Determinant elements of customer relationship management in e-business

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This study investigates the composition of customer relationship management (CRM) in e-business by examining the possible elements that determine different aspects of the relationship between customers and e-businesses. A web-based CRM survey of 38 items, constructed from SERVQUAL (service quality instrument), SITEQUAL (website service quality instrument) and literature findings, was completed by 200 customer contact professionals. Results of a factor analysis indicated three main customer relationship attributes of e-business, which are: general CRM (accounting for 51% of the total variance); personalization (accounting for 9% of the total variance); and privacy (accounting for 7% of the total variance). Results of a stepwise regression indicated that these customer relationship attributes significantly predict customer attitude (83% of the explained variance). Within the general CRM dimension, website content organization correlated highly with customer attitude (65% of the explained variance). The results of the study indicate that customers perceive three main dimensions of relationship attributes of e-business (general CRM, personalization and privacy) and that all three significantly contribute to customer attitude. These findings support the importance of including relational-type e-business attributes when investigating interactions between customers and e-business. The study concludes with related implications and design guidelines to enhancing customer perception of e-business.

1. Determinants of customer relationship management in e-business

The importance of understanding the crucial elements of customer relationship management (CRM) becomes increasingly clear when one considers there is no person to person opportunity to form relationships in an e-business. E-business must therefore depend on elements of the customer website interaction to deliver a satisfying relationship. There has been little work on determining and defining exactly what CRM is in the regular business channels (although there has been a lot of talk and guessing) and even less in the e-business channel. Given the possible hundreds of factors that could define CRM on a website, no research indicates which ones are important. So while the goals of CRM are clear, the elements and means to those goals are not. The purpose of this study is to identify the main CRM attributes of e-business. Just what is important for e-CRM that will lead to customer acquisition, retention, and profitability? An examination of CRM literature and previous research on customer – business interactions and relationships provides the rationale and foundation for this study.

1.1 Definition of customer relationship management process in 'e'

The goals of CRM are actually clear. Most definitions of CRM talk about the acquisition, the retention and the
profitability of customers (Menconi 2000, Nykamp 2001, Swift 2001). While these goals are clear the paths to them are not. It might be hypothesized that one does not acquire, retain, or reach profitability until customers reach some level of satisfaction with the product or service (Reichheld 1996, Bruhn and Grund 2000, Gronholdt et al. 2000), perceive an expected level of quality (Cronin and Taylor 1992, Boulding et al. 1993, Zeithaml et al. 1996) or trust the company/business (Bendapudi and Berry 1997, Lynch et al. 2000).

In turn customer satisfaction, perceived quality and trust have been defined a bit more clearly. Studies show that customer satisfaction is related to the business’s level of involvement and responsiveness (Goodman et al. 1995), customer dialog (Bruhn and Grund 2000), and the business’s initiating, signalling and disclosing behaviours and frequency of interaction (Leuthesser and Kohli 1995). Perceived quality is shown to be related to the service provider participation level (Ennew and Binks 1999) as well as the business tangibles (physical facilities and appearance), reliability (providing dependable and accurate service), responsiveness (providing prompt and helpful service), assurance (knowledge and courtesy of employees) and empathy (caring, individualized attention) (Parasuraman et al. 1988, 1991). One study suggests that customer trust is associated with a business’s operational competence, benevolence and problem-solving orientation (Sirdeshmukh et al. 2002).

A number of website factors have emerged as leading to perceptions and feelings of satisfaction, perceived quality and trust. Szymanski and Hise (2000) find that website convenience, site design and financial security are dominant factors in consumer assessments of e-satisfaction. Another study by Yoo and Donthu (2001) found that ease of use, aesthetic design, processing speed and security are measurement dimensions of perceived quality of an Internet shopping site. Chen and Wells (1999) reveal that entertainment, informativeness and organization of an e-business website are three major measurement dimensions of attitude towards an e-business website. Lee et al. (1999) show that comprehensive information and communication on a website is related to customer trust. As seen in these studies, customer attitudes and feelings are associated with their perceptions of an e-business website.

1.2 Customer relationship attributes of e-business

Customer relationship attributes of e-business are e-business features that contribute to and build relationships with the customer. The study by Parasuraman, Zeithaml et al. (1988, 1991) on SERVQUAL, a measurement instrument for perceived service quality, suggests that customer relationship factors fall into five main groups: tangibles, reliability, responsiveness, assurance and empathy. Yoo and Donthu (2001) built on their structure to create SITEQUAL, which adds security, speed, aesthetic design and ease of use as measures of e-business website quality.

The consistency of findings of these studies make us comfortable in proposing that the six main customer relationship attributes of an e-business include tangibles, reliability, responsiveness, empathy, security and usability. Tangibles is the overall appearance and structure of the e-business websites appearance. Reliability is the e-business’s performance of promised services, adequacy and dependability. Responsiveness is the e-business’s willingness to help, ability to provide prompt service and the website response. Empathy is the e-business’s provision of caring and individualized attention. Security is the e-business’s protection of personal and financial information. Finally, usability is the provision of an ease to use and understand e-business websites. These six main customer relationship attributes of an e-business incorporate major factors that impact the customer attitudes, which in turn contribute to CRM goals. The following customer model describes how all of these aspects of CRM work together.

1.3 Model of e-CRM

The e-business CRM connection occurs at the interaction of website and customer experience. These relationship attributes in turn influence the three main customer attitudes: customer satisfaction, trust and perceived quality. Figure 1 shows how the customer e-business interaction leads to customer relationship attributes, which in turn influences customer attitudes. These attitudes then lead to the CRM goals, which lead back to the customer e-business interaction.

To better estimate the effectiveness of CRM initiatives in e-business, the interactions between the customer and the e-business must first be examined. Only after understanding the fundamentals of customer e-business interactions can e-business develop strategies and structures to better implement CRM. Thus, this study focuses primarily on the customer e-business interaction and customer attitudes as a primary step towards enhancing CRM in e-business. This investigation centres on the customer relationship attributes of e-business and the associated customer attitudes. The overall purpose of this study is to better understand what customers expect in a relationship with the e-business and how those expectations impact customer attitude. The first objective is to examine what the customer views as major relationship attributes of e-business. The second objective is to investigate the major customer attitudes associated with CRM. The last objective is to look at the link between the CRM relationship attributes and the customer attitudes. The overall purpose of this study is to better understand what customers expect in a relationship with the e-business and how those expectations impact customer attitudes.
customer attitude. In order to achieve these objectives, an Internet-based survey of customer relationship professionals was conducted.

2. Method

2.1 Instrument

The CRM in the e-business survey is derived primarily from the structure of SERVQUAL, constructed, refined and validated by Parasuraman et al. (1988, 1991, 1994). This instrument measures customer perceptions and expectations of service quality. SERVQUAL is widely used in retail studies (Wakefield and Blodgett 1999) and has been applied in several other settings including healthcare (Lumby and England 2000) and student services (Engelland et al. 2000).

SERVQUAL lays the foundation for the relationship attributes part (a copy of the survey used in this study is available from the authors) of the survey used in this study. Customer expectation items from four of the SERQUAL dimensions: tangibles, reliability, responsiveness and empathy are included in this instrument. Due to the structure of electronic business, most customer interaction with the business is through the e-business website versus direct employee interaction in a physical store. Thus, several of the original SERVQUAL items that address the employees and physical environment were modified to focus on the e-business website. The empathy dimension definition was expanded to include personalization, which is the concept used by web guru types as they consider the emotional connection between customer and web business (Peppers et al. 1999).

In addition to SERVQUAL, SITEQUAL was another tool used to develop the survey in this study. Yoo and Donthu (2001) developed a psychometrically rigorous instrument, SITEQUAL, to measure the perceived quality of an Internet shopping site. SITEQUAL consists of four dimensions: aesthetic design, processing speed, security and ease of use. Two of the dimensions from this instrument overlap with two of the SERVQUAL dimensions. Aesthetic design is part of the website’s appearance, which is included in the tangibles dimension of SERVQUAL. SITEQUAL defines processing speed as the promptness of online processing and interactive responsiveness to a consumer’s request, which is included in the responsiveness dimension of SERVQUAL. The other two dimensions of SITEQUAL, security and ease of use, create the final two dimensions of the CRM survey. The SITEQUAL items that measure these two dimensions were modified and expanded to incorporate related CRM issues such as privacy. Several opposite paired questions were added in this part and the next to assist in determining the internal consistency of the instrument.

The second part of the survey focuses on customer attitudes related to e-business and CRM. These customer attitude items are based on previous Internet shopping studies related to customer satisfaction (Szymanski and Hise 2000), trust (Lynch et al. 2001) and perceived quality (Yoo and Donthu 2001). These items are also based on retail and service research on customer satisfaction (Giese and Cote 2000), trust (Garbarino and Johnson 1999) and perceived quality (Parasuraman et al. 1988, 1991).

In summary, the 26 items of the relationship attributes of e-business are based on the following three sources:

- The content of questions 1 to 16 were originally presented in SERVQUAL for evaluation of retailing in the traditional physical environment. These questions were modified in this study to be applicable to the e-business setting.
- The content of questions 19, 23, 34 and 25 were originally developed in SITEQUAL to evaluate the quality of e-business websites. In this study, the questions were expanded to incorporate relationship aspects in e-business.
- Questions 17, 18, 20, 21, 22 and 26 were deployed for this study based on the content derived from studies presented in the literature review.

The 11 customer attitude questions were developed, based on the available literature on customer attitudes in internet shopping and retailing. All responses to the survey were scored on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Some of the items are
worded negatively, which is in accordance to scale development recommendations to reduce bias (DeVellis 1991, Spector 1992).

2.2 Sample

A web-based survey was e-mailed to a database of people who are part of the mailing list of the Center for Customer Driven Quality at Purdue University. The centre focuses on customer contact and relationship issues, and the database consists of 2036 consumer contact professionals. Despite several conflicting views on the reliability of electronic surveys, recent studies indicate that electronic surveys as compared to paper-based studies demonstrate reliable and comparable results (Laughlin 2001) and quicker response rate (Yun and Trumbo 2000). Initially, 215 subjects responded, which were balanced in gender and age distribution. Males accounted for 51% of the subjects, and 88% were between 26 and 55 years of age. All of the subjects have web experience. The majority (88%) of the subjects purchased an item on the web in the last six months as well as intended to purchase an item on the web in the next six months.

2.3 Procedure

Emails were sent to the mailing list of the Center for Customer Driven Quality. The email referred potential respondents to a website for the survey. Of the 215 completed surveys, six surveys were disregarded because of missing responses, and nine subjects were eliminated due to contradictory responses. Thus, the study used data from the remaining 200 subjects (93% of the original sample).

3. Results

The survey had acceptable overall internal consistency (Cronbach’s alpha value of 0.79), as well as acceptable internal consistency of the customer relationship attribute section (Cronbach’s alpha value of 0.75) and the customer attitude section (Cronbach’s alpha value of 0.85). Two exploratory factor analyses were conducted, one on e-business relationship attribute items and one on customer attitude items. The factor analyses were performed to highlight the major aspects of customer relationship attributes of e-business and customer attitudes in CRM. Stepwise regression was performed to examine how well the relationship attributes predicted customer attitude.

3.1 Factor analysis of customer relationship attributes of e-business

In order to determine the structure of consumer perceived attributes of relationships with e-business, a factor analysis of relationship items was completed. Only four factors had eigenvalues equal to or greater than 1.00, which means that each factor contains the equivalent of at least one original item. The percent variance accounted for by factor one was 47.31%, factor two was 7.04% and factor three was 4.74%. Factor four and higher each explain less than 4.00% of the variance. Therefore, three factors (totalling to 59.09% of the variance) were selected with as the appropriate number of relationship attribute dimensions.

Both orthogonal and oblique rotation methods produced equivalent factor loading patterns. Items with loadings (correlation between each item and each factor) lower than 0.60 were considered not significant and eliminated. Table 1 lists the items that have a loading of 0.60 or higher. The eigenvalues and percent variance listed at the bottom of the table were calculated after removing the insignificant factor loadings. The total percent variance explained by the three factors was 66.46%.

As seen in table 1, factor 1 contains a large range of items. These items pertain to the overall e-business website structure and e-business operation. Thus, this relationship attribute factor is classified as General CRM. In factor 2, the loading items address customer preference and individuality. This factor is therefore labelled Personalization. The third factor contained items that related to customer data and communication and was labelled as Privacy and defined as clear and controlled communication between the e-business and the customer.

3.2 Factor analysis of customer attitudes

The three main customer attitudes related to CRM were believed to be customer satisfaction, perceived quality and trust. A factor analysis with varimax rotation yielded only one factor with an eigenvalue equal to or greater than 1.00, therefore only one factor was selected for the customer attitude items. The percent variance accounted for by factor 1 was 58.79%. Following the elimination of unrelated factors (see table 2) the total percent variance explained by the factor is 61.11%.

4. What is e-CRM?

The factor analyses yielded the structure of the consumer and website antecedents of e-CRM. Using stepwise regression, this structure was further investigated by examining the regression model between the customer attitude and the three customer relationship attributes. The Customer Attitude Index (the average of the customer attitude items) was the dependent variable. This dependent variable was regressed with the averages of each relationship attribute to see how well each relationship attribute predicts overall customer attitude. This regression model (see table 3) shows that General CRM has a high partial r
square value (0.81), which indicates this factor strongly predicts the variation of customer attitude. The other two customer relationship attributes, Personalization and Privacy, have low r square values (both 0.01), however both factors are significant in the model (p < 0.01).

Another stepwise regression (see table 4) of customer attitude with each of the items shows: 65% of the customer attitude variance is attributed to the organization of e-business website content (Item 3); 11% of the variance is attributed to timely provision of e-business service (Item 7); and 5% percent is attributed to the ease of customer understanding on how to make e-business purchases (Item 26). In summary, the stepwise regression models support the link between customer relationship attributes and customer attitude in e-business.

5. Discussion

5.1 Overview

The purpose of this study was to examine what is important to the customer regarding CRM in e-business. The initial CRM customer process model proposed that relationship attributes of e-business impact customer attitudes. Previous
research indicates that customer attitudes in turn lead to customer acquisition, retention and profitability. A questionnaire (developed from suggestions in the literature and modifications of SERVQUAL and SITEQUAL) was used to collect data from current and potential e-business customers to further examine the proposed relationship attributes of e-business and customer attitudes in CRM.

The factor analyses of the customer relationship attributes and of the customer attitudes resulted in three main dimensions of relationship attributes and one dimension of customer attitude. These customer relationship attributes of e-business included General CRM, Personalization and Privacy. All three customer relationship attributes were found to significantly contribute to customer attitude. Specific items within the customer relationship attributes significantly correlate with customer attitudes. The following sections examine the theoretical and practical implications of the research findings for customer relationship management in e-business.

5.2 Implications

This study contributes to both theoretical and practical developments of customer relationship management in e-business. The identification of major CRM dimensions in e-business provides a solid structure to guide further CRM research. By understanding that customers view general CRM, personalization and privacy as three main components of CRM in e-business, researchers as well as managers are better able to develop CRM in e-business. This study indicates that customers perceive that e-business and e-business websites have relational type characteristics. The connection between these relationship attributes of e-business and customer attitude that was shown in this study implies the importance of including relational type characteristics in customer-e-business interaction research. This study provides a foundation to develop specific guidelines and rules for CRM in e-business.

Another major contribution of this research is that it defines broad areas on which management of e-businesses need to focus to create the perception and reality of good CRM. Insight to what the customer expects from an interaction with an e-business assists management to better facilitate customer relationships. By developing features to meet and exceed customer expectations, the e-business enhances both customer satisfaction and customer relationships. This research clearly recognizes three practical areas as important areas the customer expects while interacting with an e-business. These three areas include a general perception or reality of CRM, a personalization area and a privacy area. All three of these areas were shown to be statistically significant in predicting customer attitude and should be considered as part of CRM in e-business.

However, General CRM had a much larger impact (explained 81% of the variance) on customer attitude, compared to personalization (explained 1% of the variance) and privacy (explained 1% of the variance). This dominance implies that companies should first focus on developing customers’ perception of General CRM, then personalization and privacy aspects in e-business. If two companies have developed equal levels services related to General CRM, then customers may choose to purchase from the company with the additional personalization or privacy features. Because the personalization and privacy have similar impact on customer attitude, an e-business may consider the cost of each to determine which one or both to

| Table 3. Prediction of customer attitude from general CRM, personalization, and privacy averages with forward stepwise regression method. |
|---------------------------------|----------|----------|--------|----------|
| Independent Variable | Partial R-Square | Model R-Square | F Value | Pr > F |
| General CRM | .81 | .81 | 798.57 | < .0001 |
| Personalization | .01 | .82 | 8.70 | .0036 |
| Privacy | .01 | .83 | 9.05 | .0030 |

| Table 4. Prediction of customer attitude with all items in customer relationship attributes of e-business. |
|---------------------------------|----------|----------|--------|----------|
| Item* | Partial R-Square | Model R-Square | F Value | Pr > F |
| 3 | .65 | .65 | 358.27 | < .0001 |
| 7 | .11 | .76 | 85.87 | < .0001 |
| 26 | .05 | .81 | 44.73 | < .0001 |
| 8 | .01 | .82 | 10.04 | 0.0018 |
| 22 | .01 | .83 | 9.50 | 0.0024 |
| 12 | .01 | .84 | 10.82 | 0.0012 |

* These items are listed in Table 1.
implement. The following sections provide implications and features for each of the three relationship attributes of e-business.

5.3 General CRM

The research shows that a General CRM is a combination of items that consumers place together in a perceptual group. These items include the organization of e-business website content, timely provision of e-business services, ease of understanding on how to make purchases, dependability of the e-business website and helpful customer assistance. When comparing these items to customer attitude, the organization of e-business website content strongly predicts customer attitude. This result suggests that the content structure of an e-business website strongly impacts the customer-e-business relationship. Based on these results, it is reasonable to suggest that e-businesses should follow established guidelines on website organization in order to enhance customer relationships. General guidelines for the organization of information on interfaces based on expert opinions, experience and previous research include: use appropriate techniques of grouping information; be consistent in the placement of displayed information; place frequently appearing messages in the same region on the screen; include explicit information on how to move from one screen to another or how to select a different screen; and place important messages in the central view of the user (Bailey 1996).

The perception of general CRM builds a foundation for the relationship between the customer and e-business. This foundation must be established before successful communication and services can be provided to the customer. Reliable and consistent website structure and organization builds opportunities for customers to reliably interact with the e-business. Only then can value-added components through additional services and features be effective. To enhance the overall relationship between the customer and e-business, a stable environment for interactions to occur must be established.

5.4 Personalization

Once the general structure and organization of the e-business website is formed, then additional relationship features, such as personalization, can add value to the customer’s experience with the e-business. Personalization is the degree to which an e-business can tailor its offerings to the individual customer on the website. As a practical example, Amazon.com provides a sign in procedure, whereby a set of personalized offerings based on purchase history are provided to the visitor. Dell provides a personalized access point for their customers, which recognizes the specific machine the customer may have purchased or the specific company that the customer is purchasing for. Personalization is seen as a way to increase customer loyalty (Carroll and Broadhead 2001). The thinking is that the greater the degree of personalization the greater the customer acquisition, customer purchase and customer loyalty. This research suggests that personalization has an even greater effect by adding to customer perceptions of the e-business’s customer relationship management ability.

Personalization has received a fair amount of attention beginning with the publication of the series of One to One marketing books by Peppers and Rogers including:

- One to One B2B: Customer development strategies for the business-to-business world (Peppers and Rogers 2001)
- The One to One Manager: Real world lessons in customer relationship management (Peppers and Rogers 1999)
- Enterprise One to One: Tools for competing in the interactive age (Peppers et al. 2000)
- The One to One Future: Building relationships one customer at a time (Peppers and Rogers 1993).

The importance and promotion of personalization for e-business is also seen by the creation of an advocacy group called the Personalization Consortium (www.personalization.org) formed to help businesses understand the issue and the available technology. The results of this study show personalization to be important in customer relationship management. The Peppers and Rogers book series and the in-depth information available at their website (www.1to1.com) indicate that for 10 businesses there are 20 different ways to operationalize personalization. Unfortunately, a simple prescription for implementing a program of personalization is not feasible.

So while this research shows that personalization is important it does not show what personalization actually means. The body of work by Peppers and Rogers shows that there are probably hundreds (maybe thousands) of possible implementations that define personalization. The One to One books and website information indicate that these implementations are available for all business people to see and use. A further interesting observation is that although much academic type research indicates the importance of personalization, there is little or no academic research that has actually defined personalization.

5.5 Privacy

In addition to personalization, privacy is another value-added feature that an e-business can utilize to enhance customer relationships. Without privacy, customers may not trust or feel secure while interacting with e-business.
This trust or lack of, may in turn impact the customer’s overall relationship with the e-business. The present research points to privacy as being a central feature of the consumer definition of CRM. Basically the consumer expects the e-business to protect data and communication that is exchanged while interacting on the website or email.

There are more standard prescriptions for applications of privacy in CRM than there are for personalization. Garfinkel et al. (2002) outline the latest issues related to privacy on the web. While the technology related to the guarantee and the braking of privacy of a web business is constantly changing, the need for it is clear. Garfinkel et al’s book focuses on technology for the business end as well as how consumers can self-safeguard information and web interactions. Amazon.com lists over 15 books related to privacy issues for e-business, which reflects both the importance of privacy and the increasing amount of information available for consumers and businesses regarding privacy.

This CRM study suggests that incorporation of privacy issues in e-business is good practice not only to alleviate consumer concerns about privacy but also to meet customer expectations of e-businesses to provide quality customer relationships. Based on the finding that privacy is a significant CRM concern, we suggest that e-businesses should clearly indicate privacy policy on the website. PrivacyBot (www.privacybot.com) helps e-businesses implement and certify privacy practices. For a fee, PrivacyBot authorizes use of their ‘official’ trust mark seal, which they claim assures consumers that the business has an approved privacy policy. PriceWaterhouseCoopers (www.pwcglobal.com) also provides privacy services called ‘BetterWeb’. Based on developed standards, e-businesses can apply to this service for certification and the ability to publish that certification on the e-business website. Trust.com is another widely used auditing organization for privacy issues.

In summary these three main consumer expectations of e-business assist companies to better provide quality interactions with customers by focusing on key aspects of website and email communication. This study shows that this process of developing customer e-business interactions should begin with enhancement of general CRM, personalization and privacy aspects.

5.6 Future research

This study lays a foundation for further research of CRM. Because of the limited sample size in this study and the complexity of CRM, analysis of broader consumer-based samples is necessary to further validate these results. Although the subjects in this study were considered to be customer-service experts (who would not only represent their personal attitudes towards e-business, but that of their customers), a broader sample of e-business consumers (both customer-service professionals and consumers) would provide a more representative estimation of customer attitude.

Once a more validated model of CRM in e-business is established, the next step is to define and understand each component of the model. The three customer relationship attributes describe general characteristics of e-business that influence customer attitude. A better understanding of what contributes to or creates each of these attributes can be gained with additional customer survey analysis or experimental evaluations. For example, various combinations of website features and tools create these customer relationship attributes. By setting up e-business websites with different combinations of features, customer identification and preference for these features can be measured.

Further investigation of what combinations of website tools and features contribute to these three attributes would also enhance the understanding and application of CRM.

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