge Management System in the ONEMI structure

In Part 2 of the present work, the development of the "Conceptual Design of the Knowledge Management System" was presented, which was drafted to be applied in ONEMI, an organization that will add to the tasks currently in force those contemplated in the model, in order to achieve the objective of Disaster Risk Reduction.

Since this implies incorporating a new system to ONEMI, some basic conditions must be considered for the successful implementation of the system, we refer mainly to the commitment that the authorities of the organization must assume with this activity, assigning priority to the activities that are carried out as well as the resources that are necessary; in addition to the above, it is no less important that all staff is committed to the task. For this to be achieved, it is essential to train everyone at different levels on the knowledge of the system, highlighting the importance of its implementation in disaster risk reduction, which is a fundamental mission of ONEMI.

The KMS to be implemented has a central element that refers to the "knowledge management" function, which given the current characteristics of ONEMI, it is deemed necessary to create an entity that assumes this responsibility, taking into account the complexity and importance of this role in the KMS. In addition, the essential functions of the system (Historical Memory, Lessons Learned, Human Resource Development, Research and Development, Network Development, Knowledge Availability, Knowledge Exhibition and the Repository) should be assigned to the current organizational structure.

The analysis of the "Assignment of the roles of the KMS processes to ONEMI entities, according to the missions and related tasks", contains a review of the fundamental tasks of all ONEMI entities established in the Organic Operating Regulations (ROF in Spanish) of ONEMI in force and establishes the affinities with the functions of the Knowledge Management System, which allows proposing which entities will have the greatest affinity with these functions.

Based on this, the entities that will assume responsibilities of the KMS are proposed, which will be assigned the fundamental tasks to be added to those existing in the ROF , as well as the creation of an entity called "Knowledge Management Unit" (UGC in Spanish), which will be located in the Civil Protection Division of the Risk Management Sub-Directorate.

The Knowledge Management Unit will be led by the System Administrator, who will carry out the management considering a matrix structure, in which the bodies indicated in the following table are created for the functions indicated and which will report directly to him.

Sub-Department	Superior Unit	Function
Risk Management Sub-Department	Civil Protection Division	System Administration
		Repository
		Lessons learned
		Historical memory

The rest of the functions will be distributed as follows.

Sub-Department	Superior Unit	Function
Risk Management Sub-Department	Civil Protection Division	Human resource development
National Sub-department	Development and Projects Dept.	Research and development
National Sub-department	Management of NCPS Dept.	Network development
Cabinet	Dissemination Unit	Knowledge exhibition
Cabinet	Communications Unit	Communications

The graph in figure 3.1.1 shows how the organic structure of ONEMI, including the KMS, looks like.

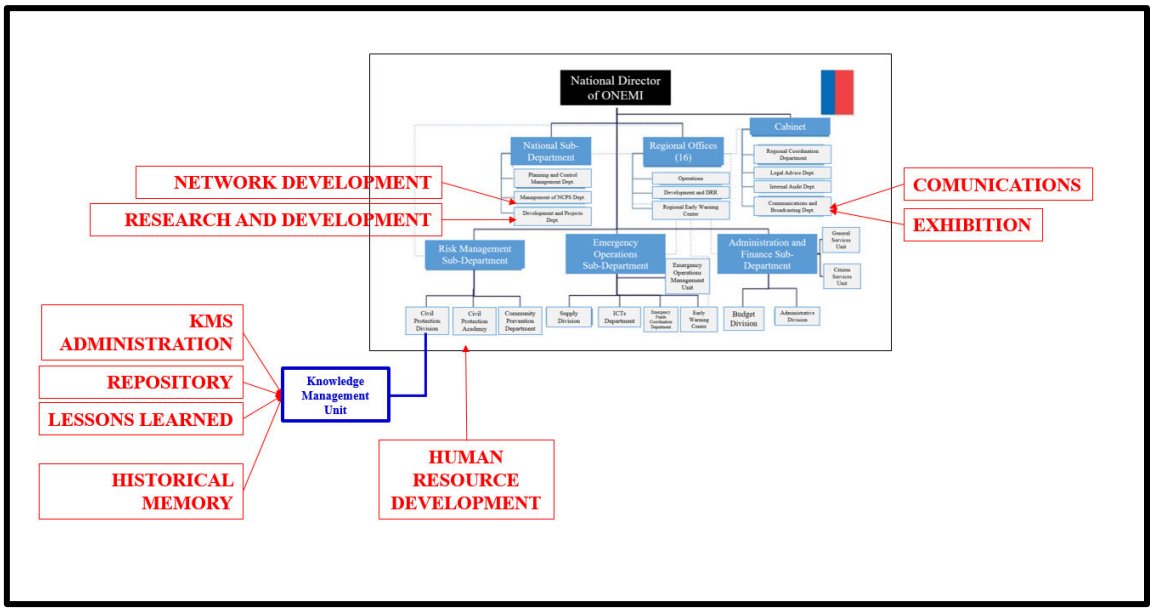


Figure 3.1.1 Organizational structure of ONEMI including the KMS

For those functions that do not have a direct affinity with those of the organizations described in the

ROF, since it is a new design in the institution, the creation of an entity is contemplated, depending on the Civil Protection Division of the Risk Management Sub-Administration, called "Knowledge Management Unit" (KMU), which will assume the essential purpose of the KMS, operating with a matrix-type structure.

Consequently, the management of the system must maintain a coordination relationship with the heads of the units in which the functions that do not depend on the KMU are framed.

Figure 3.1.2 shows the relationship between the Knowledge Management Unit and the entities responsible for the functions assigned to other ONEMI agencies.

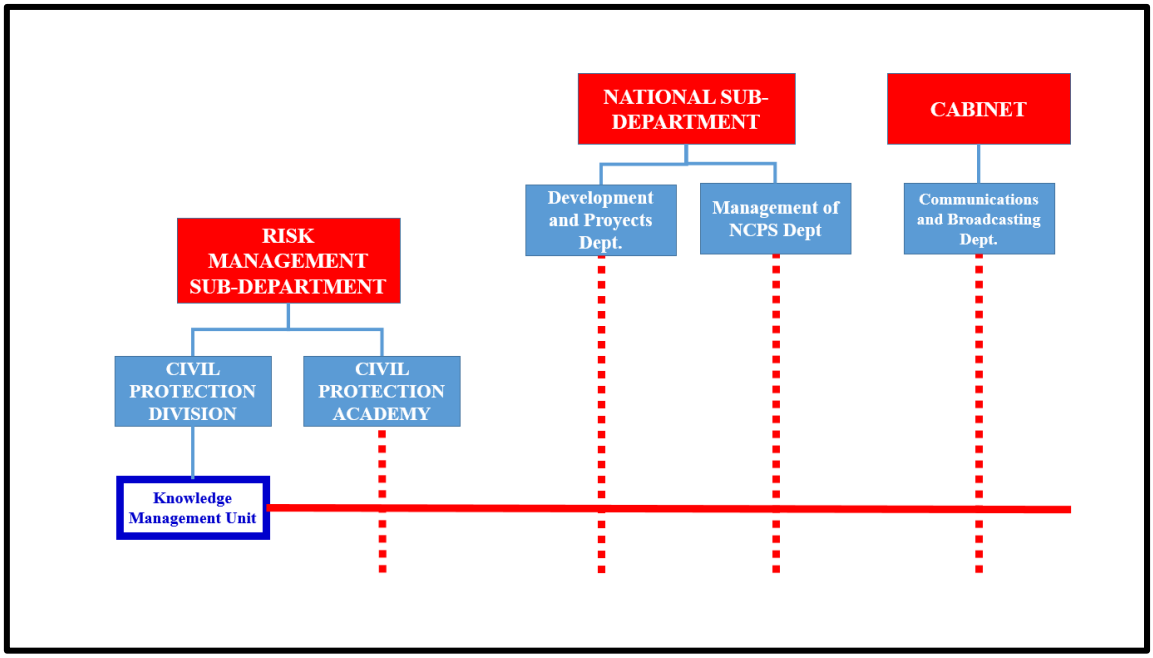


Figure 3.1.2 Matrix structure of the KMS

Another aspect that requires special attention is the IT function, considering that it will have a relevant role in the future incorporation of the system. Specifically, even though there is an ICT unit in the Emergency Operations Sub-Department, it has been estimated to consider the Repository as an entity of the Knowledge Management Unit, taking into account that it is an essential activity of the knowledge that enters, is processed and leaves the system.

As a consequence, it is necessary to complement the aforementioned design by defining an implementation strategy that allows the incorporation of the system to the ONEMI organization, for which the actions to be carried out on the organizational structure and its operation will be indicated. However, the aforementioned actions need to be implemented in an organization that has the organizational aspects updated, for which the organizational analysis will be considered in a first stage that allows making the necessary adjustments, taking into account that it is normal that in time the

aforementioned revision and subsequent regulatory formalization will be required.
This update, which corresponds to an organizational analysis, is essential to incorporate new tasks into the organization. This activity must be done with the support of the structure, particularly its authorities, led by the Risk Management Sub-Department and approved by the National Director.
The incorporation of new activities defined in the KMS to the entities of ONEMI's structure is analyzed taking into account the tasks assigned to each of them by the Organic and Operating Regulations, and it is determined which are those that have affinity with the new tasks imposed by the system, which will be incorporated to their fundamental tasks. This affinity has been defined in the model considering ONEMI's upper structure (General Directorate, Cabinet, Regional Offices, National Sub-department, Risk Management Sub-Department, Emergency Operations Sub-Department, Administration and Finance Sub-Department) and within them, specifically units at the Division, Academy, Department and Minor Units levels. These entities will be responsible for the operation of the specific functions of the KMS and its related processes. Once these tasks have been incorporated, the position profile of those who will have responsibilities in the system must be defined.

1.2. Phases of implementation

The following phases of implementation will be described in greater detail in subsequent chapters. On the other hand, it should be borne in mind that, given the size of the system and the large number of requirements that this KMS implementation process considers, it is deemed convenient to draw up a schedule that adjusts to the availability of human and economic resources, as will be shown in the roadmap and action plan.

1.2.1. First Phase "Creation of the Knowledge Management Unit”

This unit will be the engine of the KMS and is considered to start with the basic functions of the KMS, such as administration, which plans, organizes, directs, controls and coordinates the system, lessons learned and historical memory, considered as a natural expected value of the system. In addition, the repository is considered, which has a fundamental participation in the input, process and output of the KMS.

1.2.2. Second Phase "Implementation of KMS functions”.

The KMS functions to be implemented are:

- System administration.
- Historical Memory.
- Lessons Learned.
- Repository.

- Human Resource Development.
- Research and Development.
- Network Development.
- Communications.
- Exhibition.

In order to implement these agencies, some initial considerations are presented:

- The ADM must give general guidance on the system.
- For the units of its dependency:
    - Define the profiles of the heads of units for the search, selection and hiring of those responsible for each of the functions, analyzed with the Head of the Civil Protection Division, who will approve the above
    - In conjunction with the aforementioned chiefs, establish the number of personnel that each unit will have, and their profiles
    - Subsequently carry out the personnel recruitment process according to the procedures established by ONEMI in this regard
- For units dependent on other agencies:
    - In coordination with the respective Sub-Departments and Superior Units, define the profiles of the heads of units for the search, selection and hiring of those responsible for each of the functions
    - In conjunction with the aforementioned chiefs, establish the number of personnel that each unit will have, and their profiles

The implementation of functions can be distributed over time, as described in the Roadmap and Action Plan.

1.2.3. Third Phase. "Design of the process of obtaining and transforming information into knowledge"

To complete the KMS process, it is required to incorporate the generation of useful knowledge inputs for DRR to be performed by ONEMI entities, as internal suppliers of the KMS, so the process of obtaining information must be designed.

Once this information is received, it should be transformed into knowledge to prepare knowledge reports that enter the KMS, so the respective transformation process should be designed.

1.2.4. Fourth Phase "Preparation of ONEMI's organizational and functional structure”

The purpose of this phase is to review ONEMI's current organizational structure in order to ensure that

the incorporation of new activities into the system is carried out in accordance with ONEMI's current work and thus facilitate the functioning of the KMS. In this regard, it should be noted that it is normal for organizations to require a study to optimize their operations from time to time, particularly before adding tasks to better fulfill their mission. Given these characteristics, it should undoubtedly be materialized with the means of the organization's own structure.

It is understood that this activity is not part of the KMS, however, it is highly recommended to consider it and once it is done, it should be checked what was considered in the KMS study regarding the tasks of ONEMI's Organic and Operational Regulations.

2. Roadmap

The roadmap is used as one of the high-level tools to face the KMS implementation process, in which the phases indicated above will be presented distributed over time.

Considering the characteristics of the implementation process, it will be presented in two stages, taking into account that the activities that ONEMI must face on a regular basis present an important requirement to the structure, it can be inferred that there are limitations in the availability of human, material and financial resources.

In this context, the first stage incorporates those activities that allow shaping the KMS, defining those administrative aspects that are indispensable (formalization of the project), as well as those functions that will be rooted in the creation of the knowledge management unit (Knowledge Management Unit), and in the implementation of the KMS Administration, Historical Memory, Lessons Learned and Repository functions. Likewise, the Knowledge Transfer function will also be considered at this stage.

The second stage contemplates the implementation of the Human Resources Development, Research and Development, and Network Development functions, in addition to the completion of the first stage.

In this second stage, the phases of "Design of the processes for obtaining and transforming information" and "Preparation of ONEMI's organizational and functional structure" are added, which are not part of the designed KMS, but are necessary for the proper functioning of the system in ONEMI.

As for the assigned times, the following are considered:

- That the decision to implement the KMS is a priority for ONEMI, which implies that the necessary support will be provided.
- That the resources required for each stage will be allocated.
- That at the time of making the decision, the proposed times should be reviewed based on ONEMI's workload, the availability of assigned personnel and the professional experience of the members in these matters.

It is recommended that the implementation of the historical memory and lessons learned functions be initiated using the information that is available in Central ONEMI's archives, allowing for useful results in a relatively short period of time.

The tentative roadmap presented below considers a high-level graph of the project presented in a schedule that considers 18 months of duration, which is likely to vary, according to what is defined at the time of implementing the project as indicated above.

ROADMAP FOR KMS IMPLEMENTATION																		
N°	ACTIVITY	MONTHS																
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

First Stage																			
1	Formalization of the project.	x	x																
2	Creation of the Knowledge Management Unit.			x	x														
3	Implementation of KMS functions. (KMS Administration, Historical Memory, Lessons Learned, Repository and Knowledge Transfer).					x	x	x	x	x	x								
Second Stage																			
4	Update on the creation of the Knowledge Management Unit. (*)											x							
5	Implementation of KMS functions (Human Resource Development, Research and Development, and Network Development).											x	x	x					
6	Design of the process for obtaining information and transforming this information into useful knowledge for DRR.											x	x	x	x	x	x		
7	Preparation of ONEMI's organizational and functional structure.															x	x	x	x

(*): only in the case that the stages are distant in time and therefore have not been developed in the first stage.

3. Action Plan

The Action Plan will detail the activities corresponding to the phases previously indicated in the Roadmap, considering the duration of the phases that were proposed as assumptions. Regarding the sequence of the phases, it is highlighted that the formalization of the implementation project, the creation of the knowledge management unit and the implementation of the Administration, Historical Memory and Lessons Learned functions are considered first (the functions not mentioned should be programmed later), and it is also suggested that the above is treated together as a package, in the same order and sequential, while the design of the obtaining and transformation processes and the preparation of the organizational structure can be conducted before, in parallel or after those aforementioned.

A special mention should be the repository, which participates in the entire sequence: obtaining, transformation, entering into the KMS and its subsequent process and dissemination; consequently, it is suggested to be considered with high priority.

3.1. Formalization of the "Implementation of the KMS" Project.

The formalization of a project is necessary to achieve the final objective of having an ONEMI's knowledge management system that operates efficiently, and develop a set of activities that require a direction that guides those responsible for them.

Then, to conduct the implementation, the following initial activities are considered:

- Define the objective and scope of the project to later formalize them in a "Project Charter", a document that formally authorizes the project and documents the initial requirements that satisfy the needs and expectations of stakeholders
- Appoint a Project Manager dependent on the Risk management sub-administration (Civil Protection Division), with sufficient authority to interact with other sub-administrations, and with the National Sub-department and National Directorate
- Study in detail the Knowledge Management Conceptual Design, by the Project Manager. Once this is done, meetings should be held with ONEMI's authorities in order to receive guidance on the system to be implemented
- Form a project team, in which it is considered:
    - People who will have exclusive dedication to the project
    - People responsible for essential functions who work with the project as a matrix, therefore having a double dependence, on the one hand, on their usual work agency and on the other, on the project manager. The specialists that are defined will also be integrated.

- Hold meetings to achieve an understanding between the specialist team of the system and the ONEMI expert team, as to what are the current processes of the Institution and what are their expectations regarding the implementation of the system
- Prepare the project planning:
    - Establish the products of the project
    - Define the objective and scope of the final project
    - Create the work breakdown structure (WBS)
    - Define the activities
    - Sequence the activities
    - Estimate the duration of the activities
    - Formalize the project plan
- Disseminate the Knowledge Management Conceptual Design and the Project Plan to:
    - All ONEMI staff
    - Project Team (in detail)

A referential action plan proposal is presented below, which is consistent with the Roadmap mentioned in the previous point.

3.1.1. First Phase "Creation of the Knowledge Management Unit"

The Knowledge Management Unit will be the engine for the operation of the System and it is structured from the basic functions of the KMS, such as: Knowledge management, which plans, organizes, directs, controls and coordinates the System; Lessons Learned and Historical Memory, considered as a natural expected value of the System. In addition, the Repository is considered, as it has a fundamental participation in the entry, process and output of the KMS.

- Describe the current organizational structure of ONEMI
- Describe the need to be satisfied with the creation of the KMS (see KMS Conceptual Design)
- Define the mission of the Unit that is created
- Propose definition of the unit:
    - The hierarchical dependence of the Civil Protection Division of the Risk Management Sub-Administration is set out in the Conceptual Design of the Knowledge Management System, where this dependence is justified given the missions that the aforementioned Division has in the Organic and Functioning Regulations of ONEMI, which must be analyzed and subsequently ratified by ONEMI's authorities.
    - Define the magnitude of the unit, it is estimated that it could be a Department, that is, "Knowledge Management Department" (DGC in Spanish).
    - Conduct the subdivision of tasks in the Knowledge Management Department,

considering the functions Knowledge Administration, Historical Memory, Lessons Learned, Coordination of functions and Information Storage.

- Appoint the heads of ONEMI's organic units as responsible for the other functions that will not depend directly on the Knowledge Management Department.

Organic Unit	Function
Civil Protection Unit	Human Resource Development
Development and Projects Department	Research and Development
NCPS Management Department	Network Development
Dissemination Unit	Knowledge Exhibition
Communications Unit	Knowledge Availability

- Diagram and describe the processes for the operation of the unit created in the context of ONEMI
- Identify the positions and the number of personnel necessary for the unit according to the operation described above
  - Analyze the activities to be conducted by each function, as indicated in Chapter 3 of Part 2
  - Describe the positions of the Knowledge Management Department, to conduct the activities indicated above
- Describe the job profiles
  - For the Knowledge Management Department dependency units:
    - Define the profiles of the heads of units for the search, selection and hiring of those responsible for each of the functions, analyzed with the Head of the Civil Protection Division, who will approve them
    - In conjunction with the aforementioned Heads, establish the number of personnel that each unit will have, and their profiles
    - Subsequently, conduct the process of obtaining personnel in accordance with the procedures established in ONEMI in this regard
  - For units dependent on other agencies:
    - In coordination with the respective Sub-Administrations and Superior Units, define the profiles of the heads of units for the search, selection and hiring of those responsible for each of the functions
    - In conjunction with the aforementioned Heads, establish the number of personnel that each unit will have and their profiles

- Allocation of infrastructure for operation of the unit

  Those requirements of the functions that depend directly on the Knowledge Management Department are mainly considered and eventually of the other functions that cannot be satisfied by the responsible units.
- Define material and equipment for the operation of the unit.
  - Identify the needs (furniture, computers, printers, networks, etc.), with the participation of those responsible for the functions
  - Process requirements for the acquisition
  - Arrange acquisition for the agencies in charge
- Define budget for the creation of the unit and for its subsequent operation
- Request the necessary resources as stated in the previous point
- Propose text to incorporate the Knowledge Management Department into the ONEMI Organic and Functioning Regulations

3.1.2. Second Phase "Implementation of the KMS functions".

The KMS functions to be implemented are:

- KMS Administration
  - Prepare the KMS planning and disseminate it to the organizations and people involved
  - Prepare the organizational documentation, which must subsequently be kept up to date
  - Develop actions to guide, deliver information and train managers on the KMS
  - Define control mechanisms for both the objectives and the operating processes
  - Coordinate with those responsible for the functions the KMS operating procedures, particularly information flows with the participation of ONEMI's entities
  - Define the requirements that the knowledge reports and context reports issued by ONEMI entities must meet, as well as the specifications of the essential functions (Lessons Learned, Historical Memory, Human Resource Development, Research and Development and Network Development) to be managed by the KMS
  - Train the Heads of ONEMI's entities in the preparation of knowledge reports and context reports, regarding the interpretation and application of the requirements
  - Provide guidance to those responsible for ONEMI's Entities to present the knowledge reports and context reports with their corresponding objects that have been processed by ONEMI's organic entities
  - Coordinate and facilitate the interaction of the specialists of the essential functions of the KMS with those responsible for ONEMI's entities, for the processing of the

reports

- Historical Memory
    - Appoint the Historical Memory Specialist from the KMD
    - Appoint specialists in Disaster Risk Reduction and Communications. In the event that you do not have this type of specialist in your unit, request the designation from the system administrator
    - Propose the requirements that the historical memory knowledge report must meet
    - Prepare a booklet with instructions to comply with the provisions of the historical memory process

- Lessons Learned
    - Appoint the specialist in lessons learned from the Knowledge Management Department
    - Appoint specialists in Disaster Risk Reduction and Communications. In the event that you do not have this type of specialist in your unit, request the designation from the system administrator
    - Propose the requirements that the lessons learned knowledge report must meet
    - Prepare a booklet with instructions to comply with the provisions of the lessons learned process

- Information Storage (Repository)
    - Designate the person in charge of: Software platform, Equipment platform, Network platform, Electric power supply, Information security platform, Technical support. It should be noted that those aspects that are outsourced also require a person in charge of the function to interact with the suppliers
    - Define the process of entry of knowledge into the repository
    - Define the knowledge processing activities
    - Define the knowledge storage process
    - Define the output process of information
    - Disseminate and train stakeholders regarding the repository processes, with special attention to those who will have an important interaction with the system
    - Analyze the software platform that was developed in the KMS Design, to implement the system applications, and complement them if necessary
    - Define the necessary equipment platform for the operation of the system and implement it in the units that require it

- Implement the necessary networks at different levels
- Define and implement the security system of the KMS
- Define and implement technical support for software, equipment, networks and security platforms

- Human Resource Development
  - Appoint the specialist in human resource development of the Civil Protection Unit
  - Appoint specialists in Disaster Risk Reduction and Communications. In the event that you do not have this type of specialist in your unit, request the designation from the system administrator
  - Propose the requirements that the human resource development knowledge report must meet
  - Prepare a booklet with instructions to comply with the provisions of the human resource development process

- Research and Development
  - Appoint the specialist in research and development of the Development and Projects Department
  - Appoint specialists in Disaster Risk Reduction and Communications. In the event that you do not have this type of specialist in your unit, request the designation from the system administrator
  - Propose the requirements that the research and development knowledge report must meet
  - Prepare a booklet with instructions to comply with the provisions of the research and development process

- Network Development
  - Appoint the specialist in network development of the NCPS Management Department
  - Appoint specialists in Disaster Risk Reduction and Communications. In the event that you do not have this type of specialist in your unit, request the designation from the system administrator
  - Propose the requirements that the network development knowledge report must meet
  - Prepare a booklet with instructions to comply with the provisions of the network development process

- Knowledge Availability and Exhibition
    - Designate the person in charge of the Communications process, responsible for conducting the Knowledge Availability activities of the Knowledge Management Department
    - Develop criteria for the formation of working teams that will process each knowledge report that will be submitted to the knowledge transfer process
    - Develop a procedure for the processing of the working teams, specifying the way of assigning those responsible for each case. Activities that should be considered: development of dissemination material, review and transfer of available knowledge, generation of statistics and interaction with the user
    - Establish a base of candidates for the initial formation of the working teams
    - Coordinate with the Repository on the memory bank to save the knowledge and its pre-established criteria
    - Study and identify the stakeholders of the system, to determine the most appropriate dissemination strategies
    - Establish a knowledge transfer control system, indicating the measurement instruments that allow the generation of statistics and their processing
    - Designate the person responsible for the Knowledge Exhibition process of the Knowledge Management Department
    - Study alternative exhibition venues according to criteria defined by the person in charge of the function and create a tentative initial list
    - Elaborate procedures for the preparation, installation and conservation of the exhibition, as well as the interaction with the visitors to the established places

3.1.3. Third Phase "Design of the obtaining and transforming information into knowledge process"

ONEMI's entities obtain or seek information related to risks and disasters that have occurred. This information is the raw material to submit it to the transformation into knowledge process, which is the input element of the KMS. Both processes, obtaining and transforming, are conceived within ONEMI's scope of action, therefore they must be developed in this organization. It should be noted that the KMS did not consider these processes, consequently they must be developed to complete the system and implement it in the organization.

The entities involved are identified from the communal level, where the information normally originates.

There is a need to define the flows between the different levels to be covered, from the origin of the information at the communal level to the central level of ONEMI:

- Obtaining information
    - Communal level
        - Describe the process of obtaining information at the communal level
        - Define the forms of communal level information
        - Define the products delivered by the communes
    - Provincial level
        - Describe the process of obtaining information at the provincial level
        - Define the forms of provincial level information
        - Define the products delivered by the provinces
    - Regional level
        - Describe the process of obtaining information at the regional level
        - Define the forms of regional level information
        - Define the products delivered by the regions
    - National level
        - Describe the process of obtaining information at the national level
        - Define the forms of national level information
        - Define the products delivered by the national level

- Transformation of information into knowledge
    - Define requirements that the information must meet to be considered knowledge
    - Define the procedure for the transformation of information into knowledge
    - Define the process of transforming information into knowledge at the community level, at the provincial level and at the regional level, if necessary
    - Define the process of transforming information into knowledge at the national level
    - Define the procedures to manage the processes conducted at the different levels
    - Prepare forms for the transformation of information into knowledge
    - Disseminate the information-into-knowledge transformation process and forms and train those responsible for conducting them

3.1.4. Fourth Phase "Preparation of the organizational and functional structure of ONEMI"

This phase aims to review the current organizational structure of ONEMI in order to ensure that the incorporation of new activities to the system is conducted according to the current work of ONEMI and therefore, facilitate the operation of the KMS. In this regard, it should be noted that it is normal that organizations from time to time, particularly before adding tasks for the best way to fulfill the mission, require a study that optimizes the operation. Given these characteristics, it must undoubtedly be materialized with means of the organization's own structure.

It is understood that this activity is not part of the KMS, however, it is highly recommended to consider it and once conducted, check what is considered in the KMS study regarding the tasks of the Organic and Functioning Regulations.

The preparation consists of updating the Organic and Functioning Regulations of ONEMI and its processes, for which it is considered:

- Appoint a work team led by the Sub-Director of Risk Management and with the participation of a representative from each ONEMI entity
- Preparation of an executive document with the instructions for conducting the update work
- Study of the Organic and Functioning Regulations by each representative of the entities, to update the corresponding part
- Study of ONEMI's processes, to update corresponding parts
- Presentation of proposals of both studies by the entities to the Sub-Director of Risk Management
- Analysis in the sub-administration of the proposals received and preparation of the final document
- Organic and Functioning Regulations Proposal and updated processes to the National Director
- Dissemination of the Organic and Functioning Regulations (ROF) and the updated processes

Note: The third and fourth phases correspond to activities that are not directly related to the KMS, but which are recommended to be considered due to the impact they have on the success of the incorporation of the KMS into ONEMI.

3.2. Schedule of the Action Plan

ACTION PLAN FOR THE IMPLEMENTATION OF THE KMS																			
N°	ACTIVITY	MONTHS																	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Formalization of the project																			
1	Project Charter	x																	
2	KMS study	x																	
3	Appointment of personnel	x																	
4	Project Plan		x																
5	Disseminate the conceptual design		x																

ACTION PLAN FOR THE IMPLEMENTATION OF THE KMS																			
N°	ACTIVITY	MONTHS																	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Creation of the knowledge management unit																			
6	Background information of the current situation in ONEMI			x															
7	Definition of the new unit			x															
8	Operation processes of the created unit			x															
9	Definition of positions and profiles				x														
10	Infrastructure, material and equipment				x														
11	Budget and request of resources				x														
12	Text to include in the ROF				x														
KMS Role Implementation																			
13	KMS Administration					x													
14	Historical Memory					x													
15	Lessons Learned						x												
16	Repository							x	x	x									
17	Human Resource Development						x												
18	Research and Development							x											
19	Knowledge Availability and Exhibition								x										

ACTION PLAN FOR THE IMPLEMENTATION OF THE KMS																		
N°	ACTIVITY	MONTHS																
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Design of the obtaining and transforming information into knowledge process																			
20	Define flows between levels									x	x								
21	Process of obtaining information at communal level										x								
22	Process of obtaining information at provincial level											x							
23	Process of obtaining information at regional level											x							
24	Process of obtaining information at national level													x					
25	Information transformation process at communal level													x					
26	Information transformation process at provincial level														x				
27	Information transformation process at regional level														x				
28	Information transformation process at national level														x				
Preparation of the organizational and																			

ACTION PLAN FOR THE IMPLEMENTATION OF THE KMS																			
N°	**ACTIVITY**	**MONTHS**																	
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
functional structure of ONEMI																			
29	Formalize a work team															x			
30	Current situation study															x			
31	Study of processes and proposed modifications															x	x		
32	Proposal of the new ROF and structure																	x	
33	Dissemination of the new ROF																		x

Part 4 Guidelines for Collecting and Utilization of Disaster Related Information

1. Introduction

1.1. Background

JICA conducted the technical cooperation project named as “Institutional Strengthening of ONEMI for Capacity Development in Disaster Risk Reduction Project”. Under the project, the future direction of Knowledge Management System (hereinafter called as KMS) in Chile is developed. ONEMI needs to collect disaster related information from whole areas of Chile and covert it to knowledge in order for disaster related organizations and people to take actions for Disaster Risk Reduction (hereinafter called as DRR).

The materials and information related to past disasters are valuable historical materials to transfer lessons to the future generations. Such materials also can contribute to DRR in the future and effective recovery process when disaster occurs.

1.2. Purposes of the guidelines

The purpose of the guidelines is that ONEMI personnel, who are in charge of the KMS, can use them:

- for preparation of establishing KMS and operation management for KMS.
- for improving KMS functioning.
- for sharing some parts of the guidelines with related organizations in order ask them to cooperate for KMS.

2. Overview of KMS

2.1. Concept of KMS

One of the functions of ONEMI is improving DRR throughout Chile, collecting related information and converting it into knowledge. This knowledge is managed by KMS and made available to the system's stakeholders in order to use it in DRR in their respective specific activities. This concept is shown in Figure 4.2.1, Schematic of KMS operation, within the expanded Model.

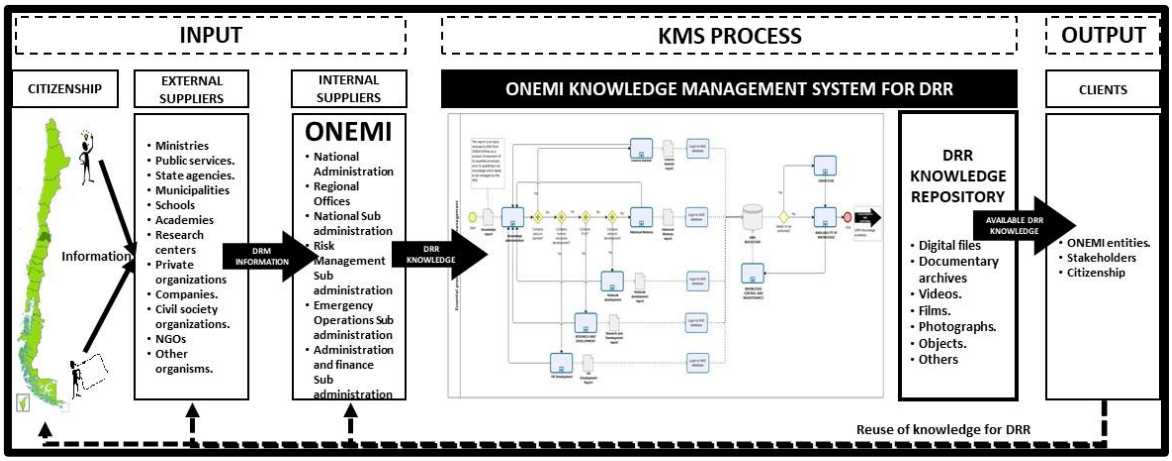


Figure 4.2.1 The scheme of operation of the KMS in the expanded Model

. The knowledge contained in the KMS is managed through the following five KMS functions:

- **Historical Memory:** It is knowledge on past disasters experiences by various level of people such as the central government, regional government, provincial, communal, community, individuals, schools, NGOs, private sectors, etc.
- **Lessons Learned:** It is knowledge based on the results from the analysis of the causes of success and failure on not only past disasters and related countermeasures but also development of a process, operation, system or project, which should be taken into account for the future.
- **Human Resource Development:** It is knowledge related to capacity development for DRR targeting various levels of people working for DRR, such as training programs, implementation of training, and monitoring/evaluation for training.
- **Research and Development:** It is the set of elements required for projects of research and development for DRR which is conducted by ONEMI individually and/or ONEMI in collaboration with related organizations
- **Network Development:** It is knowledge used to share DRR knowledge with related organizations in Chile and in the world in order to disseminate DRR knowledge to the society.

2.2. Components of KMS

The inputs considered in KMS are useful knowledge for DRR provided by ONEMI entities. They are managed, processed, stored, and transferred to related people and organizations. The detail process of these activities is mentioned in Part 2 of this document, as shown in Figure 4.2.2.

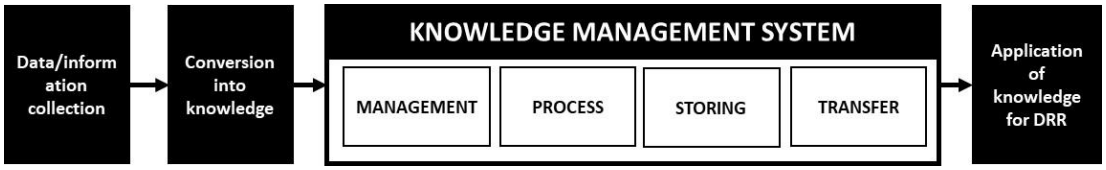


Figure 4.2.2 Main components of KMS

3. Necessity of collecting and utilization of disaster related information

3.1. Purposes of collecting and utilization of disaster related information

The knowledge entered into the KMS comes from information on disaster events obtained by ONEMI entities. It means it is necessary to differentiate between knowledge and information, that is:

- Knowledge: Knowledge is a valuable information for leading and supporting the appropriate behavior/organizational changes and decision making on DRR in individual, community, and organization levels. Knowledge covers know-how, lessons, findings verified in scientific methodology, etc. Knowledge is divided into tacit knowledge and explicit knowledge.
- Information: Information can be contextualized and categorized. Information directly cannot contribute to behavior / organizational changes and decision making on DRR in individual, community, and organization level. To covert information to knowledge, information needs to be reviewed and analyzed in appropriate practical and scientific views/methodology.

Some sets of knowledge can be produced based on past experiences. Experience is defined as a kind of memory and impact given to people and organizations by external factors and their own actions. Under the concept of KMS, experiences can be divided into experiences of past disasters and experiences obtained/produced through the activities related to DRR. Experience cannot be used for behavior/organizational changes and decision making directly. Therefore, experiences are regarded as a part of information. Figure 4.3-1 shows the importance and utilization of information for DRR as an example of disaster experiences.

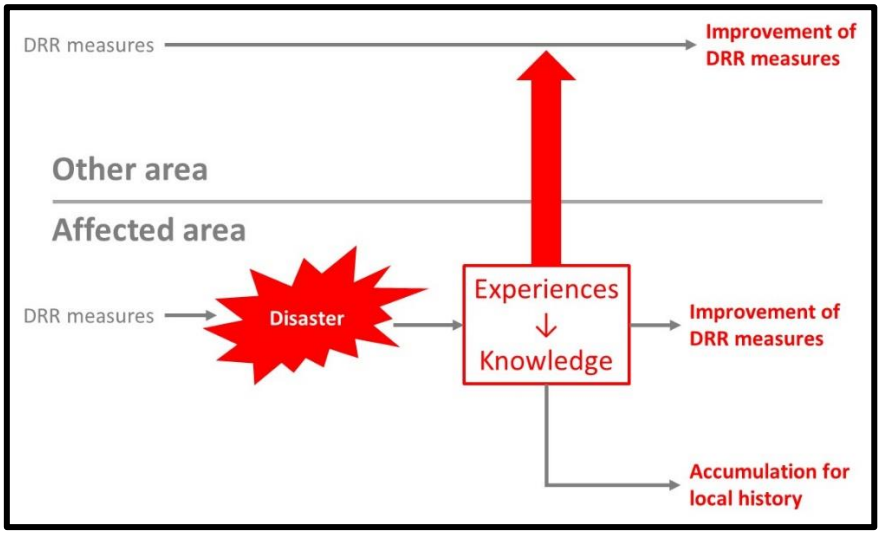


Figure 4.3-1 Importance and utilization of disaster experiences

DRR measures has been implemented in any areas although it is not sure that those measures are

enough or not. Disasters reveal invisible problems. Therefore, disaster experiences are significant to be used for the future. In a disaster affected area, experiences can be accumulated and produce the lessons which is a kind of knowledge utilized for behavior/organizational changes and decision making. Based on produced knowledge, people and related organizations can improve the future DRR measures. In addition, disaster experiences and lessons can be accumulated as a local history. In other areas, knowledge produced in affected areas can be utilized to improve DRR measures.
Therefore, information is necessary to be converted into knowledge. Knowledge needs to be utilized for enhancing DRR.

3.2. Utilization of knowledge

Table 4.3.1 shows the examples of utilization of knowledge. It is hoped to collect as much information as possible to convert into knowledge. But information is required to be collected with the aim of the utilization mentioned in this Table 4.3.1 because there are limitations on human resources, budget, etc.

Table 4.3.1 Utilization of knowledge

Utilization	Explanation
Planning	Knowledge is utilized to consider the measures against the future disasters and the revision of DRR plan and other related plans.
Training	Knowledge is utilized for training to organizations related to civil protection system.
Education	Knowledge is utilized for education in schools and universities.
Awareness Raising	Knowledge is utilized for awareness raising for general public.
Research and Development	Knowledge is utilized for innovative research on DRR and development of new technologies and good practices of knowledge application.
Network Development	Knowledge is utilized for development of collaboration network with organization related to civil protection system.

3.3. Knowledge obtained through knowledge utilization

The usefulness of knowledge becomes apparent through its application. It is important to understand how knowledge can be effectively applied, the effects of applying knowledge, and how to implement programs that utilize knowledge. These are information that can be used as a reference for applying the knowledge in different opportunities or in different places. Therefore, it is suggested that such information be documented. This is to convert the tacit knowledge of how to effectively use the knowledge into explicit knowledge. By accumulating the documented information as KMS knowledge, it can contribute to the development of research and practice.

4. Knowledge useful for DRR managed in KMS.

4.1. Future directions on collecting information

Table 4.4.1 shows the future directions on collecting information for each function of KMS. When the information is collected, the directions need to be referred.

Tale 4.4.1 Future direction of KMS functions

KMS Function	Future Directions
Lessons Learned	To get the information which can be converted to knowledge, ONEMI needs to have the network with related organizations that conduct practical activities and implementation. For the lessons of past disasters, practical and/or academic organizations can contribute to development of lessons. ONEMI needs to coordinate with them and/or to get related documented materials.
Historical Memory	Currently, there is no specific responsible organizations which can provide historical memory related to DRR. In the future, this function needs to be integrated with the National Civil Protection System in Chile. Generally, development of historical memory needs to covert tacit knowledge to explicit knowledge. It means experiences and feelings inside a person should be shown. Therefore, ONEMI needs to coordinate appropriate organizations and they conduct interviews to affected people and personnel of DRR related organizations to get explicit knowledge. In addition, ONEMI is expected to get explicit knowledge from related organizations retaining such knowledge.
Human Resource Development	DRR policy, technical guidelines, and methodology developed by other organizations are useful to utilize their important issues for the training organized by thr Civil Protection Academy. Currently, the Civil Protection Academy has relationships with related organizations. These relationships are expected to be utilized for collecting information on human resource development.
Research and Development	To enhance the quality of research and development, technical document, policy documents, etc., produced by academic institutes and government organizations are expected to be collected. ONEMI is required to consider how the collected materials are used for the future research and development.
Network Development	For the network development, information on collaboration works among related organizations including ONEMI are useful to consider for future collaboration. But information on this purpose is expected to be limited. ONEMI is required to collect documents and information of the collaborative projects and show the future directions on how the network should be developed for the future DRR.

4.2. Classification of information

ONEMI collects information related to disaster events and converts it into useful knowledge for DRR. This knowledge is sent by ONEMI entities to the KMS to be managed and made available to the System's stakeholders. Knowledge converted from information needs to be used for consideration and implementation of DRR measures. The classification of information is utilized for the following

purposes.

- To provide information comprehensively for ONEMI to collect in the future;
- To understand the characteristics of the information to be collect before collection activities;
- To understand the balance of information which is planned to be collected and information which has been collected already:

ONEMI aims that stakeholders on the civil protection system, the community, and individuals consider and implement DRR measures with the utilization of knowledge provided by KMS. Information is the basis of knowledge. Therefore, the information classification needs to emphasize the contribution to consideration and implementation of DRR measures. This section proposes the three categories of information with its necessity as shown in Table 4.4.2. Based on these necessities, subdivision matters of each category are suggested in Table 4.4.3.

Table 4.4.2 Category of information and its necessity

Category	Necessity
Hazard	DRR-related measures are in response to each natural disaster. Therefore, classification by hazard is necessary. Because laws, rules, and plans often apply to all disasters, "Overall/Multi" classifications is prepared as well as each natural event.
Issues related to consideration and implementation of DRR measures	This part classifies information that is effective in considering and implementing DRR measures. In order to implement measures, it is necessary to comply with existing laws, regulations, and plans. In addition, it is necessary to understand what hazards and risks are expected. In order to plan countermeasures, it is necessary to assume situations that may occur in the event of a disaster. It is important to understand the situation of past disasters. In addition, measures are classified into four categories according to the stage and purpose of implementation based on disaster management cycle.
Location/Administration level	Measures are implemented at the national, regional, provincial, communal (municipality), community and individual levels. It is aimed to implement measures at various levels. Therefore, information is classified based on the implementation level of countermeasures. It can also be effectively used to organize the size of the disaster and the experiences/lessons learned from past disaster response, recovery and reconstruction.

Table 4.4.3 Classification of information

Hazard	Issues related to consideration and implementation of DRR measures		Location/Administration level	
General/Multiple	Law	This includes laws related to disaster management and disaster risk reduction. Development-related laws are also included, as specific risk reduction measures may be implemented in relation to development plans.	National	It classifies information on disasters at the national level, and the response to past disasters and the implementation of past and current countermeasures by the national government.
Earthquake	Regulation	For the same reasons as above, regulations related to disaster management, disaster risk reduction and development are covered.	Region/Province	It classifies information on disasters at the national level, and the response to past disasters and the implementation of past and current countermeasures by the regional/provincial government.
Tsunami	Plan	For the same reasons mentioned above, plans related to disaster prevention, risk reduction and development will be covered. For the same reasons again, plans related to disaster management, disaster risk reduction and development will be covered.	Commune	It classifies information on disasters at the communal level, and the municipality's response to past disasters and implementation of past and current countermeasures.
Flood	Hazard	A phenomenon of natural, biological or anthropogenic origin that may cause loss, damage or disruption to people, infrastructure, services, livelihoods or the environment.	Community/	Information on community-level disasters, other small-scale disasters, and response to past disasters, and the implementation of past and current countermeasures by the community, household, and individual is classified.
Mass-removal (alluviums, landslides, rockslides, etc.)	Risk	Probability of exceeding a specific value of social, economic and environmental damages, in a given place for a given time. (D.S N°156 of 2002.)		
Forest fires	Disaster	This situation has a level of affectation and impact that cannot be managed with regional capacities, requiring reinforcements or support from other areas of the country, through coordination at the national level.		
Volcanic eruption	Countermeasures	It includes information on measures to be taken at each stage of the disaster management cycle, methods of implementation, and effects of the		

		measures.		
Altiplanic summer precipitations	Mitigation	It comprises measures aimed at reducing existing risks, avoiding the generation of new risks and limiting adverse impacts or damage caused by hazards.		
Surges	Preparedness	It involves the capabilities and skills that are developed to anticipate, respond and recover in a timely and effective manner from the impacts of imminent hazards or emergencies.		
Snowfall	Response	Corresponds to emergency response activities, which are carried out immediately after the event occurs. Their objective is to save lives, reduce the impact on the affected community and reduce losses.		
Tornadoes - Sea storms	Recovery	These are the actions aimed at reestablishing normal living conditions through the rehabilitation and reconstruction stages of the affected area, avoiding the reproduction of pre-existing risk conditions. Thus, the stages in the Recovery Phase are Rehabilitation and Reconstruction.		
Dust storms	Rehabilitation	It consists of the short-term recovery of basic services and the beginning of the repair of physical, social, environmental and economic damage in the affected area, during the transition period between the culmination of response actions and the beginning of reconstruction actions.		
Frosts	Reconstruction	It consists of the repair or replacement, in the medium and long term, of damaged infrastructure; and the restoration or improvement of production systems.		
Heat waves	Emergency	An event, or the imminence thereof, that alters the functioning of a community due to the manifestation of a natural, biological or anthropic		

		hazard, which interacts with the conditions of exposure, vulnerability and coping capacity, causing one or more of the following effects: losses: human, material, economic; or environmental impacts.		
Thunderstorms	Vulnerability	Those conditions determined by physical, social, institutional, economic or environmental factors or processes that increase the susceptibility of a person, a community, assets, infrastructure or services to the effects of hazards.		
	Catastrophe	This situation has a level of affectation and impact that requires international assistance to support the country's capacities through national coordination.		

4.3. Prioritized information to be collected

A set of information is categorized in each category depending on the contents of the information. For example, the record of interview to affected people on their tsunami experiences is categorized as Tsunami/ Disaster/ Community/Individual. If the information can be categorized in each category, all of such information are important for KMS. However, KMS needs to contribute to DRR. The following are the criteria for prioritization on each category. Table 4.4.4 shows the information classification with the priority for collecting information. In Appendix 1, a part of information is suggested for ONEMI to collect.

- Hazard: Since the KMS covers all kinds of natural disasters, all hazards are important. But earthquakes and tsunamis should be given more emphasis since they cause massive damage when they occur. Hydro meteorological-related hazards are also important.
- Issues related to consideration and implementation of DRR measures: It is necessary to consider and implement countermeasures. But the implementation of countermeasures is more important to reduce risk. While it is important to understand the risks in order to consider countermeasures, it is more important to examine what has happened in past disasters and utilize the lessons learned for the future. It is significant to learn from the past, identify risk reduction measures, and put the risk reduction measures into practical plan. From this perspective, “Disaster”, “Plan”, and “Mitigation” should be given top priority out of the issues related to consideration and implementation of DRR measures shown in Table 4.4.4.
    - Disasters: Disaster issues are important. Each person affected by disasters and people who have worked in response and recovery/reconstruction phase have their own experiences of disasters. Such experiences are useful for other people to take action for future disasters. Currently, ONEMI has not collected enough experiences.
    - Plan: DRR plan is the basis for DRR. Good practice of the DRR plan and its planning process should be shared with other regions and municipalities. The tools and guidelines for DRR planning are also useful as the knowledge.
    - Countermeasure/Mitigation: As known generally, pre-disaster measures are more important than post-disaster measures to reduce the risk, especially mitigation measures.
- Location/Administration level: It is emphasized to integrate public help, cooperation, and self-help for DRR. Therefore, all levels need to be prioritized.

Table 4.4.4 Prioritized information

Hazard		Issues related to consideration and implementation of DRR measures		Location/Administration level	
Item	Priority	Item	Priority	Item	Priority
General/Multiple	V	Law		Nation	V
Earthquake	V V	Regulation		Region/Province	V
Tsunami	V V	Plan	V V	Municipality	V
Flood	V	Hazard	V	Community	V
Mass-removal (alluviums, landslides, rockslides, etc.)	V	Risk	V		
Forest fires	V	Disaster	V V		
Volcanic eruption	V	Countermeasures	-		
Altiplanic summer precipitations	V	Mitigation	V V		
Surges	V	Preparedness			
Snowfall	V	Response			
Tornadoes - Sea storms	V				
Dust storms		Recovery			
Frosts		Rehabilitation			
Heat waves		Reconstruction			
Thunderstorms		Emergency			
		Vulnerability			

V: Prioritized information
VV: More prioritized information

4.4. Types of materials of information

There are various types of materials including useful information. Table 4.4.5 shows the material types to be considered in KMS. Tacit knowledge such as disaster experiences and experiences of implementation of DRR initiatives are not visible information. Such information can be collected in analog and/or digital form.

Table 4.4.5 Types of materials

(Source: Recovery Bureau of Iwate Prefecture Government of Japan (2016))

Type	Contents
Analog records	Documents, photos / images, audio, video (tapes, etc.)
Digital records	Text information, photo / image data, audio data, video data, web pages, Blog, social media
Objects	Relics and remains which retain the traces of disasters

4.5. Sources of information

In KMS, information is collected and provided by organizations/institutions related to DRR and communities/individuals. As information sources and information providers, the stakeholders for KMS are listed in Appendix 2. ONEMI is expected to refer to it for information collection.

5. Criteria and important issues for KMS

5.1. Collection of information

5.1.1. Overview of the action

KMS provides knowledge to be utilized for DRR. ONEMI collects information which has the potential to be knowledge and convert it into knowledge. ONEMI is required to collect information from civil protection organizations, communities, etc., and/or receive information from them.

5.1.2. Criteria

Collected information needs to meet the criteria mentioned in Table 4.5.1. ONEMI needs to refer the criteria when ONEMI collects information for KMS.

Table 4.5.1 Criteria of collecting information

Issue to be Considered	Criteria
Relationship with function of KMS	Information has clear expected functions of KMS.
Utilization methods	The expected utilization methods are clear after converting information into knowledge.
Right processing	Information does not infringe various rights (refer to Appendix 3).
Classification	Information can be classified based on Table 4.4.3.
Information source	The source of information is clearly identified.
Accuracy	The contents of information are scientifically accurate, especially: data, analysis results, etc.

5.1.3. Important issues

5.1.3.1 Planning of collecting information

To collect information effectively, it is suggested to conduct the following process. The detail explanation is shown in “Appendix 3: “Overview of the process of collection and utilization”.

- Planning
- Preparatory survey for information collection
- Right processing
- Collection activity

5.1.3.2 Coordination of related organizations

It is not practical for only ONEMI to collect information in terms of workload and budget. It is required to coordinate relevant organizations related to civil protection systems, universities, research institutes, NGOs, etc., to receive information from them.

5.1.3.3 Preservation of remains, objects, materials, and records

Disaster remains, objects that can be used to learn about the disaster, and documents that have not been digitized have the possibility of being discarded or lost to weather damage. In the immediate aftermath of a disaster, it may not be possible to sort through these items, even though many may have potential for future use. It is desirable to store and digitize, to the extent possible, anything that may be relevant to KMS.

5.1.3.4 Interview methods: Disaster ethnography

It is important to utilize the experiences of disaster victims and those who have implemented disaster response. It is also an important element in KMS. The major method of collecting experiences is interviews, and a method called disaster ethnography is proposed here. Disaster ethnography is a method of collaborating and offering tacit knowledge. When the interview is conducted, the questions are not prepared. Instead, the victims and those who have responded to the disaster talk about their experiences in order to understand disasters from their perspective. Through this method, tacit knowledge that exists at the disaster site can be revealed.

5.2. Conversion of information into knowledge

5.2.1. Overview of the action

The information collected will be compiled into a knowledge report by ONEMI staff. The format of the knowledge report was developed as a part of the concept design of KMS.

5.2.2. Criteria

When the collected information is compiled into a knowledge report, the following criteria need to be met.

Table 4.5.2 Criteria of converting into knowledge

Issue to be Considered	Criteria
Appropriate function of KMS	It is clear which functions of the KMS are appropriate.
Expected users	It is clear who can use it.

Contribution to DRR	It is clear what the contribution is to DRR.
Utilization process	The process of utilization of knowledge can clearly be identified.
Accuracy of the description	The description mentioned in the knowledge report is scientifically and/or empirically correct.

5.2.3. Important issues

5.2.3.1 Training for ONEMI Regional Offices

ONEMI, within its functions, aims to convert useful information and tacit knowledge into explicit knowledge to be used for DRR. Information and tacit knowledge need to be collected from all over Chile and converted into knowledge. Therefore, ONEMI Regional Offices play significant roles for this process. Especially, the process of conversion of information into knowledge is important since the knowledge report is a basis of KMS. It is proposed that the people in charge of KMS in ONEMI Regional Office are trained to understand how to collect useful information for DRR as well as to understand the overview of KMS.

5.2.3.2 Collaboration with related organizations

Depending on the contents of collected information, it may not be possible for ONEMI to compile it into knowledge reports. Developing the initial version of a knowledge report is an important action for KMS. In order to make a knowledge report with specific and accurate description, ONEMI and ONEMI Regional Offices need to ask for cooperation and advice from related organizations and universities if necessary.

5.3. Management

5.3.1. Overview of the action

Management has two roles: 1) validation of knowledge and 2) operation management of KMS. A developed knowledge report is validated whether it is appropriate for KMS. Operation management includes planning, organization, direction, control and coordination of the execution of activities and the use of resources, in all aspects related to the functions of processing, storage and transfer of knowledge of the KMS.

5.3.2. Criteria

To organize this management process, the following criteria need to be met.

Table 4.5.3 Criteria of management

Issue to be Considered	Criteria
Planning of KMS	Short-term goals and long terms-goals are defined clearly.
Organization of KMS	Appropriate human resources are allocated, and their duties are clearly identified.
Direction of KMS	Action plan is developed based on the short-term goals and long-terms goals.
Control of KMS	Monitoring items are defined based on the action plan and the monitoring is conducted.
Coordination of KMS	Action for improvement is done in terms of planning, organization, direction, and control based on the results of the monitoring.
Ability of responsible person	KMS administrator, head of the ONEMI entity, and exhibition specialists have enough understanding of KMS. Especially, the head of the ONEMI entity is required to have deep understanding of DRR.
Training for ONEMI entity	Training of responsible members is conducted as necessary.

5.3.3. Important issues

5.3.3.1 Establishment of advisory committee

The stakeholders of KMS includes a wide range of people and organizations. To make KMS management effective, it is suggested to establish an advisory committee for KMS. The candidates of committee members are responsible people from museums and libraries, universities, NGOs, private sectors, media, IT specialists, and communication specialists.

5.3.3.2 Conducting additional surveys

When the knowledge report is validated, the quality of the knowledge report is reviewed. If the description of the report is not enough, the report needs to be rejected. If minor corrections and additions are necessary, the report is revised. This is similar to the review process for peer-reviewed papers in general. Those responsible need to direct additional surveys to improve the quality of the knowledge report.

5.3.3.3 Internal training for responsible people

Training for responsible people is important for ONEMI to operate KMS. They need to clearly understand the concept design of KMS and to acquire the ability for judging proper knowledge reports.

It is suggested that responsible people make the knowledge report by themselves and evaluate each other in order to understand the point of the review of knowledge report, as a part of the training.

5.4. Process

5.4.1. Overview of the action

The validated knowledge is checked, revised, and finalized in the knowledge report in this phase. In this process, an administrator, the responsible person from ONEMI, specialists of each function of KMS, DRR specialists, and communication specialists are appointed. The finalized knowledge report is stored in the repository.

5.4.2. Criteria

The required description for each function of KMS is mentioned in the concept design of KMS with the form of knowledge, which is Part 2 of this document. Here, the criteria related to the management of this “Process” function are shown as below.

Table 4.5.4 Criteria of process

Issue to be Considered	Criteria
Ability of responsible person	KMS administrator, head of the ONEMI entity, specialists of each function of KMS, DRR specialists, and communication specialists have enough understanding of KMS. Especially, the head of the ONEMI entity and DRR specialists are required to have deep understanding of DRR.
Methods of organizing process	In case that the process is not organized in the computer system, communication methods for the organizing process is decided.
Record of process	Computer system or document format is prepared to record the process of the review of knowledge report.

5.4.3. Important issues

5.4.3.1 Use of external resource people

In the process of the finalization of knowledge report, several people are appointed as responsible. In case that knowledge report includes information which needs specialized knowledge to understand, it is suggested to use the external resource person(s) such as university professors and other ministries for the quality control of the knowledge of KMS.

5.4.3.2 Support for providers of knowledge report

To ensure the quality of knowledge, it may be necessary to communicate between providers of knowledge report and responsible people of KMS, such as DRR specialists, several times. The responsible people of KMS are requested to provide understandable and concrete comments of knowledge providers and to provide the concrete suggestions for the correction of the knowledge report. If necessary, it is suggested to have face-to-face communicate with the providers of knowledge providers even if all processes can be done in the computer system.

5.5. Storing

5.5.1. Overview of the action

The finalized knowledge report which is the result of the execution of the processes of the main functions of the KMS is stored in the computer applications and databases. The concept of "KMS Repository" is to be understood as an information system consisting of a set of administrative procedures, processes, computer applications and technological support that allows collecting, preparing, storing, retrieving and presenting the relevant knowledge resulting from the main processes of ONEMI's KMS for Disaster Risk Reduction.

5.5.2. Criteria

The necessary functions of KMS Repository are shown in Part 2 of this document. To develop the system of KMS Repository, Table 4.5.5 should be referred.

Table 4.5.5 Criteria of storing

Issue to be Considered	Criteria
Necessary functions	Necessary functions are developed: 1) “Knowledge Input" function, 2) "Knowledge Processing" function, 3) “Knowledge Storage" function, 4) "Knowledge Output" function.
Work in the KMS Repository system	Works in the KMS repository are defined according to the models shown in Part 2 of this document.
User interface for responsible person for KMS	Responsible people take proper actions in the system without difficulty to proceed management, process, storage, and output functions.
User interface for KMS users	KMS users search and find knowledge without difficulty.

Function of searching	Search items is appropriate for KMS users as well as search by text of knowledge.

5.5.3. Important issues

5.5.3.1 Items for searching

A search function is important for KMS users to find expected knowledge in KMS Repository. In addition to searching by each type of knowledge of KMS, the following points are suggested. Search by expected utilization of knowledge is also useful for the users such as education, training, and DRR planning. Threats and issues mentioned in Table 4.4.2 also needs to be referred to in developing search functions.

- Region
- Province
- Municipality
- Address
- Location
- Provider
- Description of Knowledge
- Type of Material
- Taken or Release Date
- Copyrights
- Search Words

5.5.3.2 Development of user manuals

The expected users are 1) responsible people of KMS and 2) general users of KMS. After the development of the KMS Repository System, it is suggested to develop user manuals in order to facilitate operation easily. The manual for responsible people can be used as training materials when ONEMI conducts the training for responsible people.

5.5.3.3 Multilanguage system

ONEMI is collaborating with international organizations working in Chile. To disseminate knowledge and KMS itself to the world through such organizations, a multilingual system is necessary.

5.6. Transfer

5.6.1. Overview of the action

The purpose is to transfer the available knowledge stored in the Repository to the users or stakeholders of the KMS, so that it can be used in disaster risk reduction actions. The types of transferred knowledge are, for example, web systems, digital files, documentary files, videos, films, photographs, objects and other elements. The transfer function is divided into knowledge availability and knowledge exhibition. Knowledge availability means facilitating access to the knowledge stored in the Repository to the users or stakeholders of the KMS, as well as to promote and encourage the use of this available knowledge in Disaster Risk Reduction actions. Knowledge exhibition is to preserve, communicate, and exhibit, for purposes of study, education, and contemplation, the sets and collections of elements with historical value and of interest for DRR.

5.6.2. Criteria

In the process of knowledge availability and knowledge exhibition, the following criteria needs to be referred.

Table 4.5.6 Criteria of transfer

Issue to be Considered	Criteria
Ability of responsible person	KMS administrator, exhibition specialists, and communication specialists have enough understanding of KMS.
Selection of a resource person for material development	Appropriate internal/external resource people are selected to formulate a working group for the development of materials.
Dissemination methods	Transfer methods are appropriate, such as television, radio, telephones, social networks, to make users aware of the type of knowledge.
Record of statistic information on the repository	Responsible people in charge of recording statistic information are selected appropriately. Record format and information systems are prepared.
Purpose of exhibition	Visitors of an exhibition understand DRR clearly as well as past disasters.
Interaction with KMS users/visitors	The purposes and methods for interaction is appropriate.

5.6.3. Important issues

5.6.3.1 Preparation of physical place for exhibition

KMS targets all of Chile and aims to disseminate knowledge for DRR. Therefore, if one or less of places are prepared for permanent exhibition, it is difficult to achieve the purpose of KMS. In addition to a permanent exhibition, it is suggested 1) to exhibit materials temporarily in accordance with

OENMI's works, 2) to organize temporal events at existing places such as libraries and museums, and 3) to provide and lend the materials to other organizations for their works.

5.6.3.2 Development of new knowledge through interaction with KMS users/visitors

Interaction with KMS users/visitors is important to enhance awareness and understanding. However, the interaction can be an opportunity to find the seeds of knowledge. Sendai Mediatheque located in Sendai City in Japan, has conducted the activities of collection of disaster experiences through communication with affected people and through the interaction events with affected people (refer to Appendix 4). ONEMI can know the awareness of users/visitors and necessary knowledge from them through the interaction. When the interaction is organized, ONEMI needs to consider how we can find future knowledge as well as how awareness of users/visitors can be enhanced.

5.6.3.3. Combination between livelihood and DRR

Everyone knows the importance of DRR but DRR measures are not implemented properly. In other words, the problem on DRR is the gap between knowledge and behavior. Under the concept of KMS, it can be suggested that the utilization of the knowledge developed in KMS are parts of the solutions: 1) to plan the tour to visit disaster affected areas and to see the objects showing past disasters, 2) to conserve objects showing past disasters as local history, 3) build monuments in affected areas to disseminate past disasters to future generations, 4) to display disaster related books, materials, etc., in public places such as libraries and municipality offices, and 5) to encourage the Ministry of Education to mainstream DRR in school education.

5.7. Application

5.7.1. Overview of the action

This is not the internal procedure within ONEMI. Application means the utilization of knowledge of KMS to reduce disaster risk and take the following structural and non-structural measures. The expected users of knowledge are ONEMI, the central government, regional government, municipalities, community, individuals, schools, NGOs, private sectors, etc. The expected utilization of knowledge for each user is proposed in Appendix 3.

Structural measures

- Infrastructure Work
- Landscape management
- Hazard Monitoring Systems
- Early Warning Systems
- Communications Systems

- Others

Non-structural measures

- Education
- Awareness raising
- Training
- Simulation
- Drills
- Planning
- Logistics Systems
- Others

5.7.2. Criteria

Planning is important to conduct the application of knowledge properly and effectively. The following are the criteria for planning the application of knowledge. It is also effective to share the criteria with the users of KMS for proper application.

Table 4.5.7 Criteria of application

Issue to be Considered	Criteria
Understanding current risk	Users clearly understand the risks to be reduced.
Relationship between existing risk and knowledge	Appropriate knowledge is selected to reduce existing risk.
Purposes of application	The purposes of the application are clearly decided to reduce existing risks. The expected results are assumed.
Responsible organizations and support organizations	Responsible organizations and support organizations are decided for the application. Their roles are clearly decided.
Timing and duration of application	Timing and duration of application is considered to apply knowledge effectively and achieve expected results.
Budget for application	Necessary budget is secured. If the application needs a large budget, a planning document needs to be used for consultation with the relevant organizations.
Planning of evaluation of application	The following are decided: 1) implementer, 2) target, 3) method, 4) evaluation items, and 5) timing.
Implementation of evaluation	Evaluation activity is conducted according to the evaluation plan and to identify the effects of application and the future improvement of the application.

5.7.3. Important issues

5.7.3.1 Suggestions to the central/regional governments and municipalities

There is a gap between the provision of knowledge and actual implementation of DRR measures through the utilization of knowledge. ONEMI is the coordination agency for DRR in Chile. ONEMI with the Regional Office is expected to coordinate with the state and private bodies and suggest specific DRR measures based on the knowledge so that they can implement DRR measures. It is necessary to support government sectors for the active utilization of KMS in the future.

5.7.3.2 Support of knowledge users

Knowledge users such as community, individuals, schools, and private sectors generally do not have enough experience and knowledge of DRR. It is considered that provision of knowledge cannot lead them to implement DRR measures. ONEMI is expected to organize workshops and training on how to understand and apply knowledge for DRR at their level.

5.7.3.3 Development of new knowledge through the implementation

In order to enhance KMS, it is important to constantly increase the number of sets of knowledge. When the DRR measures are implement based on the knowledge, the implementation process needs to be recorded, which can be a seed of new knowledge as the knowledge of implementation.

5.8. Enhancement

5.8.1. Overview of the action

It is required in the future that KMS be disseminated nationwide. ONEMI will be responsible for converting information into knowledge, but a variety of methods should be considered for transferring knowledge, not just the ONEMI repository. It can also be suggested that the experience of using knowledge, for example, the experience of implementing countermeasures, be converted into new knowledge of KMS.

5.8.2. Criteria

The following criteria should be referred to for improving and deploying a KMS:

Table 4.5.8 Criteria of enhancement

Issue to be Considered	Criteria
Involvement of active participants	It is suggested to establish cooperative systems with organizations and people who can be actively involved in

	KMS, such as ministries, related organizations, universities, and residents, for increasing the number of sets of knowledge.
Exhibition	Not only ONEMI Repository but also other methods of exhibition need to be considered.
Access to knowledge	The knowledge can be searched from not only the ONEMI Repository but also other searching systems, such as the website of the national government.
Collecting results of applying knowledge	To promote the application of knowledge, it is suggested to establish a network to collect good/bad practices of knowledge application.

5.8.3. Important issues

5.8.3.1 Utilization of existing places

If it is difficult to set up a new exhibition site, it is suggested that some of the existing related facilities be used as exhibition sites. Public facilities such as community centers and libraries are possible candidates. It is also possible to create a network of exhibition facilities by using multiple facilities in the vicinity and arranging the exhibits by theme.

5.8.3.2 Cooperation with public organizations

DRR is driven by many agencies. In Chile, different ministries are in charge of different hazards to monitor, so it is necessary to establish cooperative relationships. It is expected that the ministries in charge need to make the agreement to use existing facilities.

It would also be effective to integrate the KMS knowledge search with the national search system for official documents and books. For this purpose, it is important to cooperate with the relevant ministries.

5.8.3.3 Coordination of universities

KMS is not simply a system for collecting and storing knowledge and materials. After envisioning how the collected materials and information will be used, it is necessary to convert them into knowledge. It is important to consider what kind of materials and information are needed and how they will be used. Therefore, it is more meaningful to include an academic perspective.

In addition, universities possess much information, and the results of research projects themselves are likely to become knowledge of KMS. In this respect as well, it is important to build cooperative relationships with universities.

5.8.3.4-Involvement media company

The media has a vast amount of material that can be used for KMS, including footage of disasters and

interviews with disaster victims. By involving the media, it will be possible to increase the number of knowledge sets in KMS. For the media as well, their involvement with KMS will provide them with knowledge of DRR, which is expected to lead to effective disaster reporting in the future.

5.8.3.5 Reflection of innovations from good practices

To make KMS more useful for the users of KMS, it is expected that ONEMI will learn from good practices related to KMS in the world and reflect the innovations of the good practices to KMS. Appendix 4 shows the good practices of facilities, Website, and ICT-based exhibition in Japan.

6. Useful link

6.1. Knowledge Management Facility

Disaster Reduction and Human Renovation Institute
https://www.dri.ne.jp/en/

Nojima Fault Preservation Museum
http://www.nojima-danso.co.jp/nojima.html

Sendai Mediatheque
https://www.smt.jp/en/
https://recorder311-e.smt.jp/

3.11 Disaster Recovery Memorial Museum in Higashi Matsushima City
http://www.city.higashimatsushima.miyagi.jp/index.cfm/21,28310,67,271,html

Ruins of the Great East Japan Earthquake: Sendai Arahama Elementary School
https://www.city.sendai.jp/kankyo/shisetsu/ruin_arahama_elementaryschool.html
https://www.city.sendai.jp/kankyo/shisetsu/documents/brochure202004.pdf
https://www.city.sendai.jp/kankyo/shisetsu/documents/displayguide.pdf
https://www.youtube.com/watch?v=N1EbEPKQWM8&feature=emb_logo
https://www.youtube.com/watch?v=ng-kfvexnJE&feature=emb_logo

Natori City Library
http://lib.city.natori.miyagi.jp/web/
https://lib.city.natori.miyagi.jp/311arc/homes

The CHU-ETSU Earthquake Memorial Corridor
https://c-marugoto.jp/

6.2. Knowledge Management Archive

Earthquake Memorial Museum
https://infra-archive311.jp/en/

Japan Disasters Digital Archive
https://jdarchive.org/en

Michinoku Earthquake Record (Japanese only)
http://www.shinrokuden.irides.tohoku.ac.jp/

National Diet Library Great East Japan Earthquake Archive
https://kn.ndl.go.jp/en/#/

NHK East Japan Earthquake Archive
https://www9.nhk.or.jp/archives/311shogen/en/

Japan Disasters Digital Archive
https://jdarchive.org/en

7. Reference

Knowledge Management Tools (2018a) Defining Knowledge, Information, Data, accessed in http://www.knowledge-management-tools.net/knowledge-information-data.php

Knowledge Management Tools (2018b) The Different Types of Knowledge, accessed in http://www.knowledge-management-tools.net/different-types-of-knowledge.php

8. Appendices of Part 4

8.1. Appendix 1: “Information to be collected by ONEMI”

Table 4.8.1 Specific information to be collected by ONEMI

Department	Necessary Information	Reason	Lessons Learned	Historical Memory	Human Resource Development	Research and Development	Network Development
Division of Civil Protection	Risk map	The risk map is useful to understand what is expected to happen in case of disasters.			V	V	
Division of Civil Protection	Satellite image	Satellite images have difficulty being converted to knowledge directly. But it can be used through integration with other information so that knowledge can be more visualized.				V	
Division of Civil Protection	Risk related information	Risk information is useful to understand what is expected to be happened in case of disasters.			V	V	
Division of Civil Protection	Infrastructure information	Infrastructure information can be used for research and development since this information is important to identify future risks.				V	
Division of Civil Protection	Information on climate change	Information on climate change is useful for research and development.				V	
Division of Civil Protection	Climate change policy	Climate change policy is useful for research and development. It also can be utilized for human resource development.			V	V	
Division of Civil	Information on plans, transversal	Information on plans, transversal			V	V	

Protection	themes, recommendations, and guidelines	themes, recommendations and guidelines is useful for research and development. It also can be utilized for human resource development.					
Civil Protection Academy	Information and policy on school safety	This is useful for responsible organizations and schools to promote DRR in school.			V	V	
Civil Protection Academy	Technical guidelines on mental health	The responsible people such as medical staff can use these guidelines for training.			V		
Civil Protection Academy	Methodologies and manuals to quantify risk in public infrastructure	The methodologies can be used for training. Quantified risk can be used for research and practical works such as DRR planning.			V	V	
Civil Protection Academy	Document with experience of past disasters	Experience is related to historical memory. Analysis of experiences can produce the lessons.	V	V		V	
Civil Protection Academy	Model of mental health	The responsible people such as medical staff can use these guidelines for training.			V		
Civil Protection Academy	Document on hazard mechanism	This mechanism can be utilized for training. It also can be referred for research and development.			V	V	
Civil Protection Academy	Guidelines on disaster management/DRR	The guidelines on disaster management/ DRR can be utilized for the training for people in charge of planning.			V		
Civil Protection	Document/report related to DRR	The experiences can be analyzed for	V			V	

Academy	produced by other organizations	research and development and for getting lessons learned.					
Community Prevention Department	Existing community plan	Good community plan can be used as the good practice of community plan as the knowledge of human resource development, lessons learned, and/or research and development.			V	V	
Community Prevention Department	Existing family plan	Good family plan can be used as the good practice of family plan as the knowledge of human resource development, lessons learned, and/or research and development.			V	V	
Community Prevention Department	Experience of supporting CERT implementation	It can be knowledge for lessons learned human resource development, and/or research/development. It also can provide historical memory through the cooperation with community during CERT.	V	V	V	V	
Community Prevention Department	Training materials used in CERT	It can be knowledge for human resource development			V	V	
Regional Offices	Emergency plan	Good quality of emergency plan can use referred by other municipalities and regional governments. It can be knowledge for research and development.				V	
Regional	Contingency	Good quality				V	

Offices	plan	contingency plans can be referred by other municipalities, regional governments, and related organizations It can be knowledge for research and development.					
Regional Offices	Information on recurrence of emergencies	Industry emergency should be considered in DRR plans in case considering a complex disaster of natural disasters and industry disasters. It can be knowledge for research and development.				V	
Regional Offices	CERT experiences	Implementation experiences are useful to apply in other places. Good practice of CERT experiences can be knowledge on lessons learned.	V				
Regional Offices	PISE experiences	Implementation experience is useful to apply in other places. Good practice of PISE experiences can be knowledge on lessons learned.	V				
Regional Offices	Technical report produced by government organizations and universities	Technical report is useful to know which organizations provide, and to consider future DRR.				V	V
Regional Offices	Report on DRR implementation	Implementation experiences are useful to apply in other places. Good practice of DRR implementation experiences can be knowledge on lessons learned.	V				

8.2. Appendix 2: “List of Stakeholders”

Ministries

Table 4.8.2 Related ministries and their department

Ministry	Department etc.
Ministry of the Interior and Public Security	▪ Under-Secretariat of the Interior ・ Aliens Department. ・ Risk and Emergency Management Unit ・ Department of Territorial and Analysis Studies ▪ Under-Secretariat of Regional and Administrative Development ▪ Under-Secretariat of Crime Prevention ▪ Arica and Parinacota Region Intendance ▪ Tarapacá Region Intendance ▪ Antofagasta Region Intendance ▪ Atacama Region Intendance ▪ Coquimbo Region Intendance ▪ Valparaíso Region Intendance ▪ Metropolitan Region Intendance ▪ O´Higgins Region Intendance ▪ Maule Region Intendance ▪ Ñuble Region Intendance ▪ Biobío Region Intendance ▪ La Araucanía Region Intendance ▪ Los Ríos Region Intendance ▪ Los Lagos Region Intendance ▪ Aysén Region Intendance ▪ Magallanes Region Intendance ▪ Regional Units of International Affairs ▪ ONEMI ・ National Directorate ・ ONEMI Regional Directorate, Arica y Parinacota Region ・ ONEMI Regional Directorate, Tarapacá Region ・ ONEMI Regional Directorate, Antofagasta Region ・ ONEMI Regional Directorate, Atacama Region ・ ONEMI Regional Directorate, Coquimbo Region ・ ONEMI Regional Directorate, Valparaíso Region ・ ONEMI Regional Directorate, Metropolitan Region ・ ONEMI Regional Directorate, O`Higgins Region ・ ONEMI Regional Directorate, Maule Region ・ ONEMI Regional Directorate, Ñuble Region ・ ONEMI Regional Directorate, Biobío Region ・ ONEMI Regional Directorate, Araucanía Region ・ ONEMI Regional Directorate, Los Ríos Region ・ ONEMI Regional Directorate, Los Lagos Region ・ ONEMI Regional Directorate, Aysén Region ・ ONEMI Regional Directorate, Magallanes Region ・ National Subdirectorate ・ Risk Management Subdirectorate ・ Civil Protection Division ・ Civil Protection Academy ・ Community Prevention Department

	・ Emergency Operations Subdirectorate ・ Administration and Finance Subdirectorate ・ National DRR Platform ・ Regional DRR Platform ▪ Provincial Emergency Directorates ▪ National Committee for Disaster Risk Management ▪ Regional Committee for Disaster Risk Management ▪ Provincial Committee for Disaster Risk Management ▪ Communal Committee for Disaster Risk Management ▪ DRM Animal Aspect (15 organizations) ▪ Regional Government ▪ Regional Ministries Secretariat ▪ Regional Presidential Delegate ▪ Provincial Presidential Delegate ▪ Provincial Director of Disaster Risk Management ▪ Municipalities ▪ Communal Director of Disaster Risk Management ▪ Carabineros of Chile ▪ Criminal Investigation Police of Chile
Ministry of Foreign Affairs	▪ Chilean Agency for International Development Cooperation ▪ National State Borders and Boundaries Department ▪ Under-secretariat of Foreign Affairs ▪ Under-secretariat of International Migration ▪ Consular Emergency Unit
Ministry of National Defense	▪ Under-secretariat of Defense ▪ Under-secretariat of Armed Forces ▪ Military Staff ・ Directorate of Operations and Joint Leadership ・ Land Forces Command ・ War Academy of the Chilean Army ・ Centre for Military Studies and Research ・ Military Geographic Institute ▪ Chilean Navy ・ Designed Delegated in Regional Emergency Committee ・ General Directorate of Maritime Territory and Merchant Navy ・ Navy Hydrographic and Oceanographic Service ・ Navy Meteorological Service ・ Maritime Governance ▪ Air Force ・ Air Force Aero Photogrammetric Service ▪ National Academy of Political and Strategic Studies ▪ Civil Defense of Chile ▪ General Directorate of Civil Aeronautics ・ Chilean Meteorology Directorate
Ministry of Finance	▪ Budget Directorate ▪ Civil Service National Directorate ▪ Internal Revenue Service ▪ National Customs Service ▪ Financial Market Committee
Ministry of General Secretariat of the Government	▪ Division of Social Organizations
Ministry of General Secretariat of the Presidency	▪ Interministerial Coordination Division ▪ Government Laboratory
Ministry of Economy,	▪ Under-secretariat of Economy and Small Enterprises

Promotion, and Tourism	▪ Under-secretariat of Tourism ▪ National Tourism Service ▪ Under-secretariat of Fisheries and Aquaculture ▪ Production support corporation ▪ National Statistics Institute ▪ National Standards Institute
Ministry of Social Development and Family	▪ Under-secretariat of Social Evaluation ▪ Under-secretariat of Social Services ▪ Under-secretariat of Childhood ▪ National Service for Older Persons ▪ National Service for Disability ▪ National Institute of Youth ▪ National Corporation for Indigenous Development ▪ Programs Coordinator, International Affairs Unit ▪ Focus Division ▪ Social Observatory Division ▪ Social Evaluation and Investment Division ▪ Public-Private Cooperation Division ▪ Integrated Emergency Cadastre System Unit, Focus Division, Metropolitan Region ▪ Solidarity and Social Investment Fund (FOSIS)
Ministry of Education	▪ Under-secretariat of Education ▪ Under-secretariat of Nursery Education ▪ Planification and Budget Division ▪ Quality Education Agency ▪ National Council of Education ▪ National Council for Science and Technology ▪ National Nursery Schools Board ▪ National Board of School Aid and Scholarships ▪ Education Superintendency ▪ Disaster Risk Reduction Unit ▪ General Administration Division ▪ Educational Transversality Unit ▪ BIBLIOREDES (Library Network)
Ministry of Justice and Human Rights	▪ Under-secretariat of Justice ▪ Under-secretariat of Human Rights ▪ Forensic Medical Service ▪ National Service for Minors ▪ Chilean Prison Service
Ministry of Labor and Social Security	▪ Under-secretariat of Social Security ▪ Labor Office ▪ Secured Loan General Office ▪ Labor Security Institute ▪ Social Security Institute ▪ National Training and Employment Service ▪ Social Security Superintendency
Ministry of Public Works	▪ Under-secretariat of Public Works ▪ General Directorate of Public Works ▪ Emergency Unit ▪ Directorate of Harbour Construction ▪ Directorate of Airports ▪ Directorate of Roadway ▪ Directorate of Architecture ▪ Directorate of Hydraulic Works

	▪ General Directorate of Water ▪ General Directorate of Concessions ▪ Directorate of Planning ▪ Superintendency of Sanitary Services
Ministry of Health	▪ Under-secretary of Public Health ▪ Under-secretary of Care Networks ▪ Management of Risk in Emergencies and Disasters Department ▪ Urgent Care Services
Ministry of Housing and Urban Planning	▪ Under-secretariat of Housing and Urban Planning ▪ National Reconstruction Officer ▪ Advisory Commission for Reconstruction and DRR ▪ Housing and Urbanity Commission
Ministry of Agriculture	▪ Under-secretariat of Agriculture. ▪ National Forestry Corporation. ▪ Agricultural and Livestock Service. ▪ Emergency and Agricultural Risk Management Section. ▪ Agro insurance. ▪ Natural Resources Information Center. ▪ Agro Communications, Training and Culture Foundation
Ministry of Mining	▪ Under-secretariat of Mining ▪ National Geology and Mining Service
Ministry of Transport and Telecommunications	▪ Under-secretariat of Transports ▪ Under-secretariat of Telecommunications
Ministry of National Assets	▪ National Territorial Information System ▪ National Land Registry Division
Ministry of Energy	▪ Under-secretariat of Energy ▪ Electricity and Fuel Superintendence ▪ Energetic Sustainability Agency ▪ Nuclear Energy Chilean Commission ▪ Energy Management Risk Unit ▪ Energetic Market Division
Ministry of Environment	▪ Under-secretariat of Environment ▪ Climate Change Office ▪ Environmental Evaluation Office ▪ Environmental Education and Citizen Participation Division
Ministry of Sport	▪ Under-secretariat of Sport ▪ National Sport Institute
Ministry of Women and Gender Equity	▪ Equity Policies Division. ▪ Gender Studies and Training Division. ▪ National Women Service
Ministry of Cultures, Arts and Heritage	▪ Under-secretariat of Cultures and Arts. ▪ Under-secretariat of Cultural Heritage. ▪ National Heritage Service. ▪ National Monuments Board. ▪ Advisory Board of Native Peoples. ▪ National Conservation and Restoration Center
Ministry of Science, Technology, Knowledge and Innovation	-

Others

Table 4.8.3 Related organizations

Ministry	Department etc.
Parliamentary	▪ Deputies in commissions. ▪ Senators in commissions
Other public organizations	▪ General Comptroller of the Republic ▪ Social Security Superintendence ▪ National Seismology Center ▪ Firefighters of Chile ▪ National Council for Urban Development (CNDU) ▪ National Council for Development Innovation (CNID) ▪ Chilean Association of Municipalities (AChM) ▪ Municipalities Association of Chile (Amuch)
University and academic institutes	▪ Pontifical Catholic University of Chile. Faculty of Engineering ▪ Pontifical Catholic University of Chile. Institute of Geography ▪ Pontifical Catholic University of Chile. Disaster Risk Reduction Diploma ▪ Pontifical Catholic University of Chile. Geographist Opinion Leader Marcelo Lagos ▪ University of Chile. Faculty of Engineering ▪ University of Chile. Geology Department ▪ University of Chile. Geophysics Department. ▪ University of Chile. Faculty of Architecture and Urban Planning. Geography Department ▪ University of Chile. Center for Climate and Resilience Research (CR2) ▪ University of Santiago of Chile (USACH) ▪ Metropolitan University of Technology (UTEM) ▪ Bernardo O´Higgins University (UBO) ▪ Catholic University of Temuco ▪ Valparaíso University, Social Work School - Law and Social Science Faculty ▪ Metropolitan University of Education Science, Directorate of Permanent Education ▪ University of Playa Ancha ▪ University of Atacama ▪ Santo Tomas University ▪ National Institute of Vocational Training (INACAP) ▪ AIEP Institute ▪ Cirtrid. Disaster Risk Reduction Program of the University of Chile ▪ National Research Centre for Integrated Management of Natural Disasters (CIGIDEN) ▪ Institute for Disaster Resilience, Itrend Chile
Think tanks	▪ Flacso. ▪ Cieplan. ▪ CEP. ▪ Libertad y Desarrollo ▪ Espacio Público ▪ Horizontal
Media	▪ T13 ▪ MEGA ▪ CHV ▪ CNN ▪ TVN ▪ La Tercera

	▪ El Mercurio ▪ Las Últimas Noticias ▪ La Cuarta ▪ La Hora ▪ HoyxHoy ▪ Radio Club ▪ Radio aficionados ▪ Different platforms media
International organizations and foreign governments	▪ Japan International Cooperation Agency (JICA) ▪ UNDRR ▪ United Nations Development Program UNDP ▪ United Nations International Children's Emergency Fund, UNICEF ▪ United Nations Economic Commission for Latin America and the Caribbean ▪ United States Office of Foreign Disaster Assistance USAID OFDA ▪ Intergovernmental Oceanographic Commission of UNESCO ▪ Central American Integration System for Natural Disaster Prevention CEPREDENAC ▪ German Technical Cooperation Agency GTZ ▪ Government Secretariat of México ▪ Ministry of Education MINED, El Salvador ▪ Civil Defense of Cuba ▪ Pan American Health Organization, PAHO ▪ National Fire Protection Association Colombia ▪ Inter-American Development Bank (BID) ▪ Associated Program on Flood Management, Switzerland ▪ Office of Naval Research, USA ▪ General Secretariat of the Andean Community, Peru ▪ National Institute of Civil Defense of Peru ▪ Center for Studies and Disaster Prevention (PREDES Perú) ▪ National Oceanographic Committee ▪ General Directorate of Civil Protection, Spain ▪ International Federation of Red Cross and Red Crescent Societies ▪ Chilean Red Cross ▪ Directorate of Disaster Prevention and Attention of Colombia ▪ ADRA Chile ▪ World Vision Chile ▪ Movidos por Chile ▪ Techo-Chile ▪ Ibero-American Program on Science and Technology for Development, CYTED
Others	▪ Association of Engineers of Chile ▪ Engineers Institute of Chile ▪ Association of Architects of Chile ▪ Association of Forestry Engineers of Chile ▪ Confederation of Production and Commerce ▪ Chilean Construction Chamber ▪ National Commerce Chamber ▪ Integra Foundation ▪ National Institute of Human Rights. (INDH) ▪ Latin American Professional Institute for Foreign Trade, IPLACEX ▪ Social Pastoral Caritas Chile ▪ Corporation Program ‘Caleta Sur’ ▪ Inter-American Institute for Social Development ▪ Chilean Association pro United Nations ACHNU

	▪ NGO Voluntary Psychologists of Chile. ▪ Chile Global Compact Network. ▪ International Humanitarian Aid Network (RHI). ▪ Mission to Chile of the International Organization for Migration (IOM). ▪ College of Geologists of Chile. ▪ Veterinary Medical College of Chile. ▪ Global Network of Civil Society Organizations (GNDR). ▪ Chilean Humanitarian Aid Network (RAHCh). ▪ Construction Institute. ▪ Manufacturers' Association (SOFOFA). ▪ Mutual de Seguridad C.CH.C. ▪ Labour Safety Institute (IST). ▪ Chilean Safety Association (ACHS). ▪ Management Crisis Service and Organizations Resilience (SECRO) ▪ General Electricity Company ▪ Corporate Underwriting/global clients georiesgos research group ▪ Ibero-American Association of Governmental Organizations for Defense and Civil Protection ▪ Radius Antofagasta Team ▪ RNE, National Emergency Network of Chile NGO ▪ RED SALUD ▪ Andean Relief Corps of Chile ▪ Regional Corporation of Mining Security CORESEMIN Atacama ▪ Atacama Rescue (NGO associated with the Mining Rescue).Goldfields Mining ▪ Concessionary companies for basic services ▪ Highway concessionaires ▪ Port Companies ▪ Mining companies ▪ Volunteer corps of the lifeboats of Valparaiso ▪ Quintero Puchuncavi Industrial Area ▪ Neighborhood meetings and neighborhood groups ▪ Civil Society Councils (COSOC) ▪ General Public

8.3. Appendix 3: “Overview of the process of collection and utilization”

8.3.1. Overview

Figure 4.8.1 shows the overall process of collection and utilization of information. Table 4.8.4 shows the detail explanation of each step of the process.

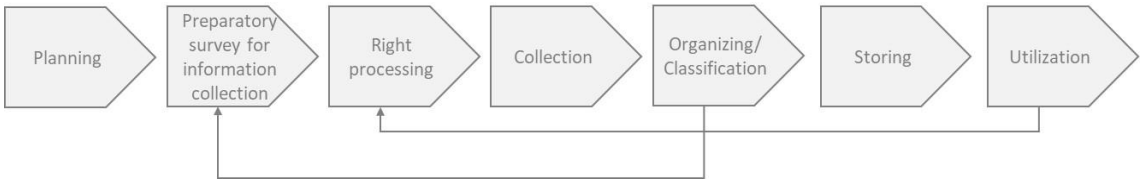


Figure 4.8.1 Overall process

(Source: Recovery Bureau of Iwate Prefecture Government of Japan (2016) modified by JICA Expert Team)

Table 4.8.4 Detail explanation of the proecss of collection and utlization of information

(Source: Recovery Bureau of Iwate Prefecture Government of Japan (2016) revised by JICA Expert Team)

Step	Explanation
Planning	It is required to make the plan including the purpose, implementation schedule, budget, etc., for the collection and utilization of information. By conducting interviews and questionnaires to related organizations such as municipalities and disaster affected people, information to be collected for KMS needs to be identified.
Preparatory survey for information collection	It is necessary to investigate the selection of organizations/people which provide information, contact information, quantity and quality of materials/information, rights processing status, cooperating organizations, etc. Since there are many types of materials/information and it is not clear who owns what kind of materials/information, it is necessary to conduct a whereabout survey before starting collection.
Rights processing	Rights processing is indispensable for the widespread use of the collected materials/information and converted knowledge. If it is hoped to use copyrighted work or portrait of the rights holder who owns the material/information, it is necessary to get permission and rights from the party who holds the rights. Rights processing is the proper legal procedures.
Collection	It is necessary to determine the collection target, timing of collection, collection area, information types, etc. It is also necessary to consider the purpose and method of future utilization. In order to proceed with the efficient collection, it is necessary to carefully explain the contents of collection and utilization, etc., in written form to the organizations/people which provide information.
Organizing/ Classification	In anticipation of long-term management, storage, and utilization, we will determine the organization and classification method in consideration of the content of permission with the rights holder and create an organization classification table. Even for materials that are not used immediately, it is important to keep a history of how they were judged in anticipation of future use. If it becomes clear that there is a shortage of materials, it is necessary to conduct an

	additional whereabout survey or collection again. The detail of this step is mentioned in Part 2 of this document.
Storing	There are various storage methods for the collected materials/information depending on the type and storage status. Looking ahead to future utilization, it is necessary to consider storage by type and permanent storage location so that long-term storage is possible. Regarding the storage of data, it is desirable to save it in the most suitable medium each time.
Utilization	Collected materials/information is converted into knowledge. It is hoped the knowledge is utilized for DRR, training, education, awareness raising, research and development, network development, etc. The knowledge is also required to be exhibited inn related places such as ann existing museum and provided in the appropriate website for the purposes mentioned above.

8.3.2. Process of collection and utilization

8.3.2.1 Planning

The issues to be considered in the plan for collection materials/information are shown in Table 4.8.4. Before formulating the plan, it is suggested to conduct interviews and/or questionnaires to related organizations, regional government, and municipalities, etc., in order to understand the current status such as existing materials/information and their types and amounts.

Table 4.8.5 Examples of contents of plan

Issue	Explanation
Purpose	The purpose is to covert collected materials/information into the knowledge and to utilize the knowledge. To collect materials/information effectively, it is suggested to decide the KMS function(s) as the target of materials/information to be collected in the planning stage.
Action	Before collecting materials/information, it is suggested to consider action and prepare implementation procedure.
Schedule	The schedule needs to include timing of whereabout survey, collection, converting into knowledge, and utilization of knowledge. The schedule can be shared with cooperating organizations if necessary.
Human resource	Responsible people of ONEMI need to be appointed. Required roles of those responsible are mentioned in Part 2 of this document.
Structure	If necessary, it is suggested to include cooperating organizations in the implementation structure. Expert meeting can be considered if necessary.
Budget	Based on the plan, it is necessary to consider the cost for the implementation. Labor cost, travel cost, equipment, reward, etc., can be considered.

8.3.2.2 Preparatory survey for information collection

Various organizations and people possess materials and information including experiences. It is not clear who owns what kind of materials/information. Therefore, it is necessary to conduct the survey on information provider, source, and other related issues before starting to collect materials/information. A preparatory survey needs to be planned with the consideration the issues

mentioned below.

Target organization and people

The following are the expected target organizations.

- ONEMI Headquarter and Regional Offices
- Organizations related to the Civil Protection National System
- Regional governments and municipalities
- Universities and academic institutions
- Libraries
- Media companies
- NGOs
- International organizations and UN organizations
- General people including affected people

Survey items

The following needs to be surveyed.

- Types of materials/information
- Amounts of materials/information
- Places of storing materials/information
- Status of rights processing

Implementation process of preparation survey

The following shows the process of the implementation process of whereabout survey.

- Design of the survey
- Preparation of the survey sheet
- Preparation of the request letter
- Request of the survey
- Collection of the survey sheet
- Analysis of the results of the survey

8.3.2.3 Rights processing

Necessity of rights processing

When collecting and utilizing materials/information, various rights are always involved in the collected materials/information. For example, in the case of photographic materials, the copyright of the photographer and the personality rights of the subject are involved. Materials/information cannot be used without proper permission from individuals, corporations, etc., who hold these rights.

Rights processing means the act of obtaining permission to use the copyrighted work or portrait of another person from the other party who holds the rights or taking over the rights itself. If the materials/information are used without permission, the users may receive a claim for injunction or damages from the rights holder based on the relevant laws and judicial precedents.
Thus, in order to collect and utilize materials/information under compliant of laws and regulations, the rights processing is a procedure that requires special attention.

Types of rights

Table 4.8.6 shows the rights to be considered. It should be noted that the permission of use is required in different situations depending on the type of rights.

Table 4.8.6 List of related rights
(Source: Recovery Bureau of Iwate Prefecture Government of Japan (2016) modified by JICA Expert Team)

Classification of rights			Contents of rights	Case when licensing is required	Rights holder
Copyright	Author's moral rights		Right to prevent the author from being mentally hurt (right to publish, nomination label, right to hold identity)	When publishing, modifying, displaying of name etc., of the copyrighted work of the author.	Copyright holder
	Copyright	Reproduction rights	Right to tangibly reproduce copyrighted works by printing, photographing, copying, recording, recording, etc.	When copying the copyrighted work regardless of the medium (including digitization)	
		Performance rights /Performance rights	Right to publicly perform or play the copyrighted work	When performing / playing at exhibition facilities etc.	
		Screening rights	Right to screen copyrighted works	When screening at exhibition facilities etc.	
		Public transmission rights / transmission rights	The right to publicly transmit copyrighted works automatically, broadcast copyrighted works, wire-broadcast copyrighted works, and publicly transmit their copyrighted works using a receiving device	When sending wirelessly or wired to the public through television, radio broadcasting, Internet, etc.	
		Recitation rights	Right to orally publicly communicate linguistic copyrighted work by recitation method, etc.	When the storyteller etc., orally communicates to the public	
		Exhibition rights	Right to display the original works of art works and unpublished photographic works publicly	Case to exhibit to the public	

		Translation rights / adaptation rights	Right to translate, arrange, transform, change, adapt, etc., (to create secondary works) the copyrighted work	When translating, modifying, etc., copyrighted works	
		Rights to use secondary works	The same right as a person owned by the copyright holder of the secondary work concerning the use of secondary works (original acts pertaining to each of the above rights) with his / her work as original work	When creating a new work by editing the copyrighted work	
	Related rights		Right to be granted to "transmitter" (performer, record production company, broadcasting company, cable broadcasting company) of copyrighted work, etc.	When collecting and utilizing broadcast programs, etc.	Related rights holder
Personality rights	Right to privacy	Portrait rights	Right that his or her appearance is not used for photographs, paintings, sculptures, etc.	When an individual person can be identified in the materials (video, photo etc.)	Individuals who are identified
		Name rights	The right that one's own name is not infringed from others	When an individual person can be identified in the materials (video, photo etc.)	
	Publicity rights		The right that celebrity's name / portrait is not used unnecessarily in advertisement, etc.	When an individual person can be identified in the materials (video, photo etc.)	
Industrial property rights	Industrial property rights	Trademark rights (Trademark law)	Right to exclusively use a combination of characters, figures, symbols, colors, etc., to distinguish between products of the company and products of others	In the case where the document shows the one with the trademark of another person	Trademark owner
		Design rights (Design law)	Right about the creation of designs of shapes, patterns and colors of goods having novelty and creativity and having aesthetic appearance	In the case where the document shows the one with the trademark of another person	Design right holder
Right of property			Rights that can directly and fully dominate specific objects	In the case that materials are borrowed or donated from the owner	Owner

Identification of right holders

In some cases, a material/information includes several rights. In case of group photos, the copyright is owned by the photographer and the personality rights are related to each person shown in the photo. The owner of the photo has the right of property. Thus, it is important to identify the right holder according to the type of right.

Directions and process of rights processing

Rights processing is an indispensable legal procedure in order to collect and utilize a wide range of materials/information. If this procedure is inadequate, the collected materials/information cannot be used effectively, and there is a risk of infringing copyright, portrait rights, and other rights. For this reason, it is necessary to accurately identify the rights related to the materials/information when collecting the materials, and to take the permission from the right holder for each type of right.

The following is the process of taking permission of rights.

- Identification of right types and right holders
- Preparation of the agreement on use permission
- Conclusion of the agreement on use permission
- Management of permission status

8.3.2.4 Collection

Directions of collection of materials/information

In the case that long time passes after a disaster, disaster related materials are dissipated. Therefore, it is difficult to collect materials systematically. It is also difficult to collect disaster experiences as a part of disaster information through interviews after time goes by because the memories of affected people gradually becomes unclear.

It is hoped to collect as many materials/information as soon as possible but it is not realistic to collect many materials/information.

When the materials/information are collected, the following should be considered to decide the directions of collection.

- Timing and duration of collection
- Prioritized materials/information and expected KMS functions after converting into knowledge
- Areas and places for collection
- Organizations and people that can provide materials/information
- Budget for collection

Organizations and people that can provide materials/information

The following are the expected organizations and people that can provide materials/information.

- ONEMI Headquarter and Regional Offices
- Organizations related to civil protection system
- Regional governments and municipalities
- Universities and academic institutions
- Libraries

- Media companies
- NGOs
- International organizations and UN organizations
- General people including affected people

Collection methods

The following are the expected methods for collection of materials/information. If necessary, several methods need to be combined according to the situation.

- Direct physical receiving
- Data sharing such through E-mail and cloud service
- Searching the internet
- Interview
- Photo and video shooting
- Literature search

Interviews to disaster victims are an effective method to understand their disaster experiences which can be historical memory and lessons learned under KMS. Many disaster victims have psychological stresses. There are a number of different stress responses in people affected by disasters. The main causes are (1) psychological trauma and (2) social environmental stress (Cabinet Office of Japan, 2012[15]). Psychological trauma is caused by experiencing, witnessing and suffering from disasters. Socio-environmental stress is caused by the disruption of daily life, the inconvenience of living after a disaster, and being perceived as a disaster victim. Interviewing may remind them of the disaster and increase their stress. When the interview is conducted, the interviewee needs to understand the stress of disaster victims.

8.3.2.5 Organizing/Classification

This activity is considered as the process of converting from collected materials/information to knowledge under KMS. The detail information of the process is mentioned in Part 2 of this document.

8.3.2.6 Storing

Converted knowledge which is saved in digital record is stored in a digital archive. In the future, the existing ONEMI repository is modified to utilize KMS repository. The future direction of modification is mentioned in Appendix of Part 2 of this document.

8.3.2.7 Utilization

[15] Cabinet Office of Japan, Guidelines for prefectural governments on mental health care for disaster victims, 2012 (in Japanese)

The utilization of knowledge is 1) planning, 2) training, 3) education, 4) awareness raising, 5) research and development, and 6) network development as mentioned in Section 3.2.
Here, the utilization is suggested for each of expected users of knowledge as shown in Table 4.8.7.

Table 4.8.7 Utilization of knowledge

User	Specific Utilization
ONEMI: Division of Civil Protection	・ Study and analysis of disaster risk management through the utilization of knowledge ・ Development of new methodologies of management and operation with reference to knowledge ・ Training of private institutions with utilization of knowledge ・ Development of the directions for DRR planning based on the knowledge
ONEMI: Civil Protection	・ Development training materials using knowledge and provision of training ・ Sharing knowledge with public and private institutions ・ Sharing knowledge with academic and cultural centers ・ Redesign of school DRR program with reference to knowledge
ONEMI: Community Prevention Department	・ Redesign of simulation program with reference to knowledge ・ Redesign of micro zoning program and other community prevention program with reference to knowledge ・ Provision knowledge targeting family and individual people
Regional government	・ DRR planning with reference to knowledge ・ Development planning with reference to knowledge ・ Considering effective DRR measures based on knowledge ・ Improvement of civil protection system referring knowledge
Municipalities	・ DRR planning with reference to knowledge ・ Development planning with reference to knowledge ・ Considering effective DRR measures based on knowledge ・ Improvement of civil protection system referring knowledge
Organizations related to the Civil Protection National System	・ DRR planning with reference to knowledge ・ Development planning with reference to knowledge ・ Considering effective DRR measures under their works based on knowledge ・ Improvement of civil protection system referring knowledge
School	・ Provision of disaster education using knowledge ・ Improvement of school disaster management plan with reference to knowledge
NGO	・ Development of project plan with reference to knowledge
University	・ Application of knowledge as a part of action research
Communities	・ Improvement of community preparedness referring knowledge ・ Improvement of community DRR activities referring knowledge
Individual	・ Enhancement of awareness and knowledge through learning from knowledge ・ Enhancement of preparedness in their house

8.4. Appendix 4: "Good Practice of Knowledge Management System"

This appendix introduces the good practices of knowledge management in Japan. (1) explains the good practice of facilities and (2) shows the challenges of archive. (3) shows the examples of ICT-based exhibition. The essences of good practices shown in this appendix are considered to improve KMS in Chile in the future.

8.4.1. Good Practice of Knowledge Management Facilities

Disaster Reduction and Human Renovation Institute

In 1995, the catastrophic earthquake named as the Great Hanshin-Awaji Earthquake occurred in Hyogo Prefecture, Japan with more than 6,000 deaths. Hyogo Prefectural Government established the Disaster Reduction and Human Renovation Institute in 2002 in order to transfer the experiences and lessons of the earthquake to future generations. The institute has the six functions as shown in Figure 4-1 According to the interview to the institute, there are several links between and among the functions. The institute has the role of a DRR museum. Exhibition materials are developed by the institute and collected from the people affected by the earthquake. After the earthquake, more than 25 years have passed. Therefore, the number of materials provided by people is gradually decreasing. In addition to the exhibition function, support for disaster response in an affected area is an important function for the institute. The experiences and lessons on support works are analyzed in the function of DRR research and the research results are utilized for human resource development (refer to Figure 4.8.2). School children from all over Japan visit the institute for DRR learning as a part of school trips as shown in Figure 4.8.3.

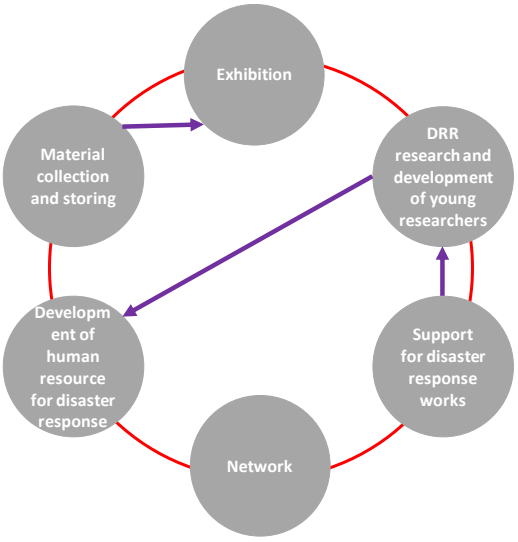


Figure 4.8.2. Function of Disaster Reduction and Human Renovation Institute

Figure 4.8.3 Disaster Reduction and Human Renovation Institute

Nojima Fault Preservation Museum

Nojima Fault is located in Awaji City, Hyogo Prefecture, Japan, which was a part of the Great Hanashin-Awaji Earthquake of 1995. Nojima Fault is the nearest fault from the epicenter of the earthquake of 1995 and appeared due to the earthquake.

The Nojima Fault Preservation Museum was established in 1998. the Nojima Fault Preservation Museum preserves the fault as it is and lets people feel the terribleness and threat of the earthquake and know the importance of preparing for an earthquake (refer to Figure 4.8.4).

At the entrance hall, there are a reproduction model of the collapse of National Route 43, a photo panel at the time of the earthquake, and a map of active faults. In the fault preservation zone, various topographical changes due to faults can be observed in detail with the explanations of cameras, panels, and guides. There is also an exhibition of a cross section of fault.

Outside of the museum, a house that was not broken even though it was right next to the active fault was opened to the public as an "earthquake-resistant house". The kitchen at that time is reproduced to know the situation in the earthquake. Museum visitors can also experience an earthquake by the simulator and see a movie about the Great Hanshin-Awaji Earthquake and the Great East Japan Earthquake.

In addition, the firewall of a market in Nagata Ward of Kobe City is relocated in the site of the museum and exhibited. This wall survived World War II and the Great Hanshin-Awaji Earthquake.

Figure 4.8.4 Nojima Fault Preservation Museum

Sendai Mediatheque

In 2011, the northern part of Japan was affected by the East Japan Earthquake and Tsunami. Sendai is one of the affected cities of Miyagi Prefecture. Sendai Mediatheque is the public institute of Sendai City established in 2000, whose functions are community center, library, etc. After the 2011 disaster, Sendai Mediatheque has conducted the innovative activity on recording the 2011 disaster through collaboration with the public. Sendai Mediatheque emphasized its role to collect and disseminate records and experiences of the 2011 disaster. But due to lack of human resources and enough budget, Sendai Mediatheque tried to cooperate with motivated people and accepted some records from them. Figure 4.8.5 is the fundamental process of knowledge management in Sendai Mediatheque. Sendai Mediatheque at first invited motivated people and they provided their records like photos, video clips,

etc. Such records are edited and released to the public. To utilize the records, Sendai Mediatheque has developed the website named as “Center for remembering 3.11” and conducted various activities to promote interaction among public people (refer to Figure 4.8.6 to Figure 4.8.9).

Figure 4.8.5 Fundamental knowledge management process in Sendai Mediatheque
(Source: Sendai Mediatheque modified by JICA Expert Team)

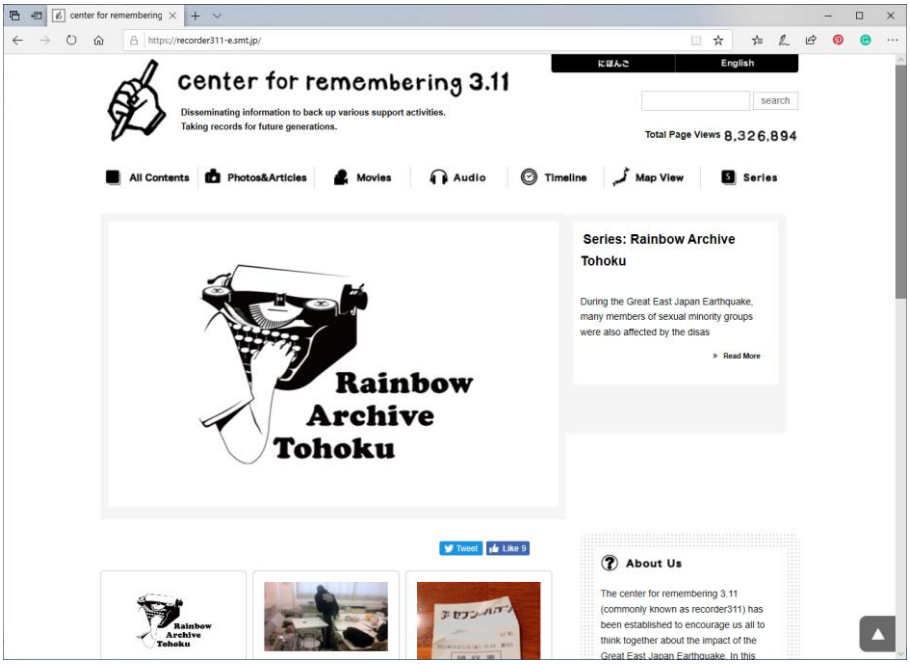


Figure 5.8.6 Website named as “Center for remembering 3.11”

Figure 4.8.7 Library area of Sendai Mediatheque and a part of area related to the 2011 disasters

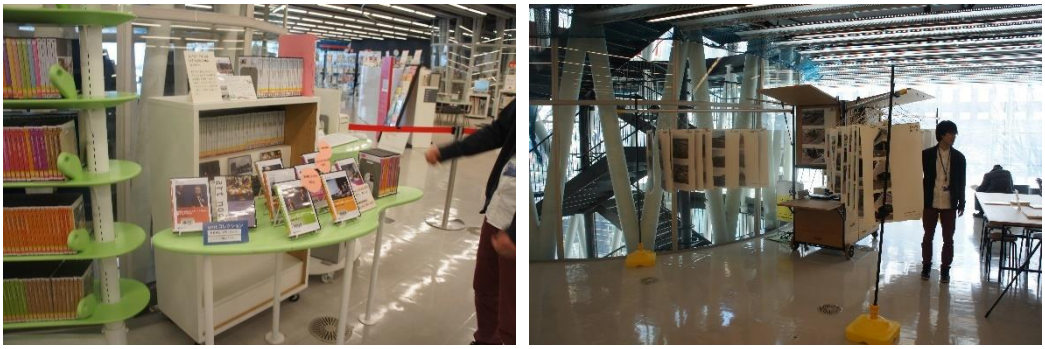


Figure 4.8.8 DVD and exhibition developed by Sendai Mediatheque

Figure 4.8.9 Interaction activities (Left: Screening, Right: Space for dialogue)
(Source: Sendai Mediatheque)

The characteristic point of the activities conducted by Sendai Mediatheque is collaboration with public. Figure 4.8.10 shows the results of the SECI model-based analysis of the activities. The activities of Sendai Mediatheque cover four phases of the SECI model which are socialization, externalization, combination, and internalization.

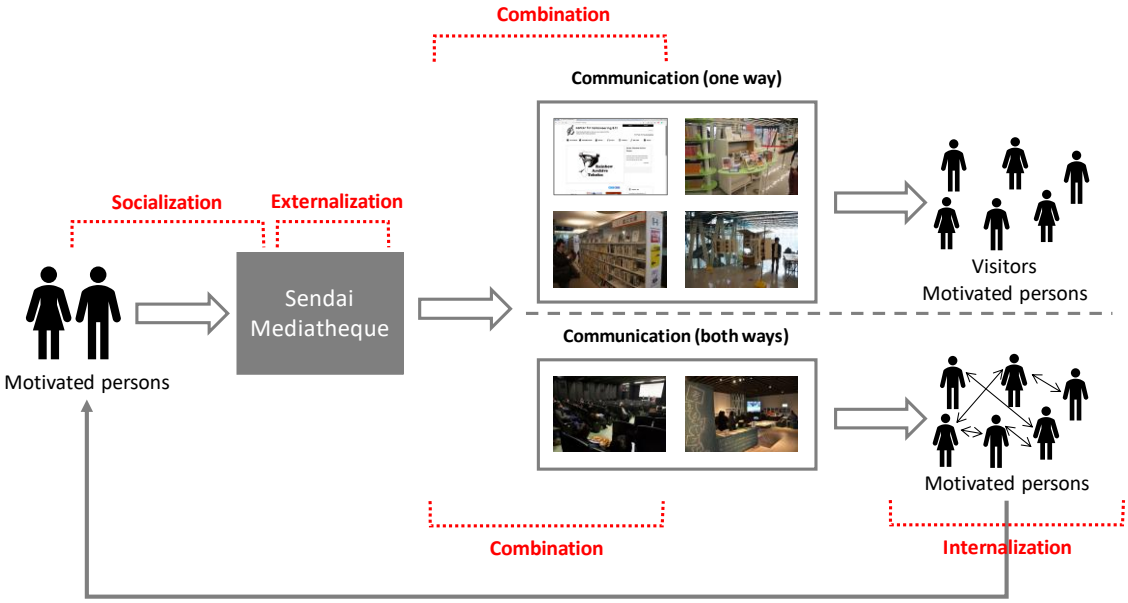


Figure 4.8.10 Analysis of Sendai Mediatheque's activities

3.11 Disaster Recovery Memorial Museum of Higashi Matsushima City

Higashi Matsushima City is one of the cities of Miyagi Prefectures. This museum is located next to the former Nobiru Station in Higashi Matsushima City, Miyagi Prefecture. The former station platform was severely damaged by the Great East Japan Earthquake. Higashi Matsushima City Government is preserving the platform and utilizing it as an earthquake remain. The museum was opened in October 2016 and renewed in October 2020 (refer to Figure 4.8.11).

The museum aims to display and introduce records of the Great East Japan Earthquake, reconstruction status, etc., and pass them on to future generations to prevent weathering of the earthquake and enhance disaster awareness.

Figure 4.8.11 3.11 Disaster Recovery Memorial Museum of Higashi Matsushima City

Ruins of the Great East Japan Earthquake: Sendai Arahama Elementary School

This is located in Sendai City of Miyagi Prefecture. When the Great East Japan Earthquake occurred, the four-story reinforced concrete school building became the evacuation area for 320 residents, students and school personnel. The tsunami surged up to the 2nd floor, and everyone who had evacuated to the school building managed to escape safely to the rooftop.

It is the goal of this facility to never again have a victim to a tsunami, to pass on the lessons learned and to show the real threat of tsunami to future generations. For these reasons, the ruins of the Arahama Elementary School building have been preserved along with other records (refer to Figure 4.8.12).

Figure 4.8.12 Sendai Arahama Elementary School

Natori City Library

Natori City is one of the cities of Miyagi Prefectures. Natori City Library has the archive system on the Great East Japan Earthquake. Before the archive was built, the earthquake record room under the direct control of the mayor was collecting records of the earthquake according to the instruction by the mayor. The library is utilizing collected records. In addition, documents, books, photos, etc., are exhibited in the library to transfer earthquake experiences to future generations (refer to Figure 4.8.13 and Figure 4.8.14).

Figure 4.8.13 Top page of the archive of Natori City
(Source: Natori City Library)

Figure 4.8.14 Natori City Library

The CHU-ETSU Earthquake Memorial Corridor

In 2004, the big earthquake named as the Great Chuetsu Earthquake occurred in Niigata Prefecture. In May 2010, the Niigata Prefecture Chuetsu Great Earthquake Reconstruction Fund commercialized "Support for the maintenance and operation of memorial bases" and the CHU-ETSU Earthquake Memorial Corridor was established in October 2011. This corridor consists of four facilities and three parks shown in Figure 4.8.15. It aims to realize a disaster-reducing society by sharing the experiences and lessons learned from the Great Chuetsu Earthquake with many people, communities, and children. Establishing the corridor is an attempt to use the disaster area as a storage for information. By visiting each base and touching on the memories of the earthquake and the trajectory of reconstruction, the huge real image of the Great Chuetsu Earthquake can be highlighted.

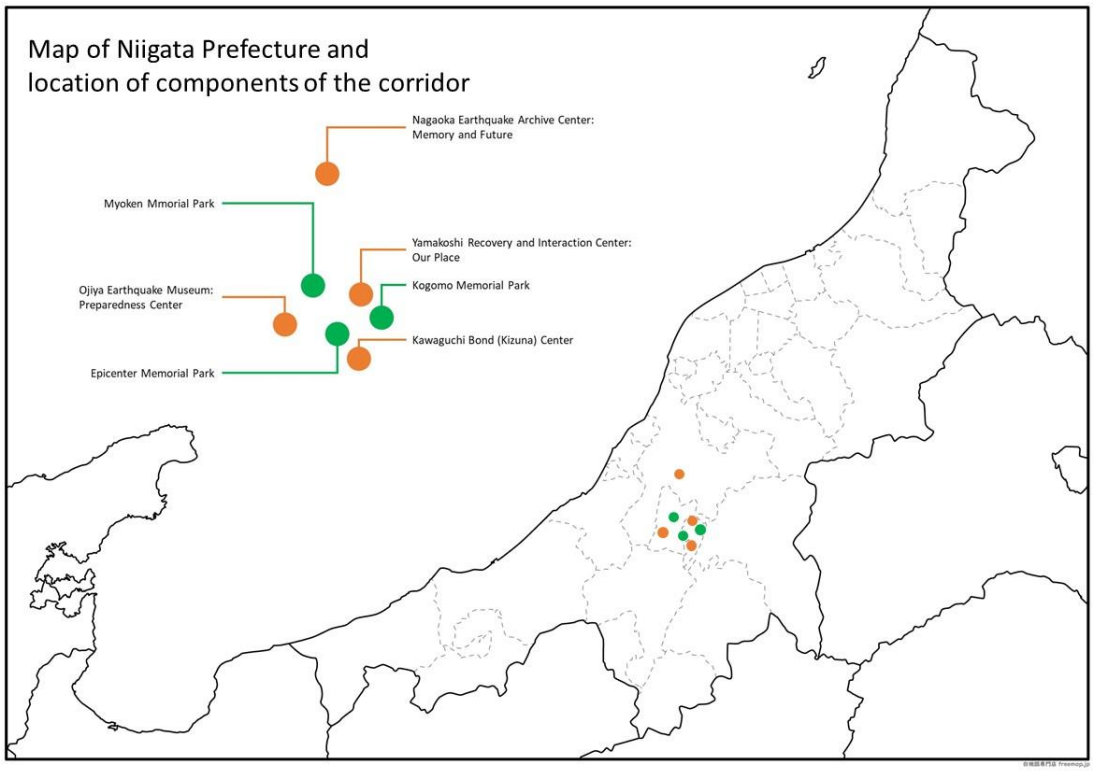


Figure 4.8.15 Location of four facilities and three parks

8.4.2. Good Practices of Knowledge Management Website

National Diet Library Great East Japan Earthquake Archive

The National Diet Library and the Ministry of Internal Affairs and Communications have collaborated and contributed to the creation of the "National Diet Library Great East Japan Earthquake Archive" (Nickname: HINAGIKU) portal site for centralized searching and utilization of digital data related to

the Great East Japan Earthquake, and officially opened the site on Thursday March 7, 2013 (refer to Figure 4.8.16). The National Diet Library carries out all maintenance and operation of HINAGIKU since its release. The portion of duties, responsibilities, etc. of the Ministry of Internal Affairs and Communications related to the site were transferred to the National Diet Library starting in fiscal 2013. The archive allows for the comprehensive searching of relevant sounds, videos, photos, web information and other materials in order to convey the record and lessons learned from the Great East Japan Earthquake to later generations and to use in recovery and revitalization projects for stricken areas, as well as future disaster prevention and mitigation measures.

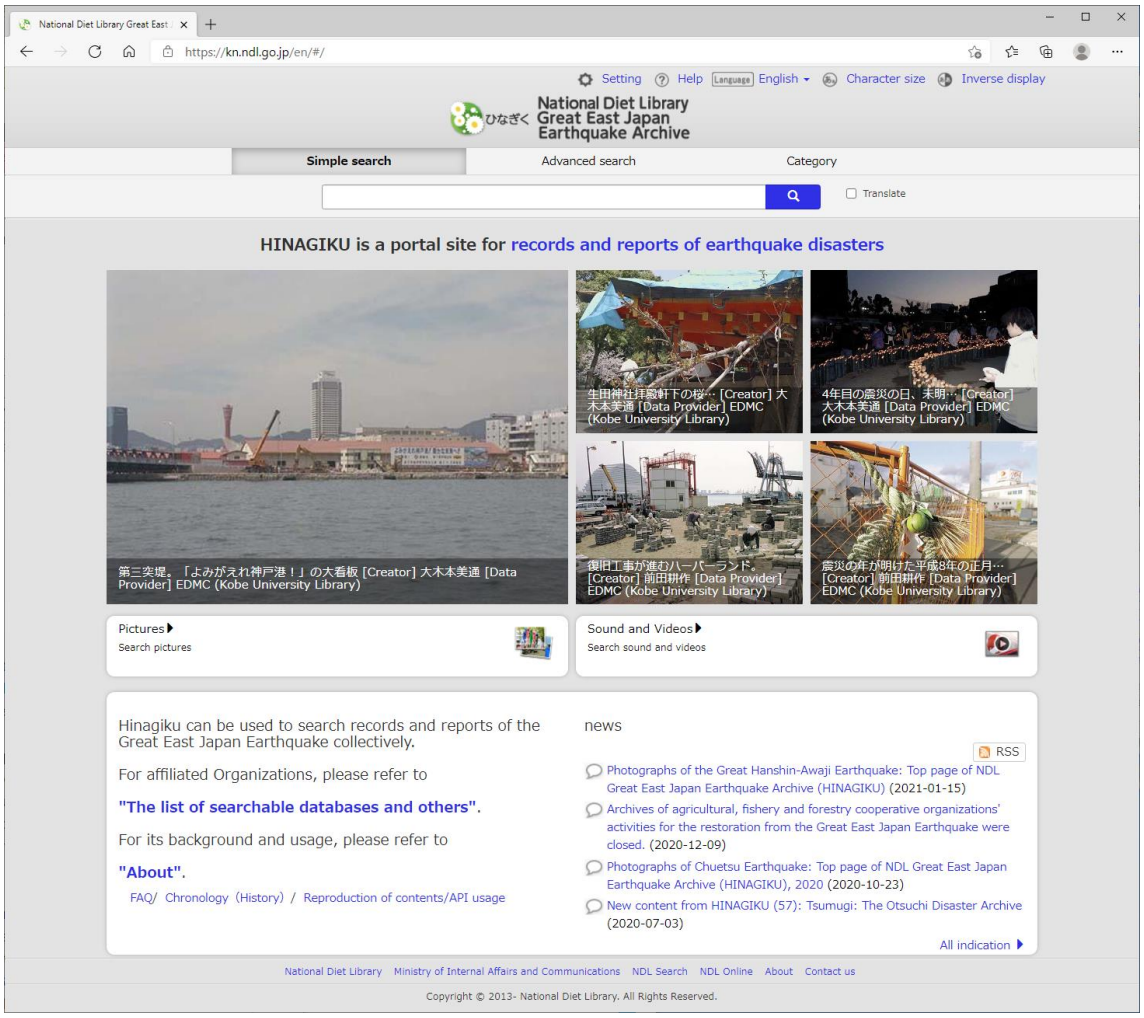


Figure 4.8.16 Top page of HINAGIKU

Earthquake Memorial Museum

On March 11, 2011, at 14:46 JST, the Great East Japan Earthquake took away a number of people's lives and properties, and traumatized many people, leaving a deep sorrow in their hearts.

There is a long and repeated history of tsunami tragedy. Tsunami-related rocks which are memorial stones show the height where a tsunami reached and have been built every time when a tsunami hits

the areas. “Never repeat the tragedy” - it has long been a desire generation after generation. The Great East Japan Earthquake was said to be the first disaster in history where a massive tsunami disaster of Japan was faithfully recorded in detail in images and videos. The Tohoku Regional Bureau, also hoping that we will not repeat this tragedy again in future and it has created this record in order to let this disaster’s experiences and lessons be useful to our future generations.

This website aims to help people share the experiences of the earthquake and pass them on to the next generation and contribute to disaster prevention in Japan in the future (Figure 4.8.17).

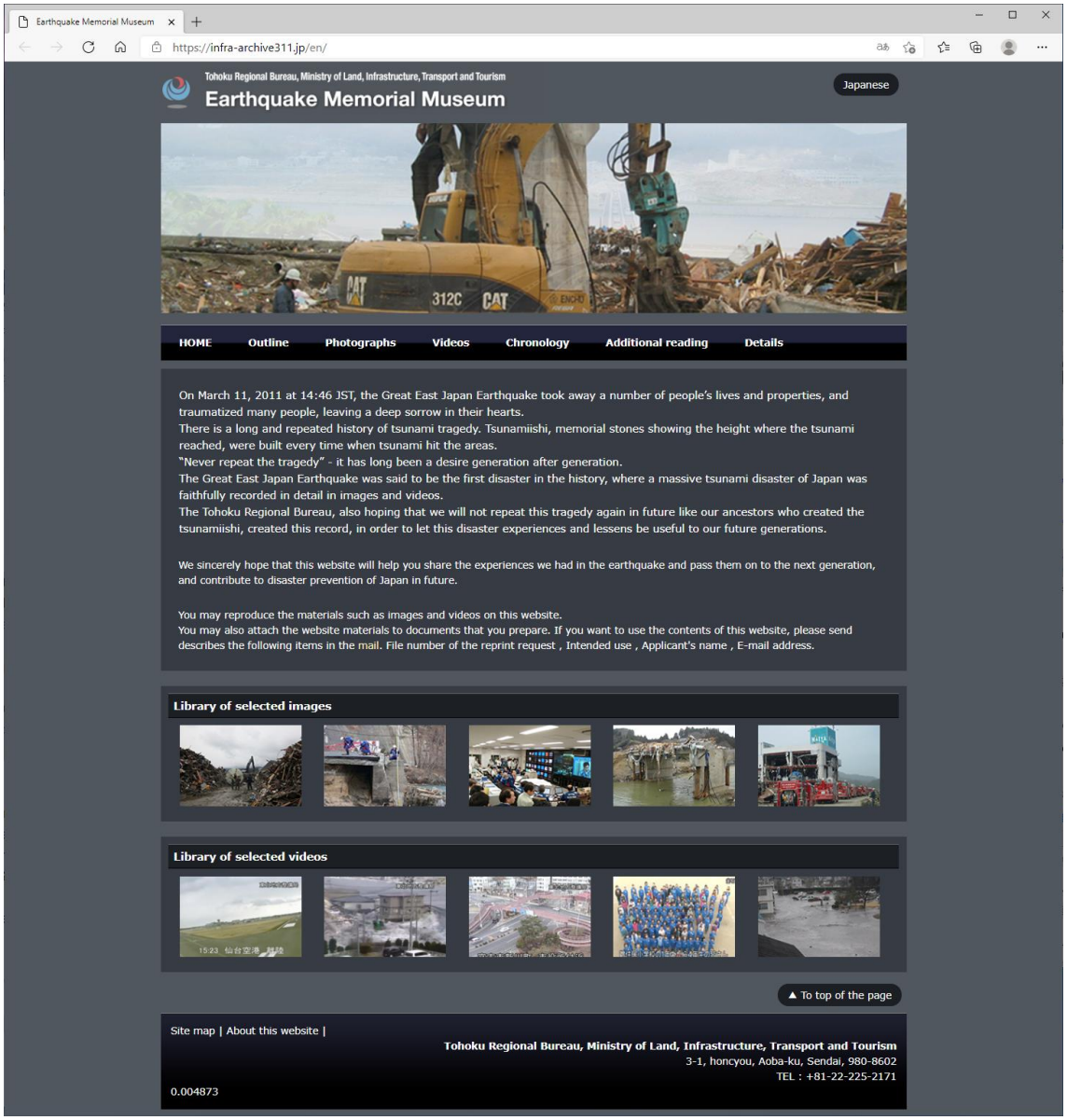


Figure 4.8.17 Top page of Earthquake Memorial Museum

Michinoku Earthquake Record

Michinoku is the old word for the area of Tohoku, which was affected by the Great East Japan Earthquake. The International Research Institute for Disaster Science, Tohoku University, started the project “Michinoku Earthquake Record” in collaboration with industry, government, and academia institutions in order to collect all memories, records, cases, and knowledge about the Great East Japan Earthquake and share them domestically and internationally (refer to Figure 4.8.18).

This project conducts cross-disciplinary research based on memories, records, cases, and knowledge gathered from various perspectives, from historical disasters to the Great East Japan Earthquake, centering on the areas affected by this earthquake. The research results can be utilized for future disasters.

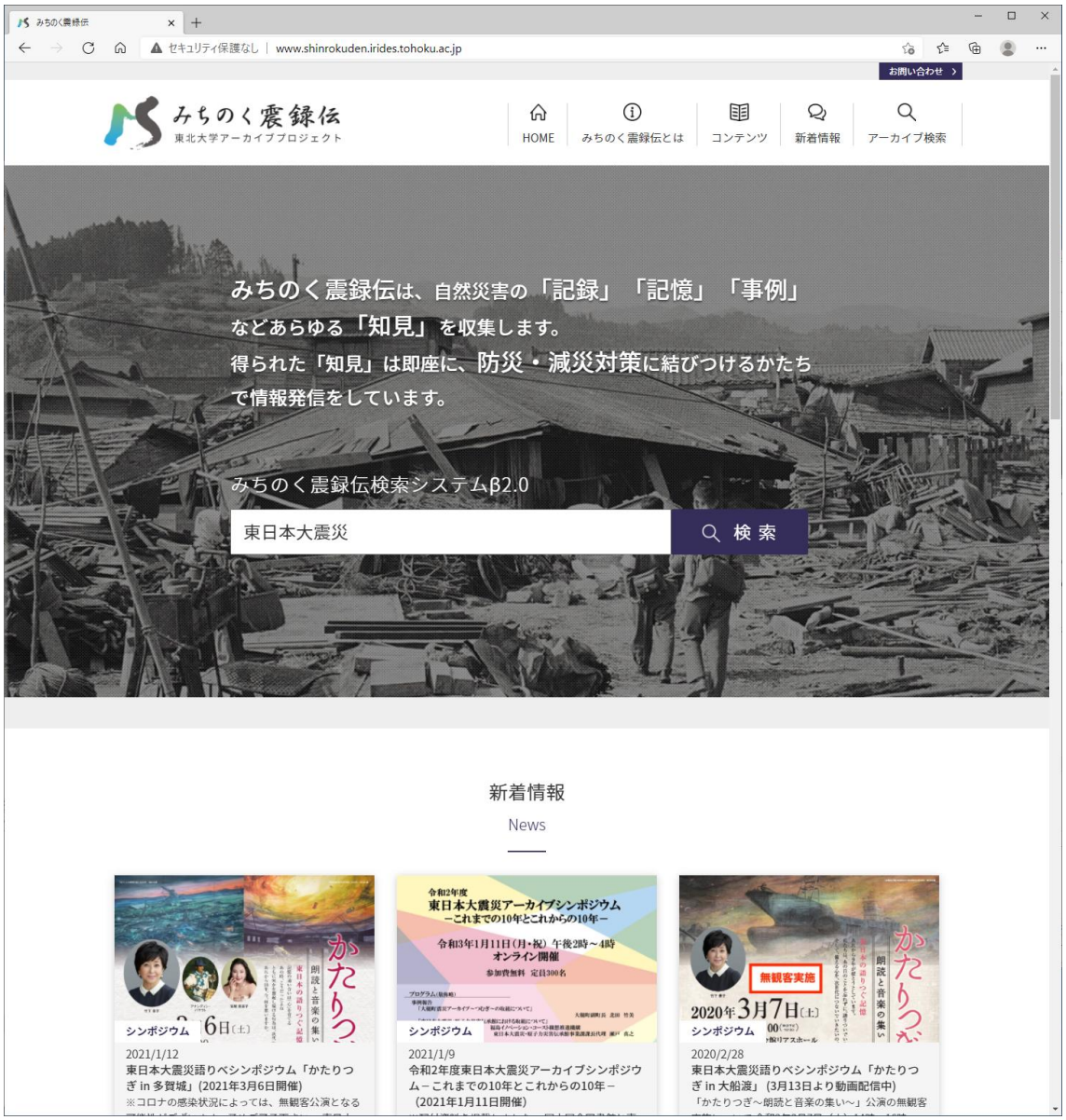


Figure 4.8.18 Top page of Earthquake Memorial Museum

NHK East Japan Earthquake Archive

This archive is a video archive of news footage of the earthquake and testimonies of the survivors and witnesses (refer to Figure 4.8.19). This aims to preserve and spread vital knowledge about how people fought to survive. It also hopes to raise awareness and contribute to future disaster risk reduction.

The testimony of the victims in this archive is a re-edited version of the interviews recorded for the program to be published on this site. The video of the news has been clipped for publication on this site based on the clips broadcasted on NHK News after the earthquake at 2:46 pm on March 11 2011.

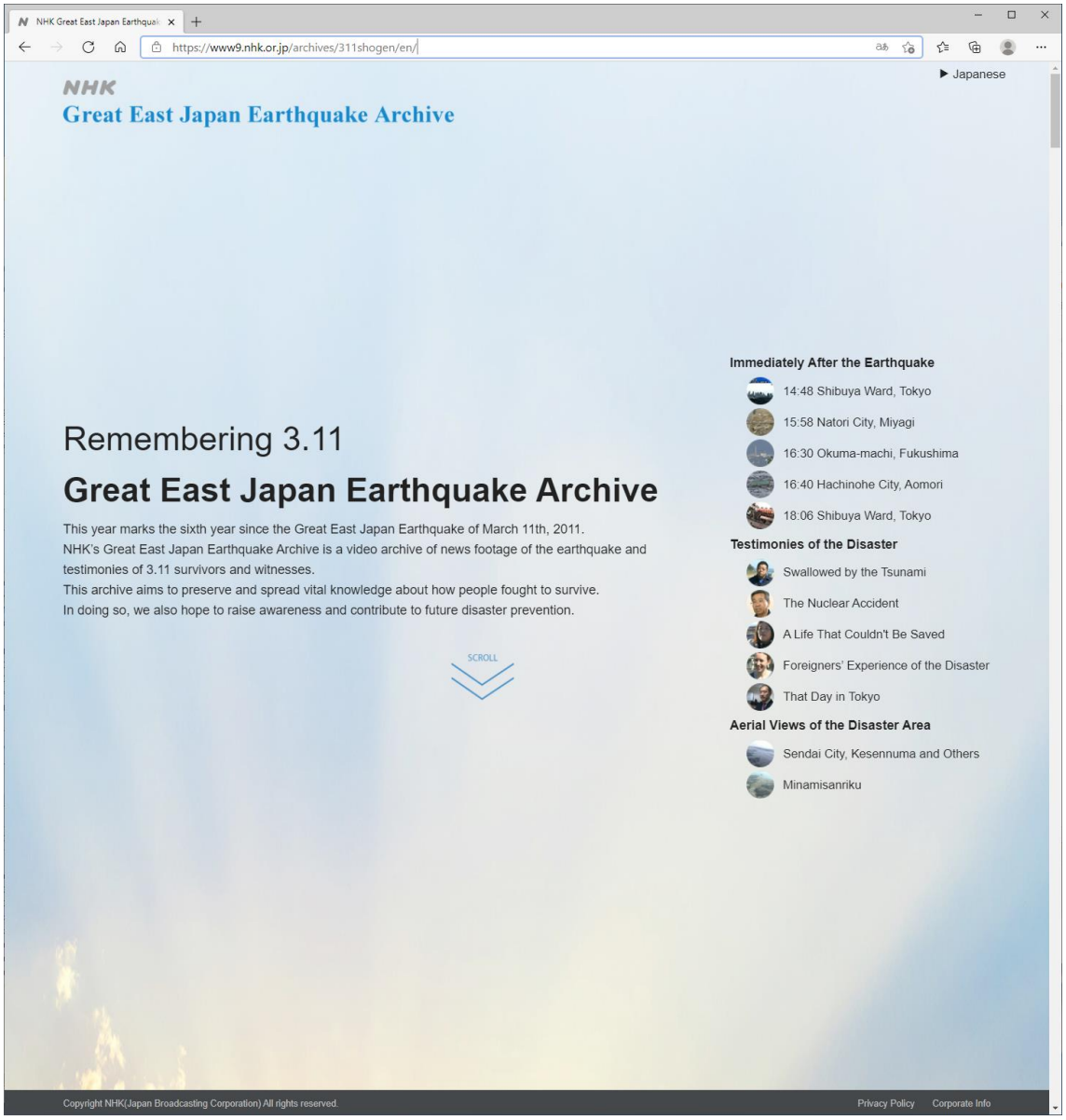


Figure 4.8.19 Top page of Earthquake Memorial Museum

Japan Disasters Digital Archive

A project of Harvard University's Reischauer Institute of Japanese Studies, the Japan Disasters Digital Archive (JDA) is an evolving, collaborative space for citizens, researchers, students, and policy makers (refer to Figure 4.8.20). The digital archive is an advanced search engine for archived materials from all over the web, individuals' testimonials, tweets, prominently including content from international partners who are building digital repositories about the disasters. The site not only facilitates the searching of materials, but also allows users to create curated collections and interactive presentations on topics of interest to them. Collections and presentations can be shared publicly and enhance the value of the various items accessible through the archive. The archive also features an innovative map feature that visualizes all materials that are tagged with geographic information in real time.

The JDA project relies on the support of partner organizations around the world to supply digital contents, including websites, tweets, video, audio, news articles, and much more1. The JDA does not store copies of the data; rather it seamlessly links to digital materials archived by partner projects, allowing you to search, view, and sort items across separate archives and collections in one interface.

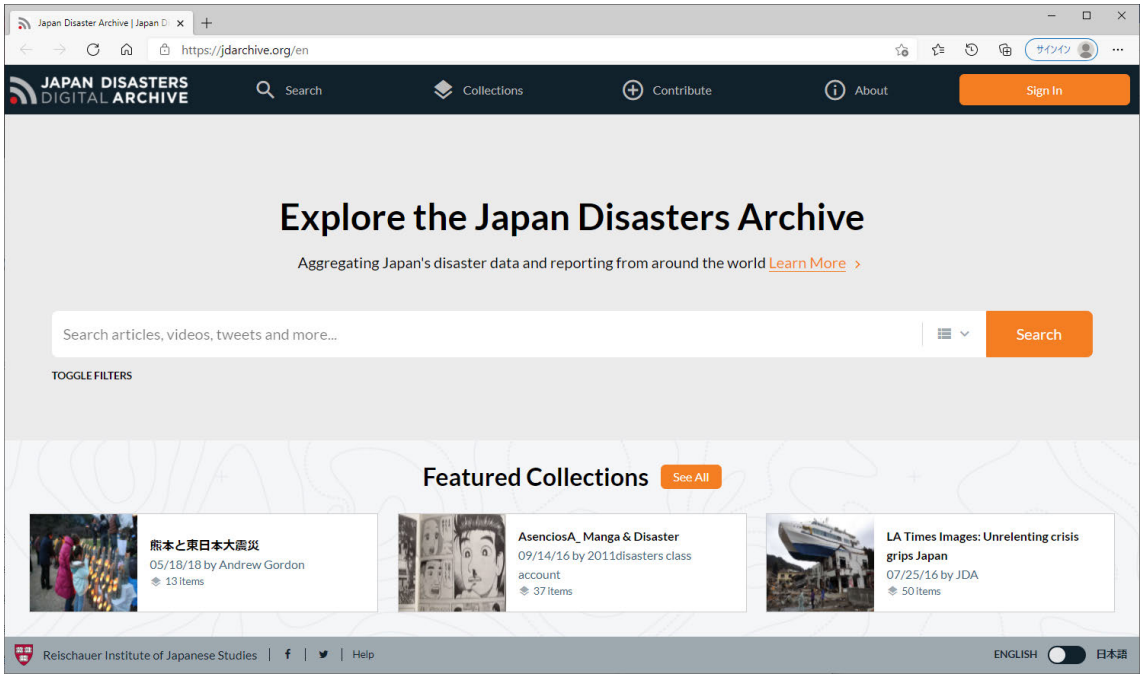


Figure 4.8.20 Top page of Japan Disasters Digital Archive

8.4.3. Good Practices of ICT-based exhibition

This section shows the good practices to be considered for enhancing a Knowledge Management System.

If relevant data in disaster risk reduction is restored in the Knowledge Management System, visualized applications can be developed by using these data.

8.4.3.1 Introduction of ICT tools for Disaster Risk Reduction

VR / AR / MR

VR is a technology that has been used for a long time, but with the spread of smartphones, many applications that utilize MR technology have appeared, and those that combine VR and AR have also come to be seen. These definitions are as follows.

Virtual reality (VR) implies a complete immersion experience that shuts out the physical world. Using VR devices such as HTC Vive[16], Oculus Rift[17] or Google Cardboard, users can be transported into a number of real-world and imagined environments such as the middle of a squawking penguin colony or even the back of a dragon.

Augmented reality (AR) adds digital elements to a live view often by using the camera on a smartphone. Examples of augmented reality experiences include Snapchat lenses and the game Pokemon Go.

In a Mixed Reality (MR) experience, which combines elements of both AR and VR, real-world and digital objects interact. Mixed reality technology is just now starting to take off with Microsoft's HoloLens one of the most notable early mixed reality apparatuses.

Extended Reality (XR) is an umbrella term that covers all of the various technologies that enhance our senses, whether they're providing additional information about the actual world or creating totally unreal, simulated worlds for us to experience. It includes Virtual Reality (VR), Augmented Reality (AR) and Mixed Reality (MR) technologies.

3D-printing and projection mapping

3D-printing is equipment which can create 3D objects from 3D-CAD data. 3D printing can make 3d-geographical features inexpensively by using 3d-geographical data.

On the other hands, projection mapping is the same technology as a projector. However, this can be used when an aerial photograph is projected to 3d-geographical features. Trainees can intuitively understand where there are dangerous sites, threatened by landslide or inundation sites by river flooding.

[16] Source: https://www.vive.com/eu/

[17] Source: https://www.oculus.com/

Digital twin or virtual city

A Digital Twin is drawing attention as a Smart City approach. A digital twin is a digital, virtual, near-real time replica of physical assets, people, places, systems, and devices whereby the transmission of data allows coexistence and synchronization between the virtual and physical entity. A digital twin models both the static elements and the dynamics of related IoT devices of real-time sensor data during their lifecycle. Foundational technologies include spatial modeling and Computer Aided Design (CAD) software, IoT, Artificial Intelligence (AI), and software analytics. Key use cases include the optimization of the operation and maintenance of physical assets, systems.

In Ministry of Land, Infrastructure, Transportation and Tourism of Japan, the digital twin named Plateau is being developed. The goal of Plateau is that a city plan, disaster prediction, and so on can be carried out and verified in this virtual data. Currently, MLIT is creating 3D-digital data of major cities (Tokyo, Osaka, and so on).

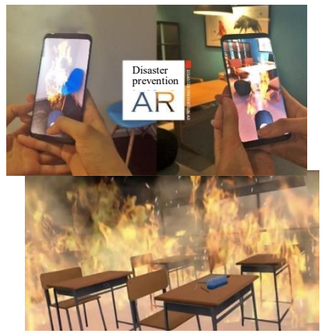
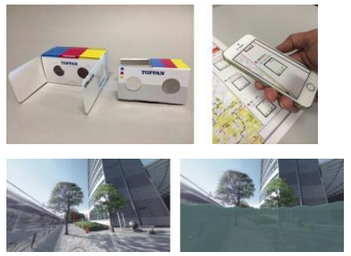
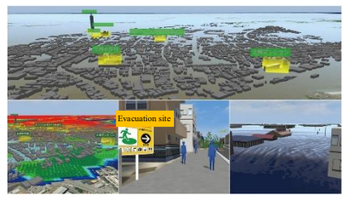
Figure 4.8.21 Image of the digital twin in case of MLIT named “Plateau”

Source: https://www.mlit.go.jp/plateau

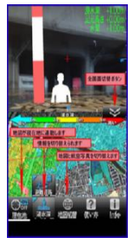
8.4.3.2 Good Practices of ICT tools in Japan

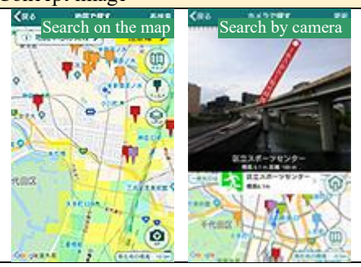
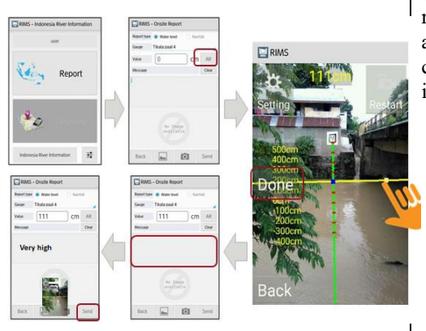
The following table shows examples in Japan. These were surveyed as of March 2021. Since these technologies are updated daily, they are required to be updated as appropriate.

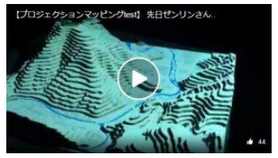
Table 4.8.8 Good Practices of ICT tools in Japan

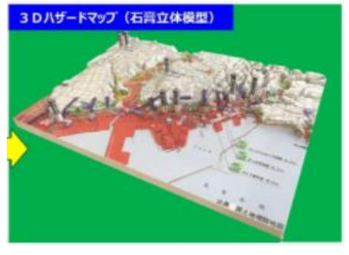
No	Category	Provider	Project title	Outline	Concept image	Suggestion to KMS	URL (Japanese Website)
1	VR	iDEACLOUD	Disaster prevention VR, fire experience	Disaster prevention VR" that can be used for disaster prevention events and disaster prevention education has been developed. The following three lineups are available to support a wide range of ages and applications. 1. Disaster prevention VR / Fire edition: Disaster prevention VR that enables full-scale training. Exercise / training type VR content that uses the HTC Vive remote control and room scale to perform simulated fire extinguishing training using a fire extinguisher. 2. Disaster prevention VR for Instant / Fire edition: Disaster prevention VR that you can experience in 60 seconds. VR content that allows you to experience escape from a room full of smoke by using HTC Vive corresponding to the room scale. 3. Disaster prevention VR for KIDS / Fire edition: Disaster prevention VR compatible with monocular VRHMD so that even children can experience it. Enlightening VR content to relearn the fear of fire.		If ONEMI stores 3D digital data and hazard data of fire in the KMS, a similar model can be created.	https://ideacloud.co.jp/works/bousai_fire_170110.html
2	VR	iDEACLOUD	Disaster prevention VR, earthquake experience	From the experience of an earthquake in a room in a general dwelling unit, content has been developed that allows you to learn while experiencing the knowledge related to an earthquake, such as simulating the initial response to an earthquake and experiencing the shaking of the earthquake step by step.		If ONEMI stores 3D digital data of earthquake and hazard data in the KMS, a model can be created.	https://bousai-vr.com/products/earthquake_evacuation
3	VR	TOPPAN PRINTING CO., LTD.	VR scope for hazard	VR scope is a box that allows you to experience 360-degree VR by inserting a smartphone. Toppan Printing has developed a VR that allows you to experience simulated flood damage using a VR scope. Based on the hazard map data of the local government, you can virtually experience the situation where the residential area was damaged through the VR image created by superimposing the flood damage expected when a tsunami, storm surge, heavy rain, etc., occurs on the actual image. In addition, since the content is provided from the cloud server managed and operated by Toppan Printing, it is not necessary to develop a dedicated application, and the workload related to the introduction can be reduced.		If ONEMI stores 3D digital data and hazard data of earthquake in the KMS, a similar model can be created.	https://www.toppan.co.jp/news/2015/11/newsrelease151118_1.html
4	VR	FORUM8 Co., Ltd.	3DVR inundation hazard map service	"3D VR Inundation Hazard Map Service" is an application that allows you to check simulations and evacuation routes in three dimensions during a disaster. Hazard maps based on flat maps are difficult to grasp intuitively, so 3DVR is constructed from flat maps and visualized in cooperation with the company's high-precision real-time simulation of inundation and tsunami. This makes it possible to provide easy-to-understand evacuation guidance explanations, which can be effectively used in disaster prevention education and evacuation drills. The created data can be viewed with another software such as VR-Cloud, and it is possible to check the overall bird's-eye view, the actual location of the evacuation site, and the state before and after the inundation from walk-throughs and various viewpoint positions.		If ONEMI stores 3D digital data and hazard data of inundated flood in the KMS, a similar model can be created.	https://www.forum8.co.jp/product/ucwin/road/hazardmap.htm

No	Category	Provider	Project title	Outline	Concept image	Suggestion to KMS	URL (Japanese Website)
5	VR	Rikei Corporation	VR for disaster drill	Content has been developed that allows you to experience various disasters such as earthquakes, fires, and floods in VR. So far, more than 20,000 people have experienced it. It also supports a simultaneous playback function that plays multiple VR goggles at the same time, and the company is developing goggles for adults and children with different types of VR goggles. The contents that you can experience are as follows. ・ Fire / Evacuation: You can experience poor visibility due to smoke during a fire. ・ Heavy rain: The heavy rain in western Japan in 2018 is reproduced in VR. ・ Sediment disaster: Reproduce the content that makes you feel the fear of sediment disaster in VR. ・ Earthquake: Experience the shaking of an earthquake in VR. You can learn about measures such as fixing furniture and preventing glass from scattering.		If ONEMI stores 3D digital data and hazard data of earthquake, tsunami or fire in the KMS, a similar model can be created.	https://www.rikei.co.jp/product/611/
6	VR	Tokyo Fire Department	VR disaster prevention experience car	The Tokyo Fire Department has procured a large vehicle that can be used for simulated experience training of disasters while watching VR images. With a head-mounted display, you can see 360-degree stereoscopic images and experience the movement of seats according to the situation of a disaster.		If ONEMI stores 3D digital data and hazard data of earthquake, tsunami or fire in the KMS, a similar model can be created.	https://www.tfd.metro.tokyo.lg.jp/ts/bousai_fukyu/bousai_vr.html
7	VR	NEC corp.	VR on-site experience training system for disaster prevention	The NEC VR on-site experience training system for disaster prevention is a system that allows you to practice appropriate disaster prevention activities by reproducing disaster sites that are difficult to experience on a daily basis with VR technology, based on the know-how of firefighters and experts. For example, at a dangerous site that is close to the actual situation reproduced based on the know-how of a fire site expert, you can practice realistic training as if you actually encountered a fire site, and practice the correct evacuation method in case of a fire.		If ONEMI stores 3D digital data and hazard data of fire in the KMS, a similar model can be created.	https://www.nec-solutioninnovators.co.jp/sl/vr/bosai/index.html
8	VR	Tanaka Denki Co., Ltd.	360 degree 3D VR theater 4DOH Disaster drill VR	The company provides a theater box that can simultaneously provide up to 16 people with simulated experiences of disasters such as fires, heavy rains, and earthquakes using stereoscopic images projected around the entire circumference of 360 degrees.		If ONEMI stores 3D digital data regarding past disasters in the KMS, a similar model can be created.	https://www.tanaka-denki.co.jp/biz-emo/product/4doh/
9	AR	Faculty of Engineering, Aichi University of Technology （Tomoki Itamiya, associate prof. at that time）, NTT DOCOMO, INC. (Tokai branch)	Virtual evacuation drill	NTT DoCoMo Tokai and Aichi University of Technology have signed a cooperation agreement for a disaster simulation experience application using augmented reality (AR) technology. Aichi University of Technology develops the basic application, and the DoCoMo Tokai becomes the contact point for dissemination activities. The app is used in combination with a smartphone and simple paper goggles, allowing you to experience the rising water level at your feet and hear the sound of heavy rain. You can also experience how smoke fills the room from the ceiling, and you can learn the necessity of evacuating while lowering your posture.		If ONEMI stores 3D digital data regarding past disasters in the KMS, a similar model can be created.	https://www.nttdocomo.co.jp/info/notice/tokai/page/180116_00.html

No	Category	Provider	Project title	Outline	Concept image	Suggestion to KMS	URL (Japanese Website)
10	VR	JOLLY GOOD Inc. Aska Motor Industry Inc.	A VR earthquake experience vehicle that allows you to experience a large earthquake with a seismic intensity of 7 in VR, assuming that you are in a school or kitchen	The VR earthquake experience vehicle equipped with "Disaster Prevention VR" developed by Jolly Good is an earthquake experience vehicle that allows you to experience the shaking of a huge earthquake with a maximum seismic intensity of 7. You can experience how it looks in school, kitchen, and outdoors in 360-degree VR.		If ONEMI stores 3D digital data regarding past disasters of earthquake in the KMS, a similar model can be created.	https://www.bosaijoho.net/2019/11/01/%E3%82%B8%E3%83%A7%E3%83%AA%E3%83%BC%E3%82%B0%E3%83%83%E3%83%89%EF%BC%9Avr%E5%9C%B0%E9%9C%87%E4%BD%93%E9%A8%93%E8%BB%8A%E3%82%92%E8%B2%A9%E5%A3%B2%E9%96%8B%E5%A7%8B/
11	AR	Kansai University CAD CENTER CORPORATION, Pacific Consultants Co.Ltd.,	iPhone app "AR Tsunami Hazard Map"	Kansai University, CAD CENTER CORPORATION, and Pacific Consultants have jointly developed the "AR Tsunami Hazard Map" that allows you to use information on the tsunami that hits your location and the surrounding evacuation sites and evacuation routes on your iPhone, iPad, etc. In the "AR Tsunami Hazard Map", disaster prevention information and evacuation routes can be displayed on the map, and inundation images due to the tsunami, information on surrounding evacuation shelters, and directions of shelter buildings can be displayed with arrows in the camera image. Also, if you turn on GPS, you can display disaster prevention information according to your current location and the direction you are looking at, and if you turn it off, you can virtually display information on the place you want to see without going to the site.		If ONEMI stores evacuation sites and hazard data of earthquake, tsunami in the KMS, a similar model can be created.	https://www.pacific.co.jp/news/2014/20140219-000167.html
12	AR	CAD CENTER CORPORATION	[AR Hazard Scope® Series] (Flood version)	A hazard map app has been developed to learn about disasters in advance. It has been introduced in Kawaguchi City and Misato City in Saitama Prefecture, Oita City, Oita Prefecture, Suginami Ward and Katsushika Ward in Tokyo, Niigata City, Niigata Prefecture, Nagoya City, Chigasaki and Kamakura in Kanagawa Prefecture, etc. It is an application that allows you to check evacuation shelter information etc., by superimposing it on the actual scenery. It provides an opportunity to think about what kind of action should be taken in the event of a disaster by grasping the dangers of the town in advance in a way that is closer to reality.		If ONEMI stores evacuation sites and hazard data of earthquake, tsunami in the KMS, a similar model can be created.	https://www.city.kawaguchi.lg.jp/soshiki/01040/010/7/1/2998.html
13	AR	CAD CENTER CORPORATION	[AR Hazard Scope® Series] (Earthquake version)	It is an application that links with information such as GPS (Global Positioning System) and electronic compass, and displays disaster prevention information of your current location on video images taken by an iPhone camera. This application provides disaster prevention information to users in an easy-to-understand manner by adopting AR (Augmented Reality) technology.		If ONEMI stores evacuation sites and hazard data of earthquake, tsunami in the KMS, a similar model can be created.	https://www.cadcenter.co.jp/products/archives/7

No	Category	Provider	Project title	Outline	Concept image	Suggestion to KMS	URL (Japanese Website)
14	AR	Mitsui Sumitomo Insurance Co., Ltd.	Smartphone-saved disaster navigation	In the event of a large-scale natural disaster, "Smartphone-saved disaster navigation" not only guides you to nearby evacuation centers, but also allows you to check the direction even in total darkness with the AR function. It is also equipped with other convenient functions in the event of a disaster, such as information gathering and safety confirmation. In addition, the AR function can be used even when communication is cut off since the evacuation center data once searched is saved in the smartphone.		If ONEMI stores evacuation sites data in the KMS, a similar model can be created.	https://www.ms-ins.com/sumaho/saigai.html
15	AR	Qwake Tech (USA)	Helmet "C-Thru" that allows you to see inside the building even at a fire site	C-Thru is a special helmet equipped with an infrared camera and sensor. By wearing it, firefighters can grasp the position of the person to be rescued and the burning place from the inside of the building projected on the AR goggles even if at the fire site that cannot be seen at all due to smoke. Firefighters can also avoid broken floors and fallen objects in dark buildings. It also plays the role of a navigation system that is displayed in real time, so it is said that they can act faster than usual. This helmet is effective not only for front-line firefighters but also for commanders outside the building, allowing the commanders to see the images of the camera attached to the helmet in real time and grasp the situation.		If ONEMI stores 3d digital data and hazard data of fire in the KMS, a similar model can be created.	https://www.qwake.tech/
16	AR	Fujitsu Limited	An app that can measure river water levels using smartphones and AR technology	By utilizing AR technology and smartphones that can be introduced at low cost, Fujitsu has built a system that allows anyone to safely perform standard measurements even from a location away from rivers. The system supports Indonesian river level monitoring, rapid information sharing between local government officials in the event of a flood warning water level, and prompt and accurate evacuation instructions to citizens. In Indonesia, it is difficult to continuously install a system to monitor water level changes by installing river water level sensors outdoors due to the high cost of equipment maintenance. For this reason, AR technology is used to create a system that allows anyone to make standard measurements safely even from a location away from the river. A demonstration experiment was conducted in Manado, Indonesia.		If ONEMI will correct real-time flood data, this application is useful to collect data inexpensively.	https://pr.fujitsu.com/jp/news/2016/03/9.html
17	AR/VR/MR	Hydro Technology Institute Co., Ltd.	AR disaster experience application development	Hydro Technology Institute has developed a disaster experience application using an AR visualization system. This software enables realistic inundation expression by detecting real objects immediately and accurately using smartphones and tablets.		If ONEMI stores past disasters data and hazard data regarding inundated flood in the KMS, a similar model can be created.	https://hydrosoken.co.jp/service/service1_bunya_detail.php?field=5106

No	Category	Provider	Project title	Outline	Concept image	Suggestion to KMS	URL (Japanese Website)
18	AR	National Institute of Advanced Industrial Science and Technology （AIST）	"Disaster medicine quest", a disaster medicine learning material from elementary school students (3rd grade and above) to junior high school students	A new type of disaster medicine learning material "Disaster Medicine Quest" has been created so that not only adults but also children can learn about disaster medicine with interest. This "Disaster Medicine Quest" consists of games, quizzes, and illustrations using the latest AR technology. When you hold the camera over and load the AR marker, the quest starts. Content aimed at children learning medical care (called meducate) while having fun is prepared.		If ONEMI stores past disasters data and hazard data in the KMS, educational contents can be created.	http://www.disaster-medutainment.jp/teaching_materials_for_junior/
19	Projection Mapping	FUKUOKA DMGT CO., LTD	Disaster drill using projection mapping	Most fires come from outlets and kitchens in the home, but real fires cannot be used in training. For reasons such as the powder of the fire extinguisher being scattered, the training so far has been limited to practicing how to use the fire extinguisher outdoors. The following efforts were implemented so that realistic fire extinguishing training could be conducted indoors using a fire extinguisher. ① Use "projection mapping" to project an image of fire ② Collaborate with multiple parties to conduct more full-scale disaster prevention drills		If ONEMI stores 3D digital data and hazard data of fire in the KMS, a similar model can be created.	https://www.fdmgt.co.jp/post/%EF%BD%8E%EF%BD%88%EF%BD%8B 福岡放送局「防災ステーション」参加報告
20	Projection Mapping	ASSOCIATION FOR PROMOTION OF BOSAI-DIORAMA	Cardboard diorama disaster prevention class	The terrain is created by assembling a diorama with cardboard, and hazards, regional characteristics, social characteristics, etc. are projected and visualized by project mapping.		If ONEMI stores 3D digital data and hazard data of landslide, inundated flood in the KMS, a similar model can be created.	https://www.facebook.com/bosai.diorama/videos/1676023679333644/
21	3D-printing	SEIBIDO Ltd.	3D disaster hazard map by color 3D printer	The company outputs a "three-dimensional disaster hazard map" using a "color 3D printer". When you look at a disaster prevention / disaster map on a flat map, you can easily identify the location, but it is difficult for anyone other than an expert to understand what the location is three-dimensionally. Therefore, a three-dimensional disaster prevention / disaster map was created as a way to raise awareness of disaster prevention. By superimposing the disaster prevention / disaster map on the 3D map output by the 3D printer based on the 3D data, the disaster prevention / disaster information can be confirmed concretely. For example, it becomes easy to understand information such as how steep the cliff is and how wide it is.		If ONEMI stores 3D digital data and hazard data of landslide, inundated flood in the KMS, a similar model can be created.	https://www.ipros.jp/product/detail/2000553100/

No	Category	Provider	Project title	Outline	Concept image	Suggestion to KMS	URL (Japanese Website)
22	3D-printing	Jumbo Co., Ltd.	3D color printer	Since Jumbo's 3D color printer uses paper as the material, the material cost is significantly lower than other 3D color printers, and since it can be manufactured in-house, it is possible to deliver at a reasonable price and in a short delivery time. As disaster education, it can be used for the following purposes. ・ Prepare a full-color 3D model that clarifies the danger zone of sediment disasters. ・ Create a 3D map for disaster prevention in the area ・ Represent an inundated area assuming heavy rain and flood with a three-dimensional map ・ Simulate a river flood on a 3D map In addition to paper, the 3D printer can also process environment-friendly recycled PET, PVC-based materials, and even surface-treated materials as metal vapor deposited materials.		If ONEMI stores 3D digital data and hazard data of landslide, inundated flood in the KMS, a similar model can be created.	https://www.jmb.co.jp/service/3d_landslide_map.html
23	3D-printing	JAMSTEC (Japan Agency for Marine-Earth Science and Technology), NIED (National Research Institute for Earth Science and Disaster Resilience)	Reproduction of the traditional monuments with 3D printers	For the traditional monuments posted on the "Archive Map", detailed shapes other than the engraved letters and the front can be confirmed on the web. Because “Some of the monuments left outdoors are weathered, covered with moss, making them difficult to read, and there is also a risk that they will be damaged or disappear in future disasters.”, these traditional monuments are converted into 3D data. By utilizing the 3D data, the monuments can be restored with a 3D printer even if they are lost in the future.	No image	If ONEMI stores 3D digital data and hazard data in the KMS, monuments with 3D printers can be created.	https://this.kiji.is/691197938028364897?c=39546741839462401
24	3D-printing	Dairoku Junior High School (Bunkyo Ward), Ochanomizu University Graduate School of Humanities and Sciences, Oyamadai Junior High School (Setagaya Ward), Ochanomizu University Science & Education Center	Practice of lessons to deepen thoughts on local topography and disaster prevention using learning materials utilizing 3D printers	In Japan's new course of study, learning from the community and disaster prevention education are emphasized. Therefore, a cross-curriculum was created; science learning about the area where students live from topography and geology, and social studies learning from maps, history, and culture. Then, they practiced a lesson in which students could learn about the area around them from various aspects and think about the natural disasters in the area. They also developed a terrain model using a 3D printer and held lessons using the terrain model, since they thought that they needed materials that would allow students to see the area from a bird's-eye view and experience the space in three dimensions in order to know the area. Students could capture the features of the terrain in the area, and could correlate the experience of the field survey with the features captured by the terrain model. In this way, understanding the terrain helped the students to think about natural disasters in the area.		If ONEMI stores 3D digital data and hazard data in the KMS, a similar model can be created.	https://www.jstage.jst.go.jp/article/jsser/34/3/34_No_3_190357/_pdf
25	3D-printing	Shin Nihon Technical Consultant Co., Ltd.	Creating a disaster prevention hazard map using 3D printing technology	Hazard maps were made into 3D as an effective means to solve the problems of disaster prevention enlightenment and disaster prevention drills of local residents. The following effects are expected to be obtained by making them 3D. 1) Intuitive understanding → Have more residents understand the meaning of what is expressed in the hazard map and the disaster risk. 2) Topicality → Because it is a three-dimensional model, it would attract the attention of a wide range of age groups and leads to an increase in the number of participants in enlightenment and training. 3) Can be seen together → It is easy for everyone to share what they understand at the same time by seeing together in a circle, both indoors and outdoors.		If ONEMI stores 3D digital data and hazard data of landslide, inundated flood in the KMS, a similar model can be created.	http://www.shin-nihon.net/news/news.html

8.5. Appendix 5: "Technical specifications of the KMS information system"

8.5.1. Digital Repository of ONEMI

The Dictionary of the Royal Spanish Academy defines the term repository as "Place where something is kept", although this is correct, for the purposes of ONEMI's Knowledge Management System project, we will take the definition of Ferreras Fernández (2010) who defines them as "A set of services provided by the institutions, to the whole community, to collect, manage, disseminate and preserve the digital documentary production generated in the institution, whatever its typology, through the creation of an organized, open and interoperable digital collection".

Repositories are part of the work of institutions that handle digital information, allowing them to give visibility and ensure access to their intellectual production or documentary information. They house all types of files, including a large number of formats, among them multimedia files, text documents, images, presentations, spreadsheets, among others, are designed to describe the digital objects stored in them, and distribute them in collections and sub-collections, according to the needs of the institution that implements it.

The ONEMI Digital Repository stores scientific-technical information that has been captured or generated by the institution, this platform was implemented in September 2012 with the objective of preserving and providing access to this information through the Internet.

It is implemented with an open-source software called DSpace, version 6.3, which is the most recent version of the software.

DSpace is one of the most widely used software applications in academic and scientific contexts to store, preserve and provide access to the intellectual material produced by an institution, 39% of the world's open access repositories were implemented with this software and, according to the DuraSpace Foundation, it has more than 3000 implementations in the world.

8.5.2. Screen flow

The designed interaction is simple, intuitive and efficient, the search process is relevant in the interaction between the user and the system, so the screens or interfaces with which a user will have to interact when navigating through the KMS, are minimal. This favors the information retrieval process based on metadata.

Given the above, the flow of screens available to all users of the KMS is designed, as follows, this flow is presented for anonymous users:

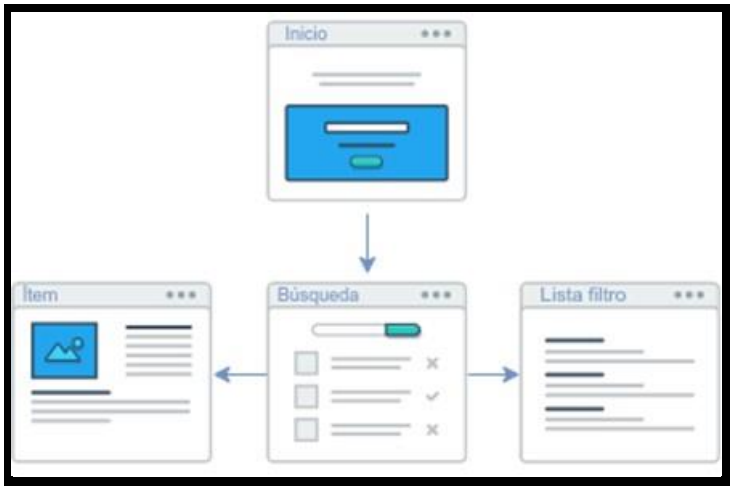


Figure 4.8.21 Flow Screen Image

An anonymous user will be able to access 3 screens, all of them directly related to the information search and retrieval process (Home > Search > Filtering > Item).

Authorized users, will be able to publish new knowledge reports, following the loading flow described in the Knowledge Management System conceptual design, therefore these users access to screens related to the DSpace ingestion process, this flow of screens assumes that they can access to the 3 screens of an anonymous user, and to those that are part of the loading process.

8.5.3. User interfaces (Wireframes)

The ONEMI Digital Repository currently bases its navigation on the concept of communities and collections, a community is a mechanism that allows the grouping of documents and digital objects; the information grouping structure can vary according to the needs of the institution, however it is advisable from the perspective of the writer, to adopt a single type of structure (these can be hierarchical by internal units of the institution, or chronological by historical periods, or typological related to the different types of documents uploaded to the system, among other types of information organization, or thematic depending on the different topics of the stored documents).

Since ONEMI's knowledge management system is strongly based on the data to be processed, user interfaces and navigation must be developed based on this data, that is why this interface does not consider the idea of community and collection and only allows users to navigate through the data (one or more) to retrieve information from the repository.

The above is closely related to the knowledge retrieval process, however it is important to note that, although the information retrieval will be done by browsing data, there must be an initial community and collection, in which digital objects are stored, this is a condition imposed by the software, in other words, there must be at least one collection where these objects are hosted, these must be inaccessible

to the user community, and must only be used as a repository of information. In this sense, the document typology and the institutional hierarchy (document origin) will be loaded to DSpace as data and will not be part of the structure of communities and collections.

Given the above, some preliminary interfaces are presented, which seek to present the information that is displayed in each of the screens that a user interacts with when browsing the repository.

These black and white interfaces, called wireframes, are intended to establish a distribution of information elements on the screen, so that, at the time of graphic design, all spaces are well defined and distributed, seeking to improve the end user's experience.

Home page

Figure 4.8.22 Wireframe Home Page

The main page of ONEMI's knowledge management system repository displays five well-defined information spaces:

- The first one is reserved for the main menu, from here the user can access additional information, language change, login, user profile, among other functions of the system management.
- The second space is for the platform title, thus presenting the user with information that

contextualizes where they are.

- The third space is destined for the main search engine of the Repository, this space is the most relevant space of this interface, since it will be located in the center of the user's screen and will allow him to access, by means of some search criteria, to all the stored knowledge, an interaction similar to that of the Google search engine is sought, that is to say, a clean interface focused on the recovery process.
- The fourth space is destined to the discoverer, which is nothing more than direct and controlled accesses to the different types of knowledge stored in the Repository, from here the user can quickly access some of them and, as we will see in the following interfaces, filter knowledge by means of other loaded data.
- The fifth space of the main page is reserved for the corporate links and help information that are proper of the footer.

This start interface allows the user to filter knowledge when typing a query, it is expected that when a user starts the search process, the search engine will display filtering alternatives, as shown in the following wireframe:

Figure 4.8.23 Wireframe of Home Page (Searched)

Search results page

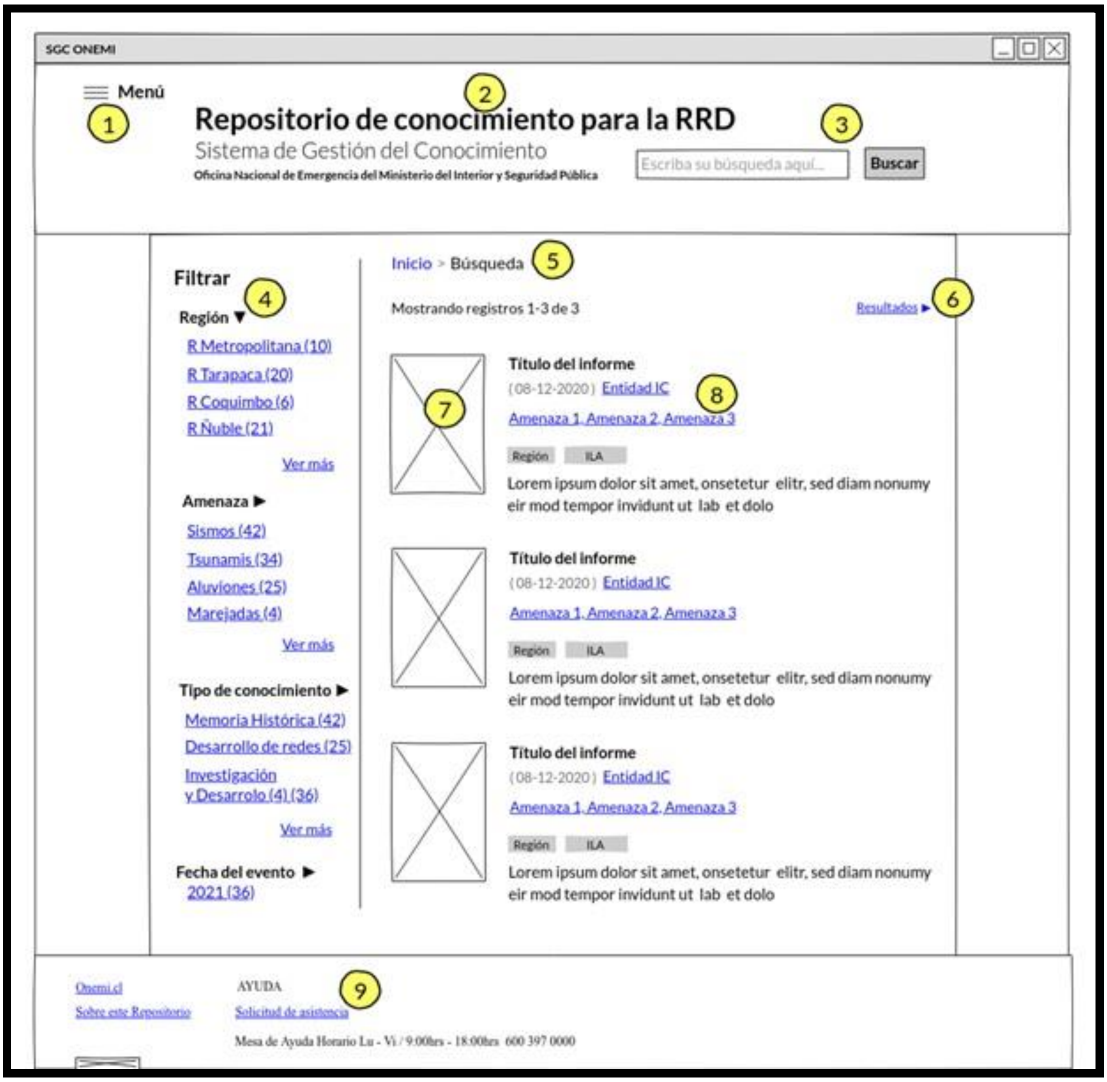


Figure 4.8.24 Wireframe of Search Results Page

Once the user makes a query to the system, it directs them to the search result. This interface is intended to be the main navigation mechanism within the repository. It is entirely based on the data, which are part of the reports uploaded to the system, so the metadata lists are not available, since it seeks to emphasize the filtering by facets. This is one of the differences between this interface proposal and the current ONEMI repository.

As in the previous interface, the following information spaces have been defined:

- The navigation menu will always accompany the user and provides access to the functions described in the home page interface.
  - The second space is reserved for the title of the platform, this space gives context to the user, it allows them to quickly know where he is, in this sense, also point 5 reinforces the idea of

location, allowing the user to know in detail its location within the repository.

- The third space is reserved for the search engine, which although it is not important in terms of location, it will always accompany the user to solve queries.
- The fourth space within this interface is reserved for knowledge filtering, it is undoubtedly one of the main mechanisms for knowledge retrieval in this repository, the data that appear in this model may vary, however the main idea is that users can select some of these filters to find the record or digital object required, you can select as many filters as you want, this is known as facets and it is common to find this type of navigation in other systems that allow grouping objects by their data.
- The fifth space is known as breadcrumb, it allows the user to know its location within the repository, it is useful to improve navigation and search experience of a user.
- The sixth space is reserved for the sorting options of the search results, from here users can change the type of order and quantity of results retrieved by the system.
- The seventh space is reserved for the covers of the reports uploaded to the system, this space has not been fully defined, since it is likely that the covers of these objects do not change frequently, in this sense it is also thought in iconography, that is to say that this space is reserved for an icon depending on the type of digital object.
- The eighth space is intended to provide the user with detailed information about the report found, although it does not present all the information related to the report, it allows the user to know background information with which to decide whether the recovered material is useful or not. All these data are navigable, i.e., the user can click on them to retrieve information directly related to the data.
- The ninth space is reserved for the footer.

Now the interface displays the information as a list, and not as a grid, so the user can navigate through the data resulting from the search process, the data in this interface are the key elements.

This interface has filtering mechanisms that allow the user to retrieve reports based on one or more filters, if the user selects a filter, the search engine retrieves the information related to that filter (data), then this user can continue incorporating filters (data) to reduce the number of search results, all these filters are presented to the user as shown below in point 1:

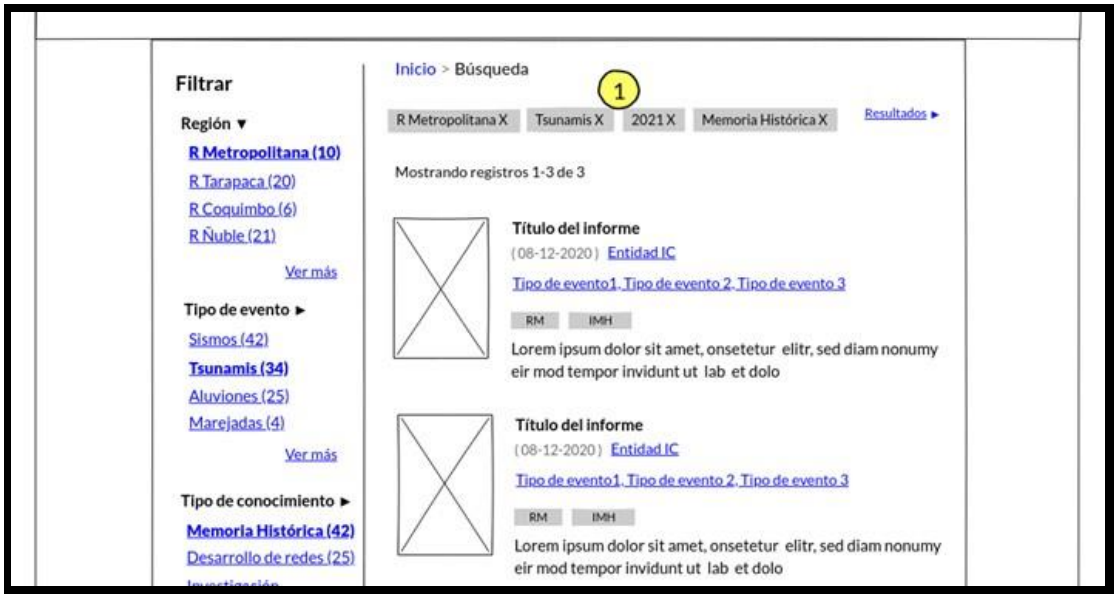


Figure 4.8.25 Wireframe of Search Results Page (Filter)

If the user wishes to delete a filter, they must press it, and the side menu will also mark those data that have already been selected.

Data list page.

Figure 4.8.26 Wireframe of Data List Page

The interface for the data list is similar to the current interface of the ONEMI digital repository, it is possible to access this interface whenever a user wants to know more results associated with a data, so it is possible to access here only from the search results interface. By clicking on any data in the list, the user is returned to the search engine with the filter applied, from there they can continue the search process.

The data list also features a tool to control the number of results:

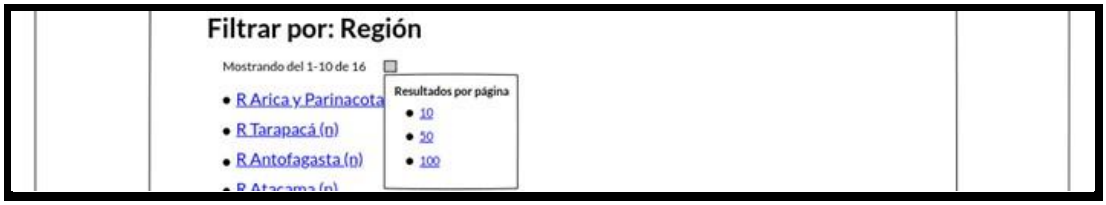


Figure 4.8.27 Wireframe of Data List Page (To Control the Number of Results)

Data Display Page

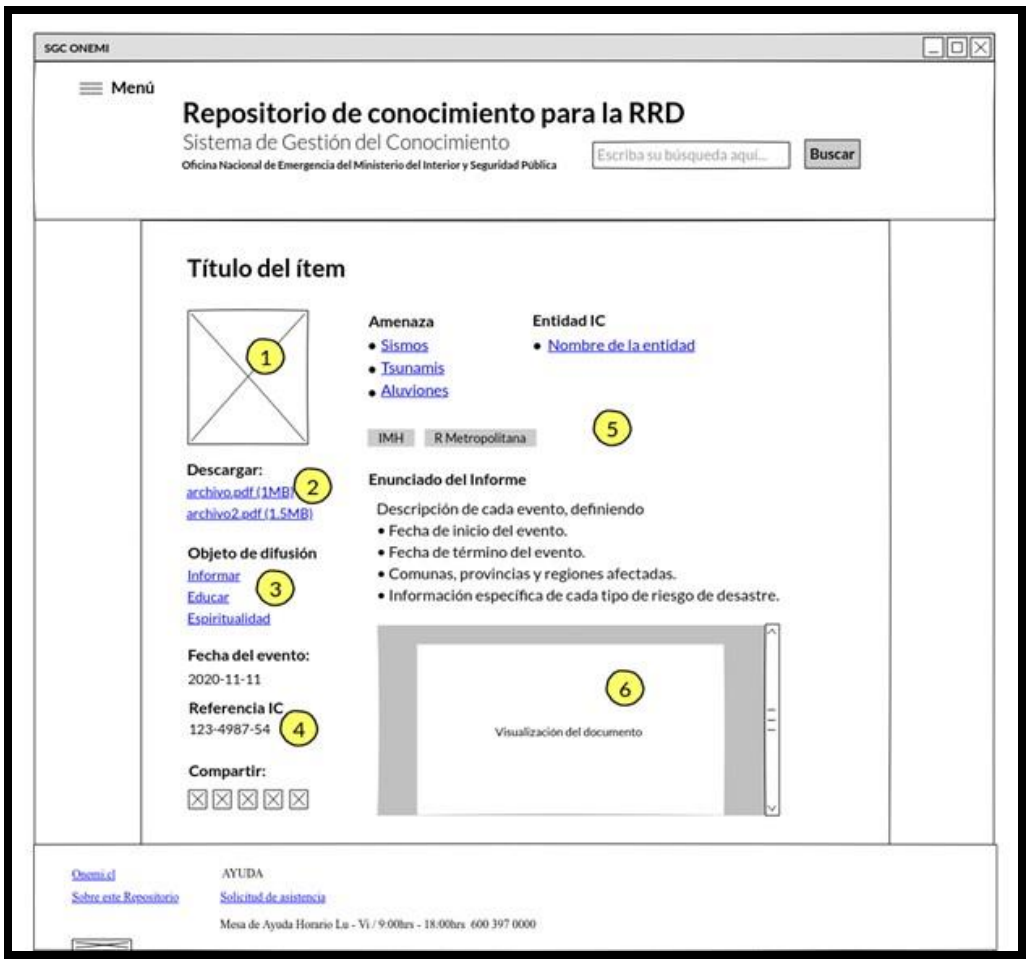


Figure 4.8.28 Wireframe of Data Visualization Page

The data visualization interface presents a distribution of information centered on the data, as can be seen, the side menu is eliminated (in relation to the current digital repository), giving focus to the content, the collection to which the object belongs is hidden in this interface, the spaces defined for this interface are the following:

- This space is defined for the thumbnail cover page of the report, document or digital object, as noted above, this space is not fully defined.
- In this second space, users can download the digital objects.

Spaces 3, 4 and 5 are reserved for the data uploaded to the system. Section 6 of this document is related to the process and data upload to the repository.

8.5.4. Metadata schema

A metadata schema is a labeling system that makes it possible to describe records; these metadata schemas define the data elements that can be used to describe a resource. The ONEMI Digital Repository has a metadata schema called Dublin Core, this metadata schema is oriented to the description of documentary resources, and this is the metadata schema used by the ONEMI Digital Repository to describe all information resources.

The data in the above list are taken from the description of the "Knowledge processing" function in the previous section. For the purposes of this document, the data that should be part of the report as the following:

Table 4.8.9 List of Function Description "Knowledge processing".

Historical Memory	**Lessons Learned**	**Human Resource Development**	**Research and Development**	**Network Development**
HM Code	Code LL	Identification of the requirement	RD Code	ND Code
HM Title	Title LL	Analysis of course availability	RD Title	ND Title
KR Reference	KR Reference	Course scheduling	KR Reference	KR Reference
KR Entity	Entity KR	Definition of the modality in which the course will be delivered	KR Entity	KR Entity

KR Date of registration	KR Date of registration	Phases of the Disaster Risk Cycle	KR Registration Date	KR Date of registration
Disaster Risk Cycle Phases	LL Problem statement	DRM instruments	Phases of the Disaster Risk Cycle	Identification of network requirements
Types of disaster risks.	LL Solution Statement	Types of disaster risks.	DRM instruments	Phases of the Disaster Risk Cycle
HMR Statement	Phases of the Disaster Risk Cycle	Communication channel	Types of disaster risks.	DRM instruments
Dissemination object	DRM Instruments	Effectiveness of the course	Description of the requirement to be solved	Types of disaster risks.
Preliminary HMR date	Types of Disaster Risks.	Conclusions and recommendations	Description of the investigation	Preliminary NDR date
Communication Proposal	Preliminary LL Date		Selection of those responsible for the research	Proposed Communication
Date of communication	Communication Proposal		Costs and financing	Date of communication
DRR Revision Date	Communication date		Research contract	DRR Revision Date
HMR Date	Date DRR Review		Research project program	NDR Date
HMR Entry Date	LL Date		Control and follow-up	NDR Entry Date
	LL Date of entry		Product usage value	Network identification
			Communication channel	Contract identification
			Conclusions and recommendations	Network maintenance

For the description of these reports in the KMS, it is proposed to use the following metadata schema,

based on the description fields above. The metadata for the process of uploading knowledge to the repository is listed below:

Table 4.8.10 Metadata List

Metadata name	Metadata element
Code	KMS.CODE
Title	DC.TITLE
KR Reference	KMS.KR.REFERENCE
KR Entity	KMS.KR.ENTITY
Date of registration KR	KMS.KR.DATE
Statement	DC.DESCRIPTION
Phases of the Disaster Risk Cycle	KMS.RISK.PHASE
Types of Disaster Risks	KMS.RISK.TYPE
Communication Proposal	KMS.COMMUNICATION.PROPOSAL
Date Communication	KMS.COMMUNICATION.DATE
Revision Date DRR	KMS.DRR.DATE
Type of Knowledge	KMS.TYPE

It is suggested that for Human Resource Development reports, the name of the course be entered as the title.

8.5.5. Type formats supported.

A metadata schema is a labeling system that allows records to be described.

Table 4.8.11 List of Formats (1/2)

Name	**MIME type**
Unknown	application/octet-stream
License	text/plain; charset=utf-8 (internal)
CC License	text/html; charset=utf-8 (internal)
Adobe PDF	application/pdf
XML	text/xml
Text	text/plain
HTML	text/html
CSS	text/css
Microsoft Word	application/msword
Microsoft Word XML	application/vnd.openxmlformats-officedocument.wordprocessingml.document
Microsoft Powerpoint	application/vnd.ms-powerpoint
Microsoft Powerpoint XML	application/vnd.openxmlformats-officedocument.presentationml.presentation
Microsoft Excel	application/vnd.ms-excel
Microsoft Excel XML	application/vnd.openxmlformats-officedocument.spreadsheetml.sheet
MARC	application/marc
JPEG	image/jpeg
GIF	image/gif
image/png	image/png
TIFF	image/tiff
AIFF	audio/x-aiff
audio/basic	audio/basic
WAV	audio/x-wav
MPEG	video/mpeg
RTF	text/richtext
Microsoft Visio	application/vnd.visio
FMP3	application/x-filemaker

BMP	image/x-ms-bmp
Photoshop	application/x-photoshop
Postscript	application/postscript
Video Quicktime	video/quicktime
MPEG Audio	audio/x-mpeg
Microsoft Project	application/vnd.ms-project
Mathematica	application/mathematica
LateX	application/x-latex
TeX	application/x-tex
TeX dvi	application/x-dvi
SGML	application/sgml
WordPerfect	application/wordperfect5.1
RealAudio	audio/x-pn-realaudio
Photo CD	image/x-photo-cd
OpenDocument Text	application/vnd.oasis.opendocument.text
OpenDocument Text Template	application/vnd.oasis.opendocument.text-template
OpenDocument HTML Template	application/vnd.oasis.opendocument.text-web
OpenDocument Master Document	application/vnd.oasis.opendocument.text-master
OpenDocument Drawing	application/vnd.oasis.opendocument.graphics
OpenDocument Drawing Template	application/vnd.oasis.opendocument.graphics-template
OpenDocument Presentation	application/vnd.oasis.opendocument.presentation
OpenDocument Presentation Template	application/vnd.oasis.opendocument.presentation-template
OpenDocument Spreadsheet	application/vnd.oasis.opendocument.spreadsheet
OpenDocument Spreadsheet Template	application/vnd.oasis.opendocument.spreadsheet-template
OpenDocument Chart	application/vnd.oasis.opendocument.chart
OpenDocument Formula	application/vnd.oasis.opendocument.formula
OpenDocument Database	application/vnd.oasis.opendocument.database
OpenDocument Image	application/vnd.oasis.opendocument.image
OpenOffice.org extension	application/vnd.openofficeorg.extension

Writer 6.0 documents	application/vnd.sun.xml.writer
Writer 6.0 templates	application/vnd.sun.xml.writer.template
Calc 6.0 spreadsheets	application/vnd.sun.xml.calc
Calc 6.0 templates	application/vnd.sun.xml.calc.template
Draw 6.0 documents	application/vnd.sun.xml.draw
Draw 6.0 templates	application/vnd.sun.xml.draw.template
Impress 6.0 presentations	application/vnd.sun.xml.impress
Impress 6.0 templates	application/vnd.sun.xml.impress.template
Writer 6.0 global documents	application/vnd.sun.xml.writer.global
Math 6.0 documents	application/vnd.sun.xml.math
StarWriter 5.x documents	application/vnd.stardivision.writer
StarWriter 5.x global documents	application/vnd.stardivision.writer-global
StarCalc 5.x spreadsheets	application/vnd.stardivision.calc
StarDraw 5.x documents	application/vnd.stardivision.draw
StarImpress 5.x presentations	application/vnd.stardivision.impress
StarImpress Packed 5.x files	application/vnd.stardivision.impress-packed
StarMath 5.x documents	application/vnd.stardivision.math
StarChart 5.x documents	application/vnd.stardivision.chart
StarMail 5.x mail files	application/vnd.stardivision.mail
RDF XML	application/rdf+xml; charset=utf-8
EPUB	application/epub+zip

Table 4.8.12 List of Formats (2/2)

Name	**Mime Type**
MP3	audio/mpeg
MP4	video/mp4
Amazon Kindle eBook format	application/vnd.amazon.ebook

8.5.6. Database

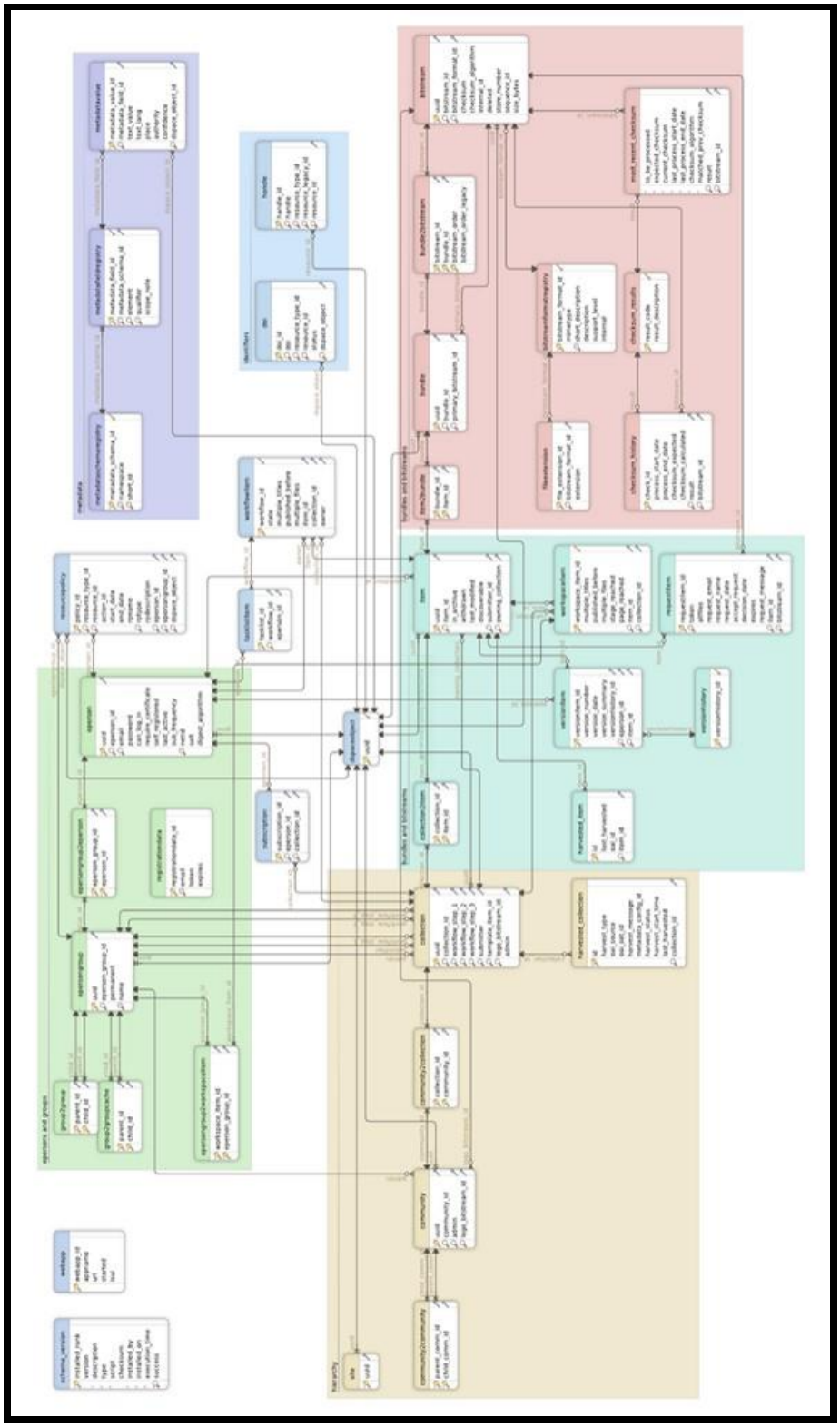


Figure 4.8.29 Database Diagram

8.5.7. Hardware requirements

A high-performance knowledge management system, which uses DSpace as the base technology, must consider the following minimum technical specifications:

- Any modern processor/CPU. (However, some backend tasks that are scheduled via "cron" do require CPUs. As the amount of content increases, you may need a high-end CPU.)
- 8GB of random-access memory (RAM) to guarantee:
    - 4-6GB for Tomcat
    - 2-4GB for database (PostgreSQL or Oracle)

It is important to consider that both the Operating System and other applications use memory. Therefore, while a mid-range DSpace may only need 8GB, it is important to ensure at least 9-10GB of available RAM.

- 1 TB of storage, this should be analyzed based on monthly system load activity.

INFORME DE CUMPLIMIENTO DEL PILAR 2 PROYECTO DE FORTALECIMIENTO DE ONEMI PARA EL DESARROLLO DE CAPACIDADES EN EL ÁMBITO DE LA REDUCCIÓN DEL RIESGO DE DESASTRES

Sistema de Gestión del Conocimiento de ONEMI para la RRD

Elaborado por:	Revisado Por:	Aprobado por:
NOMBRE: Consuelo Cornejo Solari. CARGO: Jefa Academia de Protección Civil Consuelo Cornejo Solari Firmado digitalmente por Consuelo Cornejo Solari Fecha: 2021.11.26 11:11:50 -03'00' FIRMA Y TIMBRE	NOMBRE: Rodrigo Ortiz Jara CARGO: Subdirector de Gestión del Riesgo Rodrigo Ortiz Jara Firmado digitalmente por Rodrigo Ortiz Jara Fecha: 2021.11.26 13:20:41 -03'00' FIRMA Y TIMBRE	NOMBRE: Ricardo Toro Tassara CARGO: Director Nacional de ONEMI Ricardo Agustin Toro Tassara Firmado digitalmente por Ricardo Agustin Toro Tassara Nombre de reconocimiento (DN): c=CL, st=METROPOLITANA - REGION METROPOLITANA, l=Santiago, o=Oficina Nacional de Emergencia del Ministerio del Interior, ou=Terminos de uso en www.esign-la.com/acuerdoterceros, title=Director Nacional, cn=Ricardo Agustin Toro Tassara, email=rtoro@onemi.gov.cl Fecha: 2021.12.14 14:29:29 -03'00' FIRMA Y TIMBRE

INFORME FINAL DEL PILAR 2

Sistema de Gestión del Conocimiento de ONEMI para la RRD

PROYECTO DE FORTALECIMIENTO DE ONEMI PARA EL DESARROLLO DE CAPACIDADES EN EL ÁMBITO DE LA REDUCCIÓN DEL RIESGO DE DESASTRES

Tabla de contenidos

Parte 0 Resumen del Informe final del Pilar 2.

En el año 2018 se dio inicio a un proyecto bilateral (Chile – Japón) denominado, "Fortalecimiento de ONEMI para el Desarrollo de Capacidades en el Ámbito de la Reducción del Riesgo de Desastre".
Este proyecto, busca potenciar la gestión y capacidades de ONEMI en las áreas de formación, gestión y difusión del conocimiento, con el propósito de posicionar a dicho organismo como referente latinoamericano en la gestión del riesgo de desastres, fortaleciendo con ello no sólo la propia institución, sino que al Sistema Nacional de Protección Civil, en particular, los gobiernos locales y las propias comunidades en la Gestión Integral del Riesgo con miras a la construcción de comunidades más seguras y resiliente frente a riesgo de desastre.
Para cumplir lo anterior se estableció:

Meta general	Se fortalece la capacidad de ONEMI para promover la implementación del Marco de Sendai para la Reducción del Riesgo de Desastres (RRD).
Propósito del Proyecto	Se fortalecen las funciones de ONEMI para promover la RRD.
Resultados	
Pilar 1	Se establecen los trabajos prioritarios de ONEMI como una organización de RRD a nivel nacional.
Pilar 2	Se desarrolla el diseño conceptual y su estrategia de implementación del Sistema de Gestión del Conocimiento.
Pilar 3	Se establece un mecanismo de recursos humanos y desarrollo de capacidades para la RRD en la Academia de Protección Civil y el Departamento de Prevención Comunitaria de ONEMI.

En este capítulo se trata lo referido al Pilar 2, donde se desarrolla el diseño conceptual del Sistema de Gestión del Conocimiento (SGC), el cual tiene como función principal gestionar el conocimiento para la RRD que obtienen las entidades de ONEMI derivado de su accionar, el cual quedará a disposición de los usuarios relacionados con la RRD.
Se definen, entre otros aspectos, los procesos de las funciones que se identificaron en el SGC, como: Administración (validación y gestión del conocimiento), Procesamiento de las funciones esenciales (memoria historica, lecciones aprendidas, desarrollo del recurso humano, desarrollo de redes e investigación y desarrollo), Almacenamiento (repositorio y control y mantenimiento) y Transferencia del conocimiento (disponibilidad y exhibición), todo lo anterior, concebido en el contexto del Sistema Nacional de Protección Civil actualmente vigente. Con estos antecedentes se analizó la estructura organizacional de ONEMI y se identificaron las relaciones del SGC con los otros sistemas de esta organización, lo que permite proponer una solución para insertar el SGC en dicha estructura.

Se presentó además una estrategia de implementación en ONEMI del SGC, y se propusieron las consideraciones que se estiman convenientes para lograr el éxito de este cometido. La hoja de ruta, con una duración aproximada de 18 meses, incorpora aquellas actividades que permiten dar forma al SGC, definiendo los aspectos administrativos que son indispensables para la formalización del proyecto, como también aquellas funciones que estarán radicadas en la creación de la unidad de gestión del conocimiento, (Unidad de Gestión del Conocimiento), y finalmente en la implementación de las funciones del sistema.

Además, se tratan algunos aspectos importantes respecto de la materia prima del SGC que es el conocimiento, indicando algunos criterios sobre el tratamiento de la información (clasificación, fuentes, priorización, entre otros) y también sobre los temas más importantes del SGC. Para ayudar al adecuado ordenamiento y acceso de la información recepcionada y procesada, se entrega un documento técnico para mejorar el Sistema de Repositorio de ONEMI, donde radica la acumulación del conocimiento desarrollado en el proceso del SGC.

El Pilar 2 permite contar con conocimiento estructurado y procesado para lograr la reducción de riesgo de desastres en beneficio de todos los organismos relacionados con estas materias como también para la población en general, tanto a nivel nacional, regional, provincial y comunal.

Parte 1 Introducción.

1. Actividades relacionadas con el SGC bajo el Proyecto.

El SGC tiene el propósito de recabar información sobre los desastres de origen natural, humano y biológicos y la Reducción del Riesgo de Desastres (RRD), que se utiliza en la promoción de la RRD en los niveles nacional, regional/provincial, municipal y comunitario en Chile. Las actividades relacionadas con el Pilar 2 consisten en tres actividades mencionadas en la Tabla 1.2-1. Por una parte, la actividad 2-1 muestra el desarrollo del diseño conceptual, la estrategia de implementación, la hoja de ruta y el plan de acción para que ONEMI establezca el SGC. Por otra parte, la 2-2 propuso la clasificación de información abordada en el SGC como información priorizada a ser recabada por ONEMI para el SGC. Finalmente, la actividad 2-3 desarrolló las guías para el SGC, que serán utilizadas por ONEMI para operar y mejorar el SGC. Esta última también desarrolló el documento técnico para mejorar el Sistema de Repositorio de ONEMI para la acumulación del conocimiento desarrollado en el proceso del SGC.

Tabla 1.2-1: Actividades relacionadas con el Pilar 2.

Actividad 2-1	Decidir sobre el concepto e implementación del Sistema de Gestión del Conocimiento para preparar un diseño conceptual relacionado con los tópicos a ser estudiados, ej. capacitación de recursos humanos, memoria de episodios históricos, análisis de lecciones aprendidas e informes de investigación, así como también desarrollar una hoja de ruta para el inicio del sistema.
Actividad 2-2	Identificar el estado actual en Chile sobre la recolección, acumulación, organización y utilización llevada a cabo por parte de ONEMI sobre la información, conocimiento y experiencias relacionadas con los peligros, desastres y reducción del riesgo y especificar dicha información, conocimiento y experiencia que ONEMI es responsable de gestionar.
Actividad 2-3	Basado en los resultados de la actividad 2-2 anteriormente mencionada, discutir sobre los métodos de recolección de información y su utilización (ej. generar consciencia para las comunidades, lo que está indicado en el Marco de Sendai para la RRD, el Libro Blanco en RRD, programas de capacitación en la Academia de Protección Civil, entre otras).

2. Importancia del Sistema de Gestión del Conocimiento para la Reducción del Riesgo de Desastres.

El Marco de Sendai para la Reducción del Riesgo de Desastres (SFDRR, por su sigla en inglés) se adoptó, como el primer acuerdo importante de la agenda del desarrollo post 2015, cuatro prioridades para las acciones tal como se muestra a continuación:

Prioridad 1. Comprensión del riesgo de desastre.

La Gestión del Riesgo de Desastres debiera basarse primero en su comprensión en todas sus dimensiones de vulnerabilidad, capacidad, exposición de personas y propiedades y el medioambiente. Dicho conocimiento se puede utilizar para la gestión del riesgo, su prevención, mitigación, preparación y respuesta.

Prioridad 2. Fortalecimiento de la gobernanza del riesgo de desastre para gestionarlo.

La gobernanza del riesgo de desastre a los niveles nacional, regional y global es muy importante para la prevención, mitigación, preparación, respuesta, recuperación y rehabilitación. Promueve la colaboración y las alianzas.

Prioridad 3. Inversión en Reducción del Riesgo de Desastres para lograr la resiliencia.

La inversion pública y privada en la prevención y RRD a través de medidas estructurales y no estructurales es esencial para mejorar la resiliencia económica, social, de salud y cultural de las personas, comunidades, países y sus propiedades, así como también el medioambiente.

Prioridad 4. Mejora de la preparación ante desastres para lograr una respuesta efectiva y "Volver a construir de mejor forma" en la recuperación, rehabilitación y reconstrucción.

El crecimiento del riesgo de desastre significa que existe una necesidad de fortalecer la preparación ante el desastre con el fin de emprender una acción anticipándose a los eventos y asegurar que las capacidades estén instaladas, con el fin de contribuir a una respuesta y recuperación efectivas a todos los niveles. La fase de recuperación, rehabilitación y reconstrucción corresponde a una oportunidad crítica para volver a construir de mejor forma, incluyendo la integración de la reducción del riesgo de desastres en las medidas de desarrollo.

Para lograr cumplir con estas priodades de manera efectiva, se sugiere revisar las condiciones pre y post en el caso de los desastres pasados y revisar el estado actual de implementación de las medidas de RRD, con el fin de considerar una perspectiva futura de RRD y su implementación.

En general, es posible retener la experiencia, las lecciones, los datos, el conocimiento, la información, etc y se pueden producir por las organizaciones y personas relacionadas. Significa que las personas y organizaciones relacionadas, como las municipalidades y la comunidad, necesitan encontrar la información necesaria por sí mismas debido a la falta de fuentes de información integradas. Con el fin de acelerar la RRD y lograr la SFDRR, el conocimiento y la información relacionada con la RRD se

debiera integrar en una plataforma para poder acceder fácilmente a ellas y lograr una utilización efectiva.

3. Revisión de los Problemas de la Gestión del Conocimiento.

3.1. Definición del Conocimiento, Información, Datos, Experiencias y Lecciones.

De acuerdo a las Herramientas de Gestión del Conocimiento (2018a), se definen los datos, información y conocimiento de la siguiente manera:

Datos: Hechos y cifras que se basan el algo específico, pero que no se encuentran organizados de manera alguna y que no proporcionan mayor información con respecto a patrones, contexto, etc.

Información: Para que los datos pueden convertirse en información, se deben poner en contexto, categorizarlos y condensarlos. De esa forma, la información puede esbozar una imagen más amplia; son los datos, pero con relevancia y propósito.

Conocimiento: El conocimiento está estrechamente vinculado con el hacer e implica una experiencia y comprensión. El conocimiento que está en manos de cada persona corresponde a un producto de su experiencia y aborda las normas por las cuales las personas evalúan nuevos insumos para su contexto. El conocimiento corresponde a una mezcla fluida de experiencias con un marco, valores, información contextualizada, punto de vista de un experto e intuición, con una cierta base, lo que proporciona un ambiente y un marco para evaluar e incorporar nuevas experiencias e información. Éste se origina y aplica en la mente de los que ostentan el conocimiento. En las organizaciones frecuentemente se ve incluido no solo en los documentos o repositorios, sino que también en las rutinas, prácticas y normas organizacionales.

Cuando consideramos la RRD, con frecuencia utilizamos los términos “experiencias” y “lecciones”. Tal como se mencionó anteriormente, el conocimiento es producto de las experiencias, por lo tanto, se considera a las experiencias como la base del conocimiento. Las lecciones son parte del conocimiento, ya que a ellas se las considera como know-how (saber cómo) y las perspectivas futuras.

3.2. Tipos de conocimientos: Conocimiento Explícito y Tácito.

De acuerdo a las Herramientas de Gestión del Conocimiento (2018b), “el Conocimiento” se considera como “Conocimiento Explícito” y “Conocimiento Tácito”. Lo siguiente es una explicación del conocimiento explícito y tácito:

Conocimiento explícito:

Este tipo de conocimiento se encuentra formalizado y codificado y a veces se le denomina como know-what (saber-qué). Por lo tanto, es bastante fácil identificar, almacenar y recuperar. Este tipo

de conocimiento lo puede gestionar de manera muy fácil el SGC, ya que es muy efectivo en facilitar el almacenamiento, recuperación y modificación de documentos y textos.

Desde una perspectiva de gestión, el mayor desafío con el conocimiento explícito es que es similar a la información. Requiere asegurarse que las personas tengan acceso a lo que necesitan; que el conocimiento importante se almacene y que se revise, actualice o deseche.

Muchos teóricos consideran que el conocimiento explícito es menos importante. Se le considera más simple en su naturaleza y que no puede contener la experiencia rica basada en el know-how que puede generar una ventaja competitiva duradera.

Aunque esto puede estar cambiando hasta cierto punto, las iniciativas de gestión del conocimiento que son determinadas por la tecnología frecuentemente tienen el defecto de que enfocan casi exclusivamente en este tipo de conocimiento. Tal como se discutió previamente, en campos tales como las TI frecuentemente existe una falta de definición más sofisticada. Por lo tanto, esto ha creado muchos productos etiquetados como sistemas de gestión del conocimiento, que en la realidad son/fueron nada más que información y un software de gestión del conocimiento explícito.

Conocimiento Tácito:

Frecuentemente se le denomina know-how y se refiere al conocimiento intiuitivo, difícil de definir, que en gran medida se basa en la experiencia. Debido a esto, el conocimiento tácito frecuentemente depende del contexto y es personal en su naturaleza. Es difícil de comunicarlo y se encuentra profundamente enraizado en la acción, compromiso y participación.

El conocimiento tácito también se considera como la fuente más valiosa de conocimiento y es la que más probablemente lleve a avances en la organización.

Es difícil manejar este tipo de conocimiento. Un sistema de TI se basa en la programación, que es algo que resulta difícil/imposible para la persona que ostenta el conocimiento.

Se encuentra el conocimiento tácito en: las mentes de las partes interesadas. Incluye las creencias culturales, valores, actitudes, modelos mentales, etc, así como también las habilidades, capacidades y experiencia.

3.3. Modelo SECI como Modelo de Gestión del Conocimiento.

El modelo SECI lo desarrolló Ikujiro Nonaka y Hirotaka Takeuchi (1995), que corresponde al centro del marco del conocimiento. SECI corresponde a la abreviación de Socialización, Externalización, Combinación e Internalización, tal como se define abajo:

Socialización:

Socialización corresponde al proceso de conocimiento de tácito a tácito, sin que se haga necesariamente explícito y con el fin de transferirlo y compartirlo. La socialización se puede hacer a través de la comunicación cara a cara, a través de la experiencia, etc. Un tipo de actividades de

socialización corresponde a la recolección de información, experiencias, etc (conocimiento tácito) que tiene la posibilidad de ser utilizado en la RRD.

Externalización:

En el proceso de la externalización, el conocimiento tácito se convierte en conocimiento explícito, que corresponde a un concepto concreto, gráficos, imagen y documentos escritos. Bajo el concepto del SGC, la externalización es un proceso y oportunidad para la materialización del conocimiento tácito a explícito con el fin de compartirlo con otras personas.

Combinación:

En este proceso, el conocimiento explícito se combina con otros tipos de conocimiento explícito con el fin de generar un nuevo conocimiento explícito. A través de la combinación de conjuntos de conocimiento tácito, el SGC puede preparar nuevo conocimiento tácito en materiales para la implementación y aplicación.

Internalización:

En este proceso, el conocimiento explícito se cambia a conocimiento tácito a través de la recepción del conocimiento y su aplicación. El conocimiento tácito que se obtiene de la aplicación del conocimiento explícito puede corresponder al conocimiento individual y organizacional. La implementación y aplicación de los materiales desarrollados en el proceso de "Combinación" produce nuevo conocimiento basado en la experiencia y/o evidencia, que se puede utilizar para el próximo proceso de Socialización.

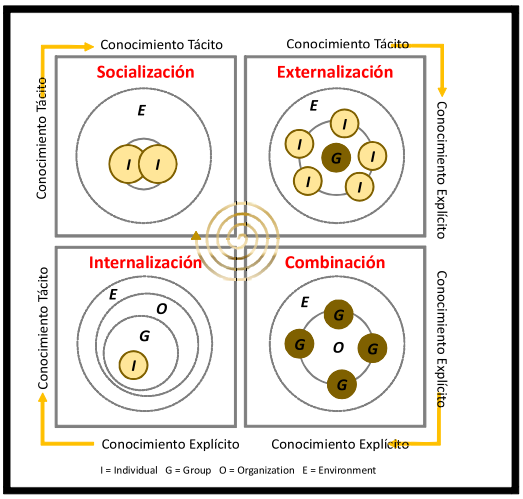


Figura 3.3-1 Modelo SECI.

3.4. Consideración sobre el SGC.

SGC es un sistema integral de recolección de información, desarrollo y utilización de conocimiento.

Es necesario para diferenciar entre información y conocimiento porque la información se convierte en conocimiento. De acuerdo al proceso del Modelo SECI, las experiencias y la información invisibles necesitan ser externalizadas como conocimientos y las experiencias de la utilización del conocimiento necesitan ser desarrolladas como un conocimiento nuevo.

4. Visión general de este documento.

4.1. Propósito de este documento.

Este documento se utiliza y consulta por parte de ONEMI para establecer, operar y mejorar el SGC. Este documento proporciona lo siguiente:

- Diseño conceptual del SGC
- Estructura dentro de ONEMI para el SGC y relación entre el SGC y el SINAPRED en Chile
- Proceso de establecer el SGC
- Información a ser convertida en conocimiento bajo el SGC
- Temas importantes para la mejora futura del SGC

4.2. Estructura de este documento.

Este documento consta de cuatro partes:

- Parte 1: Introducción.
- Parte 2: Diseño conceptual del SGC.
- Parte 3: Estrategia de implementación, Hoja de Ruta y Plan de Acción.
- Parte 4: Guías para la Recopilación y Utilización de la Información Relacionada con los Desastres.

En la Figura 4.2-1 se muestra el momento en el que se utiliza cada parte. Para establecer el SGC, se utilizarán la Parte 2 y 3. La Parte 2 también indica el proceso y operación de la conversión de la información en conocimiento y su transferencia hacia éste. La Parte 3 se utiliza durante el establecimiento y operación del SGC para su difusión a nivel nacional.

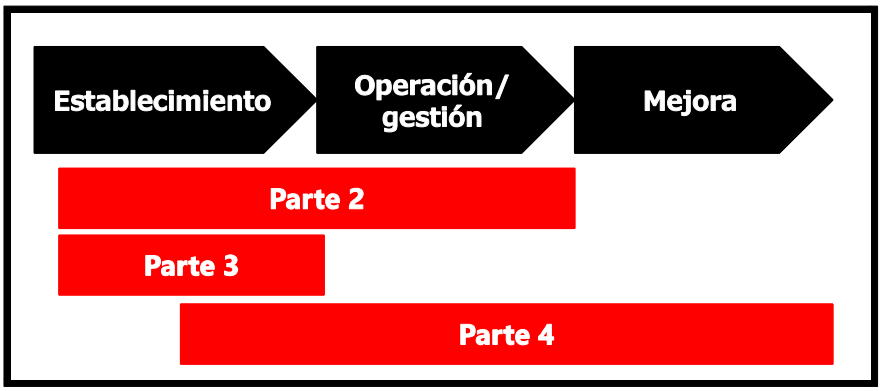


Figura 4.2-1 Momento en el que se usa cada parte.

5. Referencias.

- Nonaka I. and Takeuchi H. (1995) La Empresa que Crea el Conocimiento: ¿Cómo las Empresas Japonesas Crean la Dinámica de la Innovación?, Oxford Univ Press
- Herramientas de Gestión del Conocimiento (2018a) Definición del Conocimiento, Información y Datos, en http://www.knowledge-management-tools.net/knowledge-information-data.php
- Herramientas de Gestión del Conocimiento (2018) Distintos Tipos de Conocimiento, en http://www.knowledge-management-tools.net/different-types-of-knowledge.php
- UNDRR (2015) Marco de Sendai para la Reducción del Riesgo de Desastres , en https://www.ifrc.org/docs/IDRL/Sendai_Framework_for_Disaster_Risk_Reduction_2015-2030.pdf

Parte 2 Diseño conceptual del Sistema de Gestión del Conocimiento (SGC) de ONEMI para la Reducción del Riesgo de Desastres (RRD).

1. Descripción general del SGC.

El SGC es un sistema organizacional que pertenece a ONEMI y diseñado para gestionar el conocimiento útil para la RRD que la organización obtiene del medio externo y/o lo genera en el cumplimiento de sus funciones esenciales, con el objeto de ponerlo a disposición de las organizaciones, tanto internas como externas a ONEMI, que requieran dicho conocimiento para su accionar en función de la RRD.

Efectivamente, el Sistema de Gestión del Conocimiento, por definición, tiene como función principal gestionar el conocimiento para la RRD que adquieren las entidades de ONEMI derivado de su accionar y ponerlo a disposición de usuarios comprometidos con la RRD.

El funcionamiento del Sistema de Gestión del Conocimiento que se representa en la Figura 2.1.1, se basa en el "conocimiento" que recibe de las entidades de ONEMI, para que una vez procesado por sus funciones, transfiera ese "conocimiento disponible" a los usuarios del SGC, que a su vez pueden ser las propias entidades de ONEMI que requieran utilizarlo como información para generar nuevos conocimientos, produciéndose un círculo virtuoso.

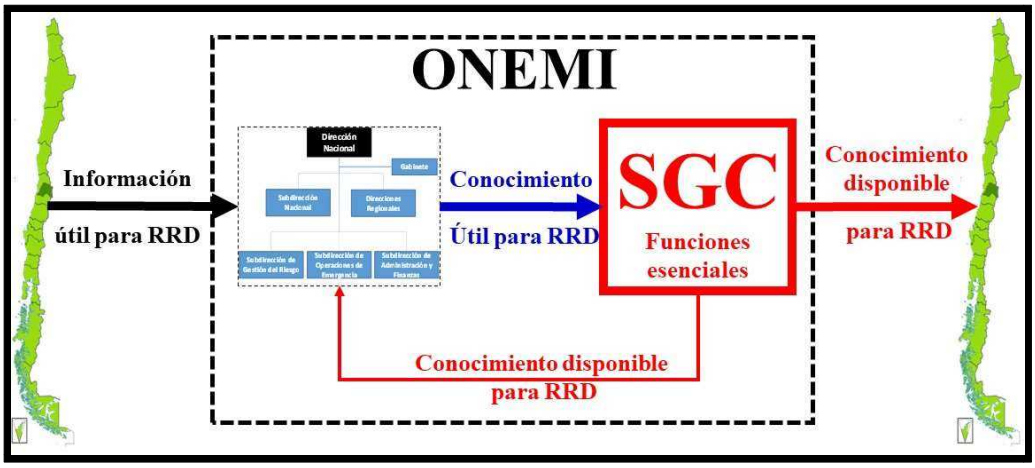


Figura 2.1.1: Esquema general del SGC.

Las entidades de ONEMI involucradas en la GRD remiten al SGC informes conteniendo un "conocimiento" específico respecto a la RRD, obtenido como producto de la ejecución de sus procesos esenciales y que estiman necesario que deben ser gestionados por el SGC, con el objeto de ponerlo a disposición de los usuarios comprometidos en la RRD.

Estos “Informes de conocimiento (IC)” remitidos por las entidades de ONEMI son los insumos de entrada al SGC.

Recibidos un IC por el SGC, se inicia una etapa de validación donde un especialista en gestión del conocimiento verifica que el conocimiento remitido por las entidades de ONEMI cumpla con los requisitos definidos previamente para ser calificado como conocimiento válido para ser ingresado y gestionado por el Sistema. Esta actividad se debe desarrollar en estrecha coordinación con la entidad que remitió el IC.

Aceptado el IC por el SGC, se inicia una etapa de procesamiento, con el objeto de verificar que el conocimiento contenido en el Informe requiera ser procesado por una o más de las funciones específicas asociadas a la gestión del conocimiento, a saber, Lecciones aprendidas, Desarrollo del recurso humano, Investigación y desarrollo, Desarrollo de redes y Memoria histórica. Cada uno de estos procesos elabora un informe específico de su función.

Realizadas las actividades de procesamiento, tanto el IC como los informes de los subprocesos específicos de las funciones asociadas a la gestión del conocimiento son almacenados en una base de datos o Repositorio del SGC, acompañando las evidencias que se adjunten en cada caso.

Una vez en el Repositorio, el conocimiento procesado por el Sistema se transfiere a los usuarios o stakeholders, a través de los canales de información que más se adecuen. Asimismo, un especialista en gestión del conocimiento del SGC define si requiere ser exhibido y el medio más conveniente de hacerlo.

Realizadas las actividades anteriores, el conocimiento para la RRD se encuentra disponible para los usuarios o stakeholders en los distintos formatos que se requieran, como por ejemplo, archivos digitales, archivos documentales, videos, películas, fotografías, objetos, etc.

Además, este conocimiento disponible tanto a nivel digital como en otros formatos es controlado y mantenido por el SGC a fin de verificar su validez en el tiempo y contenido respecto a la utilidad para la RRD. Así de esta forma, se mantiene un conocimiento reutilizable por los usuarios o stakeholders.

2. Enfoque sistémico del SGC[1].

Para efecto de este trabajo, se utilizará la definición de "sistema" del Diccionario de la Real Academia Española a saber "Conjunto de cosas que relacionadas entre sí ordenadamente contribuyen a determinado objeto".

También se puede señalar que cada una de las partes que encierra un sistema puede ser considerada como subsistema, es decir, un conjunto de partes e interrelaciones que se encuentran estructuralmente y funcionalmente dentro de un sistema mayor, y que posee sus propias características. Así los subsistemas son sistemas más pequeños dentro de sistemas mayores.

Los conceptos de sistema mayor, sistema y subsistema llevan implícita la idea de recursividad. En este sentido, las propiedades generales de los tres elementos son semejantes.

Las características principales de los sistemas son:

- El todo es mayor que la suma de las partes.
- El todo determina la naturaleza de las partes.
- Las partes están dinámicamente interrelacionadas y son interdependientes entre sí.

En general los principales elementos de un sistema son:

- Su corriente de entrada: Los sistemas, a través de su corriente de entrada, reciben del medio la energía necesaria para su funcionamiento y mantención. Por energía se entiende los recursos materiales, financieros, humanos y de información.
- Su proceso de conversión: La energía que recibe el sistema de su medio, a través de la corriente de entrada, es utilizada para el funcionamiento de los procesos que le permiten lograr los productos o servicios para cumplir con el propósito u objetivo del sistema. Los recursos son procesados por los distintos subsistemas mediante funciones de transformación parcial, para lograr los subproductos, que, procesados a su vez en forma integrada, permiten desarrollar los productos finales del sistema.
- Su corriente de salida: La corriente de salida equivale a los productos o servicios que el sistema hace al medio.
- La comunicación de retroalimentación: La comunicación de retroalimentación es la información que indica cómo lo está haciendo el sistema en la búsqueda de sus objetivos. Esta información es introducida nuevamente al sistema con el fin de que se lleven a cabo las correcciones necesarias para lograr su objetivo. Desde este punto de vista, es un mecanismo de control que posee el sistema para asegurar el logro de las metas.

[1] George Wilhelm Friedrich Hegel (1770-1831), Bertalanffy, Ludwing Von y otros. Teoría General de Sistemas.

En consecuencia, el enfoque sistémico estará dirigido hacia la definición del SGC, como un elemento organizacional, considerando al organismo en su conjunto, con las características de sinergia[2], recursividad[3] y entropía[4], como asimismo, la definición de su sistema organizacional mayor (ONEMI) y sus subsistemas componentes.

2.1. La ONEMI como sistema organizacional.

La Oficina Nacional de Emergencia (ONEMI), es un organismo técnico del Estado creado por el Decreto Ley Nº 369 de 1974, dependiente del Ministerio del Interior y Seguridad Pública, a cargo de planificar y coordinar los recursos públicos y privados destinados a la prevención y atención de emergencias y desastres de origen natural o provocados por la acción humana, proporcionando a los ministerios, intendencias, gobernaciones, municipios y organismos de Protección Civil de nivel nacional, regional, provincial y comunal, modelos y planes de gestión permanente para la prevención y manejo de emergencias, desastres y catástrofes.

Asimismo, para dar cumplimiento a su mandato legal, corresponderá a ONEMI movilizar, dentro de los parámetros establecidos por el Estado, los recursos disponibles tanto del ámbito público como privado para evitar o mitigar el potencial impacto de ocurrencia de una situación riesgo, emergencia o catástrofe. (www.onemi.cl).

Para el cumplimiento de su misión cuenta con recursos humanos, materiales y presupuestarios, organizados mediante una estructura funcional, regulada por el Reglamento Orgánico y de Funcionamiento (ROF), que le permiten lograr sus objetivos esenciales.

Por lo tanto, la ONEMI puede ser considerada como un sistema organizacional, toda vez que cuenta con las características para tal efecto, como, por ejemplo:

- Es una organización que cuenta con un conjunto de personas con los medios adecuados que funcionan reguladas por normas para alcanzar un fin determinado.
- Tiene un objetivo común que es su misión.
- Pertenece a una organización mayor.
- Cuenta con normas que regulan su funcionamiento (Decreto Ley Nº 369 de 1974 y su

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[2] Sinergia: Cuando la suma de las partes es distinta del todo y para explicar la conducta global de un objeto, es necesario analizar y estudiar todas sus partes y las relaciones entre ellas.

3 Recursividad: Para efecto de este estudio, vamos a entender que un objeto sinérgico es un "sistema", que está compuesto de partes con características tales que son a su vez objetos sinérgicos. El sistema está inserto en otro superior (suprasistema) y se puede descomponer en otros menores (Subsistemas).

4 Entropía: La tendencia a alcanzar su estado más probable, que en el caso de los sistemas sociales es el caos y la desorganización. El cambio de estados ordenados a otros más desordenados, es una cantidad definida y medible.

Reglamento Orgánico y de Funcionamiento, entre otros).

- Cuenta con una estructura funcional que determinan organizaciones dependientes.
- Las organizaciones dependientes están dinámicamente interrelacionadas y son interdependientes entre sí.

En consecuencia, la ONEMI es un sistema organizacional que puede ser definida con un enfoque sistémico, describiendo su propósito esencial, sus funciones esenciales, sus principales relaciones con el sistema mayor al cual pertenece, sus subsistemas y las principales relaciones entre los subsistemas componentes.
En el Apéndice 5.1 de este documento, se describe en forma detallada el Sistema organizacional ONEMI y las principales relaciones con el Sistema Nacional de Protección civil (SNPC).

Del análisis de los documentos que permiten identificar los elementos principales del Sistema ONEMI y el contexto en que se desenvuelve, se puede concluir que la esencia del sistema organizacional en estudio, está contemplada en su decreto de creación, el Decreto Ley Nº 369 de 1974, del Ministerio el Interior y en el Decreto N° 509 de 1983, del Ministerio el Interior que aprueba el reglamento para la aplicación del decreto ley 369 de 1974.
Asimismo, estos conceptos fundamentales han sido ratificados en los siguientes documentos:

- La Política Nacional para la Gestión del Riesgo de Desastres (Decreto N° 1512 de 2016, del Ministerio el Interior y Seguridad Pública);
- Plan Nacional de Protección civil (Decreto N° 156, de 2002, del Ministerio el Interior; Subsecretaria del Interior);
- Plan Estratégico Nacional para la Gestión del Riesgo de Desastres 2015-2018 (Decreto exento N° 3.453, de 2016, del Ministerio el Interior y Seguridad Pública);
- Reglamento Orgánico y de Funcionamiento de ONEMI (Resolución Exenta N° 44 de fecha 15 de enero de 2018, del Director Nacional de la ONEMI);
- Plan Estratégico ONEMI 2019 – 2023.

Por lo tanto y teniendo en cuenta los documentos analizados, para efecto de este trabajo, se va a utilizar como propósito esencial del Sistema ONEMI, la misión del Plan Estratégico ONEMI 2019 – 2023 y publicada en la Página web de ONEMI, de acuerdo al siguiente texto:
"*Planificar, coordinar, organizar, asesorar y supervisar las actividades del Sistema Nacional de Protección Civil para reducir el riesgo de desastres a través de la mitigación, preparación, alerta, respuesta y rehabilitación con el objeto de reducir la pérdida de vidas, disminuir los impactos económicos, los efectos medioambientales y proteger los modos de vida, contribuyendo al desarrollo sostenible.*"

A partir de la estructura organizacional que definió ONEMI en su Reglamento Orgánico y de Funcionamiento para el cumplimiento de su misión y de las funciones, se identifican los siguientes subsistemas del Sistema ONEMI, como lo muestra la Figura 2.2.1:

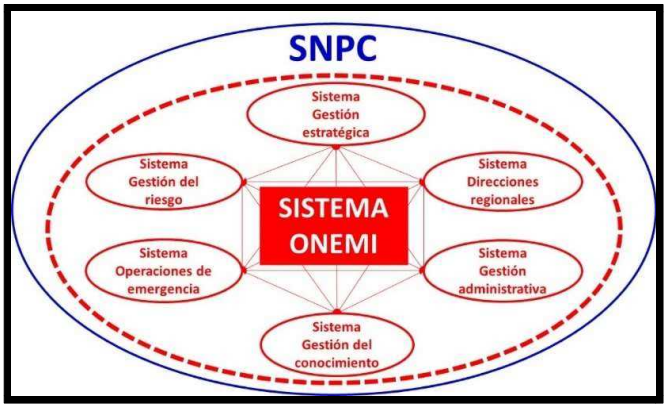

Figura 2.2.1: Subsistemas componentes del Sistema ONEMI.

2.1.1. Sistema de Gestión Estratégica (SGE).

El propósito esencial del Sistema de Gestión Estratégica es planificar, organizar, dirigir, controlar y coordinar la ejecución de las acciones y el empleo de los recursos que permitan lograr los objetivos establecidos para cumplir con la misión del Sistema ONEMI.

Está principalmente asociado a las siguientes funciones:

- Planificación estratégica.
- Organización estratégica.
- Dirección estratégica.
- Control estratégico.
- Coordinación estratégica.
- Coordinación de la gestión de las Direcciones regionales.
- Gestión del Sistema Nacional de Protección Civil.

Además, desarrolla las siguientes funciones de apoyo a la gestión:

- Asesoría jurídica.
- Auditoría interna.
- Comunicaciones.
- Difusión.
- Gestión de proyectos.
- Investigación y desarrollo.
- Secretaría Técnica y Ejecutiva de los Comités para la Gestión del Riesgo de Desastres.

2.1.2. Sistema de Direcciones Regionales (SDR).

El propósito esencial del Sistema de Direcciones Regionales es planificar, coordinar y ejecutar las actividades destinadas a la prevención, mitigación, alerta, respuesta y rehabilitación que demanda el Sistema de Protección Civil frente a amenazas y situaciones de emergencias, desastres y catástrofes, a nivel regional, provincial y comunal.

Su accionar está principalmente asociado a las funciones específicas a nivel regional, provincial y comunal, como las siguientes:

- Mitigación, Preparación, Respuesta y Recuperación, a nivel regional.
- GRD a nivel regional, provincial y comunal.
- Obtención de información relacionada con las fases de Mitigación, Preparación, Respuesta y Recuperación, a nivel regional, provincial y comunal, y remitirla a los sistemas SGE, SGR y SOE, dependiendo del tema específico, para la transformación de esta información en conocimiento útil para la RRD.
- Secretaría Técnica y Ejecutiva de los Comités para la GRD, a nivel regional.
- Proposición de los instrumentos de GRD, a nivel regional.
- Gestión del Sistema Nacional de Alerta Temprana, a nivel regional.

Además, desarrolla las siguientes funciones de apoyo a la gestión a nivel regional, provincial y comunal:

- Formación, capacitación y entrenamiento en temas de RRD.
- Difusión de informaciones e instrucciones para la RRD.

2.1.3. Sistema de Gestión del Riesgo (SGR).

El propósito esencial del Sistema de Gestión del Riesgo es planificar, organizar, dirigir, controlar y coordinar las acciones y los recursos relacionados con las fases de ciclo del riesgo de prevención, mitigación y preparación, que permitan desarrollar capacidades para la RRD.

Está principalmente asociado a las siguientes funciones esenciales:

- Mitigación.
- Preparación.
- Obtención de información relacionada con las fases de Mitigación y Preparación, y la transformación de esta información en conocimiento útil para la RRD.
- Gestión del conocimiento para la RRD, a nivel del Sistema ONEMI.

2.1.4. Sistema de Operaciones de Emergencia (SOE).

El propósito esencial del Sistema de Gestión de Emergencia es planificar, organizar, dirigir, controlar y coordinar las acciones y los recursos relacionados con las fases de ciclo del riesgo de respuesta y recuperación ante situaciones de riesgos y/o emergencias.

Está principalmente asociado a las siguientes funciones:

- Respuesta.
- Recuperación.
- Obtención de información relacionada con las fases de Respuesta y Recuperación, y la transformación de esta información en conocimiento útil para la RRD.
- Gestión del Sistema Nacional de Alerta Temprana.

Además, desarrolla las siguientes funciones de apoyo a la gestión:

- Abastecimiento.
- Tecnologías de información y comunicaciones.
- Finanzas.

2.1.5. Sistema de Gestión Administrativa (SGA).

El propósito esencial del Sistema Administrativa es planificar, organizar, dirigir, controlar y coordinar las acciones y los recursos que permitan dar cumplimiento a las normativas legales asociadas a las Bases generales de la administración del Estado y las Bases de los procedimientos administrativos que rigen los actos de los órganos de la administración del Estado.

Está principalmente asociado a las siguientes funciones:

- Oficina de informaciones y atención ciudadana.
- Oficina de partes.
- Servicios generales.
- Presupuesto.
- Contabilidad.
- Tesorería.
- Gestión de personas.
- Desarrollo de personas.
- Remuneraciones.

2.1.6. Sistema de Gestión del Conocimiento (SGC).

El propósito esencial del Sistema del Conocimiento es gestionar y transferir el conocimiento en la reducción del riesgo de desastres, a través del rescate y difusión de la memoria histórica y las lecciones aprendidas, junto con la formación del recurso humano, para que las instituciones, comunidades y personas fortalezcan la cultura preventiva.

Está principalmente asociado a las siguientes funciones:

- Función Administración del conocimiento.
    - Sub Función Validación del conocimiento.
    - Sub Función Gestión del funcionamiento del SGC.

- Función Procesamiento del conocimiento.
    - Sub Función Lecciones aprendidas.
    - Sub Función Memoria histórica.
    - Sub Función Desarrollo del recurso humano.
    - Sub Función Investigación y desarrollo.
    - Sub Función Desarrollo de redes.
- Función Almacenamiento del conocimiento.
    - Sub Función Repositorio.
    - Sub Función Control y mantención del Repositorio.
- Función Transferencia del conocimiento.
    - Sub Función Disponibilidad del conocimiento.
    - Sub Función Exhibición del conocimiento.

Asimismo, el Sistema ONEMI se puede graficar en dos niveles, como lo muestra la Figura 2.2.2:

- Nivel Estratégico: Compuesto por:
    - Sistema de Gestión estratégica.
- Nivel Operativo, compuesto por los siguientes sistemas:
    - Sistema de Direcciones regionales;
    - Sistema de Gestión del Riesgo;
    - Sistema de Gestión de Emergencia;
    - Sistema de Gestión Administrativa;
    - Sistema de Gestión del Conocimiento.

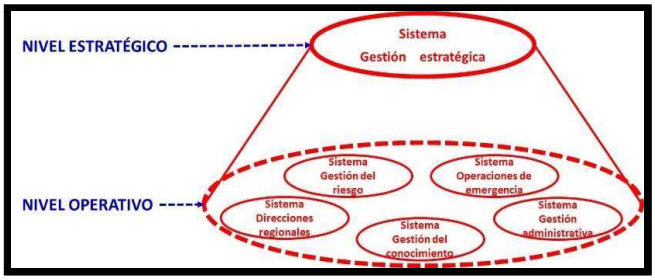

Figura 2.2.2: Subsistemas componentes del Sistema ONEMI por niveles.

2.2. Descripción de las principales relaciones entre el Sistema de Gestión del Conocimiento y los otros subsistemas componentes del Sistema ONEMI.

La identificación y la descripción de las relaciones se realizará desde el enfoque del Sistema de Gestión del Conocimiento respecto a los otros subsistemas componentes del Sistema ONEMI, como lo muestra la Figura 2.2.3:

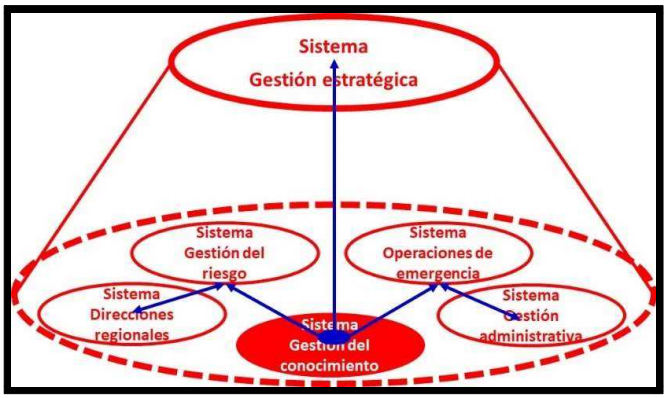

Figura 2.2.3: Enfoque de las relaciones del Sistema de gestión del conocimiento.

Específicamente, se identificarán las áreas de conocimiento referidas, en lo general, a la GRD y, en específico, de la RRD, que el Sistema de gestión del conocimiento espera recibir como insumo de los otros sistemas componentes del Sistema ONEMI, derivadas del propósito esencial y las principales funciones específicas de cada sistema. Como, asimismo, se identificarán las áreas de conocimiento que el Sistema de Gestión del Conocimiento pone a disposición de cada uno de los otros sistemas componentes del Sistema ONEMI.

Para efecto de la identificación de las relaciones entre el SGC y los otros sistemas del Sistema ONEMI, se debe tener en consideración que lo esencial del SGC es gestionar el "conocimiento" referido a la RRD que recibe de los otros sistemas, para que una vez procesado por sus funciones esenciales, lo transfiera a sus usuarios, incluidos los propios sistemas de ONEMI.

En consecuencia, el SGC recibe informes con el "conocimiento útil para la RRD" de los sistemas SGE, SGR y SOE relacionados con los temas de sus respectivas funciones y que, a juicio de sus especialistas, deberían ser procesados por el SGC y puestos a disposición de los stakeholders. El SGC procesa dicho conocimiento y lo ingresa al Repositorio. Asimismo, mediante el acceso eficiente al Repositorio y/o a los medios y lugares de exhibición, el SGC transfiere el "conocimiento disponible para la RRD" a los mismos sistemas para su utilización y reprocesamiento, como lo muestra la Figura 2.2.4.

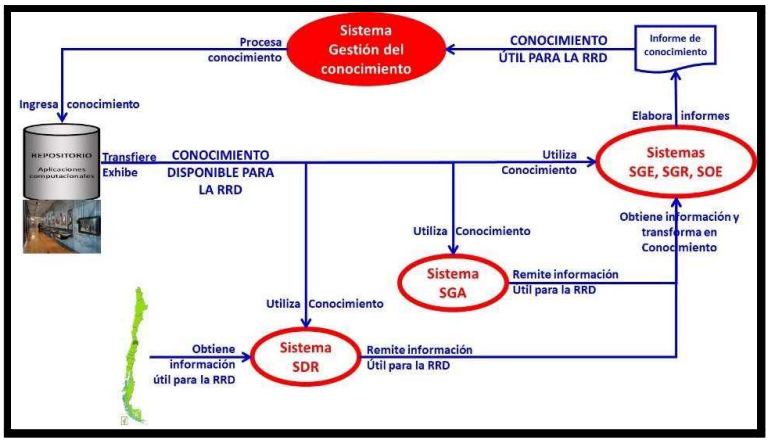

Figura 2.2.4: Relaciones del Sistema de gestión del conocimiento.

En el caso de los sistemas SDR y SGA, aunque en el ámbito de la RRD estos no interactúan directamente con el SGC, pueden relacionarse a través de los sistemas SGE, SGR y SOE, aportando información de sus áreas específicas que estimen de interés para la RRD.

2.2.1. Relaciones del SGC con el SGE, en el ámbito de las funciones específicas referidas a la RRD.

En el ámbito de la RRD, se han logrado identificar las siguientes relaciones del Sistema de Gestión del Conocimiento con el Sistema de Gestión Estratégica:

- El SGE entrega al SGC, para ser procesado y transferido a sus stakeholders, informes conteniendo el conocimiento útil para la RRD relacionados con temas específicos de su propósito esencial, como los siguientes:
    - El marco normativo para la Gestión del Riesgo de Desastres vigente.
    - La Política Nacional para la Gestión del Riesgo de Desastres vigente.
    - Los instrumentos de Gestión del Riesgo de Desastres vigentes como, por ejemplo:
        - Plan Nacional de Protección Civil.
        - Plan Estratégico Nacional para la Reducción del Riesgo de Desastres.
        - Plan Nacional de Emergencia.
        - Los procedimientos para la elaboración, aplicación y seguimiento de los Planes Provinciales y Comunales para la Reducción del Riesgo de Desastres.
        - Los procedimientos para la elaboración, aplicación y seguimiento de los Planes Provinciales y Comunales de Emergencia.
    - La coordinación del Sistema Nacional de Protección Civil.
    - La Secretaría Técnica y Ejecutiva de los Comités para la Gestión del Riesgo de Desastres.

- La gestión del Sistema Nacional de Alerta Temprana.
- La formación, capacitación y entrenamiento en temas de RRD respecto al Sistema Nacional de Protección Civil.
- Las comunicaciones y difusión de los temas de RRD respecto al Sistema Nacional de Protección Civil.
- La gestión de proyectos relacionados con temas de RRD.
- La investigación y desarrollo relacionado con temas de RRD.

- A su vez, el SGC pone a disposición del SGE el conocimiento útil para la RRD relacionado con todas las fases del ciclo del riesgo, mediante el acceso eficiente al Repositorio del SGC y/o a los medios y lugares de exhibición.

2.2.2. Relaciones del SGC con el SGR en el ámbito de las funciones específicas referidas a la RRD.

En el ámbito de la RRD, se han logrado identificar las siguientes relaciones del Sistema de Gestión del Conocimiento con el Sistema de Gestión del Riesgo:

- El SGR entrega al SGC para ser procesado y transferido a sus stakeholders, informes conteniendo el conocimiento útil para la RRD relacionados con temas específicos de su propósito esencial, como los siguientes:
  - Fase de Mitigación, que comprende las medidas dirigidas a reducir los riesgos existentes, evitar la generación de nuevos riesgos y limitar los impactos adversos o daños producidos por las amenazas.
  - Fase de Preparación, que implica las capacidades y habilidades que se desarrollan para prever, responder y recuperarse de forma oportuna y eficaz de los impactos de emergencias inminentes o presentes.
  - La Alerta, que constituye una etapa de la Fase de Preparación y consistirá en un estado de monitoreo y atención permanente; a la vez que será un estado declarado cuando se advierte la probable y cercana ocurrencia de un evento adverso, con el fin de tomar precauciones y difundirlas.
  - La formación, capacitación y entrenamiento en temas de RRD.
- A su vez, el SGC pone a disposición del SGR el conocimiento útil para la RRD relacionado con todas las fases del ciclo del riesgo, mediante el acceso eficiente al Repositorio del SGC y/o a los medios y lugares de exhibición.

2.2.3. Relaciones del SGC con el SOE en el ámbito de las funciones específicas referidas a la RRD.

En el ámbito de la RRD, se han logrado identificar las siguientes relaciones del Sistema de Gestión

del Conocimiento con el Sistema de Operaciones de Emergencia:

- El SOE entrega al SGC para ser procesado y transferido a sus stakeholders, informes conteniendo el conocimiento útil para la RRD relacionados con temas específicos de su propósito esencial, como los siguientes:
    - Fase de Respuesta, que corresponde a las actividades propias de atención de una emergencia, que se llevan a cabo inmediatamente de ocurrido el evento. Tienen por objetivo salvar vidas, reducir el impacto en la comunidad afectada y disminuir las pérdidas.
    - Fase de Recuperación, que son las acciones que tienen por objeto el restablecimiento de las condiciones normales de vida mediante las etapas de rehabilitación y reconstrucción del área afectada, evitando la reproducción de las condiciones de riesgo preexistentes. De este modo, las etapas en la Fase de Recuperación son las siguientes:
        - Rehabilitación, que consiste en la recuperación, a corto plazo, de los servicios básicos y el inicio de la reparación del daño físico, social y económico del área afectada, durante el período de transición comprendido entre la culminación de las acciones de respuesta y el inicio de las acciones de reconstrucción.
        - Reconstrucción, que consiste en la reparación o reemplazo, a mediano y largo plazo, de la infraestructura dañada; y la restauración o perfeccionamiento de los sistemas de producción.

- A su vez, el SGC pone a disposición del SOE el conocimiento útil para la RRD relacionado con todas las fases del ciclo del riesgo, mediante el acceso eficiente al Repositorio del SGC y/o a los medios y lugares de exhibición.

2.2.4. Relaciones del SGC con el SDR en el ámbito de las funciones específicas referidas a la RRD.

En el ámbito de la RRD, este sistema tiene la importante función de obtener las informaciones relacionadas con los eventos referidos a los desastres, desde las comunas, provincias y regiones, y hacerla llegar a los otros sistemas (SGE, SGR y SOE) para que sean transformadas en conocimiento, y desde estos sistemas podrán ser remitidas al SGC para su procesamiento, mediante informes de conocimiento.

En este contexto, se han logrado identificar las siguientes relaciones del Sistema de Gestión del Conocimiento con el Sistema de Direcciones Regionales, a través de los sistemas SGE, SGR y SOE:

- El SDR obtiene información de eventos de desastres desde las comunas, provincias y regiones

y las hace llegar a los sistemas SGE, SGR y SOE, dependiendo de los temas específicos respectivamente. Los sistemas transforman la información en conocimiento y los remiten al SGC para ser procesado y transferido a sus stakeholders, mediante informes conteniendo el conocimiento útil para la RRD. El SDR obtiene información relacionados con temas específicos de su propósito esencial, como los siguientes:

- Las fases del ciclo del riesgo (Mitigación, Preparación, Respuesta y Recuperación) a nivel regional, provincial y comunal.
- La Secretaría Técnica y Ejecutiva de los Comités para la Gestión del Riesgo de Desastres, a nivel regional.
- Los instrumentos de Gestión del Riesgo de Desastres, a nivel regional.
- El Sistema Nacional de Alerta Temprana, a nivel regional.
- La formación, capacitación y entrenamiento en temas de RRD, a nivel regional.
- La difusión de informaciones e instrucciones para la RRD, a nivel regional.

- A su vez, el SGC pone a disposición del SDR el conocimiento útil para la RRD relacionado con todas las fases del ciclo del riesgo, mediante el acceso eficiente al Repositorio del SGC y/o a los medios y lugares de exhibición.

2.2.5. Relaciones del SGC con el SGA en el ámbito de las funciones específicas referidas a la RRD.

En el caso del SGA, este sistema por sus funciones más bien del área administrativa no tiene relación directa con el SGC, respecto a temas referidos a la RRD. No obstante, en caso que requiera remitir una información de su área que estime conveniente que sea procesada por el SGC, deberá hacerlo a través de los otros sistemas (SGE, SGR y SOE), dependiendo del área específica que trate la información.

A su vez, el SGC pone a disposición del SGA el conocimiento útil para la RRD relacionado con todas las fases del ciclo del riesgo, mediante el acceso eficiente al Repositorio del SGC y/o a los medios y lugares de exhibición.

3. Modelo de funcionamiento del SGC.

El funcionamiento de un sistema organizacional queda determinado por el conjunto de procesos que se requieren realizar para lograr los productos definidos en las funciones especificas establecidas en el propósito esencial del Sistema. A su vez, los procesos son el conjunto de actividades y tareas que se deben realizar para transformar insumos en productos.

Por lo tanto, el modelo de funcionamiento del SGC quedará determinado a base de tres elementos:

- El enfoque basado en procesos del SGC;
- Enfoque sistémico funcional del SGC y;
- Modelo ampliado del funcionamiento del SGC.

3.1. Enfoque de proceso del SGC.

El principio de "Enfoque basado en procesos" sostiene que un resultado se alcanza más eficientemente cuando las actividades y los recursos se gestionan como un proceso.

Para efecto de este trabajo, se utilizará la definición de proceso establecida por la ISO 9001:2015, a saber: conjunto de actividades mutuamente relacionadas o que interactúan, las cuales transforman elementos de entrada en resultados.

En este contexto, el SGC va a recibir elementos de entrada, realizará actividades con esos elementos para transformarlos en elementos de salida.

Específicamente y en este enfoque, se visualizan las siguientes fases para el SGC de ONEMI como lo muestra la Figura 2.3.1:

- Entrada al sistema: La entrada al SGC es conocimiento útil para la RRD, que proviene del resultado de la transformación de información a conocimiento en cada uno de los sistemas funcionales de ONEMI.
- Proceso: Dentro del SGC se realizarán las actividades de administración, procesamiento, almacenamiento y transferencia del conocimiento disponible para la RRD.
- Salida del sistema: Como resultado del desarrollo de las actividades principales del SGC, se pone a disposición de los usuarios el conocimiento respecto a la RRD, en la forma y medio que lo requieran.
- Reutilización del conocimiento: El conocimiento puesto a disposición, es reprocesado por los usuarios como información y transformado a su vez en conocimiento, iniciándose nuevamente el proceso virtuoso de gestión del conocimiento de RRD.

Figura 2.3.1: Enfoque de proceso del modelo de funcionamiento del SGC de ONEMI.

3.2. Enfoque sistémico funcional del SGC.

Aplicando el concepto de recursividad de los sistemas, el SGC pertenece a un sistema mayor que, en este caso, es el Sistema ONEMI.

Asimismo y bajo el mismo concepto de recursividad, el SGC está formado por subsistemas con características semejantes al sistema mayor, basados en sus funciones principales.

Para determinar los sistemas componentes del SGC, se tuvo en consideración las funciones del enfoque de proceso del modelo de funcionamiento del SGC. A su vez, cada sistema componente del SGC está constituido por subsistemas basados en las funciones específicas requeridas para lograr los productos de SGC.

Por lo tanto, los sistemas y subsistemas del SGC que se identificaron fueron los siguientes, como lo muestra la Figura 2.3.2:

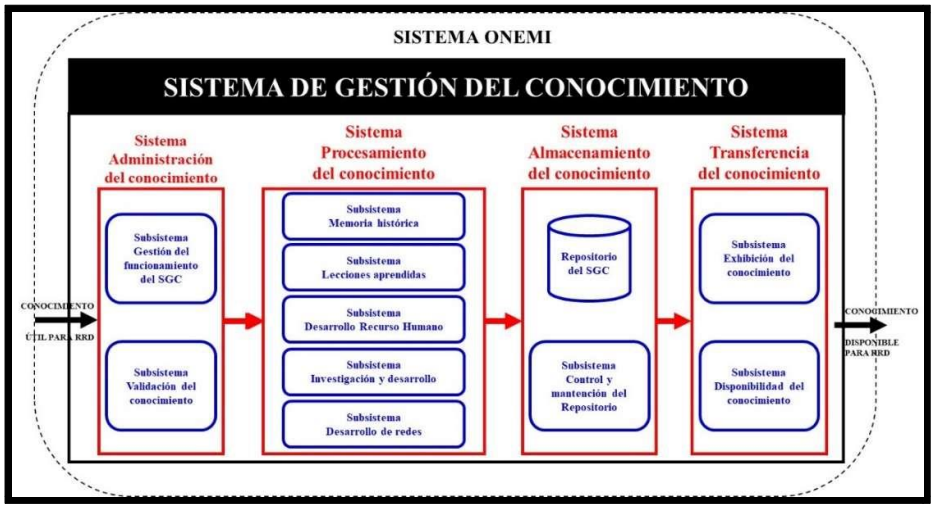

Figura N° 2.3.2: Sistemas componentes del SGC.

- Sistema de “Administración del conocimiento”.
    - Subsistema “Gestión del funcionamiento del SGC”.
    - Subsistema “Validación del conocimiento”.
- Sistema de “Procesamiento del conocimiento”.
    - Subsistema “Memoria histórica”.
    - Subsistema “Lecciones aprendidas”.
    - Subsistema “Desarrollo del recurso humano”.
    - Subsistema “Investigacion y desarrollo”.
    - Subsistema “Desarrollo de redes”.
- Sistema de “Almacenamiento del conocimiento”.
    - Subsistema “Repositorio”.
    - Subsistema “Control y mantención del Repositorio”.
- Sistema de “Transferencia del conocimiento”.
    - Subsistema “Exhibición del conocimiento”.
    - Subsistema “Disponibilidad del conocimiento”.

El funcionamiento con enfoque sistémico funcional del SGC se describe a continuación:

El SGC recibe como insumo de los sistemas funcionales de ONEMI informes conteniendo “conocimientos” específicos respecto a la RRD, que a juicio experto de cada entidad de ONEMI estiman que deben ser conocidos por los usuarios del SGC para la RRD en sus respectivas áreas. Estos conocimientos son obtenidos como producto de la ejecución de los procesos fundamentales de cada entidad.

Los informes de conocimiento los recibe el Sistema “Administración del conocimiento”, a través del Subsistema Validación del conocimiento, donde se verifica que el conocimiento remitido por las entidades de ONEMI cumpla con los requisitos definidos previamente para ser calificado como conocimiento válido para ser ingresado y gestionado por el SGC. Esta actividad se debe desarrollar en estrecha coordinación con la entidad que remitió el conocimiento.

Una vez validado el conocimiento, el Sistema “Administración del conocimiento” remite el informe recibido al Sistema “Procesamiento del conocimiento” para que sea procesado por uno o más de los subsistemas que lo componen (Subsistema Memoria histórica, Subsistema Lecciones aprendidas, Subsistema Desarrollo del recurso humano, Subsistema Investigación y desarrollo y Subsistema Desarrollo de redes).

Cada uno de los subsistemas desarrolla las actividades propias de su área, pudiendo interactuar entre ellos, a través del sistema “Administración del conocimiento” quien cumple la función de coordinación entre los subsistemas.

Cada uno de estos subsistemas elabora un informe específico de su función, el cual es ingresado al

Repositorio del Sistema “Almacenamiento del conocimiento” del SGC.

El Sistema “Almacenamiento del conocimiento” es el conjunto de elementos (aplicaciones y equipos computacionales, equipos y programas de conectividad, procedimientos administrativos y otros) que, incorporando tecnologías de la información y comunicaciones (TICs), apoya el funcionamiento integrado de los subsistemas componentes del SGC, permitiendo ingresar, procesar, almacenar y distribuir el conocimiento que requieren los usuarios del SGC respecto a la RRD.

Asimismo, el Sistema “Almacenamiento del conocimiento” cuenta con un Subsistema “Control y Mantención del Repositorio” que le permite a los subsistemas mantener actualizado el conocimiento almacenado y verificar su validez en el tiempo respecto a la utilidad para la RRD. Así, de esta forma, se mantiene un conocimiento reutilizable por los usuarios o stakeholders.

El Sistema “Almacenamiento del conocimiento” pone a disposición del Sistema “Transferencia del conocimiento” los elementos tecnológicos y los contenidos almacenados que permitan transferir a los usuarios o stakeholders el conocimiento procesado e ingresado por los Subsistemas.

El Sistema “Transferencia del conocimiento” deberá definir la forma y los canales que más se adecuen a los diferentes usuarios o stakeholders, mediante el Subsistema “Disponibilidad del conocimiento”, como por ejemplo, sistemas web, archivos digitales, archivos documentales, videos, películas, fotografías, objetos y otros elementos. Asimismo, mediante el Subsistema “Exhibición del conocimiento”, deberá definir si requiere ser exhibido y el medio más conveniente de hacerlo.

Como consecuencia del funcionamiento de sus sistemas, el SGC transfiere a sus usuarios o stakeholders conocimiento disponible para ser utilizado en acciones de reducción del riesgo de desastres.

3.3. Esquema del funcionamiento del SGC.

Considerando que el modelo de funcionamiento se diseñó a partir de las funciones principales del SGC, existe una relación directa entre los sistemas del SGC y dichas funciones principales, como asimismo, se genera una relación directa entre los subsistemas y los procesos del SGC.

Entonces, el funcionamiento del SGC queda determinado por los procesos que se identifican en las funciones principales del Sistema, de acuerdo con el siguiente detalle, como lo representa la Figura 2.3.3:

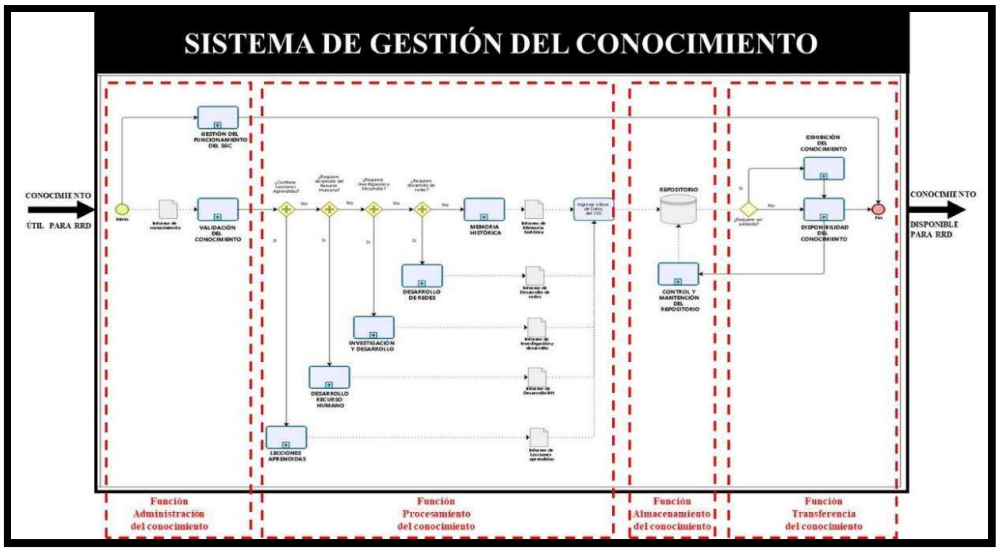

Figura 2.3.3: Procesos de las funciones principales del SGC.

3.3.1. Funcion “Administración del conocimiento”.

El propósito esencial de la función “Administración del conocimiento” es asegurar que el conocimiento que ingresa y se procesa en el Sistema cumpla con los requisitos definidos por ONEMI respecto a ser útil para la RRD.

Asimismo, la función “Administración del conocimiento” es la encargada de lograr el adecuado funcionamiento del sistema, constituyéndose en la pieza clave para lograr el cumplimiento de los objetivos del SGC, en cuanto a la planificación, organización, dirección, control y coordinación de la ejecución de las actividades y el empleo de los recursos, en todos los aspectos relacionados con las funciones del procesamiento, almacenamiento y transferencia del conocimiento del SGC.

Para cumplir con su propósito esencial, la función “Administración del conocimiento” realiza los siguientes procesos:

3.3.1.1. Proceso “Gestión del funcionamiento del SGC”.

El propósito esencial de este proceso es obtener una visión integrada del desempeño del conjunto de

competencias y actividades que corresponden a las funciones principales del Sistema, así como establecer la planificación, organización, dirección, control y coordinación estratégica del mismo, en perfecta sintonía con lo establecido para la gestión estratégica de ONEMI.

La figura 2.3.4 representa el proceso "Gestión del funcionamiento del SGC" dentro del contexto de la función "Administración del conocimiento" del esquema del funcionamiento del SGC.

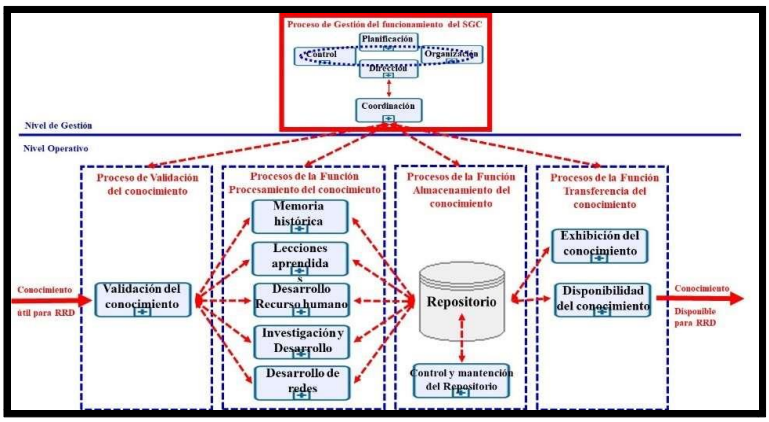

Figura 2.3.4: Esquema del proceso "Gestión del funcionamiento del SGC".

3.3.1.2. Proceso "Validación del conocimiento".

El propósito esencial del este proceso "Validación del conocimiento" es realizar una revisión de los informes de conocimiento remitidos por las entidades de ONEMI, verificando que cumplan con los requisitos definidos para ser gestionados por el SGC.

Las actividades que realiza el proceso "Validación del conocimiento" se representan en el esquema de la Figura 2.3.5.

Figura 2.3.5: Esquema del proceso "Validación del conocimiento".

3.3.2. Funcion "Procesamiento del conocimiento".

El propósito esencial de la función "Procesamiento del conocimiento" es procesar los informes de conocimiento validados por el Administrador del Sistema mediante la ejecución de los siguientes procesos:

3.3.2.1. Proceso “Memoria historica”.

El propósito esencial del proceso “Memoria histórica” es elaborar como producto final un Informe de Memoria Histórica (IMH) para la RRD, el cual debe ser ingresado al Repositorio del SGC con el fin de quedar disponible para los stakeholders del SGC.

Las actividades que realiza el proceso “Memoria histórica” se representan en el diagrama de flujo de la Figura 2.3.6:

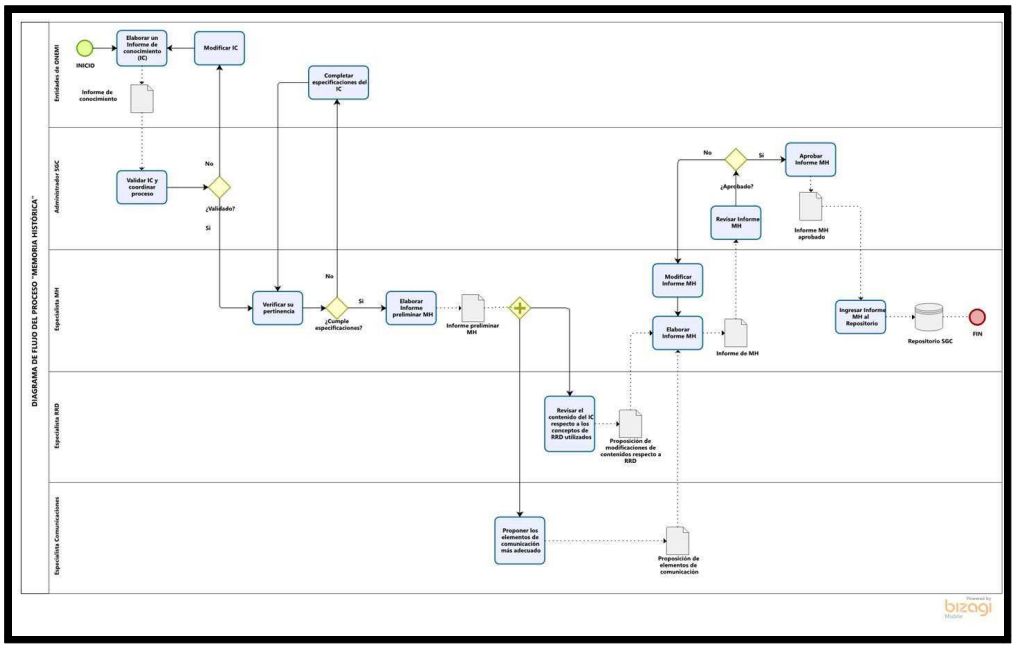

Figura 2.3.6: Diagrama de flujo del proceso “Memoria histórica”.

3.3.2.2. Proceso “Lecciones aprendidas”.

El propósito esencial del proceso “Lecciones aprendidas” es elaborar como producto final un Informe de Lecciones Aprendidas (ILA) para la RRD, el cual debe ser ingresado al Repositorio del SGC con el fin de quedar disponible para los stakeholders del SGC.

Las actividades que realiza el proceso “Lecciones aprendidas” se representan en el diagrama de flujo de la Figura 2.3.7:

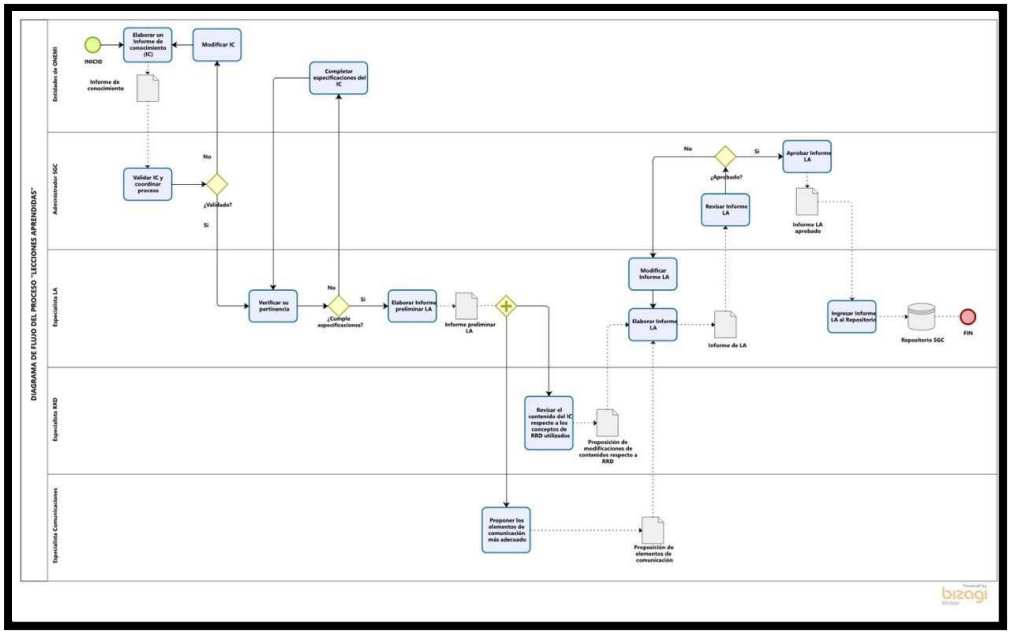

Figura 2.3.7: Diagrama de flujo del proceso “Lecciones aprendidas”.

3.3.2.3. Proceso “Desarrollo del recurso humano”.

El propósito esencial del proceso “Desarrollo del recurso humano” es elaborar como producto final un Informe de Desarrollo del Recurso Humano (IDRH) para la RRD, el cual debe ser ingresado al Repositorio del SGC con el fin de quedar disponible para los stakeholders del SGC.

Las actividades que realiza el proceso “Desarrollo del recurso humano” se representan en el diagrama de flujo de la Figura 2.3.8:

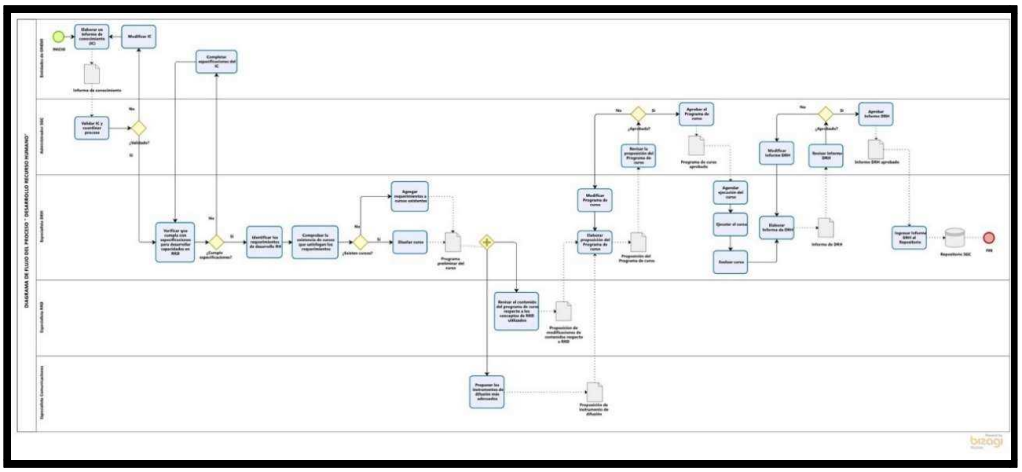

Figura 2.3.8: Diagrama de flujo del proceso “Desarrollo del recurso humano”.

3.3.2.4. Proceso “Investigación y desarrollo”.

El propósito esencial del proceso “Investigación y desarrollo” es elaborar como producto final un Informe de Investigación y Desarrollo (IID) para la RRD, el cual debe ser ingresado al Repositorio del SGC con el fin de quedar disponible para los stakeholders del SGC.

Las actividades que realiza el proceso “Investigación y desarrollo” se representan en el diagrama de flujo de la Figura 2.3.9:

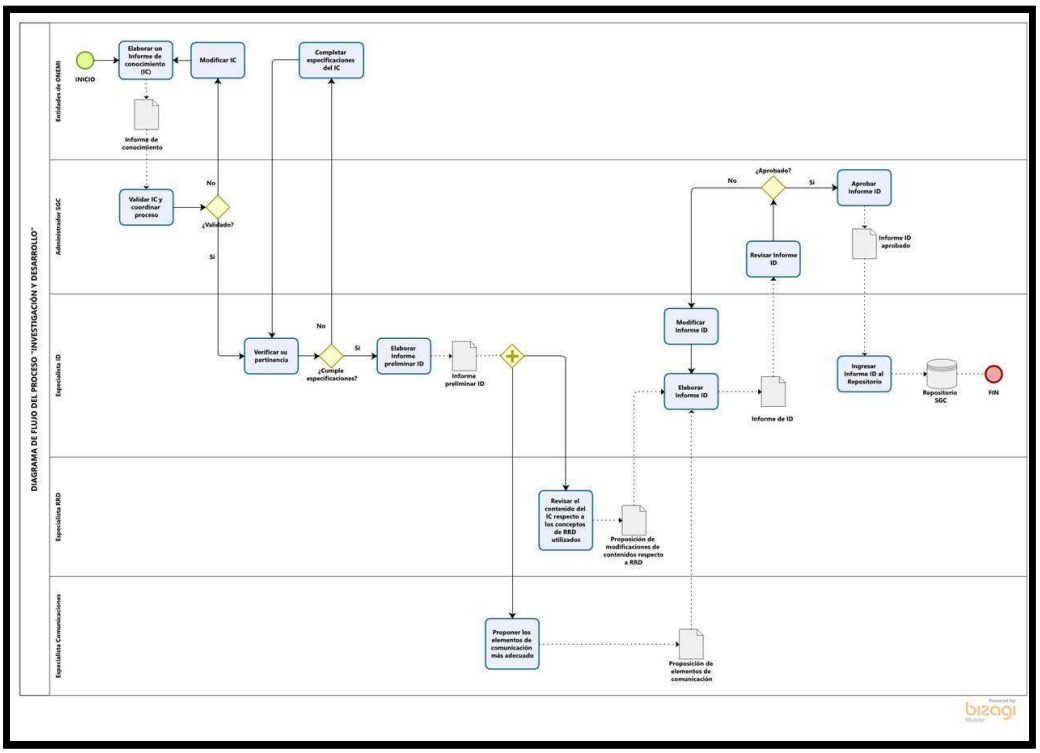

Figura 2.3.9: Diagrama de flujo del proceso “Investigación y desarrollo”.

3.3.2.5. Proceso “Desarrollo de redes”.

El propósito esencial del proceso “Desarrollo de redes” es elaborar como producto final un Informe de Desarrollo de Redes (IDR) para la RRD, el cual debe ser ingresado al Repositorio del SGC con el fin de quedar disponible para los stakeholders del SGC.

Las actividades que realiza el proceso “Desarrollo de redes” se representan en el diagrama de flujo de la Figura 2.3.10:

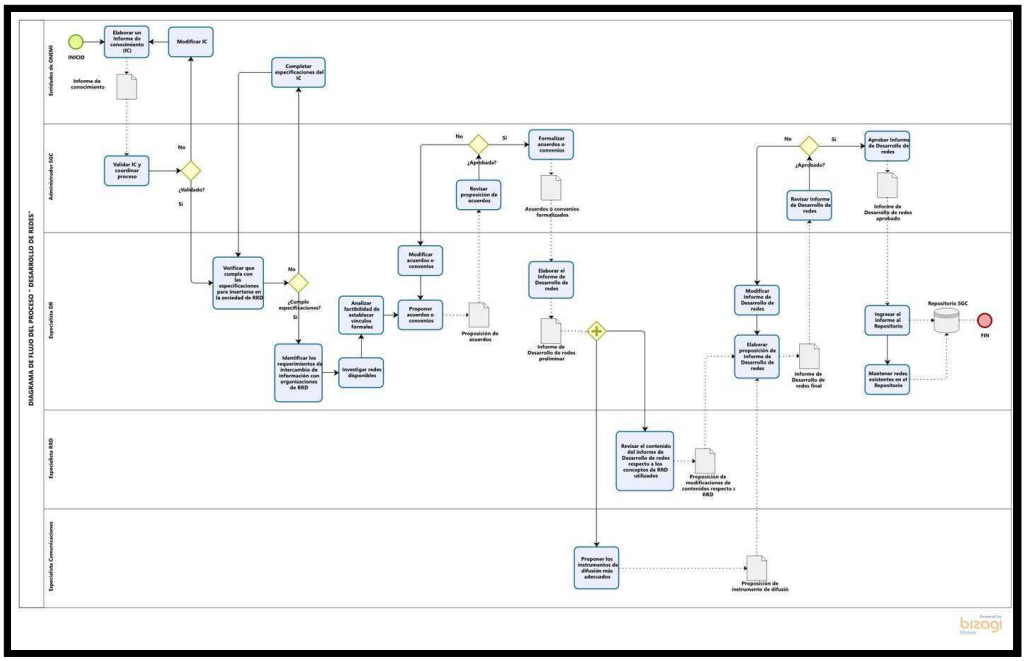

Figura 2.3.10: Diagrama de flujo del proceso “Desarrollo de redes”.

3.3.3. Funcion “Almacenamiento del conocimiento”.

La función “Almacenamiento del conocimiento” dice relación con el Repositorio del SGC que permita reunir y guardar la información relevante que se genere como resultante de la ejecución de los procesos de las funciones principales del SGC.

Las especificaciones técnicas, tanto para las aplicaciones computacionales como para las bases de datos que se requieran, deben ser definidas a partir de las especificaciones funcionales que se formulen para cada una de las funciones principales del SGC.

3.3.3.1. El Repositorio del SGC.

El concepto de “Repositorio del SGC” se va entender como un sistema informático constituido por un conjunto de procedimientos administrativos, procesos, aplicaciones computacionales y apoyo tecnológico que permita recolectar, preparar, almacenar, recuperar y presentar el conocimiento relevante producto de los procesos principales del Sistema de gestión del conocimiento de ONEMI para la Reducción del Riesgo de Desastres.

En este contexto, el Repositorio tiene como propósito esencial brindar el apoyo informático requerido para el funcionamiento de los procesos esenciales del SGC, bajo un ambiente operacional común de la plataforma tecnológica de ONEMI, como se muestra en la Figura 2.3.11.

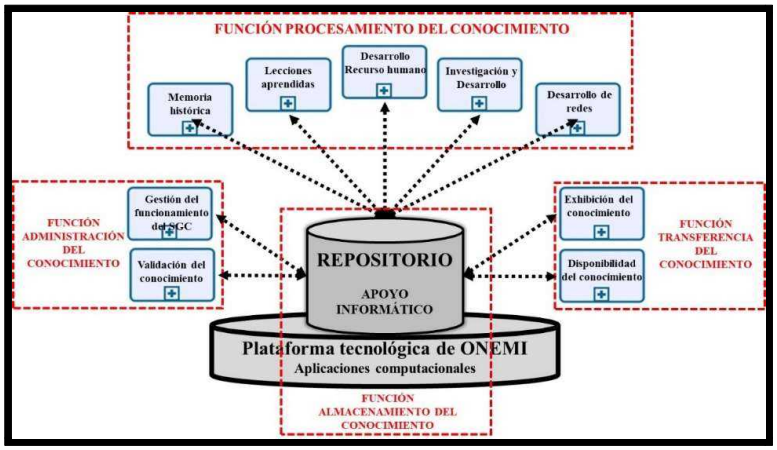

Figura 2.3.11: El apoyo informático como propósito esencial del Repositorio del SGC.

3.3.3.2. Proceso "Control y mantención del Repositorio".

Esta etapa tiene por objetivo revisar y actualizar regularmente el contenido del conocimiento almacenado en las bases de datos funcionales del Repositorio, a medida que ocurran cambios o innovaciones, como asimismo, realizar el control de gestión mediante la generación de estadísticas sobre la utilización del conocimiento puesto a disposición de los satakeholders, de manera de poder realizar una estimación sobre los aportes de la gestión del conocimiento del sistema. El esquema se representa en la Figura 2.3.12.

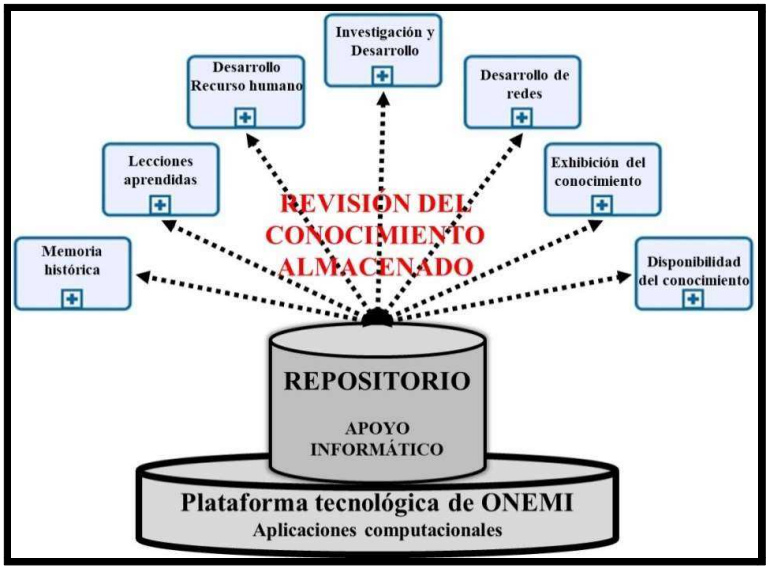

Figura 2.3.12: Esquema del proceso "Control y mantención Repositorio del SGC".

Los responsables de los procesos principales del SGC (Memoria histórica, Lecciones aprendidas, Desarrollo del recurso humano, Investigación y desarrollo, Desarrollo de redes, Exhibición del conocimiento y Disponibilidad del conocimiento) deberán revisar periódicamente el conocimiento almacenado en las aplicaciones computacionales de sus respectivas áreas funcionales, a fin de detectar errores, obsolescencias, necesidad de completar información, realizar interrelaciones de conocimiento u otras modificaciones que se requieran para actualizar el conocimiento disponibles para los usuarios del SGC.

3.3.4. Funcion "Transferencia del conocimiento".

La función "Transferencia del conocimiento" tiene como propósito esencial transferir a los usuarios o stakeholders del SGC el conocimiento disponible que se encuentra almacenado en el Repositorio, con el objeto que pueda ser utilizado en acciones de reducción del riesgo de desastres.

La función "Transferencia del conocimiento" deberá definir la forma y los canales que más se adecuen a los diferentes usuarios o stakeholders, como, por ejemplo, sistemas web, archivos digitales, archivos documentales, videos, películas, fotografías, objetos y otros elementos. Asimismo, deberá definir si el conocimiento disponible requiere ser exhibido y el medio más conveniente de hacerlo.

Para cumplir con su propósito esencial, la función "Transferencia del conocimiento" realiza los procesos de "Disponibilidad del conocimiento" y de "Exhibición del conocimiento"

3.3.4.1. Proceso "Disponibilidad del conocimiento".

El propósito esencial del proceso "Disponibilidad del conocimiento" es facilitar el acceso al conocimiento que se encuentra almacenado en el Repositorio, a los usuarios o stakeholders del SGC, como, asimismo, promover e incentivar el uso de este conocimiento disponible en las acciones para la Reducción del Riesgo de Desastre.

Para cumplir con su propósito esencial, el proceso "Disponibilidad del conocimiento" realiza las siguientes actividades, las cuales se representan en el esquema de la Figura 2.3.13:

Figura 2.3.13: Actividades principales del proceso "Disponibilidad del conocimiento".

3.3.4.2. Proceso "Exhibición del conocimiento".

El propósito esencial del proceso "Exhibición" es conservar, comunicar y exponer, para fines de estudio, educación y contemplación, los conjuntos y colecciones de elementos con valor histórico y de interés para la RRD, que permitan transmitir a los stakeholders del SGC la experiencia y aprendizajes de los eventos ocurridos, cumpliendo además con el objetivo de recordar un aspecto específico del desastre al conservar algún vestigio de él.

En este contexto se consideran lugares, imágenes y artefactos, los que reproducen interpretaciones de la historia pasada y al mismo tiempo contribuyen en la trasformación de los recuerdos mediante la repetición ritual de símbolos, discursos y estéticas, que permitan provocar el recuerdo y de esa forma conservar un fragmento del pasado. Lo anterior sirve como instrumento de educación a la población.

Para cumplir con su propósito esencial, el EEXH debe realizar las siguientes tareas que se representan en el esquema de la figura 2.3.14:

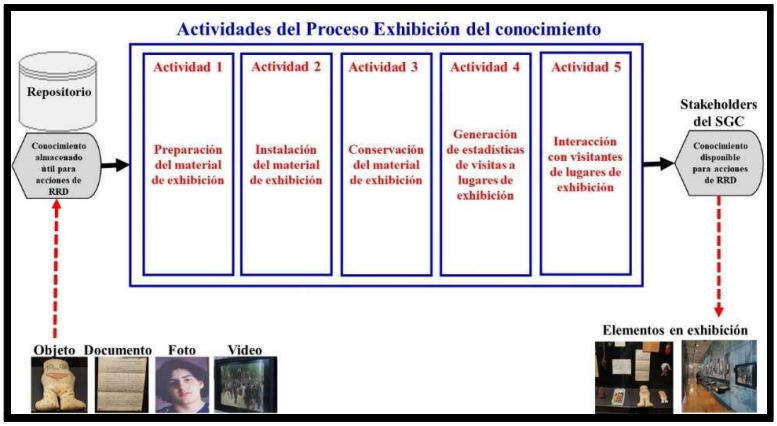

Figura 2.3.14: Actividades principales del proceso "Exhibición del conocimiento".

En el Apéndice 5.1 de este documento, se describe en forma detallada las funciones y procesos del modelo de funcionamiento del SGC.

Asimismo, en el desarrollo del diseño conceptual del Sistema de Gestión del Conocimiento, se consideró la aplicación de las actividades del proceso Memoria histórica a 4 eventos de desastres ocurridos en Chile, seleccionados de una lista elaborada por el Equipo JET durante el desarrollo del proyecto.

En el Apéndice 5.2 de este documento se describe el resultado de la aplicación del proceso Memoria histórica.

3.4. Modelo ampliado del funcionamiento del SGC.

Como una forma de contextualizar el SGC en el ámbito de acción de ONEMI y del Sistema Nacional de Protección civil, se elaboró un esquema de modelo ampliado, que se mostrará a partir del enfoque de proceso del modelo de funcionamiento del SGC, como lo muestra la Figura 2.3.1.5, y estará especialmente centrado en incorporar el proceso de la generación de los insumos de conocimiento útil para la RRD que deben realizar las entidades de ONEMI, en su calidad de proveedores internos del SGC:

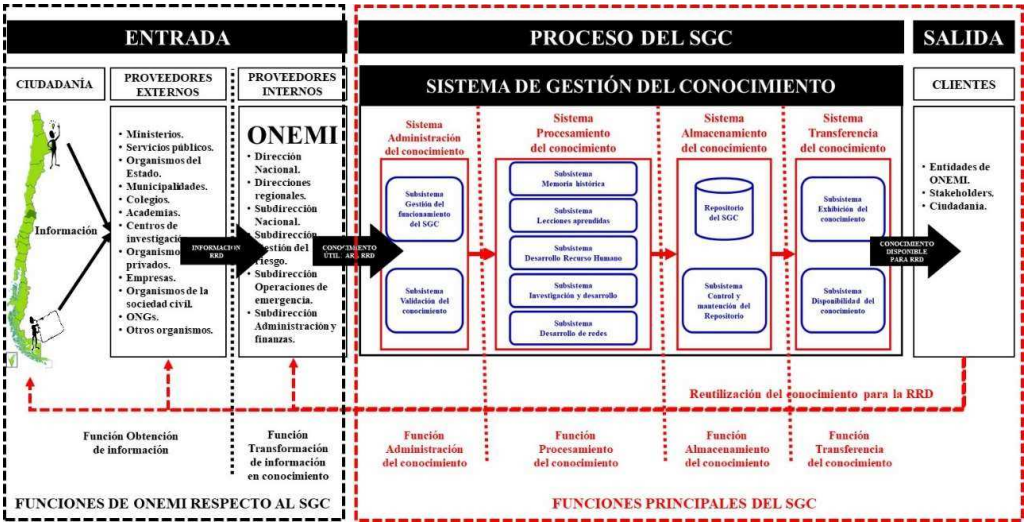

Figura 2.3.15: Modelo ampliado del funcionamiento del SGC.

Estas entidades de ONEMI reciben información de sus proveedores externos, por distintas vías, tanto de organizaciones estatales, privadas, municipalidades y otras, como de la población de cualquier parte del país, referida a los eventos de desastres ocurridos.

Las entidades de ONEMI realizan el proceso de transformación de la información recibida de sus proveedores externos en conocimiento útil para la RRD y que, a juicio de los especialistas, sea calificado como necesario de ser procesado por el SGC.

Tanto la función de obtención de la información referida a los eventos de desastres ocurridos como la función de transformación de dicha información en conocimiento útil para la RRD, son funciones del ámbito de acción de ONEMI, pero no fueron consideradas como funciones del SGC. No obstante, son muy importantes para el SGC ya que proporcionan el insumo principal para su funcionamiento.

La entrada al SGC son los informes de conocimiento que los recibe de los proveedores internos, es decir, de las entidades de la ONEMI.

Como producto de los procesos de las funciones específicas, el SGC pone a disposición de los usuarios o stakeholders un conocimiento gestionado que, de acuerdo a lo definido por las entidades especializadas de ONEMI, puede ser utilizado para la RRD. Asimismo, este conocimiento disponible

puede ser reutilizado tanto por los proveedores internos como los proveedores externos, a fin de generar nueva información y nuevos conocimientos para la RRD, iniciándose así el círculo virtuoso de la gestión del conocimiento.

Asimismo, el Esquema del funcionamiento del SGC se puede representar dentro del modelo ampliado en el contexto del accionar de ONEMI y del Sistema Nacional de Protección Civíl, como se muestra en la Figura 2.3.16:

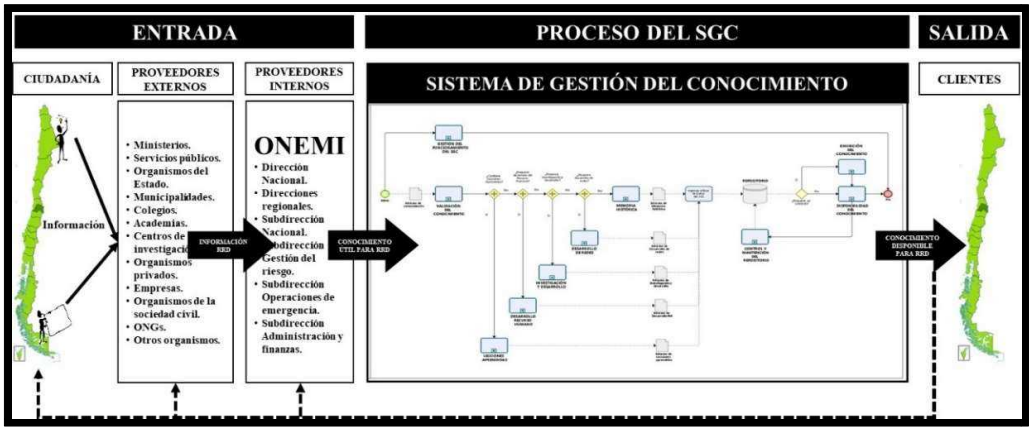

Figura 2.3.16: El Esquema del funcionamiento del SGC en el Modelo ampliado.

4. Diseño organizacional del SGC.

4.1. Concepto de diseño organizacional[5].

El concepto de "Diseño o rediseño organizacional" se encuadra en la función "organización" del sistema de gestión de una entidad. Específicamente, dentro del concepto de análisis organizacional que es el proceso por el cual los directivos construyen, evalúan o modifican la organización formal de una entidad con el propósito de facilitar la realización de las tareas y actividades necesarias para la consecución de los objetivos establecidos para cumplir con la misión.

Para entender mejor el concepto de diseño organizacional, se debe tener en cuenta las siguientes consideraciones:

- El diseño organizacional es un proceso directivo: La dirección de la organización tiene la capacidad de tomar decisiones acerca de determinados aspectos de su funcionamiento, con un claro propósito de influir sobre éste.
- El contenido del diseño organizacional es actuar sobre la organización formal: Los directivos cuentan con parámetros o variables de diseño que constituyen elementos básicos de la organización formal para influir en su funcionamiento.
- El diseño organizacional se desarrolla sobre un contexto determinado: Está condicionado por el contexto existente y guiado necesariamente por los objetivos y estrategias de la organización.
- El propósito del diseño organizacional es la eficacia y eficiencia organizacional: Facilitar la consecución de la misión y los objetivos de la organización (Eficacia) así como permitir que éstos se obtengan con la menor utilización posible de recursos (Eficiencia).
- El diseño organizacional es un proceso dinámico: La actividad incluye la construcción, evaluación y modificación de la organización formal a lo largo del tiempo.

La utilidad de diseñar o rediseñar adecuadamente una organización radica en las siguientes ideas:

- Constituye un mecanismo de influencia que permite a la dirección cambiar los modelos de comportamiento de una organización, pudiendo tener un gran impacto en su funcionamiento.
- Un adecuado diseño puede ser uno de los factores clave del éxito de la organización a largo plazo al proporcionar a ésta una ventaja competitiva.
- Introduce la racionalidad en la organización, de modo que una organización diseñada adecuadamente tiende a ser más eficiente por las siguientes razones:
    - Las líneas de autoridad y responsabilidad quedan claramente identificadas.
    - La organización diferencia sus actividades de tal forma que éstas se ejecutan eficaz

5 Diseño organizativo de la empresa, J.M. De la FUENTE y otros

y eficientemente gracias a la división del trabajo introducida.

- El proceso de comunicación es construido eficientemente, de modo que la información que se necesita por los tomadores de decisiones es proporcionada con precisión, eficiencia y rapidez.
- La estructura formal permite desviaciones en el comportamiento y, de hecho, reconoce la necesidad de la estructura informal.
- La estructura permite una adecuada descentralización y complejidad para que la organización pueda responder a las contingencias del entorno.
- Las estructuras eficaces ayudan a reducir o eliminar las situaciones en que una tarea o función importante para la consecución de los objetivos no se realiza, o se realiza por más de una unidad interna en detrimento de la eficiencia.

El diseño organizativo supone llevar a cabo un esfuerzo para establecer las relaciones y crear una estructura más adecuada que permita conseguir los objetivos establecidos.

Como consecuencia de este proceso de diseño aparece la organización formal, que está orientada a facilitar la resolución de problemas y mejorar los resultados del funcionamiento de la entidad, lo que debe quedar establecido en el Reglamento Orgánico y de Funcionamiento (ROF).

En el diseño organizacional se busca lograr la coherencia entre la misión o propósito esencial, la estructura organizacional y los procesos, como lo muestra la figura 2.4.1:

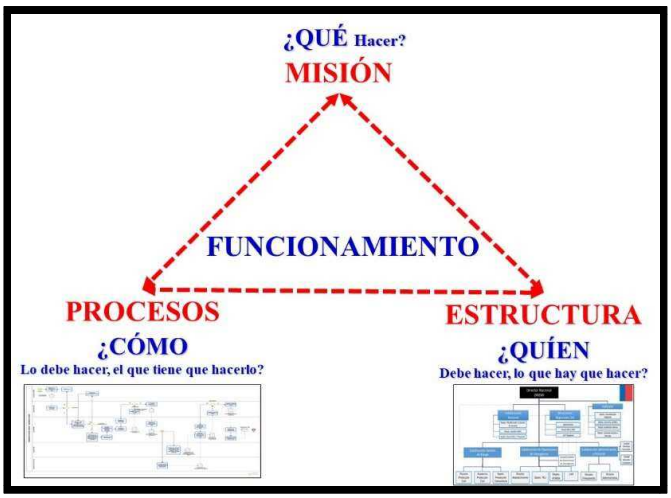

Figura 2.4.1: Coherencia entre la misión, estructura y procesos.

- El “qué hacer”, es decir, las misiones y tareas fundamentales de la organización.
- El “quién debe hacer lo que hay que hacer”, es decir, la estructura de la organización y las misiones de las unidades dependientes.

- El “cómo lo debe hacer el que tiene que hacerlo”, es decir, los procesos y los procedimientos.

4.2. Misión y tareas fundamentales del SGC[6].

La misión es la declaración fundamental que le da el carácter constitutivo a la organización y, consecuencialmente, a su acción.

El texto de la misión debe estar redactado en una forma genérica enfocada al propósito esencial de la entidad. La misión debe ser establecida por el escalón superior correspondiente y para ello el texto que se redacte para cada una de las unidades subordinadas, cualquiera sea el nivel en la estructura organizacional, deberá cumplir con los requisitos de corrección, claridad, precisión, concisión y permanencia.

Para que la misión esté bien definida debe cumplir tres criterios:

- Inclusión, este criterio se preocupa de asegurar que la misión del organismo esté orientada a realizar la misión del escalón superior, es decir que contribuya a él.
- Complementariedad, que refuerce y complete las demás misiones de su nivel, generando una fuerte relación de interdependencia entre los distintos organismos que conforman la organización, lo que exige que la realización del trabajo de unos dependa en gran medida del resultado del trabajo de los otros. Estas relaciones de dependencias forman parte de una extensa red de actividades, que se verifican en los procesos, los cuales recogen las relaciones cliente-proveedor interno que existen entre las diferentes misiones repartidas en los organismos subordinados.
- Coherencia, este criterio es el que vela por que todo el proceso de desplegar y repartir la misión en las misiones para las entidades subordinadas, se realice de forma coordinada a lo largo de la organización, asegurando que dichas misiones estén alineadas con la dirección marcada por el escalón superior para cumplir la misión de dicho organismo.

Las funciones específicas o tareas fundamentales de la entidad se entienden como elementos que permiten establecer los alcances específicos de la misión.

El Sistema de Gestión del Conocimiento tiene como propósito esencial gestionar el conocimiento para la reducción del riesgo de desastres que adquieren las entidades de ONEMI derivado de su accionar y ponerlo a disposición de usuarios comprometidos con la RRD.

El funcionamiento del SGC se basa, inicialmente, en el “conocimiento” que recibe de las entidades de ONEMI, para que una vez procesado por sus funciones esenciales, transfiera ese “conocimiento

[6] PLANIFICACIÓN ESTRATÉGICA EN LOS SERVICIOS PÚBLICOS, Serie Guía Metodológica, Comité Interministerial de Modernización de la Gestión Pública, 1996. ADMINISTRACIÓN ESTRATÉGICA TEXTOS Y CASOS, Thompson y Strickland. Mc Graw Hill, 2003

disponible" a los usuarios del Sistema, que a su vez pueden ser las propias entidades de ONEMI que requieran utilizar dicho conocimiento como información para generar nuevos conocimientos, produciéndose un círculo virtuoso.

En consecuencia, el Sistema de Gestión del conocimiento se le ha asignado la siguiente misión:

Gestionar y transferir el conocimiento en RRD a través del rescate y difusión de la memoria histórica y las lecciones aprendidas, junto con la formación del recurso humano, para que las instituciones, comunidades y personas fortalezcan la cultura preventiva.

Asimismo, sus tareas fundamentales son las siguientes:

- Asegurar que el conocimiento que ingresa y se procesa en el Sistema cumpla con los requisitos definidos por ONEMI respecto a ser útil para la RRD.
- Procesar el conocimiento ingresado y validado por el Sistema, mediante la ejecución de los procesos "Memoria historica", "Lecciones aprendidas", "Desarrollo del recurso humano", "Investigación y desarrollo" y "Desarrollo de redes".
- Brindar el apoyo informático que permita recolectar, preparar, almacenar, recuperar y presentar el conocimiento relevante para la reducción del riesgo de desastres.
- Transferir a los usuarios o stakeholders del SGC el conocimiento disponible que se encuentra procesado y almacenado en el Sistema, con el objeto que pueda ser utilizado en acciones de reducción del riesgo de desastres.

4.3. Identificación de roles de los procesos de las funciones del SGC.

De la descripción de los procesos realizado en el Apéndice 5.2 de la Parte 2, de este documento, se identificaron los siguientes roles de los procesos de las funciones del SGC:

- **Administrador del SGC (ADM)**: Especialista en gestión del conocimiento.
- **Responsable de la Entidad de ONEMI (RENT)**: Persona de una entidad de ONEMI que se hace responsable de elaborar los Informes de Conocimiento, Informes de contexto e interactuar con el SGC respecto del formato y de su contenido.
- **Especialista en Memoria histórica (EMH)**: Persona que cuenta con las competencias para elaborar Informes de Memorias históricas (IMH) y que se hace responsable del procesamiento del IMH, desde la verificación de su pertinencia hasta su ingreso al Repositorio.
- **Especialista en Lecciones aprendidas (ELA)**: Persona que cuenta con las competencias para elaborar Informes de lecciones aprendidas (ILA) y que se hace responsable del procesamiento del ILA, desde la verificación de su pertinencia hasta su ingreso al Repositorio.
- **Especialista en Desarrollo del recurso humano (EDRH)**: Persona que cuenta con las competencias para elaborar Informes de Desarrollo del recurso humano (IDRH) y que se hace responsable del procesamiento del IDRH, desde la verificación de su pertinencia hasta su

ingreso al Repositorio.

- **Especialista en Investigación y Desarrollo (EID)**: Persona que cuenta con las competencias para elaborar Informes de Investigación y Desarrollo (IID) y que se hace responsable del procesamiento del IID, desde la verificación de su pertinencia hasta su ingreso al Repositorio.
- **Especialista en Desarrollo de redes (EDR)**: Persona que cuenta con las competencias para elaborar Informes de Desarrollo de redes (IDR) y que se hace responsable del procesamiento del IDR, desde la verificación de su pertinencia hasta su ingreso al Repositorio.
- **Especialista en Reducción del Riesgo de Desastres (ERRD)**: Persona que cuenta con las competencias en RRD y que se hace responsable de revisar el contenido de los informes de Conocimiento e informes de contexto, respecto a los conceptos de RRD utilizados en ONEMI.
- **Responsable del Repositorio (RREP)**: Persona que cuenta con las competencias en gestión de sistemas informáticos, haciendo uso de las tecnologías de información y comunicaciones (TICs), y que se hace responsable del funcionamiento del Repositorio, con el objeto de brindar el apoyo informático requerido para ejecución de los procesos del Sistema de Gestión del Conocimiento, bajo un ambiente operacional común de la plataforma tecnológica de ONEMI.
- **Especialista en exhibición (EEXH)**: Persona que cuenta con las competencias en técnicas y prácticas relativas al funcionamiento de salas de exhibiciones de elementos con valor histórico y de interés para la RRD.
- **Especialista en comunicaciones (ECOM)**: Persona que cuenta con las competencias en estrategias y técnicas de comunicaciones.

4.4. Asignación de los roles de los procesos del SGC a las entidades de ONEMI.

La asignación de los roles a las entidades de ONEMI, se propuso en función de la afinidad de las tareas de los roles con las misiones de las entidades establecidas en el Reglamento Orgánico y de Funcionamiento de la ONEMI de fecha 08 de enero de 2018.

La distribución de roles a las entidades de la estructura superior de ONEMI se propuso de acuerdo lo siguiente:

- La División de Protección Civil de la Subdirección de Gestión del Riesgo asume la administración integral del SGC, mediante la creación de la "Unidad de gestión del conocimiento" y concentrando los siguientes roles:
    - Administrador del SGC;
    - Especialista en Memoria histórica;
    - Especialista en Lecciones aprendidas;
    - Especialista en Reducción del Riesgo de Desastres;
    - Responsable del Repositorio.

- La Academia de Protección Civil de la Subdirección de Gestión del Riesgo asume el rol de Especialista en Desarrollo del recurso humano.
- El Departamento de comunicaciones y difusión del Gabinete dependiente de la Dirección Nacional asume los siguientes roles:
    - Especialista en exhibición;
    - Especialista en Comunicaciones.
- El Departamento de Desarrollo y Proyectos de la Subdirección Nacional asume el rol de Especialista en Investigación y Desarrollo.
- El Departamento de Gestión del Sistema Nacional de Protección Civil de la Subdirección Nacional asume el rol de Especialista en Desarrollo de redes.
- Cada entidad de la estructura superior (Dirección Nacional a través del Gabinete, Direcciones Regionales, Subdirección Nacional, Subdirección de Gestión del Riesgo, Subdirección de Operaciones de Emergencia y Subdirección de Administración y Finanzas) deberá designar un cargo que asuma el rol de Responsable de la Entidad de ONEMI.

Cada rol puede participar en uno o más de los procesos de las funciones esenciales, realizando las tareas que fueron definidas en los respectivos procedimientos, generando, en el conjunto de todos los roles, el funcionamiento del SGC de ONEMI que permitirá cumplir con su propósito esencial de transferir a los stakeholders del Sistema, el conocimiento respecto a la RRD obtenido por ONEMI.

En el Apéndice 5.4 de este documento se detalla la distribución de roles a las entidades de la estructura superior de ONEMI.