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# Connecting Credit Grantors and Credit Requestors: Towards the Electronic Exchange of Rating-Relevant Information

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## Connecting Credit Grantors and Credit Requestors: Towards the Electronic Exchange of Rating-Relevant Information

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### Abstract

*Before granting new credits, banks must gather qualitative and quantitative information about their prospective customers in order to start a rating process which allows them to assess the credit requestor's risk class. Driven by intense structural changes within the financial industry and as a result of the specifications of the Basle II accord with regard to the rating process, banks are currently looking for new ways to improve the timeliness and quality of the rating-relevant data provided by credit requestors while at the same time reducing the costs of the rating process. Banks can achieve this by providing a platform for their prospective customers through which real-time financial data (e.g., daily cash flow data) can be transferred in an automated manner. We believe that real-time integration can be beneficial for both market sides, the banks as well as their prospective customers. Within this paper, we focus our attention on the credit requestor side. Based on the Theory of Planned Behavior and on the literature on innovation adoption, we develop a model of factors that affect the willingness of SMEs to adopt IOS for the purpose of providing real-time rating information to their credit banks. Within six exploratory case studies, we discuss this model with financial decision-makers of German SMEs.*

**Keywords:** Interorganizational Systems, Innovation Adoption, Theory of Planned Behavior

### Introduction

This study attempts to make a contribution to the interorganizational systems (IOS) adoption literature. Before granting new credits, banks need to gather qualitative and quantitative information about their prospective customers and to start a rating process which allows them to assess the credit requestor's risk class. Our driving vision is that both banks and small and medium enterprises (SMEs) would benefit from adopting IOS in order to enable a seamlessly integrated information transfer of rating-relevant information.

Integration enables banks to gather rating-relevant information about their customers accurately and without time lags. This would provide added value to their internal rating process, since at present the quantitative information they use for rating purposes (like equity ratio, cash flow, liquidity, etc. (Behr and Guettler 2004)) usually stems from the credit requestor's annual reports and thus does not provide a real-time view of the firm's

current economic situation. Furthermore, this integrated and automated information transfer would help banks to achieve efficiency gains by eliminating media discontinuities.

SMEs could profit from the information transfer in two ways. It would be possible for them to be ranked in a more advantageous risk class, since the bank is now in the position to assess its risks more accurately. Also, when provided with detailed information about the results of the rating, SMEs would be in the position to take appropriate measures to improve their internal performance and, as a result, to improve their rating class.

Within this paper, we focus our attention on the SME side of the business relationship depicted above. We focus our study on SMEs because it is to be expected that banks have greater power to impose the adoption of IOS on SMEs than on large organizations and it has been shown that SMEs have different adoption patterns than large organizations (Massey Jr. 1986; Rogers 1983). Our research objective is to find out *what factors may (ex ante) affect the willingness of SMEs to adopt IOS for the purpose of providing banks with real-time, rating-relevant information*. To explore these factors, we have reviewed past empirical and theoretical works on IOS and innovation adoption. We have developed a theory-based model of key factors which influence the willingness of SMEs to adopt IOS for the purpose of supplying banks with rating-relevant information. We conducted a series of case study interviews with executive managers from six SMEs to refine our model. The model and the outcomes of the case study interviews are discussed in this paper.

As a motivation for our study, we placed four questions related to the automated exchange of rating-relevant information in a survey among 2000 German SMEs. The results of this preliminary study show that almost 40% of the firms questioned think that in future banks will exert pressure on them, attempting to force them to adopt IOS through which banks could automatically have access to relevant rating information. Actually, 43.7% of the surveyed companies stated that they were basically willing to grant access to firm-internal data to their bank, although more than 50% think that they would encounter high risks by doing so. Figure 1 depicts the outcomes of our preliminary survey.

Beside these outcomes, which encourage our exploratory research, the theoretical motivation of this work is given by a lack of research on IOS adoption in business relationships between banks and SMEs.

The remainder of the paper is structured as follows: after a short literature review in the following section, we introduce our research model in chapter three. In chapter four, we depict the methodology that guides our exploratory research project. We then discuss the results of the six case studies (chapter five) and point out the limitations of our research (chapter six). Finally, we draw a conclusion and outline the further research (chapter seven).

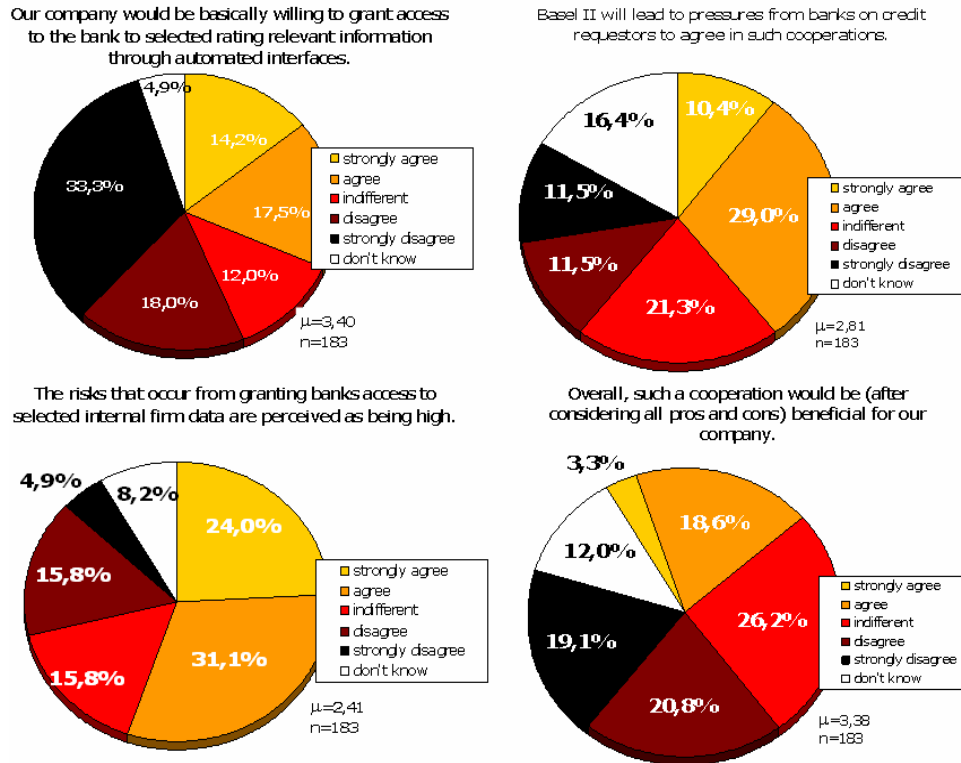


Figure 1. Results of the preliminary survey

### Theoretical foundation

The automatic provisioning of banks with rating-relevant information requires appropriate enabling support on the technical layer. The set of technologies which carry out the integration between two or more organizations are referred to in the literature as interorganizational systems (IOS). Cash and Konsynski (1985) simply define IOS as “an automated information system shared by two or more companies”. Johnston and Lawrence (1998) refer to IOS as systems which are “built around information technology, i.e., around computer and communications technology that facilitates the creation, storage, transformation, and transmission of information”. In other words, IOS are the technological means by which the application and, implicitly, business process integration of two or more firms (B2B integration) are carried out.

Conceptually, the adoption of an IOS designed to perform information transfer between the SME and the bank represents an innovation adoption. This assumption is consistent with Rogers’ definition of an innovation as “[...] an idea, practice, or object that is perceived as new by an individual or other unit of adoption” (Rogers 1983, 12). This perspective allows us to base our research model on previous works that deal with the organizational adoption of innovations, which thus provide a suitable theoretical framework for analyzing the organizational adoption of IOS.

The process of organizational adoption comprises two main stages: the initiation and the implementation stage (Frambach and Schillewaert 2002). The initiation stage may be seen as the pre-adoption period, where an organization “becomes aware of the innovation, forms an attitude towards it, and evaluates the new product; it encompasses

*awareness, consideration, and intention substages*” (Frambach and Schillewaert 2002, 164). Within the implementation stage, the actual decision to purchase and make use of the innovation occurs. The adoption is followed by the *post-adoption* phase of *intra-organizational acceptance* of the innovation (Frambach and Schillewaert 2002). Our research efforts focus on the *pre-adoption* – or initiation – stage.

Three of the four concrete factors in our research model stem from Iacovou, Benbasat and Dexter’s (1995) EDI adoption framework: they have found *organizational readiness*, *perceived benefits* and *external pressure* to be the main factors that influence EDI adoption in SMEs. We use this framework for our research domain and include *perceived risks* as an additional factor, due to the inhibiting influence that perceived risks exert on interorganizational cooperation (Englert 2000).

The three conceptual factors of our research model (i.e., attitude, subjective norm, and perceived behavioral control; see next section for in-depth discussion) are grounded in Ajzen’s (1985) Theory of Planned Behavior (TPB). This theory has been successfully applied to analyze a wide range of aspects of *individual* behavior like leisure choice (Ajzen and Driver 1992) and health-related behaviors (Godin and Kok 1996). There is a lack of research, however, on the applicability of the TPB on an *organizational* level.

Another popular framework for individual behavior analysis is the Technology Acceptance Model (TAM) (Davis 1989). It states that an innovation’s *perceived usefulness* and *perceived ease of use* are factors that influence its actual usage. This model, however, is appropriate (and has been used) for investigating behavior within the *post-adoption* stage of *intra-organizational acceptance* and is not suitable for the purpose of our research.

While focusing our research efforts on the willingness of SMEs to adopt IOS, we combine the TPB model with the concrete factors from Iacovou’s (1995) research model of EDI adoption. Together, the two models form the pillars for our exploratory research on the factors that influence the pre-adoption stage of organizational innovation adoption.

## **Research model**

### **IOS Adoption Willingness**

The willingness of SMEs to adopt IOS is the dependent variable in our research framework. This construct is quite similar to the notion of *intention* within the TPB, which indicates an individual’s *readiness* to perform a given behavior (Ajzen 1985). We chose not to use the intention term in order to pinpoint a slight, but important difference between the two notions: The TPB postulates that *attitude*, *subjective norm* and *perceived behavioral control* influence the *intention* to perform a given behavior. Intention, in turn, is the immediate antecedent of actual behavior. The IOS-based cooperation between banks and their customers with the purpose of automatically supplying banks with rating-relevant financial information has not been established yet in practice – although, as stated in the introduction, there is an indication that it will be established in the near future. This is why the adoption of this kind of IOS is only a *prospective* and not a *currently valid* behavioral option for an SME. Thus, the firm cannot form an *intention* to actually adopt the IOS, but only a *willingness* to perform this behavior, on the condition that this kind of IOS will be available in the near future. This is why we substitute the

TPB term of intention with the term of willingness for this specific research domain. Our research model is depicted in figure 2.

### Attitude toward IOS Adoption

In the TPB, the attitude toward a certain behavior “[...] refers to the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question” (Ajzen 1991, 188). The antecedents of attitude are behavioral beliefs, which represent the subjective probability that the behavior will produce a certain outcome (Ajzen 1985), including positive (perceived benefits) and negative (perceived risks) aspects.

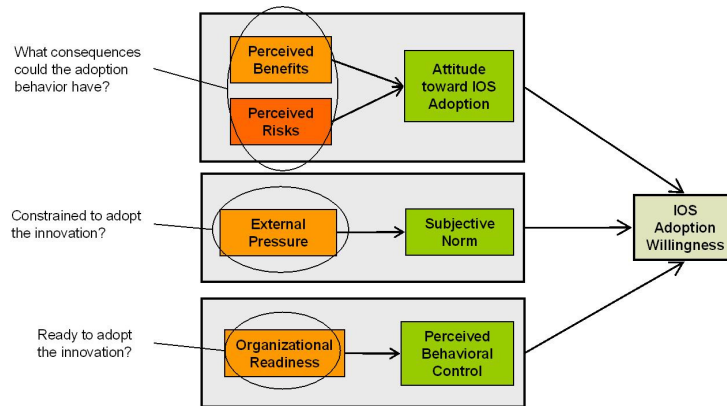


Figure 2. Research Model

The **perceived benefits** of adopting new IOS are *net* benefits that consider utility as well as costs resulting from the adoption. Benefits are thus generated by the integration of the SME with the credit bank under consideration of possible costs related to integration and coordination. Because the model follows an *ex ante* view of financial services adoption, the notion of perceived benefits refers to manager’s assessment *before* any system implementation. They are thus “*anticipated benefits*” (Iacovou et al. 1995) and, as stated there, may differ from the list of obtained benefits provided by an *ex post* view. Utility – as the positive component of benefits – includes the possibility of ranking the SME in a more advantageous risk class (as a consequence of the bank’s now improved ability to assess the SME’s risk class based on real-time data) as well as the possibility for the SME to obtain detailed information from the bank about weak internal operating figures that need to be improved in order to reach a better risk assessment. By contrast, integration costs refer to set-up investments and internal process adaptations during the implementation phase followed by interaction costs for handling errors, improvements, and changes in the information flow.

**Perceived risks** are the “*felt uncertainty regarding possible negative consequences of using a product or service*” (Featherman and Pavlou 2003, 453) and may possess several facets, which Featherman and Pavlou largely discuss in their study about individual adoption of e-services. Since it is individual beliefs that will finally determine organizational decision making, we believe that at least some of Featherman’s facets of perceived risks (psychological, financial, performance risks, as well as time and privacy risks) can be incorporated into our research model.

### **Subjective Norm**

In the TPB, subjective norm is an individual's "*perception of the social pressures put on him to perform or not perform the behavior in question*" (Ajzen 1985, 12). In an organizational context, the subjective norm is determined by the firm's environment, as depicted by Porter's (1985) Five Forces Model. It has been shown in the literature that a firm's environment may indeed influence its decision towards adopting an innovation; for example, the notion of external pressure is part of the model developed by Iacovou et al., referring to "*influences from the organizational environment*" (Iacovou et al. 1995, 470). We believe that pressures exerted by banks on SMEs (which are trying to improve the quality and timeliness of their information) may positively influence an SME's willingness to adopt IOS. *External pressure* is thus a determinant of subjective norm as a firm's perception of existing environmental pressures towards performing or not performing the behavior in question (i.e., the innovation adoption). We expect that the more an SME is motivated to comply with what the banks are trying to impose, the stronger will be the influence of subjective norm on willingness formation.

### **Perceived Behavioral Control**

In the TPB, perceived behavioral control refers to an individual's perception of being or not being able to perform a certain behavior and affects a person's intention to proceed with the behavior. On organizational level, the perception of decision makers about being or not able to adopt an innovative technology depends on the firm's technological and financial ability to perform the adoption. This *organizational readiness* influences perception of behavioral control and is in turn determined by the level of IT competence within the organization (in terms of people and know-how) and the sophistication of IT resources. How strongly are business processes supported by IS and how are the systems integrated both within the firm (enterprise application integration technology, service-oriented architecture) as well as with those of business partners (B2B integration)? The more knowledge, IT specialists and IT resources a company possesses and the more effectively the IT is used, the higher its "*level of sophistication*" (Iacovou et al. 1995), which leads to a positive perception of behavioral control.

### **Methodology**

Our research question (i.e., *what factors may (ex ante) affect an SME's willingness to adopt IOS for the purpose of providing real-time rating information to their credit banks?*) is of a *what* type. Case study methodologists suggest exploratory case studies to answer this kind of questions and to develop theories and derive hypotheses which can be validated in a following step by other research methods – e.g., through a questionnaire-based survey (Dubé and Paré 2003; Yin 2002). Our case study design considers the attributes which Dubé and Paré (2003) identify as having been evaluated as necessary by most of the case study methodologists such as Benbasat et al. (1987), Eisenhardt (1989), Lee (1989), and Yin (2002). They claim a clear a priori definition of the research questions, the constructs, and the unit of analysis. Further, a pilot case as well as a multiple-case design are recommended and have been realized.

To investigate the research model in the SME domain, we conducted an empirical research project with six different firms which participated in a multiple case study

during the course of 2005. To collect the cases, we used a regional SME database and selected 100 firms which fulfilled at least 2 out of the 3 “medium size” criteria of the European Union in 2004 (between 50 and 249 employees, turnover between 10 and 50 million EUR, balance sheet total between 10 and 43 million EUR). The sectors we focused on during the selection process were Manufacturing, Trade/Repair Services, and Real Estate/Renting (following the European NACE classification (FSO 2003)). These three sectors cover 83% of the German medium-size enterprises (FSO 2003).

After identifying the managers responsible for the SMEs’ financial processes, they were contacted by an initial mailing which explained our aims. A few days later, the managers were phoned and requested to participate. Six financial managers agreed and were visited by two faculty members who conducted interviews with them and other knowledge workers (e.g., accountants). The results of these interviews form the data basis for this paper. The transcripts of the interviews were again sent to the interviewees who had to approve them.

While interviews have been the primary data source of our case studies, in a few cases company reports were also consulted. From the research model and the underlying literature we derived an interview guideline aimed at capturing the constructs of our research model. Furthermore, we used open questions to find out whether our interview partners could think of any other factors that might affect their willingness to adopt IOS. For the first (“pilot”) case, the interview was conducted by three researchers (instead of two in later interviews) and the interview guideline was partially redesigned based on these first experiences.

### **Discussion of the Empirical Findings**

The aim of our study was to identify factors that may influence the willingness of SMEs to adopt IOS. We have identified the attitude toward IOS adoption (with its both determining dimensions “perceived benefits” and “perceived risks”) to be an important influencing factor for the willingness to adopt IOS, whereas subjective norm and perceived behavioral control both seem to be of only secondary importance. In the following section, we discuss the findings on the basis of each concrete factor of the research model, with regard to their possible influence on adoption willingness.

#### ***Perceived Benefits***

Perceived benefits have been confirmed by five companies as influencing their willingness to adopt IOS. Two of them expect positive direct utility from IOS adoption, as they anticipate better credit conditions by providing an automated interface to transmit rating-relevant information. Reduced transaction costs and higher information quality about their own financial details are not considered. Three companies expect negative benefits resulting from high implementation and integration efforts, because they are only willing to grant banks access to company data after prior in-house clearance.

#### ***Perceived Risks***

Psychological risks are the main inhibitors of IOS adoption within our six case studies. Four companies fear that automated (and probably more frequent) access to rating-relevant data will reduce communication between banks and SMEs, resulting in worse rankings due to possible data misinterpretation. (When transmitted manually, rating-



relevant information is usually complemented with explanatory comments.) Privacy risk is also stated to be important as SMEs' transparency to banks will increase through the adoption of IOS. Short-term liquidity shortages in particular can no longer be hidden under consideration of IOS adoption. Overall, more than half of the managers interviewed have a negative "gut feeling" towards banks, which is often the result of bad experiences in the past. Again, this corresponds with the results of our preliminary survey where 55.1% of the surveyed firms perceive high risks of granting banks automated access to the internal data and where only 31.7% of the respondents stated that they were willing to integrate with banks.

Interestingly, companies that are led by their owner seem to have an especially pronounced distrust of banks. All family-run firms stated high perceived risks of adopting IOS. Their distrust may even lead them to economically irrational decisions. Nevertheless, it is an important indicator of the critical need to invest in trust-building approaches if banks try to use IOS to improve the credit rating process of their corporate customers.

#### ***External Pressure***

All companies state that banks have not yet asked them to introduce an IOS in order to transmit rating-relevant information. Again, this statement is consistent with our expectations. However, future attempts by banks to impose IOS are regarded as possible by two companies. The other three of the six case study participants do not expect future pressures because they believe electronic data transfer of rating-relevant data to be too theoretical (one firm) or believe banks to have the weaker market position (two firms) and thus not to be able to impose such an interface on SMEs in future. As a comparison, 39.4% of the 183 respondents to our preliminary survey stated that they expect future pressure on the part of the banks to impose IOS adoption.

#### ***Organizational Readiness***

We have found three companies to have a high organizational readiness to adopt IOS. Two of them even stated that they were specifically ready to adopt IOS for sharing rating-relevant information with banks. The other three participants had a very low level of IT sophistication (only few and not integrated information systems) and also a low financial readiness.

#### ***IOS Adoption Willingness***

From the six interviewed SMEs, two strongly state their positive willingness to automatically transmit rating-relevant data to the bank. Interestingly, among them, one of our interview partners had a strong banking background. In his former job, he was responsible for granting credit at a big German bank and had even implemented a credit rating system at this bank.

Furthermore, three other firms were strongly (two firms) or somehow (one firm) reluctant to adopt an automatic system for data transmission to the bank. As a reason, they stated high risks which can be mostly characterized as psychological risks: they simply distrust banks and want to give them as little information as possible. Comparing their statements with the statement of the person with banking background, one can draw the conclusion that getting to know how the "other side" operates lowers the psychological risks of interaction.

Because of their high equity ratio, the two firms that are strongly reluctant to adopt IOS do not rely on bank credits for their business and therefore do not expect any pressure from banks to adopt IOS.

The last firm has a neutral attitude and stated it would probably adopt IOS if the bank would grant better credit conditions *before* IOS implementation.

We should point out that most companies stated they feared misinterpretation of their rating- relevant data because implementing IOS-based communication would lead to decreased personal communication between bank advisors and the managers of SMEs. However, one of our interview partners sees, quite in contrast, the possibility that communication between SMEs and banks would occur more frequently with an automated access to Basle II relevant data, as more questions will arise from trying to interpret a greater amount of data. Another points out that misinterpretation has already been a problem without IOS due to often very informal contacts between SME and bank managers (“deals on the bowling alley”).

### **Limitations**

First, the model’s constructs were derived from the literature and have been adapted to a structurally new phenomenon. Therefore, the model may be incomplete and/or include irrelevant factors, even after conducting the case studies. Due to this quite new phenomenon, we chose an exploratory approach which allows the refining of the model and enables qualitative research resulting in a continuation of the model design. Nevertheless, the case study results gave strong indications about the relevance of the several model elements, as discussed in the previous chapter. As more exploratory case studies follow, we will hopefully be able to refine and complete our model so it can be validated in a further, explanatory step.

Second, although we had some brief conversations with bank representatives which supported our theoretical assumption that banks are interested in establishing IOS-based relationships with credit requestors, these interviews were not structurally firm (as the interviews conducted with the SME managers were) and were therefore not included in this paper. However, we have knowledge of at least one German firm that has already started to develop an IOS for the purpose of integration of SME balance sheet data with banks.

### **Conclusion and Further Research**

The aim of this study was to develop a research model of factors that influence the attitude of SMEs toward integrating with banks by adopting IOS that allow an automatic transfer of Basle II relevant information. We derived these factors from previous conceptual (the Theory of Planned Behavior) and empirical research. A preliminary study confirmed that SMEs expect banks to exert pressure on them to adopt IOS. In six case studies, the factors of our framework were confirmed to have an influence on the attitude of SMEs.

Perceived benefits and perceived risks both seem to be the constructs with the highest influence on the willingness of SMEs to adopt IOS. External pressure will probably gain in importance as banks, as expected, try to impose this kind of relationship on their

weaker business partners. Right now, though, – because non-existent – external pressure only plays a theoretical role in the minds of the persons interviewed. Finally, the influence of organizational readiness on willingness formation could not be ascertained. Some of the firms with high organizational readiness are also reluctant about the idea of adopting IOS in the context described, while some of the firms with low organizational readiness stated their willingness to adopt IOS. The role of this construct will be the subject of further investigation.

Some steps of our future research were already outlined in the limitations section. In addition to investigating the bank-side view of the issue of IOS-based information exchange with credit requestors, we will conduct further exploratory case studies to improve our research model. After this, phase II will follow, which will comprise an empirical survey with 700 SMEs and the German Top-300 banks (to evaluate the view of the bank side as well). Afterwards, a more technical part of the project will carry out a sample implementation of an exemplary IOS, together with partners from the banking industry, from the software branch, and from the SME sector. In this manner, we will hopefully be able to make both a theoretical (assessment framework of integrated data transfer between banks and credit requestors) as well as a practical contribution (prototype implementation of IOS) to this important financial domain.

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