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Abstract

Collaboration among companies is a major development in business and electronic business concepts. While groupware, teleconferencing or e-mail-systems are widespread and cross-functional in nature, support for collaboration in business processes has mainly been studied in the engineering and supply chain area. Virtual organizations and networked business also require collaboration in customer-oriented processes such as the management of offer generation, campaigns, customer data or complaints. While the concept of collaborative customer relationship management (CRM) has been discussed by several authors already, the technological scenarios available to implement these processes are still open for research. This paper investigates the role of CRM systems as application architectures for collaborative CRM. The findings show that CRM systems provide only basic functionalities for inter-organizational collaboration and seem currently not able to support collaborative CRM without help of additional supporting tools or extensive customizing of system functionalities.

Keywords: collaborative CRM, electronic business infrastructure/architecture, CRM system

Introduction

Customers expect that companies understand their demands or problems and the kind of solution they are looking for (Rigby et al. 2002). To come up with these expectations companies will need detailed information about customers and the contexts in which they are contacting a company. Based on these expectations customers are looking more and more for problem solutions and not only single products (Sawhney 2006). The solution for those specific customer problems or needs can involve the combination of several products and business services from different companies. These facts foster the information exchange and collaboration between companies. Examples are joined lead management, campaign management or customer profiling within several companies (Geib et al. 2004). New information insights, product and service combinations as also substantial cost savings based on the concentration on core competencies and joint use of resource are possible though this kind of collaboration. The complexity of those collaborative business processes requires collaboration infrastructures. Although research and implementations in practice promise opportunities of collaborative CRM, concepts for supporting application architectures based on CRM technology are still in a development phase. Reasons for this contradiction can be the lack of functionalities for the realization of collaborative CRM business processes, missing standardization across the various CRM vendors, the isolated implementation of CRM systems today as well as political factors which impede the sharing of customer-oriented

data with business partners. This research analyzes the perspectives for using standard CRM packages in the area of collaborative CRM.

First, the phenomenon of CRM collaboration is defined and existing research in this area is reviewed. Requirements for collaborative CRM infrastructures were identified in an additional review of five case studies (Geib et al. 2004, Geib et al. 2005, Fux et al. 2007) which investigate the role of infrastructures in collaborative CRM. The results of literature and case study reviews were used for the formulation of an evaluation framework. Test scenarios were defined for two established CRM systems: Selligent as a classical packaged standard CRM application and Salesforce as a 'software as a service' CRM application. For their analysis product whitepapers (Salesforce 2008, Selligent 2008), information from the product websites as well as test implementations were used. The paper concludes with a discussion and directions for future research.

Research on Collaborative CRM

One of the main success factors for CRM is the appropriate and cost-benefit maximized satisfaction of customer needs (Paulissen et al. 2007, Romano and Fjermestad 2003, Rigby et al. 2002). Key elements of this strategic perspective are extensive knowledge about customer needs and the ideal positioning of a firms product and service portfolio in the customer process to satisfy these needs. CRM may be defined as a "process that utilizes technology as an enabler to capture, analyze and disseminate current and prospective customer data to identify customer needs more precisely and to develop insightful relationships" (Paulissen et al. 2007). Established CRM concepts are cycle models such as the customer relationship lifecycle and the customer buying cycle (Ives and Learmonth 1984). In the past CRM-related research focused on intra-organizational environments. But with increased complexity of customer processes and customer expectations this scope reaches its limits and the potentials of collaboration with business partners is one option for improving CRM. Collaborative CRM enables producers and distributors to cooperate along the value chain and extend customer acquisition, retention and development beyond traditional commodity management (Kracklauer et al. 2004). It consolidates concepts of business networking and CRM to enable in business networks the creation of customer relations at a network level and with the use of combined network resources and capabilities.

Collaborative CRM in Literature

As mentioned above, the notion of collaborative CRM has been coined and described by several authors already. Most papers focus on the identification and utilization of CRM business processes where collaboration creates new business opportunities or enhances existing processes or methods such as customer segmentation or product bundling (Rocks et al. 2005, Wirtz et al. 2004). For example, Kracklauer, Mills and Seifert (2004) examine the value of collaboration in operational and analytical marketing business processes such as category management and collaborative planning, forecasting and replenishment (Kracklauer et al. 2004). Weber (2001) emphasizes the potential of supplier-reseller relationships as one form of CRM collaboration in networks. Romano (2003) identified collaboration in e-CRM markets and as part of e-CRM business models (Romano and Fjermestad 2003) as key elements of future CRM research. Collaborative CRM may also be conceived as part of business networking which recognizes that the networking with customers and suppliers requires cross-organizational (or collaborative) business processes and infrastructures (Österle et al. 2001). All authors emphasize the impact collaboration could have on CRM and that more research regarding the application area, the concepts and theories, and the effects of collaborative CRM is necessary.

Available research on the technological aspects of collaborative CRM is more rudimentary in nature. Although several authors describe the importance of supporting IT infrastructures in networks (Klein and Poulymenakou 2006, Österle et al. 2001, Meyer 2005), only little research actually focuses on the application architecture for collaborative CRM themselves. Most research concentrates on dedicated aspects of collaboration in networks and focuses on supporting

technologies such as partner relationship management (Weber 2001, Mirani et al. 2001), e-collaboration systems (Riemer 2007) or value chain integration (Makatsoris and Chang 2008). In a more general approach Geib (2006) analyzed several collaborative CRM infrastructures in the financial sector and formulated a reference architecture. Another research examines the use of IT in a CRM collaboration case in the touristic sector (Fux et al. 2007). In general, research in collaborative CRM infrastructures is still limited to specific application areas on a high abstraction level.

Summarizing collaborative CRM is a new phenomenon in practice and has attracted the attention of the research community but is still in an early development phase. However a common accepted definition of collaborative CRM seems not to be available in literature (Geib et al. 2005, Fux et al. 2007, Kracklauer et al. 2004). Evidence in literature indicates that collaborative CRM considers CRM business processes, application architectures, joint use of customer data(bases) and exchange as well as the integration of customer orientated application systems at a network level.

Collaborative CRM Processes

CRM entails all aspects of relationships a company has with its customers from initial contact, pre-sales and sales to after-sales, service and support related (Makatsoris and Chang 2008). Collaboration between firms can improve the involved intra-organizational business processes. The identification and definition of collaborative CRM core processes is still ambiguous. Collaborative business processes that can be found in literature are marketing campaigns, sales management, service management, complain management, retention management, customer scoring, lead management, customer profiling, customer segmentation, product development, feedback and knowledge management. They cover operational and analytical CRM as also support and management processes. Case examples from the marketing area are joint market research, category management or co-marketing between several firms (Kracklauer et al. 2004). In this paper collaborative CRM processes involve operational and analytical business processes in marketing, sales and service with the involvement of several firms (Geib et al. 2004).

For the execution of those business processes the CRM systems of the involved partners as also a collaborative application architecture between these partners seems necessary. The limitations of the information systems infrastructure (e.g. low automation, incomplete standardization, low system integration of operational and analytical CRM systems) are the source of most challenges in collaborative CRM processes (Geib et al. 2004). CRM systems provide the application architecture for the basic intra-organizational CRM business processes. Collaborative CRM processes enhance them and need further functionalities such as integration components or collaborative activities in business processes (e.g. synchronization of partner lead data and processes, service workflows including different companies). The complexity of a collaborative CRM process (e.g. joined campaign management vs. stand-alone mailings) influences also the necessary degree of automation.

CRM Systems as Application Architectures for Collaborative CRM

Application architectures for collaborative CRM can be interpreted as contextual forms of inter-organizational information systems (IOIS). In general the use of IOIS takes place in networks of organizations, where a group of firms from an industry develops, controls and supports a common ICT infrastructure (Rodon 2007). Typical functions of IOIS are the support of information diffusion, communication, collaboration, transaction and coordination (Riemer and Klein 2006). They can enable inter-firm networks and support existing networks (Prasopoulou and Poulymenakou 2006). The involved firms are autonomous entities that normally do not operate on data and processes shared between them, the number of stakeholders involved is larger together with a greater diversity of interests and in inter-organizational contexts there is not always a higher authority that orchestrates the relationship (Rodon 2007). The case of collaborative CRM represents a special form of IOIS because the complexity of involved inter-organizational business processes tends to be very high and involved systems are mostly heterogeneous.

As previously elaborated the information exchange with partners and realization of inter-organizational CRM business processes are two important elements of collaborative CRM. Based on their existing functions and nature CRM systems could support both elements in business networks. They are used to centralize all knowledge about customers and the customer relationships, and can therefore act as CRM information base. In addition all customer centric business processes are managed with functionalities of operative CRM what facilitates their role as operative part of a network infrastructure.

CRM integration can affect different layers depending on the integration tasks (e.g. technology, processes, culture) (Meyer 2005, Österle et al. 2001, Rodon 2006). Process integration as one layer can be based on technological integration if a high level of automation is required or the involved processes are complex. Process integration tasks can be realized in different layers (e.g. data, presentation, process). In case of the technological integration the external scope addresses the interfaces on these different layers with network partners.

According to (Rodon 2007) standardization precedes IOIS integration on different levels. Modern infrastructure technologies (e.g. Java and J2EE application servers, .NET framework) and middleware technologies (e.g. CORBA, RMI) can interlink heterogeneous and dispersed systems across different geographic locations (Makatsoris and Chang 2008). Beyond the support of those standard integration technologies CRM systems could be able to provide standard functionalities and processes for collaboration with network participants. Premises like a widespread availability of CRM systems, support of advanced CRM functionalities, ready-to-use functions for data import and export as also web services support can be found in state-of-the-art CRM system architectures.

With regard to the literature review shortcomings of most available CRM systems in the case of collaborative CRM are the restriction of standard functionalities for collaboration to partner relationship management and multi channel management. Predefined functionalities, like joint campaign management with business partners are reduced to basic features, like target list exports or lead qualification portals. Only niche players support a broader variety of network business processes with dedicated functionalities (Geib et al. 2006).

Framework for System Integration in Collaborative CRM

To research the suitability of CRM systems as collaborative infrastructures a framework with three dimensions (integration layers, automation and topologies of collaboration infrastructures) based on the literature review and existing case studies in collaborative CRM was created. The cases studies of (Fux et al. 2007), (Geib et al. 2004) and (Geib et al. 2005) illustrate that integration can affect different layers of information systems depending on the integration task. The cases show also that more complex collaborative CRM scenarios require automated business processes (e.g. online calculation of credit rates). General research in IOIS illustrates that different topologies with different requirements are applicable as collaboration infrastructures. The case studies provide examples of interconnected and central CRM system topologies.

Integration Layers

CRM systems as information systems can provide IT support in business networks on three different layers, namely the data, process and presentation layer (Ruh et al. 2001). Those three layers can be found in most modern CRM systems and are supported by various functions within those systems. Each layer for its own and in combination has the ability to provide functionalities for technological integration between network partners.

Data integration is a key element in CRM and can be used with minor efforts also in business networks (Kennedy 2006). The integration of data can be used for information or knowledge exchange (e.g. customer data, information about customer potentials or order information) (Brohman et al. 2003). Two main directions can be found in practice (Loser et al. 2004). They are the use of one central database by all network partners or the synchronization between two or more

databases. The preferred direction of most firms is the synchronization of data between databases because the consequences for business processes and customer knowledge management are predictable. One database between different firms is typically used, when intermediate firms, such as electronic markets or market research companies are in the center of a network.

Process integration is based on data integration, but far less utilized. The objective is the integration of different information systems by mutual function calls, so that business processes can be automated, independent of firm boundaries. Several technologies and theories exist for process integration (e.g. CORBA, Remote Procedure Call) but only web services are supported by most CRM systems as standard features. The implementation of business processes in networks and among different firms is still based on extensive planning and coordination within the involved partners. One responsible reason is the poor compatibility of CRM processes and data architectures. Although there are similar CRM functionalities in most CRM systems, the underlying data and process models varies considerably.

If the technological prerequisites (e.g. web technology) are available the presentation integration provides the simplest and fastest form of integration between different firms in networks. CRM functionalities, modules or platform areas are made available for partners via micro sites, portlets or portals. Most CRM systems provide enhanced functionalities for the creation of websites with direct CRM integration. Problems still exists because sometimes the strategy and usage is not clearly defined and systems stay parallel, data security can be challenged if partners or clients can access their data directly in the CRM system and functionalities are limited because only preconfigured functions can be used. The usage of presentation integration can primarily be found in the field of partner management and customer specific websites.

Automation

Automation of CRM business processes in networks is another aspect of collaborative CRM. Flexibility and the fast execution of business processes depend on a high level of business process automation between network partners. If those processes can be executed between firms only with the involvement of human actors (e.g. coordination, triggering of processes) they will restrict the potential of the whole business network. The tightness (loose vs. tight) of integration in a business network results from the general need of automated data, process and functional integration for business processes. Automated CRM processes need a tight integration between the different information systems in a network but not necessarily on every layer.

The basic and traditional form of partner collaboration is loose coupling without automation and user specific content. This kind of collaboration relies on the supply of data and the availability of access points for partners. Common examples are the availability of websites, contact forms and the possibility to initiate manually processes in firms of network partners (e.g. service requests). The opposite is a tight and user specific automation. This form provides partners with the ability to integrate their own systems without many restrictions into the CRM systems of other partners. The realization of complex business processes within networks of companies, using different CRM systems, depends on this level of integration.

Topology of Collaboration Infrastructure

For the collaboration infrastructures different topologies are possible. The simplest way for establishing a common application architecture for collaborative CRM could be the connection of their existing CRM systems, if those systems already contain the necessary technological features (Medjahed et al. 2003). As mentioned before, CRM systems provide a set of functionalities which can be used for the technological connection to other network partners and their systems. An advantage of this solution is the absence of a centralized network infrastructure or an unequal power allocation between network partners resulting from unilateral infrastructure control. But, it relies essentially on the capability of CRM systems to connect to other CRM systems and the support of automated inter-organizational business processes. The challenges are common process

and functionality standards in connectable architectures. As long as CRM systems contain individual data models and process flows the integration between systems is difficult. Additional options used in practice are the provisioning of CRM functionalities or systems by one network partner (e.g. focal player or infrastructure provider) or the creation of a hub system which links to individual CRM systems of network partners.

The provision of CRM functionalities by one network partner has the advantage of rapid integration of new network partners in the common network infrastructure. But in this solution the providing network partner holds an unequal power over other network participants (e.g. their business processes, customer data). This solution is applicable if one partner is selected as coordination partner or if network partners depend on one partner with unique characteristics (e.g. power over network structure, goals) and an outstanding position in the network (e.g. business service providers which group around product providers). This form restricts also the abilities to collaborate because partners cannot integrate their own CRM systems and business processes.

The creation of a hub system by the network partners is another option (Christiaanse and Rodon 2005). Based on the negotiated standards between the network partners they can connect their individual CRM systems into a hub system. The hub provides interfaces for the connection of business processes or data exchange and coordinates business processes and data flows between the connected CRM systems. This solution is restricted by the implementation efforts of the hub and the investments for new business partners to align their CRM systems to the hub requirements. The advantage of one central hub are the solely implementation of interfaces to one hub instead to all network partners and the equal allocation of power between network partners. As disadvantage the implementation and maintenance expenses of the network hub increase the general network expenses.

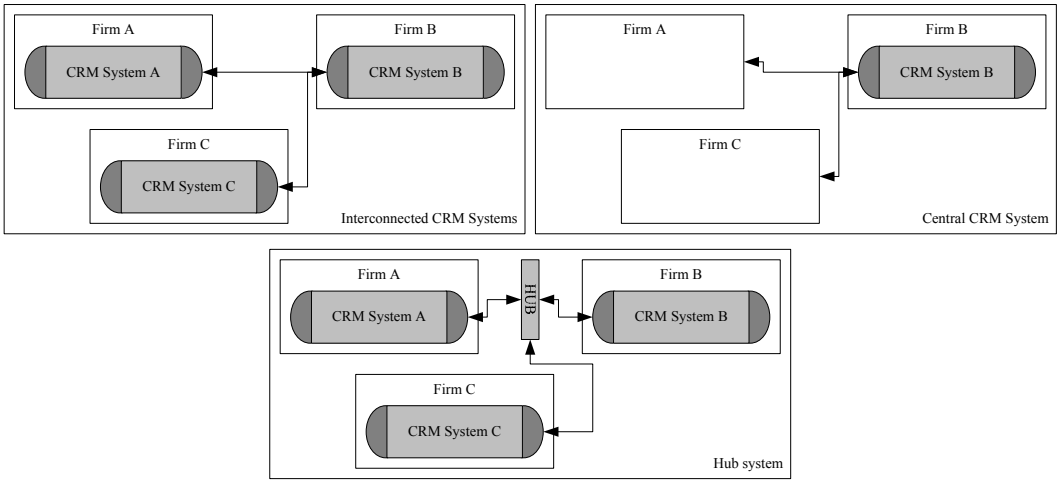

Figure 1: *Topology options*

Analysis of Two CRM Systems

The proposed framework was applied to two CRM systems using one evaluation scenario. The two systems represent state-of-the-art CRM systems and the functionalities of other CRM systems seem to be similar. However, the detailed assessment of other CRM systems was not a part of this research.

Evaluation Scenario

For the evaluation of the CRM systems a collaborative campaign management scenario based on the reviewed case examples was developed. In the test scenario three firms (e.g. service providers) execute a corporative marketing campaign (e.g. problem solutions with capabilities of different service providers). The campaign is planned and executed by one network partner as illustrated in Figure 2. Campaign targets need to be aggregated from various local customer databases. Therefore not only customer datasets must be aggregated, the campaign and target status must be visible to every network partner. In addition for analyzing the campaign results, customer data, campaign data and generated business activities must be accessible for network partners.

As described above, three options are available to support this campaign technologically. The campaign leader can provide access to his CRM systems and execute all tasks in this system. In this case, targets and responses will be exchanged via web access to the leaders CRM systems or over the export and import of data. The next option is the creation of a hub system with interfaces for all partner systems. For this option the partners must have agreed to interfaces and the creation of one hub system. In this case, the access, exchange and analysis of data as well as the execution of processes will be through the hub system. In the last option all CRM systems can be connected via web services and yield partner access for the analysis of campaign results. Key elements of the test scenario are data aggregation, visibility of process states, support of process interaction and access to internal and external data.

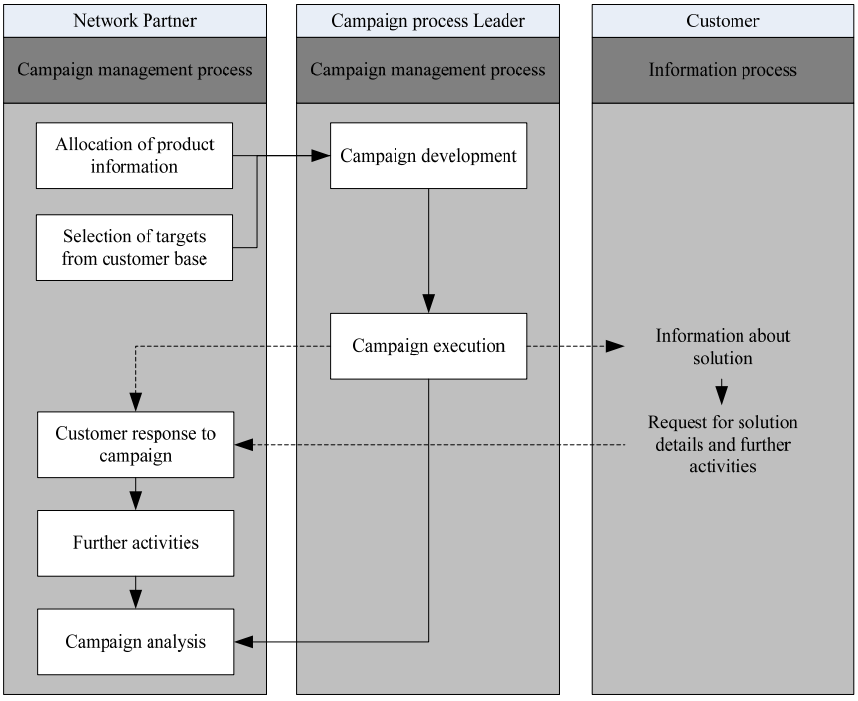

Figure 2: *Activities in the evaluation scenario*

Characterization of the Two Evaluated CRM Systems

Salesforce is known as leading CRM on-demand solution provider and offers an extensive portfolio of functionalities for CRM processes. These may be enhanced using “Appexchange”, an application directory for additional on-demand business applications. Selligent X@ is a CRM system provider who focuses on firms with complex and individual business processes. For the application on those scenarios the system can be customized in large parts of its functionalities to achieve a close fit to individual business requirements.

According to the test scenario Salesforce enables firms to aggregate and access data with business partners over traditional integration functionalities (e.g. web services, data export or import routines). Selligent offers similar functionalities, with the "Selligent Dataloader" and "XML connect & go" technologies. The interoperability of these services and functionalities depends on predefined rules and exchange formats. Both systems provide additional functionalities for data exchange and aggregation between different companies with same CRM systems. The "Salesforce to Salesforce" data sharing connection allows a secure and simple to set up data exchange between two Salesforce systems. The Selligent Global & Local concept enables companies to roll out several installations of Selligent with different core databases and with specific customizing but still integrated within a homogeneous infrastructure. Because this technology is based at the individual application architectures it is currently not applicable for use in heterogeneous system networks. The status of business processes and activities can be monitored by partners over web front-ends. Direct access and status request on business processes is possible with web services, but must be additionally implemented and customized in the participating CRM systems. Business process supporting features in Salesforce such as "partner sales support" provide only information and data entry possibilities and no integration features to external systems.

Bi-directional partner business integration depends in both systems on supplementary customizing and functionalities. However, with standard features in Salesforce such as "partner sales support" partners can initiate preconfigured business processes within the provider's CRM system. In Selligent the integration of business processes between network partners can be realized with "Selligent XML Connect & Go". This technology provides the data and functionality of the Selligent CRM system and presents it using SOAP/XML interfaces.

Evaluation Summary

The two CRM systems can be used in business networks that are using one of the previous described architecture options (**Figure 3** summarizes the evaluation). Within them the provision of CRM functionalities to external partners by one partner marks the most developed architecture option and is supported by both systems. Salesforce offers complex predefined processes and functionalities for partner management (e.g. Salesforce Partner Management) where Selligent provides an extensive customizable system but without predefined functionalities for partner management. Selligent provides instead technologies like "Selligent Web Content" and "Selligent Screenlets" that enable companies to provide direct access to CRM data and functionalities for customer and partners via a customizable browser front end or the inclusion of forms and functions in other web-based applications.

For integration via a hub system both systems provide web services and XML import and export routines, but without the use of common standards. This complicates interconnections with other CRM systems or hub systems. To overcome this restriction the additional matching of data formats and business processes is necessary and matching functionalities must be implemented in the hub architecture or participating CRM systems. The direct connection of CRM systems and execution of business processes within the network is possible, but limited by the same restrictions as the hub and providing architecture option. Based on these functionalities CRM systems can be used for the creation of business processes in networks but only with extensive efforts and financial investments if a higher level of automation is required. The most cost-efficient but also restricted option regarding joined data use and process automation is the provision of required CRM functionalities as central CRM solution by one network partner.

According to the architectures the different integration layers show an unbalanced availability of supporting features. Functionalities in the presentation layers are most applicable for collaborative use. The process and data layer have a lack of essential functionalities for collaborative use like joined customer data bases or processes interaction. The same situation can be found when automation and coupling of CRM systems is analyzed. The offering of information and processes has reached a high level of maturity but the bi-directional integration is still difficult to realize.

			Suitability	
			Selligent	Salesforce
Usability in Integration layers and for collaborative functionalities from the test scenario	Presentation layer	Provision of data access for external partners	●	●
		Business process status visibility for partners	◑	◑
		Data entry options for partners	◕	◑
		Functionalities for data exports by partners	◕	◕
		Pre-defined functions for joined campaign management	◑	◔
	Process layer	Requests on processes and data in external systems	◕	◕
		Process standards for CRM processes in campaign management	○	○
		Interconnection of external and internal processes	◑	◑
		Import and export of data in business processes	◕	◑
		Request of process states in external systems	●	●
		Analysis of business processes in the network	◔	◔
	Data layer	Flagging options of data for collaborative use	◔	◔
		Integration and updating of data from external sources	◔	◔
		Aggregation of data from different systems	◑	◑
		Access to data for external systems	◑	◑
General support of coupling between systems	Tight, automated integration with a minimum of manual interventions		◔	◔
	Semi automated integration with necessary manual intervention		◑	◑
	Loose with no automation		◕	●
Usability in topology options	Direct integration of CRM systems		◔	◔
	One system as functionality provider		◕	●
	Integration of CRM systems with a hub system		◔	◔

Suitability of function in the CRM system

○ not possible ◔ only possible with extensive efforts ◑ possible with significant efforts

● possible ◕ possible with minor efforts

Figure 3: *Evaluation framework and analysis results*

Even though Salesforce provides a whole range of standard features for business partner integration and process support, the connection of one or more layers between two CRM systems and the establishment of fully automated business process are not possible without substantial customizing. Preconfigured collaborative CRM processes such as campaign management with shared campaign steps are not available in standard packages. Selligent shows a similar set of

functionalities for collaborative CRM like Salesforce. Although it is possible to build detailed interconnections between two or more companies, the standard functionalities do only provide infrastructure components for business process integration in networks. Complex business processes or network CRM environments as described in test scenario are only possible with extensive planning and customizing of existing features.

Discussion

Limitations of Current CRM Systems as Collaboration Infrastructures

The evaluation has shown that the two examined CRM systems are suitable if CRM information should be provided for partners and business processes are used with the inclusion of human actors. If CRM systems are used in business networks, which rely on automated processes and partner specific content the standard functionalities reach their limits. An example is the consolidation of customer data as described in the test scenario which is possible in general but difficult without human interaction. Functionalities like the indication of collaborative usable datasets and fields or automated connections to external campaign management tools are not possible. This area seems to be in the focus of current technological developments but has not evolved far enough yet. If finally partner specific information interchange and automated business processes are necessary current CRM systems require substantial customization.

Although integration technologies have found their way in the CRM systems, the systems are not prepared for usage in business networks. Most of these technologies rely on complex planning of interconnections with partner firms and mutual coordination of the corresponding CRM systems. They are justified for the use of long-term integration between two partners or the mainly anonymous integration of several partners.

One main reason for the poor capability of CRM collaboration with the help of CRM systems seems to be the broad lack of standard functions and data models in CRM. If different systems should be integrated the first challenge is the standardization of common data and process models. Normally CRM systems have their own model, even if they provide web service functionalities, the services provide the own integrated model regardless to other models.

If elements of stability in networks are missing both systems show limitations. As described, if common standards and IT infrastructures are not available the IT supported collaboration in CRM is difficult. Most business settings therefore rely on close and individual cooperation in stable environments. If dynamic environments are involved, the availability of a focal actor who provides an IT infrastructure or takes the coordination role is given in most business cases. To establish scenarios like in the touristic case (Fux et al. 2007) with common CRM systems an extensive planning and customizing of functionalities is necessary. Although CRM systems have improved very fast in the recent years, they concentrated on aspects such as web availability and easier integration between two actors. The support of collaborative CRM processes should be the next development step.

Conclusion and Future Research

In this paper the technological requirements of collaborative CRM in business networks and the qualification of modern CRM systems to match them were investigated. The findings show a gap between the opportunities of collaborative CRM and the possibilities for companies to collaborate in CRM processes with the help of CRM based IT infrastructures. Although CRM systems provide basic functionalities for inter-organizational collaboration they seem currently not able to support collaborative CRM without help of additional supporting tools or extensive changes of system functionalities. This paper contributes to general collaborative CRM research and highlights the necessity for further technological advances of CRM systems if they intend to support collaboration of firms in business networks.

This paper has characterized three possible architecture options based on the utilization of CRM systems. For practice the kind of infrastructure is less important regarding to the how-to and simplicity of setting up collaborative CRM processes. The evaluation has shown that the usability of collaborative CRM infrastructures depends among other factors on the simple utilization of process interaction between firms. Therefore the adoptability of existing standards (e.g. RosettaNet) or the development of new standards for collaborative CRM processes should move into the focus of future research. Based on those standards CRM system providers could integrate common accepted process standards in the system architectures and enhance the collaborative capabilities of their systems.

The role of hub architectures for collaborative CRM seems to hold potential for additional research also. Usually hubs are expensive to establish, but like Salesforce show with the "Salesforce to Salesforce" feature, CRM system providers can create and maintain also infrastructures for the collaboration between their systems. The collaboration based on ASP or on-demand platforms could be an additional future form of collaboration infrastructures.

Furthermore prior research of CRM related collaboration in networks has concentrated primarily on internal or stable networks. Reasons can be the better documentation of implementation examples and the novelty of the research area. But as current predictions about the development of IT and changes in market structures point out, dynamic networks will play a more important role (Eito 2007) and should therefore be addressed by future collaborative CRM research (Konsynski and Tiwana 2005).

The research in this paper was restricted by several elements. First of all only five case studies of CRM related collaboration from two sources were examined. These cases show specific business processes, they are restricted by business sector characteristics and they deal with more stable forms of business networks. Furthermore the proposed evaluation framework provides only a first insight in the appropriateness of CRM systems as network infrastructures. For more substantial statements about the role of CRM systems, this evaluation schema has to be improved significantly and verified with a larger number of CRM systems.

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