

Value Chain Crossing Between SMEs and the Banking Industry

Daniel Beimborn¹, Sebastian F. Martin², Ulrich Homann³

^{1,2}E-Finance Lab, Institute of Information Systems, Goethe University, Frankfurt, Germany

¹Tel. +49-69-798 28839, ²Tel. +49-69-798 28805, ^{1,2}Fax: +49-69-798 28585

³Microsoft Corporation, Redmond, WA, USA

beimborn@wiwi.uni-frankfurt.de; smartin@wiwi.uni-frankfurt.de; ulrichh@microsoft.com

Abstract: What are future requirements for ERP solutions in small and medium-sized enterprises (SMEs)? The following research paper focuses on identifying interfacial areas between banking services and financial processes of SMEs. It should be possible for these services to be embedded into the information systems of SMEs in order to support their financial processes such as cash management, reconciliation, customer management and asset management in an automated, seamless manner. In this paper, we develop a framework and a methodology for our empirical explorative research, which are intended to be the foundation for investigating both financial processes within SMEs, as well as firms' willingness to adopt new services offered by banks. Furthermore, first results from four case studies indicate some promising results. But they also show particular problems from granting banks access to SME-internal systems.

I. Introduction

B2B integration of applications within the supply chain management has been a necessary requirement to stay in the market even for small companies in particular branches (e.g. the automotive industry) for many years. While similar trends could be observed in the financial services industry (such as outsourcing of IT and business processes as well as the inter-organizational integration of processes, which formerly were in the same firm), we want to turn around the perspective and to ask which financial processes can be insourced by banks (or other financial service providers) from small and medium-sized enterprises (SMEs). Which added-value services could a bank additionally deliver to SMEs, due to its position and competencies? These scenarios alike require a seamless integration of SMEs' business processes with a bank's service. Therefore, the investigation has to get an overview about the actual IS maturity of SMEs with the main focus on willingness and readiness to inter-organizational integration.

Presently, the financial services industry is intensively working on process optimization and modularization of processes, which leads to encapsulated services that cannot only be used within the financial firm but can also be offered to customers. A simultaneous investigation of existing or potential so-called value chain crossings (VCCs) on both sides (suppliers and customers: banks and SMEs) could give substantial insights into the future layout of an integrated market-oriented inter-organizational financial value-chain network.

One of our research goals is the identification of financial business functions (i.e., parts of business processes)

within business processes of SMEs, which can be more efficiently carried out by specialized financial service providers such as banks. The driving vision is that firms – especially SMEs, which typically lack specialized resources in certain financial domains like cash management – may profit from a bank's experience by integrating certain functions, which are offered and executed by the bank, within their own business processes. We refer to this linkage as *Value Chain Crossing* (VCC), i.e., a (financial) service provider's service seamlessly embedded within an industry partner's business process.

An old existing example which almost represents a VCC, but is not finally integrated in a seamless manner, is the EDI transmission of payment runs. Another example is the integrated Electronic Bill Presentment and Payment (EBPP).

The VCC definition matches with the service-oriented paradigm, where services can be plugged in and out within a modular business process landscape or may be even replaced by services from external vendors.

Our research questions thus are:

1. Which financial processes of SMEs offer the possibility for VCC with banks?
2. How do perceived factors like benefits, risks, external pressure, and technological readiness affect a SME's willingness to adopt new financial services, by integrating their systems with those of financial service providers?

For the first research question, we are developing scenarios for VCC between financial service providers and SMEs. Through explorative case studies, we examine whether or not these scenarios are regarded by managers of SMEs as viable.

For the second research question, we develop a theory-based framework of factors which might influence the willingness of SMEs to integrate with banks. We use this framework as a theoretical foundation for our explorative research of the VCC scenarios.

The remainder of the paper is structured as follows: after a short literature review in the following section, we depict the application domain of our explorative research and introduce our research framework. We describe the methodology for the empirical investigations before outlining the case studies we have conducted. In the last two chapters, we briefly discuss the results obtained so far, draw a conclusion and outline the further research.

II. Literature Review

VCC requires the 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 literature as Inter-organizational Systems (IOS). Cash and Kasynski [4] simply define IOS as “*an automated information system shared by two or more companies*”. Johnston and Vitale [19] 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 application and, implicitly, business process integration of two or more firms are carried out.

Inter-organizational cooperation through IOS may occur in several forms [3]. For example, from the point of view of the participant's position relative to each other, horizontal cooperation takes place between organizations that act on the same level of the supply chain, i.e., between potential competitors. In contrast, vertical cooperation occurs between organizations that act on different levels of the supply chain. Finally, lateral (or diagonal) cooperation takes place between organizations that have neither a vertical nor a horizontal relationship [3]. In lateral cooperations, the use of IOS facilitates the appearance of electronic “*links between industries that were formerly separated*” [16].

VCC is a form of lateral cooperation. As Williams [26] states, “*advances in the use of IOS entail greater interdependence between, and deeper systems penetration into, organizations*”. According to him, “*when [IOS] are used to alter the division of labor and to develop new forms of coordination and control between organizations, they penetrate more deeply into the affairs of each organization, as when one organization requires information via an IOS about work in progress in another organization*” [26].

Large parts of literature discuss the issue of innovation adoption and diffusion within organizations. For example, the Technology Acceptance Model (TAM) [7] investigates technology adoption on an individual level, where users are free to choose whether they use the new technology or not. This theory identifies two perceived attributes as key indicators for the adoption of innovation: perceived usefulness and perceived ease of use of the new technology. The usefulness is a measure of “*the extent to which an application contributes to the enhancement of the user's performance*”, while the “*ease of use relates to the effort required by the user to take advantage of the application*” [7]. This model has been validated in many studies about technological innovation “*where individual autonomy is permitted to adopt or reject an innovation*” [15].

More suitable with the context of our research is Gallivan's Organizational Acceptance Model [15]. He criticizes about the TAM that in certain situations, where its underlying assumptions are not met, the TAM is likely to “*produce findings that are weak, unstable, or open to question*” [15]. Such a situation would occur when users of a certain technological innovation are mandated to use the new technology, which is adopted at organizational level.

There is a literature stream which focuses on process and stage research models, attempting to understand organizational-level implementation of innovations. In these

research models, the matter of interest is how extensively the innovation is used and how deeply the firm's use of the technology alters processes, rather than the user adoption and use of the technology per se [15]. The best-known model which describes technology implementation in organizations [15] is the six-stage model [5] [20]. The six stages of implementation are: (1) initiation, (2) adoption, (3) adaptation, (4) acceptance, (5) routinization, and (6) infusion.

Our research concentrates on the first of the six stages named above. During the initiation stage, “*active and/or passive scanning of organizational problems/opportunities and IT solutions are undertaken*”. As a result, “*a match is found between an IT solution and its application in the organization*” [5]. For this phase, we investigate how the factors that we use in our research framework influence the willingness of decision-makers to adopt new financial services, by integrating their systems with those of financial service providers.

III. Research Domain and Framework

III.1 Research Domain

Our objective is to get an insight into the actual EAI and B2BI maturity of German SMEs as well as into the actual and possible integration of banking services into the financial processes of SMEs.

Cooperation is evaluated to be the most adequate strategy to ensure the survival of the German SME segment [3] [2] [25]. Nevertheless, many studies show that small companies use cooperation much less than larger firms. As (SME specific) cooperation inhibitors, insufficient ability and low willingness to cooperate were identified [3]. Helm et al. show that this low willingness often originates from the company's legal form [17]. Many SMEs are led by their owners, who set their primary goal on ensuring autonomy. Furthermore, this governance mode leads to a more risk adverse attitude, fearing the possibility of cooperation failure. Empirical studies showed that 30-50% of all cooperations fail [13]. Additionally, the lacking strategic orientation of SMEs is a reason for missing willingness to cooperate. Additionally, SMEs often are more risk adverse and fear the possibility of cooperation failures. Empirical studies showed that 30-50% of all cooperations fail ([13] (studies mentioned there)).

The first large empirical survey on internet-based cooperation of SMEs in Germany was conducted in 1999 [10]. The authors prescinded from particular business processes and investigated general cooperation activities and their impact on external business performance.

Due to increasing industrialization tendencies in the financial services industry, the aim of our study is to focus more dedicatedly on the cooperative support of the particular area of financial processes. These will not be part of the core business in most cases and might be a possible area of outsourcing (as a particular form of cooperation). Earlier surveys, which analyzed cooperation opportunities in the

SME segment, focused almost only on cooperation within the firms' value chains, and not on financial processes [10].

An empirical survey on large German firms showed rather high outsourcing potentials and even BPO activities in financial processes [23]. It has to be investigated whether this result can be transferred to the SME sector, or if SMEs' financial processes occupy only a minor fraction of the firm's resources, so that outsourcing will not lead to significant advantages.

Financial processes in our definition do not only cover the process of funds allocation and controlling, but also include all financial aspects involved with a firm's value chain, such as procurement and sales.

For our study, we developed a financial process map (see Figure 1), which structures an SME's financial functions into the process groups of Financial Trade Enablement & Settlement [23], Finance Management and Transactions Management. The Financial Trade Enablement & Settlement covers procurement and sales of goods and services, supported by managing the transactions infrastructure, while Finance Management embraces administrative financial functions.

For all financial processes, we investigate whether or not there are any VCC potentials, i.e., which process steps can be outsourced to banks.

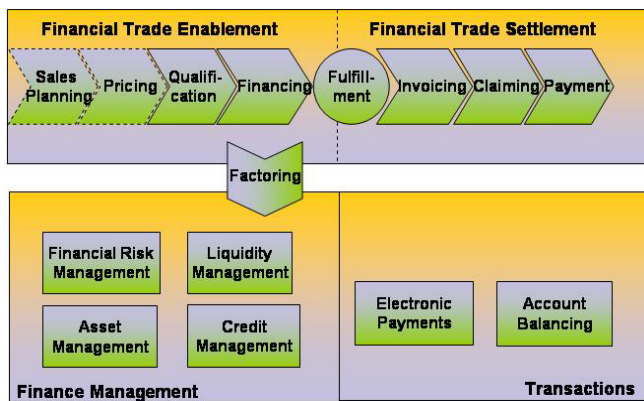


Figure 1. Financial process map of an SME

For example, during the enablement phase, banks could take over parts of the financial risk management, liquidity management, asset management, or credit management. During the settlement phase, opportunities for VCC could be offered by electronic payments or the account balancing.

III. 2 Research framework

Based on the EDI adoption framework of Iacovou et al., we have developed a framework of factors which we think have an influence on SME's willingness to adopt a VCC in the financial chain. Iacovou et al. [18] propose three factors which explain the EDI adoption behaviour of small firms: perceived benefits, organizational readiness and external pressure. We adapt this framework to our research domain, which is the VCC between SMEs and banks and add a further factor, "perceived risks", which might have an

important influence on the willingness of SMEs to adopt new financial services and thus to integrate with banks through IOS. The reason for considering this additional factor lies in the fact that, unlike EDI integration, as analyzed by Iacovou et al., where information is pushed to the integration partner, VCC implies the possibility for the bank to extract (pull) data out of SMEs information systems. SMEs might fear that, by adopting VCC, banks might get insights into the company's internal data that the company is not prepared to reveal.

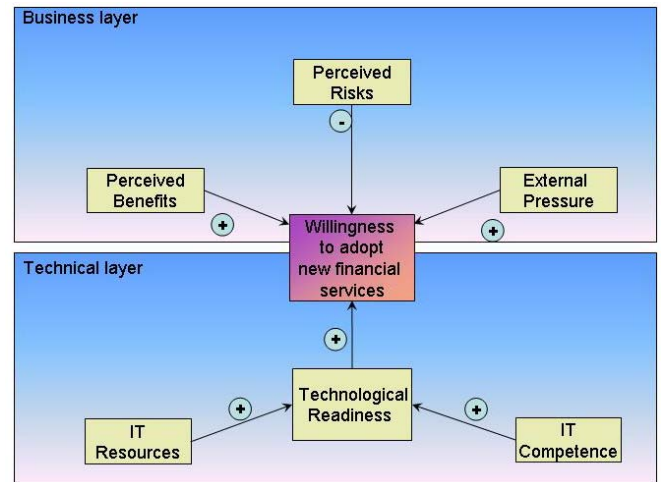


Figure 2. Research framework

Our framework is composed of the following factors:

Perceived benefits. The perceived benefits of adopting new IOS can be grouped into two categories. Direct benefits are "mostly operational savings related to the internal efficiency of the organization" [18]. The second group includes indirect benefits, like the improving impact that the implementation of new services might have on business processes and relationships [18].

Within our framework, perceived benefits refer to the benefits which decision makers within an organization believe will be generated by the integration of their own financial value chain with the financial chain of banks. While direct benefits of integration could be for example operational savings, indirect benefits could translate into a better rating of a SMEs creditworthiness and thus into better credit granting conditions, since the bank now has automated access to relevant data.

Because the framework offers an ex ante view of financial services adoption, the notion of perceived benefits refers to manager's expectations before any system implementation. They are thus "anticipated benefits" [18] and, as Iacovou et al. state, may differ significantly from the list of obtained benefits, provided by an ex post view.

A related term, "perceived usefulness", which also stresses out the ex ante character of this notion, is defined by Davis as "the degree to which a person believes that using a

particular system would enhance his/her job performance" [7].

Mehrtens et al. [22] also use the notion of perceived benefits to develop their model of factors which influence the internet adoption behaviour by SMEs.

We anticipate that firms that expect and recognize the benefits of optimizing their financial chain through integration with banks will be more frequently willing to adopt new financial services, than firms that do not expect benefits form such integration effort.

External pressure. In a study about IOS based on EDI, Crook and Kumar [6] identify three types of causal conditions for the adoption of EDI, where the first two terms can be subsumed under the notion of external pressure:

1. Customer-initiated EDI can be observed in vertically integrated industries, where large customers can force a firm to adopt EDI as an IOS.
2. Reaction to competition at organizational and industry level.
3. Organization-initiated use of EDI.

The notion of external pressure is also part of the framework developed by Iacovou et al., referring to "influences from the organizational environment" [18]. He sees the two main sources of external pressure to be (1) competitive pressure and (2) imposition by trading partners.

For our object of research, the imposition by trading partners or, using the terms of Crook et al., "customer-initiated" adoption, are not relevant, since we investigate the relationship between financial services providers (e.g. banks) and SMEs, with SMEs being the customers. But the external pressure as a "reaction to competition", or "competitive pressure" might play an important role as a determinant factor for the willingness of SMEs to adopt new financial services and thus to integrate with financial service providers. We believe this, because we think that the increased competition German SMEs have been facing in recent years will ultimately lead to optimization efforts even in secondary processes like financial processes.

Thus, we expect those SMEs that encounter external pressure from their competitors to optimize their financial chain will more frequently be willing to integrate with financial service providers, then those who do not encounter such pressure.

Perceived risks. Perceived risk is the "*felt uncertainty regarding possible negative consequences of using a product or service*" [12] and may possess several facets. Featherman identified seven facets of perceived risk for individuals, when confronted with the question whether to adopt new e-services, or not.

Decisions about VCC adoption on organizational level are taken by individuals and therefore, several of the seven risk facets described below also apply within the context of VCC. The seven risk facets identified by Featherman are:

1. Performance risk is "*the possibility of the product malfunctioning and not performing as it was designed and*

advertised and therefore failing to deliver the desired benefits" [2]. For VCC, performance risk means the possibility of malfunctioning IOS which would result into possible opportunity costs.

2. Financial risk is "*the potential monetary outlay associated with the initial purchase price as well as the subsequent maintenance cost of the product*" [19]. The current financial services research context expands this facet to include the recurring potential for financial loss due to fraud.

3. Time risk. Consumers may lose time when making a bad purchasing decision by wasting time researching and making the purchase, learning how to use a product or service only to have to replace it if it does not perform to expectations.

4. Psychological risk. The risk that the selection or performance of the producer will have a negative effect on the consumer's peace of mind or self-perception. Especially lack of trust is a very important matter when giving banks online access to company information.

5. Social risk. Potential loss of status in one's social group as a result of adopting a product or service, looking foolish or untrendy. We do not expect social risk to play a significant role in a B2B environment, since vanity is not a matter of interest when adopting VCC.

6. Privacy risk. Potential loss of control over personal information, such as when information about you is used without your knowledge or permission. In the case of the integration of SMEs with banks and granting them online access to firm data, managers of SMEs might feel that they are giving up control of the amount and the time of delivery of information to the bank.

7. Overall risk. A general measure of perceived risk when all criteria are evaluated together.

We expect all risk facets except for the social risk to influence directly managerial decision-making about the adoption of VCC.

Technological readiness. This term is derived from Iacovou et al.'s notion of "organizational readiness". In their view, the organizational readiness has two dimensions: the technological and the financial readiness. For the adoption of new financial services we assume the latter to have a rather insignificant relevance, because this kind of services would never justify huge investments. Financial efforts instead are captured in the construct of perceived benefits.

The technological readiness itself has, again, two dimensions: the level of IT competence within the organization (in terms of people and know-how) and the IT resources (in terms of hardware and software). The more knowledge, IT specialists and IT resources a company possesses, the higher its "level of sophistication" [18]. Iacovou et al. state that "*sophisticated firms usually are less likely to feel intimidated by the technology, possess a superior corporate view of data as an integral part of overall information management, and have access to the*

required technological resources (i.e. hardware, expertise, and a competent project leader)".

In the case studies, we addressed the factor of technological readiness by asking managers if they have ERP, EAI, and CRM solutions implemented within their organizations and what types of IOS, if any, they use when exchanging data with business partners.

We expect firms with a higher technological readiness to be more willing to adopt new financial services than firms with a lower technological readiness.

IV. Methodology

Our research is divided into two phases with different objectives. The first step consists of conducting multiple interview-based case studies with a mainly explorative orientation. Objective is to get an insight into the actual EAI and B2BI maturity of German SMEs as well as into the actual and possible integration of banking services into SMEs' financial processes and the associated benefits and risks. The relationships between IT-based integration readiness and already existing VCCs should be explored. Further, the interviews will be used to identify possible new VCC scenarios, i.e. which additional financial services could be offered by banks and therefore should be integrated into the SME's process landscape.

In the second step we will conduct a questionnaire-based survey to validate the results and to evaluate the potential benefits and risks which are associated with the VCC scenarios that have been identified in the case studies. The questionnaire will not only focus on SMEs but also incorporate banks as supply-side.

The research questions given in the introduction are of a *what* or a *why* type¹. Case study methodologists suggest exploratory case studies to answer this kind of questions and to develop theories which can be validated in a following step by other research methods [8] [27]. Our case study design considers the attributes which Dubé and Paré identify as evaluated necessary by most of the case study methodologists [8] such as Benbasat [1], Eisenhardt [9], Lee [21], and Yin [27]. They claim for 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 realized. The attribute of literal replication logic is only partly met, because on the one hand the research domain is quite broad and unexplored and on the other hand the primary goal of the first phase (= case studies) is to collect information about the current state of B2BI readiness in different branches and to develop possible VCC scenarios.

Interviews have been the primary data source of our case studies. Besides that, company reports were consulted. From the framework development we derived an interview guideline which captures the constructs which have to be

instantiated to each of the investigated financial processes (Figure 1). 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. Furthermore, the guideline has been marginally refined after every of the following interviews.

The interview guideline consists of two parts. In the first part, we are asking for general information about the company and the interviewee, as well as about the company's information systems infrastructure and its relationships to banks (how many bank relationships, how many accounts, etc.) and other financial service providers. In the second part, for a subset of the financial functions presented in Figure 1, six VCC scenarios have been developed, in which a bank could take over the whole or a particular part of each function by integrating his service with the SME's information systems. For each of these scenarios, we discuss the potential benefits, involved interaction and integration efforts as well as potential risks and external pressures that might affect SMEs to adopt the VCCs. These constructs represent the upper part of our framework, while the technical layer would form the same prerequisite for all scenarios.

For collecting the cases, we used a regional SME database and selected 50 firms which fulfilled at least 2 out of the 3 "medium size" criteria of the European Union in 2004. Medium-size companies are defined as companies which have between 50 and 249 employees, a turnover between 10 and 50 Million EUR, and a balance sheet total between 10 and 43 Million EUR. The reason why we only chose medium-size companies in the first step (instead of small *and* medium-size), was that for developing hypothetical VCC scenarios, a quite well developed and (more or less) process-oriented IS infrastructure should be present within the company, which would allow the embedding of external services offered by a financial service provider.

The main branches we focused on during the selection process were Manufacturing, Trade and Repair Services, Real Estate/Renting, and Construction (following the NACE classification of the EU [11]). These four branches cover 88% of the German medium-size enterprises [14]. After the list was finished, the companies were called by phone and the managers responsible for the majority of financial processes were identified. Because SMEs have a quite small management, each time this person could be identified clearly and easily. After an initial mailing which explained our aims, these managers were called and asked for participation. Six out of the 50 managers agreed in taking part in a 2-3 hours interview. Up to today, four of these case studies have been realized – unfortunately only in the manufacturing sector, so far. The first results will be presented in the following chapter. After collecting at least six further cases, the case study results will build the base for the design of the next phase of our research, which will be a questionnaire-based survey for evaluating the VCC

¹ Even the 2nd question actually is of a *what* type (reformulated: "what is the present state of maturity...")

scenarios with 700 SMEs as well as with about 300 banks.

V. First Cases

V.1 Case Study Participants

In this section we describe the firms which took part in our first case studies. To ensure anonymity, we chose fictive names.

PlastiCo is a private limited company with a family-owned majority of shares. It produces finished and semi-finished plastics goods (plastic in primary forms, plastic plates, sheets, tubes and profiles) and sells them to 800-900 established business customers located worldwide. The company has 110 employees, out of which about 75% work in the production while 25% work in the administration. The company's turnover in 2004 was about 23.5 million EUR.

In 2004, PlastiCo was forced to start insolvency proceedings that could finally be solved through consolidation and recapitalization measures. Due to this episode, the company's explicit strategy in the financial field is to maintain its independency from banks. Also because of this incident, PlastiCo currently has to pay most of its suppliers in advance, while it usually grants payment targets of 30 to 90 days to the customers. For this reason, PlastiCo's liquidities usually oscillate around zero. Our interview partner is head of IT and controlling with PlastiCo.

LacquersCo is a family-owned enterprise founded in 1917, which produces lacquers for the interior. It serves customers that range from wholesale customers to big retail store chains to craftsmen to do-it-yourself customers. In the B2B sector, the company counts about 1000 business customers. LacquersCo has 240 employees out of which about 55% work in the production while the rest works in the administration. Business figures like the company's annual turnover were not communicated by the interview partner. He occupies the position of a controller, factually responsible for all financial processes, reporting directly to the board of directors.

VacuCo was founded 1994 and is currently owned by an equity fund. It produces huge vacuum equipments for the metallurgic and automotive industry. Due to the nature of their product, they only sell about 60 to 70 complete installations each year. For the spare part business, the company has about 2,000 to 3,000 worldwide customers, all of them being big metallurgic or automotive companies. VacuCo has 268 employees and has achieved in 2004 a turnover of 74 million EUR. Our interview partner is head of the finance division, responsible for all financial processes at VacuCo.

CosmetiCo is a cosmetics company owned by a large corporation. About 85% of its products are sold to the owning corporation; the rest goes to about 7 to 9 worldwide customers, all being large companies. CosmetiCo has 230 permanent employees, out of which about 100 work in the production while the rest is working in the administration. Each year, the company hires about 80 to 160 additional workers for the Christmas season. In 2004, the company has

reached a turnover of 67 million EUR. Our interview partner was the chief of administration at CosmetiCo, in charge with all financial processes.

V.2 Units of Analysis

As units of analysis we chose six different (potential) VCC scenarios, which are linked to different financial functions in the process map (Figure 1). As mentioned before, goal of the case studies was to get first evaluations of these scenarios and to develop new ones, together with the interviewees, which have a huge expertise on SMEs' financial processes. The six VCC scenarios are shortly summarized in Table 1. Some of them do not represent new business models. Nevertheless, they are still not realized by VCCs according to our definition, i.e. by an inter-organizational integration of the relevant information systems.

The IT infrastructure of the case study participants, which would form the foundation for implementing a VCC, is briefly described in Table 2. During the case studies, the focus was on the use of inner-organizational and inter-organizational systems.

V.3 Case Study Results

In the following, we restrict the presentation of our first results to the two VCC scenarios of customer management (CM) and liquidity management (LM).

VCC scenario Liquidity Management (LM). The LM scenario describes the transfer of cash balancing tasks between multiple accounts (and possibly between multiple banks) from the SME to a bank.

The four study participants have between 2 and 21 bank accounts at 2 to 4 banks. All firms check their accounts manually at least once a day. VacuCo uses a cash pool account to manually balance its 21 accounts each day, based on liquidity requirement analyses.

VacuCo stated that outsourcing the liquidity management would be possible and very interesting. The same was assumed by the other firms for the hypothetical case, that they would have more accounts. Presently, these firms spend quite little efforts on cash balancing. Risks from granting one bank access to all of the firm's accounts were seen as low, except by PlastiCo, which made some bad experiences with banks before and during its insolvency phase.

A capital club between different firms is seen partially as interesting and partially as not practicable due to security reasons. Nevertheless, both firms that are subsidiaries of a corporate group (VacuCo and CosmetiCo) take part or will take part in a corporate cash pool program, where the corporation balances the liquidity of the different members, using an internal interest rate for allocation. The results are summarized in Table 3.

VCC scenario Customer Management (CM). The CM scenario describes outsourcing of customer-relevant financial processes, such as qualification, payment control, dunning, and customer portfolio analyses. By granting the bank access to customer-relevant data the bank can apply its

capabilities of rating etc. and use its information about the SME's account transactions to control incoming payments etc. The scenario was only discussed with three of the case study partners, because CosmetiCo makes most of its business with its parent company and has only very few customers. None of the firms mentioned problems with bad payment behavior and all wanted to protect their customer relationships. Following, no firm would outsource dunning and only one firm would perhaps grant a bank access to customer data for portfolio analyses while the interviewee could not believe that the customers would agree with releasing data about them. The results are presented in Table 4.

Beside a first evaluation of the six initial scenarios, a major issue was to identify new scenarios, which could be evaluated in further case studies and in the questionnaire-based second phase of the project. A first scenario which was developed during an inter-view was a firm's need to get Basel II support, i.e. SMEs would open their systems to banks for getting better ratings and for getting advice to optimize their business figures when applying for loans.

VI. Discussion

The presented results of our first case studies show only preliminary findings of our research. Nevertheless, they indicate potential VCCs, as well as the problems involved. It was not goal of this paper to show a representative picture of the German SMEs' attitude to adopt VCCs, but to present the research approach and to discuss its appropriateness for answering the research questions introduced in the first section. The choice of a research domain which rather does not exist in practice, yet, was the main motivation for adopting a two-phase approach (case studies and questionnaire). Our first case studies may not be representative for the German SME sector and even for their particular industry, but they helped to get first insights into the feasibility of the developed VCC scenarios and the problems involved with them. When acquiring the next case study partners, we will more strongly focus on branches which have not been included so far (esp. trade and service companies). Nevertheless, case studies are never the appropriate approach to provide a representative picture in such a broad research domain and are even less appropriate to do explanatory research. The case studies showed that, besides the type of industry, there are a huge number of factors which might influence VCC adoption within the different financial processes (e.g. the firm's liquidity situation, governance mode, type of customers, geographical operating range on supplier and customer side, prior experiences with banks etc.). An explanatory research model would have at least to cover all of these parameters as control variables, while an exploratory research approach uses the model to structure the search for concrete drivers and inhibitors.

The case studies also neglected the supply-side view. The question how feasible a VCC scenario would be from a

bank's point of view again will be part of the questionnaire-based research. Of course, the step from determining the basic possibility of implementing a VCC to designing an effective business model, which will lead to bilateral adoption, is critical. Nevertheless, the competitive pressure in Germany enforces banks to look for new business opportunities and markets. Following Porter, innovative and sophisticated products are a possible strategy to achieve competitive advantages [24].

VII. Conclusion and Further Research

Main goal of this paper was to develop a research framework and a methodology which allows investigating the interfacial area between banking business and SMEs' financial processes. Additionally, some first case study results, which finally will form the first part of the research project, were presented.

The research framework interlinks the constructs of technological readiness, perceived benefits and risks, as well as external pressure regarding the adoption of novel embedded banking services into an SME's application landscape.

First results show some promising VCC scenarios, but also uncover the problem of granting a bank access to internal data, esp. if customer information is involved.

As a next step, we will conduct more cases in other branches (esp. trade), following the proposed methodology. After this, phase II will follow, which comprises an empirical survey with 700 SMEs and the German Top-300 banks (for also evaluating the developed scenarios from "supplier side"). Afterwards, a more technical part of the project will make sample implementations of promising VCC scenarios, 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 a theoretical (assessment framework for embedded financial services) and a practical contribution (prototype implementation of VCCs) to the emerging domain of value chain crossings between banks as financial service providers and the SME sector.

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Table 1. First VCC scenarios

VCC scenario (abbr.)	Related financial function	Description
Bank reconciliation (BR)	Invoicing, payments	The bank takes over all tasks for digitally mapping bank vouchers to internal accounting vouchers.
Liquidity management (LM)	Liquidity management	SMEs often hold multiple bank accounts for different reasons. If one bank has access to all accounts and at the same time is granted access to particular internal systems of the SME, it could take over liquidity balancing. By considering planning data, liquidity balancing could be done more effectively and future-oriented. The scenario could be extended to a capital club, where the liquidity balancing could be done over the accounts of multiple small firms, which trust each other (e.g. within a regional context).
Customer Management (CM)	Qualification, claiming	The account holding bank has information about incoming payments from the SME's customers. By granting the bank access to additional customer and invoice data, it could control incoming payments, perform dunning, check creditworthiness as well as perform customer profitability and portfolio analyses (customer-based business intelligence)
Factoring (FO)	Factoring, liquidity management	Factoring means an ongoing purchase of receivables through a financial institution. These institutions adopt the risk of default and all collection and dunning issues. At present, factoring is mainly offered by specialized companies. The VCC scenario includes a factoring community under the patronage of a bank, where different companies join to sell/purchase receivables to/from each other. The bank provides claim rating, control, and mutual trust.
Financial risk management (RM)	Financial risk management	If the bank is granted access to particular systems of the SME, it can provide financial risk management capabilities to the bank, much more easily. Depending on the SME's kind of business this could be factoring risks, interest risks, and currency risks.
Asset management (AM)	Asset management	Because a bank possesses superior knowledge regarding different types of asset products and of the capital market, it could overtake all tasks related to asset management, if a SME had sufficient cash funds to do sophisticated asset management (more than overnight money).

Table 2: Information systems infrastructures of case study partners

		PlastiCo	LacquersCo	VacuCo	CosmetiCo
Enterprise Resource Planning System (ERP)	Product	SAP R/3	TWS	SAP R/3	ABAS ERP
	coverage of all processes	80-100%	Unknown	40-60%	80-100%
	coverage of financial processes	60-80%	Unknown	80%	80-100%
Customer Relationship Management System (CRM)		Covered by R/3	None	Covered by R/3	None
Internal systems integration (EAI)		None	None	SAP connectors	None
B2B integration		EDI covers 20% of all communications with automotive customers.	EDI covers about 30-40% of total business document exchange.	No integration. Only classical media (fax, mail) and email.	No integration. Only classical media (fax, mail) and email.

Table 3: Case study results on VCC scenario "Liquidity Management"

		PlastiCo	LacquersCo	VacuCo	CosmetiCo
Demo graphics	Number of bank contacts	3	3	4	2
	Number of accounts	3	3	21	2
Perceived benefits	Actual efforts, which could be reduced by outsourcing.	Rather low efforts; manual transfer of data into ERP; accounts are checked 3 times/day. Scenario was evaluated as interesting for more accounts	Rather low efforts, once per day accounts are checked. For more accounts, this scenario was evaluated as interesting.	High efforts; cash pool account is used for manual cash balancing, based on liquidity requirement analyses.	Low efforts, but in the past it was planned (but not realized) to create more accounts for foreign currencies and to outsource the balancing over those accounts.
	Integration and interaction efforts	Perceived as low	Perceived as low	Perceived as low	In the past, the VCC scenario could not be realized due to incompatible systems between the banks.
Perceived risks	Risk from granting one bank access to all accounts	Medium, due to own experiences before and during the insolvency phase	Low, would be no problem	Low, would be no problem	Low, would be no problem
	Risk from granting a bank access to additional planning data, etc.	Too high	Too high	Medium, would be realizable	No problem
	Risk from joining a capital club	Medium, a committee would have to be implemented	Rather high	Too high	Rather high, but will be implemented within the corporate
External pressure	Competitive reasons for outsourcing	None	None	None	None
	Others			Corporate forces subsidiaries sometimes to grant credits to other subsidiaries (bilateral contracts)	From Aug 2005 all subsidiaries will take part in a corporate-wide capital club, where liquidity is balanced daily

Table 4: Case study results on VCC scenario "Customer Management"

		PlastiCo	LacquersCo	VacuCo	CosmetiCo
Demographics	Number of customers	800-900 established clients, 3,000 customers in total	1,000	2,000-3,000	8-10
	Number of outgoing invoices	12,000 per year	62,000-84,000 per year	3,150-4,150 per year	1,500-2,000 per year
	Customers' payment behavior	<1% of all invoices are not paid, a few customers claim every invoice for stretching the payment target	Almost no problems	0.03% of all invoices are not paid, <1% reclaimed	No problems
Perceived Benefits	Actual efforts, which could be reduced by outsourcing.	Customer management (<i>qualification and portfolio analysis</i>) is already outsourced to a specialized service provider which offers an extensive added value. <i>Dunning</i> is done internally, outsourcing would not make sense, because there are no scale effects.	<i>Qualification</i> is done internally. External information is requested manually. <i>Portfolio analyses</i> are done internally. Benefits from outsourcing are estimated to be rather low. <i>Dunning</i> is done internally.	<i>Qualification</i> is done internally. External information is requested manually. <i>Customer portfolio analyses</i> are not needed (one-off business). <i>Dunning</i> is executed automatically by R/3.	Scenario was not discussed, because 85% of CosmetiCo's business is done with its parent company.
	Integration and interaction efforts	Perceived as rather high. Too high for outsourcing dunning.	Perceived as very high.	Perceived as very high.	
Perceived Risks	Risk from granting a bank access to customer data	High, but controllable	Too high	Too high	
	Risk from outsourcing dunning	Too high	Too high	Too high	
external pressure	Competitive reasons for outsourcing	None	None	None	