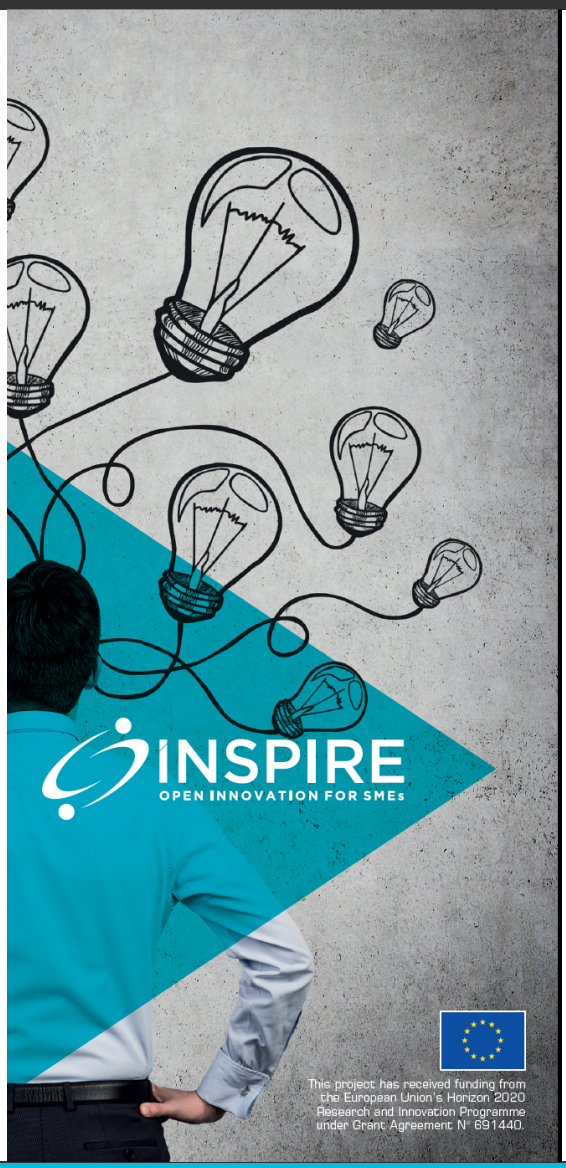

INFACTORY SOLUTIONS

Germany, www.infactory-solutions.net

An example of inside-out open innovation in which a young start-up develops an invention belonging to a large corporation and commercializes it both within the mother company and with external customers

Executive Summary

InFactory Solutions is a spin-off from Airbus, which acts independently from the large corporation, although it is still currently a 100% Airbus Group subsidiary. It started life as an idea generated within Airbus' innovation and central IT department, which was put forward as a candidate for a new internal incubator initiative of the aviation group aimed at "intrapreneurs" and fostering good ideas which were not core business for Airbus.

After an initial incubation period within Airbus, InFactory Solutions was founded as a spin-off in June 2016, but has rapidly established a solid customer base in the aerospace sector and is seeking to gain further independence from the big corporation by bringing in venture capital and renegotiating Airbus's shareholding. It is also moving into other sectors such as automation and wind energy. The case is an interesting example of "inside-out" open innovation – an SME which has evolved from know-how held by a large company, and is allowed to develop away from the big company.

CASE N°: FG18

SECTOR: INDUSTRIAL AUTOMATION

TECH INTENSITY: HIGH-TECH

LIFE CYCLE STAGE: START-UP

INNOVATION VECTORS: PRODUCT, PROCESS

OI PARTNERS: PSR, LARGE CORPORATION, LEAD CUSTOMERS/USERS

KEYWORDS: Spin-off, sensors, aerospace, composite production, additive manufacturing

- BACKGROUND FRAMEWORK
- INNOVATION CHALLENGE & MARKET OPPORTUNITIES
- OI TRAJECTORY
- BUSINESS IMPACT
- LESSONS LEARNED

INFACTORY SOLUTIONS

BACKGROUND

InFactory Solutions delivers automated, connected and intelligent solutions for improved digital manufacturing through sensor systems, data analytics and engineering consulting services, mainly for composite production in the aerospace industry, but also for the automobile and wind energy markets.

InFactory Solutions is a spin-off from Airbus, but acts and operates independently. It came into being as a result of an incubator that Airbus created specifically for internal staff ("intrapreneurs") and ideas that are interesting and have potential but are not core business. Both Franz Engel (CEO) and Caroline Legler (Deputy Director) were already employees of Airbus. They developed a business plan and an elevator pitch which secured them money from Airbus for 18 months to develop the project further.

In June 2016, just two years after its inception, it was decided that the project was mature enough to stand on its own two feet, and the small team decided to take the company out of Airbus as a spin-off. It was agreed that the SME would be founded as a subsidiary of the Airbus Group, but would have organzsational and operational independence from the mother company. This was because the systems in place at Airbus are not agile or flexible enough (e.g. procurement and HR processes take a long time) to favour projects like start-ups, which need to grow fast.

InFactory Solution's idea is to be able to connect the production of carbon and additive manufacturing (3D printing) not only in aerospace but also in other markets such as automotive and wind energy. They would like to take the concept that the SME has developed for carbon production and apply it to 3D printing. This is quite a new idea, but they are optimistic about the huge potential of 3D printing They are also keen to attract strategic investors, such as a large production integrator.

INNOVATION CHALLENGE & MARKET OPPORTUNITIES

Franz Engel, CEO of Infactory Solutions, was working within the IT innovation department of the Airbus group. He developed a sensor for putting in production machinery that could perform quality inspection automatically during the production process. Currently in the aerospace sector a lot of quality inspection is done manually.

The sensor developed was designed primarily for the carbon production process – so that quality inspection can be digitalized and automated to enable the revision and correction of errors and thus save both time and money in the overall production process. The challenge for the start-up was to convince Airbus of the potential of such an idea and to invest seed-funding for piloting and scaling-up.

There was no sensor available on the market with the capacity to perform quality inspections automatically on the production line. The idea of the InFactory team was to use different components already on the market to produce a new sensor for the different production steps where it makes sense to automate. Secondly, they wanted to incorporate data analytics within the service they offer: to collect quality data from the sensors and the machines on the production line, and to establish connections along the whole chain in order to detect and analyze why defects occur.

OPEN INNOVATION TRAJECTORY

Concept development

InFactory Solutions developed their ideas from the detected market opportunity to offer sensor systems for sale along with data analytics services to analyze the data and tell production facilities what they can do better.

InFactory Solution's first commercialization was a sensor which they applied and tested directly with the Airbus Group's automated fibre placement (AFP) production. The concept of the sensor is that it can do in-process quality monitoring of compos- ite production that reduces inspection time by more than 95%, compared with the manual inspection process which Airbus was using at the time.

The proximity of the SME to Airbus and its networks helped a rapid development process. Testing was done firstly at Airbus' Illescas plant in Spain. This involved incorporating the sensors in the machine heads (participation of MTorres machine equipment) and doing testing on the production lines in the plant. Results proved so positive that the plant deployed the system in two production lines. The system was then also trialled with two other Airbus Group production sites in Germany, which have also incorporated it within their plants.

IPR and competition strategy

InFactory Solutions is still 100% owned by Airbus, but they are in talks to attract external investors (venture capital) to the company. All the IP is owned by Airbus and InFactory Solutions has an exclusive license, free of charge. If a new shareholder comes in this position will have to be re-negotiated with Airbus. However the company does not rely too much on IP, since their service value lies in the software they have developed for the analytics. Firstly, it is hard to secure IP protection on software and secondly the codes are so complex and difficult to access that registered protection is redundant. For this reason, the majority of the technology is protect by trade secrets rather than IP that is patented.

There was no sensor on the market that InFactory could use, so they developed their own sensor system using components from the market. In general, the company tries to find other smart sensors on the market and adapt them for their own purposes. The software programming in the background is what adds value to the overall product and service that they offer.

They currently have market advantage in aerospace because they are the first to offer the joint technology and analysis service, and they have access to an established customer-base through the Airbus Group. InFactory Solutions are not limited to selling to the Airbus Group. They have freedom to operate with other actors in the aerospace industry.

Commercialization and follow-up

The company talked to machine suppliers for carbon production and also to material suppliers and to customers like Original Equipment Manufacturers (OEMs). Within the aerospace industry it was relatively easy to get customers because of their relationship with Airbus. However, the OI relationship that they have with Airbus does not limit their market; they have freedom to operate and do business with customers which are not part of the Airbus group and with other OEMs. InFactory Solutions currently offer its products and services to suppliers worldwide and aims to develop solutions for the complete composites process chain, including other layup methods, cure, machining, etc.

The relationship between InFactory Solutions as an internal spin-off of Airbus is not fully clear, perhaps because they are the first internal spin-off that the large corporation has created. There does not appear to be any preferential treatment of the SME: they are allowed to act and are dealt with as any normal supplier. However, by maintaining an equity holding in InFactory Solutions, Airbus would be able to use it as an option to reintegrate the company if the technology is considered valuable and interesting enough at some point in the future. This is something Airbus has done with other external start-ups.

As regards exclusivity with customers, in general as long as InFactory have a product already available then they consider there are no grounds for exclusivity. However, if they need big customers for development, then they discuss exclusivity agreements. Their experience within the aerospace sector is that most companies they have dealt with are just happy that they are not restricted to supplying Airbus and so the issue of exclusivity does not arise.

One of the major managerial challenges in setting-up the venture and competing in the industry as an SME has been dealing with the differences in culture between an SME and a large corporation. The aim of the InFactory management is to be independent of Airbus, to attract venture capital and give shares to the founders. However, this has met with resistance. Airbus has a very corporate view and does not agree with giving shares to its employees, even if in the case of the InFactory management they are not direct employees of Airbus. The novelty of the situation for Airbus meant that negotiating with them has been challenging. Decision-making was passed up through Airbus middle management to board level and higher as no-one in direct contact with the SME would take responsibility for making the decisions regarding new organizational requirements. Once it had reached very high up in Airbus, conversely the issues of such a small company as InFactory became unimportant. InFactory's strategy has been to find investors and make the arrangements directly so that they can offer Airbus a ready-made solution to the problem.

InFactory's strategic relationships are with their customers and also with the machine suppliers. The sensor can be used on any AFP machine head , of which there are a limited number of machine suppliers (5 in all), and they have sought to implement the sensor technology in all the machines. The obvious advantage for these companies is that they will not lose competitive advantage in this small market. Testing and implementing the sensors and data analysis service with machine tool suppliers and manufacturers gives all the parties involved the opportunity to learn and gain useful insights for optimizing the technologies.

Besides machine manufacturers, InFactory has also worked in a limited way with research

institutes, but found that their own internal development for the software went a lot faster than that of the research institute and so they slowed down the collaboration. The company's strong capabilities in development mean that they do not need to rely on external research collaborations.

Within the aerospace market, InFactory Solutions are not limited to working with the Airbus Group: they have freedom to operate with other aerospace or Original Equipment Manufacturers (OEMs). InFactory Solutions have also started to establish a customer base in the automotive and wind energy sectors. For accessing these markets they go through the machine suppliers and materials suppliers because they have the best access to the big companies. In the case of wind energy, one customer requested exclusivity for a new sensor product, but InFactory's strategy is to try to develop it in-house to such a stage that the customer cannot demand full exclusivity. This way they are able to protect their proprietary knowledge. Since this is a new market for InFactory, they do not want to restrict their customer base.

BUSINESS IMPACT

The start-up has successfully launched its technology and services, and has very quickly established itself in the aerospace sector by working firstly with Airbus production plants, convincing the machine producers to incorporate the sensor technology, and raising interest beyond Airbus. During this process, Airbus has allowed InFactory freedom to continue at its own speed and without restrictions of exclusivity.

The management developed new skills associated with launching a start-up and developing a new product and service. It also learned how to access new markets and negotiate with new customers outside the aerospace industry (automotive and energy) who are more price-sensitive and therefore require a different strategy. This is an approach which InFactory Solutions are still working on as they are reliant on establishing contacts with big companies and OEMs through the machine and materials suppliers.

LESSONS LEARNED

This case is an interesting example of "inside-out" open innovation – an SME which was allowed to grow outside the large company. Airbus has experience of accelerating external start-ups within its ecosystem, but chose to create an incubator programme which could also foster ideas originating from inside the company. InFactory is their first spin-off. It would seem logical to assume that Airbus is treating the start-up as any other SME within its ecosystem, i.e. to let it have the benefit of association with the Group, allow it to grow and prosper, and then bring it back inside once the risks have lowered and revenues and cost savings are sufficiently worthwhile to be internalized again.

The spin-off process and the development and rolling out stages show how the OI relationship can work to the advantage of the small company (it benefits from an existing and trusted base for trials and development and also an established network of customers). In this case, a non-exclusive relationship with Airbus gave the SME freedom to operate in the aerospace market. It is interesting how the SME is now trying to negotiate greater independence from Airbus and bring in external partners and financial backing. The large company does not have the culture or corporate structure to allow shareholders from among what it considers to be the equivalent of regular employees or external VCs. Following what happens next would be an interesting learning point

Main lessons learned:

1. An OI experiment between a large company (Airbus) and a spin-off allows the SME freedom to grow and prosper. This is the first internally-born spin-off created by Airbus, and as such both parties are unsure of their relationship and expectations of each other.
2. Airbus maintains equity in the spin-off, and if they decide that the technology is interesting to form part of Airbus' core business they are able to reintegrate InFactory Solutions.
3. The externalization of risks for Airbus is not really a key factor. When you compare with its revenues, the financial impact of the spin-off is still small.
4. The credibility for an SME by having a link to a large company: the sense of quality and high standards associated with the dominant market player extend to companies in its ecosystem.
5. InFactory Solutions also found that the connection to Airbus could be counter-productive because other companies think that they are somehow "protected" (financially and otherwise) by the large company – which is not their case.