



Electronic Commerce Customer Relationship Management: A Research Agenda

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Abstract. In this paper, we approach electronic commerce Customer Relationship Management (e-CRM) from the perspective of five research areas. Our purpose is to define a conceptual framework to examine the relationships among and between these five research areas within e-CRM and to propose how they might be integrated to further research this area. We begin with a discussion of each of the research areas through brief reviews of relevant literature for each and a discussion of the theoretical and strategic implications associated with some CRM technologies and research areas. Next we present our framework, which focuses on e-CRM from the five research perspectives. We then present a theoretical framework for e-CRM in terms of the five research areas and how they affect one another, as well as e-CRM processes and both performance and non-performance outcomes.

Keywords: electronic Commerce Customer Relationship Management (e-CRM), research agenda, markets, business models, knowledge management, technology, human factors

Introduction

Electronic Commerce (EC), coined by Kalakota and Whinston [1], continues to be a significant, pervasive issue for both enterprises and customers. Furthermore, they articulated EC as being comprised of three relationship types: those between enterprises and customers; those between and among enterprises; and those internal to enterprises. In this paper we focus on relationships between enterprises and customers. However, it should be noted that a significant amount of research in traditional *Market Channels* has been done and is underway (see [2–9] for examples).

Fundamentally e-CRM concerns attracting and keeping *economically valuable* customers and repelling and eliminating *economically invaluable* ones. Keen [10] asserts we are on the threshold of a shift from a transaction-based economy to a *relationship-based economy*. The increasing importance of fostering and managing customer relationships in EC is the motivation for this paper.

Based on our two previous studies [11,12], we suggest that there are five major non-mutually-exclusive e-CRM research areas: e-CRM markets; e-CRM business models;

Table 1
Research areas by medium [12].

Research area medium	Markets	Business models	Knowledge management	Technology	Human factors
Conference	112	118	68	180	171
Journal	78	75	35	121	99
Total	190	193	103	301	270

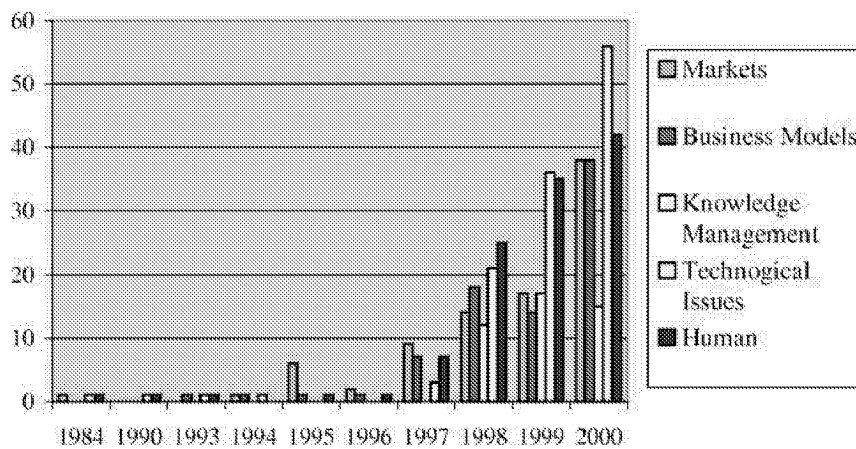


Figure 1. Journal research areas by year [12].

e-CRM knowledge management; e-CRM technology and e-CRM human factors. Each major area is composed of minor ones, due to the complexity and richness of e-CRM issues researchers are currently studying and that we assert need to study in the future. In our assessment of e-CRM research [12] we classified 369 e-CRM articles in terms of each of the five research areas that applied. The results shown in table 1 reveal two important characteristics of this large body of e-CRM literature.

First, table 1 illustrates that each of these five research areas is discussed within a large percentage of the papers in the body of e-CRM literature. This lends support to our assertion that these are important areas to the e-CRM research community at large. Second, table 1 illustrates the relative popularities of the five research areas and thus reveals potential gaps where additional research may be warranted. The most popular area was technology, with 301 of the 369 (82%) papers. The second most popular topic was human factors, with 270 of the 369 (73%) papers. Next in popularity were the topics or business models (193, 52%) and markets (190, 51%). The least popular topic was knowledge management (103, 28%) [12]. Clearly knowledge management is an area that warrants further e-CRM research.

In our research assessment [12] we also coded the papers by year and medium to look for trends in the five research areas. Figure 1 illustrates that the numbers of journal publications in each of the five research areas has been steadily increasing, again

lending support to the idea that these are important and emerging areas for the e-CRM IS research community. Figure 1 also reveals that the areas of technology and human factors have increased dramatically, while the other three are increasing at slower rates. Again this suggests where there might be gaps in the research and opportunities for additional research. Further, the dramatic rise in papers addressing technology along with concomitant rises in the other areas underscores the need for e-CRM IS research. The trends were very similar for conference publications as well over the same time period [12].

The remainder of this paper is structured as follows. Next we discuss and explain each of the five e-CRM research areas through a brief literature review and discussion of some CRM technologies in key areas and their theoretical and strategic implications. Then we present our overall conceptual framework and our theoretical framework of e-CRM influences. We then present some potential research questions in each area. We then discuss e-CRM research evaluations and assessments from the perspective of mixed-methods. Finally, we offer some concluding remarks about e-CRM research.

1. Research area 1: e-CRM markets

At its heart EC involves markets, which Williamson [13] explains serve as mechanisms to *allocate resources among participants*. Forbes and Rothschild [14] assert that the Internet is not merely a media form and a communication method, but is itself a *market-place instrument*. Currently market resources are allocated via transactions. Traditional transactions may be thought of in three phases: information phase, agreement phase, and settlement phase [15]. Selz and Schubert [15] offer a continuous transaction phase model that uses communication to connect multiple transactions across time, thus establishing relationships *among customers* and *between customers and business enterprises*. All three EC transaction phases involve e-CRM issues that have yet to be thoroughly explored. The communication phase, which links transactions across time, offers a rich area for collaborative e-CRM research. EC markets that use the Internet or other platforms to allocate resources among participants provide one component of the overall framework. For example, Allstate Insurance Company [16] recently announced an integrated e-CRM system that combines marketing-campaign management, sales-lead management, and call-center applications. Each application has been implemented and is currently running. The goal is to integrate them to enable leads generated by one channel (i.e., the company's web site or call center) to be swiftly routed to the marketing system or to a specific sales representative for action.

The basic research issues for markets involve how best to integrate e-CRM systems so they interact both effectively and efficiently. In addition, there may be cultural challenges and or work flow issues that need to be studied. e-CRM must begin to draw on theory and strategies from other disciplines such as marketing and economics [17] in order to deal with the rising demands of customers in their expectations for quality,

service, privacy, and communication with businesses [133] as well as developing its own IS-based theories and strategies.

E-commerce has led to new market structures and IS researchers and practitioners alike must consider these changes from theoretical, strategic, and technological perspectives. Prior to the rise of Internet-based E-commerce CRM was considered an indispensable tool for gaining market share [18–20]. Relationship building and management have become principal modern marketing approaches in both research and practice [18,19] as the paradigm in marketing strategy has shifted from *Marketing Mix* to *Relationship Marketing* (RM) [8]. The RM paradigm encompasses many concepts including strategic alliances, brand loyalty, personal/social relationships, customer partnering in product development, database management, and electronic media to actively interact with consumers [21–27]. RM emphasizes building relationships that lead to customer retention, in juxtaposition to traditional transactional marketing, in which increasing and maintaining market share are the primary aims [8,18,19,28,29].

e-CRM researchers must take theories into account that address exchanges between buyers and seller. For example, Dwyer and Shurr [18,28] distinguish between two types of exchanges: Discrete transactions – typically a one-time purchase lacking relational elements; and Relational exchanges – grounded on dyadic expectations of future transactions. It is the latter that e-CRM must concern itself with most; however another important strategic issue will be to determine which customers want each type of exchange [20], so that resources are not wasted on those that prefer transactions and those that prefer relationships are not lost due to failure to fulfill such wants. Relational exchanges are theorized to follow a linear developmental process with five non-discrete phases:

- (1) awareness,
- (2) exploration (including attraction, communication and bargaining, power and justice, norm development, and expectation development),
- (3) expansion,
- (4) commitment,
- (5) dissolution [30,31].

e-CRM researchers must explore whether the theory behind such a phased approach generalizes to E-commerce environments in general, or whether it applies only for specific products, industries, or other factors.

Another important component of markets for e-CRM researchers to pay attention to in terms of theory and strategy is the shift in power from seller toward consumers [32,33]. This shift in power provides many new benefits for consumers as well as new demands. For example designers of e-CRM systems may now have to “balance” the requirements of vendors and consumers [34], something quite different than IS of the recent past. e-CRM systems may have to include specialized features for consumers

such as consumer decision support systems [35–37], secure and trustworthy transaction mechanisms [38–46], to name a few.

e-CRM systems integration will change the way the work is accomplished and how relationships are established and managed over time. There are a number of ways in which e-CRM systems integration will affect work and relationships. e-CRM systems integration is leading to new distribution and processing capabilities that affect customer attitudes toward industries, and remove geographic and cost barriers to world-wide distribution of goods and services; this results in a convergence of key benefits sought by consumers across the globe [47–51]. This requires organizations to develop new strategies to build and maintain effective and consistent world-wide brand images [51–55]. Integration will also mean that other factors such as logistics and rapid delivery of products, information, and services [56–58], cyber-intermediation [59–65], must be considered from strategic and theoretical perspectives.

As Whiting [16] points out, in the Allstate case, the call centers are focused on efficiency and are judged on call throughput. When the integrated e-CRM system is in place the call center workers will become revenue generators by turning calls into sales leads and cross-selling opportunities. This one example, from among many, clearly illustrates that e-CRM markets present a rich area for future research.

2. Research area 2: e-CRM business models

Peter Keen [10] questions whether the “e” or the “c” in ‘e’lectronic ‘c’ommer^ce should be capitalized for emphasis. Keen [10] stresses the “c” as taking center stage and asserts that what lies behind the technology of DOT COM interfaces, such as order fulfillment, organizational business processes, and incentives, must be exploited by enterprises to remain competitive. Keen asserts that much more is needed beyond the *right* web site to be competitive, but also admits that it is not very clear just what that something else is. Keen [10] suggests that the result has been a shift from using the term *strategy* to talk about how to do business in the digital economy to using the term *business model*. Keen offers six *value imperatives* he asserts are vital for companies to execute:

- (1) *Perfect one’s logistics*: supply chain management; operating resource management; win–win trading partner collaborations and electronic out-tasking.
- (2) *Perfect one’s long-term customer relationships*: repeat business generation; customer self-management; community collaboration; massive cross-selling and life-time relationship-focus.
- (3) *Harmonize one’s channels*: “seamless” links between the Internet, call centers, and physical channels; and strengthening distribution channels, while simultaneously strengthening your own brand.
- (4) *Build a powerful portal/hub brand*: incentives for customers to routinely “park” on sites; aggressive customization and personalization; and revenue generation through hosting and selective use of give-it-away-free.com.

- (5) *Transform capital and cost structures*: move toward negative working capital; slashing general selling and administrative costs; leverage cash flow generation on minimal physical balance sheet “assets”; reduce cost of capital by building a price/vision premium in market evaluation; and use the valuation advantage to buy needed capabilities at low capital dilution
- (6) *Build value-adding intermediation*: provide a hub with reliable information and advice to link buyers with sellers; offer more efficient transaction processing between trading partners; and build win–win relationships along an entire business chain.

These imperatives involve developing a business model that stresses e-CRM, however little is offered as to *how* to meet these challenges. Research into alternative EC business models and the e-CRM components of such models is needed to develop descriptive, prescriptive, and predictive frameworks.

Körner and Zimmermann [66] suggest an e-CRM perspective they call the *Management of Customer Relationship in Business Media* (MCR-BM)-concept. They [66] define the concept as “*The Management of Customer Relationship in Business Media comprises the design, development and application of holistic concepts in order to manage relationships to economically valuable current or future customers*”. The MCR-BM concept [66] considers electronic markets through open platforms, based on Klose’s [67] media concept, as typical business media that provide independent agents with environments in which to create and exchange value as goods and services. They assert that their MCR-BM concept therefore offers a basic framework for the design of business models to meet the challenges posed by the digital economy. The MCR-BM model consists of seven interrelated building blocks listed below with some key associated issues:

- (1) *Customer interaction*: informational content and channels; value-added through non-standard information; pull and push mechanisms; customer communication channel choice.
- (2) *Customer added value*: mass customization and personalization; economic incentives.
- (3) *Customer profiling*: collection and analysis of customer information; value-added exchange for information.
- (4) *Trust: strong branding*; sensitive use of customer profiles; security precautions.
- (5) *Virtual communities*: information exchange about products and interests; market segment profiling.
- (6) *Processing*: cuts across blocks from 1 to 5; internal and external; interface and ease of use.
- (7) *Controlling*: cuts across all other blocks.

Their multidimensional approach focuses on the customer as an *equal member* within a certain business community, rather than being the end-node of a value chain. This

focus on the customer places CRM at the core of EC business models. Their concept is designed to measure e-CRM within EC enterprises, and thus it offers guidance for researchers to explore e-CRM business models along several dimensions.

The business press abounds with articles concerning limited success rates of e-CRM projects [68,69]. These articles suggest that companies fundamentally misunderstand their information; that is what data they have and where it comes from. This is not unlike the classic paper by Ackoff [70], management misinformation systems, wherein Ackoff argues that the problem is not that managers suffer from a deficiency of relevant information, but that they more often suffer from an excess of irrelevant information. Even more important is that Ackoff [70] stresses that managers need to understand information systems in order to be able to evaluate and control them through their managerial competence and expertise.

It goes deeper than this; fundamental business models are being challenged and sometimes obliterated to make way for new ones [10,55,71–73]. One company, student connections [74], altered its business model from providing discount cards to college students to collecting annual fees from its members and charging business partners for advertising their services on its web site or e-mail campaigns. An e-CRM solution now supports the company's effort to better understand how its products are being used and to maximize ROI on marketing opportunities. According to Deck [74], student connections fundamentally re-thought what data they were collecting and storing. For example, telephone numbers were not needed since students frequently change them; neither was Information Service Provider data since students mostly use school computing facilities.

These two proposed *frameworks* for building EC business models both suggest e-CRM as a central theme and offer a number of areas yet to be thoroughly explored through IS research and development. EC business models and the associated processes to provide back-end support behind the customer interface provide a second component of our overall conceptual framework.

3. Research area 3: e-CRM knowledge management

Internet EC enables new data gathering strategies; such as intranets, extranets, customer knowledge discovery algorithms, web-spiders, cookies, online registration and purchasing, and avatar-populated virtual trade shows, to name a few. These strategies generate huge amounts of data, however Upson et al. [75] suggest that much of it is useless without scalable methods to collect, analyze, process, and understand it. e-CRM Knowledge Management (KM) methods need to be explored and refined so enterprises can take full advantage of the data they collect and transform it into useful information and value-added knowledge for themselves and their customers.

Swan et al. [76] found issues of *People Management*, rather than IT development, pose central KM constraints. They assert there has been an over-emphasis on IT management in KM literature and that KM requires a skillful blend of people, business processes and IT. They assert that their findings imply a central role for people management issues within KM. Some of the issues raised in their paper that are relevant to e-CRM include:

commitment, trust, culture, and the social-embeddedness of knowledge. The latter has important implications for e-CRM, because unlike information, knowledge is embedded in the meanings and understandings of people and knowledge creation occurs in the process of social interactions [76–83]. This illustrates the importance of relationships, shared understandings, and attitudes and behavior related to knowledge formation and sharing within groups. Managing customer relationships within social interactions for knowledge creation may emerge as a critical area within EC.

The problem is that companies have a much greater ability to collect customer information than to provide meaningful value in return [84,85]. In Europe, where privacy laws are stricter than in the US, there is a strong desire by consumers to receive value in return for divulging information [86–93]. Research into e-CRM KM will be critical in resolving the developing conflict between EC consumers and businesses.

Many organizations build data warehouses consisting of customer data (demographics on customers and potential customers), customer activity (buying and browsing activity), and product data (product line information and performance) and call this KM. In essence KM is a process that consists of transferability, aggregation and sensemaking [94]. One important point is to find ways to leverage the information contained in the data warehouse and turn it into value. Nunamaker et al. have argued for the new concept of Intellectual Bandwidth of an organization as *“its ability to bring knowledge to bear on the task at hand. It is the product of the organization’s ability to assimilate available information, and the ability of its available people to collaborate. Information technology and collaborative technology both can enhance the Intellectual Bandwidth of the organization. This model assumes the availability of significantly more information than an individual could reasonably assimilate”* [95,96]. KM, in terms of elicitation, collection, processing, analysis, understanding, and the return of value to customers provides a third component of the overall framework that needs to be studied further.

4. Research area 4: e-CRM technology

Keen [10] stressed that technology is important in EC and the preferred medium is voice. New technologies will soon change the way customers interact with business enterprises and other customers in EC relationships. Virtual environments [97–102] are being developed to support interaction and information exchange through integrated communications channels that simulate real world interactions and relationships. Researchers in Finland and Hong Kong are working with Nokia on small palm top devices for EC [103]. Which new interface and device technologies will emerge as the winners, and which will fail miserably, may depend heavily on issues related to e-CRM. Several studies have looked into how interfaces affect online consumer behavior and the results have been mixed. As new technologies emerge for mainstream use in EC it will be important to assess their efficacy in relation to e-CRM.

Parasuraman and Grewal [104] suggest that technology is likely to be the major force in shaping customer interactions in the future. They also recommend several key research questions:

- (1) What will be the effects of technology on service quality (reliability, responsiveness, assurance, empathy, tangibles)?
- (2) How will demographics interact with technology?
- (3) Is customer loyalty altered when interacting with technology compared to employees?

The number of current technologies for internet-based e-CRM is growing rapidly. Romano et al. [105] identify some 20 different technologies that could be used for e-CRM (see table 2). They [105] also develop an RM and CRM IT classification scheme from the consumer's perspective based on how consumers communicate to develop and maintain relationships via three specific levels of participation along a continuum ranging from passive to interactive. They define three types of RM and CRM technologies as passive, active, and interactive, based on the role the consumer plays in the communication process [105]. Further research is needed to explore how these specific technologies and the three levels affect and mediate e-CRM.

Table 2
Emergent technologies for e-CRM (adapted from [105]).

<i>Passive</i>
Cookies
Chat rooms
Bulletin boards and fan clubs
Mailing lists
News groups
Observation studies through virtual reality and simulated environments
Product-related discussion groups and lists
<i>Active</i>
Chat rooms (hosted by Seller)
Bulletin boards (hosted by Seller)
Forums (hosted by the Seller)
Internet surveys
Product-related discussion groups and lists
Recommender software
<i>Interactive</i>
E-mail
Forums
Online focus groups
Interactive online interviews
Survey panels
Auctions
Online trade shows
Shopping agent

While this list is not exhaustive, and does not include the richer media technologies such as audio and video, it is illustrative of the large number and types of technologies that are available for e-CRM research and practice. Some of the same theories that applied to the human factors, and discussed in detail in that section of the paper, aspects of e-CRM also apply to the technology choices and strategies. Clearly there is conceptual, theoretical, and practical research in the area of e-CRM technologies that remains to be carried out.

Further research into technology associated with e-CRM will reveal new knowledge that will help both customers and businesses engaging in EC. The consideration of these and other technologies as they are related to e-CRM offers the fourth framework component.

5. Research area 5: e-CRM human factors

Behavioral, affective, and attitudinal factors should play a major role in e-CRM. A number of studies have looked at many different human factors related to e-CRM (see [110–118] for a few examples). This may be turn out to be the richest and most interesting area for research in e-CRM. Group Support Systems (GSS), computer-supported cooperative work and other research areas have shown that computer-mediation has changed the way humans interact with one another when they are working together [119,120]. From the customers point of view EC changes how humans interact to spend money and acquire value in return. This area will require new and different research methods and questions.

The behavioral aspect of e-CRM deals with virtual communities and interactions among customers and between customers and enterprises. Dyson [121] has suggested that scale economies may be less important on the Internet and advertisers have suggested that there is no difference between a little kid and a major corporation if they both have a web site. Gallagher [122] questions the conventional wisdom that size doesn't matter on the Internet and finds that consumers want to join sites with the largest communities in order to benefit from the interaction and exchange of information. The issues of customer behavior in EC are becoming more complex as applications increase in functionality and more markets go online. Bellman et al. [123] found that typical marketing demographics were not good indicators of online buying behavior. There are a large number of behavioral factors to be explored in relation to e-CRM.

The affective component of e-CRM relates to what Selz and Schubert [124] describe as an emotional customer experience. Customer emotional experiences can be either positive or negative in directionality. The emotional experience will have effects on a number of issues central to the human component of e-CRM such as: satisfaction, trust and confidence, commitment, willingness to interact and share information, willingness to purchase, and attitudes and opinions. The customers affective experience will play a major role in e-CRM and needs to be explored along a number of dimensions.

Attitudes and opinions are extremely important in relation to e-CRM. Ho and Wu [125] explain that Cyber Shopping Stores (CSS) present and even sell to customers *virtual products*, which they need not have in inventory, by displaying only images. The web offers opportunities to market products through multimedia presentation capabilities such as animation, audio, and video. Such complex multimedia stimuli are perceived through the senses differently than verbal and written communication stimuli. Giner-Sorolla et al. [126] assert that interpretation of evaluations as responses to most stimuli in the environment necessitates presentation of stimuli similar in form to objects perceived through the senses. Romano et al. [127] demonstrated that new techniques can enable marketers to gather customer information anonymously through free form comments. Understanding how consumers think and feel about products, companies, and brands at a very detailed level may provide competitive advantage in EC markets. Measuring attitudes and opinions in EC will require new techniques and instruments and there is a great deal of research yet to be done in this area.

One critical area involves trust, risk, and privacy. Trust is not a new concept and all business transactions require some level of trust to be completed [27]. However, trust becomes significantly more important in electronic sales channels and it has been argued that this importance will continue to increase [128]. While a number of models have been developed to classify trust in electronic commerce environments [41,129–141], little actual testable theory has been developed. e-CRM researchers may need to consider theories from referent disciplines such as the “Commitment-Trust Theory of Relationship Marketing” [27] or develop more robust, testable IS theories that go beyond classification and typology.

5.1. Commitment-trust theory of relationship marketing

This theory implies the Key Mediating Variable (KMV) model of Relationship Marketing (RM), which focuses on one party in the relational exchange and that party’s relationship commitment and trust. It hypothesizes that relationship commitment and trust are key constructs, and positions them as mediating variables between five important antecedents (relationship termination costs, relationship benefits, shared values, communication, and opportunistic behavior) and five outcomes (acquiescence, propensity to leave, cooperation, functional conflict, and decision-making uncertainty). What is unique about the theory is that it takes a cooperative perspective, rather than the more competitive perspective that most of the work in relationship marketing assumes. Business ethicists have also stressed that competition actually required cooperation:

“However competitive a particular industry may be, it always rests on a foundation of shared interests and mutually agreed-upon rules of conduct, and the competition takes place not in a jungle but in a society that it presumably both serves and depends upon. Business life, unlike life in the mythological jungle, is first of all fundamentally *cooperative*. It is only with the bounds of mutually shared concerns that competition is possible. And quite the contrary to the everyone for himself metaphor, business almost always involves large cooperative and mutually trusting groups, not

only corporations themselves but networks of suppliers, service people, customers, and investors.” (Emphasis in original) [142]

This theory may offer useful guidance for the development of IS-based theories for e-CRM or it may prove not to be generalizable beyond traditional marketing environments. Clearly both trust and commitment will be important variables and constructs for e-CRM researchers and practitioners to consider in terms of IS design and implementation.

Firms that move into e-CRM must consider a number of different technologies, policies and strategies concerning trust including: organizational privacy policy [111,143,144], third party privacy seals [38,145] (e.g., TRUSTe), information disclosure seals (e.g., WebTrust Seal), reputation and brand building activities, guarantees, return policies, reliability seals, security seals (e.g., VeriSign), and site quality [128,137]. Determining what roles each or any of these will play in e-CRM and which ones will be successful for building trust and commitment in relationships will require a significant amount of research.

Interactivity is also another area that is becoming important for e-CRM market research and practice. This involves communication between consumers and businesses and among consumers. This may be where the most interesting and exciting new technologies arise. While there has been suggestions for research into interactivity, some models developed, and studies of various factors undertaken by both IS and marketing researchers [21,36,146–155], little solid testable theory has been developed and few existing theories have been applied. e-CRM might benefit from using theories such as *Habermas’ Communicative Theory of Action* [106,107], and *Social Presence Theory* [108,109]. Each of these is briefly discussed in terms of explanation and how e-CRM research might benefit from employing the theory.

5.2. *Habermas’ communicative theory of action*

This is one of several Critical Social Theories [106,107] of communication richness that serves as an alternative perspective from the traditional positivist Information Richness Theory (IRT) [156] and the occasionally employed interpretivist perspective [157,158]. What differentiates CST from the other two perspectives is that the communication receiver can critically reflect on the content of the message and thereby analyze and detect distortion [106,107]. CST may provide better explanations of the relative effectiveness of different communications media [107]. For e-CRM researchers and practitioners alike alternative theories, such as CST, offer ways to study communication media in context and thus explore additional variables such as personal involvement, product types, prior consumer knowledge, and interactions among contextual factors that the other two perspectives do not [107]. The ability to study communication in context may lead us to consider and discover alternative strategies for e-CRM that might otherwise be overlooked or too easily dismissed.

5.3. *Social presence theory*

Social Presence (SP) refers to the degree to which media enable a communicator to establish a “personal connection” with others, clearly something that could lead to an improved relationship. SP is operationalized through the use of semantic differential scales along a continuum from sociable, warm, and personal to unsociable, cold, and impersonal [159]. Different media types, such as a letter, telephone, multi-speaker audio, video, and face-top-face support different levels of SP [109]. Media that are “high-presence” will be rated by participants in communication exchanges toward the social end of the SP continuum, while those that are “low-presence” will be rated toward the unsociable end [159]. Rice [108] has asserted that differences in the level of SP media can support may be linked to limitations the media place on communication of non-verbal cues. This is an area where e-CRM researchers can explore how different media and different uses of the same media affect how consumers feel and think about the nature and quality of their relationships. Experimental and observational studies of the level of SP could help to determine which strategies are best for relationship development and management under certain conditions and in certain markets. This is a rich area for e-CRM research.

Finally in such a rich communication and interaction environments is might be that qualitative approaches such as Action Research (AR) [160–163], and may provide useful insights into e-ECRM interactivity. Each of these is briefly described.

5.4. *Action research*

AR is “a spectrum of activities that focus on research, planning, theorising, learning, and development . . . a continuous process of research and learning in the researcher’s long term relationship with a problem” [160]. AR also usually involves the processes of “improvement” and “involvement” [164]. AR IS research that employs AR typically involves researcher intervention in an organizational core business process to improve the process and to generate novel and pertinent knowledge from the experience [165]. There are two different “versions” of AR: “classical” and “emergent”. Lau [161] describes the two as follows: classical AR focuses on changing information systems related to practice; while emergent AR focuses on changing social practice within a socio-technical system or technological innovation. Either version could be used to study e-CRM; however it seems that the emergent perspective may be more useful to study the communication that takes place between business personnel and consumers. AR offers a possible avenue for intervening through iterative prototyping of e-CRM systems, interfaces, and processes over time to learn from the experience of actual consumers and business personnel. In this way theory may emerge through out the study through discovery and experience.

Theories of usability will have to be extended to included newly emerging factors such as web site accessibility [166–174] and web site appeal or visibility [146,175,176]. Although models such as TAM [177,178] have been extended for the web [179], perhaps new theories or extensions will be required for consumer behavior

[112,115,116,180–182], interactivity, and accessibility. IS research in these areas is just beginning and there is significant work yet to be done to test and extend existing theory and develop new IS-based theories.

6. The e-CRM model

We assert that much as Keen [10] and Körner and Zimmermann [66] stress, the five research areas are not mutually-exclusive and in fact influence one another and the process and outcomes of e-CRM research and practice. Figure 2 presents our high level conceptual framework based on the five areas.

It illustrates several important notions about e-CRM. First, all five of the research areas influence e-CRM research and practice. Second some areas are more closely related to each other than to others. For example, markets are most likely influenced by and have more influence on human factors and business models, than knowledge management or technology [55,71–73,124,183]. Similarly, human factors are more influenced by technology and markets, than by business models or knowledge management [110,184–189]. In reality all of the areas influence each other directly or indirectly in some way. While this model is instructive, it does not consider the process or the outcomes of e-CRM research and practice.

Figure 3 presents our input-process-output model that serves as a theoretical framework for the study of some of the variables that we posit influence e-CRM processes and outcomes. Such a framework is useful because the areas and associated constructs, variables, and measures that can be derived from them can serve to guide future research into e-CRM. Adoption of such a framework by researchers can enable the e-CRM com-

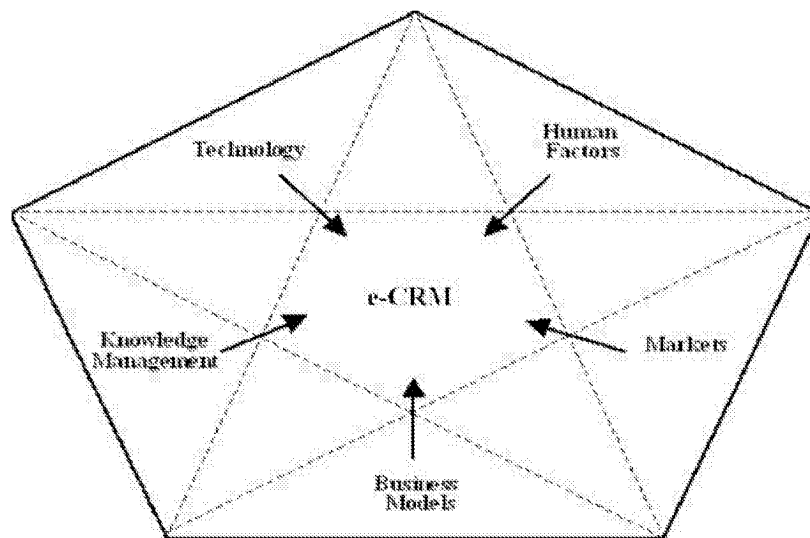


Figure 2. e-CRM research framework.

munity to compare and contrast the results of different studies and to build a cumulative tradition of research that over time may reveal patterns and common findings.

The model consists of five input variables, representing each of the five areas, and e-CRM processes and outcomes. The combination of these five input variable categories captures the human participation, economic environment, strategic considerations, technical infrastructure, and intellectual capital components of e-CRM. e-CRM processes are continuous and evolutionary in nature, just as are the relationships they attempt to foster and manage for mutual gain. Feedback loops in figure 3 illustrate that e-CRM outcomes can result in learning for both customers and enterprises. Both types of outcomes – performance and non-performance – are important. Non-performance outcomes may have significant negative or positive impacts on performance outcomes, much as they have been shown to affect outcomes in GSS research [190].

These general variable categories are consistent with models presented in other areas of IS research such as GSS and KM [94,97,119]. Together these input variables define both the human potential and the technical infrastructure for developing e-CRM processes to achieve valuable outcomes. The e-CRM process is continuous and evolutionary and consists of organizational members and individuals from outside the organization using e-CRM technologies to establish, develop, and maintain important successful business relationships, which are the outcomes of the process that are relevant to e-CRM. Within each component of the model a list of example concepts is provided to be illustrative and not exhaustive.

We believe that these five fundamental areas and the influences they have on one another and e-CRM processes and outcomes encompass some of the most important ar-

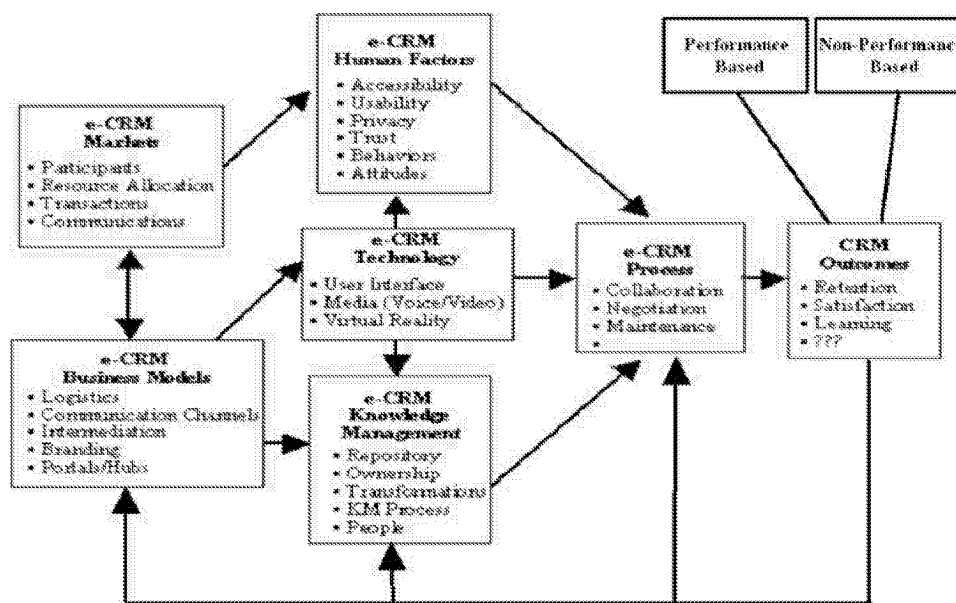


Figure 3. Model of e-CRM influences.

eas for e-CRM research. We assert that this model can stimulate researchers to consider important research questions and design additional theoretical and conceptual models and empirical studies to constructively extend the sub field of e-CRM.

One last point that we think is important to mention is that e-CRM assessment should be done from both process and outcome perspectives. There is a strong body of literature that emphasizes the importance of mixed-method evaluations for IS research projects [191–200]. We assert that e-CRM researchers should plan to assess research projects through combined process and outcome evaluations. The outcome evaluation should be mixed-method and measure both performance-based and non-performance-based e-CRM outcomes. *“Beyond assessing whether a treatment is effective, we need to understand why it is effective if we are to learn . . . how treatments might be improved”* [196]. Process and outcome evaluations are not competing, but complementary, such that process evaluation increases the interpretability of the results of the outcome evaluation.

Researchers [194,201–203] have suggested the use of mixed-method designs that include both qualitative and quantitative evaluation methods. For the purpose of studying e-CRM, we suggest that researchers consider the use of a mixed-method study with an expansion intent. This multitask design was first proposed by Cook [204] and includes multiple components with the objective of expanding both scope and breadth. This method is commonly employed by using qualitative methods to measure processes and quantitative methods to measure outcomes. Although there has been some debate as to whether mixed-method designs using both qualitative and quantitative methods are meaningful the recent trend is toward a combination approach [205–207].

7. Conclusion

e-CRM is a research topic on which there is much literature [11,12,208], but no overarching framework to guide and focus IS research in this area has yet emerged. We have presented research questions, constructs, variables, and topics derived from our framework in figure 2, from our model of influences in figure 3, and from an exhaustive literature review in the area [11,12] to illustrate the vastness of the e-CRM research domain and stimulate researchers to ask more meaningful research questions and study more useful relationships within and among these five areas. Thus, the issues we have raised have both theoretical and practical significance, and reflect a useful starting off point for e-CRM researchers. The specific variables in each category of our framework are not exhaustive, but reflect factors what the literature suggests are most likely to be relevant to e-CRM research and implementation. Research questions can be raised according to the major framework components. In this paper, we propose a research framework for e-CRM composed of five underlying research areas and a model of how these five areas influence one another and both the process and outcomes of e-CRM.

The unique contribution of this paper is its focus on e-CRM research from an IS perspective. The research framework provides a foundation for important questions to

study, and points to key constructs whose operationalization will add value to this research area. The integration of the five research areas provides a novel approach to examine the emerging area of e-CRM. Finally, the notions of e-CRM processes and outcomes being affected by the five research areas provides a direction for theory development and empirical study in both lab and field settings that may yield meaningful and useful results with both theoretical and practical implications.

Acknowledgements

This research was partially supported by the New Jersey Science Commission through a grant to the New Jersey Center for Pervasive Information Technology.

References

- [1] R. Kalakota and A.B. Whinston, *Frontiers of Electronic Commerce* (Addison-Wesley, Reading, MA, 1996).
- [2] J. Bickert, Cohorts II: A new approach to market segmentation, *Journal of Consumer Marketing* 14(4/5) (Fall/Winter 1997) 362–380.
- [3] R.N. Bolton, P.K. Kannan and M.D. Bramlett, Implications of loyalty program membership and service experiences for customer retention and value, *Journal of the Academy of Marketing Science* 28(1) (Winter 2000) 95–108.
- [4] J.P. Cannon and W.D. Perreault, Jr., Buyer–seller relationships in business markets, *Journal of Marketing Research* XXXVI (November 1999) 439–460.
- [5] G.S. Day, Managing market relationships, *Journal of the Academy of Marketing Science* 28(1) (Winter 2000) 24–30.
- [6] K.R. Evans, T. Christiansen and J.D. Gill, The impact of social influence and role expectations on shopping center patronage intentions, *Journal of the Academy of Marketing Science* 24(3) (1996) 208–218.
- [7] I. Geyskens, J.E.M. Steenkamp and N. Kumar, A meta-analysis of satisfaction in marketing channel relationships, *Journal of Marketing Research* XXXVI (May 1999) 223–238.
- [8] C. Grönroos, From marketing mix to relationship marketing. Toward a paradigm shift in marketing, *Asia–Australia Marketing Journal* 2(1) (1994) 9–30.
- [9] F.E. Webster, Jr., Understanding the relationships among brands, consumers, and resellers, *Journal of the Academy of Marketing Science* 28(1) (Winter 2000) 17–23.
- [10] P.G.W. Keen, Competing, in: *Internet Business* (Eburon Publishers, Delft, Netherlands, 1999) Ch. 2.
- [11] N.C. Romano, Jr., Customer relations management research: An assessment of sub field development and maturity, in: *34th Annual Hawai'i International Conference on System Sciences* (IEEE Computer Society Press, Maui, HI, 2001).
- [12] N.C. Romano, Jr. and J. Fjermestad, Customer relationship management research: An assessment of research, *International Journal of Electronic Commerce* 6(3) (Winter 2002) 61–114.
- [13] O.E. Williamson (ed.), *Markets and Hierarchies: Analysis and Antitrust Implications* (Free Press, New York, 1983).
- [14] M.W. Forbes and M.L. Rothschild, Toward an understanding of consumer experience on the internet: Implications for website design, in: *33rd Hawai'i International Conference on System Sciences* (IEEE Computer Society Press, Maui, HI, 2000).
- [15] D. Selz and P. Schubert, Web assessment – a model for the evaluation and assessment of successful electronic commerce applications, in: *31st Hawai'i International Conference on System Sciences* (IEEE Computer Society Press, Kona Coast, HI, 1998).

- [16] R. Whiting, Allstate bets on big payoff in e-commerce-CRM combo, *Information Week* (2001) 58.
- [17] J.Y. Bakos and C.F. Kemerer, Recent applications of economic theory in information technology research, *Decision Support Systems* 8(5) (December 1992) 365–386.
- [18] F.R. Dwyer, P.H. Shurr and S. Oh, Developing buyer and seller relationships, *Journal of Marketing* 51(2) (April 1987) 11–27.
- [19] B.B. Jackson, Building customer relationships that last, *Harvard Business Review* 63 (November/December 1985) 120–128.
- [20] D.M. Williams, BEYOND CRM weaving a loyalty web, *Pharmaceutical Executive* 22(1) (2002) 46–49.
- [21] R.C. Blattberg and J. Deighton, Interactive marketing: Exploiting the age of addressability, *Sloan Management Review* 33(1) (1991) 5–14.
- [22] N. Coviello, R. Brodie and H. Munro, Understanding contemporary marketing: Development of a classification scheme, *Journal of Marketing Management* 13(6) (1997) 501–522.
- [23] D. Fuhrman, Interactive electronic media, *Sales and Marketing Management* 43(1) (1991) 44–47.
- [24] E. Gummesson, Broadening and specifying relationship marketing, *Asia–Australia Marketing Journal* 2(1) (1994) 31–43.
- [25] P. Kotler, Marketing's new paradigm: What's really happening out there, *Planning Review* 20(5) (1992) 50–52.
- [26] A.J. Magrath and K.G. Hardy, Building customer partnerships, *Business Horizons* 37(1) (1994) 24–28.
- [27] R.M. Morgan and S.D. Hunt, The commitment-trust theory of relationship marketing, *Journal of Marketing* 58(3) (1994) 20–38.
- [28] F. Buttle, *Relationship Marketing Theory and Practice* (Paul Chapman, London, UK, 1996).
- [29] R. McKenna, *Relationship Marketing: Successful Strategies for the Age of the Customer* (Addison-Wesley, Reading, MA, 1991).
- [30] F.R. Dwyer, P.H. Shurr and S. Oh, Developing buyer and seller relationships, *Journal of Marketing* 51(2) (April 1987) 11–27.
- [31] J. Scanzoni, Social exchange and behavioral interdependence, in: *Social Exchange in Developing Relationships*, eds. R.L. Burgess and T.L. Huston (Academic Press, New York, 1979).
- [32] A. Chaturvedi and S. Bandyopadhyay, Establishing a framework for analyzing market power in e-retailing: An empirical study, in: *Hawai'i International Conference on Systems Sciences (HICSS-34)* (IEEE Computer Society Press, Maui, HI, 2001).
- [33] E.K. Clemons and M.C. Row, Electronic consumer interaction, technology-enabled encroachment, and channel power the changing balance between manufacturers' electronic distribution and established retailers, in: *32nd Annual Hawai'i International Conference on System Sciences* (IEEE Computer Society Press, Kona Coast, HI, 1998).
- [34] H. Oinas-Kukkonen, Balancing the vendor and consumer requirements for electronic shopping systems, *Information Technology and Management Journal* 1(1–2) (2000) 73–84.
- [35] H.K. Bhargava, R. Krishnan and R. Müller, Decision support on demand: Emerging electronic markets for decision technologies, *Decision Support Systems* 19(3) (1997) 193–214.
- [36] V. Haubl and G. Trifts, Consumer decision making in online shopping environments: The effects of interactive decision aids, *Marketing Science* 19(1) (2000) 4–21.
- [37] K. Mathieson, H.K. Bhargava and M. Tanniru, Web-based consumer decision tools: Motivations and constraints, *Electronic Markets* 9(4) (1999).
- [38] S.W. Ba, A.B. Whinston and H. Zhang, The design of a trusted third party for electronic commerce transactions, in: *Americas Conference on Information Systems (AIS '98)* (Omnipress, Baltimore, MD, 1998).
- [39] S.W. Ba, A.B. Whinston and H. Zhang, Building trust in the electronic market through an economic incentive mechanism, in: *20th International Conference on Information Systems (ICIS '99)* (Omnipress, Charlotte, NC, 1999).

- [40] S.P. Ketchpel and H. Garcia-Molina, Making trust explicit in distributed commerce transactions, in: *16th International Conference on Distributed Computing Systems* (IEEE Computer Society Press, Los Alamitos, CA, 1996).
- [41] A. Noteberg, E. Christaanse and P. Wallage, The role of trust and assurance services in electronic channels: An exploratory study, in: *20th International Conference on Information Systems (ICIS '99)* (Omnipress, Charlotte, NC, 1999).
- [42] A.F. Salam, H.R. Rao and C.C. Pegels, An investigation of consumer-perceived risk on electronic commerce transactions: The role of institutional trust and economic incentive in a social exchange framework, in: *Americas Conference on Information Systems (AIS '98)* (Omnipress, Baltimore, MD, 1998).
- [43] J. Singh and D. Sirdeshmukh, Agency and trust mechanisms in consumer satisfaction and loyalty judgements, *Journal of the Academy of Marketing Science* 28(1) (Winter 2000) 150–167.
- [44] R.P. Srivastava and T.J. Mock, Evidential reasoning for webtrust assurance services, in: *32nd Annual Hawai'i International Conference on System Sciences* (IEEE Computer Society, Maui, HI, 1999).
- [45] K.J. Stewart, Transference as a means of building trust in World Wide Web sites, in: *Proceedings of the 20th International Conference on Information Systems (ICIS '99)* (Omnipress, Charlotte, NC, 1999).
- [46] Y. Yang, L. Brown, J. Newmarch and E. Lewis, A trusted W3 model: Transitivity of trust in a heterogeneous web environment, in: *5th Australian World Wide Web Conference (AusWeb99)* (Southern Cross University, Lismore NSW 2480, Australia, 1999), <http://ausweb.scu.edu.au/aw99/papers/index.html>.
- [47] A. El Sawy and G. Bowles, Redesigning the customer support process for the electronic economy: Insights from storage dimensions, *MIS Quarterly* 21(4) (December 1997) 457–484.
- [48] V. Grover, P. Ramanlal and A.H. Segars, Information exchange in electronic markets: Implications for market structures, *International Journal of Electronic Commerce* 3(4) (Summer 1999) 89–102.
- [49] K.K. Kim and N.S. Umanath, An empirical investigation of electronic integration in a Supply Chain Relationship, in: *20th International Conference on Information Systems (ICIS '99)* (Omnipress, Charlotte, NC, 1999).
- [50] R. Rapp, Integration of customer strategy, organisation and information technology, *IM Information Management* 15(1) (2000) 13–17.
- [51] A. Wright, Technology as an enabler of the global branding of retail financial services, *Journal of International Marketing* 10(2) (2002) 83–98.
- [52] A. Aldridge, K. Forcht and J. Pierson, Get linked or get lost: Marketing strategy for the Internet, *Internet Research* 7(3) (1997) 161–169.
- [53] E. Allen and J. Fjermestad, E-commerce marketing strategies: An integrated framework and case analysis, *Logistics Information Management (Best paper 2001)* 14(1–2) (2001) 14–23.
- [54] D.L. Hoffman and T.P. Novak, A new marketing paradigm for electronic commerce, *The Information Society* 13(1) (January–March 1997) 43–54.
- [55] J. Porra, Electronic commerce internet strategies and business models – A survey, *Information Systems Frontiers* 1(4) (2000) 389–399.
- [56] J.D. Becker, T. Farris and P. Osborn, Electronic commerce and rapid delivery: The missing “Logistical” link, in: *Americas Conference on Information Systems (AIS '98)* (Omnipress, Baltimore, MD, 1998).
- [57] C. Loebbecke, Electronic trading in on-line delivered content, in: *32nd Annual Hawai'i International Conference on System Sciences* (IEEE Computer Society, Maui, HI, 1999).
- [58] G.C. O'Connor and B. O'Keefe, Viewing the web as a marketplace: The case of small companies, *Decision Support Systems* 21(3) (November 1997) 171–183.
- [59] J. Bailey and Y. Bakos, An exploratory study of the emerging role of electronic intermediaries, *International J. Electronic Commerce* 1(3) (Spring 1997) 35–42.
- [60] T.H. Clark and H.G. Lee, Electronic intermediaries: Trust building and market differentiation, in: *32nd Annual Hawai'i International Conference on System Sciences* (IEEE Computer Society, Maui, HI, 1999).

- [61] M.S. Janssen and H.G. Lee, Evaluating the role of intermediaries in the electronic value chain, *Internet Research* 10(5) (2000) 406–417.
- [62] L. Jin and D. Robey, Explaining cybermediation: An organizational analysis of electronic retailing, *International Journal of Electronic Commerce* 3(4) (Summer 1999) 47–66.
- [63] T. Matsuda, T.H. Clark and H.G. Lee, Electronic commerce for agricultural transactions: Role of intermediaries for accurate pricing, in: *30th Annual Hawai'i International Conference on Systems Science* (IEEE Computer Society, Maui, HI, 1997).
- [64] M. Sarkar, B. Butler and C. Steinfield, Intermediaries and cybermediaries: A continuing role for mediating players in the electronic marketplace, *Journal of Computer-Mediated Communication* 1(3) (1995).
- [65] J.-C. Wang and R.-F. Day, Feedback mechanisms as intermediaries for web information market: An exploratory study, in: *Hawai'i International Conference on Systems Sciences (HICSS-34)* (IEEE Computer Society Press, Maui, HI, 2001).
- [66] V. Körner and H.D. Zimmermann, Management of customer relationship in business media – the case of the financial industry, in: *33rd Hawai'i International Conference on System Sciences* (IEEE Computer Society Press, Maui, HI, 2000).
- [67] M. Klose and U. Lechner, Design of business media – an integrated model of electronic commerce, in: *5th Americas Conference on Information Systems (AMCIS '99)* (Omnipress, Milwaukee, WI, 1999).
- [68] D. Dunne, The CRM backlash, *CIO Magazine* (2001).
- [69] S. Patton, The truth about CRM, *CIO Magazine* (2001).
- [70] R.L. Ackoff, Management misinformation systems, *Management Science* 14(4) (1967) B-147–B-156.
- [71] M.A. Gill and Z. Wu, E-markets: Failed business model or barriers to diffusion of innovation? in: *7th Americas Conference on Information Systems* (Omnipress, Boston, MA, 2001).
- [72] D.M. Lincke, Business models for the implementation of mediating electronic product catalogs, in: *Americas Conference on Information Systems (AIS '98)* (Omnipress, Baltimore, MD, 1998).
- [73] P. Timmers, Business models for electronic markets, *Electronic Markets* 8(2) (1998) 3–8.
- [74] S.L. Deck, CRM made simple, *CIO Magazine* (2001) 104–112.
- [75] C. Upson, T. Faulhaber, Jr., D. Kamins, D. Laidlaw, D. Schlegel, J. Vroom, R. Gurwitz and A. van Dam, The application visualization system: A computational environment for scientific visualization, *IEEE Computer Graphics and Applications* 9(4) (July 1989) 30–42.
- [76] J. Swan, S. Newell and M. Robertson, Knowledge management – When will people management enter the debate? in: *34th Hawai'i International Conference on System Sciences* (IEEE Computer Society Press, Maui, HI, 2000).
- [77] L. Argote, P. Ingram, J.M. Levine and R.L. Moreland, Knowledge transfer in organizations: Learning from the experience of others, *Organizational Behavior and Human Decision Processes* 82(1) (May 2000) 1–8.
- [78] T. Erickson and W.A. Kellogg, Social translucence: An approach to designing systems that support social processes, *ACM Transactions on Computer-Human Interaction* 7(1) (March 2000) 59–83.
- [79] A.K. Gupta and V. Govindarajan, Knowledge flows within multinational corporations, *Strategic Management Journal* 21(4) (2000) 473–496.
- [80] C.W. Holsapple and K.D. Joshi, Organizational knowledge resources, *Decision Support Systems* 31(1) (May 2001) 39–54.
- [81] I. Nonaka, A dynamic theory of organizational knowledge creation, *Organization Science* 5(1) (February 1994) 14–37.
- [82] I. Nonaka, H. Takeuchi and H. Takeuchi, *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation* (Oxford University Press, New York, 1995).
- [83] J.F. Nunamaker, Jr., N.C. Romano, Jr. and R.O. Briggs, Increasing intellectual bandwidth: Generating value from intellectual capital with information technology, *Group Decision and Negotiation* 11(2) (March 2002) 69–86.

- [84] G. Freidman, M. Freidman, C. Chapman and J. Baker, *The Intelligence Edge: How to Profit in the Information Age* (Crown Publishing, New York, 1997).
- [85] J.A. Sena and A.B. Shani, Intellectual capital and knowledge creation: Towards an alternative framework, in: *Knowledge Management Handbook*, ed. J. Liebowitz (CRC Press, Boca Raton, FL, 1999) Ch. 8, pp. 8-1-8-16.
- [86] Anonymous, Communication, regulation and the law, *Communication Abstracts* 21(1) (February 1998) 48-58.
- [87] C.J.A.R. Bennett and C.D., The adequacy of privacy: The European Union data protection directive and the North American response, *Information Society* 13(3) (July-September 1997) 245-263.
- [88] M. Fjetland, Global commerce and the privacy clash: There are critical gaps in the privacy rights laws of Europe and the United States that pose a major challenge to companies embracing global commerce, *Information Management Journal* 36(1) (January/February 2002) 54-57.
- [89] G. Greenleaf, IP, phone home: The uneasy relationship between copyright and privacy, illustrated in the laws of Hong Kong and Australia, *Hong Kong Law Journal* 32(1) (2001).
- [90] J. Klosek, *Data Privacy in the Information Age* (Quorum Books, Westport, CN, 2000).
- [91] E. Morphy, *How International Privacy Laws Can Affect CRM* (2001), CRMDaily.com online at: <http://crmdaily.com/perl/story/13878.html>.
- [92] *Europe's Privacy Laws Cause Rift with US* (Associated Press, October 30, 1998), online at <http://www.freep.com/tech/qdata30.htm>.
- [93] H.J. Smith, Information privacy and marketing: What the US should (and shouldn't) learn from Europe, *California Management Review* 43(2) (Winter 2001) 8-32.
- [94] B. Katzy, R. Evaristo and I. Zigurs, Knowledge management in virtual projects: A research agenda, in: *33rd Annual Hawai'i International Conference on System Sciences* (IEEE Computer Society Press, Maui, HI, 2000).
- [95] J.F.J. Nunamaker, R.O. Briggs and G.-J. de Vreede, Value creation technology: Changing the focus to the group, in: *Information Technology and the Future Enterprise: New Models for Managers*, eds. A.G.D. Gary and G.W. Dickson (Pearson Education, Edinburgh Gate, Harlow, Essex, UK, 2001).
- [96] J.F.J. Nunamaker, N.C.J. Romano and R.O. Briggs, Increasing intellectual bandwidth: An integrated framework of kmst and Cst, in: *Group Decision and Negotiation* (Delft University of Technology, University of La Rochelle, La Rochelle, France, 2001).
- [97] S.R. Hiltz and M. Turoff, Virtual meetings: Computer conferencing and distributed group support, in: *Computer Augmented Teamwork*, eds. R.P. Bostrom, R.T. Watson and S.T. Kinney (Van Nostrand Reinhold, New York, 1992) pp. 67-85.
- [98] M.J. McQuaid, R.O. Briggs, D. Gillman, R. Hauck, C. Lin, D.D. Mittleman, J.F. Nunamaker, Jr., M. Ramsey and N.C. Romano, Jr., Tools for distributed facilitation, in: *38rd Annual Hawai'i International Conference on System Sciences* (IEEE Computer Society Press, Maui, HI, 2000).
- [99] J.F. Nunamaker, Jr., Future research in group support systems: What is needed, some questions and possible directions? *International Journal of Human Computer Studies* 47 (1997) 357-385.
- [100] J. Steuer, Defining virtual reality: Dimensions determining telepresence, in: *Communication in the Age of Virtual Reality*, eds. F. Biocca and M.R. Levy (Lawrence Erlbaum, Hillsdale, NJ, 1995) pp. 33-56.
- [101] R. Stuart, *The Design of Virtual Environments* (McGraw-Hill, New York, 1996).
- [102] M.E. Warkentin, L. Sayeed and R. Hightower, Virtual teams versus face-to-face teams: An exploratory study of a web-based conference system, *Decision Sciences* 28(4) (1997) 975-996.
- [103] New World Mobility and Nokia sign MoU on 3rd generation mobile communications trial in Hong Kong, Nokia Networks, Communications Department (2000), available online at http://press.nokia.com/PR/200004/775902_5.html.
- [104] A. Parasuraman and D. Grewal, The impact of technology on the quality-value-loyalty chain: A research agenda, *Journal of the Academy of Marketing Science* 28(1) (Winter 2000) 168-174.

- [105] N.C. Romano, Jr., J. Shapiro and B. Mittal, Emergent Internet technologies for relationship marketing: Assessing the buyer's perspective, Working paper under review at Journal of Marketing Research.
- [106] O.K. Ngwenyama and A.S. Lee, Communication richness in electronic mail: Critical social theory and the contextuality of meaning, *Management Information Systems Quarterly* 21(2) (June 1997) 145–167.
- [107] M. Shin, Habermas' communicative theory of action and the internet marketing communication effectiveness: The case of direct e-mail vs. banner advertisement, in: *5th Americas Conference on Information Systems* (Omnipress, Milwaukee, WI, 1999).
- [108] R.E. Rice and G. Love, Electronic emotion: Socioemotional content in a computer mediated network, *Communication Research* 14(1) (1987) 85–108.
- [109] J. Short, E. Williams and B. Christie, *The Social Psychology of Telecommunications* (Wiley, London, UK, 1976).
- [110] M. Cole, R.M. O'Keefe and H. Siala, From the user interface to the consumer interface, *Information Systems Frontiers* 1(4) (1999) 349–361.
- [111] M.J. Culnan and P.K. Armstrong, Information privacy concerns, procedural fairness, and impersonal trust: An empirical investigation, *Organization Science* 10(1) (January/February 1999) 104–115.
- [112] C. Liu and K. Arnett, Assessing the customer behavior intentions on the web: A research model, in: *5th Americas Conference on Information Systems* (Omnipress, Milwaukee, WI, 1999).
- [113] I. Phau and S.M. Poon, Factors influencing the types of products and services purchased over the Internet, *Internet Research* 10(2) (2000) 102–113.
- [114] C. Sohn, The properties of internet-based markets and customers' behavior, in: *5th Americas Conference on Information Systems* (Omnipress, Milwaukee, WI, 1999).
- [115] T.J. Strader and G. Hackbart, Introduction to marketing and consumer behavior in electronic markets, in: *Americas Conference on Information Systems* (Omnipress, Long Beach, CA, 2000).
- [116] N. Sukpanich and L. Chen, Antecedents of desirable consumer behaviors in electronic commerce, in: *5th Americas Conference on Information Systems* (Omnipress, Milwaukee, WI, 1999).
- [117] H. van der Heijden, T. Verhagen and M. Creemers, Predicting online purchase behavior: Replications and test of competing models, in: *Hawai'i International Conference on Systems Sciences (HICSS-34)* (IEEE Computer Society Press, Maui, HI, 2001).
- [118] A. Vellido, P.J.G. Lisboa and K. Meehan, Quantitative characterization and prediction of on-line purchasing behavior: A latent variable approach, *International Journal of Electronic Commerce* 4(4) (Summer 2000).
- [119] J.F. Nunamaker, Jr., A.R. Dennis, J.S. Valacich, D.R. Vogel and J.F. George, Electronic meeting systems to support group work: Theory and practice at Arizona, *Communications of the ACM* 34(7) (1991) 40–61.
- [120] J.F. Nunamaker, Jr., R.O. Briggs, D.D. Mittleman and P.B. Balthazard, Lessons from a dozen years of group support systems research: A discussion of lab and field findings, *Journal of Management Information Systems* 13(3) (1996–1997) 163–207.
- [121] E. Dyson, *Release 2.0. Design for Living in the Digital Age* (Broadway Books, New York, 1997).
- [122] J. Gallagher, Challenging the new conventional Wisdom of net commerce strategies (industry trend or event), *Communications of the ACM* 42(7) (1999) 27–29.
- [123] S. Bellman, G.L. Lohse and E.J. Johnson, Predictors of online buying behavior, *Communications of the ACM* 42(12) (1999) 32–38.
- [124] D. Selz and P. Schubert, Web assessment – A model for the evaluation and the assessment of successful electronic commerce applications, *Electronic Markets* 7(3) (1997) 46–48.
- [125] C.F. Ho and W.S. Wu, Antecedents of customer satisfaction on the Internet: An empirical study of online shopping, in: *32nd Annual Hawai'i International Conference on System Sciences* (IEEE Computer Society Press, Maui, HI, 1999).
- [126] R. Giner-Sorolla, M.T. Garcia and J.A. Bargh, The automatic evaluation of pictures, *Social Cognition* 17(1) (1999) 76–96.

- [127] N.C. Romano, Jr., C. Bauer, H. Chen and J.F. Nunamaker, Jr., The mindmine comment analysis tool for collaborative attitude solicitation, analysis, sense-making and visualization, in: *33rd Annual Hawai'i International Conference on System Sciences* (IEEE Computer Society Press, Maui, HI, 2000).
- [128] D.O. Kundisch, *Building Trust – The Most Important CRM Strategy*, Universität Augsburg Lehrstuhl für Betriebswirtschaftslehre mit Schwerpunkt Wirtschaftsinformatik 86135 Augsburg Diskussionspapier WI-100, ed. H.O. Buhl (October 2001).
- [129] P.J. Ambrose and G.J. Johnson, A trust based model of buying behavior in electronic retailing, in: *Americas Conference on Information Systems (AIS '98)* (Omnipress, Baltimore, MD, 1998).
- [130] R.K.K. Fung and M.K.O. Lee, EC-trust (trust in electronic commerce): Exploring the antecedent factors, in: *5th Americas Conference on Information Systems* (Omnipress, Milwaukee, WI, 1999).
- [131] D.L. Hoffman, T.P. Novak and M. Peralta, Building consumer trust online, *Communications of the ACM* 42(4) (1999).
- [132] S. Jarvenpaa, N. Tractinsky and M. Vitale, Consumer trust in an internet store: A cross-cultural validation, *Journal of Computer-Mediated Communication* 5(2) (1999) Part 1.
- [133] S. Jarvenpaa, N. Tractinsky and M. Vitale, Consumer trust in an internet store, *Information Technology and Management Journal* 1(1–2) (2000) 45–71.
- [134] K. Kim and B. Prabhakar, Initial trust, perceived risk, and the adoption of Internet banking, in: *International Conference on Information Systems (ICIS-2000)*, Brisbane, Australia (2000).
- [135] A. Kini and J. Choobineh, Trust in electronic commerce: Definition and theoretical considerations, in: *32nd Annual Hawai'i International Conference on System Sciences* (IEEE Computer Society Press, Kona Coast, HI, 1998).
- [136] D.W. Manchala, E-commerce trust metrics and models, *IEEE Internet Computing* 4(2) (March/April 2000) 36–44.
- [137] D.H. McKnight, V. Choudhury and C. Kacmar, Trust in E-commerce vendors: A two-stage model, in: *International Conference on Information Systems (ICIS-2000)*, Brisbane, Australia (2000).
- [138] D.H. McKnight and N. Chervany, What is trust? A conceptual analysis and an interdisciplinary model, in: *Americas Conference on Information Systems (AIS 2000)* (Omnipress, Long Beach, CA, 2000).
- [139] D.H. McKnight and N.L. Chervany, Conceptualizing trust: A typology and E-commerce customer relationships model, in: *34th Annual Hawai'i International Conference on System Sciences* (IEEE Computer Society Press, Maui, HI, 2001).
- [140] D.H. McKnight and N.L. Chervany, While trust is cool and collected, distrust is fiery and frenzied: A model of distrust concepts, in: *7th Americas Conference on Information Systems* (Omnipress, Boston, MA, 2001).
- [141] D.H. McKnight and N.L. Chervany, What trust means in E-commerce customer relationships: An interdisciplinary conceptual typology, *International Journal of Electronic Commerce* 6(3) (Winter 2002) 35–60.
- [142] R.C. Solomon, *Ethics and Excellence* (Oxford University Press, Oxford, UK, 1992).
- [143] C.J. Bennett and R. Grant, *Visions of Privacy, Policy Choices for the Digital Age* (University of Toronto Press, Toronto, ON, 1999).
- [144] C. Liu and K.P. Arnett, WWW privacy policies in large and small business enterprises: Do they ease privacy concerns? in: *7th Americas Conference on Information Systems* (Omnipress, Boston, MA, 2001).
- [145] J.M. Su and D. Manchala, Building trust for distributed commerce transactions, in: *17th International Conference on Distributed Computing Systems* (IEEE Computer Society Press, Los Alamitos, CA, 1997) 322–329.
- [146] K. Chen and H. Sockel, Enhancing visibility of business web sites: A study of cyber-interactivity, in: *7th Americas Conference on Information Systems* (Omnipress, Boston, MA, 2001).
- [147] J.R. Coyle and E. Thorson, The effects of progressive levels of interactivity and vividness in web marketing sites, *Journal of Advertising* 30(3) (2001) 65–78.

- [148] J. Deighton, The future of interactive marketing, *Harvard Business Review* 74(6) (November/December 1996) 151–152.
- [149] J. Dysart, Interactivity: The web's new standard, *netWorker* 2(5) (1998) 30–37.
- [150] S. Ghose and W. Dou, Interactive functions and their impacts on the appeal of Internet presence sites, *Journal of Advertising Research* 38(2) (March/April 1998) 29–45.
- [151] B.L. Massey, Market-based predictors of interactivity at Southeast Asian online newspapers, *Internet Research* 10(3) (2000) 227–237.
- [152] D. Nel, R. van Necker, J. Berthon and T. Davies, Going with the flow: Web sites and customer involvement, *Internet Research* 9(2) (1999) 109–116.
- [153] N. Sukpanich and L. Chen, Interactivity as the driving force behind E-commerce, in: *Americas Conference on Information Systems (AMCIS 2000)* (Omnipress, Long Beach, CA, 2000).
- [154] J.D. Wells, W.L. Fuerst and J. Choobineh, Managing information technology (IT) for one-to-one customer interaction, *Information and Management* 35(1) (1999) 53–62.
- [155] J.D. Wells and W.L. Fuerst, Domain-oriented interface metaphors: Designing web interfaces for effective customer interaction, in: *34th Hawai'i International Conference on System Sciences* (IEEE Computer Society Press, Maui, HI, 2000).
- [156] R.L. Daft and R.H. Lengel, Information richness: A new approach to managerial behavior and organization design, *Research in Organizational Behavior* 6 (1984) 191–233.
- [157] A.S. Lee, Electronic mail as a medium for rich communication: An empirical investigation using hermeneutic interpretation, *Management Information Systems Quarterly* 18(2) (June 1994) 143–157.
- [158] M.L. Markus, *Is Information Richness Theory Rich Enough?* (Anderson Graduate School of Management, UCLA, 1991).
- [159] M.S. Poole and M.H. Jackson, Communication theory and group support systems, in: *Group Support Systems: New Perspectives*, eds. L.M. Jessup and J.S. Valacich (Macmillan, New York, 1993) pp. 281–293.
- [160] J. Cunningham, *Action Research and Organizational Development* (Praeger, Westport, CT, 1993).
- [161] F. Lau, A review on the use of action research in information systems studies, in: *Information Systems and Qualitative Research*, eds. A.S. Lee, J. Liebenau and J.I. DeGross (Chapman & Hall, London, UK, 1997) pp. 31–68.
- [162] D.D. Mittleman et al., Lessons learned from synchronous distributed GSS sessions: Action research at the US navy third fleet, in: *The 10th EuroGDSS Workshop*, Faculty of Technology, Policy and Management, Delft University of Technology, Copenhagen, Denmark (1999).
- [163] N.C.J. Romano et al., Distributed GSS facilitation and participation: Field action research, in: *32nd Annual Hawai'i International Conference on System Sciences* (IEEE Computer Society Press, Maui, HI, 1999).
- [164] W. Carr and S. Kemmis, *Becoming Critical: Education, Knowledge and Action Research* (Deakin University, Geelong, 1986).
- [165] N. Kock, R. McQueen and J. Scott, Can action research be made more rigorous in a positivist sense? The contribution of an iterative approach, *Journal of Systems and Information Technology* 1(1) (1997) 1–24.
- [166] D. Báthory-Kitsz, *Web Accessibility of the Presidential Candidate Sites* (Orbit Access, 1999).
- [167] M. Bray and C. Flowers, Web accessibility of community colleges' web pages, *Community College Journal of Research and Practice* (in press).
- [168] C. Flowers and M. Bray, Individuals with disabilities and the World Wide Web: Accessibility at institutions of higher education, in: *WebNet World Conference* (Association of Advancement of Computers in Education, San Antonio, TX, 2000).
- [169] C.P. Flowers, M. Bray and R.F. Algozzine, Accessibility of schools and colleges of education home pages for students with disabilities, *College Student Journal* 34(4) (December 2000) 550–556.
- [170] F. Flowers, M. Bray and R. Algozzine, Accessibility of special education program home pages, *Journal of Special Education Technology* 14(2) (1999).

- [171] N.C. Romano, Jr., Customer relationship management for the web-access challenged: Inaccessibility of the fortune 100 business web sites, in: *35th Annual Hawai'i International Conference on Systems Sciences* (IEEE Computer Society Press, Kona, HI, 2002).
- [172] N.C. Romano, Jr., Customer relationship management for the web-access challenged: Inaccessibility of the fortune 250 business web sites, *International Journal of Electronic Commerce*, forthcoming.
- [173] N.C.J. Romano, Web site accessibility: A survey of is associations, organizations and conferences, in: *ISOneWorld Conference*, Las Vegas, NV (2002).
- [174] A. Schmetzke, *Web Page Accessibility at Twenty-Four US Universities: 2000 Survey Data*, University of Wisconsin-Stevens Point (2000).
- [175] J. Rowley, Retailing and shopping on the internet, *Internet Research: Electronic Networking Applications and Policy* 6(1) (1996) 81–91.
- [176] G.K. White and B.J. Manning, Commercial WWW site appeal: How does it affect online food and drink consumers' purchasing behavior? *Internet Research* 8(1) (1998) 32–38.
- [177] F.D. Davis, Perceived usefulness, perceived ease of use, and user acceptance of information technology, *MIS Quarterly* (September 1989) 319–340.
- [178] F.D. Davis, R.P. Bagozzi and P.R. Warshaw, User acceptance of computer technology: A comparison of two theoretical models, *Management Science* 35(8) (1989) 982–1003.
- [179] T. Fenech, Using perceived ease of use and perceived usefulness to predict acceptance of the World Wide Web, *Computer Networks and ISDN Systems* 30(1–7) (April 1998) 629–630.
- [180] H. Li, C. Kuo and M. Russell, The impact of perceived channel utilities, shopping orientations, and demographics on the consumer's online buying behavior, *Journal of Computer-Mediated Communication* 5(2) (1995).
- [181] T.-P. Liang and H.-J. Lai, Discovering user interests from web browsing behavior: An application to Internet news services, in: *35th Annual Hawai'i International Conference on Systems Sciences* (IEEE Computer Society Press, Kona, HI, 2002).
- [182] R.E. Pereira, Factors influencing consumer purchasing behavior in electronic commerce, in: *Americas Conference on Information Systems (AIS '98)* (Omnipress, Baltimore, MD, 1998).
- [183] J. Palmer, J. Kallio, T. Saarinen, M. Tinnila, V.K. Tuunainen and E. van Heck, Online grocery shopping around the world: Examples of key business models, *Communications of the AIS (CAIS)* 4 (September 2000).
- [184] E.B. Kim, S.B. Eom and S. Uoo, Effective user interface design for online stores in the Asia Pacific region: A survey study, in: *7th Americas Conference on Information Systems* (Omnipress, Boston, MA, 2001).
- [185] J. Kim, Toward the construction of customer interfaces for cyber shopping malls, *International Journal for Electronic Markets* 7(2) (1997).
- [186] G. Lohse and P. Spiller, Internet retail store design: How the user interface influences traffic and sales, *Journal of Computer-Mediated Communication* 5(2) (1999).
- [187] G.L. Loshe and P. Spiller, Quantifying the effect of user interface design features on cyber store traffic and sales, in: *CHI'98 Conference* (ACM Press, Los Angeles, CA, 1998).
- [188] A. Miller, Integrating human factors in customer support systems development using a multi-level organisational approach, in: *CHI'96*, University of Paderborn, Germany (Association for Computing Machinery, 1996).
- [189] R.M. O'Keefe, M. Cole, P.Y.K. Chau, A. Massey, M. Montoya-Weiss and M. Perry, From the user interface to the consumer interface: Results from a global experiment, *International Journal of Human Computer Studies* 52(4) (October 2000) 611–628.
- [190] J. Fjermestad and S.R. Hiltz, An assessment of group support systems experimental research: Methodology and results, *Journal of Management Information Systems* 15(3) (1998–1999) 7–149.
- [191] M. Alavi and P. Carlson, A review of MIS research and disciplinary method, *Journal of management Information Systems* 8(4) (Spring 1993) 45–62.
- [192] R. Galliers (ed.), *Information Systems Research: Issues, Methods, and Practical Guidelines* (Blackwell Scientific Publications, Oxford, UK, 1992).

- [193] R.D. Galliers, Choosing information systems research approaches, in: *Information Systems Research*, ed. R.D. Galliers (Blackwell Scientific Publications, Oxford, 1992) pp. 144–162.
- [194] J.C. Greene, V.J. Caracelli and W.F. Graham, Toward a conceptual framework for mixed-method evaluation designs, *Educational Evaluation and Policy Analysis* 11(3) (1989) 255–273.
- [195] Jenkins, Research methodologies and MIS research, in: *Research Methods in Information Systems*, eds. E. Mumford, R. Hirshheim, G. Fitzgerald and T. Woodharper (North-Holland, Amsterdam, 1985).
- [196] C.M. Judd, Combining process and outcome evaluation, in: *Multiple Methods in Program Evaluation*, eds. M.M. Mark and R.L. Shotland (Jossey-Bass, San Francisco, CA, 1987) pp. 23–41.
- [197] E. Mumford et al. (eds.), *Research Methods in Information Systems* (North-Holland, New York, 1985).
- [198] H.-E. Nissen, H.K. Klein and R.A. Hirschheim (ed.), *Information Systems Research: Contemporary Approaches and Emergent Traditions* (North-Holland, Amsterdam, 1991).
- [199] J.F. Nunamaker, Jr., H. Chen and T.D.M. Purdin, Systems development in information systems research, *Journal of Management Information Systems* 7(3) (1990–1991) 89–106.
- [200] L.M. Smith and P.F. Kleine, The whole is greater: Combining qualitative and quantitative approaches in evaluation studies, in: *Naturalistic Evaluation. New Directions for Program Evaluation*, ed. D. Williams (Jossey Bass, Inc., San Francisco, CA, 1986) pp. 37–54.
- [201] J. Brewer and A. Hunter, *Multimethod Research: A Synthesis of Style* (Sage, Newbury Park, CA, 1989).
- [202] L.M. Smith and P.F. Kleine, The whole is greater: Combining qualitative and quantitative approaches in evaluation studies, in: *New Directions for Program Evaluation*, ed. D. Williams (Jossey Bass, Inc., San Francisco, CA, 1986) pp. 37–54.
- [203] A. Tashakkori and C. Teddlie, *Mixed Methodology: Combining Qualitative and Quantitative Approaches* (Sage, Thousand Oaks, CA, 1998).
- [204] T.D. Cook, L.C. Leviton and W.R. Shadish, Program evaluation, in: *Handbook of Social Psychology*, eds. G. Lindzey and E. Aronson (Random House, New York, 1985) pp. 699–777.
- [205] S.C. Currall et al., Combining qualitative and quantitative methodologies to study group processes: An illustrative study of a corporate board of directors, *Organizational Research Methods* 2(1) (1999) 5–36.
- [206] I. Newman and C.R. Benz, *Qualitative–Quantitative Research Methodology: Exploring the Interactive Continuum* (University of Illinois Press, Carbondale, IL, 1998).
- [207] C.S. Reichardt and S.F. Rallis, Qualitative and quantitative inquiries are not incompatible: A call for a new partnership, in: *The Qualitative–Quantitative Debate*, eds. C.S. Reichardt and S.F. Rallis (New Perspectives, New York, 1994) pp. 85–92.
- [208] D.R. Firth, The organizing vision for Customer Relationship Management, in: *7th Americas Conference on Information Systems* (Omnipress, Boston, MA, 2001).