1 IT Strategy – Using IT for Value Creation

Today the business operations of enterprises in many sectors would be unthinkable without IT. Dynamic competition, increasing cost pressures and growing customer requirements force enterprises to make constant adjustments – to their IT as well. The technical possibilities here are infinite – however, which IT investments make sense when depends on the specific market and competitive environment and the strategic goals of the company.

The new perspectives offered by today's IT solutions make IT a propeller for change: In many sectors nowadays the question is no longer 'Which IT modifications are necessary to react to current external changes?' but rather 'Which IT prerequisites are necessary to support our corporate strategy long term?' Some examples:

- *External growth through mergers and takeovers* – Prerequisites of IT are, for example, multilingual systems and open architectures that enable fast connections to newly-acquired business units (see also Part 1, Chapter 3, 'IT Merger Integration and IT Carve-Out').
- *Internal growth through 'virtual' customer bonding* – Prerequisites of IT are, for example, the support of integrated call centers and e-business as well as B2C applications.
- *Internal growth through innovation* – Prerequisites of IT are, for example, customer relationship management and flexible production and billing systems.

Thus, how a particular corporate strategy is formulated provides valuable information on how IT is organized. As part of a value-oriented IT strategy, the business units and the IT department systematically identify the future-oriented and competition-critical IT components that promise the greatest value enhancement for the enterprise. A company-wide IT roadmap points the way to implementation ('IT blueprint'). On the basis of this, depending on their specific situation, enterprises can use innovative IT applications for optimizing business processes, assuring revenues and increasing sales as well as for developing new business potential. At the same time they can learn from enterprises already experienced in the use of IT as an enabler for business.

Deriving IT strategy from corporate strategy

Just what specific value potential a company can achieve by using IT depends – like the corporate strategy itself – on many internal and external corporate factors. In practice,

most enterprises have a tendency to derive IT modifications from the requirements of the business units. This type of procedure is an essential cause of the general dissatisfaction with IT that is prevalent in many enterprises – not only in senior management and the business units, but in the IT department as well. The business units regard their expectations of IT as being insufficiently fulfilled, while the IT department sees itself confronted with the challenge of meeting unrealistic demands, or is unable to fully exploit the actual potential benefit of IT. The senior executives see the IT investments, but are unsure about the (mostly also time-delayed) benefit.

The solution to this dilemma lies in a systematic strategy development process: In the first step, value enhancing IT projects are established under consideration of internal and external influential factors in close alignment with corporate strategy. In a second step, they are evaluated using a business case and in a third step they are integrated into a prioritized implementation plan (figure 1.1).

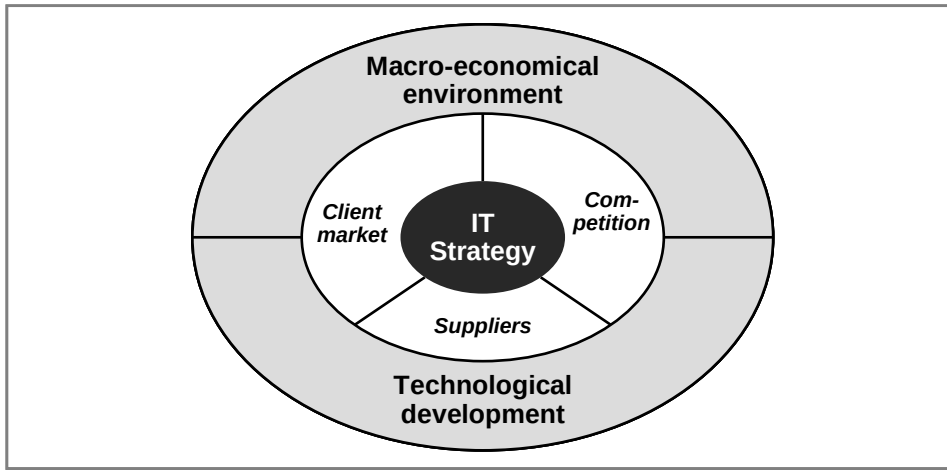


Figure 1.1: Influence factors on IT strategy development

Once the corporate strategy has been developed, a value-oriented IT strategy with a broad perspective must be initiated, which takes not only company-specific aspects with customers, suppliers and competitors into consideration but also macro-economic influences and innovative technological trends (figure 1.1). When developing a corporate strategy it is a matter of course to include macroeconomic trends such as changes in age structure, user behavior patterns, customer demands, and global developments, in order to analyze the future market and cost-cutting chances of the company. As a rule, these are diverted directly into the requirement of IT strategy, which puts the company in a position to make use of this value creation potential.

When developing IT strategy it initially appears unusual to be dealing with the same questions that also arise in the development of corporate strategy, for example: 'How old are our customers today, how will this age structure develop over the next ten years?' or 'What needs do your customers have today, and how do these needs and the buying behavior grow in line with a changing age structure?' However, such questions are immediately plausible if we take a closer look at the effects of macroeconomic changes on target group marketing: Younger people have a wider range of needs, but less money and time than older people; older people like to be approached in a more specific way. These factors have consequences for Customer Relationship Management (CRM) in terms of customer segmentation as well as whether customer segments should be approached using anonymous mass marketing or cross-selling offers on the one hand, or with exclusive, individualized offers from a small but high-quality product range on the other. Thus, IT strategy does not simply estimate the results of corporate strategy, but rather evaluates for its part the influential factors that are already taken into account in the development of the corporate strategy, with regard to its implications for IT.

Tips for IT strategy development:

- *Involve the business units in every phase of strategy development:* At the beginning the users must be involved in order to develop the long-term strategic IT requirements together with the IT department. If the IT department then makes a proposal for implementation in IT strategy, the business units must again be involved in the financial evaluation with the business case.
- *Be open to change:* When the future IT system is being developed, company-specific solutions must be tried and tested. Applications that are no longer in line with company goals must be unconditionally eliminated and migration and replacement strategies must be developed.

In addition to the IT requirements that result from the company-specific market and cost chances and macroeconomic trends, we also have the technological innovations of IT and sector-specific IT developments. Consumer goods manufacturers, for example, should include applications such as vendor managed inventory, universal Collaborative Planning and Forecasting Replenishment (CPFR), in collaboration with the retail trade or Radio Frequency Identification (RFID) in their IT and process portfolios. When developing general technological innovations like CRM or SCM, the best practices of other sectors should also be kept in mind.

In addition to these strategic IT requirements, which result from market developments and changes in the competitive environment as well as technological changes, it is important to take into consideration the in-house requirements of the various value creation phases of the enterprise – from the business units and affiliated companies – and the requirements of suppliers and customers.

Developing an IT strategy for a consumer goods manufacturer

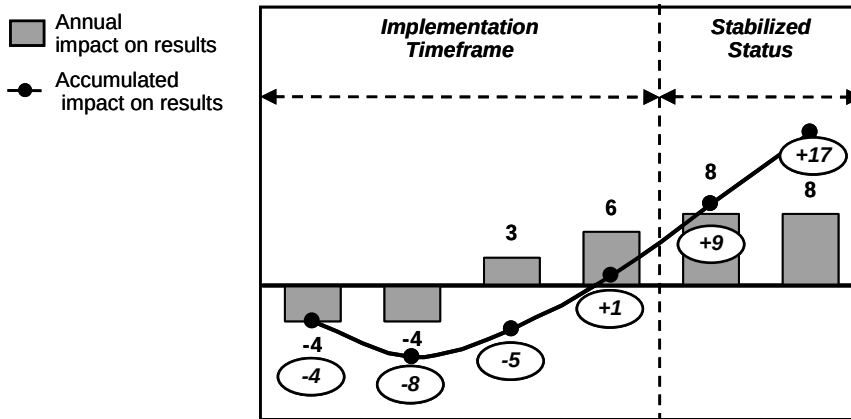
A consumer goods manufacturer, when formulating its long-term corporate strategy for a period of ten years, devoted itself mainly to the topics of international expansion and the consequential restructuring of its logistics. When developing IT strategy, it became clear that it needed to include additional environmental factors. The company initiated a joint project involving the business units and the IT department to set down a long-term IT strategy. To this end, the company environment, i.e. the macroeconomic environment, which is particularly important for consumer goods manufacturers, and the long-term technological trends were first analyzed and their relevance evaluated.

Parallel to the macroeconomic environment, an analysis of the foreseeable long-term technological changes in the field of consumer goods was carried out. Changes in manufacturing technology, for example, will result in changes to the supply chain. One technological development that is especially important to the company is RFID (Radio Frequency Identification). RFID makes it possible to equip each individual piece of merchandise with a non-contact electronic transponder, which records information about the item from a distance of several meters and reports it to a receiving device. The widespread use of RFID will have an enormous impact on logistics and on inventory planning and control. Additionally, RFID makes it possible to electronically record which goods are bought by a certain customer. All of these consequences will greatly alter internal business processes and open up a high level of potential benefit for the companies that use it – and at the same time make considerable demands on IT.

Companies now know which IT components are strategically most important for the future orientation of the enterprise. However, purely qualitative utility estimates of abstract ‘improvements in quality’ are not sufficient reason for the innovation offensive that this would necessitate. Only a business case that compares the costs for the necessary investment with the results that can be expected, and which also evaluates the time scale for this investment (see figure 1.2), is able to quantify the impact of IT, illustrate its contribution as a value-enhancing enabler for business, and control its redemption in the organization.

The preparation of the business case necessitates close collaboration between the IT managers and the users in the business units. As a rule, it is possible to determine the cost side, i.e. one-off investments in IT (e.g. licensing costs) as well as the running costs (e.g. annual maintenance costs) quickly and clearly. The potential cost reductions resulting from the increased efficiency of operations (e.g. cost savings in logistics through lower inventories due to faster order-to-dispatch times) as well as the sales potential with marketing-oriented technologies (CRM and others) can only be determined in collabora-

tion with the business units, as they are responsible either for the specific process costs in a certain area or for the marketing results.



	2002	2003	2004	2005	2006	2007
Investments/ one-off costs	-4	-6	-2	-2	0	0
Running costs	0	-2	-2	-2	-2	-2
Efficiency increases business processes	0	+4	+7	+10	+10	+10
Impact on results from assured revenues	0	0	0	0	0	0

Figure 1.2: Calculations of business cases

In a third step, the set strategic IT requirements must be evaluated consistently in terms of their contribution to revenues – optimizing the business process costs as well as revenue increase and assurance, from which the running IT costs for maintenance and customer care have been deducted. This systematic prioritization is portrayed in an IT innovation portfolio. For a manufacturing company the portfolio, which evaluates and prioritizes the established IT requirements consistently in terms of their contribution towards optimizing business process costs and revenue assurance, could look something like figure 1.3.

Most enterprises are in a position to considerably improve company revenues by using a strategically planned IT strategy. To achieve fast results, the most profitable investments should be implemented as pilot projects. While initial results are already made at this point, a binding and quantified implementation plan safeguards the realization of the overall productivity increases that are being targeted. An important factor in the implementation plan is to consider, in addition to strategy guidelines, the individual back-

ground situation of each area, as even the best IT will not have any impact if it is not accepted by its users (*cf.* Part 1, Chapter 2, 'Enterprise Transformation').

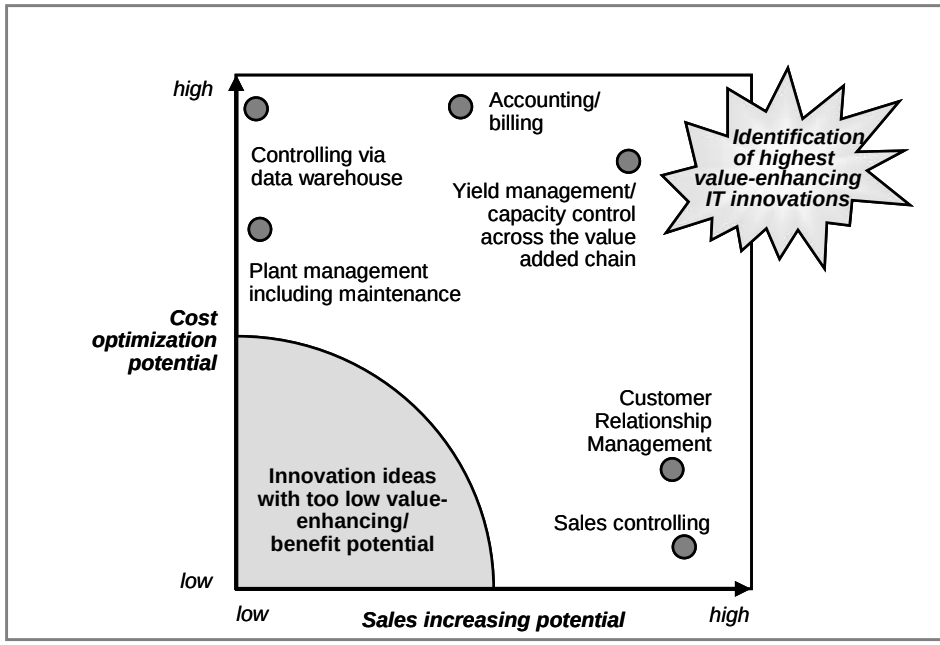


Figure 1.3: IT innovation portfolio of a manufacturing company

Using IT as an enabler for business

The value of IT is measured by the results that enterprises can achieve by using IT in primary business. Many enterprises have already had extensive experience with innovative technologies. It is remarkable that the pioneers in the use of new technologies include not only IT-oriented sectors, such as banks or the automotive industry, but also sectors in which the concept of value creation with IT is not evident at first glance, for example container logistics enterprises or manufacturers of agricultural machinery.

However, not every IT application has the same impact on every company. The possible effects of IT are influenced by a number of internal and external factors. The potential benefit of using data warehousing, for example, depends among others on the degree of standardization of IT in the company. In many cases, the customers and suppliers must also be persuaded to align their own interfaces to the new IT systems of the enterprise, for example when supply chain management systems are used.

When today's enterprises think about the value enhancing use of IT for their business operations, they are in no sense entering unknown territory. They can learn from enterprises in other sectors who have already successfully implemented IT to optimize their business processes, to directly assure or increase their sales or to use IT as an integral part of their end product to trigger new customer demand, thus directly developing new sales potential through the use of IT:

- *Optimizing business processes by:*
  - cutting costs in business processes by introducing and optimizing ERP
  - boosting efficiency and improving customer service with IT solutions and mobile communication technologies
  - reducing and improving supply chain output with integrated supply chain planning systems (SAP APO)
  - reducing costs with IT-assisted maintenance in machinery-oriented business lines
  - sinking procurement costs through comprehensive system support
- *Assuring and increasing sales by:*
  - diversified potential benefit with data warehousing
  - faster product development with Product Lifecycle Management (PLM) in engineering-oriented industries
  - increased sales with CRM technologies
  - faster turnover by shortening clinical phases until registration with IT-assisted document management in the pharmaceutical industry
  - higher level of customer bonding through better information exchange in global container logistics
- *IT as a component of the end product through:*
  - independent IT-assisted services
  - intelligent products

In practice, the potential effects of IT function like building blocks. For instance, it is nearly impossible for a company to develop new, IT-assisted business fields if the company has not intensively studied the use of IT for increasing efficiency and assuring revenues, thus gaining an understanding of the IT learning curve.

Optimizing business processes

Through well-aimed IT investments in optimizing business processes, an enterprise can not only lower costs, but also as a rule increase benefits. For example, the order-to-dispatch time is shortened, flexibility is increased and transparency created, resulting in higher customer satisfaction. New working methods help reduce the error rate, thus cutting warranty costs as well.

Examples of cost and potential benefit by optimizing business processes with IT can be found in almost every sector. The following examples demonstrate how enterprises in all sectors are well advised to assess the potential as quickly as possible, as the results of their competitors are high and it will not be easy to catch up with the resulting competitive advantage.

Reduced costs in business processes through introduction and optimization of ERP

In many cases, the IT landscape of enterprises has grown over time, and includes numerous solutions of their own and isolated projects. With the introduction of an ERP system, for example SAP, between 20 and 40 percent of business process costs can be cut – provided that these structures and the processes of the company are changed, in addition to introducing the ERP system (*cf.* Part 1, Chapter 2, 'Enterprise Transformation'). But even after extensive business process optimization through the introduction of an ERP system, more efficient use of the systems will generally achieve significantly better results (see figure 1.4).

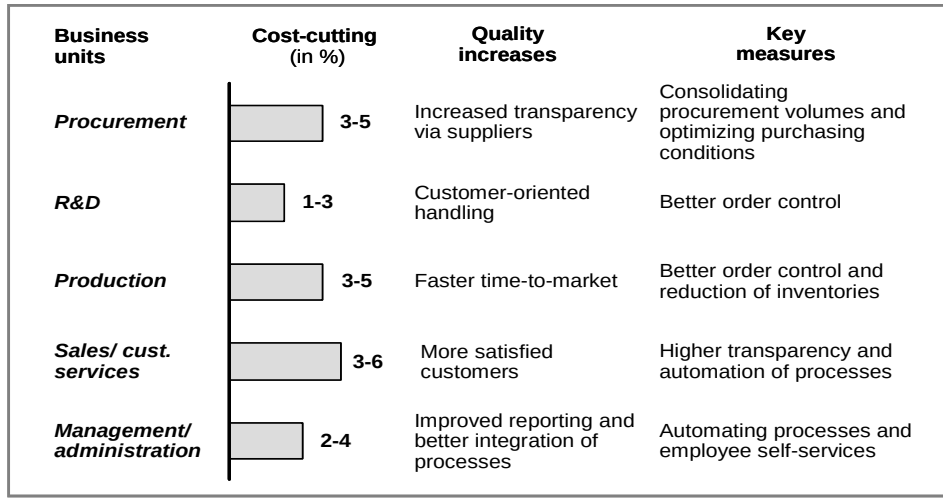


Figure 1.4: Optimization potential of installed ERP/SAP systems; Source: A.T. Kearney

A manufacturing company, for example, had already installed SAP R/3, but despite several improvements was still dissatisfied with the overall effect on operations, and was looking for further possibilities for optimization. In the final analysis, it became clear that when the SAP R/3 system was installed, a consistent alignment with the best practices of other enterprises had been neglected. Together with the business units, additional

cost-cutting potential in the existing SAP R/3 landscape was identified in the essential operational process areas.

This situation is not untypical. Many enterprises have invested a lot of time, effort and money in the introduction of ERP systems, but without achieving the anticipated impact on operations. This will remain one of the most important projects in many major enterprises over the next few years. The problem can only be solved through close collaboration between the IT department and business units.

Increased efficiency and improved customer service with IT solutions and mobile communication technologies

Currently of special interest – particularly in enterprises with geographically farflung operations, for example construction companies, services/maintenance enterprises or organizations with widely-distributed capital goods – is the use of mobile communications technology for optimizing internal operations processes. Such 'mobility offensives' combine the IT support of vital business processes with data-oriented communication. Contrary to conventional business processes, the data communication is mobile, in other words 'wireless', and high-speed, for example via the GPRS and UMTS telecommunication services.

The use of such communication and IT solutions is especially interesting for controlling and billing maintenance work and for the service technicians or maintenance teams in charge of doing the work. For example, orders can be taken 'online' by the sales force and compared directly with current inventory stock. This has a positive impact on delivery reliability for the customer on the one hand, and accelerates processing on the other. Additionally, direct input of the order at the customer's company prevents errors that could lead to complaints, as well as extra data processing work, for example for data typists.

In the case of a manufacturing company under a very high level of competitive pressure, whose 400 service employees were responsible for 12,500 technical sales devices, the introduction of mobile handhelds in combination with a central service dispatching system reduced annual costs by 1 million euros net, while customer satisfaction was increased and the existing number of employees used to better capacity. These benefits resulted from a one-off investment of 1.1 million euros.

Cost reductions and improved supply chain performance through integrated supply chain management systems (SAP APO)

Supply chain management holds great significance for the value creation of enterprises in many sectors. In the chemical industry, for example, management of the entire supply

chain from customer orders to the delivery of goods, through marketing, logistics and production represents a significant cost portion, amounting to up to 10 percent of revenues. This includes the costs of the physical stock flow in the warehouse, shipping and transport, and equally important are the costs of planning and handling, in particular inventory costs, equipment costs and handling costs.

However, the benefit of supply chain management is not limited to cost management, but rather lies primarily in the impact on operations. For example, in the chemical industry, particularly in the purely price-controlled commodities sector, the logistics service performance of a company is of great importance for competition. A high level of delivery reliability, short delivery times and immediate delivery options are important selection criteria for suppliers. A company must be in a position to give exact and immediate information about dates and availability, react flexibly to changes of orders, and offer innovative logistics service concepts with e-commerce or Vendor Managed Inventory (VMI) systems.

Supply chain management systems, such as Advanced Planning and Optimizing (APO) from SAP or supply chain management solutions from i2, JDEdwards or Manugistics, can considerably improve supply chain performance. Many enterprises in the chemical industry, especially in European countries, use SAP APO to improve competitiveness and lower costs:

- Delivery reliability is systematically stabilized through the planning feature anchored in the system.
- Thanks to better system-aided optimization of delivery services, equipment costs and inventory costs, the delivery time can be drastically shortened and delivery performance significantly improved.
- The ability of customer service staff to provide information as well as the response time – the time period up to order and delivery date confirmation – are considerably improved through system-aided availability checks.
- Inventory and equipment costs are considerably improved through the integrated, company-wide availability of key data, order data as well as mathematical optimization parameters.

However, supply chain management solutions are often introduced on a purely system-oriented basis, which then causes an even higher level of complexity. Only with a supply chain concept that aims at simple structures and which focuses on the essential features of the supply chain management system will a company be in a position to realize the entire benefit of IT.

Reducing costs with IT-based maintenance in machinery-intensive businesses

In enterprises with large, high-maintenance and perhaps also geographically widespread inventories, maintenance of the equipment is a high cost factor and, at the same time, key to competitiveness. Ideal for such enterprises are IT-driven production methods for planning, monitoring, managing and controlling maintenance jobs – with clear cost optimization potential.

A good example is power management network operators on all voltage levels. At present, network operators are feeling enormous cost pressures, particularly due to the political environment, and also pressure to yield good profits for their shareholders, which they can only achieve by substantial optimization. The strategic challenge now lies in realizing cost improvements, whilst maintaining the availability and quality of the energy supply and the necessary power transmission equipment, including electricity networks and transformer stations, at an availability level that is satisfactory for the customer, thus ensuring that such widespread blackouts as have occurred in the USA or the UK are not repeated in Germany.

An effective IT-assisted maintenance strategy begins with the maintenance systems, the network and all that is necessary for operations, as well as geographical information systems. Intelligent maintenance systems for process cost optimization consist of three simple components (figure 1.5):

- a back-end system in the central office, for example SAP PM
- local, easy-to-handle devices, for example palms, which can be used anywhere by the service technicians, and whose software is linked to the backend system via an interface and which have two essential features: receiving controlling and organization data for the service technician (‘What needs to be done today and where?’) and sending back status updates to the backend system (‘What maintenance work was done on which components?’)
- a high-performance, flexible communications technology

The implementation of such an IT-assisted maintenance strategy necessitates an IT structure that is streamlined to the maintenance systems. Besides workflow support, for example in recording and carrying out maintenance activities or their documentation, efficient coordination between the field office and the field staff via a suitable communications technology plays a key role. It supports planning and executing work schedules, and the execution of analyses and evaluations using a consistent and integrated database. This makes new, more efficient types of work, like for example ‘starting on the spot’, possible for the first time: service technicians no longer have to go to a central control depot where jobs are distributed and prepared, but rather can call up the information right at the location and start working right away. Our experience with network opera-

ting utility companies has shown that the productive work portion of service technicians – i.e. the portion of the time in which actual maintenance work is done, can be increased by up to 35 percent.

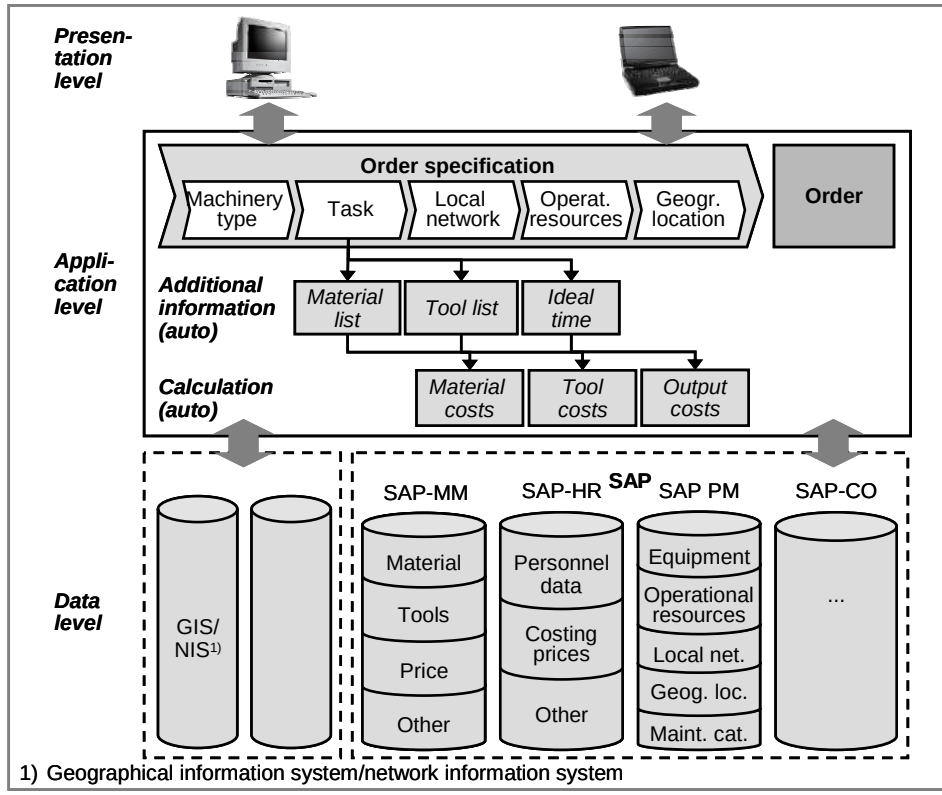


Figure 1.5: IT architecture for maintenance systems; Source: A.T. Kearney

Reducing procurement costs through comprehensive system support (data warehouse)

The necessity for cost optimization is currently causing companies across all sectors to search for cost reducing potential in procurement. However, a lack of data transparency often prevents the benefit of procurement optimization from being fully realized. Particularly in heterogeneous and international corporations, the fundamental question of which business unit should provide which products and services in what quantity from what supplier represents an unsolvable problem. But if they do succeed in consolidating the group-wide demand in framework agreements with selected suppliers, the hoped – for optimization potential still has no impact on revenues. In order to realize the savings, the actual procurement must be carried out by the user in accordance with the negotiated

framework agreement. And documenting the use of framework agreements and determining and preventing purchasing being done outside of existing contracts will also require transparent group-wide purchasing data.

The group-wide procurement volume of an internationally operating conglomerate with over 120 operative companies was not transparent enough. The system landscape in operative purchasing, with 15 SAP systems and more than 75 companies with legacy applications, was greatly differentiated and the relevant purchasing data were very heterogeneous:

- The purchasing systems were individually configured and had varying data formats
- There were over 300,000 supplier files, most of which were redundant
- There were more than 12 different systems for the classification of materials

For various reasons, the purchasing system was difficult to harmonize, both in terms of the technology and also policy. For this reason an IT-assisted solution was chosen, which was able to function without such harmonization. Based on the data warehouse technology from SAP a new infrastructure was implemented, which enabled a direct link to the relevant systems for deducting purchasing data. The required data harmonization was achieved with the help of a mechanism that automatically allocated deducted purchase documentation, for example invoices and orders, to different merchandise categories in a uniform classification system. This automated processing is done on the basis of rules and heuristics, which, with the help of all available information e.g. supplier, material classification or order text, carry out the probability-based allocation of the individual purchasing documents.

The harmonized database that has now been created enables the evaluations necessary for successful purchasing to be done. In addition to transparent purchasing volumes across the conglomerate, the use of framework agreements can be consistently documented and the payment behavior of individual business units can be analyzed (see figure 1.6).

To improve the quality of the purchasing data for the medium term, parallel to the implementation of the system, various initiatives were introduced that aimed at optimizing the operative purchasing processes and systems. This way, for example, category-specific, web-based processes were implemented for purchasing services and a group-wide uniform classification system was further implemented. With the improvement of the data quality on the level of operative purchasing, which then offers an improved basis for achieving the necessary data transparency, the cycle is complete. A further advantage for the company: the necessary investments could be directly amortized due to the potential benefit. Altogether, the system support leads to savings in the procurement pro-

cesses amounting to 11 percent of a procurement volume in the order of a single-digit billion figure.

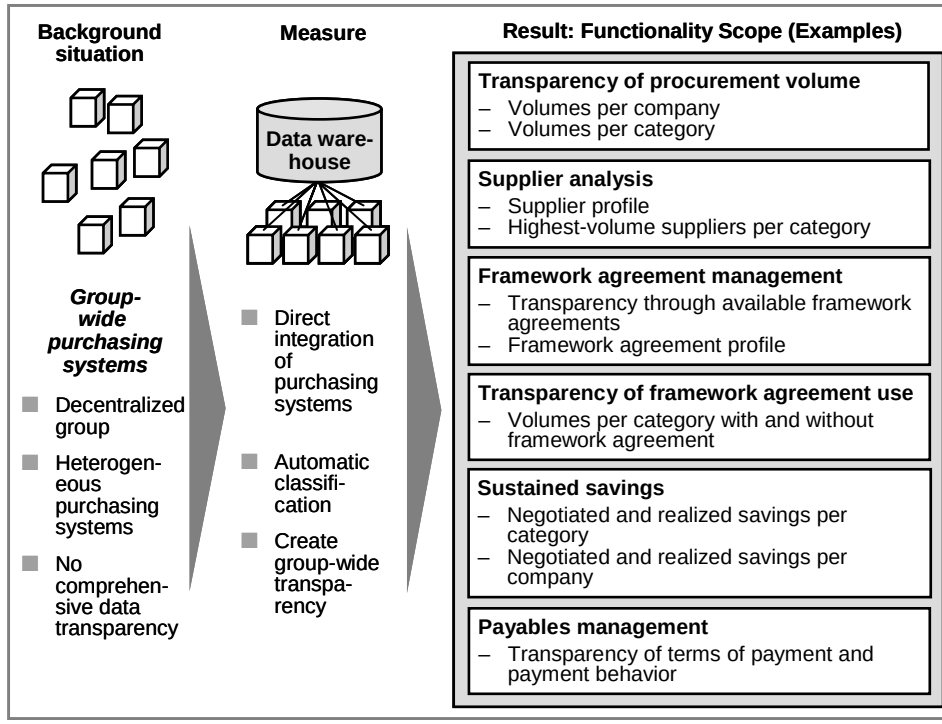


Figure 1.6: IT structure for procurement optimization in decentralized corporation; Source: A.T. Kearney

Assuring revenues and increasing sales with IT

Leading enterprises use IT specifically for assuring revenues and increasing sales. To this end, IT investments in distribution-related applications, for example order processing and customer management, are particularly relevant. An effective CRM concept with the appropriate CRM IT application helps the company, among others, to achieve additional sales, for example through cross-selling or by building up specific customer bonding and reclamation programs.

In several sectors, the possibilities for using IT to assure revenues and increase sales have already become mandatory for enterprises that will not accept competitive disadvantages. With increasing customer-oriented offerings, the customer requirements also

increase, for example in after-sales services, with regard to faster product launches or the convenience of logistics services.

Diversified potential benefit through data warehouse technology

The use of data warehouse technology is suitable not only for optimizing procurement, but also for improving company-wide controlling, not only from the financial point of view but also in terms of logistics. The cause of the increasingly widespread use of data warehouse technology lies in the historically growing complexity, diversity and incompatibility of many existing IT landscapes in enterprises of every sector. In such a situation, a data warehouse is often introduced as a 'super' system or a 'super' data pool. Like a vacuum cleaner, the data warehouse 'sucks up' all relevant financial and logistics data from the various previous systems, harmonizes them during this 'sucking' process through entry filters, which create comparability, and stores the data. On the output side, through a more-or-less flexible evaluation logic ('data mining/data marts'), the desired reports are made, usually linked to Key Performance Indicators (KPI) (see figure 1.7). This gives senior management and board members – often for the first time – a comprehensive and complete picture of the processes in their organization and with it the basis for improved decision-making and control.

The benefit for the enterprise arises from the well-aimed application of this information in the day-to-day work of the organization. In addition to the already-mentioned example of procurement optimization, this includes a wide variety of practice-oriented types of applications and potential benefits:

- A mobile communications company with around 5,000 employees implemented a data warehouse for financial Key Performance Indicators to be able to optimally control performance and costs in a stagnating market and better align investments in the further expansion of the telecommunication networks to actual demand.
- A consumer goods manufacturer with turnover of over 30 billion Euros introduced a data warehouse to better align product development and marketing processes to the individual life cycle phase of the products in its comprehensive product portfolio and to react to declining sales through product diversification, product innovation or product marketing. The effective product development time from the identification of a 'dying' product to the introduction of the replacement product could thus be cut in half, while sales in individual regions increased by up to 30 percent. Additionally, the marketing budget could be cut by more than 500 million euros – and all that with a higher level of marketing effectiveness.

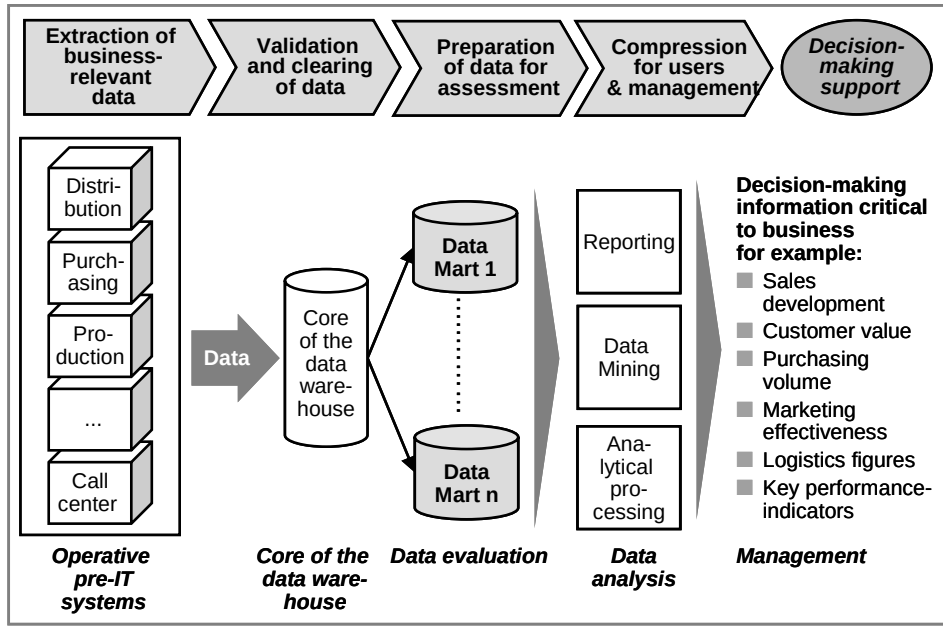


Figure 1.7: Typical architecture of a data warehouse; Source: A.T. Kearney

- A major media company introduced a data warehouse to better coordinate developing the market with the product catalog and for a more direct customer approach. In this way, many internal processes were clearly slimmed down. Thanks to the improved fine-tuning between production and demand in the individual market regions, the returns rate was lowered by almost ten percent. Also, the system was attributed with having delivered the essential know-how for turning a regional music hit into a gold LP/CD.

- A major bank and a major mobile communications company both used a data warehouse for better control of their marketing campaigns. The goal was to optimize customer value under consideration of demand in the individual life cycle phases of their customers (for example business/private use; single/young family/established family/ 'empty nest' etc.). The bank was able to reduce its process costs by more than 20 percent and achieved significant sales growth through a cross-selling method streamlined to the individual life cycle of its customers. For the first time, the mobile communications company was able to recognize migration-prone customers (churners) very early on and convince a high percentage of them to stay through individual approaches, while at the same time getting rid of less attractive customers.

Thus, we see that the use of data warehouse technology can obviously lead to rapid, positive results for a company. But the enterprise should make sure, if possible, that the

introduction of a data warehouse does not further increase the complexity of the IT landscape of the old system (i.e. existing financial, logistics, CRM and other systems, from which the data warehouse obtains its data). Rather, it is advisable to take measures to simplify the IT landscape of the old system, eliminate all redundant systems and harmonize the key data in the data structures and clean up the data files. Such a consistent concept improves the capabilities of IT, reduces IT spending and prevents unnecessary complexity. At the end of the day, every data warehouse is based on the sum total of its previous system, and if its data structures and data files are not harmonious and 'clean', such data problems will penetrate the data warehouse and diminish the significance of the benefit realized by the data warehouse – and with it the potential sales for the company as well as cost potential.

Faster product development with Product Lifecycle Management (PLM) in engineering-oriented industries

Speed and target-reaching in product development are a vital core competency for survival particularly for engineering-oriented industries. One engineering sector with particularly complex products, which is at the same time highly international, is the aerospace industry, in which IT plays a key role in the engineering and manufacture of the products. In this case, the entire product life cycle, right from the planning phase using CAD systems, through production and on to maintenance, is IT-assisted (figure 1.8).

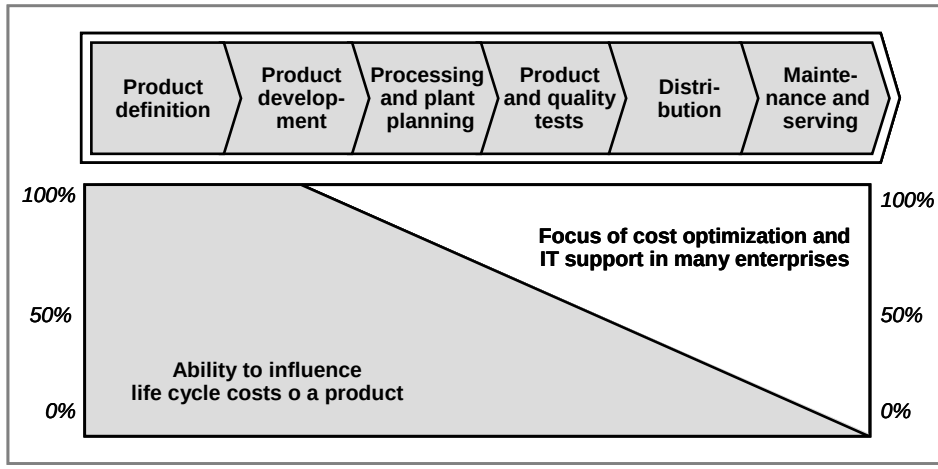


Figure 1.8: Support of the product life cycle across all phases of the value added chain; Source: A.T. Kearney

The current trend in the aerospace industry towards shortened time-to-market for product development and production, towards an increasing rate of customer-specific solutions,

for example individualized cabin designs, and towards continually growing product complexity has lead to all-new requirements being made on the engineering processes and the IT systems that support them, when a new aircraft is being developed. Even just the simultaneous working of over 20,000 employees networked in one database is no longer thinkable without modern IT solutions.

The answer to these challenges is modern Product Lifecycle Management (PLM) systems with their core building blocks 3D CAD concurrent engineering and product data management systems. In addition to the technical platform, these solutions offer concrete economical advantages, as the following examples illustrate (figure 1.9):

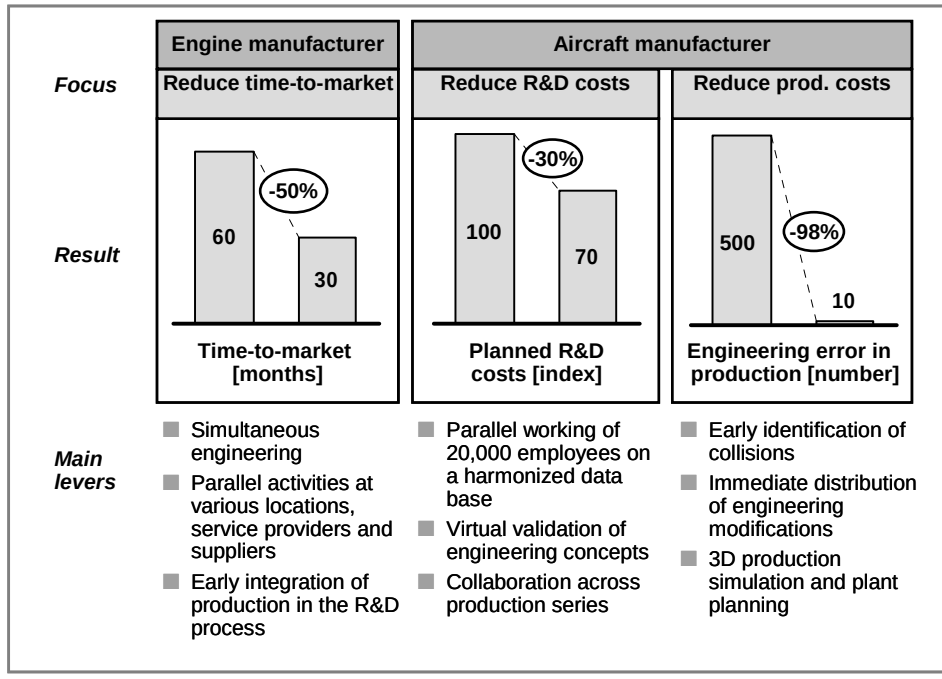


Figure 1.9: Benefit potential through systematic Product Lifecycle Management; Source: A.T. Kearney

- When a new airplane wing is being developed using digital mock-ups – i.e. assembly simulated in 3D – the number of production defects in the wing rib assembly was reduced from 500 to less than 10.
- Due to the simultaneous development with a common database being used by the various development locations and different suppliers, the time-to-market could be drastically reduced. For example, in an engine manufacturing company the time-to-

market could be reduced from five to two-and-a-half years. In a second case, another engine manufacturer was able to shorten development time from 42 to 24 months.

- Customer-specific aircraft design has been considerably simplified and accelerated by using modern 3D-assisted design tools. As a result, the serial production of passenger aircraft – together with other supply chain measures etc. – was accelerated by up to 20 percent faster than a comparable model.
- The 3D simulation of the aircraft enables an efficient and early integration of production and the assembly of components in the development process. This way, in the development phase the design can already be adjusted and optimized to the requirements of the industrial process. This way, the source of errors and their consequences (defective parts, additional work etc.) can be recognized early and be prevented. On the introduction of a new airplane model, a reduction of such errors by 20 percent (a conservative estimate) can amount to savings of up to four million euros in the work costs of tail section assembly in the first production year.
- For the development of a new airplane, one assumes that more than 30 percent of the R&D costs can be eliminated by using a holistic PLM platform:
  – development time can be shortened by 50 percent
  – production time for assembly can be shortened by 60 percent
  – the costs for holding spare parts can be reduced by 50 percent
  – maintenance costs can be reduced by 50 percent

The experiences and successes of the aerospace industry can also be put to use in other industries, for example in the automotive industry, for high-tech manufacturers, in machine/plant construction and even in the consumer goods industry.

Increasing sales with CRM technologies

Customer Relationship Management (CRM) is the type of IT support most often named when the goal is to increase sales and/or assure revenues, not only in the anonymous mass market but also in the B2B sector.

Of course, here too IT only supplies the basic foundation; CRM can only have an impact on the basis of systematically planned and consistently operations-oriented processes and distribution structures.

CRM is therefore a holistic concept that leads from the specified target groups and products and encompasses all interactivities of the organization and its customers – beginning with demand creation on the customer side through the marketing contact to customer service, including complaint management – and finally triggering demand for follow-up purchases of new models or additional products or services (figure 1.10).

CRM includes all contact points between the company and the customer and also includes approximately one marketing activity without direct customer contact. In order to efficiently record, evaluate and control these customer contacts, a uniform company-wide data model of the customer, but also of the products and all 'information objects' in connection with customer interactivities is needed – including, for example, the billing and collection data that is often forgotten in this context.

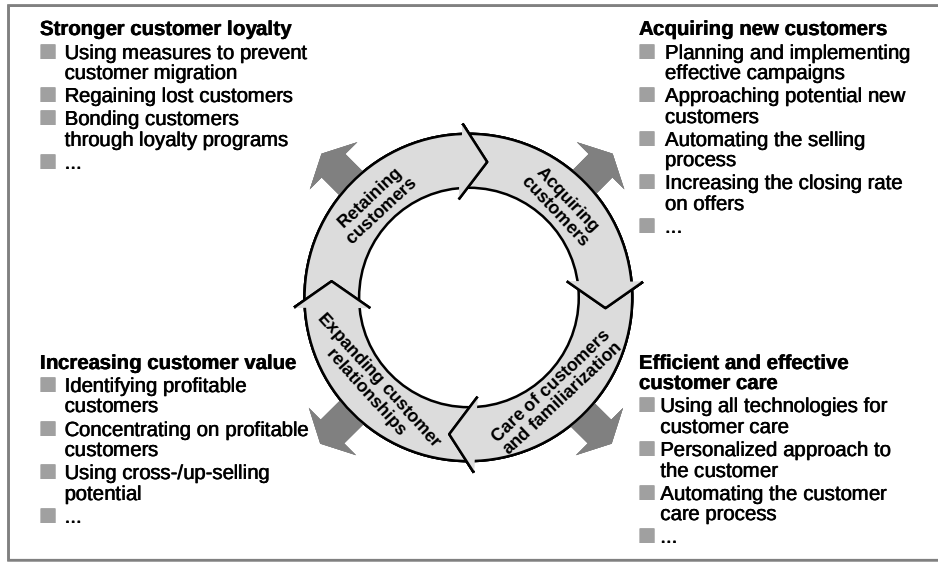


Figure 1.10: Increasing and protection sales with CRM technology; Source: A.T. Kearney

Customer data comprises statistical information about the customer (in keeping with data protection regulations, preferably with the consent of the customer) as well as data that is related to the products and services of the company (for example information about family status for banks or information about outings or special diet-related requirements of customers in the hotel and tourism sectors).

On the basis of this customer information, individualized or anonymous marketing activities are then carried out. If, for example, the evaluation of the sales made to a customer of a mobile communications company should show an abruptly declining tendency, this would suggest that the customer is in the process of switching to another network. In this case, the company can make inquiries about the reasons for the customer's dissatisfaction with the mobile communications company, and how these reasons can be remedied – and the mobile communications company retains the customer.

In the meantime, convincing results on the use of CRM are in evidence in numerous sectors, for example banks, mobile communications providers and financial service providers (figure 1.11). CRM is, however, being used equally successfully in tourism, by car makers, consumer goods manufacturers, in retail and other sectors.

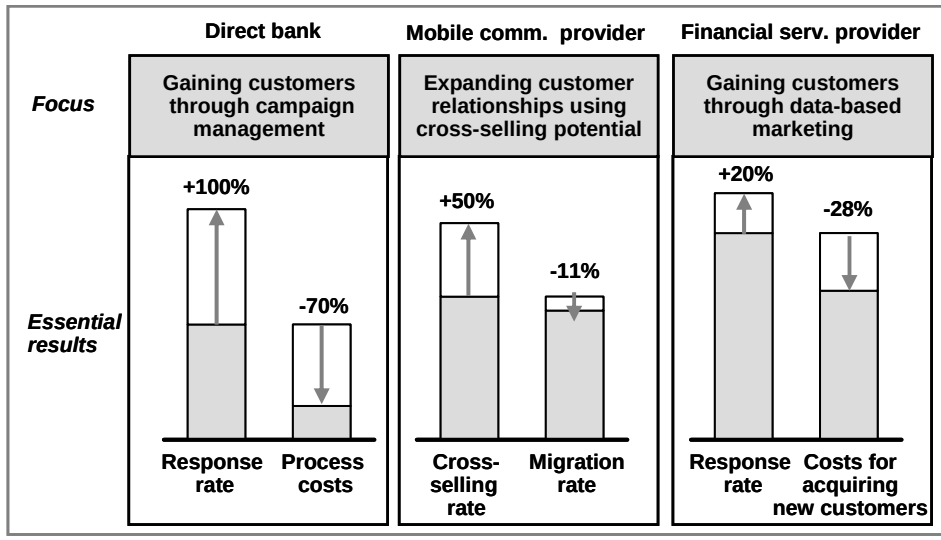


Figure 1.11: Sales potential with CRM; Source: A.T. Kearney

Faster sales by shortening clinical phases until registration using IT-assisted document management in the pharmaceutical industry

It is well known that research in the pharmaceutical industry is extremely time-consuming and expensive – R&D projects usually run for more than five years. And even during the course of a research project there is a high risk of failure. Therefore, pharmaceutical conglomerations have a vested interest in shortening the research process until registration for new medications and in recognizing less promising projects early on and stopping them.

This goal is pursued by document management systems. Besides the employees of the company, others involved in the research, for example physicians in clinics and partner companies (for example CRO – clinical research organizations), who are given the task of carrying out studies, also have access to these systems. Document management systems make the research information available at the relevant locations without media breaks and double entries of the research information. In this way they shorten the decision process and make it easier for the pharmaceutical company to identify less successful projects early on, so that they can concentrate on more promising projects. Additio-

nally, they facilitate the preparation process for the registration dossier and thereby shorten the process for registering a new drug. At the same time they improve the quality of the registration dossier.

In the meantime, global document management systems are being widely used in clinical research. However, there are as yet no empirical studies on the benefits actually achieved during the clinical phases. Merely the time needed to prepare the dossier could be shortened by up to 20 percent for some pharmaceutical companies. Expenditure for the conception and implementation of such a solution was mostly in the upper two-digit million regions (Euros), with a timeframe of one to one-and-a-half years. Even if, after such a project, the timeframe for the clinical research of a project were shortened by percent or if ten percent of the less promising projects were discovered and stopped in time, the IT investment would be amortized after only a few research projects.

Improved customer bonding through better information exchange in global container logistics

Organized marine transport is one of the most complex logistics systems there is. Modern container shipping connects load-carrying containers with the shipping system of the carrier. Both components have their own logistics and must be planned and controlled in collaboration with the services of harbors, associated cargo handlers, depots and secondary land and feeder transports at global level. To this end, carriers developed high-performance ERP systems at an early stage. Based on the system-controlled handling of the transport and the electronic shipping documents that are continuously being updated to reflect the current transport status, further functions were developed, such as system-generated transport route mapping, including price-finding or the really forward-looking load planning of the container fleet and also the ship capacity, the integrated load control (‘yield management’). Particularly carriers that switched to globally compatible processes at an early stage and realized them in a globally homogeneous system have achieved the highest efficiency increases and are able to fully enjoy the competitive edge of operative excellence today.

The development of commercial Internet technologies ultimately made it possible for carriers to do business directly with their direct customers, the shippers and the consignees. While the early web-based services were more instrumental to the information needs of the customer and for easing the burden of customer service, and thus increasing internal efficiency, leading carriers developed electronic services that opened up additional sales potential. The basic features included everything from simple but continuously updated shipping plans and global container tracking (track & trace) with reference to transport plans and even electronically transmitted warnings for expected delays. Electronic transport booking, confirmations and payment processes rounded off the services portfolio.

Individual IT components or those still in the development stage make up an IT portfolio that stretches from the employee to the customer (see figure 1.12). Via the Internet platform, the customer exchanges data with the carrier, which is automatically processed and which can be viewed by the employees of the carrier in its ERP system. Leading carriers developed services that were individually tailored to the needs of their demanding customers and which were coordinated with highly advanced Supply Chain Management (SCM) systems. Some examples are the direct electronic linking of the customer-side SCM system with the ERP system of the carrier for automated transport processes, or the transmission of detailed load-related data from the shipper to the consignee, including article numbers, material numbers and number of items for the transfer in the SCM system of the consignee.

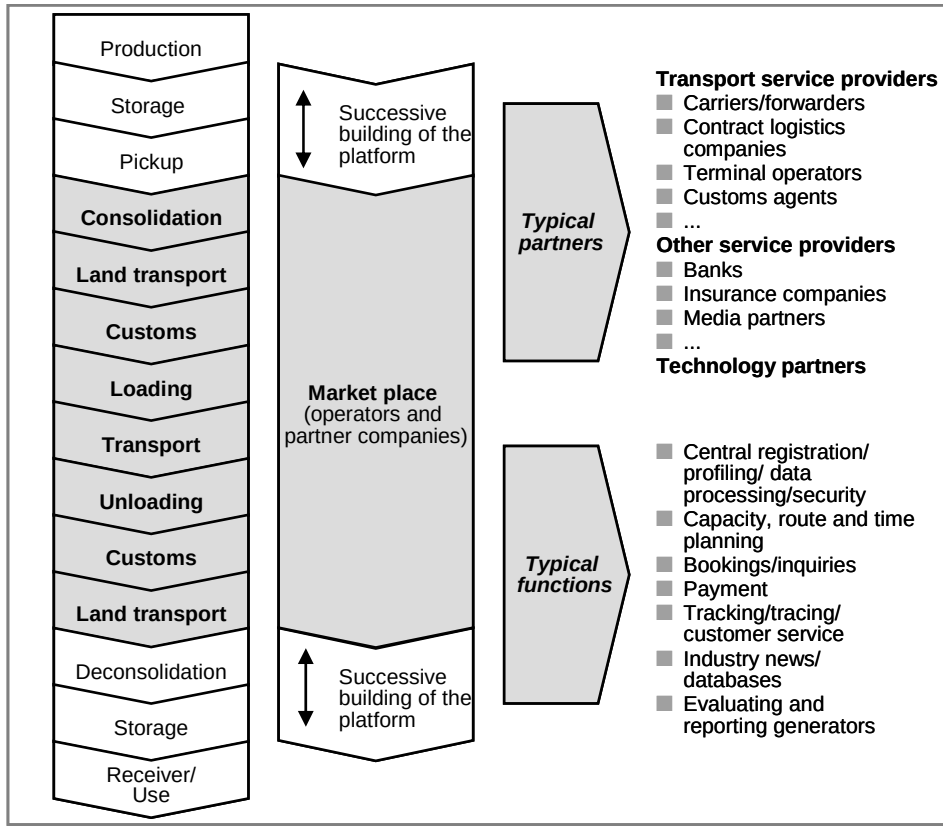


Figure 1.12: Linking all partners in the container shipping industry; Source: A.T. Kearney

Shipping customers use this new data quality and up-to-the-minuteness for their part to be able to plan well ahead and thereby increase their competitive advantage. Offering such customers added value means bonding large transport volumes long-term and planning far in advance in close collaboration with the customer. The extensive availability and up-to-the-minuteness of the information provided by the IT technology has been made a clause in many transport contracts and enables the acquisition of new, technically demanding customers.

IT as a part of the end product

For enterprises that have already had experience in enhancing value with IT, it is only a small step further to be able to increase revenues with IT not only directly – for example through price premiums based on additional benefit, as in the example of the container shipping industry described above – but also indirectly to develop new sales potential and even new business fields with IT.

Undeniably it depends on the type of individual business, whether IT can be implemented as a component in the end product at all, and whether this proves to be financially feasible. In sectors whose products are inseparably connected to IT, for example telecommunications companies, this idea of sales-relevant IT is nothing new. The introduction of the so-called prepaid card, on which funds can be loaded for making phone calls in mobile communications networks, was almost exclusively a challenge for IT managers. It was the development of software solutions in billing and accounting systems that created the prerequisites for implementing this innovative product.

The birth of transaction banking shows how IT makes improvements to operations that open up potential for increasing sales, until IT ultimately creates new sales potential.

The birth of transaction banking

As a result of enormous cost pressures, several banks automated their transaction processes and achieved considerable improvement at operational level:

- Error reduction by raising the STP (Straight Through Processing) rate
- Acceleration of transaction processes (from ‘T+3’, i.e. completion of process three days after carrying out transaction, to ‘T+1’ and finally to real-time transaction ‘T+0’)
- Improved overall bank control by linking front-office systems (trading systems) with back-office systems and systems for risk controlling and reporting
- The flexible transaction systems enabled these banks to develop the further potential benefit of IT: product innovations, particularly the handling of new derivative products, could be realized more quickly. Thanks to improved time-to-

market, some of the banks were able to position themselves as product innovators in retail banking and increase their sales in the area of purchase warrants and structured loans, while others positioned themselves as innovative market players in the credit sector with high-performance IT supporting automated credit processes. As a result they were able to make faster decisions than many of their competitors for granting deferred payment credit – a crucial competitive edge

And finally, several banks used IT for developing new business fields: Some of the operations systems were set up in a client-enabled way and the services of other banks were made available. With this step, entirely new customers were acquired and the result was a pure transaction bank, which made use of high economies of scale in the transactions. Through these transaction banks, other banks are able to achieve cost advantages of up to 30 percent over handling the business themselves. Why should every bank develop and maintain their own transaction systems for their clients when IT makes it possible to provide a larger number of such services more efficiently on a central basis?

In addition to IT-oriented sectors like mobile communications and banking, other sectors, whose products do not appear to be IT-oriented, are also using innovative IT to capture additional sales potential for their business.

- Manufacturers of agricultural machinery, for example, integrate information technology as an additional 'precision farming' component in their combine harvesters, fertilizing machines or chaff cutters – a component with its own sales that also achieves a high level of customer bonding. In connection with Global Positioning Systems (GPS), intelligent software in fertilizing machines can, based on the carbon content of the soil, calculate within a fraction of a second, how much fertilizer per square meter must be applied to each individual part of the land. In next year's harvest, the combine harvester, equipped with appropriate recording software, then measures the exact harvesting quantity for each field and feeds the information into an integrated database, from which the fertilizing machine can draw its information for calculating fertilizer quantities for the following growth cycles. This enables farmers to increase their earnings in kind, economize on inputs and optimize processes with improved soil cultivation and a focused control of all agricultural operations. Naturally, the manufacturers of farm equipment not only allow the farmer to pay for this software-driven feature, they also achieve valuable customer bonding effects, because the solutions of the various manufacturers of agricultural machinery are of course proprietary and not necessarily compatible, which means that if a farmer changed to a different machine he would lose valuable data for optimizing sowing/planting crops, fertilizing and harvesting – so for this reason alone the hurdles involved in switching suppliers are higher.

- Manufacturers of tractors, trucks and construction machinery can use information technology as a tool to analyze and diagnose the end product, for supporting maintenance and maintenance-related processes. For this, software programs – so-called 'machine messengers' – are integrated into the machines and deal with failures by calling up essential maintenance and maintenance-relevant information, such as operation hours, fuel consumption or average speed, in a cyclical and also need-oriented way. The information is transmitted via a 'communication controller' and a cellular antenna to a central server at the manufacturer's company. All information about the entire life cycle of the machine, with every problem that has ever occurred and all of the servicing that has been carried out, is stored here. This information is just as useful for the owner of the machine as it is for the manufacturer. On one hand, potential problems and particularly failures can be recognized and prevented in advance, thanks to the precise analysis and evaluation of the data. For this, alert logs are used, in which especially parameters that should be subject to regular maintenance are called up from the primary technology. If a failure could be prevented, then the recording of the maintenance and operational activities can be used to search for possible causes. In combination with the data on previous experiences, which have been collected in the database for the machines of other owners as well, this comprises an excellent database for the focused analysis of problems. The manufacturer achieves significantly more efficient and also more effective maintenance processes. The advantages for the owner lie in a higher level of availability of a restricted number of expensive machines: On the one hand failures can be prevented. On the other hand, unavoidable failures can be corrected faster. This way, in addition to the original product, the manufacturer can build up a competitively differentiated position via the implemented IT solutions.
- A completely different sector – in which the value-enhancing use of IT in the products seems hard to imagine at first glance – is the furniture industry. Behind the terms 'roomware', 'ubiquitous computers' or 'smart artifacts' technologies are hidden that aim at the direct and invisible integration of computers in our living spaces. Talking walls, at home and particularly in the office, is intended to give people the information they need in whatever context, every moment of the day. For example, a particular wall color or shading in an office can indicate that e-mails are waiting in the mailbox, or for example in the controlling division, it could mean that available funds have sunk below a defined threshold. In private quarters, the wall color could, for example, indicate that electronic appliances such as the washing machine or the dryer have a defect. A manufacturer of office furniture recognized the changing work forms and processes in enterprises and has developed new, IT-assisted products. As today's average employee spends some 30 percent of his work time in meetings and managers spend even 60 to 90 percent in meetings with colleagues, customers or suppliers, the resourceful furniture makers concluded that more highly professionalized tools and equipment could achieve considerable boosts in the efficiency and ef-

fectiveness potential of communication. Who hasn't seen them, the banks of notebooks set up round the table at every meeting, supposedly for communication, but actually blocking communication between participants rather than promoting it? The company built interactive 'electronic walls' (DynaWall), interactive conference tables (InteracTable) and systematically prepared the use of collaboration software (Basic Environment for Active Collaboration – BEACH). Without going into great detail, common to all of the products was that facts are more readily available for viewing – literally 'on the table' – and can be processed by all participants online with a stylus or by hand. The furniture company had thus created the prerequisites for inventing new customer needs and developing new sales potential. Today there is already a competitive advantage: for example, the company was the only representative of the furniture sector invited to exhibit at the CEBIT – an excellent platform for approaching customers and penetrating new market and market segments.

- A further example of the integration of IT in products is the 'smart home' – the German federal office for promoting security in information technology speaks of 'integrated building systems'. These systems equip building components such as lighting systems, blinds, window and security systems or household appliances with sensors, actuators, control units and software, and then network everything together. Based on this, systems are developed that integrate this hardware and software and offer services for improving the quality of life in various types of building utilization scenarios. For example such services enable an increased level of comfort (everything is remote-controlled), the optimization of energy consumption or the improvement of building security. Enterprises from a variety of sectors could profit from this technology. For the makers of the technology, the benefits lie in the expanded functions of the devices, in retaining and/or regaining higher profit margins through various price segments and in the possibility of integrated device and content offerings. For telecommunication companies, integrated offers for home services, Internet and cellular communications would be considerations. Utility companies can offer new services like load management, individualized energy consulting or the consolidation of services, utilities and devices, an already widespread method used today in heating systems.

All these examples show that many enterprises are already achieving success today with the use of innovative IT. Leading enterprises like Rank Xerox have already initiated comprehensive research programs, intended to deliver the expected revenues by using IT in the product at an early stage. Thus, it makes sense to think about seemingly 'impossible' and innovative integration possibilities in primary products because soon as the first company in a given sector has begun using IT to develop new market potential and create competitive advantages, it will be difficult for 'latecomers' to make up for lost time.

Checklist: Is your company ready to maximize the value of IT?

	Yes
■ Is your corporate strategy clearly defined?	❑
■ Is your IT strategy oriented long-term to corporate strategy? Do IT benefits have clear priority over IT spending?	❑
■ Have business units and the IT department identified the potential benefit with IT together?	❑
■ Have business units and the IT department decided on an IT innovation portfolio for developing IT potential benefit together? Are the business cases calculated and positive?	❑
■ Is there a systematic IT implementation plan, and has this been discussed with all parties involved?	❑
■ Is there willingness to use innovative IT to assure revenues and increase sales and to develop new sales potential by integrating IT in the product?	❑