

# Work Breakdown Structure (WBS)



## Highway Research and Training Centre (HR&TC) Program

Jul. 25th 2006  
JICA Phase-0 Mission  
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(Project Planning and Organization Structure)



Japan International Cooperation Agency

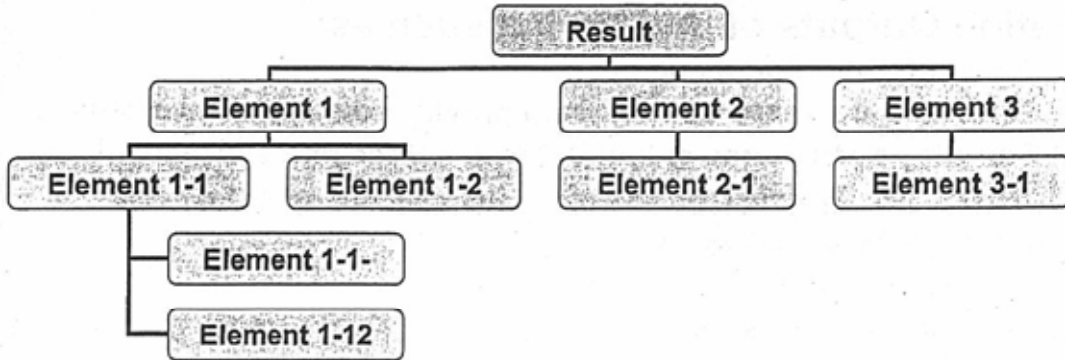
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## Introduction of WBS (Work Breakdown Structure)

- Method to create Outline of the work and is not work itself
  - \*The work consists of many activities which composes Project
- Commonly used at beginning of the Project for;
  - Defining Project Scope
  - Organizing Gantt Schedule
  - Estimating Costs
- May used throughout the Project to Identify and track work packages

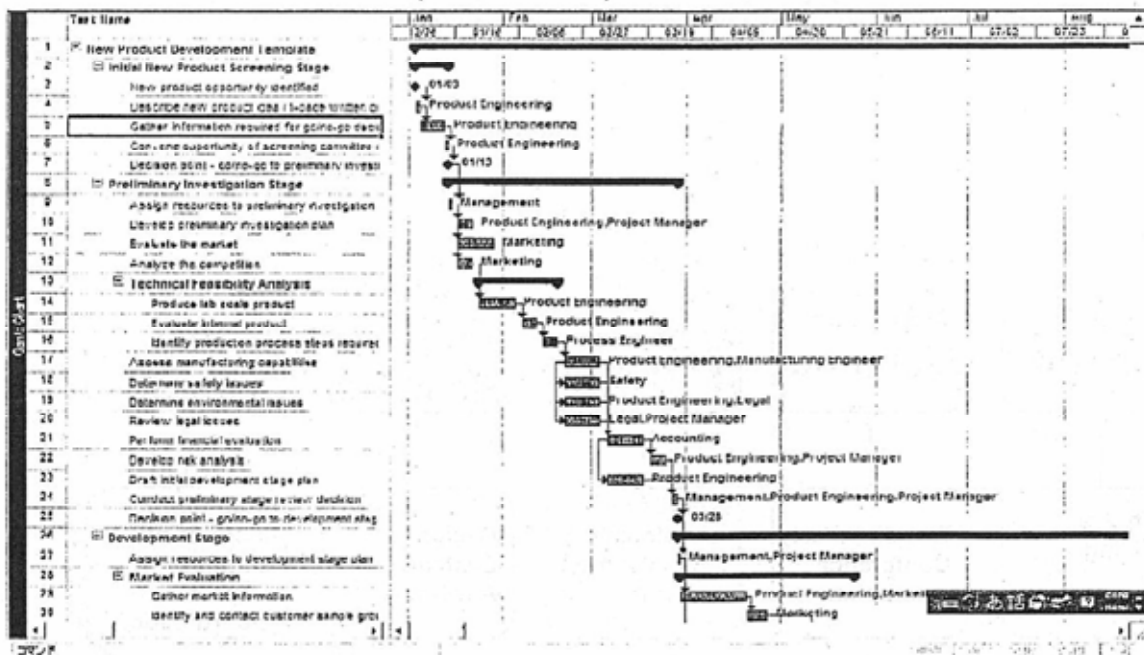
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- WBS framework is kind of Results oriented family tree.
  - Captures all work of project in organized way
  - Often portrayed graphically as hierarchical tree



- \*It's commonly expressed in terms of Nouns and modifier
- WBS can also be Deliverable or Process oriented
- \*It's also can be expressed in terms of Verbs too

- Reflected as tabular list of "element" categories and task list with chart of schedule (Gantt Chart). (Sample)



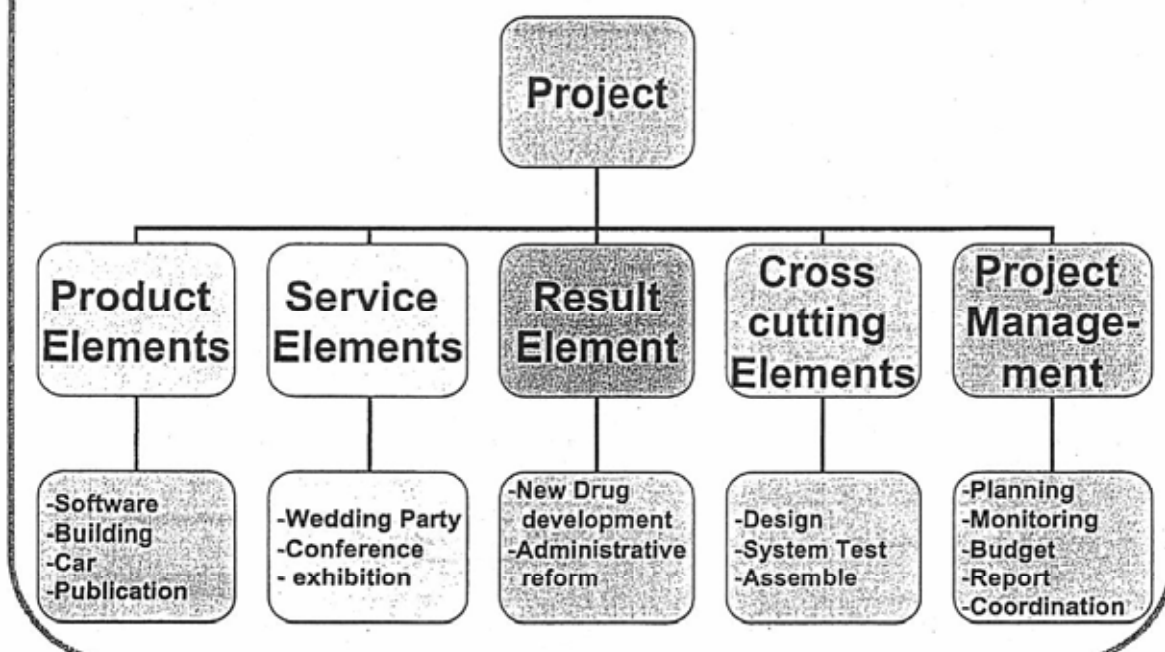
# Steps to Create WBS

1. Define Purpose of the Project
2. Define Outputs of the Project such as;
  - 1) Product ; structured output
  - 2) Service; no structured output but provide service to client/other
  - 3) Result; no structured output but result of the process (activities)
3. Identify all Elements (Not only main items= 100% rule) of
  - 1) Product/Service/Result
  - 2) Interim Product
  - 3) Common cross issue
4. Break down the elements of 2. and 3. to appropriate size to plan and control the works
  - \* break down work into each person/group in charge
  - ⇒ Work Package, Activities ⇒ Gantt Chart

*G*

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# Structure of WBS (General idea)

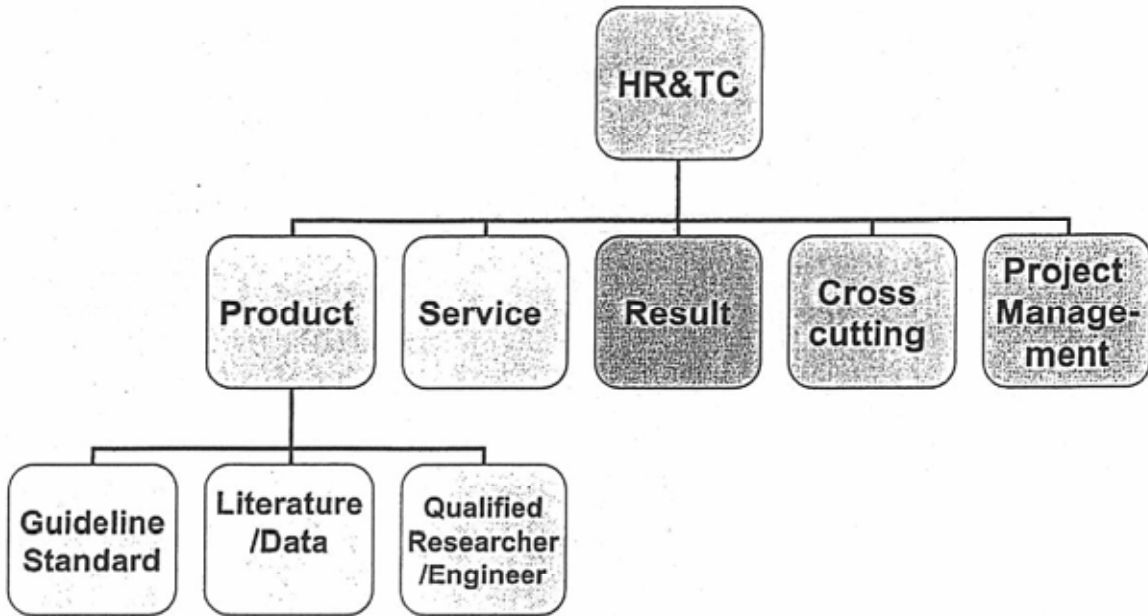


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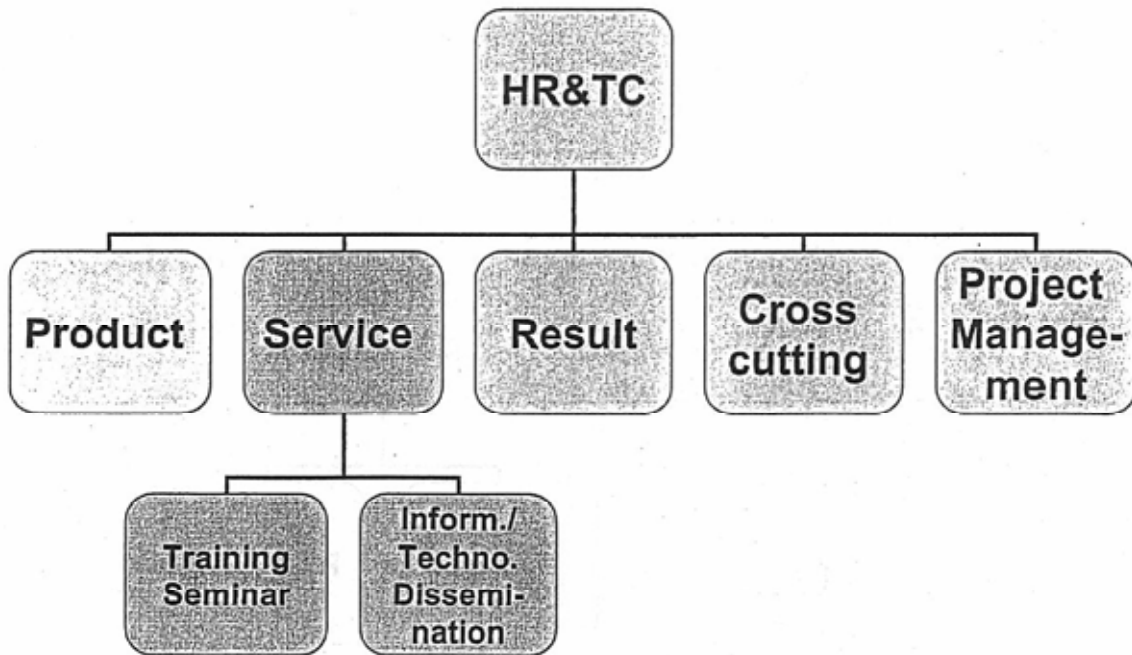
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# HR&TC WBS Structure (Tentative idea)



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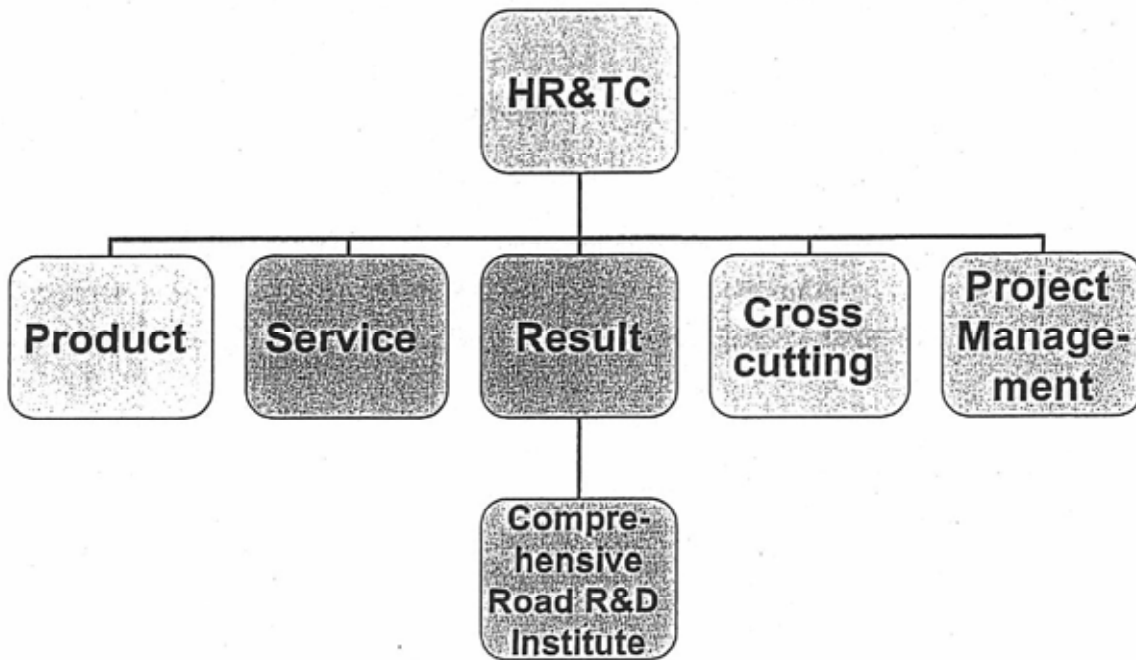
# HR&TC WBS Structure (Tentative idea)



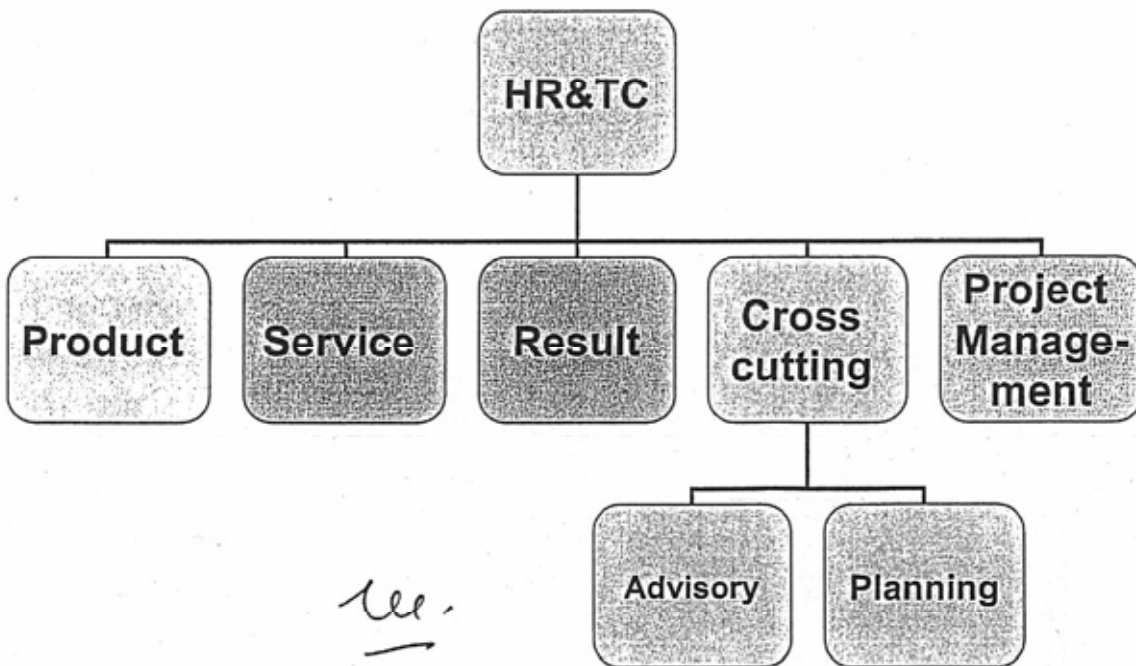
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# HR&TC WBS Structure (Tentative idea)



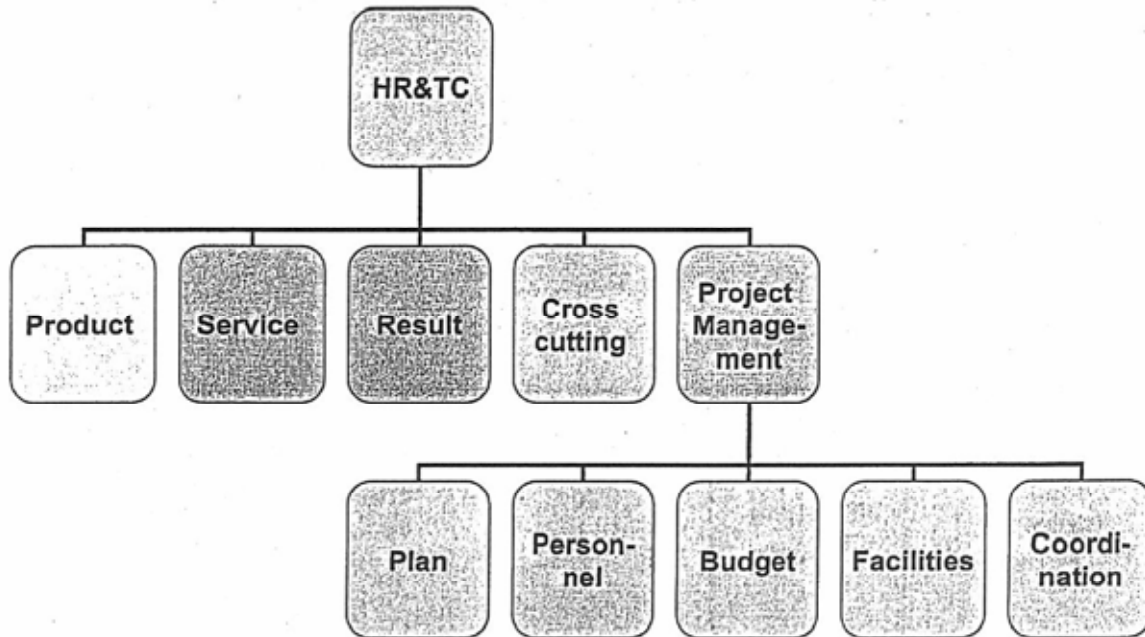
# HR&TC WBS Structure (Tentative idea)



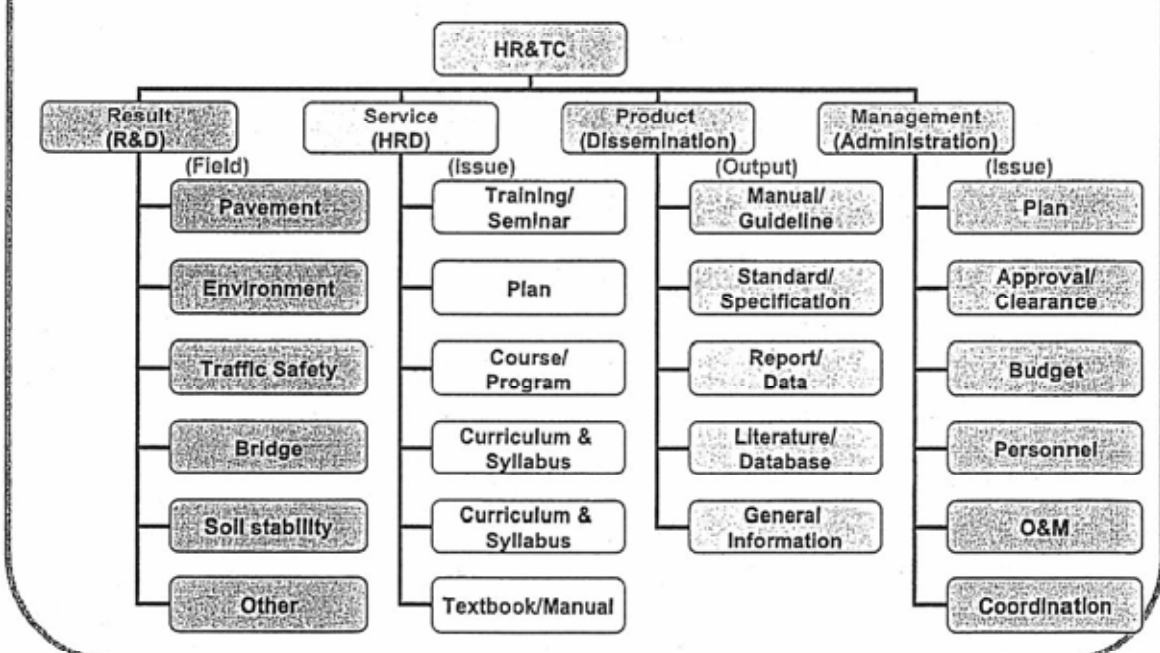
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# HR&TC WBS Structure (Tentative idea)



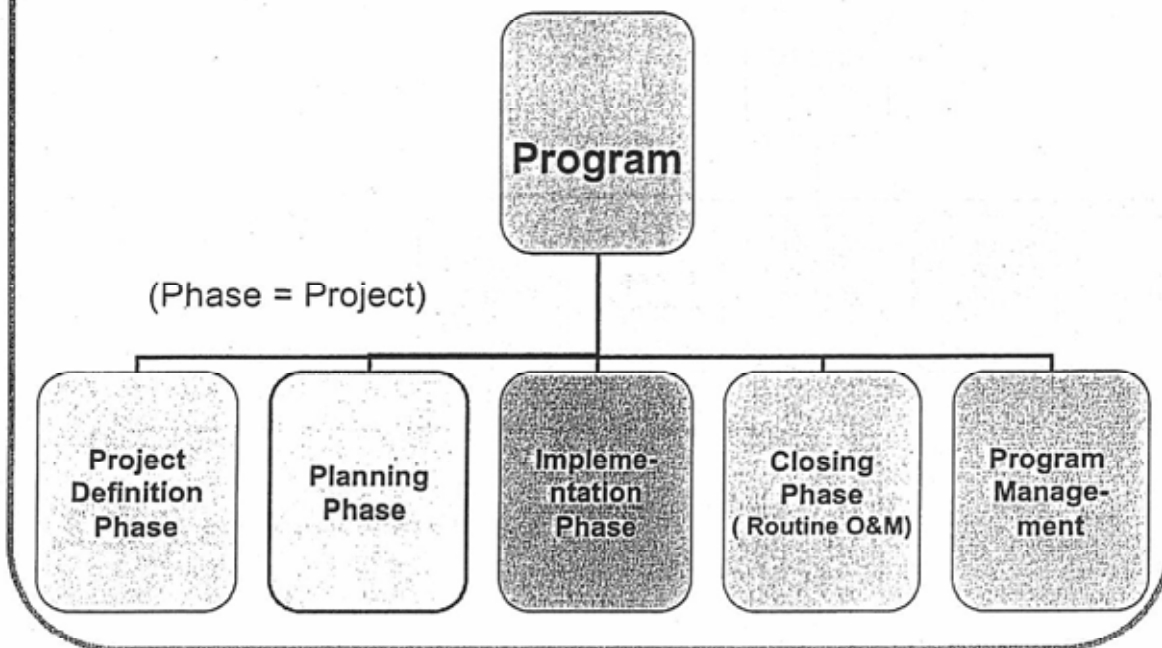
## HR&TC WBS Factor



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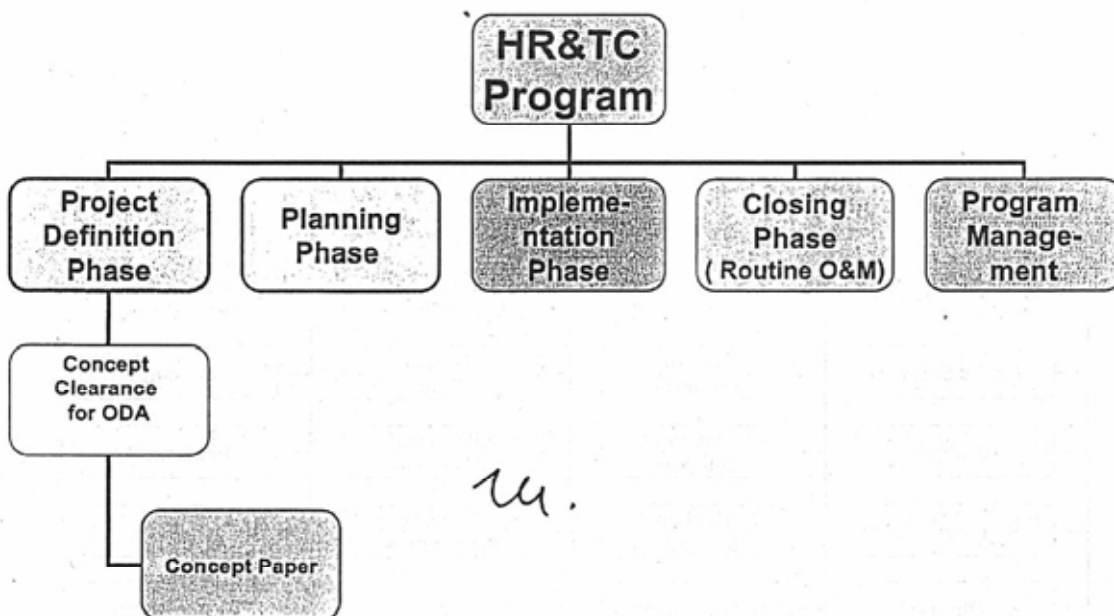
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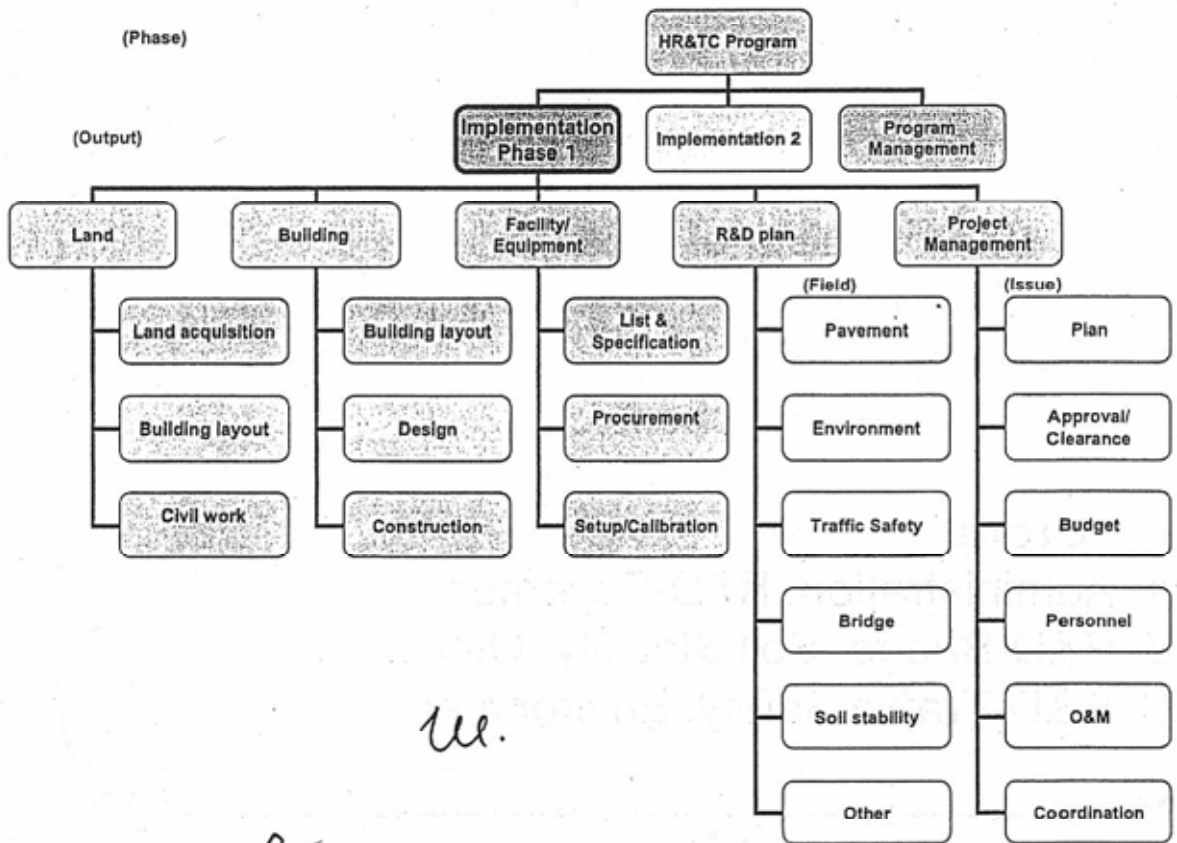
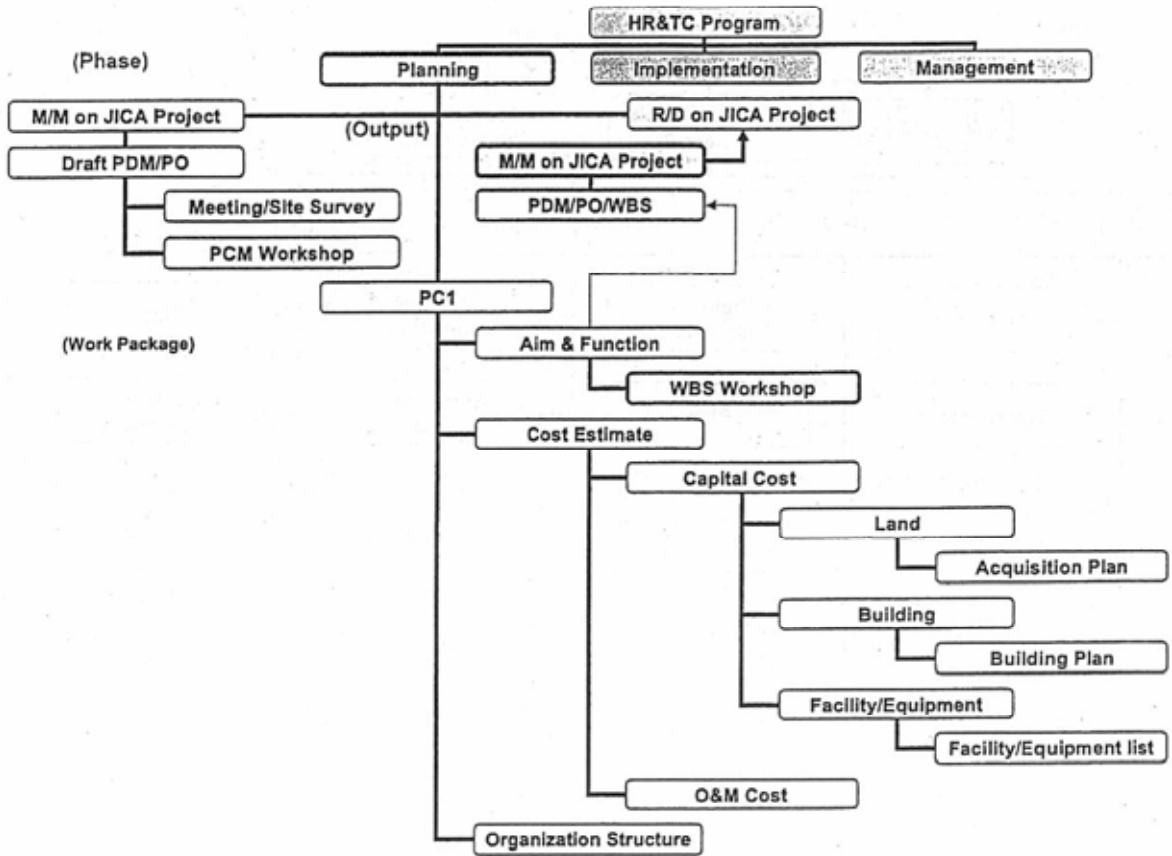
# Program WBS



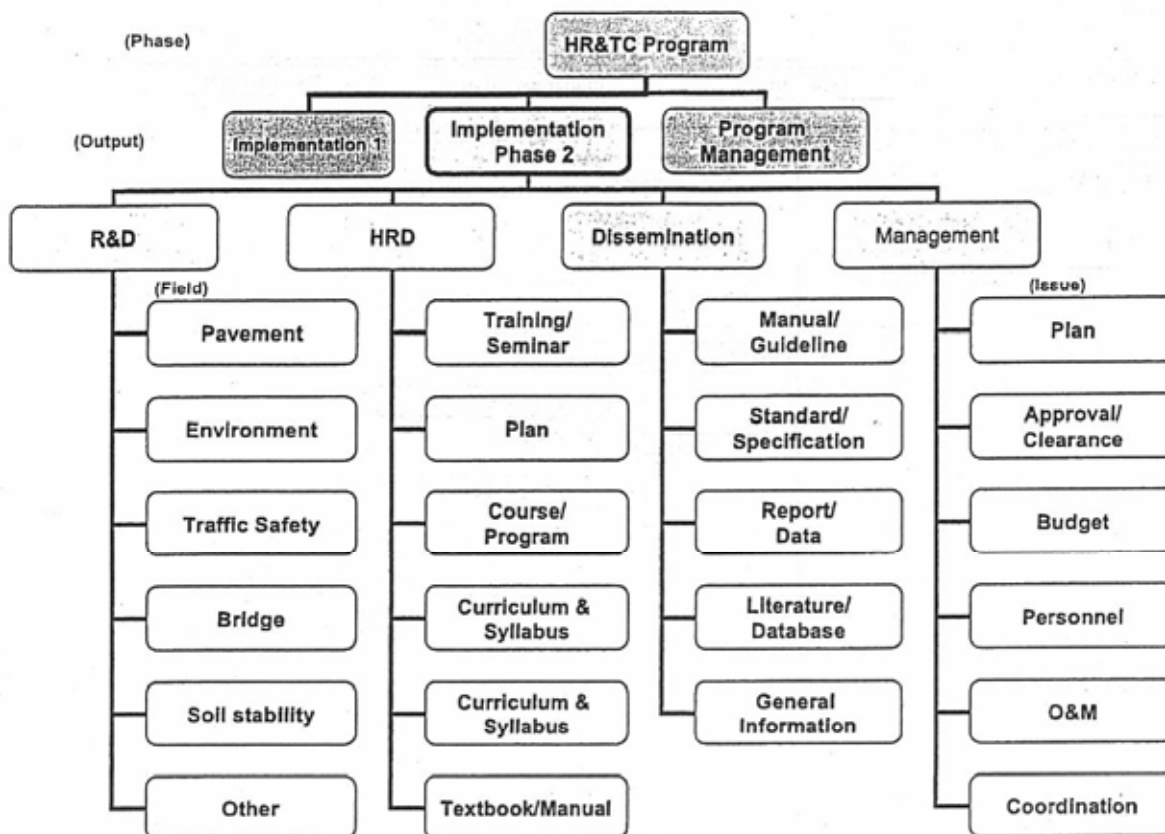
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## HR&TC Program Phase WBS (Tentative)









## Group Work on HR&TC Grand Design

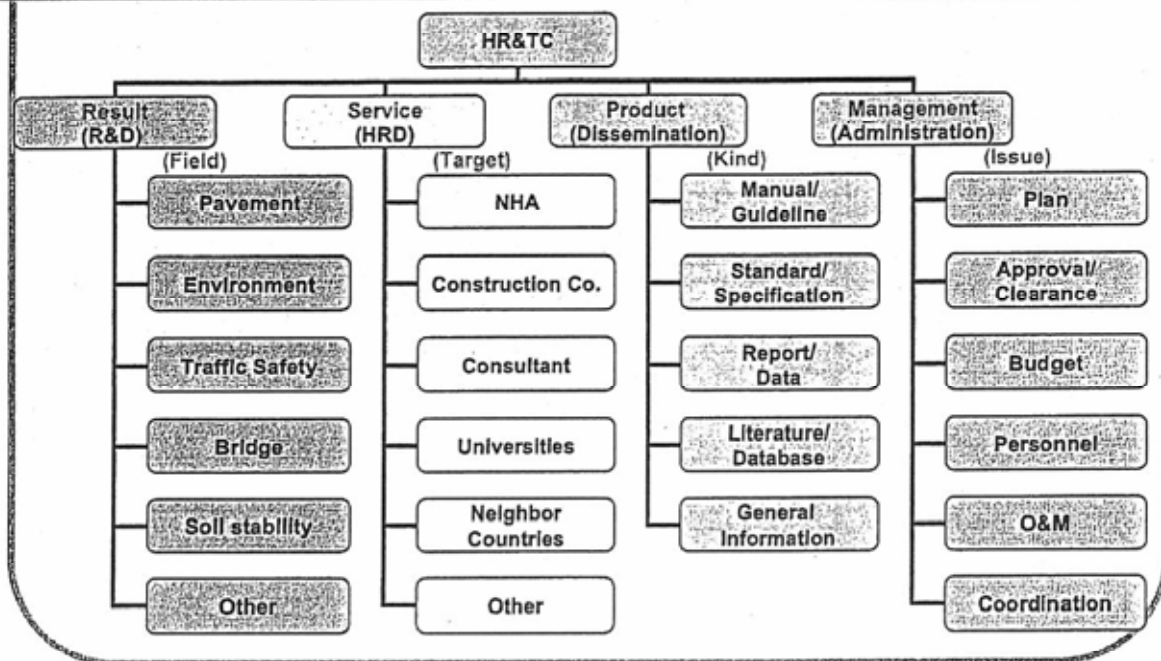
### ● Topics

1. Aim/Function of HR&TC
2. Organizational Framework (Personnel)
3. Building/Facility
4. Priority and Schedule

### ● Group

- A: Administration, R&D-Pavement  
 B: R&D-Bridge, Soil Stability, Other  
 C: R&D-Traffic Safety, Environment

# HR&TC WBS Factor



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WBS 2-1 HR&TC Aim (function) and Organization Structure (1)

| Level 1<br>(Service / Division)                | Level 2<br>(Field / Sub. Division) | Level 3<br>(Subject / Section)   | Level 4<br>(Theme / Team)                                |            |         |            |
|--|------------------------------------|--|--|------------|---------|------------|
| 1 Administration<br>(Management)               | 1.1 Administration                 | 1.1.1 Planning<br>1.1.2 Personnel  |  |            |         |            |
|  | 1.2 Budget/Account                 | 1.2.1 Budget/Account<br>1.2.2 Operation/Maintenance  |  |            |         |            |
| 2 Research and Development<br>(R&D)            | 2.1 Pavement                       | 2.1.1 Material   | 2.1.1.1 Asphalt<br>2.1.1.2 Concrete<br>2.1.1.3 Aggregate |            |         |            |
|  |                                    | 2.1.2 Binder rheology characteristics  |  |            |         |            |
|  |                                    | 2.1.3 Pavement mix design  |  |            |         |            |
|  |                                    | 2.1.4 In service pavement  | 2.1.4.1 Traffic Database                                 |            |         |            |
|  |                                    | 2.1.5 Accelerated pavement   |  |            |         |            |
|  |                                    | 2.1.6 Structural Design  | 2.1.6.1 Load and temperature                             |            |         |            |
|  | 2.2 Bridge                         | 2.2.1 Material   | 2.2.1.1 Still<br>2.2.1.2 Concrete                        |            |         |            |
|  |                                    | 2.2.2 Earthquake-proof   | 2.2.2.1 Design<br>2.2.2.2 Reinforcement                  |            |         |            |
|  | 2.3 Soil stability                 | 2.3.1 Material<br>2.3.2 Slope Protection<br>2.3.3 Drainage System<br>2.3.4 Quality control |  |            |         |            |
|  | 2.4 Traffic Safety                 | 2.4.1 Safety Audit   |  |            |         |            |
| 2.4.2 Alignment Design                         |                                    | 2.4.2.1 Design Literary/Database   |  |            |         |            |
| 2.5 Environment                                | 2.4.3 Safety Facility              |  |  |            |         |            |
|  | 2.4.4 Accident Analyses            | 2.4.4.1 Accident Database  |  |            |         |            |
|  | 2.5.1 Air pollution                | 2.5.1.1 Literary/Database  |  |            |         |            |
|  | 2.5.2 Water pollution              | 2.5.2.1 Literary/Database  |  |            |         |            |
| 2.6 Other                                      | 2.5.3 Traffic noise                | 2.5.3.1 Literary/Database  |  |            |         |            |
|  | 2.6.1 Contract System              | 2.6.1.1 Specification/TOR<br>2.6.1.2 Bid tender<br>2.6.1.3 Contract<br>2.6.1.4 Supervision |  |            |         |            |
|  |                                    |  |  |            |         |            |
|  |                                    |  |  |            |         |            |
| 3 Human Resource Development<br>(HRD)          |                                    | Target (Subject, Number of Trainee/Year)   |  |            |         |            |
|  |                                    | NHA  | Constn.Co  | Consultant | Student | N. Country |
|  | 3.1 Pavement                       | ✓  |  |            |         |            |
|  | 3.2 Bridge                         | ✓  |  |            |         |            |
|  | 3.3 Soil Stability                 | ✓  |  |            |         |            |
|  | 3.4 Traffic Safety                 | ✓  |  |            |         |            |
|  | 3.5 Environment                    | ✓  |  |            |         |            |
|  | 3.6 Road Design                    | ✓  |  |            |         |            |
|  | 3.7 Road Construction              | ✓  |  |            |         |            |
| 3.8 Other                                      |                                    |  |  |            |         |            |
| 4 Information/Technology Dissemination<br>(PR) | 4.1 Standard/Specification         |  |  |            |         |            |
|  | 4.2 Manual/Guideline               |  |  |            |         |            |
|  | 4.3 R&D Report                     |  |  |            |         |            |
|  | 4.4 Literature/Database            |  |  |            |         |            |
|  | 4.5 General Information            |  |  |            |         |            |

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