

# **New rental business models in industrial markets: a case study of partnering with intermediaries for renting industrial robots in Japan**

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## **ABSTRACT**

In industrial markets, buying and leasing production equipment are common business models. This research reports on a new phenomenon, the business model of renting industrial robots. The paper investigates how a manufacturer of industrial robots invests in a new partnership with an intermediary in a new business model (renting) to reach new customers. A case study has been conducted, where representatives from the manufacturing firm and the intermediary has been interviewed. The study points to challenges related to interacting with the new partner while also trying out the new business model. Findings also relate to the discussion about the sharing economy. The firms in the study believe that renting is a step towards the sharing of robots between customers. However, in order for customers to be able to share industrial robots between them, there are still some obstacles to overcome.

Key words: business relationships, intermediary, interaction, business model, sharing economy, case study

## **INTRODUCTION**

In competitive markets firms are trying to reach new markets and customers, sometimes through new partners or through new business models. Business markets have evolved from where once customers mostly bought production equipment, to where they today have the option of leasing such products. In the consumer market, renting has been a common business model, but it is quite new on the industrial markets. The research reported there focuses on the business model of renting industrial robots to new customer groups through a new partner, an intermediary. The aim of this study is to investigate how firms interact in the development and implementation of new business models with new partners. Therefore, a case study has been conducted. The empirical context is a new business relationship in the Japanese industrial robot market, where a global robot manufacturer collaborates with an intermediary to rent out robots to customers. Hence, a new business relationship as well as a new business model for the industrial robot manufacturer is investigated. The case is interesting since the new partner is an intermediary (which has been less studied in the IMP context) and the new business model relates to networked business models (Bankvall et al., 2017) where firms have less control. The interaction involves delivery of products and services (Ford & Håkansson, 2006) between the robot manufacturer, the intermediary and the customer. The paper also relates to more recent concepts such as the sharing economy, where the case describes the possibilities of sharing robots, and what is needed for it to take off.

## **THEORY**

In the IMP literature, interaction is an important ingredient in building relationships and creating networks. A number of IMP studies have been made that points to the importance of interaction with suppliers for innovation (Andersen & Gadde, 2018; Gadde et al., 2010; Håkansson & Waluszewski, 2013; Perna et al., 2012) and customers for innovation (see e.g. Harrison & Waluszewski, 2008; Havenvid et al., 2016; Laage-Hellman et al., 2014). The IMP

literature takes a relational perspective, pointing to the importance of having a long-term perspective for collaborative innovation. This stream of literature has several outlets that focus on interaction (see e.g. Ford & Håkansson, 2006; Håkansson & Waluszewski, 2013). Interaction happens between partners as well as across entire networks. Interaction evolves over time and is shaped by previous as well as on-going interactions. Taking an interactive view of business relationships means that it is not sufficient to look at a single company, but rather that we need to look at interactions between firms (Ford & Håkansson, 2006).

In their discussion about interaction, Ford and Håkansson (2006) point out that interaction includes interpersonal communication, delivery of products and services, information, payments and one-sided observations. Due to increased technological development, firms cannot have all relevant knowledge in-house, but need to collaborate with expert suppliers and customers in order to innovate new offerings. This increased interdependence between firms results in more complex interactions (Ford & Håkansson, 2006). Every interaction is part of a larger interaction pattern (Håkansson & Waluszewski, 2013). For instance, Havenvid et al. (2016) show that customers' requirements are not developed in isolation by the individual customer, but results from interactions in a network. Studies show that in order to succeed with developing complex innovations, firms need to develop interactions with a number of actors in a network, such as customers, suppliers, users and even competitors (Baraldi et al., 2011; Perna et al., 2012).

In the field of IMP studies, business models focus on network-embedded business models, where new patterns of interaction may be required (Bankvall et al., 2017). Hence, firms need to understand their roles and which interactions that are needed in the network related to new business models. Bankvall et al. (2017) suggest that when the business exchange extend the dyadic level to include third parties, then it is important to have a network perspective. The authors point out that for network-embedded business models, a network-level analysis is needed due to the complex sets of business exchanges that moves beyond the boundaries of an individual firm and its relationships.

A network is dynamic and changes over time. For instance, new relationships are developed within the network (Gadde et al., 2010), where the network is evolving and transforming depending on actions from the parties in the network. A recent study highlights the importance of new relationships, in particular the importance of the first customer relationships (Laage-Hellman et al., 2018).

## METHODOLOGY

This research is based on a qualitative study, a single case study (Yin, 2009), where a business relationship between an industrial robot manufacturer and a new business partner, an intermediary that rent out robots, is studied. Data has been collected through interviews, company visits and documents. Documents were in the form of sales information, product information, company information and market information. The industrial robot factory was visited in the US and the intermediary's show room and demonstration lab in Japan was visited. An interview guide was developed, which focused on background information about the industrial robot market in Japan, the interaction between the robot manufacturer and the intermediary, the internal business relationship between the industrial robot manufacturer and its sales organization in Japan, the new business relationship and new business model developed with the intermediary. The interview guide consisted of open questions, allowing for follow-up questions and for flexibility during the interviews. At the manufacturing firm two individuals were interviewed, the factory manager and the industrial robot sales manager

for the Japanese market. At the intermediary, the business manager responsible for the collaboration with the industrial robot manufacturer was interviewed.

The data was structured into a time-line to display the development of the external business relationship in the form of a mega matrix (Miles & Huberman, 1984). A case study report was written to bring together the “story” of the collaboration and the new business model. A within-case analysis was conducted (Eisenhardt, 1989), where data was organized following concepts related to new business relationships, interaction and new business models (Bankvall et al., 2017; Håkansson & Waluszewski, 2013).

## CASE STUDY

### Background

This case study involves two firms, an industrial robot manufacturer and an intermediary. The industrial robot manufacturer is part of a world leading global firm, focusing on automation and robotics. The firm has about 100 000 employees and a history of over 100 years. It is one of the larger players in the industrial robot market. It has its base in Europe but has operations all over the world. However, one market that is challenging is the Japanese industrial robot market, where there are a number of native firms that have very strong positions on the market. In order to access new markets and gain market shares in Japan, the firm has developed a new business relationship with an intermediary located in Japan.

The intermediary was established in the 1960ies in Japan, where it started a leasing business. Today it is involved in multiple sectors, such as finance, real estate and services. In recent years it has established an eco-service department which focuses on environmental sustainability. It has about 30 000 employees and is active in around 40 countries, with its base in Japan. The business part of the intermediary that is included in this study is called RoboRent, which is a rental service of robots.

The robot type under study is a smaller collaborative industrial robot that can work alongside humans. The robot is referred to as ColIndRob in this study and is developed and manufactured by the robot firm in this study. In the context of the study, the Japanese industrial robot leasing business, the robot is used in two segments: food and beverage, and production. ColIndRob has been installed in some automotive assemblies in Japan, where it replaced humans. The ColIndRob is not meant to replace other industrial robots, but to replace humans. These small robots move much faster and with more precision than traditional robots.

The Japanese industrial robot market has a number of large manufacturing firms that are used to having industrial robots on their shop floor. Moreover, the Japanese society has a high acceptance of robots, where much effort is put into how robots can be used in new ways, such as in taking care of elderly people. Due to the attitude of the Japanese society towards robots, Japan is a suitable market for trying new approaches related to robots. *“Japan is a good market for collaborative service robots. Most Japanese people like robots. They don’t think that robots will steal jobs, they think that robots are helpful to people.”* (Sales Manager, robot firm) and *“This is new for us. It needs to be tested on a market that is ready for these new ideas, which makes Japan the most suitable market.”* (Factory Manager, robot firm)

The robot rental started in 2016 at the intermediary. The biggest market is within manufacturing, where the intermediary had contacts with many manufacturing firms before

starting the rental business focusing on collaborative robots. The intermediary also rents out collaborative robots to segments such as medical, construction and food and beverage. The first rented robot that the intermediary started with was the collaborative robot from the industrial firm in this study. Following that collaborative robot rental, the intermediary now has a number of different robot brands in stock for rental, from all the major industrial brands, as well as a few more local brands. In total, the intermediary now has 17 different robot brands and 34 different robots available for rental. The intermediary is eager to please its customers and will make modifications to their stock of robots if customers ask for other robots. *“If the customer asks for a new type of robot we will add it to our rental business.”* (Business Manager, Intermediary)

#### New business model

In 2017, Japan was the second largest market of sales of ColIndRob. More than half of these robots were sold to the intermediary, who rented and leased robots to industrial Japanese customers. The firm has no other collaborations with intermediaries in Japan for renting out robots to customers. *“This is a new kind of business model for us and we need an experienced partner.”* (Factory Manager) and *“The idea was from the intermediary, who’s manager contacted our firm and wanted to start a rental business. We were interested.”* (Sales Manager, robot firm) Competitors to the intermediary also use rental business for collaborative robots. Other intermediaries also offer a number of different robot brands. However, the intermediary under study was first on the market with renting industrial robots.

The set-up is that the intermediary buys robots from the firm and then rent or lease these robots to their customers. After service is made by the firm but the intermediary handles technical support to the customers. However, the firm has contact with both the intermediary and the customers. *“This is a new type of robot, that can work alongside humans. Therefore, new types of customers want the robot, but they don’t know how to best make use of it or where to put it in their production line. By using a rental scheme, they decrease their risk.”* (Sales Manager, robot firm)

The firm had the option to start their own renting business. However, in Japan, there are several requirements to fulfill for firms to start a renting business, where firms need to be approved. Hence, it was easier for the firm to start a collaboration with the intermediary. *“We have no plans to get approved for a renting business. In order to have a renting business we would need to have a number of robots in stock, and we don’t want that.”* (Sales Manager, robot firm)

The set-up at the intermediary is a short-term rental. Customers can expand the renting time or buy the robot after that time. The minimum rental time for a robot is six months. After the six months, the customers have the option to: (i) expand the rental time from 1 month up to 3 years, (ii) buy the robot, or (iii) return the robot. About 60% of customers choose option (i), 20% choose option (ii), and 20% choose option (iii). After having chosen option (i) the customer almost always buys the robot after the extension period.

The intermediary is responsible for any damage on the robot and will exchange the robot if necessary. The intermediary is used to the rental business model, as it has similar business models for other types of products. *“We always have products in stock and are able to rent out a new robot or exchange a damage robot.”* (Business Manager, Intermediary)

Technical support is not included in the rental business model, but customers can pay extra to get support.

There are several reasons for customers to rent a robot:

- Testing a robot before installing it
- Testing where they can use a collaborative robot
- Check for problems before installing a robot
- It is too expensive to buy a robot

In the case of a first-time robot customer, these customers on the Japanese market most often only know about domestic brands such as Fanuc and Yaskawa, and will therefore want a robot of either of these brands. *“The customers most often choose a brand of robot and thereafter decides which robot of that brand to rent.” (Business Manager, Intermediary)* Customers that choose other brands, such as the brand in this study, have experience from robots and know about several different robot brands.

The intermediary has many well-established contacts at customers who are firms that are publicly listed. However, the rental business model fit much better to private companies, who are not listed on the stock market. *“There is a big need for robots in private companies. They do not have the technical competence in-house and prefer to rent robots by renting.” (Business Manager, Intermediary)* The intermediary has experienced an increase in renting to private companies from 10% to 19% on one year. The customers at the intermediary that do not have experience from robots are 60%. The ColIndRob is quite popular and accounts for 25% of the rented robots. First-time users at the intermediary want a robot that is easy to use and therefore the ColIndRob is the second most rented robot to this customer group. The rented robots are often used in a testing environment. However, some customers also use them in their production line, such as firms in automotive and electronics.

There are several aspects to consider with the rental business model. Benefits for the customer includes a decrease of risk. However, drawbacks are related to cost, where renting and buying the robot becomes more expensive than buying the robot from the start. Also, by renting through the intermediary, customers get no support from the robot firm. That is because, if the firm offered this support to the intermediaries' customers, then the firm's distributors would complain. In addition, the firm often sells the ColIndRob with other products, forming a system of products to make production more efficient to customers. The intermediary does not have the skill to provide such a solution to its customers. However, the intermediary would like to involve a system integrator firm in their RoboRent business. Since the intermediary has no system skills, it needs a system operator partner. However, this type of business is not that good from a system integrator's perspective, since there is little money involved for them and they need to take quite a big risk. Therefore, they are not interested to join and become a collaborative partner in this business model.

The firm experience no difference in the 'wear and tear' of the robot when comparing the usage from renting business model customers and standard customers. The ColIndRob is a sensitive robot and customers tend to operate it with care.

#### Sustainability and future outlook

At the end-of-life the ColIndRob is scrapped after some electrical parts are collected, which is regulated by the government. Whereas industrial robots are considered machines, the collaborative robots are considered electrical products, which has different regulations comparing with the traditional industrial robots. From a sustainability point of view, it is

possible to prolong the life of ColIndRob by replacing parts of the product. However, that is often more expensive than to buy a new robot.

The future outlook on the business model of industrial robots takes different perspectives. On the one hand, it is argued that these new collaborative robots will become standard and then the customers will either buy or share robots. *“I believe that these collaborative robots will be the new ‘normal’ industrial robots in the future, and then customer will not lease but buy or share robots.”* (Sales Manager, robot firm) Since ColIndRob is a lightweight robot, it is easy for customers to move it and thus also share it between tasks on the shop floor or between firms.

There is also the outlook on the future that rental business will grow. *“We believe that the rental business will grow in the future.”* (Business Manager, Intermediary) Since labor shortage is a problem, more firms will invest in automation and robots. *“Labor shortage is a big problem in Japan. Many companies want to automate the production line.”* (Business Manager, Intermediary) The intermediary believes that there will be a segment of robot users that will not want to buy robots. *“We believe that SME companies will rent robots in the future, because they cannot afford to buy robots. Rental is a model where they pay every month, which suits these companies.”* (Business Manager, Intermediary)

Related to popular concepts such as the circular economy, the sharing economy and a sustainable usage of products, the prospects of sharing robots provide a good example for a sustainable production. However, there are some difficulties to overcome before sharing industrial robots between work stations or between firms can take off. *“Sharing robots is difficult at the moment because customers need to do the programming themselves and it is difficult for them. But in the future, I believe that programming of robots will be much easier. When programming becomes easier, then customers can re-program robots and that will make it easier to share the robot with other firms.”* (Sales Manager, robot firm) The intermediary has a similar view on the sharing of robots, where there still are some technical obstacles to overcome. *“The sharing economy will grow. Today it is difficult to share a robot between firms, because they use the robot differently and that requires re-programming. If that programming problem is solved in the future, then sharing of collaborative robots will happen.”* (Business Manager, Intermediary)

## CONCLUSIONS

This is an on-going research and a few preliminary findings will be presented. First, this research provides a study of a partner that is new to the firm, an intermediary. This is a partner that has been less studied in the IMP context. Second, the study builds on the idea of networked business models (Bankvall et al., 2017), where firms have less control. The study shows limited interaction between the manufacturer and the customers, where most interaction is with the intermediary. Third, the study highlights the importance of interaction in a business context, exemplifying how interaction takes place with a new partners in a new business model. The interaction is based on the delivery of products and services (Ford & Håkansson, 2006). Finally, fourth, the study provides insight into a sustainability issues, a topic where the IMP literature could contribute. The study shows how the sharing economy can be implemented in an industrial context, between SMEs that share robots between them. Here, a new business model could be developed, focusing on how customers can share industrial robots between them.

This is a work-in-progress paper and further data analysis will be made. Also, an additional study of rental business models is being conducted at another manufacturing firm of manufacturing equipment towards industrial firms. These two cases will be compared in the next version of the paper.

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