

Action Plan for FY 2015

Robot Revolution Initiative Council

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Prologue

In “New Robot Strategy” (The Headquarters for Japan’s Economic Revitalization; 10/2/2015), a new concept of “robot” is established that encompasses systems that perform work by utilizing advanced sensors and artificial intelligence, while making the most of the advantages of digital technology as well as network technology. Domestically, the development and diffusion of robots in this broad sense can contribute to the solutions of the societal issues that our country faces. Moreover, it is incumbent upon our country, as a center of robot innovation and in light of the changes taking place in industry and global technology due to, among other factors, the impact of IoT (Internet of Things) on manufacturing, to assume a leadership role in addressing the development and diffusion of robots in a comprehensive way.

It is with these hopes and expectations that this Council, with wide participation from relevant companies, business organizations, academia, research institutions, and in conjunction with relevant government agencies, will take concerted action to address and offer solutions to the issues that must be faced, and will make wide-ranging efforts to promote a New Robot Strategy that is appropriate for the IoT era.

In FY2015, the first year of activity, we will launch the WGs necessary to carry out the Council’s mission, activities will begin, and we will get started on the correct course.

Section 1: Project Objectives

Below are listed the activities that should be undertaken to accomplish the project objectives, to be attained by 2020, laid out in “New Robot Strategy.”

1.1 Project Objectives

The aim is to realize the following three pillars that compose the goal of the robot revolution.

1) Drastic strengthening of robot creativity

Make Japan the center of robotic innovation.

2) Robot utilization and diffusion (creating a Robot Showcase)

Make Japan the world’s top society in terms of robot utilization, spreading robots to every corner of daily life.

3) Development and growth of a globally focused robot revolution

Attempt to establish the rules and international standards that will result in world leadership in robots in the IoT era.

1.2 Activities Undertaken to Achieve Objectives

- 1) Promote matchmaking and sharing of best practices among the relevant parties that can offer solutions to the issues involved in the promotion of robot innovation and utilization.
- 2) Share information that will promote international standardization activities; plan and draft proposals for organizing shared issues and crafting solutions.
- 3) Plan and draft proposals for establishing information security.
- 4) Plan and draft proposals for international projects.
- 5) Prepare environment for empirical tests.
- 6) Plan and draft proposals for training and securing human resources.
- 7) Promote collaborative R&D with related organizations; promote regulatory reform.
- 8) Compile/disseminate relevant information, including international sources; promote robot diffusion/education activities.
- 9) Perform other activities that will aid in the attainment of the Council's objectives.

Section 2: Outline of FY 2015 Activities

2.1 WG (Working Group) Activities

1) WG on the IoT-Driven Transformation in Manufacturing

Recognizing the fact that the rules of competition in the manufacturing sector are changing dramatically due to IoT, and in order to lead the world even in a data-driven society as a robot superpower and a country built on production technology, it will be necessary for our country to bring about a transformation in manufacturing..

Specifically, the WG will assemble those who are most aware of this problem—including control equipment and networking companies, IT/software vender companies, various manufacturing companies, business organizations, academia, and research institutions—to carry out the following activities.

1. Share the knowledge of those manufacturers who have put the IoT to practical use and deepen understanding of the merits of IoT application, for the purpose of promoting the IoT-driven transformation in manufacturing.
 - a. Lectures by representatives of foreign companies that have developed cutting-edge approaches to the issue.
 - b. Engage research firms to compile information on the benefits of connectivity from both domestic and foreign sources, and publish the findings under the activities of the WG.
2. Establish a steering subcommittee within the WG that will discuss the expected challenges, as well as their solutions, in the IoT-driven manufacturing

transformation. The subject will be considered from the following perspectives:

- a. By manufacturing sector, such as automotive, industrial machinery, small and mid-size enterprises, etc.
- b. By topic, such as standardization, security, etc.

The plans and proposals of this WG will be based on the activities of the private sector, which currently is taking the lead, along with the cooperation and coordination with other countries and organizations. As these lead to the construction of international standards, it will help Japan to make the most of its manufacturing technology expertise in global markets.

The secretarial functions for this WG will be assumed by the RRI General Secretariat, which will also issue a report on the WG's activities in FY2015.

2) WG on the Promotion of Robot Utilization

This WG will attempt to prepare the environment for a society that leads the world in robot utilization, a society in which robots are a fact of everyday life. The goal is to set the stage for the introduction and proliferation of actual usable robots into a wide range of sectors such as small and mid-size manufacturing; services; medical and caregiving; infrastructure/disaster response/construction; and agriculture/forestry/fishery/food industry.

Specifically, the WG will enlist the participation of those knowledgeable in this issue such as companies that supply robots, companies that utilize robots, relevant business organizations, academia, and research institutions. In addition, representatives of local governing bodies will participate as observers. With the aim of promoting robot utilization, the participants will share their knowledge, initiating best practices and creating matching opportunities. To that end, the following activities will be undertaken.

1. Establish a structure by which business people in all the various sectors that utilize robots can communicate to their needs and expectations to robot suppliers.
 - a. Establish a one-stop process by which the needs of the various sectors can be ascertained.
 - b. Allow the identified needs to be prioritized by feasibility for suppliers (hardware/integrators/software).
 - c. Offer matchmaking opportunities with suitable suppliers.
2. Establish an organization on the prefectural level to support work in robotics.
 - a. Establish an organized base, composed of local large and mid-sized companies that possess robot technological expertise, along with prefectural

technology centers and regional universities, that will support small companies who seek to develop and improve robots.

- b. Liaison with the corresponding prefectural organizations of the relevant government agencies and form a link to “Needs, Seeds.”

3. Expanding the parameters of robot utilization (turning used robots into educational materials)

- a. Explore the idea of having robot makers donate their used robots to vocational high schools, polytech colleges and junior colleges, tech training centers, regional technology centers, and the like.
- b. Offer to develop training programs. Adapt know-how into a manual for the proliferation of robots in developing countries.

4. Prepare an environment conducive to the proliferation of robots (attaining a robot barrier-free society)

- a. Have each of the major sectors share information and discuss the troubles encountered by business people and others as they try to introduce robots, identifying systemic barriers. (The discussions in the different sectors will bring to light the problems, and shared issues can be firmly identified and fleshed out.)
- b. Form consensus on desired regulatory reform.
- c. Address global machine and safety standards

5. Sharing knowledge and eliminating the non-symmetrical nature of information

- a. Discovering, sharing, and publicizing best practices, drawn primarily from actual successful robot applications.
- b. Explore building a base (data base, etc.) for the purpose of sharing empirical knowledge.

The secretarial function of this WG will be primarily the responsibility of the Japan Robot Association (JARA), supported by the RRI general secretariat. There will be an interim report on the progress of the FY 2015 activities of this WG.

3) WG on Robot Innovation

This WG will promote reform in robot development, manufacture, and introduction that will aid in the development of next generation robots and broaden the areas of robot applications, as Japan moves to become the world center of robot innovation.

Specifically, the work of this WG will be carried out by three sub-working committees (SWG). The three SWGs will provide a technical base that will be able to respond flexibly to the needs of various sectors, in the following manner.

- 1. Platform SWG: This SWG will study the feasibility of a platform-robot that is easy to use by virtually everyone.

- a. Select a robot that will serve as a platform for each sector, or for each process.
 - b. Promote the development of modular hardware and software (improve versatility, reduce integration costs)
2. SWG on Safety Standards and Rules for Robot Utilization: This SWG will examine the safety standards and rules for robot applications, all of which are becoming internationalized.
- a. Produce proposals for safety standards (other than life-supporting robots, ISO13482), guidelines, JIS, and ISO; expansion of ISO13482 categories, etc.
 - b. Prepare the rules (legal/regulatory) for autonomous robots.

In addition, this SWG will also explore the idea of a “Robot Olympics” (provisional name).

3. Robot Olympics SWG: This SWG will explore the overall design of a Robot Olympics.
- a. Overall design, detailed arrangements
 - b. Proposals for competitions (including a survey of technology trends)

The secretarial function of this WG will be primarily the responsibility of the New Energy and Industrial Technology Development Organization (NEDO), supported by the RRI general secretariat. There will be an interim report on the progress of this WG’s activities for FY 2015.

4) WG on Training and Securing Human Resources

Business people from companies of every size and from a wide variety of industries are using IoT as leverage to transform business. As the transformation of the entire Japanese industry is accomplished, a similar major transformation is required in regards to training and securing IT technical talent. This is a major issue not only to system vendors but to IT users as well, among whom IT technicians are few in number even in the United States. Accordingly, in FY2015, in conjunction with the main body of the Japan Machinery Federation, this WG will explore ideal ways for the user side to train and secure technical talent. Focusing on the machinery-related industries as users, the WG will bring to light the current and future problems that the user side has in cultivating and securing the necessary technical human resources. IT as used here will include major factors such as AI, algorithms for analysis of big data, security, systems integration technology, etc.

The method used will be to establish a survey and research WG consisting of companies, universities and academia, and relevant associations and agencies. The WG will pursue the following:

- 1. Develop a profile of the type of person needed in the future

2. Examine the issues facing different categories, such as students or companies, and develop policies and strategies for each
3. Examine system-wide issues

The secretarial function of this WG will be primarily the responsibility of the RRI general secretariat.

2.2 Linkage with Related Projects

1) Robot Prize

The Japanese Ministry of the Economy, Trade and Industry (METI) and the Japan Machinery Federation sponsor the Robot Prize. As part of the New Robot Strategy, additional award categories will be established and the field of award recipients will be expanded. The Council supports these efforts by actively providing information to JMF member companies as well as JMF associations and their member companies, for the purpose of deepening their understanding.

2.3 Survey Project

Moving toward the goals set in the New Robot Strategy, and strongly promoting the push for robot utilization that is occurring in our country, even greater linkage between the public and private sectors, as well as between centralized and regional elements, is increasingly necessary. To accomplish this, it is an urgent matter to create a perusable database that offers an overview of all of the individual projects undertaken in response to the New Robot Strategy. It is the goal of this survey project to create such a database and thereby promote the effectiveness of the new strategy and contribute to its success.

1) Project content

1. A database will be constructed containing all the current domestic projects related to the New Robot Strategy that have been undertaken by a variety of organizations. The following are projects to be surveyed.
 - a. Projects undertaken by national, prefectural, and municipal governments; agencies related to those governments; regional industry groups, etc.
(Example: development projects; various programs such as development, subsidies, special districts, etc.; networking)
 - b. Projects undertaken by universities and research institutions
(Example: development projects; networking, etc.)
 - c. Regional projects undertaken cooperatively among industry, academia, and government
(Example: subsidies and incentives, awards, enlightenment, education, training and human resource development, networking, services, etc.)
2. In order to make the database easily accessible in a form that will accommodate high usage not only among members of the Council but among

others involved in the promotion of the New Robot Strategy, the database will be accessible through a website and in other ways.

3. The database, even after its completion, will be designed so that it can be updated at any time.

2) Implementation

1. A Survey Committee will be formed to design the survey. Committee members will be people involved in the promotion of the “New Robot Strategy,” and will be drawn from national and regional governments; robotics organizations; potential user groups (selected from agriculture, medical, caregiving, infrastructure, manufacturing, etc.); scholars and experienced individuals; robot makers; system integrators; and robot venture firms, etc. The committee will determine the survey policies and select the firm(s) to commission for the survey.

2. In addition to utilizing the services of a survey firm, a variety of other ways of gathering information will be employed, including a survey by questionnaire to all of the Council members. The commissioned survey firm will be chosen from firms that have a domestic and international information network, and they will be expected to utilize those resources.

3) Implementation Schedule

October-November The Survey Committee will determine survey policies and select the firm(s) to carry out the survey.

December-February The survey will be conducted.

March Organize results, construct the system and open it to users, publicize the outcome

2.4 International Projects

1) International Symposium

In Europe and the U.S., as well as in our country, policies to strengthen robotics and manufacturing that rely on IoT and IT applications, aided by the increased sharing of cutting-edge case studies, have caused new trends to emerge as manufacturing enters the IoT age. The proposed program for an International Symposium would consist of case studies of approaches to innovation and robot applications as well as introductions and updates to the activities of Germany’s Industry 4.0 and the U.S. Industrial Internet Consortium.

February 2016 is the target date for the symposium.

2) International Exchange

Establish contact with the secretariats and other promoting bodies of Industry 4.0 and the Industrial Internet Consortium, and carry out exchange of views and other interaction, including reciprocal visits. This will be carried out in conjunction with the activities of all the WGs listed above.

2.5 Providing Information to Council Members, Promoting Council Participation

1) Providing information to Council members

The Council will endeavor to keep Council members informed of Council activities through the following methods.

1. Regular lecture meetings with the following topics
 - a. Explanation and discussion of the FY2015 edition of the Manufacturing White Paper
 - b. Case studies of approaches to building the IoT-empowered Smart Factory, case studies in training and human resource development, etc.
 - c. Case studies in cutting-edge robot applications, projects of local governmental bodies, etc.
2. Providing information via website
 - a. Council members' site
 - (1) Information on Council activities
 - (2) Information on lecture meetings, symposiums, etc.
 - (3) Other information concerning the Council
 - b. WG members' exclusive site
 - (1) WG lecture materials
 - (2) WG meeting minutes, etc.

2) Promoting Council Participation

In order to maximize Council interaction and to better promote the Council's activities, the Council will continuously strive to expand its membership by the following methods.

1. Participate in international robot exhibits
2. Provide information through the Council website on how to join the Council
 - a. An overview of the Council
 - b. A guide to joining the Council
3. Approach, on an individual basis, the companies and associations that are related to the Council's activities.

Section 3: Council Management

The work of the Council will be managed appropriately and harmoniously through regularly scheduled meetings. These meetings will include a General meeting (at least once annually), Steering Committee meetings (approximately three times per year), and Business Liaison meetings (approximately three times per year).