Robot Revolution & Industrial IoT Initiative

To Survive by agile and open value creation.

Background of establishment

The Robot Revolution & Industrial IoT Initiative (RRI) was established as an organizational platform to promote the "Robot Revolution" stated in the national "New Robot Strategy" (2015/2/10, The Headquarters for Japan's Economic Revitalization).

In "New Robot Strategy", robot is widely defined as a system that executes tasks by utilizing digital and network technology, advanced sensors, and artificial intelligence.

Prime Minister Abe at that time attended the establishment party in 2015

Organization profile

Robot Revolution & Industrial IoT Initiative (RRI) is an organization that rebuilds the Japanese manufacturing industry in order to respond to the Fourth Industrial Revolution and Society 5.0 in cooperation with the industry and government.

In the Third Industrial Revolution, Japan developed mechatronics, contributed to the world through high quality manufacturing with variable volume mixed production system.

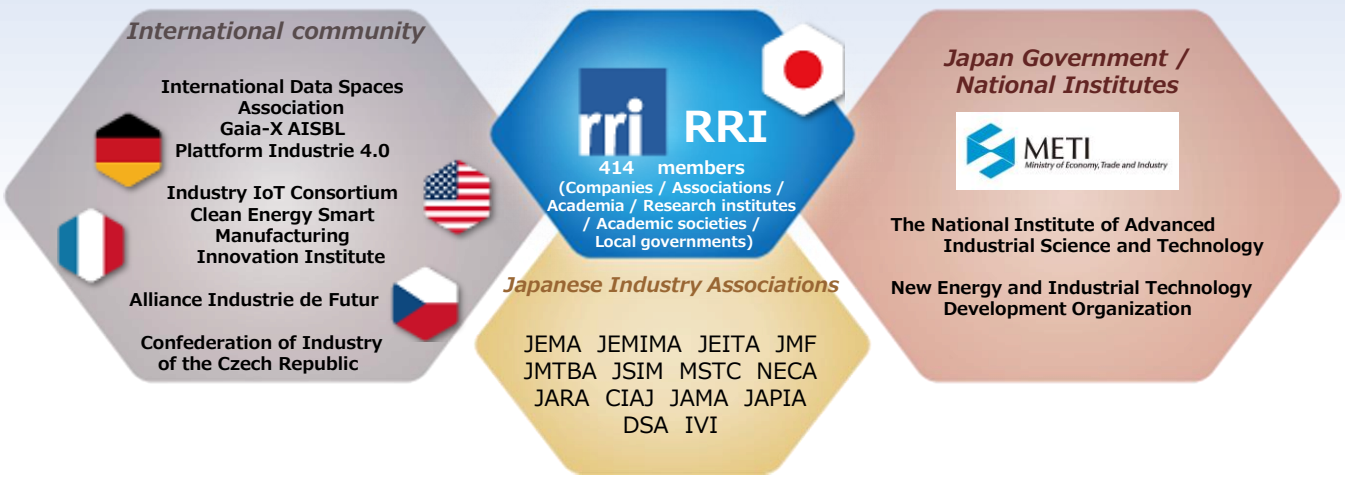
In the Fourth Industrial Revolution, we are in a position to lead the world based on these achievements

RRI includes a wide range of related business organizations, companies, academic societies, and research institutions. RRI aims to share issues to be tackled and actions to be taken to solve them, while collaborating with relevant government ministries and agencies, and to promote a new robot strategy across the board in response to the IoT era.

Cooperative relationship

To Survive by agile and open value creation with Industrial IoT and Robot.

RRI : Robot Revolution & Industrial IoT Initiative



Organization name of Japanese Industrial Association

JEMA: The Japan Electrical Manufacturers' Association, JEMIMA: Japan Electric Measuring Instruments Manufacturers' Association, JEITA: Japan Electronics and Information Technology Industries Association, JMF: The Japan Machinery Federation, JMTBA: Japan Machine Tool Builders' Association, JSIM: The Japan Society of Industrial Machinery Manufacturers, MSTC: Manufacturing Science and Technology Center, NECA: Nippon Electric Control Equipment Industries Association, JARA: Japan Robot Association, CIAJ: Communications and Information Network Association of Japan, JAMA: Japan Automobile Manufacturers Association, JAPIA: Japan Auto Parts Industries Association, DSA: Data Society Alliance, IVI: Industrial Value Chain Initiative

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Organization chart

Chairperson : Toshiaki Higashihara (Hitachi, Ltd. , Chairperson of the Japan Machinery Federation)
- Plenary meeting (members: 414 as of March 2023)

Working Groups:
- WG1 : Manufacturing Business Revolution through IoT
- WG2 : Promotion of Robot Utilization in Society
- WG3 : Robot Innovation

- IEC Systems Committee Smart Manufacturing, Secretary of Japan National committee

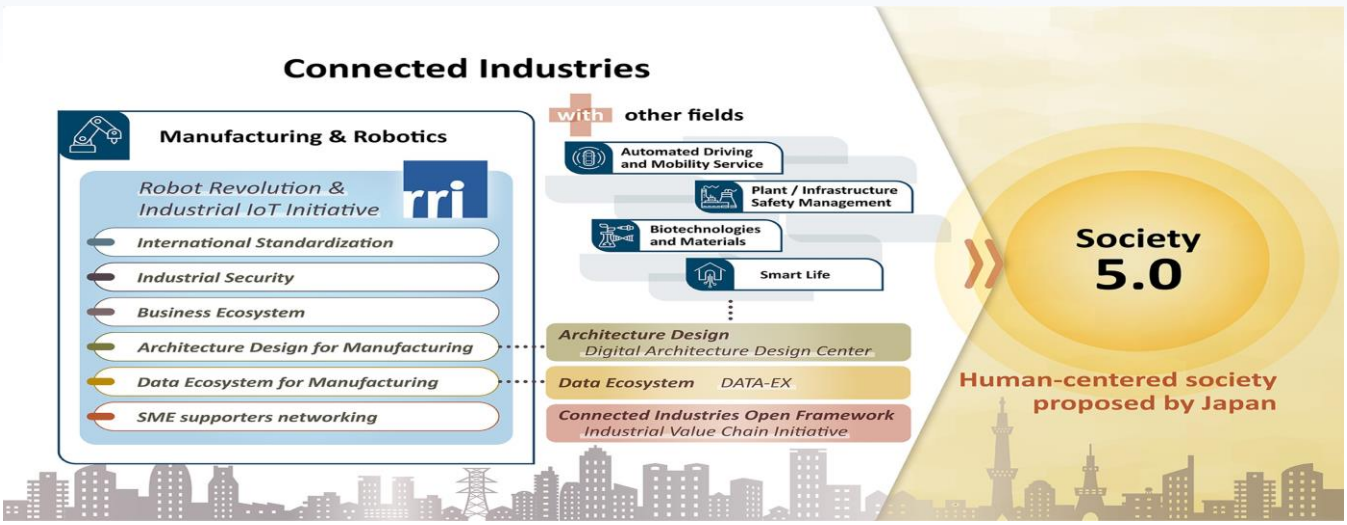
- The Consortium of Human Education for future Robot System Integration (CHERSI)

Activities

RRI contributes to improving the industrial competitiveness of Japanese manufacturing and non-manufacturing industries by supporting co-creation activities in the area of cooperation of companies.
RRI is leading the development of technologies in the fields of industrial IoT, robot innovation and utilization, rule-making efforts such as international and domestic standardization, and human resource development support.

1. **Manufacturing Business Revolution through IoT:**
   RRI draws up the future shape of the manufacturing business and developing international standards on smart manufacturing and security. RRI also supports the introduction of IoT and the revitalization of regional industry and SMEs in response to globalization.
2. **Promotion of Robot Utilization in Society:**
   RRI establishes specific cross-sectoral mechanisms that are effective in accelerating the utilization of robots in priority fields where they are to be promoted..
3. **Robot Innovation:**
   RRI works toward robot development, manufacturing and social implementation to expand the base of next-generation robot development and robot utilization..
4. **IEC Systems Committee Smart Manufacturing, Secretary of Japan National committee:**
   RRI is operating IEC Systems Committee Smart Manufacturing National Committee, and coordinates Japanese positions to contribute to standardization in IEC and ISO.
5. **The Consortium of Human Education for future Robot System Integration (CHERSI):**
   CHERSI trains a wide range of robot utilization human resources such as robot engineers, system integrators, and robot users for the automation of domestic and overseas industries in all Japan.

Toward the target



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Activities on Manufacturing Business Revolution through IoT

1.Collaboration with the government:
1) Promotion of Connected Industries with METI
2) Hosting "Robot Revolution and Industrial IoT International Symposium"

The Robot Revolution and Industrial IoT International Symposium 2023

2.Group Activities:
1)Marketing of global trend information
2)Use case study
3)Systems Engineering Research
4)SME support
Hosting Smart Manufacturing supporting group Conference
5)National and international trend study

3.Information sharing:
National and international trend seminars

4.International collaboration:
1) Japan - Germany collaboration (expert meetings)
- Standardization and Interoperability
- Industrial security
- Business models

2) International symposium (9 times since 2016)
Speakers in 2023
Session 1 - Mr. Markus Heß (Deputy-Director General, Federal Ministry for Economic Affairs and Climate Action(BMWK))
Mr. Hagen Heubach (Board Member, Catena-X Automotive Network / Global Vice President, Head of Industry Business Unit Automotive, SAP SE)
Mr. Ingo Sawilla (Trumpf Werkzeugmaschien SE, Coordinator Datagovernance + Datasecurity)
Session 2 - Prof. Dr. -Ing. Boris Otto (Fraunhofer ISST, Director / Fraunhofer ICT Group, Chairman of the Board of Directors / TU Dortmund University, Chair of Industrial Information Management)
Prof. Dr. Noboru Koshizuka (Interfaculty Initiative in Information Studies, the University of Tokyo / Data Society Alliance, CEO)
Mr. Dan Isaacs (CTO of Digital Twin Consortium)

3) Information dissemination at international exhibitions
Booth at Hanover Messe 2023, and speeches at partner session of Platform Industrie 4.0.
4) Workshops
- Dataspace seminar
- Manufacturing Policy in the world of Post COVID-19

5) Joint collaboration with CESMII (Clean Energy Smart Manufacturing Innovation Institute, USA), Platform Industrie4.0, Industry IoT Consortium, Alliance Industrie de Futur, Confederation of Industry of the Czech Republic, International Data Spaces Association

5.National collaboration:
1) Coordination with national committees of International standardization related to smart manufacturing
2) Workshops jointly with related industry associations and Regional seminars

6.Database:
1) IoT use case map (Japan, Germany, France)
2) IoT Tools and solutions
3) Future image videos

7.Reports:
- Digital-Platforms-in-Manufacturing Industries (Japan – Germany collaboration)
- IIoT Value Chain Security - Realizing Trustworthiness Attributes for Supply Chain Elements (Japan – Germany collaboration)
- Revitalizing Human-Machine Interaction for the advanced society (Japan – Germany collaboration)
- The beginning of digital economy in industries
- Understanding Hanover Messe 2021 ~ The industrial ecosystem at a turning point ~
- Industrial IoT Roadmap Research Committee Report

8.International standardization:
Secretary of Japan National committee, IEC Systems Committee Smart Manufacturing

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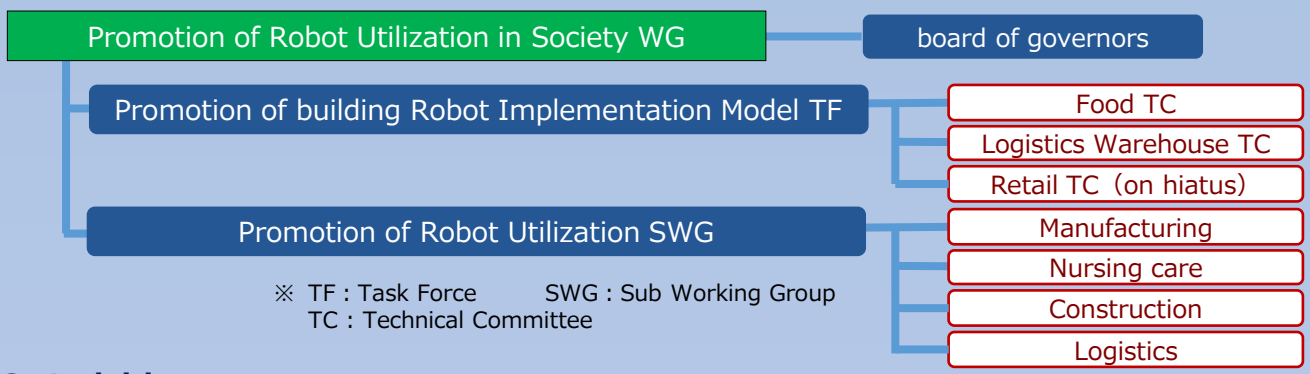
Activities on Promotion of Robot Utilization in Society

1. Objectives:

In priority fields where the utilization of robots is to be promoted, specific cross-sectoral mechanisms effective for accelerating the utilization will be established.

2. Structure:



※ TF : Task Force　　SWG : Sub Working Group
TC : Technical Committee

3. Activities :

1) Promotion of building Robot Implementation Model TF

The Technical Committees in each field works on to establish robot-friendly environments. In each TC , the leading users take the lead in working with robot manufacturers and system integrators to develop robot implementation models by restructuring current business processes and environments including examining standards and standardization for building.

1) Food TC
Accelerate automation for side dish and lunch box production left behind automation and understaffed.
Developing automation system for side dish and lunch box presentation.

2) Logistics Warehouse TC
Proposing 14 improvement items to establish robot-friendly environments.
Accelerate standardization for I/F among WMS and robots and material handling system.

2) Promotion of Robot Utilization SWG

The SWG in each field works on activities to promote robot utilization more widely by proposing development of an environment .Each SWG work on making strategies to promoting robotics, the proposal for regulatory reform requests of the development of an environment for the widespread use of human-collaborative and service robots, organize use cases , risk assessment , insurance ,enlightenment activities.

1)Manufacturing
Making easier to install human-collaborative robots to promote of robot more widely.
Making case studies and safety guideline for human-collaborative robots.
https://www.jmfrri.gr.jp/info/rri/collab_robot.html

2)Nursing care
Discussing the building efficient environment for nursing robots.
Working on further utilizing data of nursing case.

3)Construction
Working on further utilizing robot of construction.
Working on exchanging information between user and vendor.

4)Logistics
Investigating newest robot for Logistics and making proposal for regulatory reform requests.
Discussing the safety guideline for AGV/AMR.

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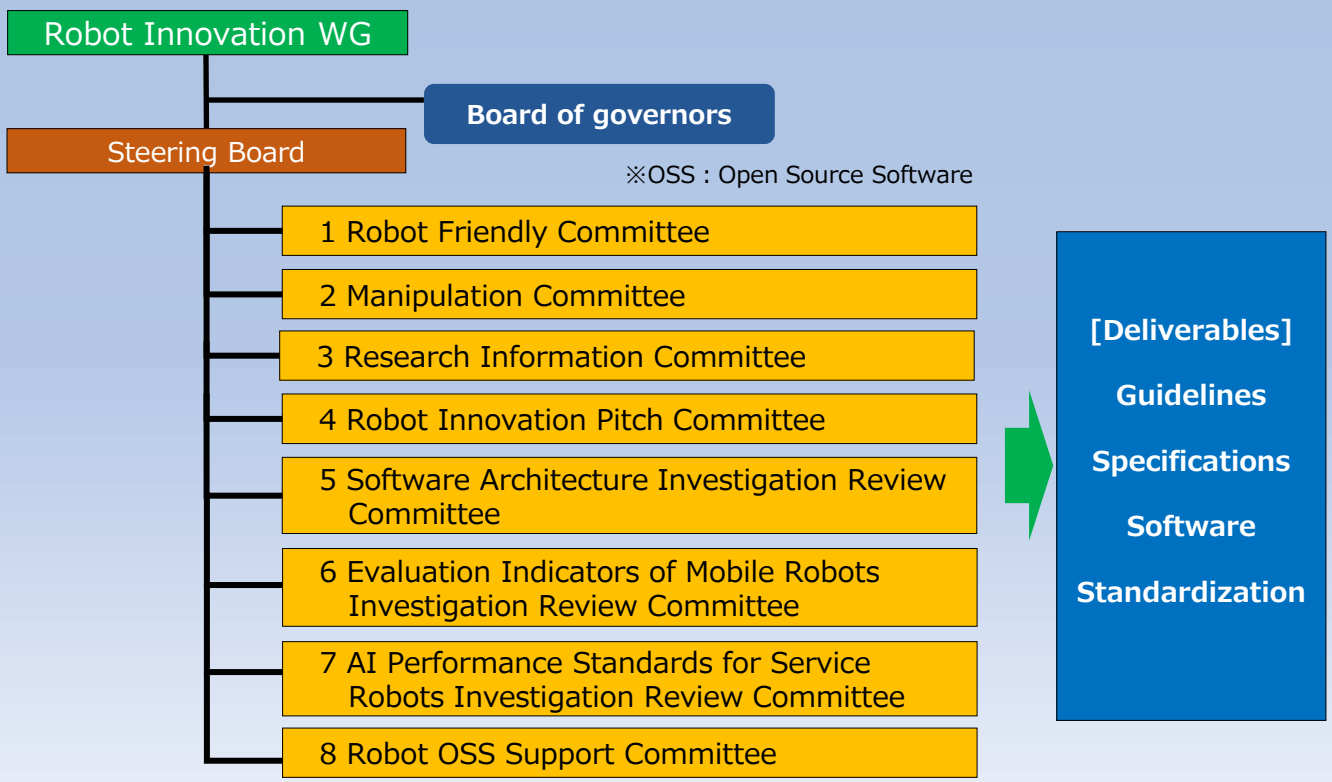
Activities on Robot Innovation

1. Objectives:

(1) Expand robot implementation, develop the base of next-generation robot through the discussion with industry and university members.
(2) Discuss the rules and standardization for international deployment.

2. Structure:



3. Activities :

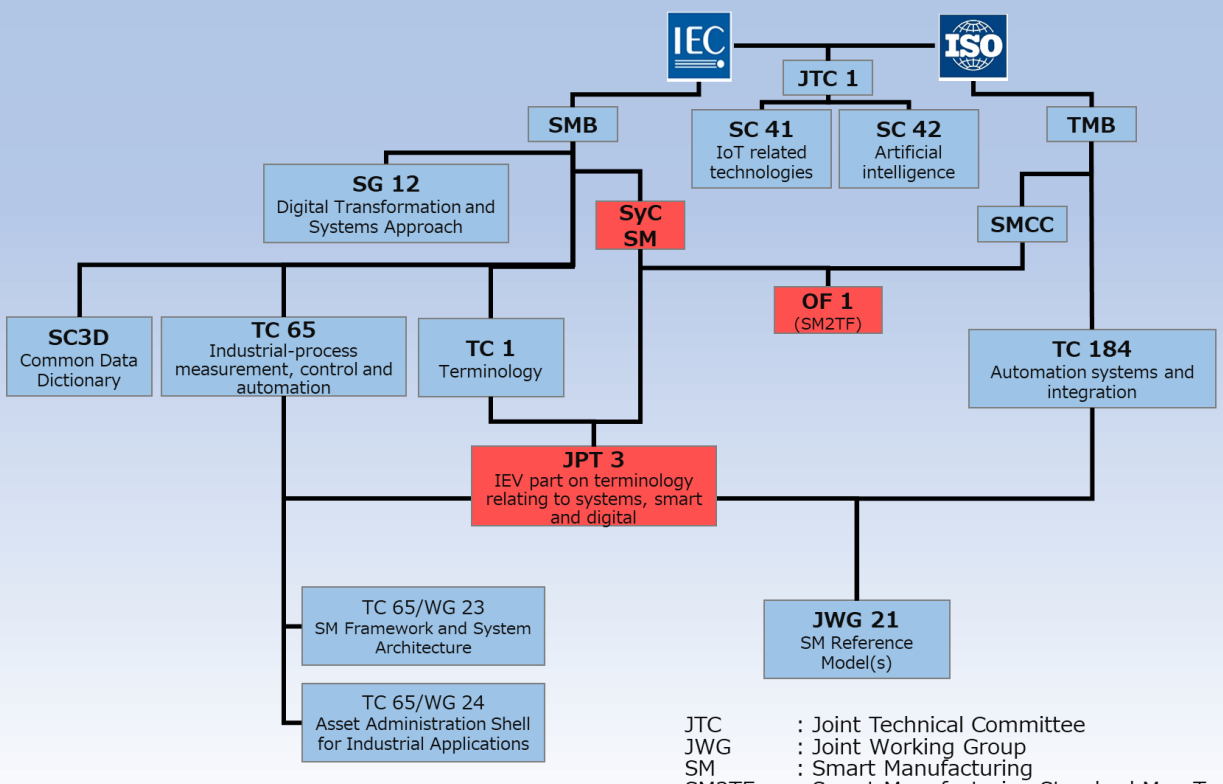
Committee	Activities
1 Robot Friendly	• Gather excellent Robot Friendly system examples to publish guideline.
2 Manipulation	• Extract evaluation index for items handled by EE (End Effectors) among foods and logistics fields to examine effective area for existing EE, and find development target for new EE.
3 Research Information	• Investigate research papers presented in international conference (IROS、ICRA), discuss trends in robotics fields, inform the discussion results to WG3 members.
4 Robot Innovation Pitch	• Promote the matchmake between startups in robotics fields and giant robot makers in Japan for the growth of the startups.
5 Software Architecture	• Standardize robotics software architecture in the fields of operation management of moving robots, manipulation for picking robots, and safety environments.
6 Evaluation Indicators of Mobile Robots	• Prepare evaluation items and software environments for functional and performance evaluation for mobile robots.
7 AI Performance Standards for Service Robots	• Standardize the method for performance evaluation of mobile robots through the actual experiments of moving robots going across the group of pedestrians.
8 Robot OSS Support	• Discuss OSS maintenance, modification, and trends. • Support OSS of member companies' software

Activities on IEC Systems Committee Smart Manufacturing, Secretary of Japan National committee

1.Smart Manufacturing definition (IEC/ISO definition of Smart manufacturing in 2018):
Manufacturing that improves its performance aspects (*1) with integrated and intelligent use of processes and resources in cyber, physical and human spheres to create and deliver products and services, which also collaborates with other domains (*2) within enterprises' value chains.

*1 performance aspects: Performance aspects include agility, efficiency, safety, security, sustainability or any other performance indicators identified by the enterprise.
*2 domains: In addition to manufacturing, other enterprise domains can include engineering, logistics, marketing, procurement, sales or any other domains identified by the enterprise.

2.SyC SM and other standardization committees:



JTC : Joint Technical Committee
JWG : Joint Working Group
SM : Smart Manufacturing
SM2TF : Smart Manufacturing Standard Map Task Force
SMB : Standard Management Board
SMCC : SM Coordinating Committee
SyC : Systems Committee
TC : Technical Committee
TMB : Technical Management Board

3.Operation of Japan National Committee of IEC SyC SM:
- Coordinate the discussion among experts, contributing the international standardization effort in the field of Smart Manufacturing.

4.Dissemination and promotion:
- Seminars, Conferences
- Publication of Smart Manufacturing related documents

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Activities on The Consortium of Human Education for Future Robot System Integration (CHERSI)

1. Activity Goals:

In addition to solve social issues such as the declining birthrate, aging population, labor shortage, and productivity improvement, expectations are rising for automation involving the implementation of robots to address the Three Cs in COVID times (automation, manpower reduction, remote operations).

We will cultivate humans resources who will contribute to the automation of domestic and overseas industries in the future, including robot engineers, system integrators, robot users, and all who will handle robots, right here in Japan.

2. CHERSI Organization:

Under the leadership of the Ministry of Economy, Trade and Industry (METI), CHERSI was established under RRI in June 2020, and has engaged in various activities.

CHERSI provides the seeds of the latest technology trends from the industry to meet the needs of educational institutions and others.

3. CHERSI Initiatives:

1) Technical colleges

・Reviewing skill standards for technology achievement goal guidelines
・Continuous promotion of teacher training and visiting classes

2) Technical high schools

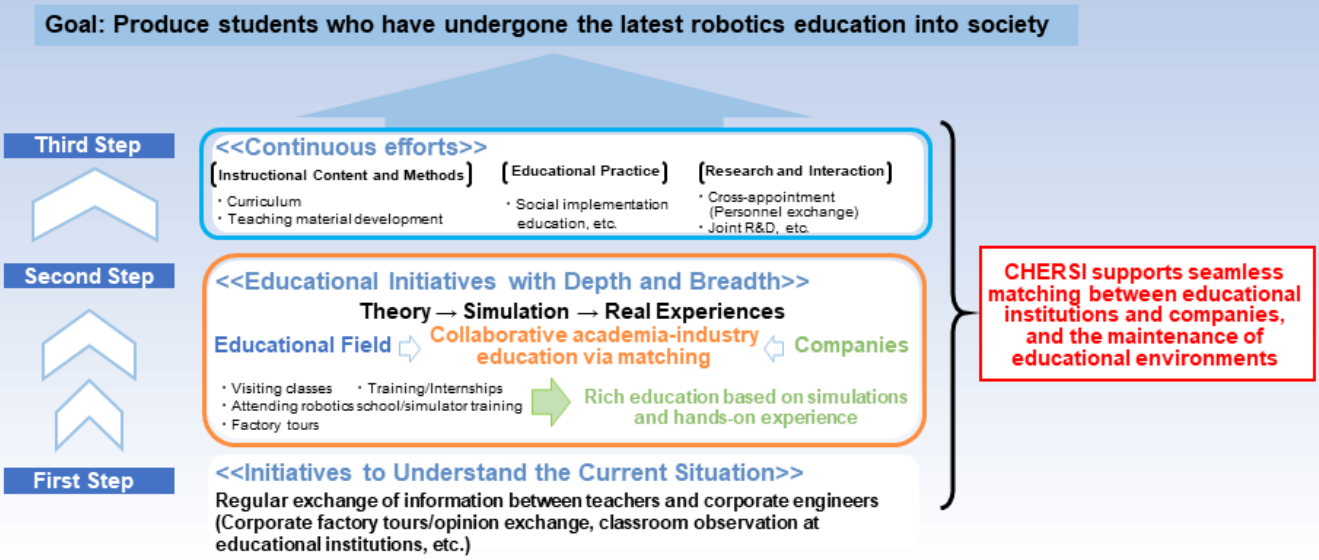
・Hold summer seminar "Robot Training for Teachers"

3) Japan Organization for Employment of the Elderly, Persons with Disabilities and Job Seekers

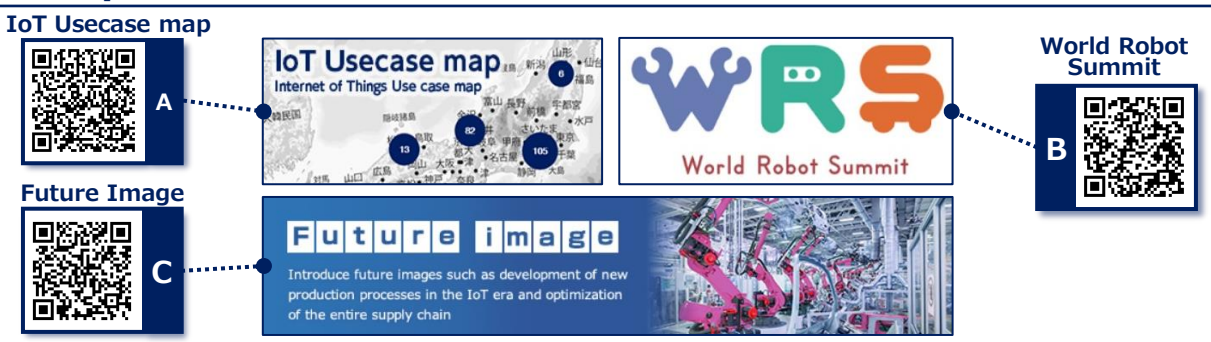
・Development of seminar courses in the robotics field, lectures, company tours, etc.

4) Global Expansion

・Promote specific activities such as collaborations with overseas target countries, with aim to cultivate human resources for robot system design using Japanese robots.



Pickup web resources



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