



Democratizing robotics

Kinova is a leader in innovation robotics, creating robotic solutions that help researchers, medical professionals, businesses and educational institutions achieve their innovation goals. By partnering with Capgemini, Kinova was able to adapt its robots for use in industry and help Capgemini deliver Robotics-as-a-Service (RaaS). This flexible service model makes it easier for companies to use robots to perform different tasks and assist their employees.

The need for flexible robots

Companies are often asked to produce customized products, and that means being productive and cost effective when manufacturing at a lower volume. Robots can be used to increase productivity in manufacturing, but the typical robot is highly specialized for a particular task. It's ill-suited to the evolving requirements of a manufacturing plant that might have 25 assembly lines and produces a diverse range of products.

Kinova makes portable, adaptable and open robotic arms that are used for academic and industrial research, medical, security and industrial purposes. Collaborating with Capgemini, Kinova identified the opportunity for its robots to be used in industrial environments. Weighing 5kg and capable of lifting up to 2kg, the robots assist employees with some of their most challenging tasks.

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Overview

Customer: Kinova

Industry: Manufacturing

Location: North America

Client Challenges / Business Need:

- Introduce its robotic arms to industrial users for the first time
- Understand client requirements in industry
- Enable industrial clients to easily train robots for multiple and dynamic tasks

Results:

- Created Robotics-as-a-Service model with Capgemini
- Capgemini XIoT platform enables industrial data collection and processing
- Capgemini's Teach Robot Yourself (TRY) enables operators to program robots themselves
- A large European aircraft manufacturer is using Kinova robotic arms for cockpit testing



Introducing Robotics-as-a-Service

Kinova and Cappgemini are pioneering a low-risk deployment model, called Robotics-as-a-Service (RaaS). Taking inspiration from Software-as-a-Service and similar models, RaaS enables companies to acquire the robotics capabilities they need without making a heavy up-front investment.

Unlike a simple rental agreement, under a RaaS contract, Kinova and Cappgemini are responsible for delivering the robotic capabilities required, including supporting the installation, configuration, and staff training. The robot can be customized under the terms of the contract if more suitable hardware becomes available.

Using its extensive experience in industry, the Cappgemini team begins by analyzing the customer's needs and identifying how robots can help. The robots connect wirelessly to an Intel IoT Gateway, which hosts the Cappgemini XIoT platform. The XIoT software sends the data from the robot to the cloud, where Cappgemini software for analytics processes the data collected. Users can analyze the number of tasks completed, the success rate of tasks, data from the robot's sensors, and additional operational data to help with preventative maintenance of the robot.

"The best thing about the Cappgemini XIoT platform is its versatility," says Keith Blanchet, VP Global Sales and Innovation Director, Kinova. "It's extremely open, like our hardware, so the robots can be adapted, making them ideal for use in assembly lines dealing with diverse products or tasks. They can also be integrated with other systems easily."

The data in the cloud can be used with Artificial Intelligence or big-data platforms to enhance the robot's capabilities. The IBM Watson artificial intelligence platform could be used, for example, to help identify products coming along the production line, or to help recognize manufacturing flaws. The cloud can also be used for voice processing, so that the robot can be controlled using spoken commands.

"Robots are able to gather and use information at a much faster speed than humans, and can be particularly effective at inspection tasks," says Blanchet. "By integrating with the Manufacturing Engineering System (MES), the robot can collect the criteria for a pass or no pass, and be given a task to check specific parameters."

How Cappgemini helped

- Brought an understanding of industrial best practices and the likely knowledge levels of the solution's operators to help with solution design
- Designed the Teach Robot Yourself (TRY) platform to enable anyone to program sequences for the robots using a visual language
- Provided the Cappgemini XIoT platform, which enables data to be gathered from the robots
- Created dashboards and analytics in the cloud to enable data from the robots to be analyzed effectively
- Collaborated globally to create the solution
- Collaborated with Kinova to identify commercial opportunities and win new business opportunities

Teaching the robots

“Our aim is to democratize robotics for people who are not engineers,” says Blanchet. “We want people to feel that they are part of the robotic revolution and that the robot adds value to their unique skills and experiences. It’s there to assist them, not replace them.”

To that end, the robot is designed to be easy for everyone to program. Capgemini has created a platform called Teach Robot Yourself (TRY), which enables operators to program sequences by physically manipulating the robot, using a joystick or on-screen controls. Recorded sequences can be combined in any order and given parameters, such as the speed of operation. The programming language uses visual blocks that lock together like jigsaw pieces, similar to the Scratch programming language widely used in schools. Because the robots are portable and can easily be reprogrammed, they can be moved around the factory to carry out tasks as required.

The solution also has application programming interfaces (APIs), so that engineers can write sophisticated functions using their usual languages and tools.

Putting the robots to work

The RaaS solution has already been used by a large European aircraft manufacturer for testing helicopter cockpits. The robotic arm is able to conduct repetitive movements that would be boring and potentially harmful for humans to carry out, and the robot is able to work through the night so the manufacturer can get results faster and maximize the use of its test bench. Unstaffed testing makes new kinds of assessments possible, and reduces the cost of the process. While the robot does the hard physical work, the staff are free to focus on designing the tests and analyzing the results.

A Kinova robot is light and power efficient, so it can be mounted onto the customer’s choice of transport for remote use. It can be fitted to mobile bases or even drones to enable inspections in inaccessible or inhospitable environments, such as inside plane wings, under bridges, or in areas with extreme temperatures or chemical hazards.

Combining inspection data with Artificial Intelligence in the cloud, the solution can help predict when structures or parts are likely to fail, so that maintenance

About Capgemini

A global leader in consulting, technology services and digital transformation, Capgemini is at the forefront of innovation to address the entire breadth of clients’ opportunities in the evolving world of cloud, digital and platforms. Building on its strong 50-year heritage and deep industry-specific expertise, Capgemini enables organizations to realize their business ambitions through an array of services from strategy to operations. Capgemini is driven by the conviction that the business value of technology comes from and through people. It is a multicultural company of 200,000 team members in over 40 countries. The Group reported 2017 global revenues of EUR 12.8 billion.

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About Kinova

Kinova is a global leader in innovation robotics. Kinova’s mission was initially to empower individuals with upper-body limitations through assistive robotics. Over a decade later, the company has evolved its solutions and product suite to service new markets — helping researchers, medical professionals, governments, businesses and educational institutions achieve their innovation goals through strategic partnerships and collaborative efforts.

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cycles can be optimized.

Working with Capgemini

The RaaS solution emerged from trans-Atlantic cooperation, with the Capgemini team based in Europe and Kinova based in Canada.

“We’re looking for partners that are passionate, and the Capgemini team was passionate about our shared vision of democratizing robots and respecting the people who work with them,” says Blanchet. “If our alignment had only been on paper, it would have quickly died, but we succeeded thanks to a shared belief in our vision. The quality of the Capgemini team was fantastic: they were very open, easy to work with, and brought a detailed understanding of industry, which filled the gaps in our skillset.”

Working with Capgemini has enabled Kinova to transform its business to enter the industrial market, and Kinova is now hiring talent to grow its new division dedicated to this market. The companies are working together to explore new opportunities in Asia, Europe, and North America.

Interested in this solution or other Smart Services?

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