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Entering the Next Level of Value Generation: Servitization and Digitization for Industry 4.0 by ifm electronic


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Case study on Bachelor level

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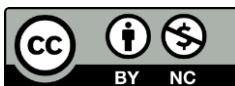
Abstract

Ifm electronic is a mid-sized world market leader in sensor electronics for industry and automotive applications. The hidden champion shows an impressive growth trajectory in the last 20 years from around 200 mio. € to 1 bn. € in 2019. In this case study, the ambitious leaders of this company start to elaborate the strategy for achieving the next billion. Students are required to identify the drivers of growth in the past decades and evaluate the steadiness of this recipe for success in the context of major shifts and technological advances in key customer industries such as industry 4.0 and new business models driven by digitization and servitization. Thus, students will explore the benefits and limits of business model innovation and investigate further strategic options for growth.

Keywords

Growth strategy, innovation, internationalization, hidden champion, business model, value proposition, smart services, servitization, digitization

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Integrated Case Method

The case researchers / writers have conducted primary research by collecting qualitative (interview managing director and marketing manager) and quantitative data from ifm electronics and developed a student-centred, problem-based teaching case study (see Fig. I).



Fig. I Integrated Case Method IFM.

Disclaimer

Robert Ciszewski and Prof. Dr. Jan-Philipp Büchler are the authors of this case study, which is intended solely for teaching purposes in management education at institutions of higher education. The case is designed to be used as the basis for class discussion rather than to illustrate either effective or ineffective handling of a management situation.

The contents of the case study are carefully researched based on interviews with company representatives as well as publicly available primary and secondary sources. Nevertheless, mistakes cannot be fully eliminated. The publisher, editor and authors can assume neither legal responsibility nor any liability for incorrect information and its consequences.

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In the quest for the next billion

Michael Marhofer is live on the stage in his headquarters and broadcasted live to more than 1.000 sales and technical service managers around the world. As co-chairman of the board of ifm electronics, it is his role to open the global annual sales conference and set out the strategic frame: *"Industry 4.0 must bring a recognizable benefit right from the first time it is used"*. Under his ambitious leadership, the hidden champion ifm electronics experienced an impressive growth trajectory: *"We achieved record sales! We surpass one billion Euros of sales for the first time in our history thanks to your performance all over the world! It is because all of you live our value and promise to the customer: ifm is close to you! Now we calibrate our focus on the next billion!"* Applause!

An important key to this success is the trained and customer-driven sales force of ifm. Michael Marhofer always loves to motivate and to thrill his troops for excellence and performance. However, this time it was not only a message for a new sales objective. The age of industry 4.0 and digitization made strategic messages more complex: *"We need to accept that more sales will just not be enough. We can manufacture the best sensors in the world and use them to generate the largest imaginable amount of digital data. So what? All of this is worthless as long as customers do not see any benefits or added value for which they are willing to pay. We need to show the benefit. Our customers need to understand the added value for their business. That is the basis for our big goal: The next billion! We will have a series of workshops with our global leadership team and countries in the weeks ahead of us. Please prepare for this important process of strategy making and reshaping our business."*

The annual sales conference flipped a new chapter of growth for ifm open. Michael Marhofer looked forward to the strategy workshops and prepared a well-structured presentation of his company profile, growth trajectory and market development.

The profile of a global market leader

The ifm group (ifm), headquartered in Essen, is a global manufacturer and distributor of automation systems and components for industrial companies. ifm's exceptionally large product range does not only consider all relevant standard solutions, but also the specific requirements of individual industries. Apart from position and process sensors, this product range also includes sensors for motion control and safety technology. In addition to this, ifm offers products for industrial image processing and communication as well as identification systems for mobile machines.

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ifm serves customers from all kinds of industries like packaging, automotive, food & beverages, mobile machines, machine tools and equipment manufacturers, wind energy, hydraulics as well as steel and metal. Beside the coverage of many industries, ifm is represented by more than 7,300 employees in over 95 countries worldwide and manages a portfolio of more than 150,000 buying customers on all continents. The family-run ifm group operates fully owned subsidiaries, development and production sites in more than 70 countries. Their sales and service team of about 1,450 employees offers the best advice to their customers in every country.

A twofold family business with successful transition

The founding fathers of ifm were driven by a passion to develop sensors with extraordinary quality and to provide incomparable customer service. It was with this Vision that Gerd Marhofer and Robert Buck started ifm in October 1969. Starting out from humble beginnings – not in a garage space, but similarly in the bedroom of a 80qm flat in Tettang in the South of Germany – the engineer Robert Buck developed the first touchless microswitch having been inspired Gerd Marhofer, who worked as technical sales manager for different electronic device companies before.

In 1972, three years after foundation of the company in Essen, 32 employees generated 2.5 mio. DM. In the following years, the founders established sales offices overall Germany and headquarters in Essen while research, development and production remained in Tettang. In 1976, ifm went international and opened-up the first subsidiaries abroad in France and Japan. In the same year, sales revenues exceeded 10 mio. DM. To the end of planning reliability and options for further company growth, ifm invested strategically in land of 52.000 qm for in Tettang.

In 1980, ifm was one the first companies to enter the production of optical sensors which turned to be one of the most attractive growth segments. Consequently, the company increased production capacity and invested in 1988 in a second production site in Le Bourget-du-Lac in France.

The reunification of Germany in the early nineties set the opening stage for expansion to Eastern Europe starting with a sales and service unit in Eastern Germany and further international subsidiaries in Slovakia (1993) and Czech Republic (1993). The further international expansion was driven by market opportunity and customer demand, thus ifm established a further subsidiary in Malaysia (1994) and a sales office in India (1994). In 1996, the US-American market entry was manifested with a production site in Pennsylvania. Further The ECASA project (2019-1-DE01-KA203-005037) is financed by Union funds (ERASMUS+). But the content of this document only reflects the views of the authors, and the European Commission cannot be held responsible for any use which may be made of the information contained therein.

subsidiaries in Austria and Australia were established in 1998. In the same year, ifm introduced a successful range of innovative safety sensors to the market.

In 2001, the next family generation took over the leadership of ifm. Michael Marhofer and Martin Buck - the sons of the founding fathers – continued this successful growth journey. The second generation consolidated the independent German legal entities and simplified the legal structure and organization. In 2003, the acquisition of i-for-T GmbH allowed for entering a new strategic business field of vibration sensors. An accelerated wave of international expansion took place from 2003 to 2005, when ifm entered Canada, Mexico, Netherlands, Poland, Portugal, Russia, Turkey and Hungary. A breakthrough innovation was presented in 2006, when the IO-Link as the fundamental platform and linking device for industry 4.0 applications was developed together with strategic partners.

In 2010, ifm expanded the geographical scope for research and development activities by opening up a research and development site in India and a production and development unit in Singapore. In addition to the internationalization efforts, ifm realized several technology-driven acquisitions in 2012. The acquisition of Handke Industrie Software laid the basis for ifm datalink and the takeover of pmd technologies, a specialist developer of 3D-technologies, followed by a majority equity participation in TISC AG – software developer and IT infrastructure specialist - in 2016. To show the shift towards digitization and realize cross-synergies between ifm units and the new acquisitions, ifm opened up a software- and technology center “The Summit” in 2019.

Today, ifm is a privately-held global manufacturer of industrial sensors and controls as well as software solutions for industry 4.0 applications located in all major countries producing more than nine million sensors annually. ifm’s global reach ensures that customers can count on local support all over the world.

ifm in Germany: A powerhouse for development and production

Nevertheless 70 % of their products are developed and manufactured in Germany. They feel closely connected to the location Germany. But they have reached a point at which they want to further extend the vision of their commitment "close to you". With manufacturing and development locations in the USA, Singapore, Poland and Romania they follow their principles and can respond to the requirements of the different markets with high professional competence, high speed, flexible adjustments and professional consultation. All their manufacturing and development locations are set up according to the reliable German quality

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standards, whether it concerns the working conditions for their staff, environmental protection or the highest quality standards in development and production.

After many years of intensive cooperation with their customers, they have established themselves in the market as service-oriented sensor specialists. Even though ifm has grown into a big company, they have still maintained the virtues of the founding years: The flexibility and individuality of a small enterprise and the quality and professionalism of a group. The customers are still today in the centre of their work: “close to you”.

Over the last 25 years ifm has grown by an average of +6% CAGR until they reached sales of 1 billion Euros in 2020. Even right before the first billion was reached, several ambitious employees asked themselves: “How do we reach the second billion?”

Reshaping the business focus for the 2nd billion goal

“The first billion is a huge goal for us as a company which is in mind of every employee through the hole year. Nevertheless, even before the first billion had been reached, the idea of how to reach the second billion arose among employees. It quickly became clear to everyone that with such growth and a new growth target, structures, focuses and business models would also have to be rethought and adjusted to a new level. It was therefore clear to us that a structured but also targeted working group would have to develop ideas and solutions in several workshops. Two principles were important to us. The circle of those involved in the workshops should cover the technical and business functional diversity of the company. Also, we need down-to-earth solutions with clear hands-on qualities.”, commented Sascha Rahman, Head of Strategic Marketing & Sales Excellence who was commissioned for the structured processing and preparation of the 2nd billion project.

In preparation of the strategy workshop Michael Marhofer thinks about adapting the sources of growth for the future as well. Three quarters of future sales revenues should come from a stable core business and the remaining quarter should be generated from new business areas on top. With the help of this goal, it should be easier for the company and its employees to channel their efforts.

An overview of ifm’s core business fields is shown below (see **Fig. 1**).

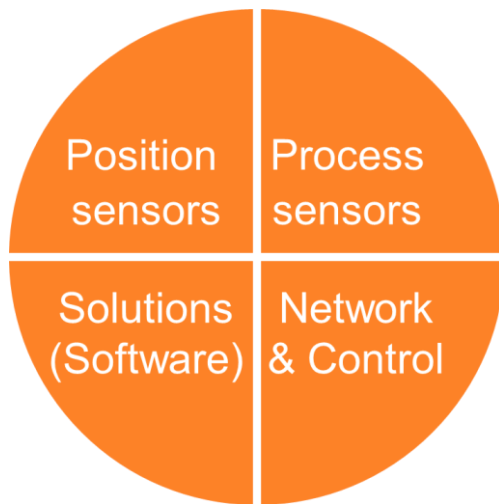


Fig. 1 Business fields of ifm electronics (source: ifm).

Currently ifm's main pillars are the position and process sensors which are the main contributors to ifm's growth history. The third and upcoming pillar are the products from the field of Network & Control. The newest product field of the company's product history is ifm solutions.

ifm solutions GmbH is the holding company for all software subsidiaries of the ifm group. It is responsible for the strategy and management of the associated companies. In addition, ifm solutions GmbH bundles and provides central services with the company's ifm services GmbH, ifm software GmbH and GIB mbH:

- ifm services bundles the expertise around IT, software and production systems and thus offers worldwide support at the highest level.
- ifm software offers a continuous, seamless connection between the world of sensor technology and management. The customer can thus be offered a holistic flow of information that makes the supply chain process transparent and optimizes it.
- GIB is a manufacturer of SAP-based and licensed software that optimizes all supply chain processes. With more than 25 years of experience, 60,000 satisfied users and around 600 customers worldwide, GIB is a central key player among the manufacturers of SAP-based supply chain software.

Based on the outlook of the company owner and chairman of the board, Michael Marhofer, the goal of the 2nd billion should be reached by 2029. Europe should continue to provide the largest share for this growth objective. Americas and APAC are to play an increasingly stronger role, so that the share of company sales should be close to that of Europe. Although the relative

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growth of Africa should make significant leaps, it will probably still make a comparatively small share of ifm's sales until 2029.

In order to reach this sales growth goal, ifm owner, Michael Marhofer, defined some crucial conditions for the company, so that the company is able to cope with the associated challenges as illustrated in Figure 2.







-  We must be a problem solver.
-  We must be reliable and provide exemplary services.
-  We want to develop whole industries.
-  We will digitize business models.
-  We must practice cross-selling.
-  We shall tackle new market (America, Asia, Africa) and maintain established markets (Europe).

Fig. 2 Capabilities and conditions that are necessary for the 2nd billion goal (source: ifm).

Industry 4.0 and Digitization as transformational drivers for ifm

Industry 4.0 and digitization are megatrends that concern all industries. In 2005 ifm took the first steps towards Industry 4.0 with technologies such as IO-Link and other activities. Ifm's current approach is to work with "use cases": The focus is on the digitization of individual machines in order to build an all-encompassing network of production locations. Ifm sensors are designed for manifold applications and requirements of various industries.

In preparation for the strategy workshop Michael Marhofer discusses together with the co-chairman Martin Buck the impact and chances of industry 4.0 and digitization on ifm. "*We can not only produce sensors, but also systems for industrial automation and individual solutions for special requirements of our customers that go beyond the standard*", says Martin. "*I mean, we should sell more systems instead of just individual components in the future.*"

Today ifm's products form the basis for automation, networked production and Industry 4.0. "*It's no longer just about controlling machines,*" says Martin Buck, "*but collecting data, evaluating it and drawing conclusions about the condition of the systems or increasing their productivity. Ifm is increasingly developing into a solution provider. Ifm no longer offers sensors only as components but deals with a problem at the customer's and offers him several components which, in combination, represent a solution to the customer's problem. In addition to the components sensor, connection technology, IO-Link master and edge gateway, such a solution also includes parameterization and software.*"

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Therefore, in addition to the sensor technology, ifm has expanded its portfolio in recent years and offers complete systems. Among other things, the sensor experts were involved in the development of the IO-Link communication standard, which is considered the basis for Industry 4.0 applications. Ifm also supplies the appropriate hardware with so-called masters. Sensors are connected to them in order to transfer data to the IT environment or to a cloud.

IFM was already involved in the development of the IO-Link communication standard, which forms the basis for many Industry 4.0 applications. "Do you remember our big moment in Hannover?" Michael asks. "Sure! The Brave New World Moment", Michael answers and smiles. The two of them remember an important visit on the Hannover trade fair: "It's a brave new world," said the then US President Barack Obama when he together with German chancellor Angela Merkel visited the IFM stand at the Hannover Messe 2016 and stayed longer than planned. An unforgettable highlight in the company's annals.

Sensor market overview

Defining the exact market or the exact competitive environment of ifm turns out to be more difficult due to ifm's heterogeneous product portfolio. In many cases, competitors are relevant in certain specific product areas, but not at all in others. In addition to the product range, the companies also differ in the markets they are targeting. Most of the time, the sensor providers, especially the larger ones, have a fairly broad industrial portfolio, but mostly also have industrial applications in which they are particularly specialized.

For an initial overview, however, the most relevant market participants from Europe and their development in recent years can be considered. The market participants listed can be clustered into three groups according to their size (turnover and number of employees). Festo, Endress + Hauser and Phoenix Contact are among the three largest market players. Sick, Wika, ifm and Pepperl & Fuchs can be assigned to the midfield and Turck, Balluf, Vega and Jumo as smaller market participants. In terms of development, the listed sensor manufacturers achieved an average growth of + 10.6% in the years 2016-2018. While some participants, especially the medium-sized ones, achieved double-digit growth in sales and employees, Festo and Endress + Hauser as well as Vega and Jumo are growing below average. Overall, ifm achieved above-average growth in the sensor market in terms of sales and personnel in the years 2016 to 2018 (see Fig. 3).

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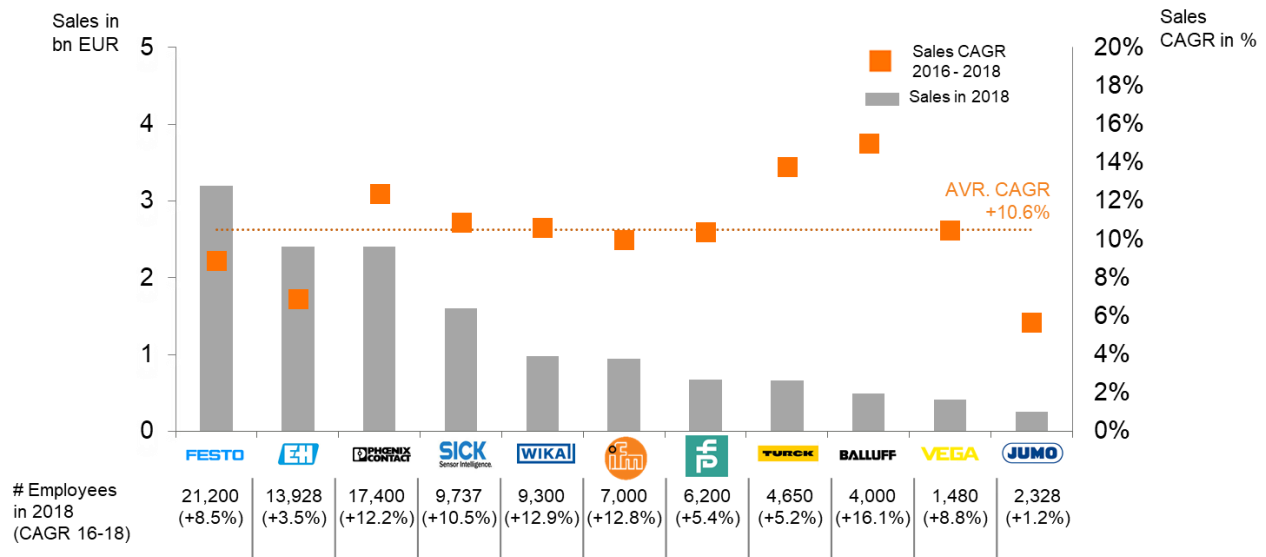


Fig. 3 Selective overview of sensor producers.

The role of services in the industry and within ifm

Within the sensor market, the long-term business focus is shifting towards the offer of solutions. The aim is that customers can rely on the fact that their applications and processes are guaranteed by the solution of the sensor provider through connecting the various components of the solution within the customer process and acting smartly with one another in order to make it as successful as possible.

When it comes to offering services, the perspective of market participants in the sensor and automation market is different, especially when it comes to monetization and the underlying business model.

One of the larger players within the automation market, Endress + Hauser, developed a huge service unit within the organization. Their worldwide strategic service organization counts around 1,000 employees with 150,000 customer requests per year. Their service business grew disproportionately. For example, their competence in the maintenance and calibration of measuring devices is increasingly in demand. Knowledge transfer is also gaining in importance, increasingly in the form of webinars. The monetization of the services at Endress + Hauser becomes clear through a four-stage offer (see Fig. 4). Thereby the availability, type of technical help and support with the performance review differ.

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	ESSENTIAL	STANDARD	PLUS	PREMIUM
Online access to Endress+Hauser knowledge base	Basic	Extended	Extended	Extended
Support request online & phone hotline	✓	✓	✓	✓
Technical support availability	8/5	8/5	8/7	24/7
Priority Callback		4 hours	2 hours	1 hour
Visual support (live video transmission)		✓	✓	✓
Support Success Program & performance reviews			Quarterly	Monthly
Business Model	Free of charge	Contracted offering	Contracted offering	Contracted offering

Fig. 4 Service packages from the sensor supplier Endress + Hauser (Source: Endress + Hauser).

However, ifm has a different perspective when it comes to the organizational set-up of the service area. Regarding building up people and hiring process: They currently do not want to become a ‘service company’ with hundreds of service employees and organizational structures. Rather, they want to attack service offerings from competitors with smart and digital solutions. Also, they want to identify and monetarize existing service offerings where the customer is willing to pay for. This means they want to identify services in the market that are worth attacking – as well as identifying services that are worth charging for. Right now, many sales and service offerings are not charged by ifm. They are more likely to be seen as part of the product offering and are monetarized through higher prices for the respective components. Services that are currently monetarized are Inspections (follow-up time measurement), training activities for personnel, consultation, calibration & programming, repair, certificates and references as well as reporting & documentation.

The challenge for ifm is, that their claim „close to you“ might soon mean to not only sell hardware components to their customer, but to also offer a complete range of complementary services along the value chain of their customers. Certain competitors are already working in this direction and have proven success in this area. However, it must be noted that in addition to the numerous opportunities for portfolio expansion with services, there are also some risks for ifm, when it comes to the alignment of resources, capabilities and strategy of the company. Some of the chances and risks are displayed in Figure 5.

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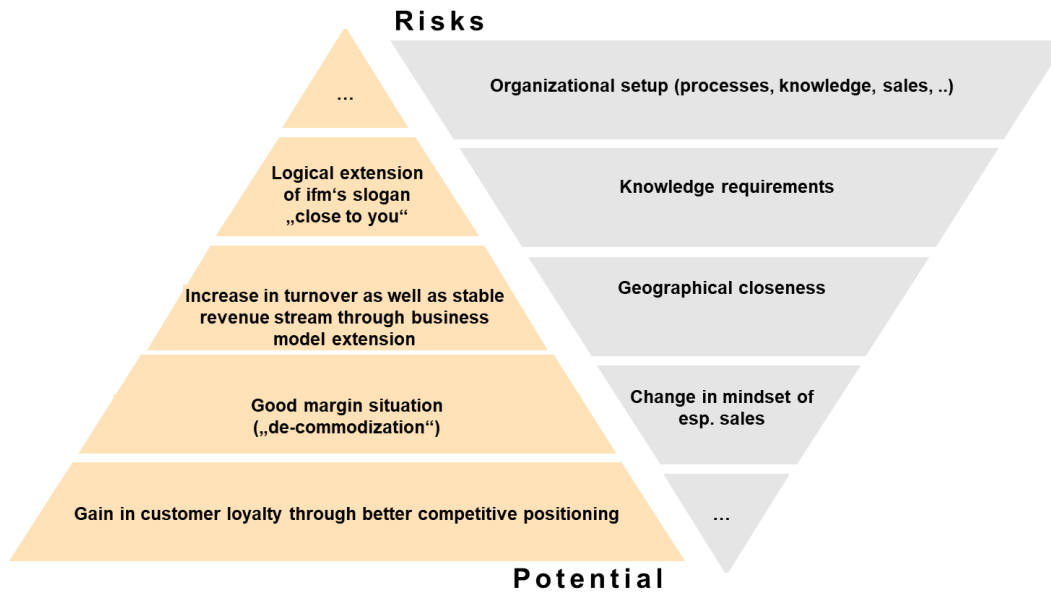


Fig. 5 Comparison of the potentials and risks for ifm of expanding the service business (based on Turunen and Neely (2012)).

Excursus: Development from component over service to solution selling

It can be observed that the service business is becoming increasingly important for the portfolio of companies in many industries. The development to a service provider is very lucrative for companies and relevant for their sales growth. The maturity of a market is relevant to the speed and pressure of companies to develop. The more mature a market is, the shorter the life cycles of the products. The blue curve in Figure 6 clearly shows that the total sales of a product decreases with a shorter life cycle, shown with the area between the curve and the X-axis. When the market is getting more mature and the cycles are getting shorter and shorter, companies have to develop products and bring them to market more and more frequently in order to maintain total sales. If development costs remain the same, this has a negative effect on profit. In comparison, studies show that service offers for certain products can, for example, result in two times the sales of the product, since the life cycle is longer than that of the mere products.

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Sales

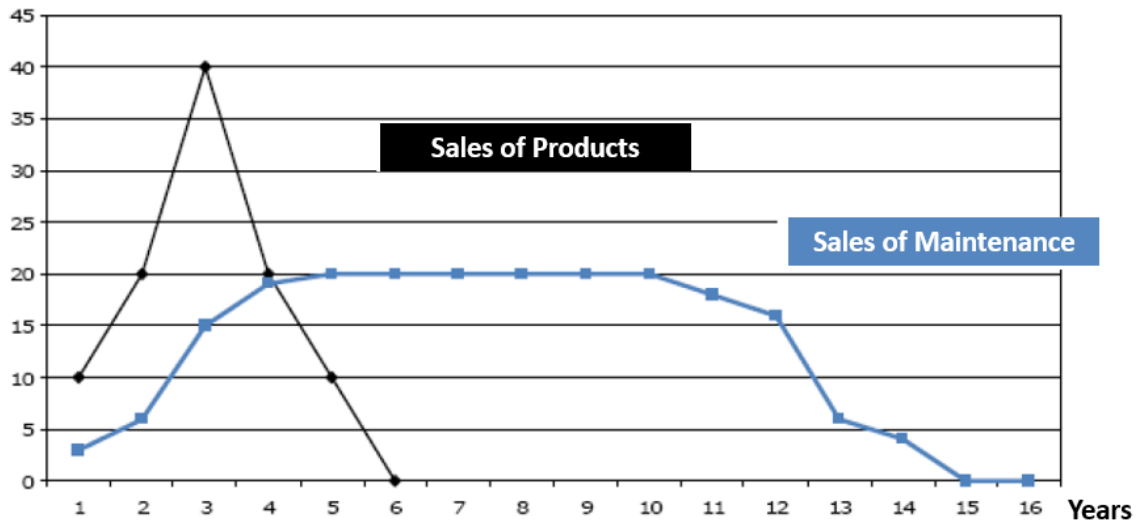





Fig. 6 Example of a product and maintenance life cycle (source: Simon (1993)).

The expansion of the portfolio with service offerings are mostly seen as an intermediate step by the component manufacturer towards a strategy of becoming a solution provider (see **Fig. 7**). Within this process, which numerous companies go through, a change or development of the value proposition takes place. As the value proposition within a product focus is to sell high value products, the value of service is to improve the efficiency and effectivity of customers. This illustrates the first step in shifting the focus from the product and its properties to the actual added value for the customer created by the company. In the third development step, becoming the solution provider - in contrast to the product provider - the focus is on the added value of the customer and how this can be achieved for the customer. In doing so, it is less one's own skills and strengths that are analysed than those of the customers, so that they are successful within their business.

Strategy focus	Product	Service	Solutions
Value proposition	"We sell high value products"	„We improve efficiency and effectivity"	We increase the success of our customers
Branches		We avoid the breakdown of diesel engines	We optimize our customers' transport costs
		We react quickly to product defects	We reduce the lifecycle costs of the fleet
		We improve the logistic efficiency	We minimize the logistics costs for C-Parts

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Fig. 7 Development from product to solution selling (based on Gebauer 2014).

The speed at which companies develop within the three-stage process depends on the maturity of a market or industry. While very young technologies persist in the product offering stage for a long time and bring out innovations in this area, particularly mature markets are increasingly offering their customers solutions.

A well-known example of the development from a product to a solution provider is Hilti (see **Fig. 8**). Starting with screws, drills and other tools, they have manufactured and sold high quality and innovative products here. The next step was to expand the service business. Repairs, maintenance, theft protection and financial services have expanded the portfolio. Hilti has now become a leading example in the solutions business. They promise "Concentrate on your core business. We take care of your tool fleet." From procurement, delivery, repairs, maintenance to replacement, Hilti offers its customers complete fleet management.

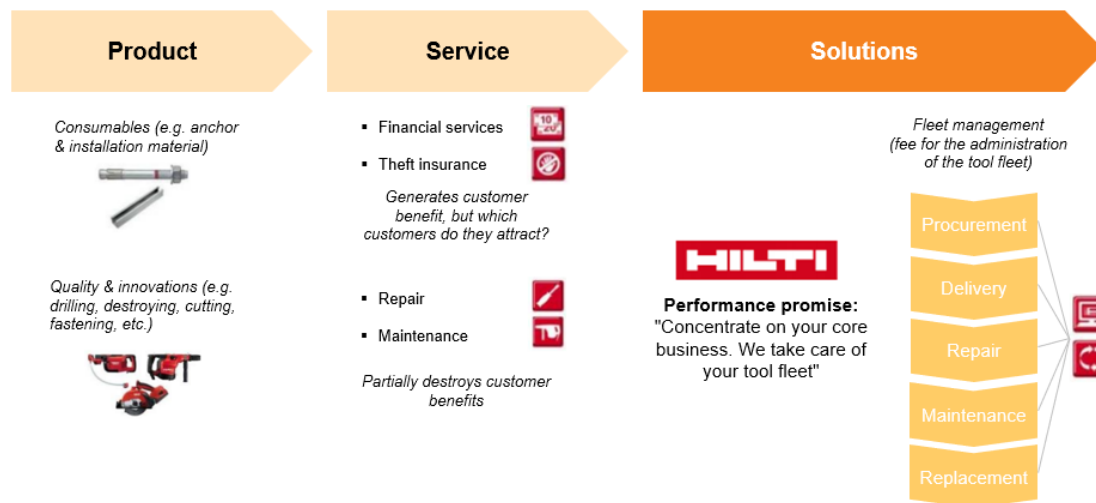
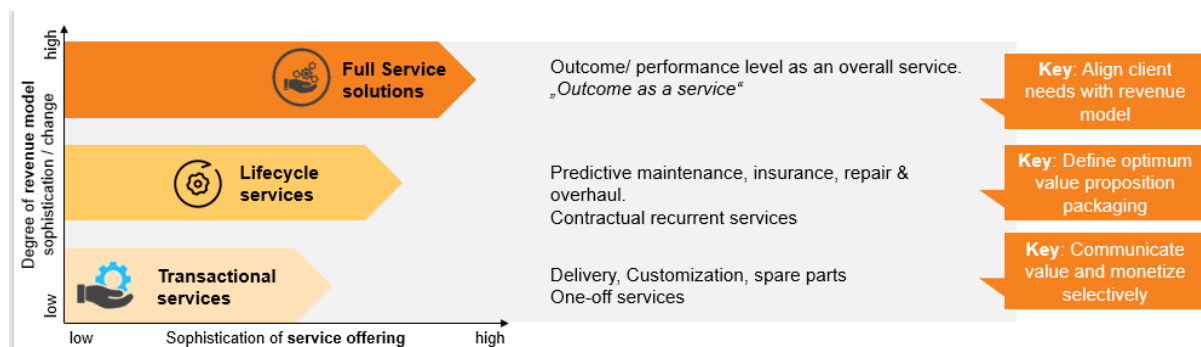


Fig. 8 Hilti's development towards solution provider (based on Gebauer 2014).

Services themselves can be viewed differently, depending on the revenue model and the degree of sophistication of the service offering. One way is to cluster services into three different types.



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Fig. 9 The three sub-stages of services (based on SKP).

Transactional services have the lowest level of sophistication of those three of Figure 9. This service type is usually carried out in one transaction by the provider to the customer and contains value added services like consulting, payment handling, delivery, customization, spare parts and one-off services. The decisive driver for the success of these services on the market is the communication of the value-added by the service and the selective monetarization of it.

On the other hand, lifecycle services deal with extending the life cycle of customer products. They are not completed with a transaction but are characterized by constant and ongoing support. Typical examples of lifecycle services are predictive maintenance, insurance, repair & overhaul, contractual recurrent services, enhanced technical support and planning regarding specifications, design as well as training. Mostly lifecycle services are not offered as one single product but more likely a package of service. It is therefore crucial to define an optimum value proposition packaging in order to successfully bring these services to market.

The service with the highest level of sophistication are so-called full-service solutions. The focus here is less on the actual performance than on the actual outcome for the customer. Full-service solutions are characterized by usage-dependent monetarization (shifting from CAPEX to OPEX for industrial goods) and dynamic contracts (e.g. demand based shipping). Additionally, so-called new digital solutions (Internet of things / cloud) are increasingly being classified in this service category.

Growth strategy workshop: Starting for the next billion

During the strategy workshop on the ifm's 2nd billion growth strategy, which deals with the development of ideas and approaches for the service business, Michael Marhofer presents a process perspective of corresponding services allocated along the value chain of a typical customer of ifm sensors (see **Fig. 10**).

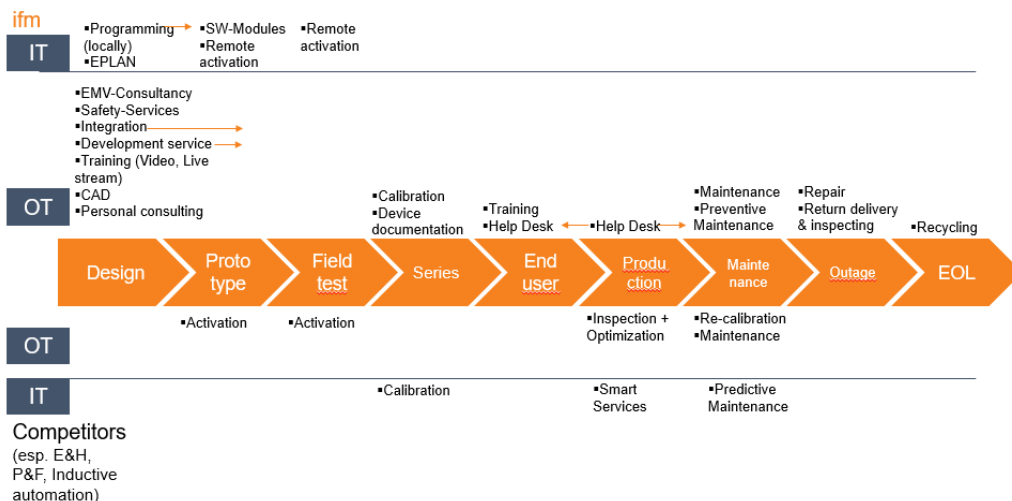


Fig. 10 Strategic requirements for the 2nd billion; EOL = End of Lifetime (source: ifm).

Services above the horizontal activity chain represent existing ifm services. The services below show those offered by competitors. Within this dimension, a distinction is also made as to whether the services are based on operational technology (OT) or information technology (IT). “Which services would you recommend to build in our business model and how could be create value with these services?” Michael asks his expert team.

Mario Holt, Head of Content and Campaign Management takes the initiative for the first answer: “Services are not that easy to scale. There is a great risk that a large investment will be necessary for the development and that there will not be a sufficient ROI. We must avoid the mistake of building services just for the sake of the services.”

The head of Strategic Marketing & Sales Excellence Sascha Rahman rebuts: “Nevertheless, services are already an essential part of our value proposition for the customer. We’re already doing a lot, but we’re not even aware of it. The various services that we already provide are not booked directly by the customer, but they are a major reason why customers like to pay more for our offerings – I mean of course paying for sensors and services.”

Robert Mönning, Product Manager: “If we look at our market environment, there are many services that we are working on, some that we could offer without further ado and some for which we would first have to invest significantly in people and their capabilities as well as in organizational structures and resources in order to be able to offer them.”

Mario Holt: “We should use digitization to offer smart services. In the first step we can consider whether we can scale existing ifm offers with the help of digitization in order to set free existing resources. Then we can determine which services our competitors can add to other services that are also digitally scalable. This will enable us to develop this business area without deviating from the strategy and building up too many resources in this area.”

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Nadine Rahman, CEO of ifm solutions: *“However, we have to avoid the risk of sticking a price tag directly to all services just so that our service portfolio is of a corresponding size. However, we should equally appreciate monetization through an invoice as part of our growth path, as well as that through a higher price. Nevertheless, a more systemic and structured analysis and execution of both monetization variants would improve our performance.”*

“I am in search of IT services that will provide smart scalability with the help of digital resources. Therefore, two approaches make sense to be used when developing and investigating smart services: First, to identify approaches in traditional and known areas – I mean based on competition and customer requirements - and also to identify approaches in ,out of the box‘ so-called unknown areas – this is based on cross-industry benchmarking and best practices.”
Michael Marhofer concludes.

Assignments

1. *Please describe why ifm is a Hidden Champion and explain the notion of market leadership presented by the CEO of ifm, Michael Marhofer.*

Recommended literature:

Simon, H. (2009) *Hidden Champions of the 21st Century. Success Strategies of Unknown World Market Leaders*, Springer: Wiesbaden.

2. *What is the growth trajectory of ifm? How did the company grow? What is the role of innovation and internationalisation in this history of success?*

Recommended literature:

Audretsch, D.B. / Lehmann, E. E. / Schenkenhofer, J. (2018) *Internationalization Strategies of Hidden Champions: Lessons from Germany*. In: *Multinational Business Review*, Vol. 16, No. 1, pp. 2-24.

Johanson, J. / Vahlne, J.E. (1990) *The Mechanism of Internationalization*. In: *International Market Review*, Vol. 7, No. 4, pp. 11-24.

Penrose, E. (2009) *The Theory of the Growth of the Firm*, oxford 4th ed. => pp. 6: *The Creation of New Productive Services*.

3. *Please describe the business model of ifm by using the business model canvas.*

Recommended literature:

McGrath, R.G. (2010): *Business Models: A Discovery Driven Approach*; in: *Long Range Planning*, Vol. 43, No. 2-3, pp. 247-261.

Osterwalder, A. / Pigneur, Y. (2010): *Business Model Generation*, Hoboken, NJ: Wiley.

4. *Please describe the value proposition of ifm using the value proposition canvas.*

Recommended literature:

Osterwalder, A. / Pigneur Y. / Bernarda, G. / Smith, A. (2014) *Value Proposition Design*, Wiley, Hoboken: NJ.

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5. *Please describe the future growth initiatives and future objectives. To what extent do services fit into these growth goals?*

Recommended literature:

Markides C. (2008) *Game-Changing Strategies – How to Create New Market Space in Established Industries by Breaking the Rules*, John-Wiley & Sons: San Francisco, CA.

6. *Which smart services and with which resources should be tackled by ifm (digital and automated or with an excellent analogous, but still technically experienced sales team)? What would you recommend Michael Marhofer to invest in?*

Recommended literature:

Frank, A.G. / Mendes, G.H.S. / Ayala, N.F. / Ghezzi, A. (2019) *Servitization and Industry 4.0 convergence in the digital transformation of product firms: A business model innovation perspective*. In: *Technological Forecasting and Social Change*, Vol 141, pp. 341-351.

Jussen, P. / Kuntz, J. / Senderek, R. / Moser, B. (2019) *Smart Service Engineering*. 11th Conference on Industrial Product-Service Systems, RWTH Aachen.

Gebauer, H. / Paiola, M. / Rapaccini, M. / Saccani, N. (2020) *Digital Servitization: Crossing the Perspectives of Digitization and Servitization*. In: *Industrial Marketing Management*, Vol. 88, pp. 378-388.

Chesbrough, H. (2011) *Open Services Innovation. Rethinking your Business to Grow and Compete in a New Era*. Jossey-Bass: San Francisco, CA.

7. *How can ifm sustain its capability to innovate in the long-term? What are the requirements for the organisation? In how far will ifm need to (re-)structure its resources?*

Recommended literature:

Etiemble, F. / Osterwalder, A. / Pigneur, Y. / Smith, A. (2020) *The Invincible Company - How to Constantly Reinvent Your Organization with Inspiration From the World's Best Business Models*, Wiley, Hoboken: NJ.

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- Frank, A.G. / Mendes, G.H.S. / Ayala, N.F. / Ghezzi, A. (2019) Servitization and Industry 4.0 convergence in the digital transformation of product firms: A business model innovation perspective. In: *Technological Forecasting and Social Change*, Vol 141, pp. 341-351.
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- Rammer, C. / Spielkamp, A. (2019) *The Distinct Features of Hidden Champions in Germany: A Dynamic Capabilities View*. ZEW Discussion Paper No. 19-012, Mannheim.
- Simon, H. (2009) *Hidden Champions of the 21st Century. Success Strategies of Unknown World Market Leaders*, Springer: Wiesbaden.
- Jussen, P. / Kuntz, J. / Senderek, R. / Moser, B. (2019) Smart Service Engineering. 11th Conference on Industrial Product-Service Systems, RWTH Aachen.
- Penrose, E. (2009) *The Theory of the Growth of the Firm*, oxford 4th ed. => pp. 6: The Creation of New Productive Services
- Markides C. (2008) *Game-Changing Strategies*, pp. 37 => Redefine what you are really offering this customer / table 2.2. Innovating by offering the same product but selling it on a different value proposition

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Teaching Note

Target group: Bachelor students > 5th sem. with a specialization in:

- Innovation Management
- Strategic Management
- Sales Management
- Entrepreneurship
- General Management

Teaching objective: The case study invites students to:

- learn about the characteristics and leadership attributes of Hidden Champions.
- investigate the fundamentals of business growth, value-added and different growth levers as well as value drivers (especially for Hidden Champions)
- analyse the fundamentals of business model design and innovation as well as transformation due to Industry 4.0, and which resources and capabilities companies need to develop

Learning Outcome: Students should be able to:

- apply appropriate management frameworks to analyse resources and competencies
- use instruments for analysing the external environment and evaluate the impact on the company's strategy
- describe the business model of a company in an appropriate framework and pinpoint the opportunities for innovation

Case Type

This case is a situation case with a decision element on smart service development for business model innovation as a strategic recommendation to the CEO.

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Case Format

The case is a written case that can be supported by infographic, video interviews and photographs.

Evaluation criteria

Evaluation shall take place based on the following criteria

Evaluation criteria	Weight
research and analysis	high (40%)
problem solving	high (40%)
communication	moderate (20%)

Grading

Grading shall take place according to the following assessment structure:

German Grade	in words	ECTS grade	% of points
1.0	sehr gut / excellent	A	100%
1.0	sehr gut / excellent	A	99%
1.0	sehr gut / excellent	A	≥ 95%
1.3	sehr gut / excellent (-)	A	≥ 90%
1.7	gut / good (+)	A	≥ 85%
2.0	gut / good	B	≥ 80%
2.3	gut / good (-)	B	≥ 75%
2.7	befriedigend / satisfactory (+)	C	≥ 70%
3.0	befriedigend / satisfactory	C	≥ 65%
3.3	befriedigend / satisfactory (-)	D	≥ 60%
3.7	ausreichend / sufficient (+)	D	≥ 55%
4.0	ausreichend / sufficient	E	≥ 50%
4.7	mangelhaft / fail	FX	< 50%
5.0	mangelhaft / fail	F	< 50%

Preparation

We recommend that students are already familiar with the basics of strategic management. The case study is particularly suitable for discussing how to balance innovation and internationalization strategies. Furthermore, it invites to analyze and debate options for the design and development of new business models in the context of servitization and digitization. As this will involve also external growth strategies, students should have a basic knowledge of mergers & acquisition as well.

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Instruments

The case study is designed to teach and apply the following strategic management tools:

- business model analysis
- value proposition design
- Servitization-Digitization-Portfolio

Solution Outline

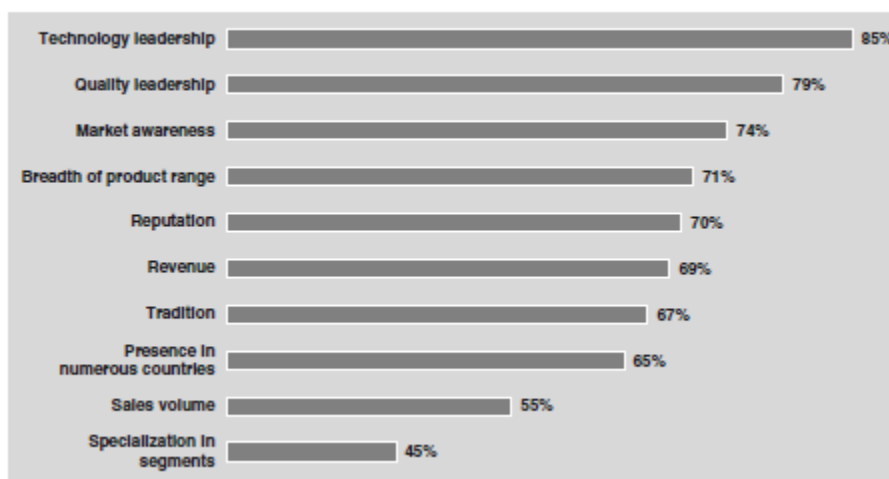
Nota bene: For each task there are references given, which refer both to textbooks for basic knowledge and additionally to primary sources for further and advanced reading.

1. *Please describe why ifm is a Hidden Champion and explain the notion of market leadership presented by the CEO of ifm, Michael Marhofer.*

Preparation: Students should have read in Hermann Simon (2009), pp.49 on market leadership.

Opening question: What constitutes market leadership?

Fig. 2.6: What constitutes market leadership?



Source: Simon, H. 2009, p. 49.

Afterwards, the term Hidden Champion should be defined and elaborated on:

The term “Hidden Champion” (In the following, HC is used as an abbreviation for Hidden champions) was defined in the mid 1990’s by Hermann Simon as he found out during his research, that German export success did not come from the large German companies,

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but was much more due to a group of companies that had and still have their origins in the middle class. These companies acted as world leaders in their markets. This laid the foundation for his research into the hidden champions.

Hidden champions set themselves the goal of achieving market leadership and expanding their growth. Market leadership is created by setting standards that define their markets and are binding for their customers and competitors. It is a value-oriented view that relates to market leadership through innovation, technology and quality. Growth takes place continuously and in line with market leadership.

Mostly, Hidden Champions are hardly known by the general public, but still have an outstanding market positions worldwide and Europe-wide in their market, which they have earned through top performance. They are characterized by ambitious and strong growth goals, which is driven by a high degree of internationalization and innovation. Their growth path is rather continuous than spectacular and proves to be fairly stable. Even though their goal is to reach market leadership.

From the beginning, HC do not limit themselves on the national, but aim for the whole global market. Europe and USA are their main markets. Asia, especially China, is their third pole with emerging trend. Due to its outlook Africa may be the next big goal for HC, but more likely in the long-term.

When it comes to growth within their product fields, HC focus on narrow markets and create unique products through depth. They are characterized by a high degree of innovation and invest twice as much as German industrial companies in research and development. As consulting and system integration is a main aspect of their value creation identity, it is difficult for their competitors to imitate the advantages of HC.

Hidden Champions maintain very close relationships with their customers. Being close to their customers is an important and crucial part of their strategy. They adapt their products to their customers, maintain close contact through their direct sales and sometimes expand together with their customers on new continents. Due to a continuous and regular exchange with their customers they are able to build up and maintain a long-term customer relationship.

Due to the high demands of their customers, Hidden Champions set high, above-average standards on the quality and value of their products and service quality. This includes the continuous and further development of technologies in order to meet the company's own standards and external expectations. Therefore, Hidden Champions are able to continuously offer top performance on the market, with the price playing a subordinate role.

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2. *What is the growth trajectory of ifm? How did the company grow? What is the role of innovation and internationalisation in this history of success?*

Understanding the roots for market leadership on a global playing field requires an in-depth analysis of the external and internal drivers. Students shall be encouraged to make their own choice for this analysis alongside the case material and further information from the ifm website. In addition, students should read in the recommended literature on success factors of hidden champions. Thus, this assignment is a perfect homework designed for approx. 2-3 hours of preparation before class.

In class, a presentation of students results and a moderated discussion by the case teacher should be directed towards the following findings and key take-aways:

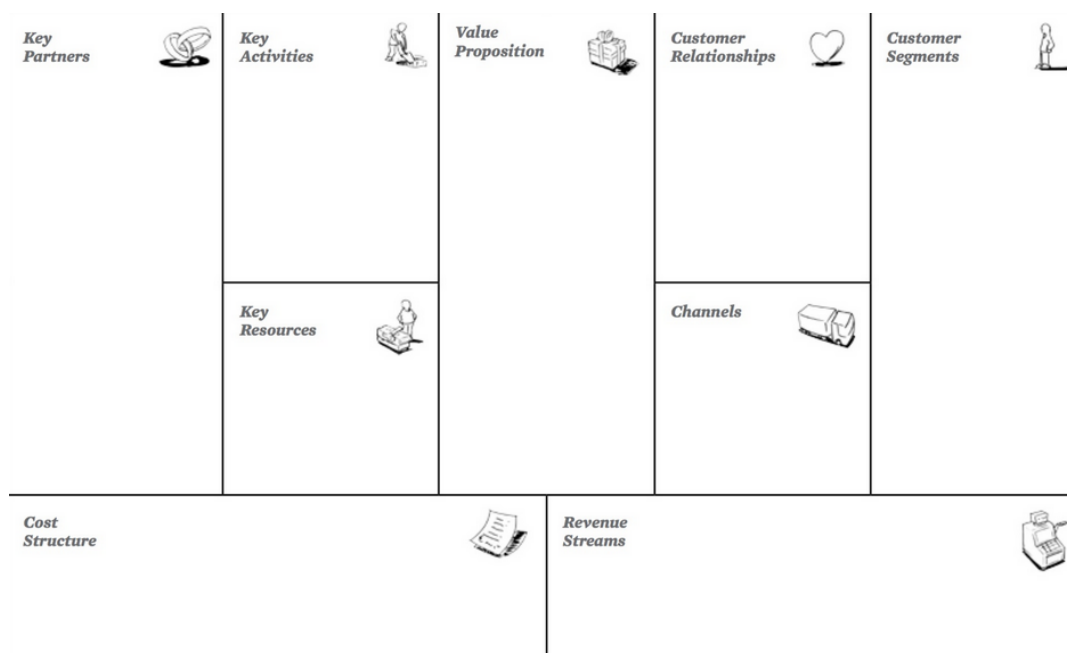
- Ifm remarkably complies with Simon's (2009) identified theoretical HC Model traits: being 'leadership with ambitious goals'; 'innovation'; 'high-performance employees'; 'closeness to customer'; 'globalisation', and 'focus' as well as 'visions and values'.
- Ifm established a virtuous cycle of market leadership advantages from which growth of ifm benefited. The findings are in line with Teece's (2014) model of dynamic capabilities, extending his framework by including market leadership approaches, alongside more specific concepts relating to entrepreneurial orientation.
- HCs do not invest more into innovation, but achieve higher innovation success. The higher efficiency can be linked to their superior technological capabilities and to higher investment in human capital and HR management practices that mobilise the creative potential of their employees. (Rammer / Spielkamp 2019)



Source: ifm 2018

3. Please describe the business model of ifm using the business model canvas.

Students should use the business model canvas and work-out the canvas in pairs or groups of three students. As an in-class assignment, we recommend 20-30 minute time.



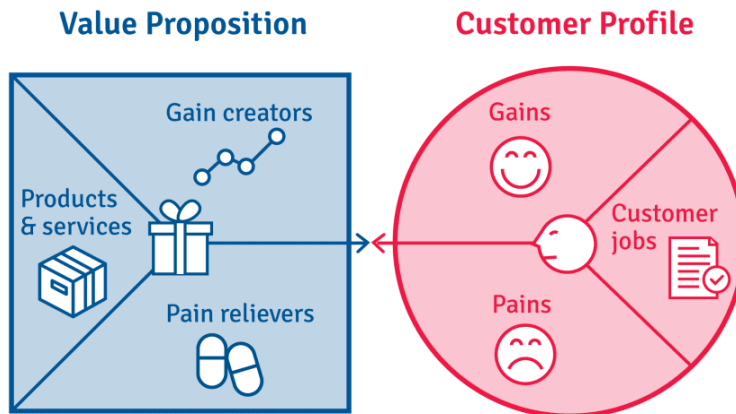
Source: Osterwalder / Pigneur (2010), p. 18-19.

Students should present their results in-class (by cold call).

4. Please describe the value proposition of ifm using the value proposition canvas.

Students should use the value proposition canvas and work-out the canvas in pairs or in groups of three students. As an in-class assignment, we recommend 20-30 minutes time.

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Source: Osterwalder / Pigneur (2010), p. 18-19.

5. *Please describe the growth initiatives and future objectives. To what extent do services fit into these growth goals?*

Being a specialist for automation technology with fifty years of experience in industrial manufacturing ifm positions itself as a reliable partner for the introduction and implementation of tailor-made digitisation solutions on the way to the smart factory. Students should discover the smart industry 4.0 examples of ifm customers to better understand the services offered and connected to the “classic” sensor business:

	<p>Iveco - Intelligent diagnostics in the body shop Ready for industry 4.0 with ifm system solutions</p>
	<p>STARRAG - ifm IO-Link sensors provide more information for better processes Digital upgrade by using IO-Link sensors from ifm</p>
	<p>FCA - from cyclical to condition-based maintenance With ifm IIoT solutions to gold status</p>

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 <p>effective</p>	<p>SFH - 30 % time saving by intelligent ifm solutions</p> <p>ifm system solutions for the digital upgrade</p>
 <p>smart</p>	<p>SMART LOCK - detect damage early</p> <p>Predictive maintenance with ifm vibration diagnostics</p>
 <p>safe</p>	<p>AGV - predictive 3D cameras for fast and reliable pallet handling</p> <p>The ifm 3D camera used at the company Tecnoferrari</p>

Source: <https://www.ifm.com/il/en/shared/technologies/industrie-4.0/industrie-40>

To sum up, ifm aims at generating added value and growth by services for:

- optimisation of production and maintenance processes
- increased efficiency and effectiveness
- less cost

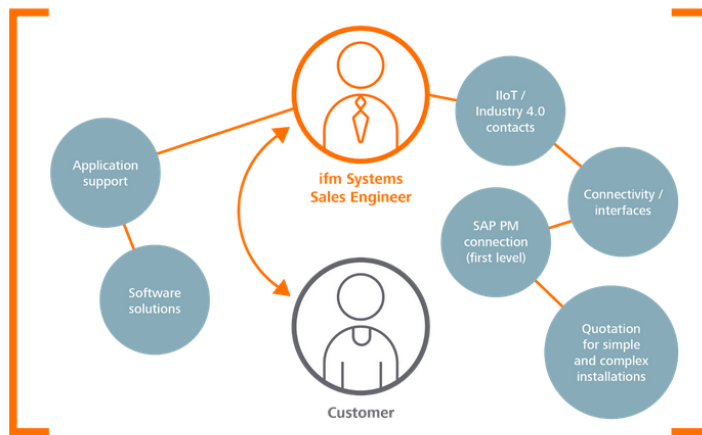
whereas the basis for this service and value-added is always sensor-generated data.

The convergence is called smart solution.



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and puts the ifm systems sales engineer at the center of the business model:



ifm system sales network

Your personal ifm system sales engineer will provide you with the entire ifm know-how to implement and optimise your plant monitoring. We are there for you.

<https://www.ifm.com/il/en/shared/technologies/industrie-4.0/industrie-40>

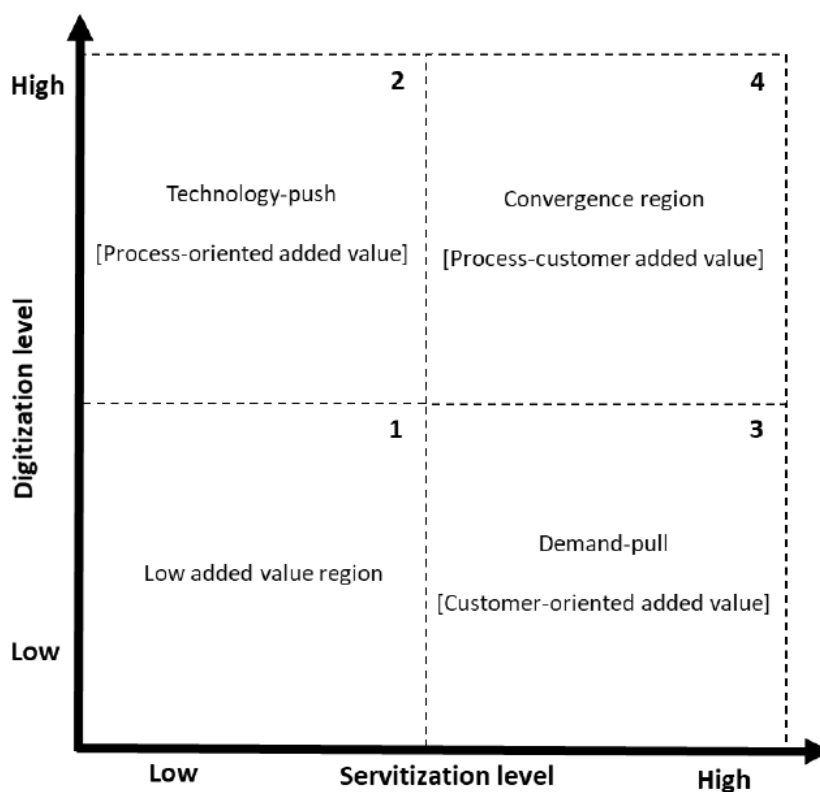
Case teachers might show the embedded video.

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6. Which smart services and with which resources should be tackled by ifm (digital and automated or with an excellent analogous, but still technically experienced sales team)? What would you recommend Michael Marhofer to invest in?

There are multiple solutions possible in answering this assignment. There is neither right nor wrong. The assignment is suitable for experienced / advanced bachelor students in order to invite them for reflection and conceptualization.

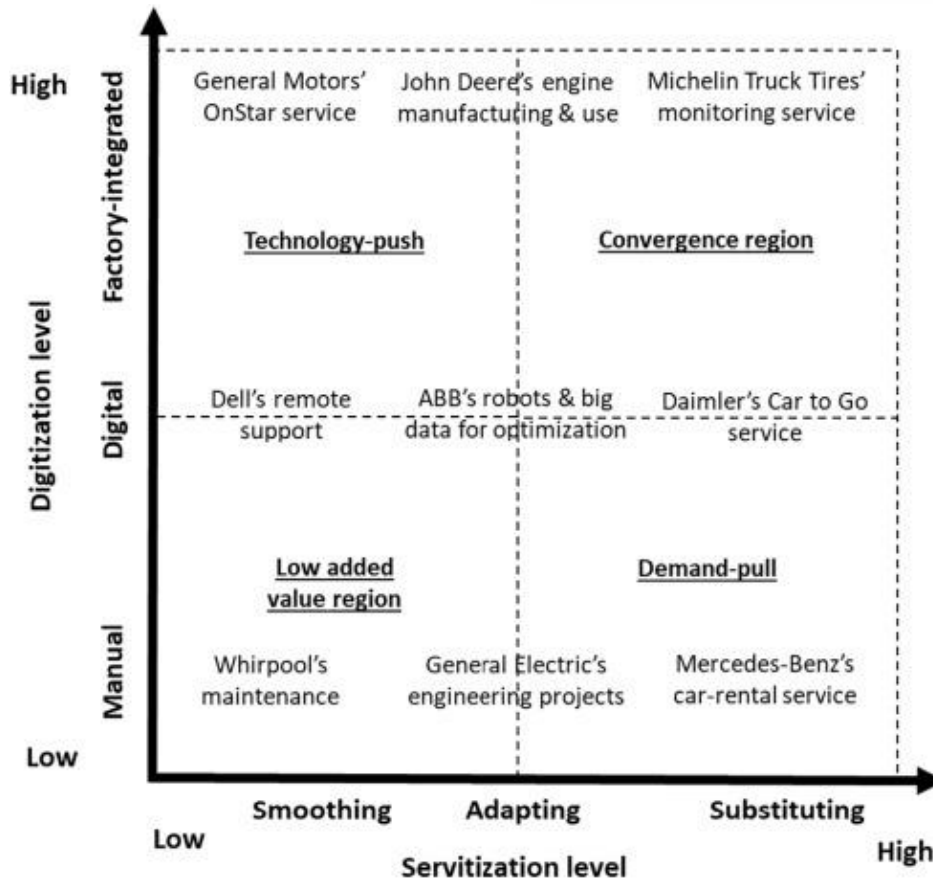
As the assignment asks for the level of servitization and digitization which could be discussed based on the following 2x2-matrix.



Source: Frank et al. (2019)

In order familiarize students with this matrix, the case teacher could give or ask for known examples of product firms and classification into the matrix as shown below:

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After this discussion and reflection students should understand:

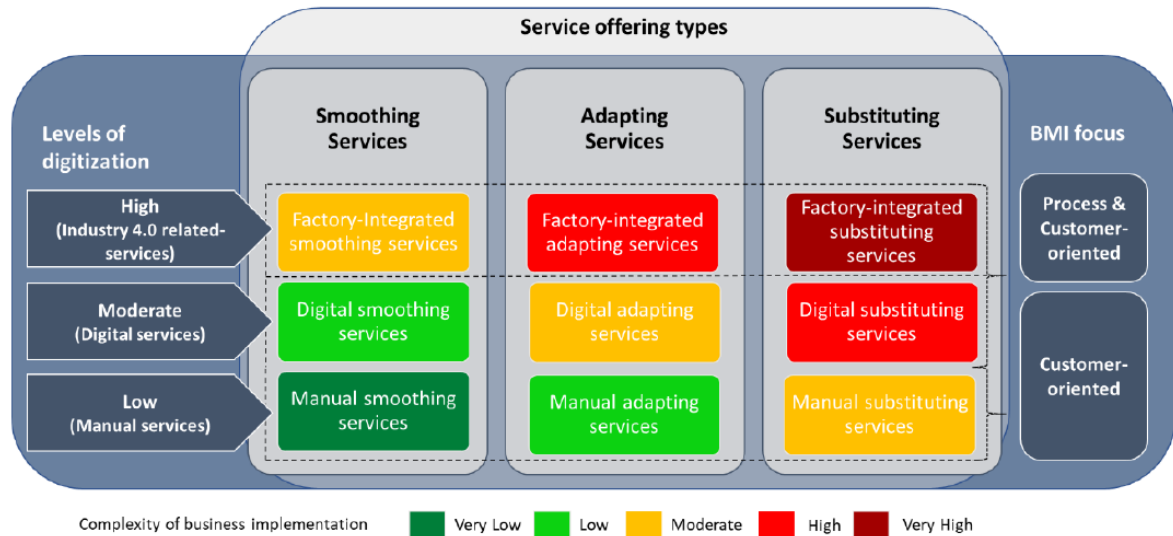
- **Servitization and its added value**

Industrial companies are in a great change. Companies from almost all industries are equally concerned with two megatrends: digitization for Industry 4.0 and servitization. Digitization is a technology push that deals with value creation within the value creation process. On the other hand, servitization is a demand pull in which value creation for the customer is the focus.

But in addition to the customers, these developments are also of great importance on the supplier side, as they mean developments and great opportunities for business model innovation. For this purpose, Frank et al. (2019), for example, set up a model that combines servitization and Industry 4.0 concepts from the perspective of Business Model Innovation (BMI). This is based on based on three levels of servitization (i.e. smooth, fit, and replace) and three levels of digitization (i.e. low, medium, and high digitization).¹

¹ For detailed information on the model, see Frank et al. (2019, p. 9-13).

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Conceptual framework for Servitization and Industry 4.0 convergence (Source: Frank et al. (2019, p. 9))

But in addition to the possibilities, servitization also means that companies increasingly have to deal with challenges in order to successfully contest the development. This includes, among other things, that the perspective of industrial companies is changing from a technology focus to a customer-centric focus. That only works if there is absolute backing for this change from top management. This change in culture must be achieved in all employees and anchored in the entire life cycle process. In addition, skills must be developed to embed the customer in their own technology development. Corresponding performance indicators of the customers' total cost of ownership must also be recorded, but the productivity of their own services must also be guaranteed.

- **Digitalization within the sensor market**

Digitization is changing the different industries and thus also the demands on automation technology. Sensors can be understood as sensory organs in Industry 4.0. For many decades, sensor technology has mainly supplied binary sensor signals for the control. Sensor signals are now used to see the state of the machine. Machine and factory data are therefore increasingly being recorded as part of condition monitoring. This also changes the requirements for the sensors. This results in the trend towards wireless sensors. In addition, factories can be wirelessly networked more quickly and easily than cable solutions. A second trend is the topic of security, because the factory opens up to the Internet. This means that security features must also be taken into account in the automation components.

In industrial technology, for example, sensor systems are becoming more and more important because they have to collect huge amounts of data. For companies, this means

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that they have to invest properly so that they can meet the demand for intelligent data use and not give up their expertise.

The sensors of the future will not only emit one signal as in the past, but several. This is made possible by IO-Link. Because IO-Link can be connected to control systems with Ethernet-based fieldbus systems. The data link allows a sensor to output more than one signal. So far the output of a sensor could only be one signal. Due to IO-Link, the output of a sensor can now be several signals, such as real-time signals or status signals. A classic example are process sensors that can output temperature signals in addition to pressure, flow, flow and level signals. This information was already available in the sensor before but was not output and IO-Link now enables these signals to be sent to the outside.

Another development with regard to sensors of the future is that sensors are increasingly recording machine status data, such as the temperature curves in the machine. In addition, the sensors enable process monitoring in order to subsequently be able to draw conclusions about quality issues by measuring the corresponding processes along the production chain. These tasks change the sensors and its required capabilities. In the future sensors will be more intelligent sensors with more computing power.

Industry 4.0 means that you collect data from factories and do something with them. But data alone has no value. Information must be obtained from this. But in order to turn data into information, you need computing power, because you have to evaluate and calculate a lot of data that is collected worldwide. This enormous amount of data cannot be processed in the machine because it requires too much computing power. The cloud is suitable for this. This means that we collect the data with the appropriate specialist or application knowledge, process it and turn it into information.

7. *How can a firm's ability to innovate be guaranteed over the long term and how can the resources be structured for this?*

Students should run a moderated discussion on the dynamic capabilities concept of Teece.