WHITEPAPER

Internationalization of companies with ERP systems - a case study

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In this whitepaper you will find:

- which problems can occur during ERP internationalization,
- which alternatives exist for the international use of ERP
- how these alternatives can be evaluated.

Content

Management Summary

The establishment of foreign production sites is associated with high investments. In order to ensure the profitability and competitiveness of these foreign locations, the ERP structure must be able to adapt to the respective situation in the country or continental region concerned. The Potsdam Consulting Group has developed a procedure for the internationalization of ERP systems in cooperation with the Chair of Business Informatics, Processes and Systems at the University of Potsdam.

Based on an analysis of existing ERP structures in the international application environment, a target model for the distribution of the ERP task is conceptualized and prepared for implementation according to the individual company requirements. The competitive advantages of the individual companies will be taken into account in order to achieve an economical international ERP use that corresponds to the respective market position.

In numerous industries, companies that were initially predominantly active in Germany are now expanding their manufacturing capacities according to their customers around the world. This is the case, for example, in mechanical and plant engineering, which today generates more than 80 percent of its sales with customers abroad. Similar developments can be seen in the automotive supplier sector, which follows the respective OEMs to the respective manufacturing countries. An internationalization of supply for externally manufactured products can also be discovered in the area of trade. These globalization trends are leading to production sites of German companies on all continents, with the main focus on North and South America and Asia, but also in Africa, especially in countries bordering the Mediterranean and in South Africa.

In order to cope with this increasing internationalization, also in the mapping of business processes in ERP systems, company-wide IT structures are required which can offer a satisfactory degree of business-related internationality. The lack of qualified employees at foreign locations is becoming a problem. There are rarely enough qualified employees available to operate the ERP systems. This represents a major obstacle to the transfer of the ERP philosophy maintained at the German headquarters. The situation is further aggravated by the fact that in some countries (e.g. China) fluctuation is very high and employees with university degrees sometimes work for the same company for less than a year.

The establishment of a foreign production site is associated with high investments. Therefore, in order to ensure the economic efficiency and competitiveness of this foreign location, it is extremely important to be able to adapt to the respective situation of the country or continental region concerned. This requirement applies in particular to the automotive supply industry.

The Potsdam Consulting Group has developed a procedure for the internationalization of ERP systems in cooperation with the Chair of Business Informatics, Processes and Systems at the University of Potsdam. Based on an efficient analysis of existing ERP structures, a target model for the distribution of the ERP task scope in the international application environment is determined and can be implemented according to the individual company requirements. The individual competitive advantages of the respective companies will be taken into account in order to achieve an international ERP usage that corresponds to the respective market position and is economical.

This whitepaper describes the ERP internationalization at a medium-sized automotive supplier company with numerous locations on several continents. First the analysis of the companies market position is shown, then alternative strategic plans are proposed and eventually the recommended alternative is described.

The strategy determines the distribution of tasks

The procedure for developing the future ERP structure is shown in Figure 1 [1].

It is assumed that the corporate strategy is market-oriented. These market requirements are surveyed and used as the basis for defining a strategic focus for the company and its IT. The strategic focus must also be reflected in the IT architecture of the company and in the international use of ERP, as shown in Figure 1.

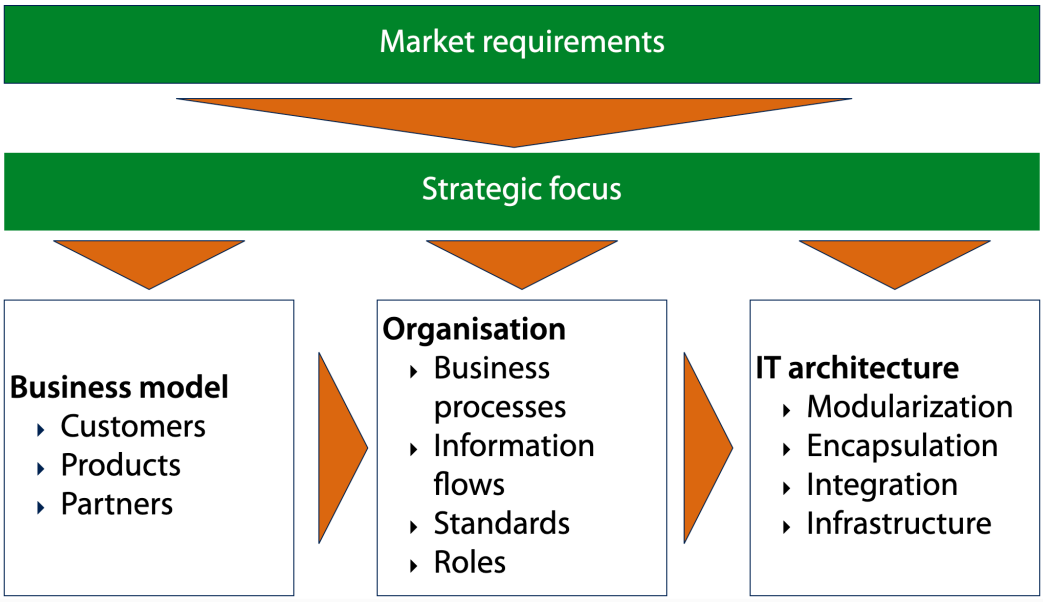

Figure 1: Process model for development of an international IT structure

Market requirements can include, for example, a high delivery capacity (> 99.5%) and a global presence that enables delivery within 24 hours to any place in the world. This requirement is one of the main reasons for establishing local production.

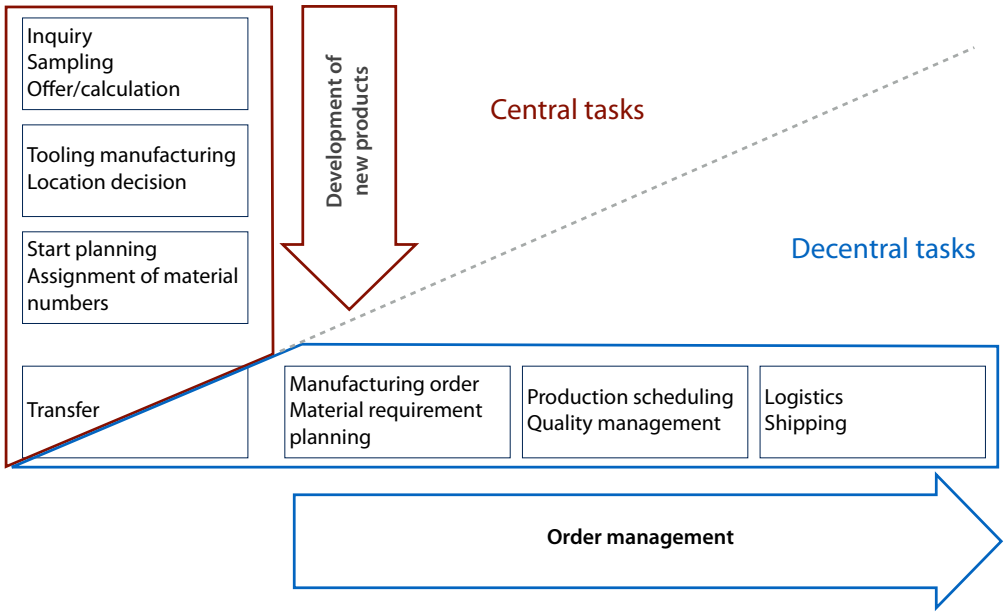

Figure 2: Differentiation between centralized and decentralized tasks.

Further market requirements include strict compliance with the quality requirements specified by the respective manufacturer and consideration of an increasing number of variants. Simple articles are replaced by more complex products with several variants.

The company presented as an example derives the following strategic statements from these market requirements:

The company wants to have a global presence, it aims for relative market leadership in the area of the products it manufactures. The company is pursuing a differentiation strategy. The focus is not on achieving the lowest possible costs, but rather on enabling a product range that is as customer-specific as possible. A further strategic determination is to be able to supply the complete product range from any plant worldwide (from local production).

The next step was to differentiate between centralized and decentralized tasks. The required scope of ERP functions at each global location is primarily based on the tasks that can be performed there largely autonomously [2].

The differentiation made is shown in Figure 2. The development of new products and the preparation of the start of production are central tasks. The processing of production orders and delivery schedules is a decentralized task.

Cross-plant business processes

Subsequently, the cross-plant business processes were examined to determine the impact of the order distribution decisions made on these business transactions. Examples include product or location decisions, the creation of routings and the establishment of electronic communication between producers and suppliers. Most of these tasks are performed centrally; the worldwide locations are informed by the head office and, if necessary, involved in decisions.

For situations that require a rapid response to unforeseen events, such as machine breakdowns, warehouse bottlenecks or unplanned changes in demand, a plan of action has been defined that provides for decentralized processing first and then for a transfer to headquarters if the problem or situation that has arisen can no longer be handled decentrally.

The securing of the information supply by an appropriate company or plant controlling can be regarded as a cross-sectional task across central and decentralized areas. Exemplary key figures for the controlling of the company are the achieved productivity, the complaint rate as well as the respective local stocks. Requirements for the ERP system at central level and at decentralized level are then derived from the specifications made for the distribution of tasks.

During the subsequent process mapping in the local application systems, country-specific differentiations must also be taken into account. It does not always make sense to map these centrally because they differ from country to country. Examples of this are material valuation procedures that only require certain adjustments in South America, the printing of invoices to local customers in China, which must be done on paper provided by the government.

Alternative models for ERP internationalization

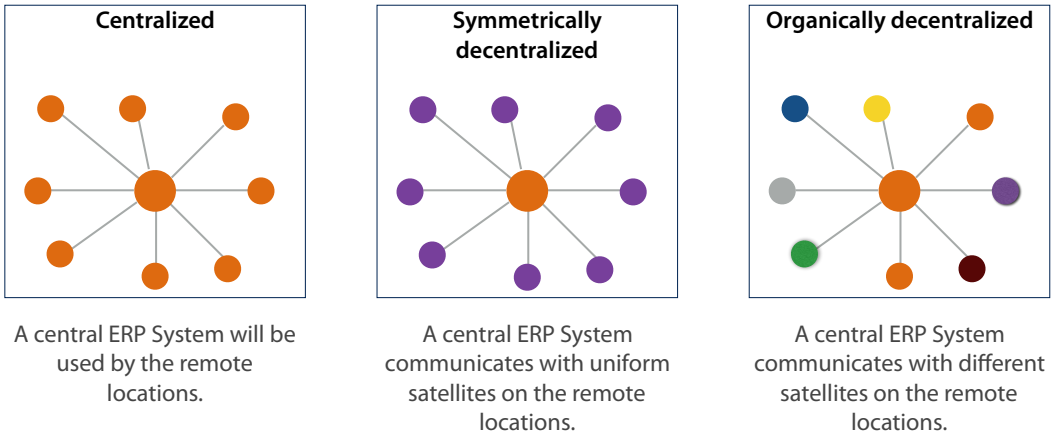

Figure 3: Alternative models for ERP Internationalization

Figure 3 shows three alternative models with which a solution to the requirements that arise is possible in principle. The *centralized* model envisages that the ERP system with its functionality will also be used at all production sites worldwide. In principle, this is quite possible with ERP systems and is also quite common if the corresponding line connections are available. The disadvantage of this option is the high complexity of the resulting system. Country-specific features must either be taken into account globally or mapped externally.

The *symmetrically decentralized* model differentiates between a centrally used ERP system and another application system that offers globally standardized functions for production and logistics. The complexity of the decentralized system is significantly lower and country-specific adjustments can be made more easily.

The third model, *organically decentralized*, gives greater importance to individual country requirements and therefore uses locally offered systems from the respective country to map the requirements of the individual locations. In this way, country-specific requirements can be mapped well. A uniform interface is then also used to as in the decentralized-symmetric model, the exchange of data with the central ERP system

The appropriate solution for a specific task and a concrete corporate strategy and worldwide distribution of tasks cannot be found in general, but must be

decided individually, taking into account the respective strategy and market position.

Criteria for selecting the appropriate model

The Potsdam Consulting Group, in cooperation with the Chair of Business Informatics, Processes and Systems at the University of Potsdam, developed an evaluation approach that enables a comprehensible assessment of the alternative models. The evaluation criteria are essentially based on the aspects of sustainability, costs and feasibility.

Criterion 1: Sustainability

This criterion deals with the necessary adaptability and flexibility. It can be assumed that internationalization, although it takes very different courses depending on the sector, is not a completed process that will stop at some point. For this reason, a fast and efficient ability to change in the overall architecture is of great importance. This applies, for example, to the relocation of central tasks to the plants, but also vice versa to the spin-off of products or product groups or organizational units into separate companies, the acquisition of national companies, but also to changes in processes and the continuous adaptation to changing customer requirements.

Criterion 2: Costs

Even if the company presented as an example pursues a differentiation and not a cost leadership strategy, the costs arising from the respective solutions must still be taken into account. A more expensive solution will only be given preference if it has clear advantages in terms of future viability.

Criterion 3: Feasibility

Finally, it must be checked to what extent the functional requirements, which are based on the distribution of tasks and the required process coverage, can be met by the respective models.

Case study: an automotive supplier

An automotive supplier has plants in Central America, South Africa, Asia and Europe (Germany and South West Europe). It manufactures parts of the interior fittings of passenger cars and supplies these to first-tier suppliers, who in turn supply their products to OEMs. Four scenarios have been developed to assess the future viability of the company, which indicate the possible changes that could occur in the next few years in terms of ERP deployment and business processes. The method for determining the adaptability [3] is used.

For the cost-related criteria, the introduction of a new central ERP system was assumed; new projects were also assumed for the respective local systems. This

was possible because the focus was not on cost comparison with the previous IT structure. Licenses and maintenance costs, training, customizing and hardware were taken into account.

Feasibility was checked on the basis of the functional requirements and their implementation within an acceptable time. It was assumed that standard functionality leads to a short implementation time, while adaptation efforts, the integration of partner solutions and the necessary interface development and individual programming induce a higher time requirement.

	Brazil	Spain	Czech Republic	China	Namibia	Group holding
Generation of Shipping documents	✅	✅	✅	✅	✅🛠️	✅
Transfers of invoices to the headquarter	✅	✅🛠️	✅	✅🛠️	✅🛠️	✅
Complaint management	✅	✅	✅	✅	✅🛠️	✅
Central access to warehouse stock, complaints key figures, manufacturing data	✅	✅🛠️	🛠️	✅🛠️	✅🛠️	✅
HR time capture and salary calculation	❌	✅🤝	💻	✅	🛠️	✅
Reports and analyses	✅	✅	✅	✅	✅	✅
Real time access to finance and accounting system	✅	✅	✅	✅	✅	✅

✅ Requirement fulfilled
🛠️ Requirement fulfilled by customizing
✅🛠️ Requirement fulfilled with additional customizing
💻 Requirement fulfilled with programming
✅🤝 Requirement fulfilled with partner software
❌ Requirement not fulfilled

Figure 4: Exemplary fulfillment of ERP requirements

Corresponding evaluations were made for all models. Figure 4 shows an example of how ERP requirements are met.

Table 1: Comparison of the three alternatives, summarized.

Alternative	Assessment of changeability	Cost	Feasibility
Central ERP	50 %	2.1 Mio EUR	68 %
Decentral ERP	67 %	2.8 Mio EUR	100 %
Decentral MES	58 %	1.7 Mio EUR	100 %
Decentral local ERP	37 %	2.7 Mio EUR	49 %

Table 1 shows the results achieved for the company in the case study. In principle, sustainability is greatest in the decentralized-symmetric model; due to the selected assumptions, the greatest differences in costs also arise here. By clever selection of appropriate providers, a feasibility of 100% and thus a short

implementation period and integration effort in the course of the project can be achieved.

In contrast, the "central ERP" model with a medium-sized sustainability does not show complete feasibility, which tends to require more time for implementation.

In the example, the decentralized-local solution has the lowest sustainability and also presents some feasibility requirements as not being feasible.

When evaluating the knowledge gained, it should be taken into account that the preferred model is particularly suitable for the company presented in the example and that other models may prove more suitable if the distribution of tasks and other requirements are different.

Sources

[1] Aier, S.; Schönherr, M. (Hrsg.): Enterprise Application Integration - Flexibilising of complex enterprise architectures. GITO: Berlin, 2004 (in German).

[2] Gronau, N.: Enterprise Resource Planning: Architecture, Functions and Management of ERP systems. Oldenbourg: München, 3rd edition 2014 (in German).

[3] Andresen, K.: Design and Use Patterns of Adaptability in Enterprise Systems. GITO: Berlin, 2006.

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