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# The Roles of Information Technology in Customer Relationship Performance, Employee User Satisfaction, Service Quality and Customer Satisfaction

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# The Roles of Information Technology in Customer Relationship Performance, Employee User Satisfaction, Service Quality and Customer Satisfaction

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by

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# Abstract

This paper presents a review of the relationships between information technology and customer relationship performance, employee user satisfaction, employee service quality and customer satisfaction. An extensive literature research is conducted to answer three research questions about the roles of information technology in the context of customer relationship management, the effect of information technology on front-line employees' user satisfaction and service quality, and the impact of user satisfaction of information technology on employee service quality and thus customer satisfaction. A mechanism how information technology affects the two key parties in the front-line business process, customer service employees as well as customers, is discovered along with the answers to the research questions. CRM technology, representing customer-related information technology, is mainly discussed in the paper. The role of CRM in customer service is explored from the role of the relational information processes and technology use in customer relationship performance; the mediating effect of customer knowledge and the moderating effect of supply integration is reviewed. Sales force automation (SFA) as an operational CRM technology is also examined of its role on customer service in terms of five levels. Ineffective interaction of relationship information processes and CRM, insufficient supply chain integration, and organizational and contextual elements are the factors of CRM technology malfunction. Needs theory and equity theory are used to discuss the impact of information technology use on employees' user satisfaction. Service profit chain (SPC) theory is used in understanding the impact of user satisfaction on employee service quality, moderated by employees' embodied service knowledge. Finally, the impact of service quality on customer satisfaction is found mixed in many researches.

# 1. Introduction

Information technologies are transforming organizations' customer-side operations and organizations are eagerly looking for effective IT strategy and applications to take advantage of these technologies. Rapid pace of innovations, shorter product life cycles, diverse customer needs, and growing internationalization of businesses, have made customer service performance critical for business entities' survival and thrive (Setia et al. 2013).

Information technologies have long been used in every aspect of business, especially in the front line of the business process, which is critical for the revenue generation and business growth. Information systems use has drawn ample focus of practitioners and consistent interests of researchers.

Both customers and employees are two parties of key players at the customer-side operations, which is in the front line of the business process. This paper focus on customer relationship management and one of its subsets, sales force automation, for the front-line of business process, because these aspects directly correlate to the market performance and financial performance of organizations and have gained a large amount of attention if researchers and practitioners. It's important looking into the relationships among the four elements: the use of information systems, employees' user satisfaction of information systems, employee service quality and customer service quality.

This paper is aimed to understand the three research questions through an extensive literature review:

RQ 1: What are the roles of customer-related information technology in customer relationship performance?

RQ 2: What are the factors that affect user satisfaction of the use of customer-related information technology?

RQ 3: What is the impact of front-line employees' user satisfaction of information technology on employee service quality and then customer satisfaction?

The construct of rest of the paper will be as follows. Based on a broad review of research literature, first the role of customer-related information technologies in customer service (hereby namely CRM) will be explored from multiple perspectives suggested by different researchers. The perspectives include relational information process and its interaction with CRM technology, the mediating effect of customer knowledge and the moderating effect of supply chain integration. Sales force automation (SFA), as operational CRM applications, are also included in the exploration. Given the strategic imperative nature of effective customer service and the evidence that forty percent of customers who experience poor customer service stop doing business with the target company (Dougherty and Murthy 2009; Pavlou and El Sawy 2010), in this paper it is also explored why the use of CRM technology might not always deliver the expected customer relationship performance outcome.

Second part of the construct of the paper is to understand the factors that affect user satisfaction of information technology. The customer service provided by front-line employees and the interaction between the front-line employees take place in the CRM systems. Front-line employees are the users of the information technologies, and they are the direct provider of customer service. It's also empirically meaningful to understand what would affect employees' user satisfaction of information technology because of employees' close contact to customers they serve.

The third part of the main construct is the study of the impact of front-line employees' user satisfaction of information technology on employee service quality and thus customer satisfaction. The service profit chain (SPC) theory will be introduced in the beginning of this part. Most often in business context, once the CRM technology is implemented it will be rolled out to the entire organization and eventually become part of the business infrastructure in which the front-line employees engage with customers. In other words, in most circumstances the CRM become mandatory for the employees to perform customer service. Impact of user satisfaction with mandated CRM use on employee service quality is also studied. The impact of service quality and customer satisfaction is briefly discussed.

## 2. The Role of Information Technology in Customer Relationship Performance

Customer service has been strategically critical for most firms. It is a top priority for many business and information technology (IT) executives. A one-point rise in a firm's customer satisfaction index corresponds to an average $240 million increase in market value (Sweat and Hibbard 1999), projecting to today's $364 million. According to a study of 300 IT executives, the top two key strategic technology, business, and IT project implementation priorities are understanding and meeting customer needs and improving customer service (Davis 1999).

Firms are trying to get closer to their customers and transforming the customer relationship into providing support and service via solution finding and partnering. Customer support and service consist of the way that a product is presented, ordered, delivered, bundled, charged, installed, repaired, renewed and improved. With its function in managing and developing

successful long-term customer relationships, customer support and service is becoming one of the most critical core business processes (Sawy and Bowles 1997).

Nowadays it has become common agreement among scholars and business executives that quality customer service is not only the most important condition to achieve outstanding marketing goals, in terms of customer satisfaction, but also is the major measurement of the competitiveness of the customer service process (Szymanski and Henard 2001; Zeithaml 2000). Meanwhile the increased focus on customer service has elevated the priorities of information systems, implying that the essential role of IT in supporting the customer service process (Sawy and Bowles 1997).

The scope of this paper lies in the roles and impact of information systems use in the business process on customer side. Customer relationship management IT solution is the focus of information systems in the front-line business engagement.

Therefore, in this section of the paper, customer relationship management (CRM) technology will be studied, representing information systems in front-line business process. Parallelly, sales force automation (SFA) technology, representing operational CRM applications in support of selling tasks, will be studied as a CRM technology as to its role in customer service.

## 2.1 The Roles of CRM in Customer Relationship Performance

### 2.1.1 The Role of Relational Information Processes in Customer Relationship Performance

Customer relationship management (CRM) is a core organizational process that focuses on establishing, maintaining, and enhancing long-term connection with customers (Srivastava et al. 1999). As specific types of business process, relational information processes are a collection of linked tasks in the CRM context.

Jayachandran et al. (2005) define relational information process as encompassing the specific routines that an organization uses to manage customer information in customer relationship management. Jayachandran et al. (2005) examine the key drivers and outcome of relational information processes. The construct and findings of the research by Jayachandran et al. (2005) are presented in the following section.

Relational information processes support and facilitate the collection and use of customer information in a systematic way so that an organization builds relationships effectively and avoids poor communication, information loss and overload, and information abuse. Researchers suggested that the relational information processes construct consists of five dimensions (Jayachandran et al. 2005):

Information reciprocity

Information capture

Information integration

Information access

Information use

Information reciprocity sets the foundation of effective communication, information capture and integration prevent information loss, information access limits information overload, and information use rules ensure that customer information is used appropriately with the needs of CRM for customer service.

The antecedents to relational information processes need to be identified. The antecedents include customer relationship orientation and customer-centric management system. Customer

relationship orientation is rooted in the organization's overall culture and guides the organization's approach toward both customer relationship management and the implementation of the necessary processes (Day 2000). Customer relationship orientation builds a "collective mind" (Weick and Roberts 1993) or a belief system for the organization. With the belief, the organization considers customer relationship an asset and makes the choice of means, by means of processes, to achieve this outcome (Day 2000). Because relational information processes are the ways to build effective relationships, customer relationship orientation can lead to CRM implementation.

A customer-centric management system ensures that organizational actions be driven by customer needs and not by the internal functional concerns. At the same time, employee evaluation systems and incentives should be designed to encourage employees to act with a customer relationship-oriented mindset, and thus make sure the organization to focus on customer interactions and ensure that expertise from all functional areas is deployed to enhance the quality of customer experience (Day 2000). A customer-centric management system can break down functional barriers, form customer-centered actions, and ensure necessary focus on customer interaction. The relational information processes that are created in a customer centric management system can be expected to have outcome of effective relationship management. Both antecedents corelate with relationship information processes positively.

With the five elements - information reciprocity, information capture, information integration, information access and information use – relational information processes initiate and augment a collection of structured activities that lead to effective customer relationship management outcome.

Customer relationship performance outcome can be measured by two key aspects of relationships: customer retention and customer satisfaction. Following the established relational information processes, front-line employees can provide quick and effective responses to customers, and customized service is likely to enhance customer satisfaction. Relational information processes help to capture customer needs and make it possible to incorporate customer needs into the development of products or services; the processes also help register customers' complaints and address them promptly. The integration of customer information not only allow different functional areas support front-line customer contact employees in their work, but also enable customers to communicate with their contact, the front-line employees easily and effectively because the employees are empowered with integrated customer knowledge. The fluent information flow between the organization and customers can improve customers' efficiency and upgrade customers' perception in consuming the organization's products or services, and therefore enhance customer satisfaction and loyalty.

## 2.1.2 The Role of CRM Technology Use in Customer Relationship Performance

The rapid advance in information technology (IT) has presented firms with new technology-based solutions, including CRM technology, to manage customer relationships. Such technology is a set of IT solutions designed to support the CRM process (Rigby et al. 2002). Rigby et al. (2002) define such technology as a set of IT solutions designed to support the CRM process. Many companies have invested in CRM technology in order to identify profitable and unprofitable customers, customize service, and retain customers (Peppers et al. 1999).

Jayachandran et al. (2005) consider CRM technology use distinct from the relational information processes that drive CRM and evaluate the role of CRM technology use in customer

relationship management by examining its moderating effect on the association between relational information processes and customer performance.

The use of CRM technology enables information integration and share, facilitates efficient and effective interaction between an organization and its customers, enables analysis of customer information and customizes the responses to customers. Thus, CRM technology use can be expected to boost the ability of an organization to sustain profitable customer relationships (Day 2003). Technology components of CRM include front-line office applications that support sales, marketing and service, and data acquisition and storage, as well as back office applications that help integrate and analyze the data (Greenberg 2001). IT does not substitute for organizational processes, and instead its role is moderating between the processes and customer relationship performance. IT increases the processes' marginal value by enabling effective implementation (Hitt and Snir 1999). Therefore, firms use IT technology to complement organizational processes by augmenting their marginal value (Brynjolfsson and Hitt 2000). Reinartz et al. (2004) note that CRM technology is a facilitator of CRM activities. By playing a complementary role, CRM technology enhances the marginal value of relational information processes, thereby improving customer relationship performance.

Although CRM technology can perform a complementary role to improve customer relationship performance, the results of adopting CRM technology in different organizations have been mixed. Jayachandran et al. (2005) suggest that this might happen when appropriate relational information processes are not implemented. Further exploration about the reasons of malfunction will be discussed in the later part of the paper.

### 2.1.3 The Effect of Customer Knowledge and Supply Chain Integration in CRM Applications' Role on Customer Service Quality

Mithas et al. (2005) suggest the role of CRM applications on customer service quality, in terms of customer satisfaction, is mediated by customer knowledge and moderated by supply chain integration. Customer relationship management applications help organizations to understand customers' behavior through the interaction with customers, including pre-sales, placing order, making transaction and aftersales service. The applications facilitate the acquisition and storage of data of customer preference and requirement, and the analysis help the organization understand customers better and thus serve the customers better. The raw customer data are collected with the CRM applications. After being analyzed the data turn into information that is useful in business activities; when the customer information is accumulated, shared and learned by employees in the organization it turns into customer knowledge.

Supply chain integration means an organization shares information about its customers with its supply chain partners (Mithas et al. 2005). The integration connects the dots of the value chain, including various functional areas within the organization and its suppliers. The CRM applications facilitate fluent information flow and coordination, which is needed for product development and delivery with better customer experience. When supply chain integration is well implemented with the antecedent of an integrated IT infrastructure, customer knowledge can be accessed by both the organization and all the partners in the supply chain. The organization can leverage customer knowledge to deliver quality customer service, and the supply chain partners can coordinate and support the delivery in the broader business process.

Based on discussion of the mediation effect of customer knowledge and moderation effect of supply chain integration, Mithas et al. (2005) suggest that the use of customer relationship management applications is associated with greater customer satisfaction. CRM applications facilitate organizations to gain customer knowledge. Organizations use CRM applications to

accumulate information across customer interactions, analyze the information and transform it into customer knowledge. Customer knowledge assists in the product development process of the organizations so that the products or services meet customers' requirements and deliver best value to customers. Suitable products and customized delivery are the foundation of good customer service quality, after which comes customer satisfaction. Because CRM applications facilitates customer knowledge accumulation and supply chain integration, organizations use CRM applications to process and respond to customers' order, request and complaints in a timely and consistent manner. The responsiveness and consistency enhance customer experience and improve customers' perception of liability about the front-line employees and thus the organization.

CRM applications facilitate supreme quality of products and customer service quality and build customers' perception of liability. Thereby customer satisfaction comes along. Customer knowledge mediates the role of CRM on customer service quality, and supply chain integration in the CRM process and the whole system moderates the service outcome.

## 2.2 The Role of SFA in Customer Relationship Performance

In the modern world the dynamic of the sales territory is vital, and firms need a new vision of the sales function to create more value and to gain competitive advantage. Therefore, organizations invest heavily in customer relationship management (CRM) software solutions. As an operational CRM system specialized in the front end of the process, sales force automation (SAF) has been a hot spot for the CRM investment for many organizations (Widmier et al. 2002). SFA involves the application of information technology to support the sales function (Boujena et al. 2009). Other experts suggest that SFA means remote access to a continually

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updated centralized database by sales people (Parthasarathy and Sohi 1997). Therefore, SFA can be categorized as an operational CRM application, and is able to collect and communicate market information, assist sales activities and support the development of value-added customer relationships (Ahearne et al. 2008).

SFA brings benefits to both employees and customers. Customers' perception of the benefit reflects the effectiveness of SFA (Ahearne et al. 2004). SFA is designed and implemented to ensure sales force productivity, which has direct and instant impact on customers. Given the initiative, customers' perception of the benefit they receive, demonstrated by employees' qualities such as productivity, skills, competencies and responsiveness, can be the measurements of SFA success (Othman et al. 2009).

In industrial settings, customers' perception of service quality during the interaction with sales force influence overall customer satisfaction the most (Homburg and Rudolf 2001). Boujena et al. (2009) also measure SFA benefits from customers' perspective, and based on a relationship-building process, evaluate the role of SFA from the following five levels: salesperson productivity, information processing, communication effectiveness, perceived competence and customer relationship quality.

**Salesperson Productivity**

SFA is usually considered to happen when organizations computerize their business processes or apply technology to improve the effectiveness and efficiency of their sales force (Boujena et al. 2009). Effective implementation of SFA can yield enhanced productivity through better customer prospecting, development, and account profiling (Pullig et al. 2002). SFA help to increase the organization's capacity to learn customer needs, provide customized options, make

informed decisions, develop mutually beneficial customer relationships and improve front-line employees' productivity (Hill and Swenson 1994). With SFA, salespersons can access information that reflects both individual customer's needs and overall market dynamic in a timely and systematic manner. Finally, it's proposed that IT can facilitate data interpretations and analyses (Huber 1990) and positively impact front-line employees' productivity and effectiveness (Igbaria and Tan 1997).

SFA reduces the time spent on administrative tasks and provides faster access to timely information (Rivers and Dart 1999). Customer contact management tools can enhance salesperson efficiency by organizing contacts in a way that salespersons can use to create value for both customers and the organization. Finally, SFA can help front-line employees to respond faster (Gilbert 2004), which impact customer's perception of customer service quality.

**Information Processing**

SFA is operated on a centralized CRM database. The database enables sales force to access to large amount of information on products, customer records, competitive products and prices, customer production plans, industry events and market trends. By SFA, salespeople can communicate with customer about the features and benefits of the products or services, understand customer requirement and fulfill customer needs better. SFA enables organizations to offer more products and services that will be welcomed by the customers and create more relevant information from the analyses of customer data (Boujena et al. 2009). When the relevant information is shared, absorbed and leveraged by employees, the information can turn into embodied customer knowledge. Therefore, using SFA technology, salespeople can reduce the time navigating in the huge customer data and focus on critical information, use the information to better demonstrate customer benefit and close the sale (Jayachandran et al. 2005).

**Communication Effectiveness**

Sales technology applications help salespeople interact with customers rapidly and relevantly, which improves their responsiveness and capacity to meet customer needs (Ahearne et al. 2008). The greatest potential of SFA for an organization stems from shared contact information and improved coordination across the organization's various customer service functions (Boujena et al. 2009).

**Perceived Competence**

SFA provides more and relevant market intelligence to salespeople with easy access, and therefore salespeople are empowered with higher competence (Huber 1990). A survey indicates that sales managers believe information technology influences buyers' perceptions of salesperson competency; ninety percent of those surveyed decided to adopt SFA technology because it made salespeople appear more professional and competent (Colombo 1994; Keillor et al.1997).

**Customer Relationship Quality**

Although the above four benefits are presented directly about salespeople, who interact directly with customers, they all lead to customer relationship quality, which is the direct outcome of SFA. Lagace et al. (1991) define customer relationship quality as the bundle of intangible value related to the interchange between buyers and sellers, and Crosby et al. (1990) define it as a buyer's trust in a salesperson and satisfaction with the relationship.

Hitt and Brynjolfsson (1996) evaluate the impact of CRM technology on customer relationship quality and suggest that overall IT investment leads to increased customer value. Fisher (2001) states that the influence of people for CRM is probably the most important element. Technological implementation can improve interactions in terms of time, intensity, and

emotions (Kasper-Fuehrer and Ashkanasy 2001). When it comes to selling and buying activities, SFA helps to develop buyer-seller relationships and enhance the buyer's trust in the salesperson (Keillor et al. 1997). Hawes et al. (1989) identified five factors that may increase the potential for buyer-salesperson trust, including customer orientation, competency, honesty, dependability, and likability. SFA can help salespersons to demonstrate the qualifications and thus build customer trust.

Salespeople demonstrate customer orientation when they propose products based on customer needs, help to solve customer problems by providing adequate customer service and be responsive. SFA technology helps to organize product information in a way that salespeople and access and present to customer according to customer needs and provide solution combinations automatically and quickly when salespeople only input minimum parameters of customer requirement. The ability to quickly address customer questions and solve their problems can increase the customer's perception of salesperson credibility as well as trust in the salesperson. SFA applications can manage customer contacts so that salespeople can recognize and access the contact information anytime they need to reach to customer in any forms such as phone call, email or even social media. When the product and service and problem solutions are delivered in a consistent and timely manner, customers can perceive dependability of salespeople. Fisher (1998) indicates that the implementation of SFA technology is linked to higher revenues because it supports salespeople to enhance customer satisfaction and thus increase sales proposal closure rates and customer retention.

Sales force automation (SFA) is one type of operational CRM technologies in the customer side of the business process. SFA involves the implementation of information technologies to collect and communicate information about customers and the market, assist sales activities and

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support customer relationship development. In this section, the role of SFA on customer service is assessed from five levels: salesperson productivity, information processing, communication effectiveness, perceived competence and customer relationship quality. SFA assists salespeople demonstrate the performance that can enhance customer experience, by facilitating customer information collection and analysis, providing salespeople structured product information and solution proposal and supporting salespeople to respond to customers timely and effectively. At each level of the relationship-building process, SFA demonstrates a powerful tool to provide quality customer service and as a result enhances customer satisfaction.

## 2.3 Some Factors Why the Use of CRM Technology Might Not Always Deliver Expected Customer Relationship Performance

### 2.3.1 Ineffective Interaction of Relational Information Processes and CRM

Jayachandran et al. (2005) provide insights into why the use of CRM technology might not always deliver the expected customer relationship performance outcome by exploring the interaction of relational information process and CRM technology.

As discussed earlier, relational information processes ensure customer relationship orientation by structuring the routines in which an organization should use customer information in effective customer relationship development (Jayachandran et al. 2005). If these processes are not clearly defined or specified, front-line employees as well as supporting-function employees will struggle to follow the predesigned routines. CRM technology is intentionally adopted for fluent and effective customer information management. When the users, including the front-line employees and supporting-function employees, cannot leverage the advantages of the CRM technology to serve the customers without adequate information collecting, processing and

utilizing. Implementing IT solutions with the absence of appropriate process design and adequate training may cause "significant productivity losses as any benefits of computerization are more than out-weighed by negative interactions with existing organizational practices" (Brynjolfsson and Hitt 2000). Jayachandran et al. (2005) provided further findings of the interviews of organizations that had implemented CRM technology. In some organizations the implementation of CRM technology was driven by mere technology instead of IT strategy aligned with business strategy or user needs. These organizations usually experienced frustration with CRM technology use. In some organizations, even if the planning and execution of the IT initiatives (CRM technology use) was carried out with strategic alignment among different functional areas, users still struggled to adopt the CRM technology as a new way of working, because the learning curve was too steep, and the users had to retrace their steps and redesign processes and software. Some organizations failed to implement many aspects of the technology, so they dailed back the technology implementation, prioritized a few specific applications, and made it to fulfill the relational marketing intention, which is effective customer relationship management via CRM technology (Jayachandran et al. 2005).

### 2.3.2 Supply chain integration

Many researchers have pointed out that it's crucial to integrate IT systems to an organization's value chain in order to achieve the full benefits of fluent information sharing and data synergy (Brohman et al. 2003). For example, the moderating effect of supply chain integration in the role of CRM applications on customer service quality was discussed in the previous section of the paper. Fisher et al. (2000) suggest that data accuracy enhanced by IT is critical for accurate in-time forecasting and agile supply chain management processes. Anderson et al. (2003) argue that "interweaving of IT links through-out the supply chain create value by

enabling each member of the supply chain to identify and respond to dynamic customer needs." CRM technology is an organic part of an organization's IT systems, and it's implemented in the organization's overall IT infrastructure, in which it is linked to other functional areas, including supply chain. Nowadays customer needs are ever changing in a faster and faster pace and competition landscape is evolving more quickly. Operating in an integrated IT infrastructure, an organization's functional units are able to leverage their resource effectively and efficiently address the rapid changes while still meeting customer needs (Sambamurthy et al. 2003).

If supply chain system is not linked effectively with the CRM system in an integrated IT infrastructure, customer knowledge cannot be accessed by the parties from both the organization and the supply chain. Supply chain partners cannot access or leverage adequate customer information provided by the CRM system, consequently nor can they adjust to the changes at the same pace as the organization's front-line units to support the quality customer service.

Researchers and practitioners have proposed that the cause of many CRM implementations' failure is "the propensity of firms to avoid the important 'data transformation and convergence' processes including all transactions, interactions, and networked touch points" (Swift 2002). It When an organization effectively integrates its supply chain systems with its CRM applications, both supply chain management and customer relationship management can benefit more from improved customer knowledge, shared by both sides. On the other hand, if supply chain integration is not well implemented, customer information cannot flow fluently in the organization's value chain; consequently, the core benefit of CRM technology, which is related to improved customer relationship via quality customer service, cannot be fulfilled due to lack of effective support from supply chain partners.

### 2.3.3 Organizational and Contextual Factors and Human Factor

Although the benefits of the use of CRM technology, including SFA technology, have been widely accepted and most firms in the modern business world have adopted more or less CRM technology, hoping to reap the benefits, a stream of literature still suggests that CRM technology use can sometimes hurt customer service performance as well. In the studies of Speier and Venkatesh (2002), some firms' absenteeism and voluntary turnover got worse significantly after implementing technology, while perceptions of organizational culture deteriorated and job satisfaction decreased. These findings illustrate the inconsistency of IT outcomes.

Ahearne and Rapp (2010) explain the IT paradox by three factors. The first factor is the importance of customer relationship in the selling. The more important a relationship is to the effective interaction between the salespeople and the customers, the more likely the relationship will moderate the link between customer-specific technology. Relational Selling will weaken the positive link of CRM technology with customer service quality and sales activities outcome. The second factor is the role of persuasion. Ahearne and Rapp (2010) argue that technology alone cannot persuade a customer but will weaken the positive relationship between customer-specific technologies and both employees and customers. A successful persuasion needs four main components: good timing, mutual benefit, perception of authority and embodied knowledge. Not CRM technology but salespeople and customer service employees can demonstrate the persuasion components. The third factor is product complexity. The more complex the product is, the more involvement of the salespeople is needed to communication with customers about their needs and customize the product or solution proposal to address the needs.

Other literature has also supported that organizational or contextual factors are important moderators from the link of technology usage to performance (Ahearne et al. 2005). For example, when a new CRM technology is first adopted, adequate employee training and IT

support need to be in place for to implement the technology and achieve the desired goals, which is effective customer relationship management and customer satisfaction.

The technology acceptance model (TAM) can also help to explain the human factor in the effective implementation of CRM technology (Ahearne and Rapp 2010). The TAM is a theory (Davis et al.1989) that models how users evolve to accept and use a technology. According to the model, a number of factors affect users' decision about how and when they will use a new technology upon its implementation (Davis 1989). The factors are related to the users, such as the technology's perceived usefulness and perceived ease of use.

The organizational and contextual factors and human factor are double-sided, when it comes to their influence on the implementation effectiveness of IT, specifically CRM technology. When the circumstances turn to be the unfavorable side as discussed above, they will weaken the performance of the CRM technology.

# 3. Factors That Affect Employees' User Satisfaction of Information Technology Use

Satisfaction is defined as consumer's fulfillment response (Oliver and Swan 1989). It depends on the consumer's judgement if a product or service provides a pleasurable degree of fulfillment upon the consumption. It includes categories of under-fulfillment and over-fulfillment. Whether the consumer's needs is fulfilled or satisfied or not involves two elements – an outcome or performance and a comparison reference. As for information technology users, Doll and Torkzadeh (1988) define user satisfaction as the affective attitude towards a specific computer application by the person who interacts with the application. Information technology user satisfaction is defined by Au et al. (2008) as an accumulative experience-base evaluation

developed along the time and represents users' general affection and cognition of the entire information systems user experience.

It's important for information technology management to evaluate the effectiveness of information technology in organizations. Among various assessments of information technology effectiveness or success, user satisfaction is one of the most widely applied measurements. Aligned with the importance of its significant sense to measure information technology's effectiveness, studying the factors that affect user satisfaction of information systems has become a hot topic. In business practice, it's also crucial for organizations to understand the factors affecting user satisfaction along the course of the implementation of an information technology.

Some studies suggest that psychological and organizational issues instead of the systems' technological issues are the causes of the failures of the implementation of information technology in organizations (Regan and O'Connor 1994). Some researchers argue one of the main causes of the failure of information systems project is that users don't have sufficient support and commitment. To fulfill the needs of users, on one hand, of course the information systems have to be functionally adequate, and on the other hand, users do play a role of the outcome of the information systems. Therefore, besides a functional information system and technology support, employees' willingness and ability to use the system is also required. Ang and Soh (1997) report the relationship between user satisfaction and user variables (such as user demographics) and user involvement. Athanassopoulos et al. (2001) discovered the strong relationship between user satisfaction and intended use or actual use of information technology. Aladwani (2003) refers to technological frames of reference and personality. However, not all of the personality attributes identified in Aladwani (2003) study significantly impact user

satisfaction. There have been assumptions that a technically well-performing information technology will result in high user satisfaction, but these assumptions have not been consistently demonstrated (Goodhue and Thompson 1995).

Many attempts have been made to access the effectiveness of information technology and its user satisfaction on a more solid base of supporting theories. Expectancy disconfirmation theory is one the main theories. But Khalifa and Liu (2004) questioned the application of expectancy disconfirmation theory in the context of information systems. Au et al. (2008) give further reasoning of Khalifa and Liu's question: with the complex and fast evolving nature of information systems development, it may be difficult for users to accurately anticipate the performance of information systems. It may happen that users may even have no prior expectations or don't know what an information system can offer.

Although numerous research has been done to explore the factors that affect user satisfaction on information systems, and researchers have proposed various factors and models for the measurements, there still lacks of a widely agreed consensus on a set of factors. So far existing models still may not be able to fully capture the underlying reasons for user satisfaction or dissatisfaction with information systems. However, with a stream of theories, models and proposed measurements, some factors are frequently referred and used.

## 3.1 Theory Basis

Landy and Becker (1987) put forth three theories of motivation, which consist of expectancy theory, needs theory and equity theory and all of which use satisfaction as the dependent measure.

According to the expectancy theory, fulfillment can only be measured related to a standard that make the basis for comparison; thus disconfirmed expectation is broadly considered as one of the key reference standards and factors of consumer satisfaction (Oliver 1989). Other information technology researchers also identify the impact of user's expectations of information technology on their levels of satisfaction with the technology.

Equity theory has been applied in consumer behavior research as an important factor of transaction or product satisfaction (Oliver and Swan 1989). According to equity theory, an individual will feel dissatisfied if his/her own inputs are larger than the benefits he/she can get, regardless of the benefit-input ratios of other people (Oliver 1980). Input is considered as what an individual perceives to be his/her contribution to an exchange when he/she expects a return (Adams 1965). In the context of information systems, the inputs and benefits for information systems are not clearly specified yet and needs further research effort.

The needs theory was primarily developed based on the researches back in 1940's to 1960's. When deficiencies of a need exist, individuals are motivated to take action to remove them so as to meet the needs (Steers and Porter 1991). It's been found that needs fulfillment significantly correlates to satisfaction. Sirgy (1984) suggests that satisfaction is more likely to be determined by the level of which product performance fulfills needs than the level of which performance compares with repurchase expectations. Therefore, knowing an individual's needs of different categories is critical to satisfaction prediction. This is constantly verified in the practice of sales and marketing, in which understanding customers' needs is one of the primary requirements for effective sales result and customer satisfaction.

## 3.2 Findings from an Equitable Needs Fulfillment Model (Au et al. 2008)

Based on equity and needs theories, Au et al. (2002) propose a new end user satisfaction (EUS) model, in which each individual user benefit received is compared against the corresponding input required with information technology use. In a follow-up study, Au et al. (2008) further develop the conceptual model and test the key concepts and relationships empirically, proposing an equitable needs fulfillment model. The model is believed to offer more explanation than many current models and provide a framework to investigate the antecedents of user satisfaction formation. It's proposed that information technology users seek to fulfill three types of needs: work performance fulfillment, relatedness fulfillment and self-development fulfillment. By identifying three separate needs fulfillments, it's expected to reveal more insights on the way various needs affect user satisfaction.

Work performance fulfillment refers to the user needs that are fulfilled in completing assignments when the user use information systems at work. This is the fundamental needs that information systems are supposed to fulfill. Relatedness fulfillment consists of the social needs of the user that involve interactions with other people. Self-development fulfillment corresponds to users' higher-end needs, including individual self-growth and self-advancement that are achieved by using the information systems.

The model includes six variables, which are information systems (IS) performance, information systems (IS) performance expectations, equitable relatedness fulfillment, equitable work performance fulfillment, equitable self-development fulfillment, and finally end user information systems (IS) satisfaction (Au et al. 2008). The end user IS satisfaction is the dependent variable.

Au et al. (2008) study of the model reveals that perceived IS performance is the most significant determining factor of user satisfaction. Equitable work performance fulfillment and

equitable relatedness fulfillment are significant in directly affecting user satisfaction. There is direct and moderating effects of IS performance expectations on user satisfaction, but the effects are not significant. No direct significant impact of equitable self-development fulfillment of user satisfaction was found.

# 4. Impact of User Satisfaction of Information Technology on Employee Service Quality and then Customer Satisfaction

## 4.1 Service Profit Chain (SPC)

The service profit chain (SPC) theory can be a starting point to understand the chain of impact. The SPC theory provides links among internal service quality, employee satisfaction, employee retention & productivity, external service value, customer satisfaction and revenue growth & profitability (Heskett et al. 1994). According to the theory, customer satisfaction is largely affected by the value of the service customers receive, while the value is created by the employees. The external service value can be considered as equivalent of the service employees' service quality. Mediated by employee retention and employee productivity, the external service value is driven by employee satisfaction. Internal service quality lies in the beginning of the service profit chain and drives the employee satisfaction.

By service profit chain theory, internal service quality refers to how the working environment facility and support the employees to fulfill their work objectives. The internal quality is measured by the perception of the employees towards their job, coworkers and the working environment. Internal service quality directly affects employee satisfaction. Heskett et al. (1994) propose several factors that may influence the internal service quality, including workplace design, job design, employee selection and development, employee rewards and recognition, and

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finally, tools for serving customers. In context of this paper, information systems, such as CRM and SFA, are the tools that frontline employees use to serve customers. Implied by the technology acceptance model, IT adoption impacts employee satisfaction.

Employee satisfaction contributes to low employee turnover rate. Higher employee royalty can be observed among satisfied employees. Employee loyalty interact with employee productivity. When the employee turnover rate is high, the firm has to invest resource in recruiting, hiring and training replacement. Due to the learning curve, there exists the loss of employees' productivity among the new replacement and coordination across the organization. So employee royalty drives productivity.

Service employee productivity can be evaluated by multiple measurements. Proposal of the right product or service that meets customers' needs, prompt response to customers' request, appropriate handle of customers' complaint, and maintenance of customer bond to the organization all contribute customer satisfaction.

## 4.2 Impact of User Satisfaction on Employee Service Quality Under Mandated CRM Use

When the use of information systems, specifically in this research, CRM, is mandated, which commonly exists in the business world, if or when the employees are dissatisfied with the mandatory implementation, the outcome of the use of CRM may be contrary to the management's expectation.

Hsieh et al. (2012) explore the impact of user satisfaction with CRM use on employ service quality in the mandatory-use context and discuss the prediction effect of employee service quality on customer satisfaction with customer service employees.

Consistent with the concept indicated by the service profit chain (SPC), Hsieh et al. (2012) highlight the importance of the factor of support or tools for serving customers, including information systems, such as CRM. The support or tools are the initial driving factors of the service profit chain, which leads to employee service quality and ends with customer satisfaction and revenue growth and profitability.

Service quality provided by frontline service employees has direct and significant impact on customer satisfaction. Customer satisfaction is one of the key factors for a firm to retain existing customer, attract new customers and thus grow sales. Knowing the marketing significance and financial significance of customer satisfaction, as well as the correlation between customer satisfaction and employee service quality, more and more firms are implementing customer relationship management systems (CRM) to enhance employees' service quality.

Employees are either mandated to use the customer relationship management systems or are allowed to use it voluntarily.  In majority of the firms, once implemented, the customer relationship management systems are imbedded in the business routine and infrastructure of the operation system, the use of the CRM systems are obligated. McCalla et al. (2003) point out many organizations mandate their employees to use CRM during customer interactions. The technology acceptance model (TAM) (Davis 1989; Wu and Lederer 2009) suggests the voluntariness of the use of information systems affects the intended outcome of the information systems, which implies that the involuntary use of information systems may have discrepant outcome.

Different employees may need different support to do their service work, with various education levels, experience, characters etc. So the use of the same CRM may meet different employees' needs to different extents. Along the time, employees' experience with CRM, which

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can be translated into user satisfaction, and affect their attitude toward the tool and ultimately, the service performance. When the use of information systems, such as CRM, are mandatory, the degree of user satisfaction reflects user's own perception of their user experiences with the system (Scheepers et al. 2006). Since the perception is objective, it can't be mandated even if the use of the system is obligated. When employees perceive the information systems (CRM) can fulfill their needs to service the customers, they are satisfied; when employees perceive the information systems don't adequately support their work, they are dissatisfied. When employees are satisfied with the implementation of the information systems, their positive attitude to the systems will reflect on their productive use of the systems. In this way, satisfied employees can get the most benefit out of the implementation of the information systems to serve customers. On the other hand, when employees are mandated to use the systems of which they have negative perception, they may still use the system because of the top-down pressure but they can not proactively leverage the systems' potential to serve customers; the initial intention of the implementation of the information systems is not achieved. Hsieh et al (2012) demonstrate that in mandatory CRM use context, user satisfaction with CRM have positive impact on employee service quality.

## 4.3 Employees' Embodied Service Knowledge as Moderating Factor Between User Satisfaction and Service Quality

Besides the direct impact of user satisfaction with CRM on employee service quality, there are moderating factors between the relationship of user satisfaction with CRM and employee service quality. Aligned with the service profit chain (SPC) theory, Heskett et al. (1997) argue that front-line employees or support systems, such as information systems, including CRM, are the most cost-effective way for customized service to meet customers' needs. The argument

implies that employees' personal competencies are somehow parallel to the function of service support systems, such as information systems in certain aspects of customer service.

Hsieh et al. (2012) study the role of front-line employees' embodied service knowledge and job dedication in the relationship between user satisfaction with CRM use and employee service quality in mandatory CRM use contexts. When the CRM cannot fulfill an employee's needs to work effectively, the employee starts to be dissatisfied. The dissatisfactory perception builds up along the time and results in user dissatisfaction. In this circumstance the employee may get around the ineffectiveness of the system by leveraging his or her embodied service knowledge to achieve his or her customer service goal. In the customer service front line, the service knowledge include product knowledge, service offerings, organizational business process, sales techniques, market intelligence, communication skills and etc. For example, if the CRM's special pricing process is slow, or the front-line employee's special price request is stuck at a joint of the evaluation chain because the backup of an absent reviewer is not effectively embedded to the CRM system, but the employee knows what is needed to get his or her price request evaluated and even approved, so the employee can prepare the materials for processing the request outside of the CRM. Meanwhile the employee knows how and who to advance the evaluation process off-line, the employee can go around the system and contact the relevant parties in person directly. The employee's embodied service knowledge compensates the ineffectiveness of the CRM and overcome the dissatisfaction of the information systems.

However, employees' personal competency and service knowledge vary. Employees with appropriate and sufficient service knowledge are more likely to achieve their service goals no matter they are satisfied with the information systems, such as CRM or not, because they can leverage their service knowledge to get the work done with or without the support of the system.

On the other hand, employees with deficient service knowledge are more vulnerable to the negative impact of user dissatisfaction on service quality because these employees cannot counteract on the CRM's ineffectiveness with adequate personal knowledge by taking other approaches to address their needs of customer service. Inconsistences of service quality and thus customer satisfaction may happen in case of employees' low user satisfaction of the information systems, such as CRM, depending on the employees' embodied service knowledge.

The above discussion on the moderating role of employees' embodied service knowledge demonstrates the importance of user satisfaction of information systems, such as CRM, for consistent and good customer service quality.

## 4.4 Impact of Service Quality on Customer Satisfaction

Service quality represents the degree to which the employees or entities satisfy its customers' needs. Service quality is linked to customer outcomes in terms of customer satisfaction, customer loyalty and purchase intentions. There has been a stream of literature studying the relationship between service quality and customer satisfaction. Here is a closer look at service quality: service quality is considered as the outcome of a service delivery system.

Surprisingly, there is no consensus in the research community about the causal relationship between service quality and customer satisfaction. In practice the impact of service quality on customer satisfaction can be affected by various other factors. For example, in a study examining the role service quality in overall service satisfaction with nursing home residents, Duff and Ketchand (1998) found that service quality doesn't necessarily lead to customer satisfaction and that an additional variable, customer well-being, significantly affects overall service satisfaction and furthermore customers' well-being is seemingly influenced by mood. In other words,

Customer satisfaction may not be affected by other factors such as service quality but by customers themselves.

Parasuraman et al. (1998) develop the SERQUAL model to measure the service quality perceived by customers who compare customers' own expectation and their actual judgement of performance. The SERQUAL model uses five service quality dimensions: reliability, tangibles, responsiveness, assurance and empathy (Parasuraman et al. 1988). Besides the SERQUAL approach, researchers try to understand other key antecedents of service quality than the five dimensions. The antecedents included organizational culture, employee empowerment, coworker support, leadership, employee training, tip size, service process, price and brand awareness (Oh and Kim 2017). With these antecedents, researchers still don't find a clear role of service quality in relation to customer satisfaction.

However, in research work, a common assumption is that service quality still may lead to customer satisfaction (Anderson and Fornell 1994; Duffy and Ketchand 1998; Mirandaa et al. 2018). In the context of information systems use, it's safer to summarize that service quality has a weak causal relationship with customer satisfaction.

Based on the research results, in addition to the service profit chain (SPC) theory, the relationship chain of employees' user satisfaction with information systems (i.e. CRM), employees' service quality and customer satisfaction is visible. Employees' user satisfaction with information systems has a positive impact on employees' service quality. However, service quality is not commonly agreed to have strong causal relationship with customer satisfaction.

## 5. Conclusions

The rapid advance in information technology has provided firms with technology solutions, such CRM and SFA to manage customer relationships and provide customer service. In this paper, an extensive literature review is conducted to understand the correlation between the use of information systems, customer service, employees' user satisfaction, employees' service quality and customer satisfaction. The role of customer relationship management systems on customer relationship management is demonstrated from multiple aspects, including relational information processes, technology use in CRM, mediating effect of customer knowledge and moderating effect of supply chain integration. The role of sales force automation (SFA), an operational CRM system, is also reviewed. Some factors that may explain why the use of CRM technology doesn't always deliver the expected customer relationship performance outcome are also included. The impact of information systems on employees' user satisfaction is investigated and no significant and clearly stated impact is found, but the relationship between these two variables is discussed by the three theories of motivation and a study with equitable needs fulfillment model. The impact of user satisfaction of information systems on employee service quality and then customer satisfaction is also examined, by applying the service profit chain (SPC) and reviewing a setting of mandated CRM use; employees' embodied service knowledge as moderating factor is considered. In all the literature that is reviewed, the consensus of significant positive impact of service quality on customer satisfaction is not found, and the relationship between these two variables are sparse and needs future research attention to be sorted out.

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