For Yaskawa The Future is Now

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Mike Knapek
Yaskawa America, Inc.

At Columbia Business School

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The Future is Today

- Presenters
- Who is Yaskawa
- Yaskawa 2025
- Yaskawa New and Future Technologies
- What Comes in Future
Presenters

Masahiro Ogawa-
Corporate Vice President of Yaskawa Electric Corp.;
Chairman and CEO of Yaskawa America Inc.

28 years with Yaskawa Corporation
5 years in Product Engineering
18 years as Head of global Robot development
4 years in charge of Yaskawa’s Drive, Motion and Robot’s business in the America’s

Michael “Mike” Knapek-
Corporate Vice President of Yaskawa Electric Corp.;
President and COO of Yaskawa America Inc.

29 years with Yaskawa America and Magnetek
12 years in Sales and Marketing Management
13 years in Business Management of Inverter business’ of Yaskawa and Magnetek
4 years in charge of Yaskawa’s Drive & Motion business in the America’s

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Who is Yaskawa

3 Products Global Leader

Robotics
Realizing efficient manufacturing and saving people dangerous work

Installed over 300,000 Industrial Robots

Servo Drives & Machine Controllers
Improving performance of various machinery and enhancing labor-saving

Installed over 10 Million Servo Motors and Amps

AC Drives
Supporting our society with energy saving

Installed over 23 Million Industrial Inverters
Who is Yaskawa

Yaskawa is a technology leader starting with Electric Motors and evolving into Factory Automation and Robots.

Mechatronics is the marriage of mechanical components and electronics to solve problems in factories and machines. Yaskawa founded the word “Mechatronics”

World Wide leader in Robots, Servo’s and Inverters
Yaskawa 2025

Offer a new value to society through fusion of core technology advancement and open innovation.

Our Goal

Respect Life

We aim to contribute to improving quality of life and building a sustainable society with technologies accumulated over the past century.

Empower Innovation

We venture in new technologies/domains/targets to bring “Waku-Waku”\(^1\) excitement to people.

Deliver Results

We promise to deliver assured results to stakeholders, while continuously enhancing business execution capabilities.

Our Business Domains

Mechatronics

Achieve revolutionary industrial automation, through combination of world’s leading edge technologies and open innovation.

Clean Power

Provide safe and secure living in a sustainable society.

Humatronics

Create a society where people’s capabilities are maximized, through the application of mechatronics technology to medical/welfare segment.

\(^1\) “Waku-Waku”: Onomatopoeia used in Japanese language to express someone’s feeling of enthusiasm

\(^2\) Humatronics: Term coined to denote a cross of Human and Mechatronics
Environmental requirement for energy saving unit has developed variable speed drive, while principle of technology has negative side-effect as higher harmonics and loss of electricity on motor deceleration.

Solution of these problems is realized in Matrix Converter, which Yaskawa successfully introduced into market first time ever in the world. U1000 is an integrated solution of these two problems in single unit.

This unit enables;

- Simple electric structure to avoid less harmonic turbulence
- Long system life and less maintenance requirement
- Continuous electric regeneration by bi-directional switching
- Highly efficient operation with less energy consumption.
Shift to sustainable society is essential change of global movement and Solar Energy offers major solution of alternative energy. However, application of residential solar voltaic system requires technical breakthrough to realize;
- More efficient energy conversion
- Smaller size
- Quiet operation.

Yaskawa introduced GaN (Gallium-Nitride) Power Device with advanced technology of electric circuit and control. Enewell SOL V1 is 40% smaller unit which features higher efficiency and generate no mosquito-sound in operation.
BioMedical Robot

Robot can operate human motion using tools and machines in hazardous environment. Precise movement of a dual-arm six-axis robot enables meticulous process of human hands to be automated.

Robot can support BioMedical field of industry in many ways, such as;

- Continuous inspection of patient-origin samples
- Concoction of individualized drug without contamination
- Support doctors in internal treatment
- Repetitive experiment of chemicals in search of new drug
Human Assist Robot

Aging population and low birth-rate are common problem in advanced counties. Yaskawa is developing technologies of service robot for healthcare/welfare requirement. Decrease of physical strength is a symptom of aging and causes lowering quality of life. Yaskawa is developing service robot to help such as:
- Prevent decrease of physical strength
- Post-infection/injury rehabilitation
- Support decreased physical function.

We call fusion of mechatronics and human ability to increase QOL as “Humatronics”.

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2015

2025

Ultra lightweight
Simple Design
Easy to use

Independence support
Wider usability

Generation of new market
Collaborative Robot

Remove the fence between robots and humans, so that robots can work together with us. Collaborative robots recognize safety, interface with humans, and do not need programming.

Broader automation demand of industry requires next generation relationship of robot with human. Collaborative robot will share a space with us tomorrow.

Most industrial application is open to this kind of robot, which includes:
- Picking/Packaging/Palletizing of foods, beverages and drugs
- Assembly of components, machines, and automobiles
- Material handling for logistics, container loading, warehousing
Yaskawa Combined Technologies

Yaskawa supports industrial line solution with **singular control**

- Support of Yaskawa’s standard line of robots as well as a variety of custom mechanisms
- Support of Yaskawa’s standard line of general motion control components for discrete machinery
- Support of Yaskawa’s variable speed drives for material handling

Control all line components under one communication platform facilitates versatile and standardized operation; which leads to higher overall equipment efficiency (OEE).

Tablet or traditional pendant for commissioning of robotics
What Comes in Future

Industry 4.0

Advent of IoT and M2M communication breaks ground for Yaskawa to contribute industry with integral solution of products and technologies. Yaskawa foresees new horizon for the world of factory automation, where ultimate efficiency and complete service is provided.

- Products information
- Traceability information
- Parts maintenance information
- Degrade and failure diagnosis
- Provide SaaS applications
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