

Saigon High-Tech Park Training Center

Summary Report

Vietnam

VERIFICATION SURVEY WITH THE
PRIVATE SECTOR FOR
DISSEMINATING JAPANESE
TECHNOLOGIES
FOR
ROBOT MANUFACTURING SYSTEM
BASED ON SAIGON HI-TECH PARK
TRAINING CENTER IN VIETNAM

December 2017

Japan International Cooperation Agency

TOYOOKA CO., LTD

1. BACKGROUND

In the “Socio-Economic Development Strategy 2011-2020” (SEDS), the government of Vietnam aims to industrialize the nation by 2020 by intensively strengthening competitiveness of the industry and improving efficiency and productivity as the core of economic growth. The SEDS states that it is important to focus more on “educational training and scientific technology” in order to achieve industrialization of the nation, and requires industrial automation as one of the measures for it.

The current statistics indicate, however, that the primary agricultural, forest and fishery products and products from labor-intensive and less value-added light industries such as shoes and sewn products occupies 55% of the overall national export. The statistics also indicate that the labor productivity of USD 5,250 in 2012 (at almost the same level as Lao PDR) is lower than the neighboring countries like Indonesia, the Philippines, and Thailand.

The GDP (purchasing parity) of Vietnam has been increasing by 4.7% on average from 2005 to 2012, whereas the wage rate has been increasing by more than 10% annually, thus it is important to mitigate inverse effect from the increasing wages. Introduction, establishment, and dissemination of high-quality and high-productivity production and processing technologies are therefore essential, and the industrial robot system is one of such technologies.

Although the related training has been given to industries by the government agencies including Saigon High-Tech Park Training Center (SHTPTC), the counterpart (C/P) of the Survey, there are still challenges to properly respond to the needs of high-tech human resource development that utilizes industrial robot system, accordingly implementation of this Survey has been long expected by the C/P.

2. OUTLINE OF THE PILOT SURVEY FOR DISSEMINATING SME’S TECHNOLOGIES

(1) Purpose

The purposes of the Survey are as follows:

- To strengthen SHTPTC’s capacity to implement training of the subject, through nurturing master trainers for teaching robot manufacturing system at SHTPTC
- To contribute to the development of human resources who can enhance high-tech manufacturing and industrialization of the nation through implementation of high-tech training to those from governmental organizations, educational institutes (universities and training schools) and firms.

- To promote installation and enlightenment of robot manufacturing system by broadly publicizing its effectiveness to above-mentioned stakeholders.

(2) Activities

Activities for nurturing master trainers, who teach at the training on robot manufacturing system are as follows:

- 1-1 Hold detailed discussions with the SHTPTC on the implementation of the Survey.
- 1-2 Produce, procure and transport “4 sets of robot manufacturing system equipment”.
- 1-3 Install the equipment at the survey site and get facilities such as power sources ready.
- 1-4 Select the master trainers and prepare the activities of “robot manufacturing system” to nurture the master trainers.
- 1-5 Implement the activities to nurture the master trainers.
- 1-6 Evaluate the master trainers’ comprehension of the nurturing through test.

Activities for implementation of training on robot manufacturing system by master trainers are as follows:

- 2-1 Conduct a survey on needs of automation skills and capacities in firms.
- 2-2 Prepare training programs and materials of robot manufacturing system.
- 2-3 Invite and select personnel from governmental organizations and firms for training.
- 2-4 Implement training by master trainers.
- 2-5 Evaluate the training by comprehension tests to the participants.
- 2-6 Support SHTPTC for preparing of future action plan for the training.

Activities for verification through consultation and pilot operation of the automation system at selected firms are as follows:

- 3-1 Select 2 firms for consultation for automation and pilot operation of “robot manufacturing system”.
- 3-2 Conduct consultation for automation to the selected firms.
- 3-3 Install the equipment into the selected firms.
- 3-4 Operate the equipment and verify its effectiveness in terms of improvement in productivity, improvement in product quality, reduction in inferior goods, etc.

Activities for conducting dissemination seminars and academic seminars in Ho Chi Minh City and Hanoi City and making up TOYOOKA’s business plan are as follows:

- 4-1 Conduct a survey regarding the needs of the robot manufacturing system after implementation of the training.

- 4-2 Prepare a dissemination seminar program based on the results of the survey.
- 4-3 Hold discussions with SHTPTC on the dissemination and academic seminars.
- 4-4 Prepare materials and invite governmental organizations, educational institutes and firms for the dissemination seminar.
- 4-5 Conduct the dissemination seminar in Ho Chi Minh City and Hanoi City.
- 4-6 Evaluate the results of the seminar through a questionnaire to the dissemination seminar.
- 4-7 Conduct an academic seminar for educational institutes and researchers.
- 4-8 Prepare TOYOOKA's work plan based on the results of dissemination and academic seminars, and the training.

(3) Information of Product/ Technology to be Provided

The proposed “4 sets of Robot Manufacturing System Equipment (TOYO-VT2000)” (the Product) is operated with 200 V single-phase electric power. The Product can be used for the training and theoretical explanation on robot engineering. The Product consists of the following 3 parts:

Name	Robot Main Body (MZ-07)	Main Frame (TOYO-VT2000)	Mechatronics Training Material (MM3000-FVT)
Power Source Electricity Consumption	Triple-Phase AC200-230V Single-Phase AC200-230V 1.2KVA (Body and controller)	Triple-Phase AC200-230V Single-Phase AC200-230V 6KVA (Maximum including robot and education materials)	Single-Phase AC200 3KVA
Size	Maximum moving radius: 723mm	900mm (W) × 900mm (D) × 900mm (H)	450mm (W) x 1092mm (D) x 867mm (H) (maximum unit size) 750mm (W) x 1500mm (D) x 900 mm (H) (standard layout size)
Weight	30 kg	80 kg	160 kg
Number of Units	4 units	4 units	4 units

(4) Counterpart Organization

Saigon High-Tech Park Training Center (SHTPTC) was established in 2005 with the mission to develop high-qualified workforce to meet the needs of advanced technology sectors in order to boost the international integration process and economic development of Ho Chi Minh City and Vietnam.

SHTPTC aims at bridging the gap between real requirements of enterprises and the capabilities of employees. The functions are as follows:

1. Training:

- Offer training packages in English, soft and technical skills for individuals, schools and enterprises
- Consultancy for overseas study, specializing in technological fields

2. Human Resource (HR) Consultancy:

- Provide HR support and consultancy for enterprises in technological fields
- Assist students in internship and employment at enterprises in SHTP

3. Research and Collaboration:

- Implement strategic market research on human resource for the support of training and recruitment operations
- Leverage international relationships to create and apply advanced training programs to meet the requirements of enterprises

(5) Target Area and Beneficiaries

Target Area: Ho Chi Minh City and Hanoi City

Beneficiaries are as follows:

- SHTPTC acquires the skills and the knowledges regarding robot manufacturing system. Then, the educational environment is established where human resources are continuously developed for robot manufacturing system in Vietnam.
- Engineers in private and public manufacturing companies are trained to be robot system integrators at SHTPTC.
- Firms which understand robot manufacturing system improve labor productivity and make profits.
- Students and researchers at educational institutes learn academic theories and practice of the robot manufacturing system at SHTPTC.

(6) Duration

Form June 2016 to February 2018

(7) Activity Schedule (See Table 1)

Table 1 Activity Schedule

Activities	The Year 2016											The Year 2017											
	0	1	2	3	4	5	6	7	8	9	10	0	1	2	3	4	5	6	7	8	9	10	11
1-1 Hold detailed discussions with the C/P (SHTPTC) on the implementation of the Survey																							
1-2 Produce, procure and transport "4 sets of robot manufacturing system equipment".																							
1-3 Install the equipment at the survey site and get facilities such as power sources ready.																							
1-4 Prepare "robot manufacturing system" to nurture the lecturers who are selected as master trainers.																							
1-5 Implement the nurturing of master trainers.																							
1-6 Evaluate the master trainers' comprehension of the nurturing through test.																							
2-1 Conduct a survey to firms regarding their needs on automation skills and capacities.																							
2-2 Prepare training program and materials of robot manufacturing system.																							
2-3 Invite and select personnel from firms for training.																							
2-4 Implement training by master trainers.																							
2-5 Evaluate the training by comprehension tests to the participants.																							
2-6 Support SHTPTC for preparing of future action plan for the training.																							
3-1 Select 2 firms for consultation for automation and pilot operation of "robot manufacturing system"																							
3-2 Conduct consultation for automation at the selected firms.																							
3-3 Install the equipment at the selected firms.																							
3-4 Operate the equipment and verify its effectiveness in terms of improvement in productivity, improvement in product quality, reduction in defective goods, etc.																							
4-1 Conduct a survey regarding the needs of the robot manufacturing system after implementation of the training.																							
4-2 Hold discussions with SHTPTC on implementation of the dissemination seminar.																							
4-3 Prepare a dissemination seminar program based on the results of the survey.																							
4-4 Prepare materials and invite governmental organizations, educational institutes and firms for the dissemination seminar.																							
4-5 Implement the dissemination seminar in Ho Chi Minh City and Hanoi City.																							
4-6 Evaluate the results of the seminar through a questionnaire to the dissemination seminar.																							
4-7 Conduct an academic seminar for educational institutes and researchers.																							
4-8 Prepare TOYOOKA's work plan based on the results of dissemination and academic seminars, and the training.																							
Making up the implementation report, settlement report																							
Timing of Submission (display △, and the name of report)																							
Monthly report	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△
Progress report																							
Completion report (tentative)																							
Completion report (final)																							

■ Vietnam ■ Japan

(8) Implementation System (See Figure 1)

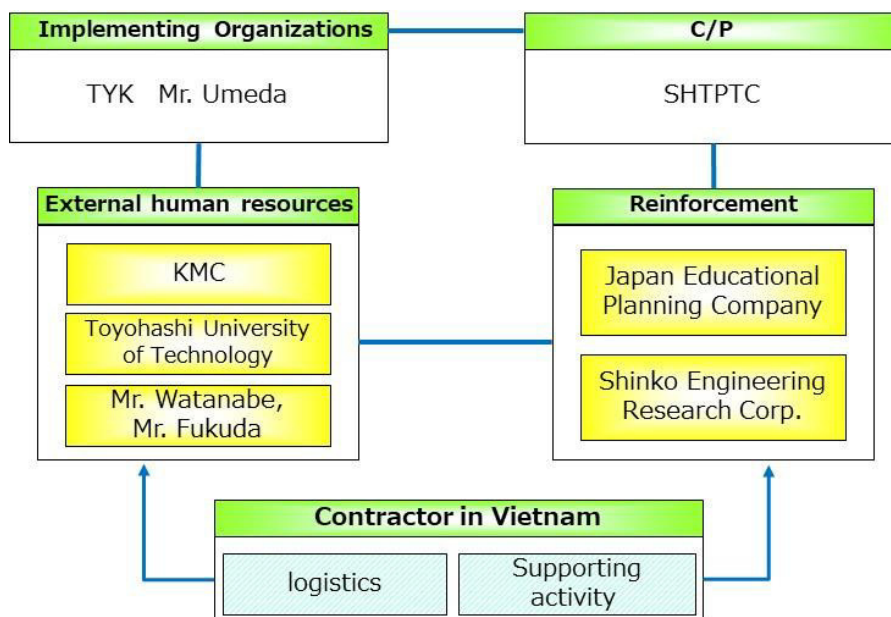


Figure 1 Implementation System

3. ACHIEVEMENT OF THE SURVEY

(1) Outputs and Outcomes of the Survey

- TYK trained 6 MT-candidates from January to April 2017. TYK assessed them comprehensively based on their attendance, attitude and comprehension, and approved that all of them could be called as “MT”.
- 6 MTs conducted training on mechatronics and industrial robots to totally 154 corporate engineers from 16th to 18th May 2017. As a result of the questionnaire survey, over 90% of the participants showed high satisfaction and comprehension.
- A simulation to verify the effect of automation was carried out from July to August 2017 for a proposed solution against the problems on production process of 2 selected companies. The results of the verification at each company are as follows:
 - #1 UYEN PHAT Ltd. (trade and supply company): Safety of the workers was secured and cleavage by laser cutter was done neatly. The number of workers was reduced by 2/3.
 - #2 Nidec Tosok Akiba Vietnam: Time for deburring work per product was reduced from 7 or 8 seconds to 6.7 seconds. Accuracy of the deburring was raised, reducing defective rate to 1/20. Safety of the workers was secured.
- TYK held the dissemination seminars in Hanoi, Hai Phong and Ho Chi Minh City in July and September 2017. A total of 131 companies, 190 people participated in the

seminars. According to the questionnaire survey, nearly a half of the respondents consider that they introduce an automation system for improving their production. Besides, TYK conducted a match-making meeting between Japanese and local companies on the day of the seminars, and received inquiries on their products from 3 companies in Ho Chi Minh and 1 company in Hanoi.

- TYK held the academic seminar for 2 days in Ho Chi Minh and Hanoi in September 2017, respectively. There were 31 teachers and researchers from 17 organizations in Ho Chi Minh, and 22 teachers and researchers from 10 organizations in Hanoi. Regarding the needs of teaching materials, some research and educational institutions have already introduced some to their work, but 24 participants responded that they would purchase within next few years. There are the needs of teaching materials at educational institutions.

(2) Self-reliant and Continual Activities to be Conducted by Counterpart Organization

According to SHTPTC, it is possible to obtain the budget of USD 2000 per year for maintenance and repair of the equipment provided by JICA, and it is also possible to apply for additional budget if necessary. After this project, SHTPTC has a plan to establish the Vietnam-Japan Training Center (VJTC) and conducts business training by MTs with the facilities and the teaching methods provided by JICA. In the future VJTC would become a company-like organization by conducting a needs survey on factory automation and providing solutions on product automation to companies.

4. FUTURE PROSPECTS

(1) Impact and Effect on the Concerned Development Issues through Business

Development of the Product/ Technology in the Surveyed Country

The following impact and effect are expected through Sler training to be conducted with SHTPTC as well as sales of teaching materials on product automation and Sler business:

- In the short term, Sler are developed (assumed to be 1000 people annually)
- In the medium term, labor productivity is improved (assumed to be 5% increase)
- In the long term, the number of enterprises introducing automation system is increased (assumed to be 100 assumptions annually)

(2) Lessons Learned and Recommendation through the Survey

- The response of the Vietnamese side was sometimes delayed as compared with the plan; for example, issuance of the "Decision of the 93 Laws and Ordinances" required to advance the tax exemption procedure of the equipment from Japan was delayed,

and selection of a local contractor for installing the equipment was delayed. It is necessary to include some idle time when a plan is prepared.

- Vietnamese tend to focus short-term rather than long-term expenses, and are interested in the magnitude of initial investment. Therefore, it is desirable that a product to be brought to a new market is locally produced and assembled as much as possible, thereby its manufacturing cost and price are significantly lower than Japan.
- Human network and relationships are essential for business in Vietnam. Business requiring a permit in particular should keep the terms with government officials good. It is expected to maintain strong relationships with the counterparts of the project.
- When a product has not yet penetrated into market, it is important to promote it directly to potential customers. In addition, a product would be recognized gradually by market if a company could cooperate with public organizations for facilitating policy implementation related to its business expansion, or with its business partners for promoting the partners' business development.

ATTACHMENT: OUTLINE OF THE SURVEY

Socialist Republic of Vietnam

VERIFICATION SURVEY WITH THE PRIVATE SECTOR FOR DISSEMINATING JAPANESE TECHNOLOGIES FOR ROBOT MANUFACTURING SYSTEM BASED ON SAIGON HI-TECH PARK TRAINING CENTER IN VIETNAM TOYOOKA CO., LTD

Concerned Development Issues

- Transforming into an industrialized country based on efficiency, productivity, and international competitiveness from the labor intensive industrial structure
- Introduction and establishment of precision manufacturing and processing technology required for parts and final products
- Advanced industrial human resources development that can utilize robot system
- Promotion of automation and labor saving (introduction of industrial robots, etc.)

Contents of the Project

- Nurturing master trainers
- Implementation of training on robot manufacturing system by master trainers
- Verification through consultation and pilot operation of the automation system at selected firms
- Conducting dissemination seminars and academic seminars in Ho Chi Minh City and Hanoi City

Information of Product/ Technology to be Provided

The proposed “4 sets of Robot Manufacturing System Equipment (TOYO-VT2000)” (the Product) is operated with 200 V single-phase electric power. The Product can be used for the training and theoretical explanation on robot engineering. The Product consists of the following 3 parts:

1. Robot Main Body (MZ-07)
2. Main Frame (TOYO-VT2000)
3. Mechatronics Training Material (MM3000-FVT)

Outline of the Project

Counterpart Organization : Ho Chi Minh City -Saigon Hi-Tech Park Training Center (SHTPTC)
Duration : Form June 2016 to February 2018
Survey Site : Ho Chi Minh City

Expected outcomes of Vietnamese Side

- SHTPTC acquires the skills and the knowledges regarding robot manufacturing system. Then, the educational environment is established where human resources are continuously developed for robot manufacturing system in Vietnam.
- Engineers in private and public manufacturing companies are trained to be robot system integrators at SHTPTC.
- Firms which understand robot manufacturing system improve labor productivity and make profits.
- Students and researchers at educational institutes learn academic theories and practice of the manufacturing robot system at SHTPTC.

Outcomes of TYK

- There were 15 inquiries such as automation equipment during this project period
- A business system has been established in Vietnam
- Business such as sales and consulting of industrial robot production system and related equipment has been ready for start
- The inside of TYK has been revitalized, and motivation of employees has been improved