Business Software Integration:
An Empirical Study in Swiss SMEs

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Abstract

The integration of information systems is a topic which has long been discussed in the literature. Due to technological development, the possibilities for integration have considerably improved in recent years. The following paper concentrates on the integration of business software in SMEs and presents empirical primary data of the current situation in Switzerland. The study aims to demonstrate what has been experienced in previous integration projects and what the demands upon future business software solutions will be. The findings show that, in some software modules, the intensity of use and the degree of integration is dependent on the size of the company.

1.   Introduction

The following paper is concerned with state-of-the-art integration of business software and e-business application in business practice. In order to obtain a picture of the current level of usage in Swiss SMEs, a representative study was carried out [Dettling et al. 2004]. This confirmed that the support of business processes by means of business software has become commonplace in Swiss SMEs. Solutions available on the market are increasingly offered in modular form and fulfil, ever more, the particular requirements of small companies in performance and cost terms. A high level of competition can be observed among a substantial number of providers, which has resulted in a strong orientation to the individual needs of the customer. This situation has brought about a heterogeneous range in Switzerland which has provided not only standard software packages but also niche products for specialised solutions.

A central topic, long discussed in the literature in the context of information technology support, is the topic of integration. Concepts originating in the late 1980s and early 1990s such as CIM, CIB and CIE can be described as having failed. Certainly at that time, there was neither a suitable technical system, nor a sufficient orientation towards the organisational and system integration of company needs [Scheer 1996; Dürselen 1998].

As a consequence, integrated solutions were long primarily the preserve of larger companies. Increasing technical development and the trend towards a more process-oriented system of organisation smoothed the transition towards more networking and integration. Initially, this development predominantly affected internal company applications (e.g. ERP systems) and later extended itself to inter-company applications (e.g. e-business systems). Since then, technical and organisational conditions for the integration of information systems have substantially improved.

One important development was the considerable increase of band width necessary for data transfer, while the transfer rate also significantly increased and costs sank. As the use of internet protocols became more widespread and further standards for exchange of data came into being (XML, SOAP etc.), an important basis emerged for inter-company applications. Today there are many applications with integrated e-business modules in the business software field. Further steps towards direct B2B integration of ERP systems are under way.

The decision of which level of business software should be integrated remains difficult for small and medium size companies even today. For every supposed economic advantage, such as the avoidance of media changes and an increased customer loyalty, there are significant disadvantages. The latter arise primarily because of the complexity of integrated systems. The problem of system complexity particularly affects SMEs; they often lack the necessary expertise or financial resources to carry out the project. Additionally, the return on investments in small companies is often insufficient because transaction frequency tends to be lower than in larger companies [Leimstoll 2001].

Against this backdrop, the following paper aims to show the kind of experiences Swiss SMEs have had in integration projects and how this in turn affects their expectations of future applications. Central to the discussion are the results of an empirical study [Dettling et al. 2004]. From the basis of theoretical considerations, hypotheses are formulated and tested, and the evidence of dependency between company size, turnover, degree of integration and company success is shown.

The following chapter provides a brief overview of the terms used and the theoretical foundation of the topic ("integration of business software and e-business applications"). Next, the research goals are more closely specified and hypotheses are formulated. Section 4 details the design of the empirical study. Selected results of a descriptive analysis are then presented and the hypotheses are tested. A summary concludes the report.

2.   Integration and Business Software

The question of the "ideal intensity of e-business integration" is a fundamental topic of e-business management. As Davydov points out in his following statement, e-business is per se geared at establishing seamless communication channels between business departments (intra-company) and businesses (inter-company) alike. "Fundamentally, e-business is, first and foremost, about breaking all kinds of „walls" – internal corporate „walls" that exist between functional departments, but more importantly, external "walls" that limit companies' willingness and actual abilities to engage in new business relationships and accept new ideas." [Davydov 2001, p. 17]

Electronic data processing is only about 50 years old and the systems supporting electronic transactions have been growing historically over the last decades. The heterogeneity of information systems is a result of existing competition between vendors for hardware, databases, operating systems, and software applications and has led to complex enterprise information architectures. The broad acceptance of Internet

technology finally enables applications, endowed with different hardware and incompatible operating systems to seamlessly communicate with each other.

According to Dettling [2002], the Fortune 500 companies were operating an average of 47 different business critical software applications in 1990. Over the course of the last decades, a multitude of specialized systems for specific business tasks have been implemented. Even the functionality which, nowadays, is being offered by modern standard ERP systems is often distributed over multiple specialized applications in large companies.

With the increasing interconnectedness between commercial partners, the call for an IT-supported integration of the entire value creation process is getting stronger. Employees jointly working on a business process increasingly need access to different internal (and external) information systems. This is exactly where e-business integration comes into play: in the connection of specialized application systems for the support of business processes from the point of view of an employee.

A growing number of IT experts believes, that heterogeneity of systems is not necessarily a bad thing [Liebhart 2002] and that systems should not be migrated for the reason of total integration only. According to Sneed [2003] there are only three reasons to dispose of an information system in favour of a new one: (1) There are no more employees that possess the necessary know-how for the maintenance of the system, (2) the hardware/software/database is not being maintained by the vendor any longer, or (3) the application does not meet the requirements of the users any more.

2.1 Definition of the Term "E-Business Integration"

We define the term e-business integration as follows: "E-Business integration is the connection of business processes and information systems with the objective to produce a coherent product or service for the customer in a distributed value chain."

Following on from this definition, we distinguish between *internal* and *external* integration. Internal integration is being discussed in literature using the term „Enterprise Application Integration (EAI)" focusing on the integration of information systems within one single company. The challenge of external integration, also known by the term „B2B Application Integration (BBAI)", is the application of pre-defined formats and protocols in order to bridge enterprise boundaries. External integration is far less widespread in current practice [Schubert/Dettling 2004].

2.2 Enterprise Application Integration: Company-Wide, Internal Integration

EAI is the abbreviation for Enterprise Application Integration, the company-wide integration of software applications. There is a multitude of different definitions of EAI [e.g. Linthicum 2001; Davydov 2001; Buhl et al. 2001; Dettling 2002; Schelp and Winter 2002; Keller 2002; Kaib 2002; Voigtmann and Zeller 2002; Holten 2003]. Some authors restrict the definition to the integration of application systems within *one* company; others include the creation of interfaces *between business partners* in their definition of EAI. The common denominator of all definitions is the *connection of applications* and the *exchange of business documents*.

Some experts believe that EAI is a prerequisite for an "easier start" into B2B integration [Voigtmann and Zeller 2003]. To them the state of EAI reflects the "e-readiness" of a company to set up electronic communication channels to business partners. They argue that once the requirements of business departments have already been taken into

consideration companies have the basis for an easier integration of inter-company processes [Hagel 2002].

2.3 BBAI: Boundary-Spanning, External Integration

BBAI is the abbreviation for Business-to-Business Application Integration, which is the inter-company-spanning integration of applications. Linthicum [2001] defines BBAI as follows: "(B2B Application Integration) is, at its foundation, the mechanisms and approaches to allow partner organizations, such as suppliers and consumers, to share information in support of common business events. In short, B2B application integration is the controlled sharing of data and business processes among any connected applications and data sources, intra- or inter-company." [Linthicum 2001, p. 10]

Figure 1 shows a systematic overview of management concepts, applications and involved parties. An examination of an actual company can be seen in the centre (sketched through the dotted line). The company uses an ERP system, with which tasks such as procurement, selling and accounting are supported. A more detailed account of the listed terms can be found in [Dettling et al. 2004].
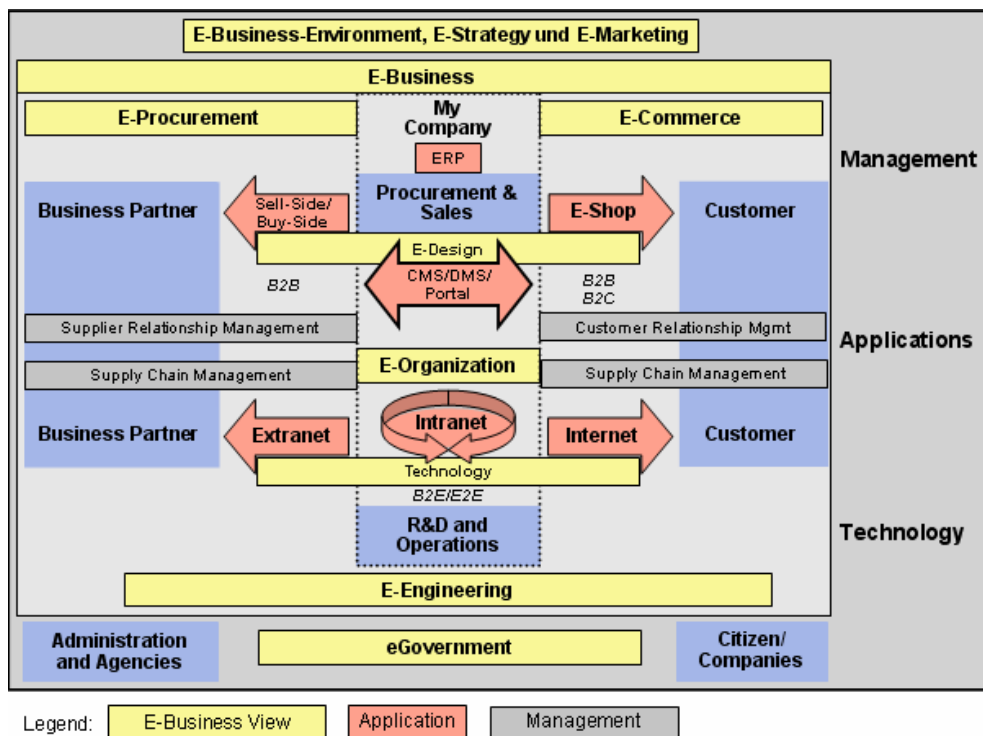

Figure 1: The E-Business Navigator: Classification Scheme [Schubert/Wölfle 2000]

The following remarks deal primarily with ERP systems and connected e-business applications. In this context, we describe the linking of information systems as "integration", e.g. a connection of various ERP modules such as bookkeeping and ordering systems or the linking of ERP order management with an e-business module such as an e-shop [Schubert et al. 2003].

The term "business software" serves as a generic term for business management software. It encompasses, therefore, ERP software as well as e-business software. ERP software

basic modules support, first and foremost, functional areas and business processes *within a company*. Bookkeeping, stocks & warehouse management, procurement and sales constitute the core area for the use of an ERP system. E-business software modules predominantly emphasize the support of *inter-company* business processes. **Error! Reference source not found.** gives an overview of the software modules examined.

Table 1: Software modules examined in the study

ERP Modules (within the company)	E-business Modules (inter-company)
Accounting (debits, credits, financial accounting, cost planning, facilities)	E-Procurement
Stocks and warehouse management	E-Organization (Collaboration, project management, charging)
Procurement	E-Commerce (E-Shop)
Sales and order processing	Marketing and Customer Relationship Management
Services and charging	Supply Chain Management
Production planning and steering (PPS)	Mobile applications
Operational data collection	Content Management Systems (CMS)
Human resources	Special industry-specific software modules
Controlling, FIS	

3.   Subject of the Examination and Hypothesis Building

In order to portray the current extent of business software integration in Switzerland, it is necessary to understand how widespread ERP and e-business modules are in SMEs and what the significance of internal and external integration is today. Experiences of previous projects can demonstrate what manners of difficulties have been observed up till now.

Drawing conclusions about future developments is not possible without determining what goals Swiss SMEs aim for when they take on future integration projects. Requirements for future systems should be of particular interest to the software sector. As well as the analysis to be described, certain factors which influence the use and the integration of business software in SMEs are identified below. Moreover, it will be reported whether the use and integration of business software has a positive effect on the success of the company.

Firstly, company size and turnover are provided as examples of exogenous factors in user- companies. It will than be examined whether organisational characteristics have an influence on the use of business software and the degree of integration. The company size (number of employees) appears to be a plausible influencing factor. A higher number of employees causes an increased number of tasks, which leads to a higher level of processing and controlling. The need for a supportive integration system is therefore greater.

Turnover is a further exogenous factor taken into consideration. Rising turnover generally increases transaction frequency and usually stimulates cash flow. These factors could have a positive effect upon the use of business software.

Secondly, the use and integration of business software show the exogenous factors, in order to test their influence on the success of the business. The use of information

systems as a success-producing factor in SMEs has previously been documented in several studies. [Raymond et al. 1995; Lybaert 1996; Scholl et al. 1993; Levy/Powell 1998; Leimstoll 2001]

Figure 2 shows the described correlation visually. Six hypotheses are formulated on this basis. The numbers in the diagram correspond to the numbering of the following hypotheses. All the assumed relationships are positive.
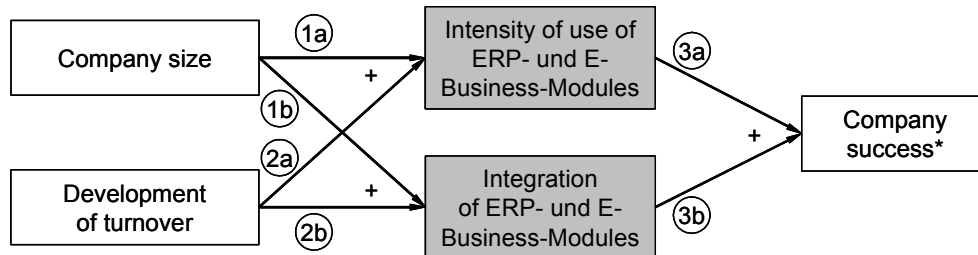
* **Success** is measured as the development of **turnover**
of a single company **compared** to the development of turnover
of competitors in the same industry

Figure 2: Described correlations

Hypothesis 1a: Larger companies introduce ERP and e-business modules more often than smaller companies.

Hypothesis 1b: These systems are more often integrated in larger companies than in smaller companies.

Hypothesis 2a: The more positive the impression in the company that the turnover is doing well, the more willing the company is to introduce ERP and e-business systems.

Hypothesis 2b: The more positive the impression in the company that the turnover is doing well, the more willing the company is to integrate ERP and e-business systems.

Hypothesis 3a: Companies which introduce ERP and e-business systems on a large scale record a greater degree of business success than other companies.

Hypothesis 3b: Companies which introduce ERP and e-business systems on a large scale and integrate them into a complete system record a greater degree of business success than other companies.

4. Research Design

4.1 Method of Investigation

The primary data was collected in autumn 2003 by means of a written survey (Figure 3). 5'032 Swiss companies and other organisations with 10 to 250 employees were questioned; these were from business sector 2 (industry) and 3 (service). From a universal set of over 33'607, The Swiss Federal Office for Statistics conducted a stratified random sample of SMEs, according to sector and business size.
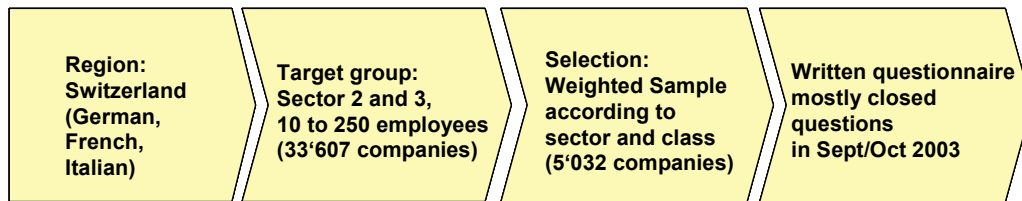
| Region: Switzerland (German, French, Italian) | Target group: Sector 2 and 3, 10 to 250 employees (33'607 companies) | Selection: Weighted Sample according to sector and class (5'032 companies) | Written questionnaire mostly closed questions in Sept/Oct 2003 |

Figure 3: Research steps

A standardised questionnaire was developed in collaboration with industrial research partners and trialled several times in pre-test interviews. It was aimed at company management. Because internet use is so widespread in Switzerland, an online version of the questionnaire was available to accompany the printed version. A total of 819 companies (16.3%) answered the questionnaire. Among them were many refusals with reasons given. As an example, 15.5% of the companies which declined to participate use no business software.

494 companies sent a completed questionnaire; a return rate of 9.8%. 463 of the questionnaires could ultimately be used for the analysis, corresponding to a net return rate of 9.2%. Table 2 summarises the key figures.

Table 2: Overview of survey

Time frame	September/October 2003
Region	Switzerland (language regions DE, FR, IT)
Research method	Written survey by means of a standardized questionnaire (print questionnaire by mail, additional online form available)
Company size	SMEs with 10 - 250 employees (FTE)
Industry sectors	Sectors 2 (industry) and 3 (service)
Target group	CEOs and CIOs
Sample size	5'032 companies, stratified random sample, according to sector and business size
Return rate	463 usable questionnaires, rate: 9.2%

The proportion of small companies in the universal set is considerably higher than in the control sample. The data for the descriptive analysis was therefore weighted according to the company size and should be considered as representative of Swiss SMEs using ERP systems.

4.2   Characterisation of the Control Sample

Because the content of the questionnaire was demanding, it can be assumed that companies participated which were already dealing with the topic of ERP systems and e-business integration. In order to convey an impression of the following control sample, the next section describes some fundamental characteristics of the companies.

4.3 Companies according to Company Size

The distribution of companies according to their size shows a very balanced picture. The company size was measured from the number of employees, by which the full-time equivalent was calculated. The majority of the businesses in the control sample (39%) have between 10 and 49 employees. 28% of the companies have between 50-99 employees, 33% between 100 and 250 employees (Figure 4).

The distribution according to size in the control sample does not, then, correspond to the universal set, in which the small companies would comprise a larger proportion. The results of the descriptive analysis are based, therefore, on data which is weighted according to the company size. In this way, representative conclusions about SMEs in Switzerland are presented.
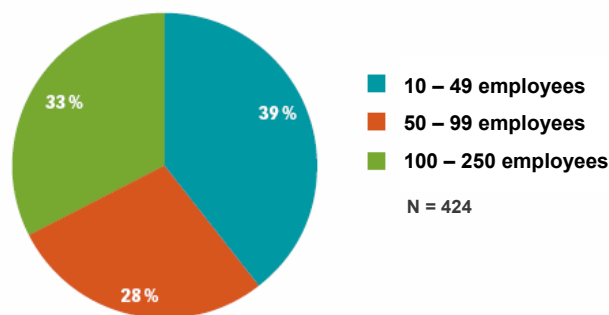

Figure 4: Companies in the sample according the number of employees, N=424

4.4 Companies according to Sector

Companies from business sectors 2 (industry) and 3 (service) are represented in the control sample; almost all business fields. The largest proportion is taken up by Health and Social Services (17%), closely followed by Processing industries (16%) s well as Other Services. Construction (15%) and Public Administration (including Education) (13%) are also strongly represented (Figure 5).
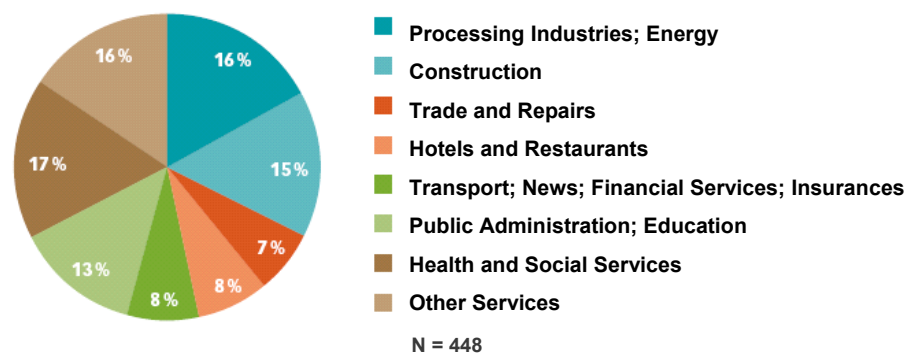

Figure 5: Companies in the sample according to industry sector, N=442

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5. Descriptive Analysis

60% of Swiss SMEs state that the costs of integration projects are too high. These statements result from previous experience with integration of information systems. It was also observed that too many interfaces are caused by integration (48%). The problem of perceived benefit is a further critical point; the amount of benefit and the value of it need to be differentiated. Almost half of the SMEs were doubtful of the benefits of integration at all before beginning a project and any possible benefits seemed to be insufficient (Figure 6).
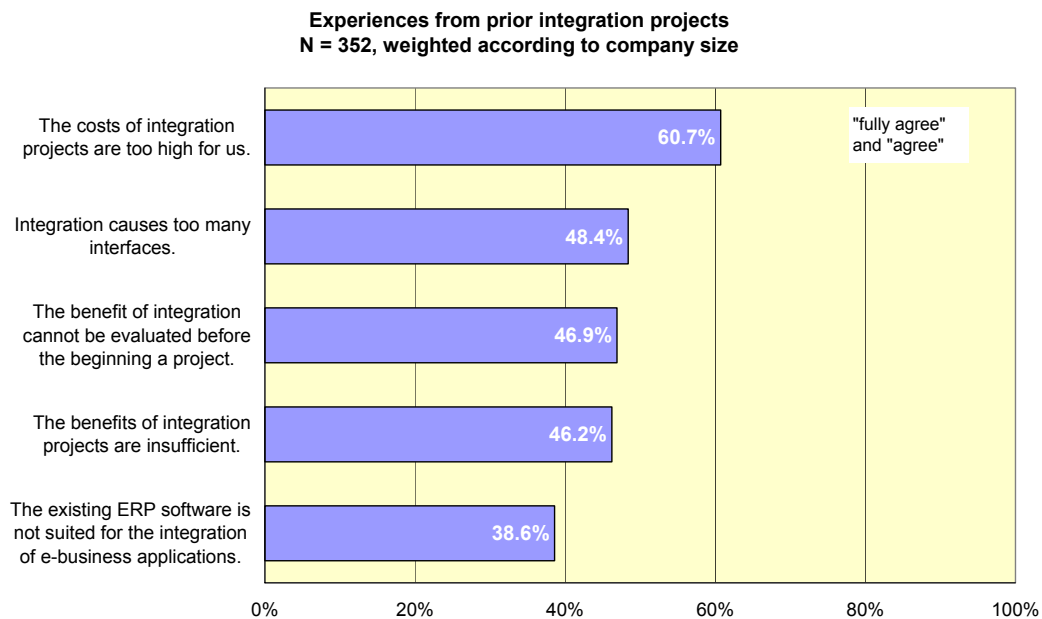
Experiences from prior integration projects
N = 352, weighted according to company size

Statement	Value
The costs of integration projects are too high for us.	60.7%
Integration causes too many interfaces.	48.4%
The benefit of integration cannot be evaluated before the beginning a project.	46.9%
The benefits of integration projects are insufficient.	46.2%
The existing ERP software is not suited for the integration of e-business applications.	38.6%

"fully agree" and "agree"

Figure 6: Experiences from prior integration projects

What kind of actual benefits can the integration of business software really generate? On the data level, the issue of access to a standardized database and the seamless communication of data between different applications of system modules is a key benefit. On the organizational level, the acceleration and the qualitative improvement of cross-functional processes are pronounced [Dürselen 1998]. On the inter-company level, there are additional strategic advantages, such as higher customer loyalty.

Swiss SMEs emphasise that, to an increasing degree they regard the purpose of integrated systems in the support of *internal* business processes. Around 80% of SMEs report that integrated systems are important for transactions within the company and should considerably simplify internal collaboration in future. In comparison, around 60% of SMEs state that integrated systems for transactions which are cross-company will be important and will make collaboration between customer and supplier considerably easier in the future (Figure 7).
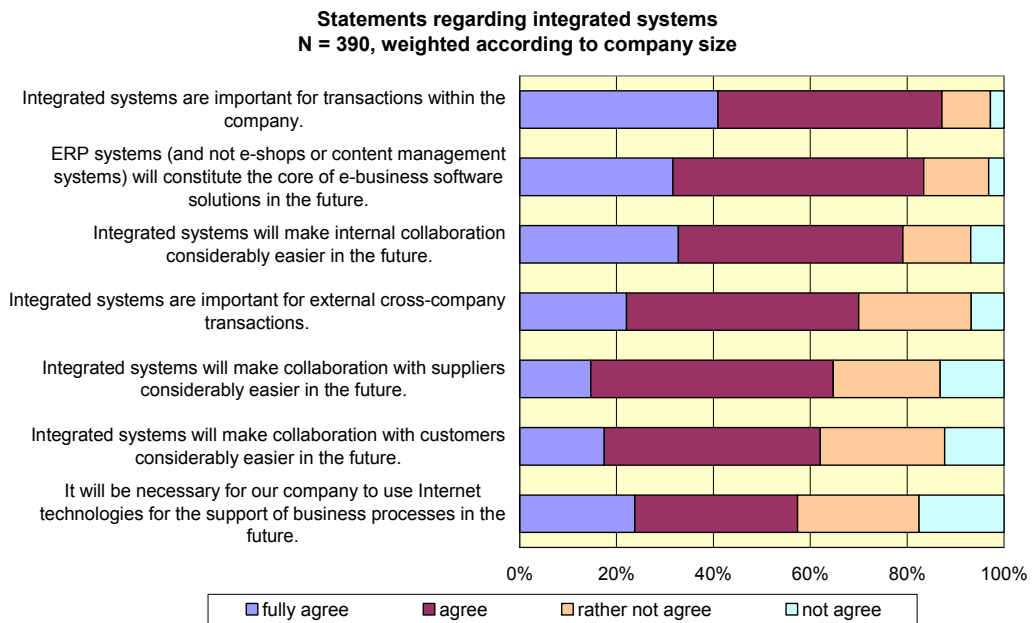
Statements regarding integrated systems
N = 390, weighted according to company size

Figure 7: Statements regarding integrated systems

The reason why business software orientates itself more towards internal company processes can be traced back to the observation that in SMEs the internal processes are the ones most supported by business software. ERP software basis modules are used today, on average, in around half of all SMEs. In contrast, e-business modules are used in just 10%. The latter will certainly show a considerable increase in the future: in the next two years e-business software module use will double on average [Dettling et al. 2004].

What exactly are the future benefits that Swiss SMEs aim to achieve with integration projects? Over the next two years the improvement of data quality will be considered as being on an equal footing with technical aspects (reduction of interfaces, reduction of maintenance, reduction of data redundancy) and the standardisation of information systems. These three IT aspects were mentioned with around 80% agreement. They are followed by three more business management-oriented benefits which each have around 70% agreement; the speeding-up of order processing, reduction of transaction costs and increase in productivity (Figure 8).
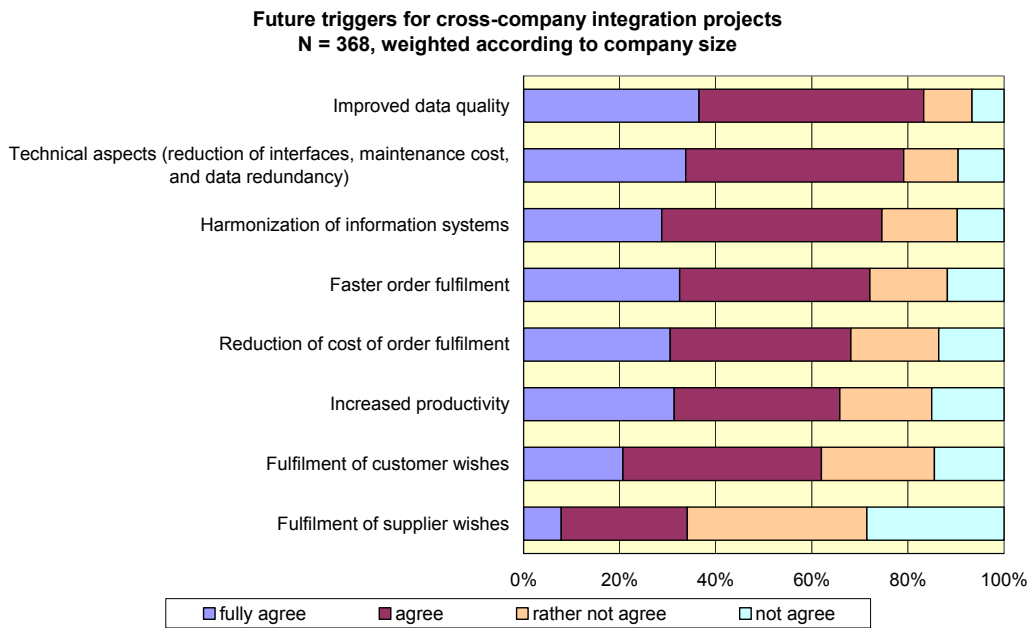
Future triggers for cross-company integration projects
N = 368, weighted according to company size

Figure 8: Future triggers for cross-company integration projects

Somewhat surprising, however, is the issue of customer satisfaction. 60% of SMEs agree that they intend to take on integration projects in future in order to fulfil customer wishes. This assessment is, however, in line with the already mentioned strong orientation towards the internal business focus of integration. The observation that the wishes of the supplier play a secondary role (Figure 8) is also consistent. In order for the integration of information systems to achieve the desired benefits, compatible systems are necessary. Otherwise, more complexity could simultaneously result for SMEs as systems become unmanageable or too expensive. Strictly speaking, ERP systems are affected, which already have the capacity for expansion into the e-business sector. 84% of SMEs which mention this point, tend towards the opinion that ERP systems will constitute the core of e-business solutions in future (Figure 7).

The demands made by SMEs on future ERP systems are high. The meeting of specific Swiss needs such as regulations for account rendering, payroll, bookkeeping, etc. are critical factors for a decision to purchase.

More than half of the Swiss SMEs described this criterion as crucial in their decision to purchase. Flexibility and compatibility to future releases follow in second place, followed by reaction-time of the supplier or partner in cases where support is needed and, lastly, the expandability of the systems. When the ranking "important" is included as well as "decisive factor for purchase", all of these four requirements were mentioned in over 90% of the comments (Figure 9). According to these results, aspects meeting the Swiss needs mentioned above such as further development and system maintenance stand out.
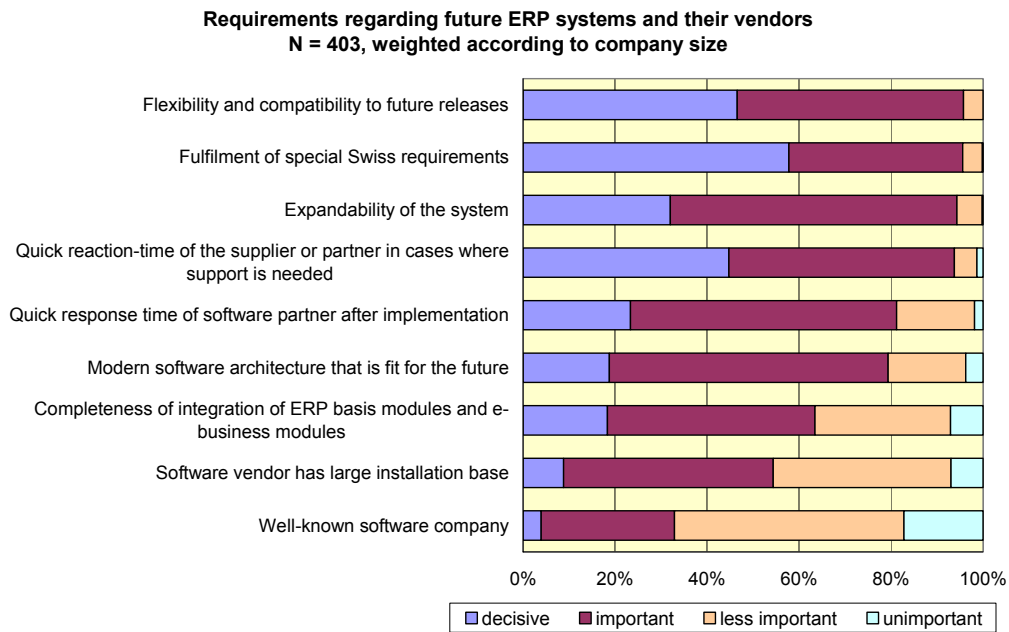
Requirements regarding future ERP systems and their vendors
N = 403, weighted according to company size

Figure 9: Requirements regarding future ERP systems and their vendors

Figure 9 shows some further demands on ERP systems, some of which are also regularly/often ranked as "important". These apply, for example, to the complete integration of ERP basis modules and e-business modules. The ranking criteria "deciding factor to buy" comprises 60% of the mentions. This confirms again the thesis that ERP systems form a central foundation of e-business solutions and that the introduction and integration of e-business solutions will increase in the future.

As already mentioned, the Swiss market for business software stands out because of its substantial heterogeneity. Even the market leader Abacus only has a market share of about 16%. The remainder is shared among more than 200 different producers and retailers. The Swiss providers, rather small but very competitive, compete in the marketplace with subsidiaries from internationally-known providers. Some providers have specialised in the requirements of individual sectors and established themselves within a niche. The user is faced with the task of choosing the right supplier for them from all of this variety.

Swiss SMEs attach particular importance to the openness of software modules, so that modules from any producers can be combined. Again, there is an indication of the growing significance of integration and the desire for flexibility. Not only is the openness/compatibility of systems desirable, but also the ability to obtain ERP system modules from the same provider. This again underlines the need SMEs have for simple and direct co-ordination with the provider; the majority opinion is that, where possible, the provider should be in close geographical proximity to the user. The particular significance of regional producers and integrators again becomes apparent (Figure 10).
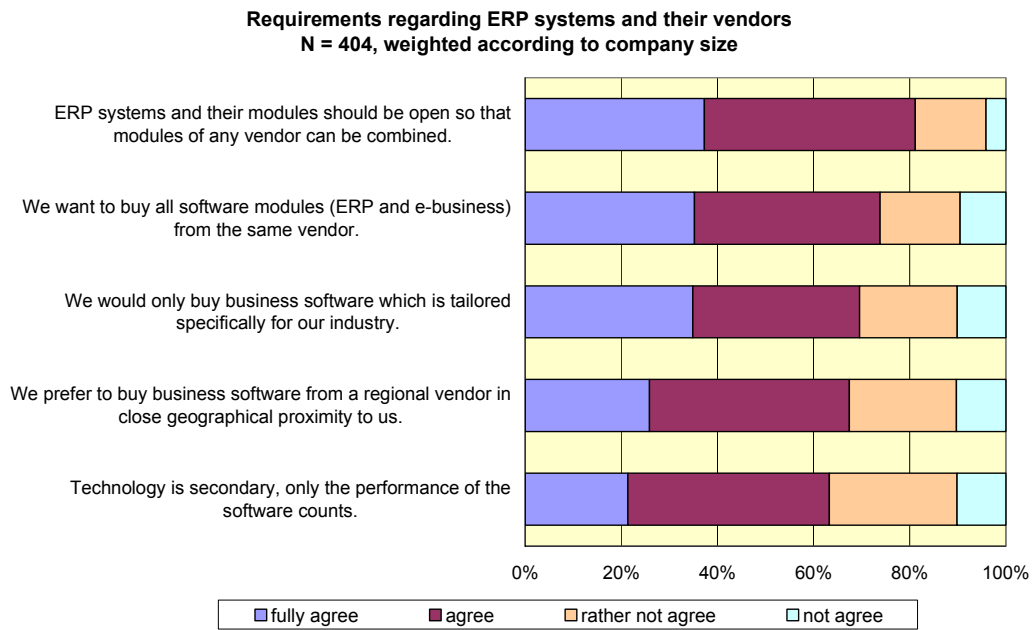
Figure 10: Requirements regarding ERP systems and their vendors

6. Analytical Evaluation

Six formulated hypotheses make categorical data available, clearly shown in contingency tables [Steinborn 1993]. Pearson's chi-square test was used for the statistical analysis of the contingency tables [cf. Backhaus 1996; Sachs 1992]. It allows qualitative conclusions on the dependency between two attributes (independency test) as well as the identification of respective levels of significance.

Hypothesis 1

Hypothesis 1 examines the relationship between the company size and the use and integration of ERP and e-business modules. The company size is measured according to the number of employees. The responses were summarized into three categories (1) 10-49 employees, (2) 50-99 employees and (3) 100-250 employees. The use of integration of ERP and e-business modules was, therefore, measured irrespective of whether the mentioned modules were present/integrated or not. The modules listed in **Error! Reference source not found.** were examined.

In the case of company size as a determinant of use (hypothesis 1a), the chi-square test can be used for all modules. Table 3 shows that a significant relationship can be observed between the company size and the use of the ERP modules *Sales and order processing, Stocks and warehouse management* and *Procurement*. These modules are more often used in larger companies than in smaller companies.

No significant relationship for the use of e-business modules could be proven. The null hypothesis of independency is upheld for this module. In most cases – this applies also to the further hypotheses – the test cannot be used because the expectation frequency is too low. The low expectation frequency results from the fact that e-business modules of the

examined SMEs are not yet widespread and comparatively few companies comment on the underlying questions relating to the use and integration of e-business modules.

The chi-square test is only applicable to the relationship between company size and the use of e-business modules *E-commerce, Marketing & CRM, Mobile applications, Content management* and *Special industry-specific software modules*. A statistical relationship does not exist to prove that the use of this module is dependent on the size of the company.

The company size also partly determines the intensity/degree of integration (hypothesis 1b) or ERP modules. This is the case in the following modules:

Accounting, Stocks & warehouse management, Procurement, Controlling & FIS. These modules are more often integrated in larger companies than in smaller companies.

The influence of company size on the integration of e-business modules is, due to low expectation frequency, only examined in the following modules:

E-commerce, Marketing & CRM and *Special industry-specific software.* The relationships are not significant. The company size, accordingly, has no influence on whether E-commerce, Marketing & CRM and Special industry-specific software are integrated into a complete system or not.

Table 3: Correlation between the criteria "company size" and "development of turnover" and the intensity and integration of software modules (only significant results were selected)

Hypothesis	Characteristic 1	Characteristic 2	Module	Significance *)	Significance level **)
1a	Company size	Intensity of use of ERP modules	Sales and order processing	0.008	1.00%
1a			Stocks and warehouse management	0.01	1.00%
1a			Procurement	0.043	5.00%
1b	Company size	Integration of ERP modules	Accounting	0.007	1.00%
1b			Stocks and warehouse management	0.006	1.00%
1b			Procurement	0.024	5.00%
1b			Controlling and FIS	0.044	5.00%
2a	Development of turnover	Intensity of use of ERP modules	Sales and order processing	0.041	5.00%
*) Asymptotic significance (two sides) in Pearson's chi-square test					
**) Residual probability of error α					

Hypothesis 2

Hypothesis 2 examines the relationship between the development of turnover and the use and integration of ERP and E-business modules. The company's turnover development is measured according to the general turnover development during the last three years (2001-2003). The responses are divided into 5 categories/classifications: (1) greatly

decreased, (2) decreased, (3) stable (stagnant), (4) increased and (5) greatly increased. Turnover development as a determinant for ERP use (hypothesis 2a) and ERP integration (hypothesis 2b) shows a significant influence only in the case of modules *Sales and order processing* (table 3). The better the turnover development of a company is, the more prevalent the use of ERP modules is in supporting *Sales and order processing*. In the case of many other modules, the test is not appropriate because of low expectation frequency.

This also applies to the relationship between turnover development and the integration of ERP modules.

The relationship between turnover development and the use/introduction of integration of E-business modules cannot be examined. The expectation frequencies were too low, in every case, to use the test.

Hypothesis 3

In Hypothesis 3 the use (Hypothesis 3a) and integration (Hypothesis 3b) of ERP and E-Business modules constitute the exogenous factors. It was tested whether the use or integration of these modules positively affects company success. Company success is measured by comparing the turnover development of a company with the turnover development in the respective business sector. The turnover development of the company and the turnover development in comparison with the sector are seen in the same section in the evaluation. The resulting evaluation index for company success is categorised for the associativity analysis as follows: (1) less successful, (2) successful and (3) very successful. A significant influence on company success can only be observed in the case of the ERP module "Operational Data Collection" (Table 4). Companies, where data collection is integrated into an ERP system are very significantly more successful than other companies.

Table 4: Correlation between the criteria "integration of software modules" and the success of the company (only significant results were selected)

Hypothesis	Characteristic 1	Module	Characteristic 2	Significance *)	Significance level **)
3b	Integration of ERP modules	Operational data collection	Success of the company	0.004	1.00%
*) Asymptotic significance (two sides) in Pearson's chi-square test					
**) Residual probability of error α					

The relationship between company success and E-Business modules can only be analysed in the cases of the use of modules *E-Commerce* and *Special industry-specific software*. These relationships are not significant. The use of *E-Commerce* and *Special industry-specific software* does not, consequently, have a significant effect on company success. This also applies to the integration of *E-Commerce* and *Special industry-specific software*. The hypothesis that the use and integration of E-Business modules have a positive effect on company success can, therefore, not be confirmed.

7. Conclusions and Final Remarks

The results of our study show that Swiss SMEs make high demands on business software, above all on the adaptability of the systems and the close proximity of the provider. The

main focus for the integration of business software will continue to be in the *internal* company area. The availability of *inter*-organizational business software does not seem to be a major driver for an increased intensity of collaboration between customers and suppliers.

An enduring trend is the installation and upgrading of *e-business* applications in general. Over time, the SMEs examined in this study will be increasingly concerned with inter-company integration. Because of this, regional Swiss providers have a competitive advantage when they plan for ERP systems in which not only the basic module but also the integration of e-business modules is possible.

It was not possible to complete all tests for the hypotheses presented in this study. Some e-business modules are not commonly used yet and we were not able to collect enough data for reliable statistical testing.

The *key driver* for the use and integration of business software is the *size of the company*. This can be best seen for the modules "stocks and warehouse management" and "procurement". These two are more often in use in big companies as compared to smaller enterprises. We can assume that the ICT-support of these organizational functions creates a greater benefit for big companies. The same applies to the use of software for "sales and order processing" and the integration of software for "controlling and FIS". The latter can be explained in that the financial accounting creates the necessary data basis for financial controlling. The more integrated the system the more accessible the databases.

E-business software is less dependent on the size of the company. For some software modules the original hypotheses (that there is a dependency) had to be rejected, e.g. for "e-commerce", "marketing and CRM", and "special industry solutions". The same for integration: e-business modules in smaller companies are as frequently integrated with other modules as in big companies.

The answer to the often raised question about the influence of the use of ICT on the *success* of a company can be given as follows (focussing on business software only): We did not find a significant influence of the intensity of software use on the success of a company. This confirms our opinion that it is not possible to reap competitive benefits from the use of business software. This is obvious when bearing in mind that most business software is standard software and thus potentially accessible to all market players. Only in the case of an integration of operational data, we could observe a significant impact on the turnover. This might be a coincidence but it may also point to the fact that Corporate Performance Management based on an effective (close to real-time) use of operational data might be a key driver for company success.

The increasing offer of ERP systems with integrated e-business modules provides SMEs with a definite opportunity of implementing integrated solutions. Today the scale of integration is still highly dependent on the company size. This could well change in the next few years.

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