The Adoption of E-Procurement and Its Impact on Corporate Success in Electronic Business

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Abstract

E-procurement encompasses a spectrum of buying applications, from simple Web-shopping on suppliers’ online interfaces or storefronts, participating in or organizing auctions to participating in or even actively operating buyside marketplaces, which can all be summarized as the “use of the Internet for purchasing and procurement”. The benefits from e-procurement, especially the potential savings, are often emphasized, and companies spend large sums on implementations.

However, there is a lack of research providing broad empirical evidence on the effectiveness or business value of e-procurement at the corporate level. Based on a comprehensive theory background, we develop a research model for the adoption of e-procurement and its effect on corporate success in electronic business. Employing covariance structure analysis, we test our model against empirical data comprising 425 cases collected in a large-scale survey in the German-speaking market.

We find that the perceived benefits are a driver for adoption, whereas the perceived effort is an inhibitor. Contrary to expectations, the perceived effort has a positive impact on the perceived benefits. While our results suggest that adoption rises with companies’ experience on the Web, no support can be found that adoption increases with company size. We also find that the adoption of e-procurement has a positive, but small impact on corporate success in electronic business.

1. Introduction

E-procurement encompasses a spectrum of buying applications, from simple Web-shopping on suppliers’ online interfaces or storefronts, participating in or organizing auctions to participating in or even actively operating buyside marketplaces [24], [5]. For this paper we will employ a generic and comprehensive definition viewing e-procurement as the “use of the Internet for purchasing and procurement”.

Due to the breadth of different applications it encompasses, e-procurement is – at least in parts – affordable for many more companies than its precursor EDI used to be. Yet, although a substantial amount of research has been dedicated to EDI, only few works investigate the adoption of e-procurement and its organizational impact. The main shortcomings of existing research can be summarized as follows:

- Many studies on the business value of e-procurement are either conceptual analyses or based on case studies, e.g. [26]. There is still a lack of broad empirical evidence.
- Often, savings or process-oriented measures are used to analyze the organizational impact of e-procurement, such as in [11]. Top-level constructs, such as corporate success in electronic business, are seldomly employed.
- Also, due to the different characteristics of EDI and as research on EDI adoption often includes suppliers (e.g. [16]), the results are not readily transferable to e-procurement.

In order to address this research gap, we develop a research model which is then tested against empirical data collected in a large-scale survey comprising 425 cases from the German-speaking market, which is one of the key international E-Business markets.

The remainder of this article is structured as follows: The research model is developed in the next section, where we present an overview of prior research relevant for our work. Then, we derive the research hypotheses, develop the model structure, and explain our research approach. In the third section, the survey, the statistical analysis, and its results are presented. In the fourth section, we interpret and discuss the major findings, contributions and shortcomings of our research. Finally, we discuss the implications of our work for further research and for practice.
2. Research Model

2.1 Theoretical Background and Literature Review

The adoption or implementation of e-procurement can be considered as a specific case of information system/information technology (IS/IT) adoption or implementation. Analogously, its impact on corporate success in electronic business is linked to the issue of IS/IT success and business value. As there is a rich body of literature available on these subjects, we will, in the following overview, discuss a selection of previous works from traits of research in the IS/IT discipline relevant for building our research model and deriving our research hypotheses:

IS/IT adoption

In their recent meta-analysis [18], Mahmood et al. aggregate the factors affecting the adoption or use of IT investigated in previous studies to a single model. They propose that the use of IT is determined by the following four dimensions of factors: the perceived benefits which an end user expects from using a particular IS, the individual characteristics of an end user, the IT maturity of the organization in which a particular IS is employed, and the characteristics of that organization (such as size and the degree of support for IS usage). They find that the perceived benefits which an end user expects is the key determinant for the usage of a particular IS. This dimension of factor has been introduced by Davis (cf. [9], [10]) as a part of the Technology Acceptance Model (TAM), proposing that the perceived ease of use of an IS influences the perceived usefulness and, in turn, that both of these factors determine an end user’s usage decision. Davis’ study has since been the subject of a multitude of replication studies for many different IS. Particularly companies’ adoption behavior in dependence upon their size has been the subject of many studies suggesting that due to a different endowment with resources and a more long-term strategic orientation, large companies exhibit different adoption behavior from SMEs (e.g. [22], also see below).

The link between adoption of IS/IT and corporate success

DeLone and McLean (cf. [12]) develop a taxonomy of different stages of IS success, covering system quality, information quality, use, user satisfaction, individual impact, and organizational impact. They derive this broad spectrum ranging from system- to top-level constructs from a “series of influence events” occurring “at the receiving end of an information system”, thus establishing the conceptual link between these stages of IS success. For every stage, they review a number of previous studies employing IS success measures from the respective stage. They conclude that “not enough MIS field study research attempts to measure the influence of the MIS effort on organizational performance”. Recently (cf. [13]), DeLone and McLean have reviewed past works based on their model and made some extensions to it, e.g. service quality or the application to electronic commerce. They introduce net benefits as the new top-level construct to substitute individual and organizational impact, again strengthening the importance of this stage of measures.

The business value of IT

The issue of the business value of IT addresses the last stage of IS success in the DeLone and McLean model. Many studies have been undertaken to find empirical evidence for the business value of IT, yet their results have been inconsistent. The results of several works even suggest that IT might have a negative impact on business performance, leading to the so-called productivity paradox [3]. In an attempt to resolve this paradox, Hitt and Brynjolfsson separate the organizational impact of IT into three dimensions: productivity, consumer value, and business productivity [4]. While they find evidence that IT spendings increase productivity and consumer value, their results do not support the hypothesis that IT spendings drive business productivity. For a more recent and comprehensive discussion of related literature see the discussion e.g. in [7].

EDI – the precursor of e-procurement

Before the advent of the Internet as a universal open standard, companies could conduct electronic business transactions with other companies only if they participated in Electronic Data Interchange (EDI) mostly operated on specialized or proprietary systems and networks [15]. EDI can thus be regarded as an early stage of e-procurement and has already been widely investigated.

Based on a review of prior studies, Chwelos et al. develop and test a three-factor model to explain companies’ intent to adopt EDI [8]. They find that all three factors, namely external pressure, readiness, and the perceived benefits (in that order), have a significant impact. However, their research is subject to some limitations severely impacting the generalizability of their results, including the facts that they do not measure actual adoption it-self and that the subjects of their study are Canadian SMEs who have not yet implemented EDI.

Due to the high costs, EDI has first been implemented by large companies and been unaffordable for many SMEs. It is mainly due the diffusion of the Internet that EDI/ e-procurement has become available also for SMEs. Likewise, research has first concentrated on EDI/ e-procurement adoption in large companies and only recently shifted its attention to SMEs. Findings confirm that SMEs exhibit an adoption behavior different from large companies and are generally more reluctant [16], [6]. Similarly, research on the business value of EDI has also been conducted separately for large companies [20], [17] and SMEs [23], suggesting that the drivers for EDI success differ for large companies and SMEs.

Unique characteristics of E-Procurement

The main difference between e-procurement and EDI is that the former comprises a broader spectrum of buying applications with varying degree of complexity and
integration and (mostly) based on Internet technology [11]. Therefore, as adoption costs can be substantially lower, Web-based e-procurement can be implemented by SMEs who can rarely afford to participate in traditional EDI. Thereby, Web-based e-procurement can supplement traditional EDI. By operating traditional EDI with their bigger suppliers and Web-based e-procurement with their SME suppliers in parallel, large buying organizations, e.g., can conduct their purchasing 100% electronically [19].

2.2 Model Development and Derivation of Hypotheses

In order to pursue the research questions, we assume companies’ perspective towards the adoption and success of e-procurement, choosing the corporate level as the level of analysis and the whole company as the object under study. We combine the insights gained from previous research on IS/IT adoption and success to construct our two-stage research model:

In the first stage, we investigate the factors leading to the adoption of e-procurement. As we assume the corporate perspective, we drop the factors characterizing the individual user from the model proposed by Mahmood et al. For the same reason, we also omit intermediate stages from the TAM such as the attitude towards adoption or the intention to adopt. Further, in a simplified approach, we leave external factors related to competition, market pressure, or supply-chain relationships out of the model. We transfer the dimension of perceived benefits to the corporate level, yielding the two central factors perceived benefits of e-procurement and the perceived effort (which is a mere inversion of the ease of use construct). Thus, these factors measure the perceptions of decision makers or high-level representatives who judge e-procurement from the perspective of their company. According to Davis, we then postulate:

H1a: The higher the perceived effort, the less likely are companies to adopt e-procurement.

H1b: The higher the perceived effort, the less are the perceived benefits from e-procurement.

H2: The higher the perceived benefits, the more likely are companies to adopt e-procurement.

In order to account for companies’ organizational characteristics and their IT maturity, as suggested by Mahmood et al., we further introduce two control variables to our model:

HC1: With increasing company size, companies are more likely to adopt e-procurement.

HC2: With increasing experience on the Web, companies are more likely to adopt e-procurement.

In the second stage of our research model, we simplify the causal chain between system characteristics and organizational impact in the DeLone and McLean taxonomy and directly test the impact of e-procurement on corporate success in electronic business:

H3: The adoption of e-procurement increases companies’ success in electronic business.

The resulting research model is displayed in Figure 1.

3. Method

3.1 The Survey

The numerical data used in the statistical analysis of this model has been collected in a large survey that was conducted from May to June 2000. The questionnaire and a comprehensive descriptive analysis of the results have been published as the “e-reality 2000” study in September 2000 [25]. Among other issues, such as companies’ readiness for electronic business or organizational and strategic measures, the purpose of this
The finance, insurance, and real estate sector, 81 (or 11.7%) belong to the trade industry, whereas 41 (or 9.6%) are wholesale trade establishments. Another 22.9% belong to the manufacturing sector, 42 (or 9.8%) have 2 years or more of experience in e-procurement adoption has been measured on a nominal scale with a choice of 3 items (“no usage and not planned, either”, “no usage yet, but planned for the next 12 months”, and “currently in use”). For the numerical analysis it has then been aggregated to a binary variable (“0” representing “not in use” and “5” representing “in use”). Similarly, company size and industry. In case that an interview could not be conducted as planned, a replacement was determined from the same superset in order to maintain the representativeness of the sample.

### 3.2 Aggregation and Preprocessing of the Survey Data

Prior to the statistical analysis, the gathered raw data is reduced and condensed to an essential subset as follows: At first, we concentrate on companies who had a Web page online at the time of the survey, reducing the original data set of 1308 cases to 730 cases (or 55.8%). (Another 171 companies, or 13.0%, were still planning to launch their site within the next 12 months.) In a second step, we focus on companies who specified that they had yet gained sufficient online experience such as to provide information on the success of their company’s electronic business activities, diminishing the number of cases to 469. Then, in a third step, we eliminated those cases exhibiting excessive missing values (i.e. more than 50% of the items left unanswered) in the 13 question items covering the success of their company’s electronic business activities or in the items recording the perceived characteristics of e-procurement, leaving a total of 425 valid cases for the numerical analysis. Missing values in all of these items are each substituted by a value generated by linear interpolation and subsequent rounding to the nearest integer value on the measurement scale.

### 3.3 Descriptive Analysis

Same as in the original survey, the remaining 425 cases constitute a heterogeneous selection of companies from all industry backgrounds, company sizes, and business models, even if the original claim to be a representative selection for the German-speaking market must be relaxed. Among the surveyed companies 97 (or 22.9%) belong to the manufacturing sector, 42 (or 9.8%) to the construction industries, and 27 (or 6.2%) to the group of transportation, communications, and utilities. A fraction of 74 companies (or 17.3%) are in the retail trade industry, whereas 41 (or 9.6%) are wholesale trade businesses. Finally, 50 companies (or 11.7%) belong to the finance, insurance, and real estate sector, 81 (or 19.1%) to the service industries, and 3 companies (or 0.7%) to the public administration.

The size of 135 companies (corresponding to a fraction of 31.8%) ranges between 1 and 19 employees, that of another 182 companies (43.0%) between 20 and 49 employees, and 86 companies (20.3%) have 50 or more employees. A group of 198 companies (or 46.5%) specify consumers as their main customer segment, 199 companies (or 46.9%) state that they mainly serve businesses. Another 15 (or 3.5%) mainly serve administrations, thus consider themselves as B2A-companies. Concerning companies’ experience on the Web, 204 (48.1%) have had a Web presence for up to 2 years, while 218 (51.3%) have owned one for 2 years or more. Finally, 256 (or 60.3%) already use e-procurement and another 61 (or 14.3%) plan to do so in the next 12 months.

### 3.4 Operationalization and Encoding of Variables

In the survey, indicator variables have mostly been operationalized as metric variables implemented on an equidistant interval (or Likert-like-) scale ranging from “1” (worded “does not apply at all”, representing strong dissent) to “5” (worded “fully applies”, representing strong agreement). The wordings for these indicator variables can be found in Table 1. As an exception, the indicator variable for measuring companies’ e-procurement adoption has been measured on a nominal scale with a choice of 3 items (“no usage and not planned, either”, “no usage yet, but planned for the next 12 months”, and “currently in use”).

For the numerical analysis it has then been aggregated to a binary variable (“0” representing “not in use” and “5” representing “in use”). Similarly, company size and experience on the Web have also been recorded on a nominal scale with 9 or 7 items, respectively, which have then been projected on an equidistant interval scale.

### 3.5 Conceptualization and Operationalization of Corporate Success in Electronic Business

We limit our view on the concept of corporate success in electronic business to the shareholders’ perspective. The concept is implemented as a construct comprising several subdimensions such as to accommodate for the major theories on competitive advantage, value creation and firm performance [1]. With the exception of the last, every subdimension consists of a score obtained from the unweighted addition of the values of two or three

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1 In this section, the numbers (fractions) of cases short of the total of 443 (100%) are due to missing values in the question items covering company structure.

2 The scale items “0” and “5” have been chosen in order to match the scale of the remaining items, since the ULS estimation method employed for the numerical analysis (cf. below) is not scale free, i.e. the resulting path coefficients and even the identification of the model varies with the measurement scale of the underlying manifest variables.
underlying indicator variables for a total of 13 indicator variables:

- “Hard factors”, reflecting economic performance, increased market share, increased revenues, and increased overall corporate earnings.
- “Soft factors”, accounting for a company’s achievements in the relation to- or perception by its customers, improved corporate image, increased customer retention, increased customer satisfaction, and increased customer loyalty.
- “Cost reduction”, indicating a company’s improvements in process efficiency as well as procurement conditions, therefore covering firm performance from a transaction-cost economical perspective, reduced marketing costs, reduced sales costs, and purchased more cheaply.
- “Innovation”, recording to what extent a company has strengthened its competitive position from the perspective of Schumpeterian theory, i.e. by being innovative, developed new markets and offered new services.
- “Corporate value”, reflecting companies’ valuation and perception by third parties such as investors, therefore being the broadest subdimension and most susceptible to external influential factors, increased corporate value.

Same as for the four items above, each of the 13 indicator variables is implemented as a metric variable on an equidistant interval (or Likert-like-) scale, ranging from “1” to “5”. They are preceded by the question “To what extent have the goals from this list actually been accomplished through your Internet activities?”

3.6 Statistical Analysis and Hypothesis Testing with Structural Equation Modeling and Covariance Structure Analysis

For testing our model hypotheses, the research model is implemented as a structural equation model, which is displayed in Figure 2. Covariance structure analysis is employed as the numerical method. It allows us to make use of complex constructs for operationalizing our model constructs. Also, we can analyze the impact which several independent, yet interrelated constructs have on the dependent construct at the same time.

Based on the sample variances, covariances, and mean values from the data set, the model coefficients have been estimated using the unweighted least squares (ULS) method. Significance values have been obtained from repeated bootstrap analyses (1000 samples).

Further, in order to avoid “capitalizing on chance”, i.e. obtaining a model structure which happens to fit our data set very well, yet has little or no general validity, the coefficients for the model structure are not only estimated based on the data set as a whole. Instead, a variation of the cross-validation technique is employed: The model coefficients are estimated simultaneously for the full data set as well as two subsets with the constraint that the path coefficients within the complex constructs are fixed to the same value. The subsets (213 and 212 cases, respectively) have been generated by randomly dividing the data set in half.

Fit Measures:
GFI: 0.926, AGFI: 0.910, NFI: 0.841, RFI: 0.826, parsimony ratio: 0.912,
PGFI: 0.764, PNFI: 0.768

Significance levels for the path coefficients are indicated as follows: ***= significant at the 1% level, **= significant at the 5% level, and *= significant at the 10% level.

Figure 2: Results of the numerical analysis: path coefficients between constructs and selected fractions of explained variance (percentage values) in the (partially) endogenous constructs.
<table>
<thead>
<tr>
<th>construct</th>
<th>wording of the indicator variable or name of the subconstruct</th>
<th>standard. regr. weights</th>
<th>indicator reliabilities (≥ 0.4?)</th>
<th>factor reliability (≥ 0.6?)</th>
<th>avg. fraction of rec. variance (≥ 0.5?)</th>
<th>Cronbach’s Alpha (≥ 0.7?)</th>
</tr>
</thead>
<tbody>
<tr>
<td>effort for e-procurement</td>
<td>“e-procurement requires reengineering the whole purchasing process”</td>
<td>0.710†</td>
<td>0.504</td>
<td>0.592</td>
<td>0.335</td>
<td>0.599</td>
</tr>
<tr>
<td></td>
<td>“e-procurement necessitates expenses for training affected employees”</td>
<td>0.563</td>
<td>0.317</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>“e-procurement holds considerable problems in the integration with the company’s existing IT/IS”</td>
<td>0.429</td>
<td>0.184</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>benefits from e-procurement (2nd order construct)</td>
<td>“impact on processes” (1st order construct)</td>
<td>0.867</td>
<td>0.752</td>
<td>0.910</td>
<td>0.772</td>
<td>(not computed)</td>
</tr>
<tr>
<td></td>
<td>“impact on the supply chain” (1st order construct)</td>
<td>0.871</td>
<td>0.759</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>“savings from e-procurement” (1st order construct)</td>
<td>0.897†</td>
<td>0.805</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>impact on processes</td>
<td>“e-procurement reduces need for IT/IS compared to prior systems, e.g., EDI”</td>
<td>0.517</td>
<td>0.267</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>“e-procurement allows for delegating purchase decisions to the business units in charge while maintaining stronger centralized control”</td>
<td>0.694†</td>
<td>0.482</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>impact on the supply chain</td>
<td>“e-procurement leads to a re-evaluation of existing suppliers”</td>
<td>0.455</td>
<td>0.207</td>
<td>0.489</td>
<td>0.332</td>
<td>0.470</td>
</tr>
<tr>
<td></td>
<td>“e-procurement leads to better purchasing conditions for us”</td>
<td>0.676†</td>
<td>0.457</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>savings from e-procurement</td>
<td>“e-procurement leads to shorter procurement cycles”</td>
<td>0.688†</td>
<td>0.473</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>“e-procurement leads to lower administrative costs”</td>
<td>0.812</td>
<td>0.659</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>“e-procurement allows for better data acquisition and automatic reporting”</td>
<td>0.720</td>
<td>0.518</td>
<td>0.873</td>
<td>0.580</td>
<td>0.871</td>
</tr>
<tr>
<td></td>
<td>“e-procurement leads to reduced stockkeeping”</td>
<td>0.792</td>
<td>0.627</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>“e-procurement causes purchasing managers to focus more on strategic tasks”</td>
<td>0.789</td>
<td>0.623</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>corporate success in electronic business</td>
<td>&quot;hard factors&quot;</td>
<td>0.797</td>
<td>0.635</td>
<td>0.861</td>
<td>0.556</td>
<td>0.845</td>
</tr>
<tr>
<td></td>
<td>&quot;soft factors&quot;</td>
<td>0.805</td>
<td>0.648</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>“cost reduction”</td>
<td>0.753</td>
<td>0.567</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>“innovation”</td>
<td>0.729</td>
<td>0.531</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>“company value”</td>
<td>0.631†</td>
<td>0.398</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

† indicates that the respective unstandardized path coefficient has been set to 1 for the numerical estimation.
3.7 Global Model Fit

Overall, the fit measures included in Figure 2 indicate a decent fit of our structural model with the sample covariances in the data set [2]. While the GFI and AGF values exceed the recommended value of 0.9, the NFI and RFI remain somewhat below. Similarly, the parsimony-adjusted PGFI and PNFI are close to the recommended value of 0.8. Part of this seemingly weak fit between the estimated model structure and the sample covariances should be attributed to the fact that the model structure was simultaneously fitted against the full data set as well as two subsets and that the global fit parameters reflect the discrepancy between the model structure and all three of these data sets.

3.8 Construct Quality

An overview of the constructs, wording of the indicator variables, resulting indicator loadings, and quality measures for the constructs is displayed in Table 1. The model construct “benefits from e-procurement” has been implemented as a second-order construct consisting of 3 first-order constructs. The quality measures indicate that the constructs largely meet the usually required minimum values [14], [21]. Yet, there are overall three indicator variables (the items “e-procurement holds considerable problems in the integration with the company’s existing IT/ IS”, “e-integration with the company’s existing IT/ IS”, “e-procurement reduces need for IT/ IS compared to prior systems, e.g. EDI”, and “e-procurement leads to a re-evaluation of existing suppliers”) with low loadings, implying poor indicator reliabilities, thus degrading the quality measures of the respective constructs. Typically, these three indicator variables would be deleted in a next step of model development, but, mainly for theoretical breadth, we have decided not to exclude this factor from the model at this stage.

3.9 Numerical Results and Findings

The resulting model parameters for our numerical analysis are displayed in Figure 2. With one exception, all path coefficients are found to be strongly significant. The findings from the numerical results can be summarized as follows:

The adoption of e-procurement can be explained by two main factors which account for almost half (47.2%) of the variance: the perceived effort for and benefits from e-procurement. While the perceived effort strongly deters companies from using e-procurement (i.e. acts as an adoption inhibitor, supporting H1a), the prospective benefits lead companies to employ it (i.e. act as an adoption facilitator, supporting H2). Interestingly, the perceived effort also has a strong positive impact on the prospective benefits constructs (explaining 21.0% of its variance, contradicting H1b). Further, no evidence can be found that the adoption of e-procurement depends on company size (HC1) – on the contrary, the latter seems to have no impact at all. However, there is evidence that adoption seems to increase with the time which companies have been on the Web (supporting HC2).

The adoption of e-procurement, in turn, has a clear positive impact on companies’ success in electronic business (supporting H3). Yet, it only explains a small fraction (7.2%) of the variance in the latter construct.

4. Discussion

4.1 Interpretation of Selected Findings

While we have found empirical support for most of our research hypotheses, a few issues arising from the numerical results demand further clarification:

First, why does the perceived effort for e-procurement have a strong positive impact on the perceived benefits? From Davis’ results (cf. [9] [10]), one would expect that the perceived effort for e-procurement, being the opposite of the perceived ease of use, has a negative impact on the expected benefits. Maybe our findings are due to the fact that corporate decision makers assume a different perspective towards the adoption and usage of IT/ (M)IS in general and, specifically, electronic business concepts than end users do. While end users’ adoption decision is usually determined by short-term objectives (i.e. quickly and effortlessly fulfilling a certain operational task), decision makers’ point-of-view is more strategic and long-term. One could argue that in part, decision makers expect to reap benefits from the effort for implementing e-procurement (especially organizational and process changes, as we have operationalized it), which they also anticipate.

Second, how come that company size seems to have no effect on the adoption of e-procurement? A key reason for this finding may be that with the diffusion of the Internet and Worldwide Web, Web-based purchasing, depending upon the degree of its implementation, is easier, quicker, and cheaper to adopt than many other information systems or electronic business concepts. E.g., even very small companies can order office supplies over the Web, although certainly not every company is likely to build and operate a buy-side marketplace. Among the decision makers questioned in our survey, 43.1% agree to the statement “e-procurement reduces need for IT/ IS compared to prior systems, e.g. EDI”.

Third, as a fraction of 47.2% of the variance in the construct for e-procurement adoption is explained in our model, we conclude that companies’ decision to use e-procurement or not is also strongly determined by other factors not included in our model. There may be many such factors, e.g. corporate strategy, perceived competitive pressure, budget constraints etc. Similarly, the low fraction of 7.2% of explained variance in the dependent construct of corporate success in electronic business suggests that the adoption of e-procurement is only a minor success driver among many others (e.g. sell-side concepts, Web site management etc.).
4.2 Limitations and Weaknesses of the Research

The central shortcoming of our research is that we chose a single indicator variable (item), and not one or more complex constructs, as the empirical instrument for recording the adoption of e-procurement. Although the advantages of this approach are that the respective part of the survey is easy and quick to administer and that the statistical model is kept simple, the disadvantages are limited resolution, reliability, and validity. Ideally, it would have been desirable to further specify, qualify and quantify the implementation of e-procurement and of flanking (e.g. strategic-, organizational-, etc.) measures as well as the specific readiness of every company under these aspects.

Another weakness of the empirical design of our survey is that it was targeted at only one representative from every company who, as far as this study is concerned, had to assess the characteristics of e-procurement from the perspective of his or her company. Pursuing this approach implies that the resulting survey data may be influenced by a variable informant bias, depending upon the interviewee.

Lag problems might be another shortcoming of our research. As the implementation of integrated electronic business concepts such as e-procurement may require a considerable investment and the accompanying structural changes take time, it also takes time for the effect on corporate success to become visible or measurable. The fact that e-procurement was still in the emerging phase at the time of the survey implies that a considerable fraction of companies in our survey may have been affected by lag problems. On the contrary, from case studies it is known that the ROI for e-procurement may be reached as quickly as within a year.

5. Conclusion

5.1 Suggestions for further Research

Weighing the contributions of our study against its limitations and shortcomings, it is clear that our contribution must be viewed as a first-level analysis, as a “snapshot”. It leaves a number of issues open for future empirical research. Some suggestions are:

- The survey should be repeated in a similar manner in order to assess how the identified interrelations change with time (as e-procurement further matures).
- Future surveys should be more refined and focus more on e-procurement. Different measures of e-procurement, its usage and implementation, and corporate readiness should be developed.
- Future research should examine if and how the business benefit from e-procurement varies between different industries or markets (market segments).
- Future research should investigate the integrated effect of e-procurement together with other potential success factors in electronic business (e.g. strategy, organization etc.).

5.2 Managerial Implications

Corresponding to the contributions of our research, we can formulate some implications and recommendations for managerial practice:

- E-procurement is one of the factors determining companies’ success in electronic business. It has a rather small, but significant impact.
- While the perceived effort and benefits are important factors governing companies’ adoption of e-procurement, there are also other influential factors which, in sum, are equally important.
- Assessing the necessary effort will in part help executives judge and appreciate the possible benefits their companies can gain from implementing e-procurement.
- Company size is not a relevant factor influencing companies’ adoption of e-procurement. Yet, companies with more experience on the Web are more likely to adopt e-procurement.

References