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CUSTOMER RELATIONSHIP MANAGEMENT (CRM) SYSTEMS SUCCESS FACTORS

Pedro Eduardo Facho do Nascimento

Proposal for Master Thesis report presented as partial requirement for obtaining the Master's degree in Information Management, with a specialization in Knowledge Management and Business Intelligence

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ABSTRACT

CRM systems are coming to the front for winning over new customers by developing service and products to improve customer satisfaction and to retain existing customers. Due to the huge impact CRM systems have in companies, understanding the factors leading to CRM systems success is of extreme importance. Customers' needs are evolving and firms must rapidly discover, anticipate and fulfill these changing needs through a quick and efficient customer response capability (CRC), supported by business analytics (BA). This study provides a deeper understanding of the determinants that positively impact a CRM systems success. This study proposes a CRM systems success model that includes Delone and Mclean ground constructs, as well as, modern factors regarding CRM systems success measurement. It also reports an empirical study developed through an electronic survey distributed to 130 companies located in Portugal and United Kingdom. This study applies quantitative methods in order to obtain results. Our findings demonstrate that CRM performance is positively influenced by CRC and BA use for CRM. Results demonstrate the determinant role of system quality on CRC, as well as, CRC on CRM performance. This empirical research discusses the theoretical and practical implications.

KEYWORDS

Customer relationship management, customer response capability, CRM performance, CRM systems

RESUMO

Sistemas de CRM são cruciais para adquirir novos clientes através do desenvolvimento de serviços e produtos a fim de aumentar a satisfação destes e para reter os já existentes. Devido ao enorme impacto que os sistemas de CRM têm nas empresas, é de extrema importância compreender os fatores que levam ao seu sucesso. As necessidades dos clientes estão em constante evolução e as empresas devem rapidamente descobrir, antecipar e preenchê-las através de uma rápida e eficiente capacidade de resposta ao cliente (CRC), suportada por análise de negócio (BA). Este estudo providencia um profundo entendimento dos factores que positivamente impactam o sucesso de sistemas de CRM. Este estudo propõe um modelo para medir o sucesso de um sistema de CRM, usando fatores base de Delone e Mclean, bem como, fatores modernos referentes à medição do sucesso de sistemas de CRM. É reportado um estudo empírico desenvolvido através de um questionário online distribuído a várias empresas. Os métodos utilizados para obter resultados são métodos quantitativos. As descobertas demonstram que o desempenho do CRM da empresa é positivamente influenciado pelo CRC e pelo uso de BA em CRM. Os resultados demonstram o papel determinante que a qualidade do sistema tem em CRC, bem como o papel que CRC tem no desempenho do CRM da empresa. Esta pesquisa empírica discute as implicações teóricas e práticas.

PALAVRAS CHAVE

Gestão da relação com o cliente, capacidade de resposta ao cliente, performance do CRM, sistemas de CRM

PUBLICATIONS

Customer Relationship Management (CRM) systems success factors (In peer-review in a Top Journal).

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LIST OF ABBREVIATIONS AND ACRONYMS

CRM	Customer Relationship Management
IT	Information Technology
IS	Information Systems
D&M	DeLone and McLean
BA	Business Analytics
IQ	Information Quality
CRC	Customer Response Capability
PLS	Partial Least Squares
SEM	Structural Equation Modeling
AVE	Average Variance Extracted
VIF	variance Inflation Factor

1. INTRODUCTION

Customers are educated, under higher stress, living longer and more influenced by global culture (Wilson, Daniel, & Mcdonald, 2002). Based on this belief, organizations' success heavily depends on the ability to drive customer relationship management (CRM). CRM is defined in several ways in marketing and information systems (IS) literature. CRM is currently thought as a method to create personalized solutions for customers (Luca, Nicuta, & Apetrei, 2018). It can be seen as the process of acquiring, maintaining, and partnering with selective customers (Parvatiyar & Sheth, 2001), to create value to customers (Rababah, Mohammed, & Ibrahim, 2011) and to the firm (Ruivo, Mestre, Johansson, & Oliveira, 2014). It encompasses the use of existing customer information to increase company profitability and customer service (Couldwell, 1999) while developing and maintaining proper relationships with customers (Payne & Frow, 2005) to create shareholder value (Payne, 2006). Furthermore, in order to develop a successful CRM strategy, information technology (IT) is needed (Pai & Tu, 2011). IT and IS are often brought together and associated with firm performance. CRM systems have exploded on the enterprise space (Ruivo, Oliveira, & Mestre, 2017) and Gartner stated that CRM turned out to be the largest software market in 2017 and will be the fastest growing software market in 2018 (Gartner, 2018). CRM tools increase the company's knowledge regarding the customer (Fróis, Pereira, & Ferreira, 2018). Consequently, it is of great importance the application of IT in CRM, mainly in its operational and analytical methods (Knox, Payne, Maklan, Peppard, & Ryals, 2002), in order to analyze data and mining knowledge from it (Ahn, Kim, & Han, 2003).

IS measurement has long been recognized as crucial by both IS researchers and practitioners (Ballantine, Levy, & Powell, 1998; DeLone & McLean, 1992; Irani & Love, 2002; Themistocleous, Irani, & Love, 2004). Two groupings arise when studying the efforts researchers have made when proposing a better way of evaluating IS: the first one is about the development of methods to evaluate IS; the second one regards the identification of factors impacting IS success (DeLone & McLean, 1992; Irani, Themistocleous, & Love, 2003; Seddon, 1997), which is this study's emphasis. Nowadays, IS evaluation is challenging (Brynjolfsson & Hitt, 1998; Irani, 2002; Serafeimidis & Smithson, 2003) and Delone & Mclean (2016) encourage us to be brave and bold. Moreover, it is not yet clear why various CRM projects become successful while others fail. A survey of 202 CRM projects found that only 30.7% were successful (Dickie, 2000). A complete understanding of what features lead to CRM success is the vital starting block for effective CRM systems implementation and deployments. CRM systems success' determinants need more in-depth studies, especially in understanding CRM systems determinant factors related to CRM performance.

Motivated by these topics, this study develops and tests a theoretical model grounded in a well-established IS literature to understand the main drivers of CRM systems success. Business analytics (BA) has been actively invested and widely adopted to support CRM technology (Nam, Lee, & Lee, 2018). This method leads to a higher CRM performance due to its abilities to manage data and to respond to customers' needs (Nam et al., 2018). Additionally, the use of these abilities will improve the organizations' customer response capability (CRC) (Jayachandran et al., 2005). CRC is crucial when attending customers' needs and wants. Fast and efficient actions will lead to sustained success (Jayachandran, Hewett, & Kaufman, 2004). Nam et al. (2018) studied the impact BA use, and CRC had on CRM performance – surprisingly, CRC had a weak impact on CRM performance. Due to the speed

customers' needs change and therefore the importance of quickly respond to customer needs (Narver & Slater, 2008), it is appropriate to test this relationship again. In order to understand the success determinants of CRM systems, it is appropriate to adapt DeLone & McLean's (D&M) information systems success model (1992,2003) and Nam et al.'s CRM systems success model (2018). This study uses 3 D&M dimensions as ground constructs – information quality, system quality, and service quality; and three constructs from Nam et al.'s model – BA use to CRM, CRC and CRM performance. Thus, the research question is: what factors positively impact the CRM performance?

Data were collected through an online survey to which 130 from 500 firms responded. The results of this study will be beneficial for companies who are implementing a CRM system and still deciding their options. It will allow them to understand the dimensions that will lead to the success of a CRM system, therefore positively impacting the CRM performance.

This paper includes seven sections. The second section presents the theoretical foundations of CRM, the history of information systems success and the groundwork of the research model. In the third section, it is explained, in more detail, the model's relationships, and suggested a theoretical model. The fourth and fifth sections describe the empirical study and present the results. The last two sections are the discussion and conclusions.

2. LITERATURE REVIEW

2.1. CUSTOMER RELATIONSHIP MANAGEMENT

Relationships are built through respect and loyalty (Fournier, Dobscha, & Mick, 1997). According to various studies (Buttle, 1996; Morgan & Hunt, 1994; Webster, 1992), marketing is about the development and preservation of mutually long-term relationships with customers. Relationship marketing was born on these relationships between firms and customers. By building and managing ongoing customer relationships, relationship marketing was a critical theoretical basis for CRM (Morgan & Hunt, 1994; Webster, 1992).

In the 90s, customer relationship management (CRM) originated from relationship marketing (Payne & Frow, 2006) and emerged in the information technology (IT) vendor and practitioner communities (Payne & Frow, 2005). It is a method of marketing, supported by relationship marketing theory (Morgan & Hunt, 1994). Nowadays, CRM is known as a customer-oriented strategy to manage the relationship with customers (Kumar & Reinartz, 2012).

CRM, a derivative of the American term ‘‘contact management” (Pai & Tu, 2011), focuses on establishing, maintaining, and enhancing long-term mutually beneficial relations with strategically significant customers (Buttle, 2001; Srivastava, Shervani, & Fahey, 1999). CRM also aims to generate profit by reaching to customers’ needs (Chen & Popovich, 2003), by cutting costs (Xu & Walton, 2005), and through customer retention (Day, 1994; Sivadas & Baker-Prewitt, 2000) – obtaining a new customer is far more expensive than retaining one (Abbott, Stone, & Buttle, 2001). In the beginning, CRM research focused on obtaining new customers (Lee & Chan, 2015), but then their concentration went to long-term relationships and customer retention (Blattberg & Deighton, 1995; Parasuraman, 1997; Payne & Frow, 2006). Companies should aim to the “economically valuable” customers in order to produce more value for both parties and to achieve business outcomes (Ahani, Rahim, & Nilashi, 2017; Charband & Jafari Navimipour, 2016; Giannakis-Bompolis & Boutsouki, 2014; Iriana & Buttle, 2006; Romano Jr., 2000; Verhoef & Donkers, 2001). A comprehensive knowledge regarding customers will facilitate the understanding of its needs and wants (Gwinner, Bitner, Brown, & Kumar, 2005), leading CRM to a positive impact on companies (Morgan & Hunt, 1994; Slater & Narver, 1995).

Customer loyalty is achieved through data measurement (Reichheld, 1996). Having this need in consideration, CRM has been thought as the information-enabled relationship marketing because of its use of IS to support CRM processes (Jayachandran et al., 2005; Parvatiyar & Sheth, 2001; Ryals & Payne, 2001). Information plays a crucial role in relationship marketing and CRM, but CRM can use IS and data analysis to unleash the potential of data and information (Jayachandran et al., 2005; Ling & Yen, 2001).

IT along with IS increase overall efficiency, effectiveness (Azadeh, Keramati, & Jafary Songhori, 2009), decision making quality (Davern & Kauffman, 2015; Melville, Kraemer, & Gurbaxani, 2004; Mithas, Ramasubbu, & Sambamurthy, 2011; Nevo & Wade, 2011; Ravichandran & Rai, 1999) and firm performance (Akter, Wamba, Gunasekaran, Dubey, & Childe, 2016; Davenport & Harris, 2013; Kim, Shin, Kim, & Lee, 2011; Tanriverdi, 2005). CRM success requires IT designed for CRM (Jayachandran, Sharma, Kaufman, & Raman, 2005), in order to build a more customer-oriented philosophy, generate

sales and assist marketing (Chen & Popovich, 2003; Xu & Walton, 2005). A CRM system has been defined as an information system to manage customer relationships (Rigby, Reichheld, & Schefter, 2002; Staiger, 1997; Tanriverdi, 2005) and information about customers, suppliers and competitors (Rollins & Gabrielsson, 2016). Adopting a CRM system brings benefits to the company (Kumar, Sunder, & Ramaseshan, 2011; Roh, Ahn, & Han, 2005), as well as, off-the-shelf CRM solutions (Hunter & Perreault, 2007; Shao & Lin, 2002; Wolfgang, 2002), customer value (Šebjan, Bobek, & Tominc, 2011), increased sharing of information (Day, 2003), customer loyalty (Phan & Vogel, 2010), customer retention (Day, 2003; Peppers, Dorf, Rogers, 1999; Sen & Sinha, 2011), better decision making and company's increased performance (Reinartz et al., 2004; Roh et al., 2005). IT speaking, CRM can be seen as an enterprise-wide integration of technologies working together (Bose, 2002; Lal & Bharadwaj, 2015), using customer data to develop strategies for each customer (Berger et al., 2002; Lal & Bharadwaj, 2015), as well as, mass customization techniques (Dewhurst, Lorente, & Dale, 1999; Verhoef & Donkers, 2001). CRM systems enable firms to execute more quickly and efficiently marketing actions due to its ability to integrate customer data (Chen & Popovich, 2003).

However, in the past, CRM technology viability was called into question (Reinartz et al., 2004; Rigby et al., 2002). CRM technology acquisition is not sufficient for a better CRM performance (Day, 2003; Ko, Kim, Kim, & Woo, 2008). Gartner Group (2003) referred the majority of CRM implementation as failures, and in 2007 stated that failures were between 29% and 71% (Fletcher & Bois, 2007). There was a remarkable investment in IS, but again many companies have failed to employ a successful system (DeLone, & McLean, 2008). Even though CRM was presented as a strategy in several companies, failures still occurred (Finnegan & Currie, 2010). IS success measurement is as complex as needed (Petter et al., 2008).

2.2. Information Systems Success

In the past, several models were already in use, but there was still a need for more effective success criteria (DeLone & McLean, 1992). Due to the tremendous impact IS have in companies, measuring their success has never been so important (Gorla, Somers, & Wong, 2010). This problem has been treated as a major concern and therefore extensively studied by the IS research community (Davis, 1986; Pitt, Watson, & Kavan, 1995). There were several studies and multiple variables (DeLone & McLean, 1992), always searching the underlying factor (Cavaye & Cragg, 1995; Johnston & Carrico, 1988; Reich & Benbasat, 1990).

Several authors in the field regard DeLone and McLean (D&M) work as a significant breakthrough (Pretty & McCarthy, 1991). D&M studied 100 IS success empirical studies during seven years, 1981-1987 (Seddon, Staples, Patnayakuni, & Bowtell, 1999), and developed a model considering 6 factors (Figure 1), with interdependencies between them (Hu, 2003), conceptualizing and operationalizing the success of IS: quality measures (system and information quality), attitudinal outcomes (use of system and user satisfaction), and performance-related outcomes (individual and organizational impact) (DeLone & McLean, 1992) – it was successfully tested (Iivari, 2005; Rai, Lang, & Welker, 2002) and considered one of the best studies in IS success investigation (Barry, Kappelman, & Prybutok, 1997). Seddon (1997) presented an extended version of the D&M model where the model was split into two variance submodels (of use and success), and the process model interpretation was eliminated (Gorla et al., 2010).

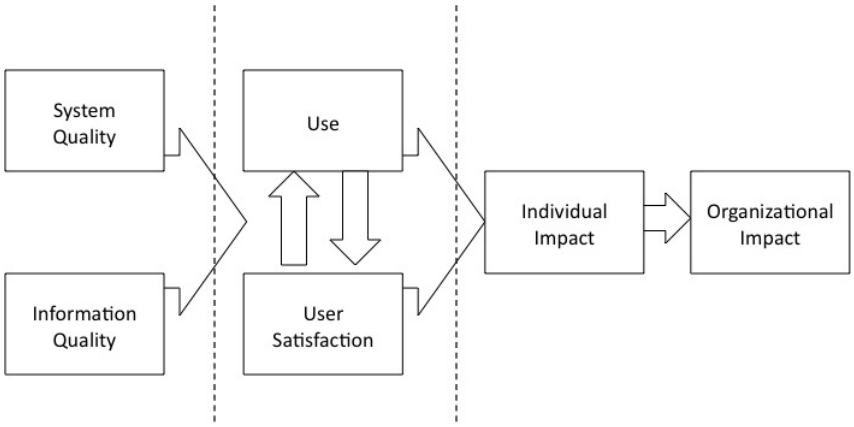

Figure 1: DeLone and McLean model (DeLone & McLean, 1992).

Referring that IS success models were intensely focused on the product, and based on D&M model, Pitt et al. (1995) developed an augmented model with one more measure: service quality (Figure 2). Since IS budgets were now more devoted to IS services, more emphasis was given to this dimension - SERVQUAL instrument, by Parasuraman, Zeithaml, & Berry (1988), was validated in IS context (Pitt et al., 1995; Watson, Pitt, & Kavan, 1998) and generally accepted (Kettinger, 1997). After six years, Parasuraman, Zeithaml, & Berry (1994) proposed and tested the SERVQUAL + instrument, also validated in the IS context (Jiang, Klein, & Carr, 2002; Kettinger & Lee, 2005).

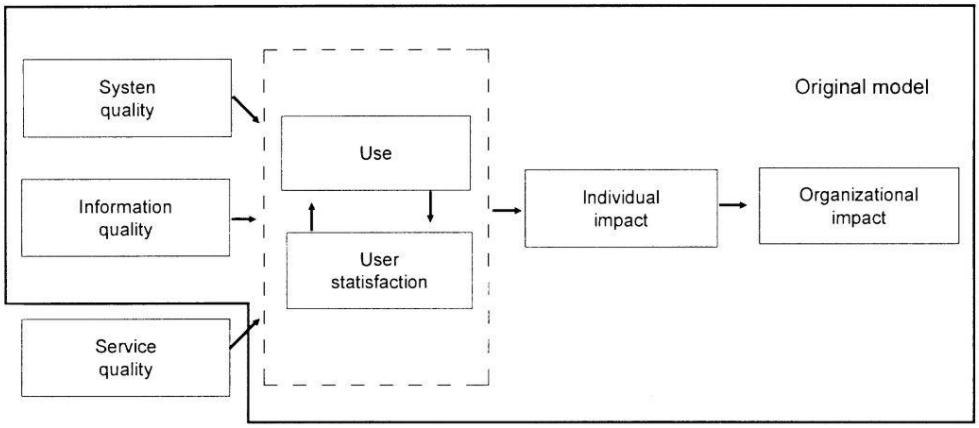

Figure 2: Pitt, Watson, and Kavan augmented model (Pitt et al., 1995).

Based on the evaluation of several contributors (Rai et al., 2002; Seddon, 1997; Seddon, Kiew, & Patry, 1994), DeLone & McLean (2003) updated their previous IS success model (Figure 3). As IT impacts much more than immediate users (Gorla et al., 2010), DeLone & McLean (2003) replaced two dimensions (organizational and individual impact) for "net benefits." Just like Pitt et al. (1995), D&M also added "service quality." It was successfully analyzed at the individual level (Petter et al., 2008; Sabherwal, Jeyaraj, & Chowa, 2006) and also without service quality (Wu & Wang, 2006).

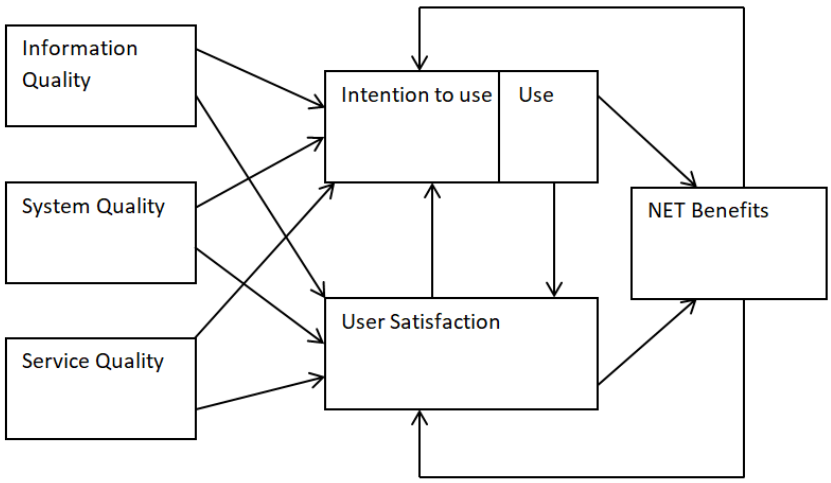

Figure 3: DeLone and McLean updated model (2003).

2.3. Information Quality

Knowing customers is dire to overall CRM success (Roh et al., 2005). Information quality represents a key factor in IS success (DeLone & McLean, 1992; Y. Lee & Kozar, 2006) and an important source of customer value (Licker & Molla, 2001). If well done, it delivers accurate (Popovič, Hackney, Coelho, & Jaklič, 2012), complete (Palmer, 2014; Vladimir, 1996), relevant (Wixom & Todd, 2005) and timely (Chuang & Lin, 2013) information. These fours measures are used by DeLone & McLean (2003). If the product (information) is not provided in time (timeliness) and does not conform to the necessities (relevance), clients (users) will not be satisfied (Clikeman, 1999). With the arrival of big data, a much higher level of data quality is required (Prahalad & Krishman, 2008). Poor quality of data raises product-related costs (Banker, Kauffman, & Morey, 1990; Russom, 2006; Swanson, 1997) and takes much longer to analyze – since analysis teams spend 90% of their time manipulating, cleansing and integrating data (Vidgen, Shaw, & Grant, 2017).

A CRM system uses quality information for almost everything. For instance, to customize functionalities and generate even more meaningful information for the end users – such as reports or online screens (DeLone & McLean, 1992), which will, of course, improve the decision making and managerial success (Lal & Bharadwaj, 2015). If the information is right, companies can make the right decision at the right time, and it will also reduce costs, diminish churn, comprehend relationships, anticipate trends, predict demand, and optimize campaigns (Roh et al., 2005), ultimately impacting firm's performance (Choo, 1998; Daft & Lengel, 2012; Porter & Millar, 1985; Raghunathan, 1999; Stvilia, Gasser, Twidale, & Smith, 2007).

2.4. Service Quality

Past studies have stressed the significance of providing a high quality of service (Teas, 1994; Zeithaml, Berry, & Parasuraman, 1996). Due to service intangibility, it is difficult to understand how users perceive it (Parasuraman, Zeithaml, & Berry, 1985). Service quality is defined as the quality of the information system support team (Gorla et al., 2010; Marsico & Levialdi, 2004; Wolfinberger & Gilly, 2011) and as the comparison between the expectation and the actually quality of the service provided (Alsaleh & Bageel, 2016; Gorla et al., 2010; Grönroos, 1982; Lewis & Booms, 1983;

Parasuraman et al., 1985; Sasser, Olsen, & Wyckoff, 1978). Bad service quality will lead to sales and customers loss (Delone & Mclean, 2004). Younghwa Lee & Kozar (2006), as well as, SERVQUAL (Parasuraman, Zeithaml, & Berry, 1994b), a well-known instrument, suggests empathy and responsiveness as essential measures. SERVQUAL also values assurance. IS experts (assurance) with excellent communication skills (empathy), will be able to quickly answer the end users (responsiveness) in order to generate better decision making, improved profitability, the customer wishes anticipation, precise sales forecasting and new business opportunities (Huang & Benyoucef, 2013). Responsiveness concerns to the expectation of service support, empathy is about the interaction that the support team can provide, and assurance reflects the capability of solving users' problems (Gorla et al., 2010; Huang & Benyoucef, 2013). Numerous studies (Teas, 1994; Zeithaml et al., 1996) also refer to follow-up service as an important factor when measuring service quality. The quality of the support team can be assessed by the support team expertise and the capability of providing quick response (Lal & Bharadwaj, 2015). SERVQUAL is also known for the ability to measure customers' expectation and perception of service quality. This instrument was successfully adopted by the IS area. It values responsiveness as the willingness to provide support, its quickness, and empathy as the caring and attention capability (Landrum & Prybutok, 2004; Van Dyke, Kappelman, & Prybutok, 1997; Watson et al., 1998). IS Service has a tremendous impact on the firm's success: when delivered on time and error-free will improve decision making and company's efficiency (Kettinger & Lee, 2005; Pitt et al., 1995).

2.5. SYSTEM QUALITY

System quality is recognized as a crucial factor in the use of an information system (DeLone & McLean, 1992). Nowadays, data is captured in different formats, and CRM systems must have capabilities to manage and analyze all these formats in order to get insights from it (Lal & Bharadwaj, 2015). The quality of an information system will impact not only the use of itself but also user satisfaction (Lal & Bharadwaj, 2015). System quality refers to data components and software, and it contributes to the measurement that evaluates if the software is technically sound or not (Gorla et al., 2010). If the information system presents quality, it will provide organizational benefits (Kim, 2004), such as cost reduction, increased revenues, and improved process efficiency (Bakos, 1987). In the opposite side, if an IS does not provide quality, it will, for example, increase the cost of the product (Gorla et al., 2010). Usually, software quality means system quality. If the software presents lower quality, it is prone to errors and security failures (Torn, 1990). Technology quality and ease of access are vital for learning effectiveness (Webster & Hackley, 1997). Bhimani (1996) was a supporter of, among others, rapid access (Bailey & Pearson, 1983; Belardo, Karwan, & Wallace, 1982; DeLone & McLean, 2003; Molla & Licker, 2001; Tiwana, 1998), quick error recovery and security. Several studies (Nelson et al., 2005) believed that the usability was the primary factor when evaluating a system's quality. A higher system quality will positively impact individual and organizational productivity (DeLone & McLean, 2003).

2.6. BA USE FOR CRM

Analytics is most used to analyze customers' insights from several sources, to improve frontline employee-customer communication and to reach real performance (Davenport & Harris, 2013; Lam, Sleep, Hennig-Thurau, Sridhar, & Saboo, 2017; Nam et al., 2018). Data is the new gold. Analytics will let companies know what keeps customers loyal. It will use traditional and new data to discover

patterns, with the primary goals of incorporating it in a production environment and provide employees with the best timely information to make quality decisions every day (Bean & Kiron, 2013; Park, Huh, Oh, & Han, 2012).

Even though analytics can be used by every organization (Park et al., 2012), this study will focus on the use of it for CRM. Analytics has been widely used to support firms' CRM due to its ability to analyze, integrate, and power information resources and customer feedback for a better decision-making, and by offering personalized services (Nam et al., 2018). It will improve the firm's ability to acquire and retain customers, to cross/up-sell and to increase business value (Coltman et al., 2011; Coltman, 2007; Jayachandran et al., 2005; Shanks & Bekmamedova, 2012) by using data mining and prescriptive analytics (Kim & Kim, 2009). These abilities will enable CRM to capture patterns and then respond to customer needs (Jayachandran et al., 2005; Ling & Yen, 2001).

Nevertheless, technology per se will not have meaning if it is not used (Bharadwaj, 2000; Bhatt & Grover, 2005; Orlikowski, 2000). The use of technology is one of the most critical factors that will lead to a firm's performance and success (Devaraj & Kohli, 2003). It is not about having the technology but how a firm uses the extracted information for decision making (Davenport & Beers, 2013; Diamantopoulos & Souchon, 1999; Rindfleisch & Moorman, 2001; Vuksic, Bach, & Popovic, 2013). CRM systems' use is a crucial point for its success (Pedron, Picoto, Dhillon, & Caldeira, 2016).

2.7. Customer Response Capability

Due to this hypercompetitive atmosphere of quickly shifting technology, customers' needs are changing and evolving (Jayachandran, Hewett, & Kaufman, 2004). Marketing literature has been advocating for a long time the significance of quickly respond to customer needs (Deshpande, Farley, & Webster, 1993; Kohli & Jaworski, 1990; Narver & Slater, 2008). A fast response is crucial because a delay can mean the loss of a sales/market opportunity (Krubasik, 1988), the loss of customer' commitment to the firm and, the loss of future revenues and positive word-of-mouth advertising (Reichheld, 1996). In order to achieve competitive advantage, firms must rapidly discover, anticipate and fulfill these changing needs (Bradley & Nolan, 1998; Day, 1994). These effective and fast actions are crucial for attaining success (Jayachandran et al., 2004) and innovation (Roberts & Grover, 2012). Alshawi, Missi, & Irani (2011) stated customer response/attitude as a crucial factor affecting CRM adoption in small and medium-sized enterprises. Efficacy and performance are higher when CRC is higher (Jayachandran et al., 2004; Roberts & Grover, 2012).

2.8. CRM performance

A successful CRM starts with the capture of the right customers (Dowling, 2002; Rigby et al., 2002; Verhoef, 2003; Winer, 2001). Companies should invest on the acquisition of the right customers - the ones who are loyal and profitable; and avoid bad customers – those that only shop products with discounts and in small quantities (Cao & Gruca, 2005). According to Jayachandran et al. (2005), CRM performance is supported by two key aspects: customer satisfaction and customer retention. As stated by several studies, CRM performance is grounded in company growth (Day & Van den Bulte, 2002; Zahay & Griffin, 2002), market share (Jayachandran et al., 2005; Schoder & Madeja, 2004), customer satisfaction (Croteau & Li, 2003; Stefanou & Sarmaniotis, 2003), profitability (Cao & Gruca, 2005; Kim, Suh, & Hwang, 2003) and customer loyalty (Colgate & Danaher, 2000; Gustaffsson, Johnson, & Roos, 2005). Reinartz et al. (2004) also value customer retention (Becker, Greve, &

Albers, 2009). Based on a model of 172 US corporations, Jayachandran et al. (2005) also found that if firms have relational information management processes, they tend to see the results in customer satisfaction and customer retention. Other studies found that CRM systems have a positive impact on customer satisfaction (Mithas, Krishnan, & Fornell, 2005; Soltani & Jafari, 2016), therefore having a positive impact on CRM performance (Keramati, Mehrabi, & Mojir, 2010; Kim & Choi, 2010). Coltman et al. (2009) and Krasnikov et al. (2009) state that CRM management philosophies positively impact CRM performance. A better relationship with customers will enhance loyalty, sales and CRM performance (Palmer, Lindgreen, & Vanhamme, 2005). These relationships are originated from CRM strategy, together with and enabled by a CRM system – these two aspects will use customer knowledge to improve clients' happiness and to keep them loyal, therefore enhancing CRM performance (Boulding, Staelin, Ehret, & Johnston, 2005; Mithas et al., 2005).

3. RESEARCH MODEL AND HYPOTHESES

3.1. RESEARCH MODEL

Based on D&M (2003), the efficiency of the IS support, the value of the customer data and the quality of the information system are the basis for every IS success study. Moreover, based on Nam et al. (2018), business analytics along with CRC represents a major competitive advantage and should have a tremendous impact on the CRM performance. This study combines dimensions of one of the best studies of IS success literature and variables of Liu & Arnett (2000) with a modern CRM success approach. Moreover, Teo and Wong (1998) concluded that satisfaction is not a distinct construct. Therefore, user satisfaction was excluded.

3.2. HYPOTHESES DEVELOPMENT

Analytics is the broad use of information (Davenport & Harris, 2013). Analytics starts with information management - this was confirmed by firms' interviews who stated the importance of data management for BA use (Nam et al., 2018). Marketing and IS literature distinguish the connection between information quality and its use (Citroen, 2011). Information quality is essential for BA use due to the tons of unstructured data captured from several sources (Prahalad & Krishman, 2008), and in the end to get accurate insights, increase business goals and create business opportunities (Nam et al., 2018). With the right information, analytics can discover the business value, to generate insights about clients and market behavior (Roh et al., 2005), in order to improve the data-driven decision-making process, enhancing the CRM performance (Bean & Kiron, 2013). Therefore, the following hypothesis is proposed:

Hypothesis 1a. Information Quality is positively associated with BA use for CRM.

Information quality is vital for CRM; it is used for taking the right decision, at the right time (Roh et al., 2005). CRC is evaluated by meeting customers' needs and taking effective and quick actions (Jayachandran et al., 2004). Customer knowledge will enable a company to discover clients' needs better, and it will improve the decision-making process (Jayachandran et al., 2004). Therefore, the quality of information is of great importance for a better capability to customers' response. Therefore, the following hypothesis is proposed:

Hypothesis 1b. Information Quality is positively associated with Customer Response Capability.

Service quality is defined as the general support delivered by the service provider (Delone & Mclean, 2004). The product distribution and customer services automation has been succeeded by using Web-based technologies - using among other functionalities, analytics (Dibb & Simkin, 1993). It is imperative for these systems to have a service with quality, in order to have an efficient support team, timely updates and quick responses to users' questions (Lal & Bharadwaj, 2015). Therefore, the following hypothesis is proposed:

Hypothesis 2a. Service Quality is positively associated with BA use for CRM.

Poor user support will lead to lost customers and lost sales (Delone & Mclean, 2004). IS specialists providing quality service will lead to a better decision making process, a more efficient sales forecasting and better anticipation of customers' needs, therefore improving the CRC (Gorla et al., 2010). Therefore, the following hypothesis is proposed:

Hypothesis 2b. Service Quality is positively associated with Customer Response Capability.

Since BA is an IT-enabled technology, the system quality is of extreme importance (Nam et al., 2018). System quality has been appointed to be a vital success factor influencing technology use (DeLone & McLean, 1992). Due to the velocity customer's needs change, organizations should use quality technology to analyze customer behavior and act on it (Jayachandran et al., 2005). The right software is vital for using the resources at hand to create a competitive advantage (Wade & Hulland, 2004). If the IS provides quality and competence, it has been proved to be a critical aspect for successful IS usage (Zhu & Kraemer, 2005) and to support analytical capabilities (Demirkan & Delen, 2013). Therefore, the following hypothesis is proposed:

Hypothesis 3a. System Quality is positively associated with BA use for CRM.

According to Jayachandran et al. (2004), customer knowledge is about the creation, analysis, and share of customers' information. This knowledge is positively related to the speed and capacity to respond to customers (Jayachandran et al., 2004). The capability to analyze the information is enabled by an information system (Jayachandran et al., 2005), where its quality is essential to manage and analyze all the requested formats (Lal & Bharadwaj, 2015). Consequently, system quality positively impacts CRC. Therefore, the following hypothesis is proposed:

Hypothesis 3b. System Quality is positively associated with Customer Response Capability.

BA use needs to be associated with CRC (Overby, Bharadwaj, & Sambamurthy, 2006). Analytics is able to identify and respond to market opportunities (Roberts & Grover, 2012; Teece, 2007), and its use accelerates the decision-making process when it comes for example to customers' retention purposes (Nam et al., 2018). Companies use BA to capture insights, and this ability will lead to a better CRC because the identification of customers' needs will enable a quick response (Jayachandran et al., 2005). Therefore, the following hypothesis is proposed:

Hypothesis 4a. BA use for CRM is positively associated with Customer Response Capability.

CRM starts by analyzing customers' behavior (Bose, 2002). BA use is positively associated with CRM performance due to its capability to identify customers' needs and to capture insights (Nam et al., 2018). BA and technology use are drivers of business performance (Devaraj & Kohli, 2003; Nam et al., 2018). CRM processes, as well as, customer acquisition and customer retention need data mining

techniques to analyze patterns and create knowledge (Kim & Kim, 2009; Ling & Yen, 2001). The application of CRM data on decision-making processes will improve the sales results (Stein, Smith, & Lancioni, 2013), thus improving the CRM performance. Therefore, the following hypothesis is proposed:

Hypothesis 4b. BA use for CRM is positively associated with CRM Performance.

Responding to customers' needs allows companies to shape opportunities and threats (Roberts & Grover, 2012). CRC leads to customer loyalty (Jayachandran et al., 2005), first-mover advantages (Kerin, Varadarajan, & Peterson, 1992), customer satisfaction (Nam et al., 2018; Oliver, 1996), and firm's performance (Hult & Ketchen, 2001). Therefore, the following hypothesis is proposed:

Hypothesis 5a. Customer Response Capability is positively associated with CRM Performance.

I propose a model that evaluates the impact of CRM systems on the firm's CRM performance. Figure 4 illustrates the research model.

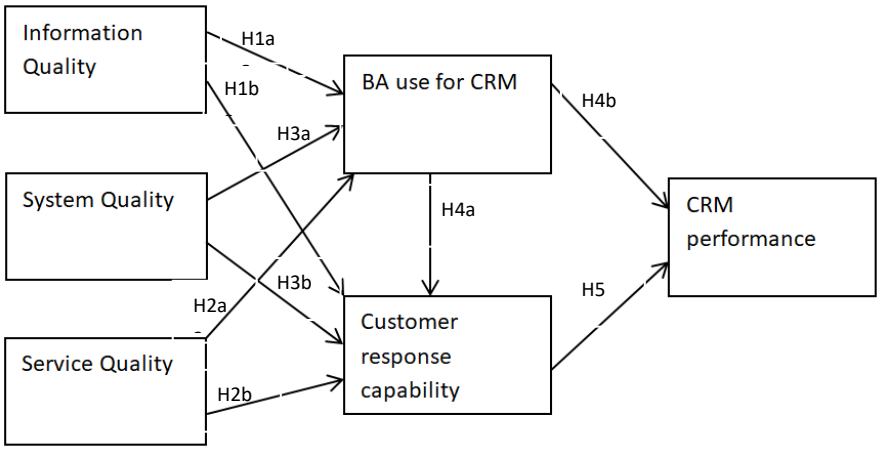

Figure 4: CRM Success proposed research model.

4. EMPIRICAL STUDY

4.1. CONSTRUCT OPERATIONALIZATION

In order to measure Information Quality (IQ), the validated scales of timeliness, accuracy, completeness, and relevance were used (Liu & Arnett, 2000). System Quality (SysQ) was measured regarding error recovery, accessibility, security and usability (Liu & Arnett, 2000). To measure Service Quality (SerQ), it was used items for assurance, empathy, responsiveness and follow-up service (Liu & Arnett, 2000). For BA use for CRM (BA_Use), it was adopted (Nam et al., 2018) measures: potential customers, customers needs' change, customer defection, personalized services, loyalty program and up/cross-selling. CRC was measured by unexpected change, actions implementation and customers needs' change (Nam et al., 2018). The used measures for CRM performance (CRMP) were customer satisfaction, customer loyalty, customer acquisition rate, and customer retention rate (Nam et al., 2018). The measurement of these items is displayed in Appendix A.

4.2. DATA COLLECTION

In order to test the research model hypothesis, I undertook a quantitative method, designed a questionnaire and conducted a firm-level survey. The questionnaire questions were composed of the indicators of the study, as described in Appendix A. Companies responded on a seven-point scale (1- Totally disagree, …7- Totally agree). It also included questions regarding the CRM system in use and companies' characteristics – industry and size: micro (up to 10 employees), small (up to 50 employees), medium (up to 250 employees) and big (from 250 employees).

The questionnaires were electronically distributed. The data was collected during the spring and summer of 2018. 500 firms were randomly selected and a total of 130 companies responded to the survey, therefore a response rate of 26%. Table 1 presents the sample characteristics.

Table 1: Sample characteristics.

Organizations' size	
Micro	4%
Small	14%
Medium	23%
Big	59%
Industry	
IT Services	28.7%
Banking	10.7%
Telecommunications	10.7%
Business Consulting	9%
Pharmaceutical	9%
Retail	7%
Other	5%
Automotive	3%
Hospitality and Tourism	3%
Healthcare	2%
Insurance	2%
Education	1.5%
Electricity	1.5%
Food & Beverage	1.5%
Security	1.5%
Transportation	1.5%
Entertainment	0.8%
Environmental	0.8%
Oil	0.8%
CRM System in use	
Salesforce	32%
Microsoft Dynamics	23%
In-house developed	15%
Siebel	12%
SAP CRM	4%
SAS	4%
Pipedrive	2%
Buzzmonitor	0.8%
Cendyn	0.8%
Izigo	0.8%
Microstrategy	0.8%
Quiter	0.8%
Sellead	0.8%
Sugar	0.8%
Veeva	0.8%
Zendesk	0.8%
Zoho	0.8%

The respondents were mainly from big companies (59%), typically from the IT (28.7%), banking (10.7%), telecommunications (10.7%), business consulting (9%) and pharmaceutical (9%) industries, and mostly using Salesforce (32%) and Microsoft Dynamics CRM (23%).

5. ANALYSIS AND RESULTS

The main goal of this study is analyzing the impact CRC have on the companies' CRM performance. Structural Equation Modeling (SEM) is a statistical method for testing and assessing causal relationships, combining theoretical causal assumptions and statistical data (Henseler, Ringle, & Sinkovics, 2009). Partial Least Squares (PLS) is a powerful statistical method to explore relationships between a group of variables and discover the key trails (Hair, Hult, Ringle, & Sarstedt, 2013). To access the validity of this analysis, SEM was adopted, using the technique of PLS (Henseler et al., 2014). PLS is more adequate to causal models (Wright, 1934), it doesn't require a normal data distribution (Hair, Ringle, & Sarstedt, 2011; Hair, Sarstedt, Ringle, & Mena, 2012), and it is adequate for the sample size in use (Hair, Sarstedt, Pieper, & Ringle, 2012) - since the sample size is relatively small but yet respecting the minimum size: (1) ten times the largest number of formative indicators used to measure one construct; or (2) ten times the largest number of structural paths directed at a particular latent construct in the structural model (Simulation, Chin, Marcolin, & Newsted, 2003). Smart PLS 3.0 was the used software to analyze the relationships presented in the research model (Ringle, Wende, & Becker, 2014).

5.1. MEASUREMENT MODEL ASSESSMENT

The measurement model was assessed through construct reliability, indicator reliability, convergent validity, and discriminant validity, shown in Tables 2 and 3, and Appendix B. Construct reliability was tested by measuring composite reliability for each construct. While Cronbach's undertakes that the reliability is equal for all indicators, PLS establish the priority according to indicator's reliability, therefore becoming a more reliable composite (Henseler et al., 2009). All constructs present values of composite reliability above 0.8 - this proves the reliability of all constructs. Indicator reliability was measured by testing if all items' loading is above 0.70. Item SysQ3 presented a loading value under 0.70 – It was excluded and the average variance extracted (AVE) improved. All other results were greater than 0.70, proving the reliability of all indicators. AVE value was used in order to analyze convergent validity (Fornell & Larcker, 1981). An AVE value should stay above 0.5 so as to explain more than half of indicators' variance on average (Hair et al., 2013). All constructors' AVE is greater than 0.7, confirming its convergent validity. For discriminant validity two tests were used: the first one is responsible for comparing all items' loading with cross loading – the loading of each indicator should be greater than all cross loadings (Chin, 1998), which was true; the second one required that the square root of AVE values were greater than correlations among other constructs (off-diagonal results) (Fornell & Larcker, 1981), also true.

Table 2: Measurement model results.

Construct	Code	Loading	AVE	CR	Cronbach's alpha	DV?
Information Quality	IQ1	0.799	0.668	0.889	0.835	Yes
	IQ2	0.813				
	IQ3	0.870				
	IQ4	0.784				
Service Quality	SerQ1	0.883	0.779	0.934	0.907	Yes
	SerQ2	0.887				
	SerQ3	0.878				
	SerQ4	0.882				
System Quality	SysQ1	0.856	0.709	0.88	0.795	Yes
	SysQ2	0.877				
	SysQ4	0.791				
BA use for CRM	BA_Use1	0.801	0.734	0.943	0.927	Yes
	BA_Use2	0.902				
	BA_Use3	0.890				
	BA_Use4	0.867				
	BA_Use5	0.850				
	BA_Use6	0.826				
Customer response capability	CRC1	0.817	0.737	0.894	0.820	Yes
	CRC2	0.836				
	CRC3	0.919				
CRM performance	CRMP1	0.882	0.768	0.93	0.899	Yes
	CRMP2	0.887				
	CRMP3	0.858				
	CRMP4	0.880				

Notes: CR = Composite Reliability; DV = Discriminant validity

Table 3: Correlation matrix and square root of AVE (diagonal results).

	BA_U	CRC	CRMP	IQ	SerQ	SysQ
BA_U	**0.857**					
CRC	0.428	**0.859**				
CRMP	0.489	0.683	**0.877**			
IQ	0.330	0.544	0.431	**0.817**		
SerQ	0.283	0.417	0.346	0.612	**0.883**	
SysQ	0.309	0.608	0.567	0.701	0.510	**0.842**

5.2. STRUCTURAL MODEL ASSESSMENT

Before the structural model's validation, all constructs were tested for multicollinearity through the variance inflation factor (VIF) calculation. All values were under 2.5 – far less than the conservative threshold of 5 (Rogerson, 2001) - showing that multicollinearity does not exist.

The quality of the structured model was evaluated by applying the bootstrap (a resampling method that draws a big number of subsamples captured from the original dataset), using 5000 subsamples in order to define the paths significance within the structural model (Henseler et al., 2009) (Figure 5 and Table 4).

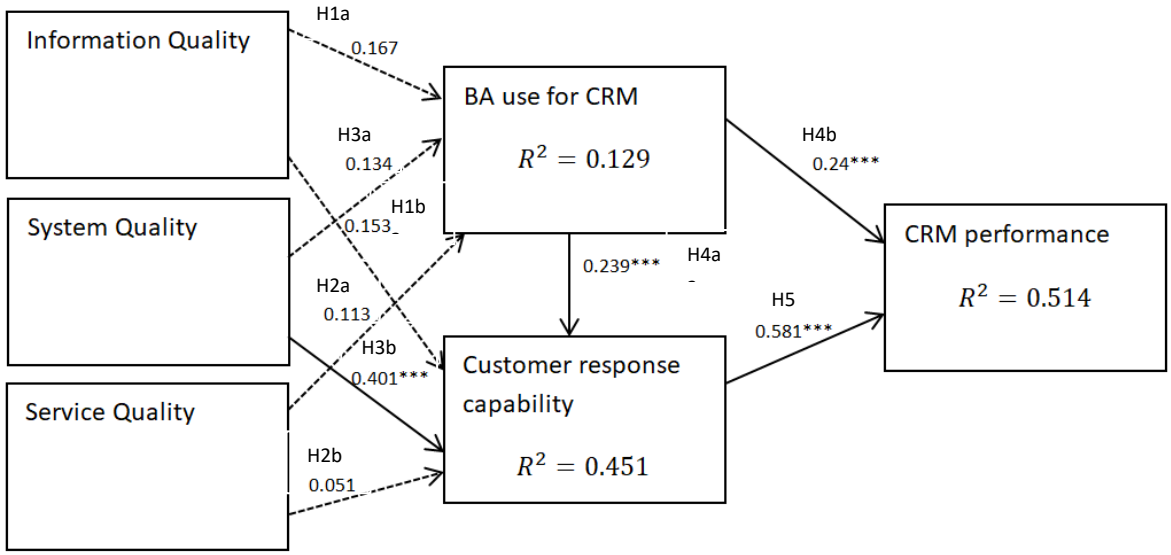

Figure 5: Structural model analysis results.

The CRM performance is explained in 51% by the variance of BA use for CRM (β = 0.240, p <0.01) and customer response capability (β = 0.581, p <0.01). CRC is explained in 45% by the variance of BA use for CRM (β = 0.239, p <0.01), system quality (β = 0.401, p <0.01), service quality (β = 0.051, non significant) and information quality (β = 0.153, non significant). BA use for CRM is explained in 13% by the variance of system quality (β = 0134, non significant), service quality (β = 0.113, non significant) and information quality (β = 0.167, non significant).

Information quality, system quality and service quality are not statistically significant in explaining the BA use for CRM construct, therefore H1a, H2a and H3a are not confirmed. System quality significantly explains CRC (β = 0.401, p <0.01), consequently confirming hypothesis H3b. Information quality and service quality don't explain CRC, and as a consequence of this, hypotheses H1b and H2b are not confirmed. BA use for CRM explains CRC (β = 0.239, p <0.01) and CRM performance (β = 0.24, p <0.01), leading to hypotheses H4a and H4b confirmation. CRC significantly explains CRM performance (β = 0.581, p <0.01), and as a consequence hypothesis H5 is confirmed. In summary, H3b, H4a, H4b, and H5 are supported. H1a, H1b, H2a, H2b, H3a are not supported. This model supported pathways with a minimum predictive impact (small).

Structural model's quality is based on the results of squared multiple correlations (R^2). When finished the measurements validation and confirmed the structural model quality, it was confirmed the model validation. Path coefficients were used to test the research hypotheses. The relationships between the dimensions were considered supported by the empirical data when the corresponding path coefficients (β) had the predicted sign and if considered significant at p < 0.10 (Hair et al., 2013). In order to calculate the effect size - the impact one construct have on the other, F^2 was used. The values considered are the following: >0.350 large; >0.150 and ≤0.350 medium; >0.10 and ≤0.150 small (Chin, 1998; Cohen, 1988).

Table 4: Hypotheses tests results.

Hypothesis	Independent variable	Dependent variable	Findings	Conclusion
H1a	Information Quality →	BA Use for CRM	Non-significant effect	Not supported
H1b	Information Quality →	Customer response capability	Non-significant effect	Not supported
H2a	Service Quality →	BA Use for CRM	Non-significant effect	Not supported
H2b	Service Quality →	Customer response capability	Non-significant effect	Not supported
H3a	System Quality →	BA Use for CRM	Non-significant effect	Not supported
H3b	System Quality →	Customer response capability	Positively & statistically significant (β = 0.401, p <0.01)	Supported with small effect
H4a	BA Use for CRM →	Customer response capability	Positively & statistically significant (β = 0.239, p <0.01)	Supported with small effect
H4b	BA Use for CRM →	CRM performance	Positively & statistically significant (β = 0.24, p <0.01)	Supported with small effect
H5	Customer response capability →	CRM performance	Positively & statistically significant (β = 0.581, p <0.01)	Supported with large effect

Notes: Path Coefficient - β; * significant at p < 0.10; ** significant at p < 0.05; *** significant at p < 0.01; Effect size: >0.350 large; >0.150 and ≤0.350 medium; >0.10 and ≤0.150 small (Chin, 1998; Cohen, 1988).

6. DISCUSSION

6.1. HYPOTHESES DISCUSSION

45% of the model is supported (H3b, H4a, H4b, and H5) and 55% is not (H1a, H1b, H2a, H2b, H3a).

Hypotheses H1a and H1b were not supported. This indicates that there isn't enough evidence to say that information quality is important to BA use for CRM and to CRC.

Information quality does not influence the use of BA in CRM, perhaps because business analytics require firstly other dimension, and this dimension would mediate the relationship between information quality and BA use for CRM, for example information management (Duque, Varajão, & Filipe, 2018; Nam et al., 2018).

Similarly, information quality does not influence CRC, possibly because information management and BA use for CRM could play an important role mediating this relationship (Duque et al., 2018; Nam et al., 2018). Possibly information sharing could mediate the relationship between information quality and CRC due to its ability to connect firms and customers – improving the customer response capability (Ahani et al., 2017). As proved by Roh et al. (2005), the connection between customer information quality and profitability was rejected, therefore a mediating role between information quality and CRM performance seems clearly needed.

Hypotheses H2a and H2b were not supported, meaning that service quality does not influence BA use for CRM and CRC.

This result might suggest that users sense that service quality is not that important when using business analytics and when responding to customers' needs, but could be important when directly influencing use and user satisfaction (DeLone & McLean, 2003), or information management (Duque et al., 2018; Nam et al., 2018), and then possibly these constructs could mediate the relationship towards BA use for CRM and CRC. It could also be replaced by IT skills – a key factor when measuring IT adoption in Portugal (Oliveira & Martins, 2009).

Hypothesis H3a is not valid in this study, even though system quality had been said to be crucial when evaluating technology use (DeLone & McLean, 1992; Tam & Oliveira, 2016) and, Demirkan & Delen (2013) appointed a highly capable system as requirement to do analytics, and also stated that 40% of spending on business analytics will go to system integrators, using as an example IBM's Watson. Hypothesis H3b results show that system quality positively influences CRC ($p < 0.01$).

Results reveal that BA use for CRM positively affects CRC (H4a) ($p < 0.01$) and CRM performance (H4b) ($p < 0.01$).

This demonstrates that insights captured by BA will lead to a better CRC, as well as, improved CRM performance (Jayachandran et al., 2005; Nam et al., 2018). Similar results were obtained when choosing BA use for CRM as an influencer to CRC and CRM performance (Nam et al., 2018). Perhaps a higher impact of BA use to CRM on CRM performance would exist if: operational benefits – such as operational performance, operational efficiency, accounts receivable collectability, and earnings predictability (Haislip & Richardson, 2017); and strategic benefits mediated this relationship (Li, Huang, & Song, 2018).

Hypothesis H5 was supported by empirical results ($p < 0.01$), discovering a positive impact of CRC on CRM performance. Results indicate that when companies are able to respond to customers' needs and wants, the impact on CRM's performance is positive.

Another idea to possibly increase the positive impact BA use to CRM and CRC have on CRM performance, would be a mediator dimension as CRM effectiveness (Rodriguez, Peterson, & Krishnan, 2018).

This study demonstrates that system quality positively impacts CRC; BA use for CRM positively affects CRC and CRM performance; and CRC is determinant for CRM performance. On the other hand, this analysis shows that information quality and service quality as influencers on BA use for CRM and CRC were not supported, as well as, system quality on BA use for CRM.

6.2. IMPLICATIONS

This study reveals that System quality positively impacts CRC and, CRC and BA use for CRM positively lead to a higher CRM performance, achieving CRM systems success.

From this study theoretical implications derive from the validation of the research model, joining for the first time D&M ground determinants (1992,2003) with CRM system's success determinants from Nam et al. (2018). Clear implications derive from this study, i.e. CRC is truly important when leading to a better CRM performance. The significant relationship between system quality and CRC has not been studied before in this context.

Practical implications arise from the proposed model. For companies to improve the CRM performance, CRC must be accomplished with accuracy and wih the help of BA use for CRM and system quality. Companies should know the determinants to the success of CRM systems when adopting, implementing or evaluating them. Our study reveals that companies cannot just focus on IT and data analysis, the capability to respond fast and in an accurate way to their clients is crucial to a higher CRM performance. On the other hand, IT (BA use for CRM and system quality) is essential as the basis to a good response to the clients. The study encourages companies to improve their CRC. It explains which factors are important for a good CRC, for example, a fast implementation of the planed decisions. This study also contributes in a valuable way to universities since it sheds light on the factors that lead to CRM systems' success, leading to a better choice of what to teach.

7. CONCLUSIONS

The battle for customers has never been so intense. CRM is crucial when running a successful business. It is the most efficient technique for customer retention and acquisition. Consequently, CRM is strategically important for any organization. The importance of the assessment of CRM systems' success and its impact on the CRM performance has been increasing in recent years due to their considerable role in academia, industry, and society. Its measurement is not an easy job, and system failure is recurrent. It is presented a theoretical model to understand what can be of value when evaluating a CRM system success, i.e. what justifies its success and impact on the CRM performance. The model includes information quality, system quality, service quality, BA use to CRM, CRC and CRM performance. The model is based on IS/CRM systems success literature. The research model was empirically tested and validated by 130 organizations. This study's findings provide valuable implications for the design and evaluation of CRM systems. The study demonstrates that CRC is incredibly important when trying to increase CRM performance. Furthermore, system quality is an important factor leading to CRC and it is the first time this relationship is studied. BA use to CRM is also critical when supporting a higher CRC. BA use to CRM and CRC will then positively impact the organization's CRM performance.

This study encourages companies to invest in the CRC, due to its enormous impact on the CRM performance, i.e. on the customer satisfaction, customer loyalty, customer acquisition rate and customer retention rate. The model developed in this study is able to help organizations improve the decision-making process during CRM implementations and/or on posterior evaluation of these systems.

This empirical study also indicates that the success dimensions of D&M (1992,2003) do not fully cover CRM systems success, at least when directly related to BA use for CRM and CRC. This study could possibly bring more insights if considered more IT dimensions, such as IT business spanning, IT management, or big data. Due to the positive impact technological readiness has on knowledge management, and knowledge management on CRM impact, probably knowledge management would be a good option to include, even though knowledge creation process and its general low/medium impact on CRM systems should be taken into account. I also suggest more focus on what can successfully support a higher CRC and an efficient BA use to CRM. Another limitation of this study derives from the fact that only 130 companies responded to the questionnaire. If more data were collected, the results could be different.

Nevertheless, artificial intelligence will certainly revolutionize CRM systems and consequently its measurement.

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Appendix A: Measurement Items.

Construct	Code	Indicator	Author
Information Quality	IQ1	The information provided by the CRM System is timely.	(Liu & Arnett, 2000)
	IQ2	The information provided by the CRM System is accurate.	
	IQ3	The information provided by the CRM System is complete.	
	IQ4	The information provided by the CRM System is relevant.	
Service Quality	SerQ1	The responsible service personnel have sufficient knowledge to assure a high quality service.	(Liu & Arnett, 2000)
	SerQ2	The responsible service personnel show empathy whenever I need support with the CRM System.	
	SerQ3	The responsible service personnel provide a quick response when I experience problems with the CRM System.	
	SerQ4	The responsible service personnel provide a follow up service.	
System Quality	SysQ1	The CRM System provides quick error recovery.	(Liu & Arnett, 2000)
	SysQ2	The CRM System provides rapid accessing.	
	SysQ3	The CRM System is secure.	
	SysQ4	The CRM System is ease of use.	
BA use for CRM	BA_Use1	BA is used for acquiring potential customers.	(Nam et al., 2018)
	BA_Use2	BA is used for capturing change of customer's needs.	
	BA_Use3	BA is used for expecting and protecting customer defection.	
	BA_Use4	BA is used for offering personalized services to customers.	
	BA_Use5	BA is used for designing and running a loyalty program.	
	BA_Use6	BA is used for up/cross selling.	
Customer response capability	CRC1	We are able to respond fast if something happens to a customer.	(Nam et al., 2018)
	CRC2	Our planned actions regarding the customer are quickly implemented.	
	CRC3	We are able to respond fast if customers' needs change.	
CRM performance	CRMP1	We have experienced higher customer satisfaction through BA.	(Nam et al., 2018)
	CRMP2	We have experienced higher customer loyalty through BA.	
	CRMP3	Customer acquisition rate has increased through BA.	
	CRMP4	Customer retention rate has increased through BA.	

Appendix B: Cross-loadings.

Items	BA_Use	CRC	CRMP	IQ	SerQ	SysQ
BA_Use1	**0,801**	0,350	0,410	0,291	0,156	0,276
BA_Use2	**0,902**	0,348	0,433	0,348	0,282	0,323
BA_Use3	**0,890**	0,381	0,459	0,252	0,216	0,222
BA_Use4	**0,867**	0,434	0,455	0,243	0,196	0,265
BA_Use5	**0,850**	0,370	0,387	0,327	0,324	0,319
BA_Use6	**0,826**	0,304	0,356	0,229	0,289	0,167
CRC1	0,319	**0,817**	0,543	0,517	0,352	0,553
CRC2	0,456	**0,836**	0,615	0,376	0,342	0,456
CRC3	0,327	**0,919**	0,601	0,509	0,378	0,557
CRMP1	0,320	0,662	**0,882**	0,398	0,353	0,534
CRMP2	0,430	0,622	**0,887**	0,384	0,339	0,521
CRMP3	0,464	0,532	**0,858**	0,390	0,292	0,474
CRMP4	0,505	0,576	**0,880**	0,342	0,230	0,456
IQ1	0,190	0,466	0,315	**0,799**	0,448	0,626
IQ2	0,194	0,330	0,257	**0,813**	0,377	0,508
IQ3	0,298	0,519	0,433	**0,870**	0,506	0,608
IQ4	0,366	0,426	0,367	**0,784**	0,628	0,534

SerQ1	0,270	0,392	0,296	0,581	**0,883**	0,452
SerQ2	0,216	0,291	0,254	0,456	**0,887**	0,362
SerQ3	0,228	0,311	0,248	0,482	**0,878**	0,427
SerQ4	0,272	0,441	0,394	0,604	**0,882**	0,526
SysQ1	0,292	0,528	0,511	0,625	0,467	**0,856**
SysQ2	0,277	0,541	0,487	0,574	0,390	**0,877**
SysQ4	0,203	0,463	0,429	0,573	0,436	**0,791**