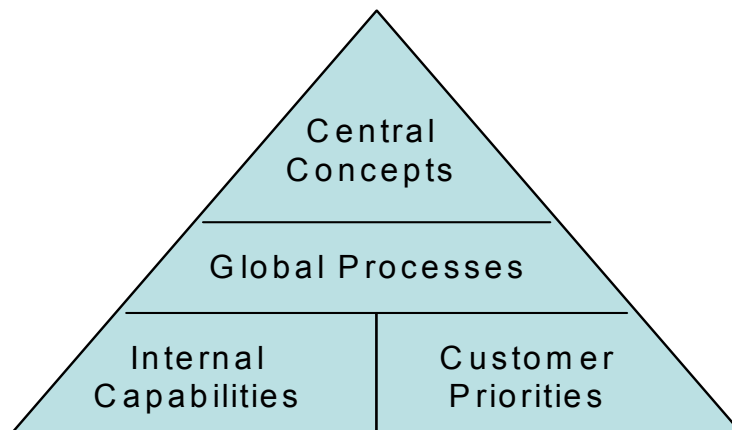


The IASS Umbrella project

INDUSTRIALIZING AFTER SALES SERVICES



Industrializing After Sales Services, IASS, is a research and development project equally financed by participating companies and VINNOVA, performed by the Marketing Technology Centre (MTC), Linköping University School of Management, and the Swedish Industrial Design Foundation (SVID).

Participating companies are AGA/Linde Gas, BT Industries, TeliaSonera, ITT Flygt, Metso Minerals, Electrolux Laundry Systems, Volvo Bus Corporation and Saab Technologies.

The aim of the project is to identify how to increase companies' ability to develop and produce after sales services in an industrialized way.

This report summarizes the work within the umbrella project IASS primarily addressing the industrialization aspect of after sales services.

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1. INDUSTRIALIZATION OF AFTER SALES SERVICES

When industrial companies change strategies from products to systems and functions, the after sales part of business is becoming even more important. In many cases, after sales is also the most profitable. However, this profitability can perhaps more often be connected to “local monopolies” and “lock in effects” with customers created by the “new product sales”, rather than a high degree of value added and efficiency in the after sales activities. If so, the situation could very quickly change if competition in the after sales area increases and the companies at the same time are slow to improve their efficiency (productivity) and their effectiveness (value added).

The big challenge for these companies going the path from products and production to services and after sales is to reinvent themselves as service organisations. The trend towards the bundling of services, more focus on financial and consultative services etc, raises a number of new demands in terms of capabilities, processes and development. The established “product and production logic” based upon centralized product development and production has to be replaced by “service logic”, which basically is about the integration of internal processes between front-office and back-office functions as well as working close to and often together with the customers.

These challenges can consequently be associated with the situation that manufacturing is no longer the sole core aspect. Activities previously carried out by the customers or other actors in the value chain are taken over by the supplier and also considered as core aspects (for example maintenance, training, operations, consultancy, and service provision). In addition, this trend is adding a need for rethinking the use of information technology, since it represents an innovation which enables the company to carry out its new core activities in other ways, often more cost efficient as well as more organisationally integrated.

In this project the focus has been on strategies for handling after sales services according to principles for industrialization. Compared to products, services tend to be more difficult to improve in the direction of standardisation of concepts and processes: customers, activities, and business deals tend to differ in too many ways – at least at first sight.

The situation is not getting any easier to handle, since traditionally after sales services have been designed as highly customized and carried out locally without any influence from central units. Therefore, a typical after sales service can be carried out in numerous ways, which are all meeting the customer demands, but resulting but at a large variance in service costs.

The concept of *industrialization* is most often used in manufacturing settings to denote the ramp up process of taking production from prototype phases with low volumes to an efficient high volume situation, taking full advantage of learning and scale effects. When using the concept on after sales services, the concept of industrialization implicates two things:

- *Central concepts* regarding the bundling of services, the definition service levels and other things that are related to the content of the offering. There is little room for local variation in the after sales offering to the customer.
- *Global processes* meaning that the interaction with customers, as well as the interaction between front-office and back-office, is implemented in a uniform (standardized) way, often with the back-up of IT-resources.

In this way industrialization should be the vehicle for both better service quality and other value added components as well as lower costs. Standardisation and scale economy are important issues, but also to conceptualize best practice applications in service development.

Of course, industrialization efforts could not be implemented one hundred percent. There are always needs for some kinds of local adaptation to customer demands and to local organisations.

2. THE IASS PROJECT

In order to continuously generate knowledge during the entire project period we agreed upon a project plan, where results were reported already from the beginning and also at several occasions to get a learning effect. The project was started by conducting a number of “mini drills” – small case descriptions - in each of the participating companies. These “mini drills” were carried out as a combination of personal interviews and a seminar (3-5 hours long) at the company, where all relevant documents and information were discussed and documented.

Focus was on a multitude of important issues: the present portfolio of services, how these services were developed, how the production and delivery of services was organised, what future challenges was most demanding and which companies and services that were used as benchmarks.

Four areas were identified as very important and these were also defined as the IASS subprojects. Industrialization was the overall theme and formed the umbrella project. The four subprojects are also analyzed in individual reports, each one focusing on one of the following issues:

- 1) How to increase the efficiency of the present portfolio of services.
- 2) How the value of services could be increased in the development and providing of services.
- 3) The contacts points between the company and its customers.
- 4) Price models for services that are bundled or unbundled into total offerings.

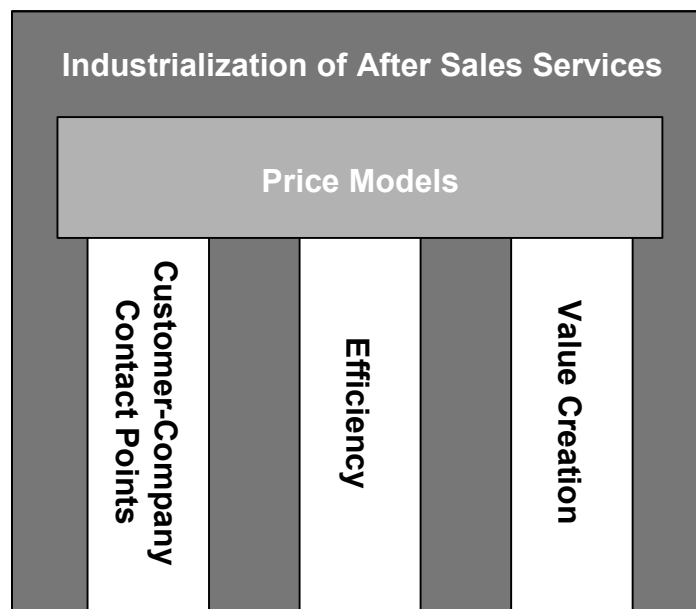


Figure 1: Four subprojects within the IASS project

In each of the subprojects, the researchers have been working closely with industrial specialists from the companies. In all companies knowledge and focus upon after sales services have increased during the project period and also partly as a consequence of the

project. Our choice of subprojects has also been validated as being very relevant. Knowledge has been gained and shared and has also been transformed into business development. From an industry perspective, the main benefit of the project has been access to systematic research results with an impact on their business development. The industrialization project has taken the role as a forum for benchmarking between companies and at the same time the researchers have got immediate access to relevant empirical cases and the most updated catalogue of strategic issues in the after sales area.

3. AFTER SALES SERVICES OFFERED

In this chapter we will present empirical results regarding the after sales service offerings that are provided by our partner companies. The different services are divided into categories (Table 1 below) and we also discuss to what extent the services are locally or centrally driven, i.e. how far towards industrialized concepts and processes different kinds of services have reached.

Table 1. After sales services offered by the case companies categorized into 4 categories.

		Telia Sonera	Metso Minerals	Electrolux Laundry Systems	Volvo Bus	ITT Flygt	Saab Aero- systems	BT	Linde Gas/ AGA
1	Operational services								
	Maintenance	@	@	@	@	@	@	@	@
	Training		@	@	@	@	Partly	@	@
	Upgrade	@	@	@	@	@	@	@	@
	Renovate		@	(@)	@	@	@	@	
	Operate the products		@		(@)	@			@
2	Business consultancy services								
	Advice on business plans, installations		@	@	@	@	@	@	@
	Design and provide the setup	@	@	@	@	@	(@)	@	@
	Maintenance program design		@	@	@	@	@	@	@
	Operations advices	@	@	@	@	@	@	@	@
2	Financial services								
	From investment to operations costs		@	@	@	@	@	@	@
	Operations		(@)		@	@		@	@
4	System integration								
	Design and integrate HW, SW and services to customer solutions	@	@	@	@	@	@	@	@

We have divided the after sales services into four categories:

- *operational services* are those basic services built on the spare parts business through service personnel, technical staff and other types of field personnel,
- *business consultancy services* which are based on the experience gained through the supply of products over long periods of time and under very different operational conditions,
- *financial services* that most often are offered to the customer as a way to either shift capital expenses (CapEx) to operational expenses (OpEx) or in more advanced situations to charge the customer based on their utilization of the products (a new revenue model),
- *systems integration services* that also include offerings from other companies and are putting them together into “total solutions”.

The different *operational services* are the backbone of the after sales services. For many companies these services are fundamental because of the close relationships to the “new product sales”. Maintenance and upgrading is an essential service in providing a guarantee for the products sold. These activities are often considered as strategically important, but it can be difficult to manage them on a global basis. Therefore, they are in some cases outsourced to local partners. But after some time these decisions have been questioned and the external service companies have been acquired. This has been the case for Electrolux Laundry Systems which in some locations (for example major cities) have acquired independent service partners and established their own service centres.

Training is an operational service that in itself incorporates a wide range of different sub-services. Historically, training has mainly been a responsibility of the customer, supported by the selling company. But this situation has dramatically changed during the last years. More and more customers demand that the supplier provides training services as a kind of guarantee that the performance levels of their offerings are going to be reached. But for the suppliers, this situation is often very complex. Taking Volvo Bus as an example, a mixed picture is at hand; training is important for some customer categories whereas for others it has a very limited value. For customers buying training services from the supplier, the step towards buying other kinds of supporting services for the operation of the products is not that dramatic, even if there are very few customers that actually are demanding them today.

An organisational backbone in the operational services is the assistance from some type of back-office support. Customers having problems may call or email reporting their problems or the products will automatically indicate (to the back-office) that problems have occurred. As a first step in the assistance process, it is important to identify what type of problem is at hand and how to address it in terms of activities. If an early identification of the problem can be reached, the downtime for the customer can be minimized which in turn boosts the reputation of the supplier, their products and services and thus are creating a positive circle. But back-office also have a role in identifying areas in which new types of services are required and ultimately how products could be modified to reduce the problems that are identified.

In price negotiations in a “new buy situation”, the offering of additional *business consultancy services* can make the difference for the customer. The problem from a supplier perspective is that this category of services is then often offered for free, even if they from the beginning have a specified price tag. Besides though competition, there are historical explanations to this kind of negotiation behaviour. Going back some ten to fifteen years, the sales of the

products or systems (the hardware) had enough margins to cover up for giving away some services for free. This is not the case of today.

The exemption, not giving up business consultancy services for free, within our group of companies is Metso Minerals. They also offer business consultancy services as stand alone products, i.e. without any obligation from the customer to buy products or other services. All companies offer business consultancy services, but their content differ. Consulting can be more directed towards the technical set up, identifying the products and services required for the customer. It can also be more directed towards how the customers business can be improved.

Financial services are for some of the suppliers a key aspect in their after sales service offering. Especially, by turning capital expenses into operational expenses in some kind of leasing agreement, the after sales activities are included in a total solution. Often financial services are bundled together with other after sales services to an offering that makes it possible for the customer to predict costs as well as adjust their capacity to the actual need (Example BT Industries – rental solution). However a financial service is often offered together with a financial partner, either wholly owned by the company or an independent actor. The independent financial actors can also turn out to be a powerful competitor (for example GE Capital). From a supplier point of view, the negotiation of a financial service in a total solution that “locks in” the customer could be very advantageous in different ways: the margins could be higher, better planning could reduce costs and the service level could be higher.

For systems integration, we can see that several of the companies handle these services in an independent division or company within the group (i.e. Metso Systems within Metso Mineral, Ferronova within AGA/Linde Gas) or for more specific settings requiring competence from outside companies through joint ventures (i.e. CO2 cleaning that is a joint venture between AGA/Linde Gas and Electrolux Laundry Systems).

Degree of Industrialization

From the overview of the current status of after sales services, we can draw the conclusion that some of the services are the result of more centrally driven initiatives, whereas others originate from more locally defined customer needs (Figure 2).

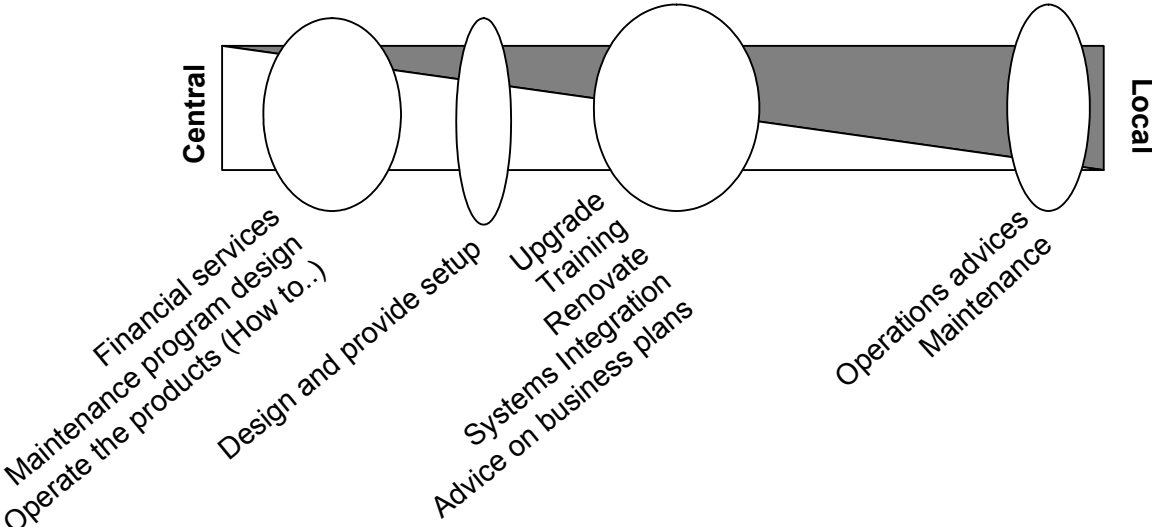


Figure 2: Degree of central vs local influence on the services offered

The overview also points to the fact that for some types of service the possibility to industrialize is larger than for others. Services already handled at the central level tend to be more standardised, for example all types of financial services, maintenance program designs, as well as directives on how the customer should operate the product in order to gain for example a specified performance level.

Maintenance, repair and operations advice tend to be handled in a mainly local way due to the tradition of independent local companies. This local diversity is something that a majority of the companies in the project have identified as a prioritised area of their industrialization efforts. For example ITT Flygt, Electrolux Laundry Systems and BT Industries have all started to focus on identifying standard processes in the work of the service engineers and to establish a limited number of standard service concepts with the objective to offer the same services and service quality in several countries. Industrialization through global processes and standardized central service concepts will be essential for these companies ability to provide maintenance and other operational services in a competitive way.

A majority of the services have both central and local influence. For example Volvo Bus has put increased efforts on their Key Account Management (KAM) organisation and the knowledge they represent. The KAMs for larger customers have knowledge not only about the specific situation of a customer, but they also have knowledge on how to integrate different products into a solution and on the linkages between different services in order to increase the performance. To be able to industrialize services, focus has to be put on how to utilize the competencies and capabilities within the organization in all possible settings. Saab Aerosystems has focused a great deal on these issues, so they will be better prepared to meet the demands from a changing customer base (from one major customer to several). At AGA/Linde Gas and Metso Mineral using the "collective knowledge" within the organisations have resulted in the creation of new businesses based on how to operate the customer production processes in order to gain the highest productivity at the lowest cost (for example Ferronova, Metso Systems).

Which potential does industrialization represent for these companies? The internal calculations of the industrialization potential discussed in the project points at a great potential to increase the after sales service efficiency as well as the after service value added. A focus upon reducing administrative costs is often combined with rethinking service processes, organisational solutions, service concepts and other aspects closely linked in after sales services.

4. INDUSTRIALIZED AFTER SALES SERVICES AT BT INDUSTRIES

BT Industries offers a broad range of materials handling solutions. The company is worldwide known for its trucks – from handheld forklifts to radio shuttle systems – but also for its services ranging from software to maintenance, field service and spare parts supply. BT Industries employs approximately 7800 people, with a net sales of 12,4 Billion SEK in 2004. The profit margin was 6.5%, operating margin 6.8 %, capital turnover rate 2.2 and the inventory turnover rate 9.0. Operating costs constitute approximately 22% of net sales. BT Industries is full owned by Toyota and part of the Toyota Materials Handling Group.

After Sales Services

BT Industries is a complete supplier of manual trucks, electric powered warehouse trucks and counterbalanced trucks. Focus is on developing solutions that are competitive throughout the lifetime of the truck, which places high demands upon the product itself and its functionality, upon competitive financial packaging and not the least upon service and spare parts availability.

Efficient and reliable materials handling services constitute a vital link in the logistics and distribution chains. It is essential that the trucks have high availability and that their operations are predictable. BT Industries offers a broad range of spare parts and accessories, not only for their own trucks, but also for most other makes on the market as well. Since the 1980-ies, BT Industries has offered rental agreements to their customers. Rental means a high degree of flexibility, reflecting the changing needs of the customer operations. By selecting the ideal combination of rental plans, BT Industries can help the customer to manage all truck-related activities in a way that enables the customer to enjoy both flexible capacity levels and low and predictable costs. The rental idea is a strong part of the after sales service offering of BT Industries.

Industrialization of service activities

A project aiming at reducing paperwork in the field service process and making some 1300 field service technicians more efficient was launched in the year 2002. The pilot project was called EASY (Engineer Administration System) and introduced a mobile field service solution developed by BT Industries together with the software suppliers Intenia and Cap Sogeti. Initially the project was implemented in Sweden, Great Britain and Belgium. By the end of 2005, EASY is operational throughout Europe.

In the EASY project hand-held computers for the technicians were introduced with functionality for sending / receiving service orders to / from technicians, information on service history, contracts and inventory, planned service / planning overviews, spare parts ordering, reporting and invoicing. EASY was synchronised with the ERP-system so that the same information was available for BT personnel independently of their geographical location.

After Sales Services before EASY

A service assignment is started when the customer contacts the service provider (BT Industries in this case) to order service. It can also be planned, contractual service that is to be performed. After the orders have been received, the call centre can start to plan for service execution. The different steps in the process are visualised in Figure 3.

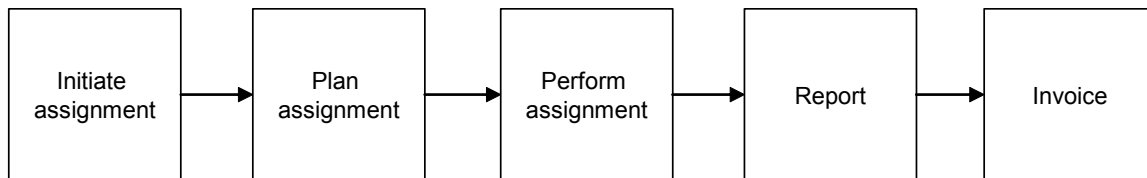


Figure 3: The service process.

Initiate assignment. The contact with customers is most often via telephone, fax or email. The call centre which receives the assignment collects necessary information from the customer and forwards the assignment to the planner.

Plan assignment. The assignment is sent to the planner either electronically or on paper – he schedules the assignments on to the available technicians in the organisation based on task complexity, geographical area and competence. Also different kinds of contacts with technicians and technical support are performed.

Perform assignment. The assignment is sent to the service technician who receives it via phone or on paper. In practice the field technician visits the local warehouse to pick up service notes and spare parts. During assignment the call centre or technical support can assist with supporting information such as customer details, equipment and contracts. Some documentation is also available in the technician's van. The ordering of spare parts is done via phone and inventory control can only be done manually.

Reporting / Invoicing. When repair and maintenance has been performed, a service report is produced where time and spare-parts are listed. This report is later stored into the system by back office personnel and then invoiced. Contract management is most often done manually.

In this situation quite a lot of phone calls between technicians and the call centre have been necessary to answer questions regarding service assignments or customers. The technicians have only had small possibilities to do adjustment to the work plan or to be planning in advance. If future maintenance was scheduled, the technician did not know about this. The reports were most often not handed over to the call centre more often than weekly – meaning that invoicing took longer time than needed and cash flow was slower. Also, inventory control was insufficient as there were no connections between service assignment and spare parts, i.e. the technicians had no control of what parts should follow which service assignments. As a whole the process output showed rather poor quality.

After Sales Service with EASY

After the EASY implementation the service process has been much more efficient and the information reaches all the parties involved much faster. The implementation process was divided into phases, with limited functionality for technicians in the first step and secondly also covering call centres and the customers. Focus was firstly to introduce the hand-held computers, secondly to cover planning and reporting, and thirdly to cover inventory issues and more detailed information. Each change in the service process is discussed below:

Initiate assignment. The contacts between the call centre and the customers are still via phone, fax or email and as such more or less unchanged. Much of the information, like customer contracts, is now stored in the system and searching can be performed by the technician when he receives the assignment. In a near future the field technicians themselves will be able to initiate the assignments.

Plan assignment. As a sub-project within EASY, the ERP system was configured for automatic planning of service orders based on competence or geographical area. By introducing hand-held computers the reception of assignments has become easier and also

re-planning done by technicians are more easily done. In practice this means that technicians do not need to visit the local warehouse to receive assignments and that emergency and planned maintenance can be performed at the same time. A web application is also included for the call centre to monitor field service activities – a help for manual planning that sometimes is needed for emergency calls.

Perform assignment. When service orders are sent to technicians, also service history, contracts and planned maintenance are shown in the hand-held computer. Drawings and supportive documentation can be retrieved directly by the technician. Ordering of spare parts and items available in the van can also be made visible in the field.

Report. When the assignment is accomplished, the job is reported directly in the hand held computer. This is done step by step by specifying used time and material, which then is signed by the customer. Data quality is now radically higher than before.

Invoice. After reporting the invoice is sent automatically, or by an intervening manual check up, to the customer. During this process customer contracts are also checked automatically.

From an implementation perspective the initial effects were on planning / synchronization for the technician and the call centre to find suitable service people and doing several jobs at one occasion. Secondly improvements have become visible for the call centre in reporting and invoicing. However, the technicians have taken over activities from the call centre and have to some extent become less efficient in their more operative work. Also education has been needed to teach new planning procedures. Inventory control has slightly become better with less stocking costs and decreased throughput times, staffing has so far decreased in the call centre and there is an opportunity to restructure the organisation of the field service technicians. For the customers, the quality of service has incrementally increased and also the service availability has become better. On the other hand there have been negative effects on personal communication. Possible technical extensions are to connect a web based interface with customers and to change the work routines for the field technicians. The field service process has become more automated, with some manual intervention, and resources have been released for other use. Improvements have been made in several steps both on the customer and the provider side.

Assessment of the BT case

An important part in industrializing services is the evaluation phase. In the EASY project this was a key aspect already integrated in the initial plan. After the pre-study and the implementation in Sweden, Belgium and Great Britan the whole concept was evaluated and related to the investment cost by calculating payback times, changes in return on capital employed, efficiency gains and return on investment. Examples of indicators from these evaluations can be seen in Table 2.

Table 2: Some evaluation indicators

Indicators	Before	Current state
•No of Worksheets copy	>3	0-1
•Feedback of worksheets	1-14 days	<1 day
•Parts replenishment	3-14 days	1 day
•Rolling planning	Monthly	Daily
•Input of information	2 or more	1
•Order spare parts direct	No	Yes
•Auto directed allocation	No	Yes

The effects of the industrialization project can also be measured in several other aspects, all leading to more efficient and customer oriented after sales services. For the customers, the EASY project has lead to higher perceived quality, which has been measured in customer surveys on several occasions. Since all contact persons within the BT organisation have access to relevant data about each and every truck, the possibility to do it “right at first time” has increased. Through EASY, historical files, comments, adjustments, etc can easily be traced which increases the ability for service engineers to solve all related problems already at the first time he or she meets the customer. The results are minimized down-time and that the customer will get the same information independently of who they contact at BT Industries; i.e. sales person, service engineer, back-office, or administrative support.

For BT Industries the efficiency is achieved through similar processes among all individuals independent of location. With more information stored within the EASY-system the flexibility of the service engineers have also increased since all information is now documented within the same system, and not on individual databases. The EASY project has also decreased the time that back-office and administrative personnel need to spend on planning and follow up of the service operations. This gives the opportunity to work more on other things, such as evaluating the customers operations and advising the customers on how to increase their efficiency, leading to increasing business for BT Industries.

5. A MODEL OF THE INDUSTRIALIZATION OF AFTER SALES SERVICES

In this chapter we will more formally summarize the concept of industrialization to denote a strategy that strives for coherent design and implementation of after sales services throughout the corporation that will create value for the customers and at the same time a high degree of cost effectiveness. Industrialization has two main dimensions – a centrally designed content of the after sales offering and the standardised production and delivery processes involved in the implementation of the services (with the customer as an important co-producer), what we call global processes (see Figure 4).

Centralised service offerings as well as standardised global processes have to be developed in parallel with the development of the internal capabilities of the company and also with regard to (variations in) customer wants and needs. Realistically, all after sales services need a certain degree of local adaptation, so industrialization can not be expected to reach one hundred percent.

- Important aspects of **central concepts** are the design (content) of different services, the bundling of services and definition of service levels. Pricing strategy is another important issue that should be handled centrally. In some cases the customer is the co-producer of the services and to handle this situation within the frames of central concepts could demand extra attention.
- **Global processes** provide activity platforms for efficient and repetitive transfer of after sales services. Important aspects are cost effectiveness, co-operation between front-office and back-office functions, co-operations with partners and customers in the production and delivery of the services and what IT-solutions that should be used.

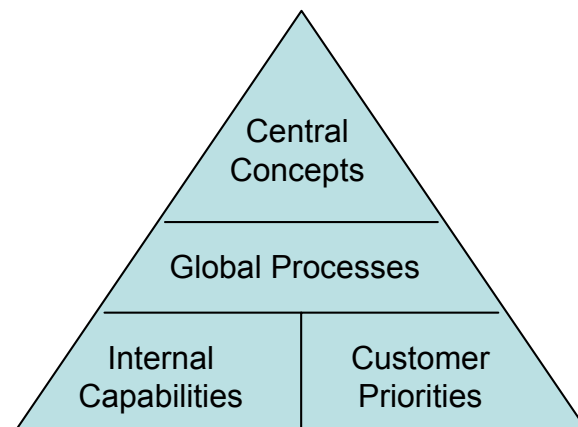


Figure 4: A model of industrialization of after sales services

The company has in parallel to build *capabilities* internally and in interaction with the customer, trying to develop the customer relationship for a better understanding of the *customer* problems and possible solutions to these problems. Industrialization of services has to involve the customers, but the customer demands or priorities have to be balanced with the internal capabilities in order to establish a platform to industrialize upon. This platform is built on the front-office personnel as well as the back-office personnel and related facilities.

We think that the results from the EASY project at BT Industries have more general implications. The main benefits have been better service quality lower running costs as well as working capital through better inventory control, less cost for reporting and invoicing and less time wasted through planning overview. The opportunity opens up to change the organisational structure for the field technician as well as how back-office is used in the after sales service business.

Through the EASY project BT Industries was able to integrate technology, processes and organization, see Figure 5.

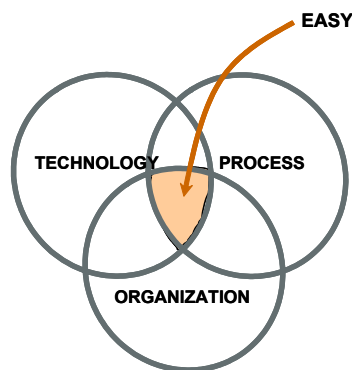


Figure 5: Three objectives of the industrialization project EASY

The technological development enabled information that previously was accessible on-line with the ERP-system (Enterprise Resource Planning; handling all planning and follow up of a companies operations and business) to also become available in hand-held computers and opened up possibilities to industrialize services that previously not was possible.

Using this new technology also turned the focus to the after sales service processes. BT Industries identified several processes that could be handled in the same way, independent of geographical location, type of customer, type of products to be serviced and also independent of it was reported as a planned or an emergency demand. Working with the processes and the technology also the people of the organisation and it opened up new opportunities to increase the organisational efficiency among service engineers, administrative staff and sales support units.

Industrialization could be the vehicle for a new way to look upon and to handle after sales services. Strategy, organisation and processes are all involved in such a change.

Based on the experience from our case companies, the competitive situation in the after sales segment is not so exposed to competition as we feared in the beginning of the project. At least, this has not yet happened. But all the same, we think that industrialization of after sales services is a good way stay ahead of competition also in the future.