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SUCCESS FACTORS IN THE INTRODUCTION OF STANDARD SOFTWARE IN CORE PROCESSES OF BANKS

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Abstract

The financial services industry has experienced major changes in recent years, including globalization, deregulation, disintermediation, technological advancements, and new competitive structures. In the light of these changes, banks try to simultaneously achieve higher operational efficiency and higher flexibility. Both goals have been achieved in other industries with the digitalization and standardization of core operational business activities such as the introduction of standard software packages like ERP. Vendors of standard software are now discovering the financial services industry and its core business functions, as a market, and banks are eagerly examining the potential benefits from standardization. However, ERP projects are known to have high risk levels and to be complex and expensive. Multiple studies have investigated the success factors of standard software introductions in general as well as in specific industries. New standard software packages for banks' core business functions have emerged on the market, but little is known about their introduction's success factors. In this study, we analyzed four major banks from German-speaking central Europe that have introduced a standard software package for their core business functions. Findings include that the key benefits are fairly comparable to benefits realized in other industries, and that organizational changes are similar and enable the financial services industry to reduce the vertical range of production significantly. Key success factors include those found in other studies from other industries but also further factors specific to the financial services industry.

1 Introduction

1.1 Standard Software in Core Banking

Major challenges have had a noticeable impact on the financial services industry in recent years. Schierenbeck identified five major drivers for changes (Schierenbeck, 2003, pp. 5): globalization, deregulation, disintermediation, technological advancements, and new competitive structures.

In reaction to these challenges, banks focus on improving the efficiency of their operational business while maintaining, or even extending the flexibility necessary to stay competitive in the market. Measures to implement these efforts include the digitalization and standardization of operational business processes such as transaction banking (Schierenbeck, 2003, p. 26) as well as the foundation of an information technology infrastructure based on open or industry standards (Vaciago, 2000). In the light of the renewed legal framework and deregulation, cross-industry standardization produces synergies that are enabled by technological advances. One of these technological advancements is the availability of standard software packages for core banking processes.

Similar effects have already been realized in other business functions, such as human resource management, financial accounting, controlling and procurement, in which companies successfully realized benefits from the introduction of ERP software solutions such as SAP R/3 or Oracle Applications.

Besides these benefits of standard software, the financial services industry had been an early adopter of software support in its core business processes, which has resulted in many legacy applications still being in use today. The introduction of standard software can also help to overcome the difficulties implied by these legacy applications.

1.2 Research Goals and Structure

This paper provides insight into three aspects of the introduction of standard software in banks' core business processes, which include account management, loan management or customer master data management (see section 2.3). We will focus on three different perspectives:

- The expected *project results* of the technological change,
- the organizational changes observed, and
- the *key success factors* that have been identified.

In section two, we will describe the research background and related research, including an overview of research and practical experiences regarding standard software applications in industries other than financial services. In addition, we will highlight the challenges in financial services and analyze the potential standard software as an enabler to overcome or at least mitigate those challenges. The third section outlines the research methodology applied to obtain the results. Section 4 describes the project triggers and subsequent implementation experiences. The fifth section discusses the results of the cross-case analysis of the cases studies, focusing on the project results, the organizational changes and the key success factors. Section 6 concludes the paper and provides prospects for further research.

2 Research Background

2.1 Standard Software in other Industries

When the subject of standard software in enterprise systems is discussed, the most prominent and most extensively discussed example is Enterprise Resource Planning (ERP) software. ERP software promises to provide an integrated view and a single point of storage for all the information that an enterprise needs to handle. It promises "to provide information to those who need it when they need it" (Ragowsky & Somers, 2002). If done correctly, ERP implementation can have significant benefits. Senger (2004) finds that the implementation of standard ERP systems such as SAP is mostly done to provide a technological and informational basis for higher level business initiatives, such as new business models or cooperation of partners across a value chain¹. ERP has been widely covered in the literature as the first example of enterprise application standard software (Davenport, 1998)². We provide a brief discussion of the core results of different aspects of standard software in enterprise systems.

Österle (1990) analyzes the relevance and impacts of standard software for the corporate strategy. Core findings are that the recognition of the business potential of IT plays an important role in higher management's decisions on the implementation and usage of standard software and the choice of vendor, as these decisions can be mission critical for the company. Critical challenges can often be found in organizational rather than in technical aspects. The first major decision concerning the introduction of standard software is the vendor selection. Brenner (1990) identifies three major types of selections of standard software: *strategic selection*, selection according to *corporate policies and standards* and selection of an *isolated solution*. The first type is a selection that a company only makes once. If a strategic decision concerning a vendor has already been made, subsequent solutions can only attempt to comply with the standard or to select an isolated solution. The latter is only recommended in a few cases.

According to Bernroider & Koch (2000), the decision is generally made by the top management, while multiple business units are consulted in the decision process. Modern methods of cost-benefit analysis are rarely applied. In the case study companies, the project management of the implementation of standard software is usually the IT office's responsibility.

¹ Detailed examples from different industries can be found in Brown, C. V. B. and Vessey, I. (2001) Nibco's "big bang". *Communications of the AIS* 5 (1 (January)), 1-41. (manufacturing industry), Holland, C. P. and Light, B. (1999) Global enterprise resource planning implementation. In *32nd Hawaii International Conference on System Sciences*, Hawaii. (textile industry), Lin, S. E. and Senger, E. (2003a) Case study olin chlor alkali products - b2b solutions for electronic ordering and information exchange. Center for Digital Strategies at Tuck School of Business at Dartmouth and Institute of Information Management University of St. Gallen, Hanover, NH, and St. Gallen. (chemical manufacturer), Lin, S. E. and Senger, E. (2003b) Case study xiameter - e-commerce solution covering business customer ordering and information processes. Center for Digital Strategies at Tuck School of Business at Dartmouth and Institut of Information Management University of St. Gallen, Hanover, NH, and St. Gallen. (chemical manufacturer) and Senger, E. (2003) Fallstudie abb turbo - portallösung aturb@web zur unterstützung des service- und verkaufsprozesses der abb turbo systems ag. Institut für Wirtschaftsinformatik Universität St. Gallen, St. Gallen. (turbo charger manufacturer).

² For an annotated overview see Esteves, J. and Pastor, J. (2001) Enterprise resource planning systems research: An annotated bibliography. *Communications of AIS* 7 (8), .

Once the decision for a standard software package has been made, the next questions that need to be answered are how to define the scope of the desired solution (i.e. which of the chosen package's modules will be installed), and how to introduce the solution into operations (e.g. the introduction all at once vs. a step-by-step approach). Buxmann & König (1997) conducted an empirical analysis and found that most companies accept the trade-off between the disadvantage of suboptimal solutions in some functionalities and the advantage of an integrated and scalable solution. They therefore implemented multiple modules of a standard software package (in this case SAP R/3) and set the scope of the implementation internationally and corporation-wide. In the English business literature, the first contribution to examine the cross-organizational issues of enterprise systems' implementation was probably that of Davenport (1998). He pointed out the crucial importance of the alignment between business and an enterprise system, which leads to a trade-off between the loss of differentiation and the standardization of systems and processes. The latter are especially crucial in industries with standardized products. Davenport concluded that it is of major importance to consider the expected benefits versus the expected risks. He stated that the challenges mostly stem not from technological issues within the enterprise system, but from organizational issues arising from its implementation. As Davenport put it, the motto should be to "stress Enterprise not System". Brown & Vessey (1999) then extended Davenport and others' ideas and created a framework of factors that determines the approach that companies take when introducing ERP systems. They identified two blocks of fundamental prerequisites to be analyzed: the implementing company's organizational environment and the capabilities required of the ERP package to be chosen. These respectively reflect the Enterprise and the System (in Davenport's language). Both determine the vendor choice and the project scope (i.e. which modules to introduce on which organizational level etc.). The influence of these prerequisites on the ERP implementation approach and the attributes Brown & Vessey (1999) found to classify these approaches are depicted in Figure 1.

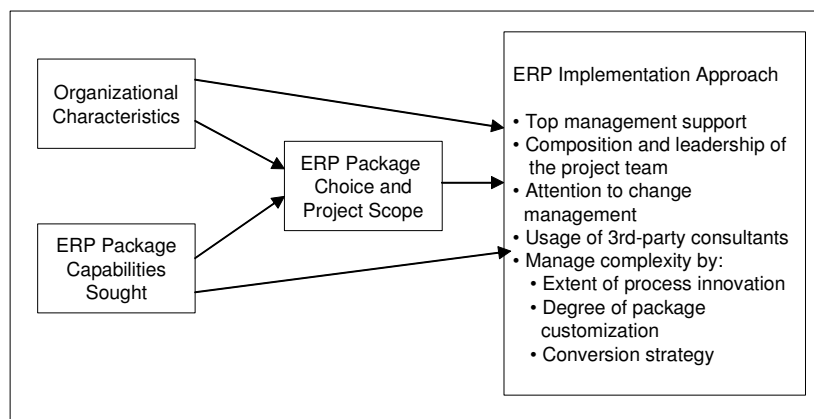


Figure 1: Model of ERP implementation approaches (Brown & Vessey, 1999)

Nah et al. (2001) analyzed the critical success factors for enterprise systems implementations. They found eleven factors and classified them into Markus & Tanis's ERP life cycle model stages (2000) (see Figure 2). Hitt et al. (2002) additionally found that the benefits of ERP system implementations are rarely realized in the short term, but rather on a mid-term timeframe. Long-term studies have yet to be performed. This emphasizes the strategic nature of ERP initiatives. In their decade-long in-depth study of a dozen large ERP projects, Brown & Vessey (2003) supported top management support, experienced project leaders, change management and an appropriate mix of new business and legacy systems (which they refer to as a satisfying mindset) as success factors. They also introduced a further factor, that of third parties (such as consultants), who fill gaps in expertise and transfer their knowledge to the implementing organization.

Shang & Seddon (2000 and 2002) analyzed 233 web-published ERP cases and conducted 34 in-depth interview series with participants in selected projects, which led to the development of the following framework of benefits that can be expected from enterprise systems. Murphy & Simon (2002) added a classification of these factors according to tangibility and quantifiability.

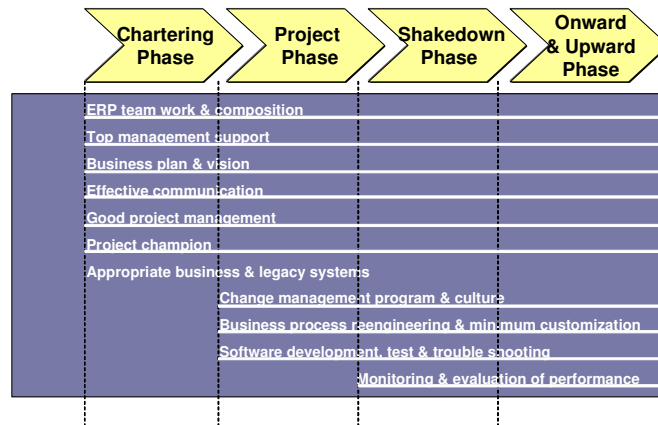


Figure 2: Critical success factors for enterprise systems implementations (Nah et al., 2001)

2.2 Challenges in the Financial Services Industry and Potential of Standard Software

The financial services industry has faced and is still facing major challenges that have a strong impact on the market in general as well as on the way financial services companies do their business. The following major drivers of change have been identified (Schierenbeck, 2003, pp. 5):

- **Globalization:** The increasing transfer of foreign currencies; the percentage of capital transactions increasing and exceeding the export/import volume by far; tighter international networking between financial markets and marketplaces; international standards set for legal regulations (e.g. Basel II, IAS/IFRS), which have changed the market structure radically; markets opening to international players, and financial services operating more easily on the global market.
- **Deregulation:** Loosening of legal market regulations opens financial services markets to “non-banks” and “near-banks” (e.g. telecommunication providers offering billing services). This is especially applicable with regard to the European Union’s standardizing of market regulations, and further encourages globalization trends.
- **Disintermediation:** Encouraged by deregulation, banks are eliminated from the value chain where they merely play the role of financial transactions facilitators. Mutual fund companies, insurance and other financial services providers also no longer rely on banks as retailing partners, but address their end customers directly.
- **Technological advances:** Advances in information and telecommunication technologies allow the diversification of marketing and service channels, endangering or even eliminating the competitive advantage banks had in their dense branch networks. These advances specifically encourage the disintermediation trends mentioned above. An increasing level of industrialization can be identified in the banking sector, which is visible in the higher rationalization potential in service delivery and sales processes, and is specifically driven by advances in information and telecommunication technology.
- **New competitive structures:** As a whole, all of the previously mentioned trends lead to a restructuring of the existing competition. Standardized financial services products can be copied more easily by new market players; on-line banks entering the market without the burden of a major investment in a branch network, and financial service mediators – such as MLP in the central European, British and Spanish market – specifically address the rising expectations of the most profitable private customers.

The previously described drivers of change lead to higher market efficiency and thus stronger competition and the need for financial services providers to change faster. In order to cope with these challenges, banks have to increase the efficiency of their operations. One measure to reduce operational costs is the standardization of operational business processes, such as transaction banking (Schierenbeck, 2003, p. 26). The technological advancements mentioned above are the technological basis for such standardization efforts, while the legal frameworks and deregulation are its organizational and legal basis. Together they allow the outsourcing of standardized business processes - even of banks’ core business. The example of transaction banking and account management again comes to mind. Having more scalable systems at hand which also offer better interoperability to industry standard enterprise applications, as some banks can reduce their operational costs by realizing economies of scale as an outsourcing partner offering, for example, account management or transaction banking to other banks, while others can achieve the same result by outsourcing their standard processes to the former..

Similar results have already been realized in other business functions, such as human resource management, financial accounting, controlling, procurement etc., in which the success of ERP software solutions such as SAP R/3 shows the benefits that companies realize through their application.

Besides standard software's benefits, many banks face the necessity of having to rethink their IT landscape, as they have traditionally been early adopters of IT, building large, often monolithic applications, which are often in use for decades. These applications are mostly based on currently outdated technologies like COBOL and PL/I that cannot meet modern challenges such as highly integrated multiple sales and service channels, or which are hard to maintain because the necessary skills are increasingly difficult to find.

2.3 Core Processes in the Banking Industry

Optimization for operational efficiency is related to the business processes within the banking industry. There are several analyses of banking process frameworks in the academic literature, some focusing specifically on these processes' out- or in-sourcing potential. Since we specifically want to analyze the introduction of standard software in the banking industry, we consider the processes unique to the banking industry as the "core processes" and will investigate them.

Based on Porter's work, Lammers et al. (2004) developed a model of the processes in the value chain within banks. They classify processes into two high-level categories (see Figure 3):

- *Primary Activities*: marketing, sales, products, transactions
- *Supporting Activities*: risk management, technology development, human resources, firm infrastructure

They further break down the primary activities into:

- *Marketing*: advertising, branding, sales support
- *Sales*: acquisition, offering, multi-channel management
- *Products*: funding (deposits, securitization, credits), investment (credits, securities, financial products, corporate investments, other) and services (account management, asset management, issuance/IPO, mergers & acquisitions, advisory services, other)
- *Transactions*: Payment, Trading, Clearing & Settlement, Custody

Even though *Marketing* and *Sales* are identified as primary processes in this model, they are not entirely unique to the banking industry, as they are similar to those in other industries. Consequently, similar standard software such as CRM software can be used. We therefore only consider the *Products* and *Transactions* process classes as core processes. Risk management is also considered a core process, as it is a major core competence of the banking industry.

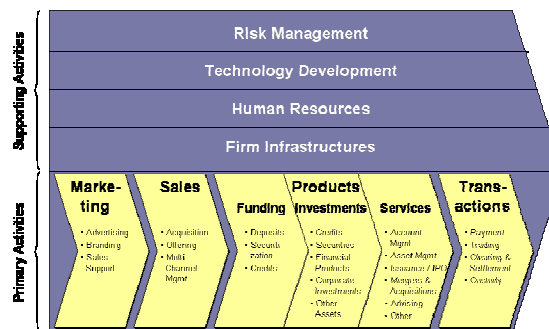


Figure 3: Process Model of the Banking Industry (Lammers et al., 2004)

3 Research Methodology

3.1 Case Sites

The research data were collected in a study of German banks from July 2003 to July 2005. These sites were chosen for theoretical rather than statistical reasons and selection was based on two criteria: purposeful sampling (businesses' different characteristics regarding size and business segments, see table 1) and a willingness to cooperate (Yin, 2002). The banks cover a wide range of total assets, profits, and multiple market segments. Analyzing the different roles, we discerned different viewpoints and consequently gained a more complete picture of the possible challenges (Eisenhardt, 1989, p. 537). Table 1 provides a brief overview of the case sites.

	POSTBANK	WFA	DZ BANK	MHB
<i>Established</i>	January 1990, after the splitting up of Deutsche Bundespost	April 1958	January 2001 in a merger of DG Bank and GZ Bank	1896 as "Bayerische Landwirtschafts-bank"
<i>Principal office</i>	Bonn, Germany	Düsseldorf and Münster, Germany	Frankfurt (Main), Germany	Munich, Germany
<i>Business segments</i>	Corporate and retail banking, life insurance	Provides low-interest loans to companies and individuals willing to build or modernize social housing	Central bank for 1130 credit societies, commercial bank with functions in corporate and investment banking	Mortgage and loan banking
<i>Homepage</i>	www.postbank.de	www.landesbank-nrw.de	www.dzbank.de	www.muenchener-hyp.de
<i>Total assets</i>	€ 141.1 billion (2002)	€ 21,902 billion (2002)	€ 172 billion (2003)	€ 29.9 billion (2002)
<i>Profit before tax</i>	€ 399 million (2002)	€ 63 million (2002)	€ 147 million (2003)	€ 48.3 million (2002)
<i>Employees</i>	8,700 (2003)	388 (2002)	4,562 (2002)	378
<i>Implemented Core Banking modules</i>	FS-BP, AM	BCA, CML, RBD	FS-BP, BCA, CML, CMS	FS-BP, BCA, CML, CMS, RBD

Table 1: Overview of the analyzed case sites

3.2 Data Gathering

In all four cases, data were collected through semi-structured interviews with key informants and a document analysis of annual reports, organizational charts, and system charts. The central semi-structured interviews' structure was provided by Senger and Österle's case study method (Senger & Österle, 2002). Dividing an interview into several levels is often suggested as a method to control complexity (Ferstl & Sinz, 1997; Scheer, 1995). In respect of the research goals, we chose the following levels:

- *Initial situation*: What did the system landscape look like before the project? How were the systems operated? How were the core processes organized? Which activities were necessary? How satisfied were the users with the previous systems and the process support provided by them? What were the project triggers and who sponsored the project?
- *Project Characteristics*: How was the project set up? How did it fit into the corporate context? What did the project organization look like? What was the project image? Which steps or phases did the project plan contain? Who were the implementation partners and how were they selected? How long was the project duration? Which change management measures were taken?
- *Project Results*: What does the system landscape look like after the project? How are systems operated? How are the core processes organized, and which activities are necessary? How satisfied are users with the new systems and the process support provided by them? How do the project results compare to the initially pursued objectives? What are the organizational consequences of the project and how did the core processes change? How were the employees' required skills and qualifications affected?
- *Further Development*: What are the plans for further development of the standard software in the core processes?

To clarify and elaborate on the case descriptions, they were reconciled with the interview partners, and sometimes required further interviews.

3.3 Data Analysis

We used a two-stage strategy for data analysis (Yin, 2002). During the first stage, the within-case analysis of the data from each case study site was undertaken. The objective was to build an explanation of the case, using a cycle of deduction and induction. The validity of the data was ensured through multiple sources of evidence, reviews of case interpretations by interviewees, and a chain of evidence provided by the case data.

The second stage involved the cross-case analysis of the data, locating and examining similarities and differences across the cases. In the process, the companies' different environments had to be taken into account. The objective was to generalize beyond the data to subsequently discover the reasons, challenges and key success factors that play an important role when introducing standard software into banks' core processes. The results are described in the following section.

4 The Core Banking Projects

4.1 Initial Situations and Project Triggers

In general, the analyzed banks all faced the challenges explained in section 2.2. The regulations of the New Basel Capital Accord (a.k.a. Basel II) and the growing propagation of the International Accounting Standards/International Financial Reporting Standards (IAS/IFRS) were particularly mentioned in this regard. Compliance was therefore an issue in the organizations, including that of the software used in the core processes. General market pressure required higher flexibility with regard to configuring the services and products as well as the channels for customer interaction. Another crucial issue was the integration of back-end systems to allow the smoother execution of processes across organizational units.

The IT landscape often contained legacy applications based on outdated platforms and/or written in outdated programming languages. Skilled personnel for the maintenance of these systems were hard to find and the systems themselves were inflexible. Thus, maintenance of the legacy applications was an issue, particularly in the light of the requirements applicable to the banking industry as a whole, such as legal regulations, which strengthened the desire for a standardized solution. The complexity of the system landscapes also led to non-transparent cost structures, making, for example, the appropriate billing of business units for system usage an issue (with the exception of Wfa, where a billing system based on transactions, CPU usage etc. was in place).

The aggregation of these challenges and their growing impact on business operations led the management to address them. Additional influences were a merger in the case of DZ Bank and an internal re-organization in the case of Wfa. Corporate standards and policies encouraged a switch to standard software in these cases. User satisfaction was generally not an issue, even though terminal interfaces, which are generally regarded as user-unfriendly, were often in place. All banks decided to introduce a standard software solution rather than developing a new custom solution. They chose the vendor for reasons such as the software product's fit and easy integration with already existing standard software in other departments, the vendor's reliability, its ability to support large volumes, as well as its compliance with corporate standards or market leadership. In the case of the DZ Bank, one party to the merger already had a standard solution partially implemented, which was then merely extended. Generally speaking, the decision to implement standard software and the choice of vendor was a long-term, strategic decision primarily aimed at establishing a sustainable, flexible and industry-standard compliant solution, rather than realizing short-term costs and staff reductions.

Table 2 shows a comparison of all the analyzed cases' situation before the project and the project triggers.

Legend (see below ³)	Postbank	Wfa	DZ BANK	MHB
Initial situation				
IT landscape				
Server platform	Siemens Mainframe, BS2000/OSD, Sesam/SQL	Mainframe	OS/390	IBM OS/390 mainframe, Assembler application
Client platform	PCs, MS-Windows	Host terminals	Host terminals	Host terminals
Core Banking applications	KORDOBA	Self-developed	ZIS	Self-developed
IT organization				
Development	Decentralized, in-house	Centralized, in-house	Centralized, outsourced	Centralized, in-house
Operations	Decentralized, in-house	Centralized, in-house	Centralized, outsourced	Centralized, in-house
Billing	--	Based on transactions, CPU time, batch time, hard disk usage	--	No explicit billing
User satisfaction	good	good	good	good
Project triggers				
High efforts for new requirements	●	●	--	●
Technical sustainability	●	●	--	●

³ Legend: -- = no statement; ○ = does not apply; ◐ = applies marginally; ◑ = applies to some extent; ◒ = does apply; ◓ = applies predominantly

Post-merger alignment	○	◐	●	○
Outsourcing / insourcing of transaction processing	●	○	◐	○
Flexibility regarding platform choice	◐	◐	◐	◐
Reduction of IT production costs	◐	--	◐	◐

Table 2: Comparison of initial situations and project triggers across analyzed cases

4.2 Implementation

All four projects were initiated and sponsored by the top management. In three banks, the entire board of directors sponsored the projects. The exception was MHB, where the CIO sponsored the project. Top management support proved to be a major success factor. The technical objectives differed across the banks, although all of them were directly derived from the business strategy:

- *Postbank* wanted to become a cost leader in transaction processing and establish an opportunity for the in-sourcing of transaction processing.
- *DZ BANK* wanted to establish an opportunity for the out-sourcing of systems operations to reduce the level of vertical integration. *DZ BANK* furthermore aimed at the unification of its post-merger system landscape.
- The strategic objective of *MHB* and *Wfa* was the establishment of a sustainable and interoperable core banking solution.

In their business case analysis, MHB and Wfa made specific estimates regarding the anticipated costs and benefits. Postbank and DZ BANK made only rough estimates of the costs and benefits due to the projects' strategic nature. Postbank, DZ BANK, and Wfa's projects were embedded in larger initiatives that, for example, included the founding of a new IT subsidiary (in the case of Postbank), the merger of two banks (in the case of DZ BANK), and Wfa's integration into a new parent company. This made attributing specific costs and benefits to the standard software implementation especially difficult, and not always desirable.

Implementation partners were chosen for their proven expertise in the affected business functions, or for their record of projects with the chosen software package. All projects were supervised by a steering committee, had a program management team, and included several sub-projects. *MHB* and *Wfa* also employed an advisory board compiled of members of the affected business units and the IT unit. There were typical sub-projects for requirements definition, implementation, systems and data migration, testing, training and education, and organizational changes. Nevertheless, the project organizations differed greatly due to the different initial situations and strategic objectives. Mixed project teams, consisting of business units, IT units, and implementation partners, characterized these projects. This mix also applied to the project management teams, which consisted of one business and one IT unit member. Nevertheless, the primary responsibility always lay with one project manager.

In respect of the project plan, three of the projects – all except Wfa – showed a high degree of parallelization. This was done to speed up implementation and to limit the project duration. The business units' early involvement was also regarded as a key success factor, and therefore adopted by all the banks. All the banks employed a step-by-step approach with regard to the implementation of core banking modules to reduce the risks and complexity. The average project duration was four years, and project budgets ranged from € 25 million at *MHB* to € 250 million at *Postbank*, depending on the bank's size and the scope of the implemented core banking modules.

Project issues experienced included

- *greater testing efforts* than initially planned,
- *more functionality requirements* than covered by the standard software,
- leading to *greater customization efforts* than expected,
- ensuring *operational business functionality* during the project,
- *greater data migration complexity* than expected, and
- *general resistance to changes* in the employee body, which required specific change management measures.

In all the cases, the project image was good to excellent, mainly due to the top management's commitment and strategic importance. All projects employed extensive use of communication channels to convey the expectations

and results, including corporate newspapers, intranets and annual reports. Internally, regular project meetings ensured proper communication across sub-projects.

The range of skills required by the staff members changed dramatically, especially for the IT staff. These skills shortcomings were mainly addressed by internal training programs. Both layoffs and new hires were the exception. Due to the higher market demand for skills in the implemented standard software, all banks expected a brain drain. Nevertheless, the impact on human resources management was regarded as positive because most of the banks assumed it would be easier to acquire new IT employees with standard software skills than employees with skills in their legacy systems. To ensure that the required IT skills are available in the long term, all banks have introduced new objectives and new career paths for their IT personnel. In the business units, intensive training has also addressed the new skill requirements. All the banks successfully employed key-user concepts for employee training. As key-users, the business units' employees were involved in the project at an early stage and played an important role in disseminating information on the project and on the use of the new software modules. Table 3 provides an overview of the main project results across all analyzed cases.

Legend (see below ⁴)	Postbank	Wfa	DZ BANK	MHB
Project results				
IT landscape				
Server platform	IBM Mainframe with zOS, IBM application server, DB2	Sun Solaris on Sun application server, Oracle DBMS	Sun Solaris, Oracle DBMS	IBM AIX-based servers
Client platform	PCs with MS-Windows	PCs with MS-Windows	PCs with MS-Windows	PCs with MS-Windows
SAP Core Banking applications	SAP FS-BP, AM	SAP CML, SAP FinServ	SAP FS-BP, BCA, CML, CMS	SAP BCA, SAP CML, SAP RBD
IT organization				
Development	Decentralized, in-house	Centralized, in-house	Centralized, in-house	Centralized, in-house
Operations	Decentralized, in-house	Centralized, in-house	Centralized, outsourced	Centralized, in-house
Billing	--	Fix price contract with SLAs	Complex calculation key based on usage	No explicit billing
User satisfaction	good	good	good	good
Organizational consequences				
Standardization of business processes	●	●	●	●
Increased IT competence in business units	○	●	●	●
Rejuvenation of IT staff	○	●	○	●
Lower efforts for new requirements	--	○	●	○
Flexibility regarding platform choice	●	●	●	●
Costs & benefits				
Business case realized	●	○	--	●
Technical goals achieved	●	●	●	●
Process efficiency goals achieved	●	●	--	●
In-time completion	●	○	●	●
In-budget completion	●	○	●	●
Key Success Factors				
Top management commitment	●	●	●	●

⁴ Legend: -- = no statement; ○ = does not apply; ○ = applies marginally; ● = applies to some extent; ● = does apply, ● = applies predominantly

Highly motivated project staff	●	○	◐	●
Rigid project management	●	○	●	◐
Early involvement of business units	◐	●	●	◐
Mixed teams (IT and BU staff)	◐	--	◐	◐
Management of expectations and open communication	●	○	◐	◐
Step-by-step approach	●	●	◐	●
Thorough definition of requirements and target architecture	◐	◐	--	○
Test management	●	●	--	◐
Cross-project coordination	◐	--	◐	◐
Release management	◐	--	--	◐
Good cooperation with implementation partner	◐	◐	●	●
Little deviation from SAP standard processes	○	◐	●	◐

Table 3: Comparison of project results across analyzed cases

5 Discussion

5.1 Project Results

In all the cases, the previously used applications and infrastructures could be largely, if not completely, replaced by standard software-based solutions. This coincided with the replacement of the outdated underlying platform technology, such as host operating systems, by modern UNIX-based server operating systems (e.g. Sun Solaris, IBM AIX or IBM z/OS) and standard relational database management systems (e.g. Oracle or IBM DB2). This provided greater flexibility in vendor and product choice, avoiding lock-in situations. Interface complexity could be reduced as the chosen standard software supported the connectivity to enterprise application suits. All the banks intend to update their release versions, even though this could cause additional administrative overheads not necessarily justified by new or changed business requirements.

Generally speaking, all participating banks could eventually realize their planned functional and technical goals with the standard software rollout. MHB and Wfa could not fully realize the pre-calculated business cases. This was due to the existing processes' efficiency being underestimated (MHB) or the required customization efforts and project duration being underestimated. This led to higher project costs than anticipated in the business case calculations (Wfa). The benefits realized by the case companies can be considered analogous to the ERP benefits for other industries as identified in the literature (see section 2.1)

5.2 Organizational Changes

With the exception of MHB, all the banks' IT organization, including the further development and maintenance of the SAP-based solution, changed:

- *Wfa* has undergone certain reorganizations related to the standard software's rollout. Nonetheless, the previous billing system has now been replaced with a fix-priced contract with WestLB Systems (an IT service subsidiary of the twin bank of Wfa's parent organization LB NRW). Furthermore, since WestLB already had other software modules from the same vendor, the new modules for Wfa could be installed in the same infrastructure, thus producing synergies in the administration and operation.
- *DZ BANK* realized its optimization potential by outsourcing some aspects of the standard software operation and further development, while the customizing can now be done in the operational business units, as the chosen software requires less IT know-how than the previous host applications.
- The *Postbank* reduced its system and operation complexity because the new software is able to handle all accounts in a single installation of the system as opposed to the previous 14 decentralized installations. In order to comply with higher SLAs, the new systems now requires 24x7 service, which has been outsourced to the vendor supporting Postbank with on-site service.

As far as the staffing in the IT departments is concerned, a trend towards the rejuvenation of staff is observed in all the participating banks. The standard software-related skills are also easier to find and the banks have become

more attractive employers. In the operational business units, the business processes often had to be redesigned to match the standard business processes suggested by the standard software vendor. Furthermore, the business units' required level of IT skills, which was mostly addressed by training measures, has increased. This increased IT know-how, especially that related to the standard products, has allowed better coordination in subsequent IT projects. In addition, the business units can also better identify and evaluate the IT support potential in their operational business. On the whole, the organizational changes experienced by the case companies resemble those experienced by other industries during standard software introduction. Most noticeably, the standardization of the IS infrastructure allows reconfiguration of the value chain and, thus, reduction of the vertical integration level. Previously this was a very rare experience in the banking industry.

5.3 Success Factors

Key success factors mentioned by the four banks can be classified as general and specific success factors. General success factors are IT project management factors known from almost any software project. More importantly, specific success factors are those that apply in particular to banking standard software implementations. The general success factors include:

- Top management support,
- High motivation of project staff,
- Rigid project management,
- Early involvement of business units,
- Mixed teams including IT and business functions,
- Management of expectations, and
- Open communication.

Success factors not identified as such in studies on other industries and thus apparently specific to core banking software introduction were mainly:

- *Step-by-step introduction* to control complexity and risk,
- *Thorough definition of requirements* and target architecture,
- *Extensive test management*,
- *Cross-project coordination* to reflect the complex interdependencies typical of banking software support processes across business units,
- *Release management* coordinating the roll-out of new releases across multiple modules and business units,
- *Good cooperation* with the implementation partners, and
- *Process redesign reflecting the standard processes* as supported by the standard software.

6 Conclusions, Limitations and Further Research

The four cases reveal that the triggers for the introduction of standard-software-based solutions to support the core banking processes were mainly strategic considerations. Due to the long-term nature of the decision, no ROI calculations can as yet be made. Typical project issues were related to the complexity of the task and the necessity to maintain the operational business. The adaptation of business processes to the standard processes as supported by the standard software was also mentioned as a critical success factor. All the banks could handle the newly required skills after appropriate training and the reorganization of their IT units rather than with new hires and layoffs. All the banks eventually achieved their functional goals.

In order to obtain a full picture of the organizational evolution, change management and human resources aspects, issues such as skill base migration should also be assessed. However, those areas were not the focus of this study.

To improve the findings' empirical generalizability, more case studies and more detailed data are needed. Further research will therefore strive to broaden the empirical basis of the academic analysis. Subsequently, those results need to be reconciled with and compared to findings from ERP research conducted in other industries. This may lead to a better understanding of how standard application software in an enterprise's business critical core processes is selected, introduced and managed.

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