A Design Science Approach to Investigating the Piloting of Customer Relationship Management

Carl Erik Wikström, Department of Computer Sciences, University of Tampere, Finland, Bulevardi 48 B 40,
FIN-00120 Helsinki, Finland, P 358-400-233 151, carl-erik.wikstrom@pp.inet.fi\

ABSTRACT

Customer relationship management (CRM) initiatives have emerged in a form of strategic and high priority projects in many organizations, but risks and rewards are equally high. One avenue of reducing risk is to apply piloting. In this empirical research we investigate whether the piloting of CRM has a role in decreasing implementation risks. We use design science approach in analyzing our findings, which indicate that the final outcome of piloting – contrary to what management may expect - can even raise resistance to CRM. Further, our findings indicate that CRM has a role in organizational policy-making and can cause power shift from one organizational entity to another.

INTRODUCTION

Given the high cost of acquiring new customers, companies are stepping up efforts to keep existing customers (Almquist et al. 2002), and are increasingly embracing the promise of customer relationship management. Organizations that effectively use a CRM business strategy are likely to emerge as market leaders, but risks and rewards are equally high (see the Gartner report in Starkey and Woodcock 2002). The high risk of failure has motivated researchers to study CRM success (Yu 2001; Abbott et al. 2001; Bose 2002; Fjermestad and Romano 2003; Croteau and Li 2003; Wikström 2004; Bhatia 2005).

The risk involved in IT implementation has been covered in many research projects (Lyytinen et al. 1998; Markus 2004). Markus (2004) has suggested that one avenue of reducing risk is to apply "prototyping" techniques. The goal of reducing risk of failure may be for a company the main motivation to rely on piloting, but there might be other motivations: the fear for resistance, the need for gaining organizational commitment, and the uncertainty which surrounds the whole concept of CRM. In order to get insight into the phenomenon of piloting CRM, we used design science approach in analyzing the data collected from one case company. Our first research question was: why do companies adopt piloting before a CRM implementation project and what are their primary expectations? Our second research question was: what is the outcome of piloting and to what extent piloting may reduce CRM implementation risks?

In the next section we introduce and define the core concepts of customer relationship management, CRM success factors, piloting, prototyping, and finally design theory as an approach in information systems research. Thereafter we represent our case and explore data gathered from a company called F-Bank (a pseudonym). Then we evaluate the CRM prototype, which was built in F-Bank. Finally we report our findings and their implications relevant to both academics and practitioners.

LITERATURE REVIEW

Customer Relationship Management

The concept of customer relationship management (CRM) is based on the relationship marketing paradigm according to which "marketing is to establish, maintain, and enhance relationships with customers and other partners, at a profit, so that the objectives of the parties involved are met. This is achieved by mutual exchange and fulfillment of promise" (Grönroos 1994). The utilization of information technology in supporting various relationship marketing activities has led to the formulation of the concept of customer relationship management. We define CRM as the bundling of customer strategy and processes, supported by the relevant software, for the purpose of improving customer loyalty and, eventually, corporate profitability.

CRM Success Factors

According to the account of problem areas in CRM success Rigby et al. (2002) list four problem areas out of which two, "the implementing of CRM system before a business strategy has been created" and "rolling out CRM before changing the company's organization", relate directly to organizational change issues. Corner and Hinton (2002) examined the implementation risks and found that politics and vested interests, the need for mobility, and inadequate funding were the most common risk categories. To avoid the risk of failure, Colgate and Danaher (2000) point out the importance of internal marketing and employee empowerment, profitable target segments, a business strategy emphasizing service, sufficient levels of involvement, high experience or credence qualities, and the ability to calculate relationship performance. Croteau and Li (2003) have constructed a CRM research model, where they as critical success factors include operational and strategic perceived benefits, top management support, technological readiness, and knowledge management capability. Plakoyiannaki and Tzokas (2002) maintain that the lack of learning and market orientation, integration, and direction capabilities may explain CRM failure. Resistance and usability have been found critical for CRM implementations to succeed, too (Fjermestad and Romano 2003).

Piloting vs. Prototyping and Piloting as a Research Method

Piloting involves innovation and testing of this innovation with people, i.e. with its potential users. According to Krcmar and Böhmann (2005), pilot projects of IT-based innovations are a particular type of design-oriented research. They aim at understanding the preconditions for implementing socio-technical systems in a field setting and the effects on their context of use. Piloting may be seen as a research method related to both design science (see Vaishnavi and Kuechler 2005) and action research (Schwabe and Krcmar 2000). Järvinen (2005) sees action research as one approach in design science. Markus (2004), who formulated a technochange lifecycle model, maintains that an essential part of a good technochange process is prototyping, where both the technological solution and the organizational change should be prototyped together.

Winograd (1995) has identified four different types of prototypes: *rough hand sketches and scenarios* help the researcher to explore a large number of possibilities for a program; *low-fidelity prototypes* give users a sense of the dynamics of a program without having to build a functional

version of it; *programmed facades* can be built on the computer using prototyping tools and may mimic some illustrative aspects of the functioning of the intended program; *prototype-oriented languages* are very close to full-fledged programming languages that are designed to support the prototyping process.

In our case the piloting of a CRM system may be seen as a level-three type of a pilot project (see Schwabe and Krcmar 2000). First the needs of the sales, marketing and customer service functions for a new CRM system were analyzed. Next a CRM prototype was developed. This prototype was then implemented for the use of a pilot group and evaluated in terms of its capability to better support the relevant CRM processes. Further improvements to the prototype were executed in order to enhance its service and applicability to the organizational context.

Design Science as a Method for Studying the Piloting of CRM
Design research involves the analysis of the use and performance of designed artifacts to understand, explain and to improve the behavior of some aspects of information systems (Vaishnavi and Kuechler 2005). Design theory concerns both how to undertake the building of an artifact and what the artifact should look like when built (Gregor 2002). Vaishnavi and Kuechler (2005) represent a general methodology of design research (Figure 1). In their model all design begins with *awareness of a problem*. *Suggestions* for a problem solution are abductively drawn from the existing knowledge/theory base for the problem area. An attempt at implementing an artifact according to the suggested solution is performed next. This stage is shown as *development* in the diagram. Partially or fully successful implementations are then *evaluated. Development, evaluation* and further *suggestion* are frequently iteratively performed in the course of the research (design) effort. The basis of the iteration, the flow from partial completion of the cycle back to *awareness of the problem*, is indicated by the *circumscription* arrow. *Conclusion* indicates termination of a specific design project.

We chose to apply the design research approach because "it addresses important unsolved problems in unique or innovative ways or solved problems in more effective or efficient ways" (Hevner et al. 2004). We do not claim that the construction of a CRM system prototype would be a unique innovative problem today. However, based on our review of CRM risks, we do maintain that more research is needed to increase CRM implementation success.

RESEARCH SETTING AND METHODOLOGY
We selected F-Bank as our case because we had the opportunity to conduct participatory research and act in the piloting as both researchers

Figure 1. General methodology of design research (Vaishnavi and Kuechler 2005)

and consultants. F-Bank is an independent privately owned investment service company. F-Bank's operations are divided into three business units, which serve both institutional and private clients: Asset Management, Markets, and Corporate Finance. F-Bank has a staff of 290 employees and its turnover in 2004 was 59 million euros.

We chose to conduct a single case study "which focuses on understanding the dynamics present within a single setting" (Eisenhardt 1989). After constructing a research protocol, we gathered data of organizational events related to both the construction of the CRM prototype, and the process of evaluating the prototype in the organizational context. We used documents extensively and utilized our own side notes. A total of 5 interviews lasting from 60 to 90 minutes were conducted, recorded and then transcribed. We interviewed members of the business management and the CRM project group. We asked questions related to the expectations of the piloting, the piloting process itself, and the outcome of the piloting.

ANALYZING THE PILOTING PROJECT FROM A DESIGN SCIENCE PERSPECTIVE

Awareness and Relevance of Problem
F-Bank had recently gone through a major reorganization, wherein the separate daughter companies were merged to F-Bank. There existed three separate customer databases and as the new organization was transformed, awareness grew that F-Bank needed a centralized customer database. The goal was to build a new CRM system and integrate it with the customer master database. The new customer-oriented business strategy was another motivating factor. Based on feedback data collected from the customers and the internal sales and customer service organization, a need to better manage customer relationships had become evident.

Knowing of previous CRM failures both at F-Bank and at other companies, selecting a piloting approach evidently was a search for a solution to a relevant business need in a more effective or efficient manner (Hevner et al. 2004). However, our perspective was that F-Bank first needed to align customer relationship management strategy with sales, marketing and service processes before implementing a CRM application or even piloting it (see Wikström 2004). Therefore our first purposeful intervention was the proposition to define all major sales, marketing and customer service processes.

F-Bank's decision makers were aware of the current literature on CRM risks: our second intervention (a request of the project manager) had been the sending, to both the CEO and the CRM project manager, of some academic and managerial literature on both CRM risk issues and CRM opportunities (the papers sent were: Bhatia 2005; Goodhue et al. 2002; Rigby et al. 2002).

Suggestion for a Solution
Apart from the need of reducing risk of failure, we observed several other motivations for the piloting: the potential need for organizational changes; a need for a method to ensure that relevant CRM issues would be covered in the implementation; the desire to set the expectations of the new CRM by business units to a "realistic" level; and the strive for getting more and better business intelligence and analytical data of customer purchase behavior. The scope of the piloting project included the construction of a CRM system prototype, in which the customization features of Microsoft's CRM program were utilized.

Development of the Artifact: A CRM Prototype
The piloting project extended over four months. In the definition phase altogether 9 project meetings were held, one with each business unit and their sub-units. This phase was conducted according to general CRM needs definition guidelines (Starkey and Woodcock 2002; Chen and Popovich 2003; Bhatia 2005). First the concept of "customer" of each business unit was defined. Secondly the relevant customer segments of
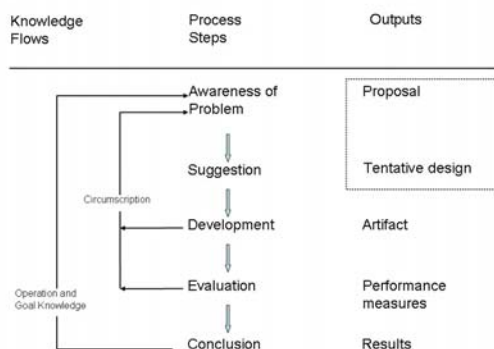
each business unit were analyzed and defined. Finally the servicing model of each customer segment was explicated. As a result, customer relationship types, their segmentation strategy and the respective customer care strategy were documented.

The next step was the analysis, definition and documentation of the core sales and service processes of each of the three business units. As a result *institutional asset management* chose to describe what they called the "sales driven sales process". *Customer service* unit chose to describe their "lead process", and *capital markets* unit chose to describe their "daily sales process". At this time *corporate finance* business unit had decided not to invest more of their time in further planning and therefore their sales processes were not described in more detail.

We had, together with the F-Bank's project manager, one-to-one meetings where the functionality of the CRM prototype was refined. Altogether three customization cycles were executed. The prototype was customized in terms of the number and attributes of various data fields, form lay-out, search and scrolling grids, and most importantly the sales process workflow logic. The purpose of the construction of the workflows was "to demonstrate, whether the CRM processes could in fact be automated and in this way improve their efficiency" (Hevner 2004). The prototype resembled "a programmed façade" (Winograd 1995), but it was a fully functional customized version of the Microsoft CRM product, which could be further cycled through iterative phases until full functionality for production use would be achieved.

Evaluation of the Piloting
As a result of the piloting, the expectation that the main importance of the new CRM system would be in forming a centralized customer repository, turned out to be wrong. During the piloting process, the project group members realized that the major achievement was the identification and description of sales and service processes. This had never before been accomplished by any of the business units. It became evident that what CRM could bring to F-Bank, was IT-assisted support for these processes. As a result of piloting, awareness grew of what a more systematic way of conducting sales work along the newly described sales processes would actually mean to the users: their work practices would need to change; more information of sales tasks and activities would be documented in the CRM database and this would shift power of managing customer relationships from salespeople to the company itself.

Piloting acted for the IT department as a tool for organizational policy-making: piloting increased business unit commitment to the CRM implementation and ensured that future implementation would not be driven by IT alone. The CRM prototype highlighted the importance of accurately defining the owner of each customer relationship. Customer ownership was the basis for incentive allocations. The prototype made clearer to everyone how its utilization would increase the transparency of customer and pipeline information across users and business units.

DISCUSSION AND CONCLUSIONS
We have learned that the final outcome of a piloting project may be very different from the initial expectations. As a result of our exploration, several new findings emerged: the role of piloting in organizational policy-making or as a factor in power shift from users to the company itself; the effect of CRM implementation to salespeople's work practices; the role of piloting as a change agent. The prototype brought forward many aspects of potential risks of failure in a future CRM implementation including the potential effect on the incentive policies. Afterwards the board of directors at F-Bank decided to proceed to the final CRM implementation in the fall of 2005. Implementation start-up was, however, later postponed due to an actualized risk of failure: the F-Bank's piloting project manager had suddenly left the company.

Referring to previous research results on CRM success and risk factors our findings indicate that piloting may increase top management support to CRM through increasing overall understanding of "what CRM is all about" (Croteau and Li 2003). We found support to the notion by Rigby et al. (2002) that a company should first change the organization

to become customer-oriented before rolling out a CRM solution. However, some new results came to light showing that piloting may potentially fuel political controversies between organizational entities: increasing transparency may reveal how effectively salespeople do their sales work; their results may be compared with those of others; and the power of an individual salesperson may decrease through the loosing of the ownership of customer relationships. Users' resistance to CRM may therefore increase as a result of piloting.

For practitioners our research results indicate that a piloting approach is recommendable, if the company does not yet have a unified view of what CRM might bring about, especially on work practices and on better management of customer processes. For management piloting may act as a change agent and give an organization a direction where CRM developments should be focused on, but a program to support and continuously motivate users to change the way they work, is still needed.

Our design science approach focused on the construction of an artifact – the CRM prototype – and its use setting. In our case a programmed façade level of a prototype was enough to clarify the process oriented functionality of a CRM application and to show how the application of workflow functionality might affect present work practices. For future research it would be feasible to investigate what level of a prototype is capable of bringing the research cycle to a saturated level. If we had not participated in the piloting project ourselves, important observations on organizational change events might not have been revealed. Therefore we suggest that design theoretical research should extensively utilize action research approach.

REFERENCES
Abbott, J.; Stone, M.; and Buttle, F., *Customer relationship management in practice – a qualitative study*, Journal of Database Marketing, 9, 1, (September 2001), 24-34.

Almquist, E.; Heaton, C. and Hall, N., *Making CRM Make Money,* Marketing Management, 11, 3, (May/June 2002), 16-21.

Bhatia, A., A roadmap to implementation of customer relationship management (CRM). (available at http://crm.ittoolbox.com/peer/docs/crm_abbhatia.htm, referenced on 08/20/2005).

Bose, R., *Customer relationship management: key components for IT success*, Industrial Management and Data Systems, 102, 2, (2002), 89-97.

Chen, I. J. and Popovich, K., *Understanding Customer Relationship Management – People, Process and Technology*; Business Process Management Journal, 9, 5, (2003), 672-688.

Chen, J-S. and Ching, R., *An Empirical Study of the Relationship of IT Intensity and Organizational Absorptive Capacity on CRM Performance*, Journal of Global Information Management, 12, 1, (January-March 2004), 1-7.

Colgate, M.R. and Danaher, P.J., *Implementing a customer relationship strategy: The asymmetric impact of poor versus excellent execution*, Journal of the Academy of Marketing Science, 28, 3, (2000), 375-387.

Corner, I. and Hinton, M., *Customer relationship management systems: Implementation risks and relationship dynamics*, Qualitative Market Research: An International Journal, 5, 4, (2002), 239-251.

Croteau, A-M. and Li, P., *Critical Success Factors of CRM Technological Initiatives,* Canadian Journal of Administrative Sciences, 20, 1, (March 2003), 21-34.

Eisenhardt, K.M., *Building theories from case study research,* Academy of Management Review, 14, 4, (1989), 532-550.

Fjermestad, J. and Romano, N.C. Jr., *Electronic customer relationship management. Revisiting the general principles of usability and resistance - an integrative implementation framework*, Business Process Management Journal, 9, 5, (2003), 572-591.

Goodhue, D.L.; Wixom, B.H.; and Watson, H.J., *Realizing business benefits through CRM: hitting the right target in the right way,* MIS Quarterly Executive, 1, 2, (June 2002), 79-96.

Gregor, S., *Design Theory in Information Systems*, Australian Journal of Information Systems, Special Issue, 14-22, (2002).

Grönroos, C., *From marketing mix to relationship marketing: Towards a paradigm shift in marketing*, Management Decision, 32, 2, (1994).

Hevner, A., March, S., Park, J. and Ram, S., *Design Science in Information Systems Research*, MIS Quarterly, 28, 1, (2004), 75-105.

Järvinen, P., *Action research as an approach in design science*, http://www.cs.uta.fi/reports/dsarja/D-2005-2.pdf, (referenced on 08/20/2005),

University of Tampere, Department of Computer Sciences, Series of publications D-2005-2, May 2005.

Krcmar, H. and Böhmann, T., http://www.winfobase.de/lehrstuhl/publikat.nsf/intern01/B4F8E2B48BEE0999C125703E003CD1AF/$FILE/04-30.pdf, (referenced on 08/15/2005).

Lyytinen, K., Mathiassen, L. and Ropponen, J., *Attention shaping and software risk – A categorical analysis of four classical risk management approaches,* Information Systems Research, 9, 3, (1998), 233-255.

Markus, M. L., *Technochange management: using IT to drive organizational change*, Journal of Information Technology, 19, 1, (2004), 4-17.

Plakoyiannaki E. and Tzokas N., *Customer relationship management: A capabilities portfolio perspective*, The Journal of Database Marketing, 9, 3, (March 2002), 228-237.

Rigby, D.K.; Reichheld, F.F.; and Schefter P., *Avoid the four perils of CRM*, Harvard Business Review, (February 2002).

Schwabe, G. and Krcmar, H., *Piloting a Sociotechnical Innovation*, Proceedings of the 8th European Conference on Information Systems ECIS,* 2000.

Starkey M.; Woodcock N., *CRM systems: Necessary, but not sufficient. REAP the benefits of customer management*, The Journal of Database Marketing, 9, 3, (March 2002), 267-275.

Vaishnavi, V. and Kuechler, W., Design Research in Information Systems (portal), http://www.isworld.org/Researchdesign/drisISworld.htm, (referenced on 08/15/2005).

Wikström, C-E., *A Case Study of Emergent and Intentional Organizational Change: Some Implications for Customer Relationship Management Success,* January 2004, in Proceedings of the 37th Annual Hawaii International Conference on System Sciences (HICSS'04) - Track 7 - Volume 7.

Winograd, T., *From programming environments to environments for designing*, Communications of the ACM, 38, 6, (1995), 65-74.

Yu, L., *Successful Customer-Relationship Management,* MIT Sloan Management Review, 42, 4, (Summer 2001), 18-19.

Related Content

Change Management: The Need for a Systems Approach
Harry Kogetsidis (2013). *International Journal of Information Technologies and Systems Approach (pp. 1-12).*
www.irma-international.org/article/change-management/78903

Fuzzy Decision Support System for Coronary Artery Disease Diagnosis Based on Rough Set Theory
Noor Akhmad Setiawan (2014). *International Journal of Rough Sets and Data Analysis (pp. 65-80).*
www.irma-international.org/article/fuzzy-decision-support-system-for-coronary-artery-disease-diagnosis-based-on-rough-set-theory/111313

Approaches for Semantic Association Mining and Hidden Entities Extraction in Knowledge Base
Thabet Slimani, Boutheina Ben Yaghlaneand Khaled Mellouli (2010). *Ontology Theory, Management and Design: Advanced Tools and Models (pp. 119-141).*
www.irma-international.org/chapter/approaches-semantic-association-mining-hidden/42887

An Efficient Image Retrieval Based on Fusion of Fast Features and Query Image Classification
Vibhav Prakash Singh, Subodh Srivastavaand Rajeev Srivastava (2017). *International Journal of Rough Sets and Data Analysis (pp. 19-37).*
www.irma-international.org/article/an-efficient-image-retrieval-based-on-fusion-of-fast-features-and-query-image-classification/169172

Future Smart Products Systems Engineering
Julia Kantorovitch (2015). *Encyclopedia of Information Science and Technology, Third Edition (pp. 3806-3817).*
www.irma-international.org/chapter/future-smart-products-systems-engineering/112820