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CÍNTIA CRISTINA SILVA DE ARAÚJO

THE MEDIATING EFFECT OF DYNAMIC CAPABILITIES ON THE RELATIONSHIP BETWEEN CUSTOMER RELATIONSHIP MANAGEMENT AND INNOVATION CAPABILITY

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Cíntia Cristina Silva de Araújo

O EFEITO MODERADOR DAS CAPACIDADES DINÂMICAS NA RELAÇÃO ENTRE CUSTOMER RELATIONSHIP MANAGEMENT E CAPACIDADE DE INOVAÇÃO

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A dissertation submitted to the Administration Graduation Program of the Nove de Julho University, as a partial fulfillment of the requirements for the degree of Doctor in Administration.

SUPERVISOR: PROF. CRISTIANE DREBES PEDRON, PH.D

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By

Cíntia Cristina Silva de Araújo

A dissertation submitted to the Administration Graduation Program of the Nove de Julho University, as a partial fulfillment of the requirements for the degree of Doctor in Administration, evaluated by the Examining Board formed by

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"We must continue to dream big, and in doing so, we empower the next generation of women to be just as bold in their pursuits."
(Serena Williams)

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ABSTRACT

A fundamental factor to achieve competitive advantage is the ability to foresee market tendencies faster and more efficiently than competitors. Organizations can adapt themselves to this ever changing environment by building solid customer relationships that enable them to anticipate market trends and customer demands. In this scenario, Customer Relationship Management (CRM) is an important organizational initiative to acquire customer knowledge, to develop individualized marketing strategies and to customize products and services according to marked needs. In turn, dynamic capabilities are fundamental for organizations to rearrange and renew their resources as to respond to environmental changes. Finally, innovation capability is a capacity that organizations should develop in order to translate all knowledge attained from the environment into innovative and profitable initiatives. Literature shows that CRM can provide valuable customer knowledge that helps organizations rearranging their resources and processes to create innovative solutions and services that meet market demands. For this reason, this research aims to answer the following question: what is the effect of CRM and dynamic capabilities on the development of innovation capability in organizations? To answer this question, the main goal of this research is to identify the relationship between CRM, dynamic capabilities and innovation capability. One of the main contributions of this study is to show, for the first time, that for itself CRM cannot bring innovation capability. For organizations to develop innovation capability they need to combine CRM with dynamic capabilities; as they are able to rearrange their resources and process, organizations can develop innovation capability. Another contribution of this research is the development a new instrument to measure CRM, dynamic capabilities and innovation capability.

Keywords: customer relationship management, dynamics capabilities, innovation capability

RESUMO

Um fator fundamental para se alcançar vantagem competitiva é a habilidade de se antecipar as tendências do mercado de forma mais rápida e mais eficiente que seus competidores. As organizações podem se adaptar às constantes mudanças do mercado ao construir relacionamentos sólidos com seus clientes, o que permite antecipar a evolução do mercado e as demandas dos consumidores. Neste cenário, o *Customer Relationship Management* (CRM) é uma importante iniciativa organizacional para se adquirir conhecimento sobre os clientes, para se desenvolver uma iniciativa organizacional de marketing individualizada e para se customizar serviços e produtos de acordo com as necessidades do mercado. Por sua vez, as capacidades dinâmicas são essenciais para que organizações sejam capazes de rearranjar e renovar seus recursos para responder adequadamente às mudanças no ambiente. Finalmente, a capacidade de inovação é a capacidade que as organizações devem desenvolver para que possam traduzir todo o conhecimento obtido a partir da análise do ambiente em iniciativas inovadoras e lucrativas, sejam elas de cunho tecnológico, administrativo ou organizacional. A literatura mostra que CRM pode prover valioso conhecimento sobre os clientes que pode ajudar as organizaçõs a rearranjarem seus recursos e processos, a fim de criar soluções e serviços inovadores que atendam às demandas do mercado. Por este motivo, esta pesquisa se propõe a responder a seguinte pergunta: qual o efeito do CRM e das capacidades dinâmicas no desenvolvimento da capacidade de inovação nas organizações? Para responder esta questão, o principal objetivo de pesquisa é identificar o relacionamento entre o uso de CRM, as capacidades dinâmicas e a capacidade de inovação. Um das principais contribuições deste estudo é mostrar, pela primeira vez, que CRM por si só não pode resultar em capacidade de inovação. Para que as organizações possam desenvolver a capacidade de inovação, elas precisam combinar o uso de CRM com capacidades dinâmicas; uma vez que, ao serem capazes de rearranjar seus recursos e processos, as organizações podem desenvolver capacidade de inovação. Outra contribuição desta pesquisa é o desenvolvimento de um novo instrumento conciso para medição de CRM, capacidades dinâmicas e capacidade de inovação.

Palavras-chave: gerenciamento de relacionamento com cliente, capacidades dinâmicas, capacidade de inovação

INDEX

LIST OF FIGURES

LIST OF TABLES

1. INTRODUCTION

The ability to foresee market tendencies faster and more efficiently than competitors is fundamental (Kim, Im, & Slater, 2013; Boso, Story, & Cadogan, 2012; Prahalad & Hamel, 1990). Not only is it necessary to adapt to the environment but also to develop the ability to innovate in order to survive (Chen & Jaw, 2009). The ability to adjust to the market and to innovate can be achieved as organizations acquire customer information (Chuang & Lin, 2013; Weerawardena et al. 2006) and knowledge from partners and providers (Mitrega, Forkmann, & Henneberg, 2012). For that to happen, organizations need to build a solid relationship with their customers so that they can obtain valuable and precise customer information (Rajola, 2013).

In tune with this business trend, Customer Relationship Management (CRM) strategy focuses on building relationships and customer knowledge (Garrido-Moreno, Padilla-Meléndez, & Águila-Obra, 2010) to acquire and retain customers individually (Payne & Frow, 2005). CRM is "a strategic approach concerned with creating improved shareholder value through the development of appropriate relationships with key customers and customer segments" (Payne, 2005, p. 22). CRM strategy implies that the assessment of customer value during the whole lifecycle of customer relationship (Kincaid, 2003; Zablah, Bellenger, & Johnston, 2004). By assessing the value of customers, organizations establish investments strategies and customer segmentation (Zablah et al., 2004).

The adoption of CRM strategy allows organizations to anticipate customers' demands and market tendencies (Rajola, 2013); to customize products, services and processes; as well as to develop individualized marketing strategies (Verrill, 2013; Pedron & Saccol, 2009). By building valuable customer relationships organizations are able to monitor the level of customer satisfaction (Mithas, Krishnan, & Fornell, 2005) which can prevent problems (Bolton, 1998; Verhoef & Donkers, 2001) and put the organization in advantageous position in the market (Day, 1994). CRM and its technology also enable organizations to communicate with their customers and to collect and filter information more effectively. In addition, CRM can provide employees with accurate customer information that can support decision-making, product development and service customization (Jayachandran et al., 2005).

The success of CRM is not tied to a specific industry (Boulding, Staelin, Ehret, & Johnston, 2005). However, success of CRM depends greatly on the alignment between CRM processes, organizational functional and managerial structure (Reinartz, Krafft, & Hoyer, 2004). Besides that, to achieve success when implementing CRM strategy, organizations need to prioritize building profitable relationships. In other words, organizations need to assess how valuable are their customers to their strategy and business performance (Zablah et al., 2004).

In turn, the perspective of dynamic capabilities (DCs) emerged to explain how organizations can develop VRIN (valuable, rare, inimitable and nonsubstitutable attributes) resources on dynamic environments (Eisenhardt & Martin, 2000; Teece et al., 1997). The dynamic capabilities view (DCV) focuses on the capacity to survive in dynamic environments by creating new resources and by renewing or changing the resource base (Bowman & Ambrosini, 2003). DCs involve routines and processes that are implemented to reconfigure the resource base in order to adapt to markets as they evolve (Eisenhardt & Martin, 2000).

DCs enable organizations to integrate, reconfigure, and recombine their resources in timely manner in order to adjust to environmental changes and demands (Teece, Pisano, & Shuen, 1997). DCs is fundamental for organizations to achieve sustainable competitive advantage (Eisenhardt & Martin, 2000). If organizations have sufficient resources and competencies, but lack the ability of combining and arranging these assets in a way to achieve profit, organizations will be unable to sustain and even to attain any competitive advantage (Teece, 2007). DCs ensure that organizations adapt to environment changes, as they constantly renew, rearrange and recombine their resources (Teece et al., 1997).

Finally, the capacity to innovate enables organizations to transform all accumulated cumulative knowledge into innovative solutions and initiatives (Hult, Hurley, & Knight, 2004). Innovation capability (IC) is the "integrative process of applying the collective knowledge, skills, and resources of the firm to perform innovation activities pertaining to technical innovations (products and/or services, and production process technology) and nontechnical innovations (managerial, market, and marketing)" (Ngo & O'Cass, 2009, p. 48). IC is also the ability to change or create new systems, policies, programs, products, processes, devices, or services to achieve better performance (Lin, Chen, & Chiu, 2010). As organizations develop a strong IC, they are able to develop new

products and services and to leverage their resources to attend to market demands (Chen & Jaw, 2009).

As organizations implement CRM, they are able to build a customer-centered structure, which implies reorganizing their internal processes and resources to respond to customers' demands and needs (Rigby, Reichheld, & Schefter, 2002). For this reason implementing CRM can be a great driver of DCs. In dynamic and highly competitive markets, organizations should be "active actors", capable to adapt to environment changes "at least to some extent, mainly within the limits of its resources and capabilities" (Makkonen, Pohjola, Olkkonen, & Kaponen, 2014, p. 2707). Sensing and seizing opportunities as well as taking initiatives to avoid potential threats is imperative (Teece, 2007); and to do so, organizations need to overcome the inertia and to promote the continuous change of the resource base (Makkonen et al., 2014).

CRM strategy is also strongly linked to IC. When organizations have the ability to acquire knowledge from customers in view to understand their needs and demands, they are capable to implement innovation in their services and products (Salunke, Weerawardena, & McColl-Kennedy, 2011). Therefore, using CRM is an effective strategy to enhance IC (Belkahla & Triki, 2011; Lin, Chen, & Chiu, 2010).

Besides that, as I analyzed literature, I realized that DCs and IC are highly related (Teece, 2007). Since DCs enable organizations to change their status quo and to create new ways to profit (Helfat & Winter, 2011), developing DCs create the means to sustain the continuous improvement of IC (Chen & Jaw, 2009). In fact, organizations that have well established DCs to sense and seize opportunities as well as to reconfigure resources according to the environment are more successful on using their current capabilities and resources to implement innovation in their products and services (Ellonen, Wikström, & Jantunen, 2009). Moreover, as organizations use their DCs to sense market orientation, they develop market intelligence that will enable them to innovate (Hurley & Hunt, 1998).

1.1. RESEARCH QUESTION AND OBJECTIVES

Based on these arguments, the research question is: what is the effect of CRM and dynamic capabilities on the development of innovation capability in organizations? To

answer this question, the main goal of this research is to identify the relationship between CRM, dynamic capabilities and innovation capability.

The specific goals of the research are:

- To review literature and to conceptualize the three constructs;
- To develop a model to test the relationship between the three constructs;
- To develop and validate an instrument to measure three constructs;
- To measure the mediating role of dynamic capabilities on the relationship between CRM and innovation capability.

1.2. JUSTIFICATION FOR RESEARCH

Studying CRM is relevant for academics and practitioners. Since the 1990's, CRM has emerged as a prominent area of study and has been widely implemented as core strategy among organizations (Soltani & Navimipour, 2016). Investments on CRM have increased constantly, according to report developed by Software Advice CRM (Verrill, 2013). Many of these organizations have implemented CRM in order to improve their capability to create and manage customer segments as well as to increase customer retention and service quality (Josiassen, Assaf, & Cvelbar, 2014). Besides that, organizations implement CRM to reduce costs in marketing processes and customer service (Siriprasoetsin, Tuamsuk, & Vongprasert, 2011) as well as to improve efficiency (Verrill, 2013).

It is important to highlight that CRM strategy allows organizations to become more market-driven, as they acquire customer knowledge and understand market tendencies in advance. As organizations become more market-driven their "decisions start with the customer and are guided by a deep and shared understanding of customer's needs and behavior" (Day, 1994, p. 45).

Another reason to study CRM is that, despite the advantages and investments on CRM, studies show that in many occasions, organizations do not achieve positive results as they implement CRM (Payne, 2005). In fact, many organizations are not able to make the most use of CRM to create customer knowledge (Khodakarami & Chan, 2014). Then, it is relevant to analyze the impact of CRM on an important aspect of organizational performance such as IC, as CRM has become a key driver of innovation performance as

well as academia has put little emphasis on the impact of customer knowledge on innovation (Belkahla & Triki, 2011).

Besides, organizations are demanded to adjust to market changes in order to sustain competitive advantage (Eisenhardt & Martin, 2000; Teece, 2007). Under this perspective, in order to identify and shape market opportunities, assessing and analyzing customers' needs is fundamental (Teece, 2007). For this reason, I can infer a linkage between CRM and DCs: CRM provides the customer knowledge (Mithas et al., 2005; Rajola, 2013), that is necessary to build the market intelligence that will enable organizations to sense and seize opportunities as well as to avoid or minimize risks (Teece, 2007).

Despite the increasing relevance of the concept of DCs on strategic management research field and the great amount of theoretical studies on the subject, several authors have criticized this theory for being tautological, difficult to operationalize (Priem & Butler, 2001; Williamson, 1999) and difficult to be measured empirically (EasterbySmith, Lyles, & Peteraf, 2009). Some affirm that there are few reliable empirical studies regarding DCs (Ellonen, Wikström, & Jantunen, 2009; Kindström, Kindström, & Sandberg, 2013). Authors plead that empirical studies on DCs are too abstract and limited to case studies (Ali et al., 2012). In fact, researchers have a hard time identifying DCs in organizational processes (Ali et al., 2012; Easterby-Smith et al., 2009). It is even more complicated to measure the effect of DCs on organizational performance (Easterby-Smith et al., 2009).

Therefore, developing a new instrument to measure the effect of DCs and presenting empirical evidences of the effect of DCs on an important element of organizational performance (IC) can contribute to the study of DCV(Dynamic Capability View).

Despite the evident linkage between CRM and DCs, few studies have applied the (Resource-Based View) or the DCV to explore the effect of CRM on organizational performance (Desai, Sahu, & Sinha, 2007). On the top of that, literature confirms the positive effect of customer knowledge and of customer-oriented strategy on the capacity to innovate (Day, 1994).

Analyzing DCs as a mediating factor between CRM and IC is a great contribution to empirical studies on DCs. As I analyzed literature on DCs, few studies have analize DCs as a mediator: Fernández_Mesa, Alegre_Vidal, Chiva_Gómez, and Gutiérrez_Gracia

(2013) studied the mediating effect of DC on the relationship between organizational learning capability and product innovation; Han and Li (2015) analyzed the mediating effect of DCs on the relationship between intellectual capital and innovative performance; Camisón and Puig-Denia (2015) studied the effects of quality management process on process innovation with the mediation role of DCs; and lastly, Alegre, Sengupta, and Lapiedra (2011) analyzed how knowledge management affects innovation performance with the mediation of DCs.

It is important to highlight that this position implies that this research aims to confirm that DCs explain why (Baron & Kenny, 1986) CRM can lead organizations to develop IC. For organizations to obtain positive results from adopting CRM strategy, they need to adjust processes, structure and procedures in order to ensure CRM success (Pedron, Picoto, Dhillon, & Caldeira, 2016). Likiwise, for organizations to develop IC by using the input provided by CRM, they need to be able to rearrange their resources and processes.

Finally, I focus on analyzing the internal processes of organizations that are related to DCs (Ali et al. 2012; Helfat & Peteraf, 2003) and IC (Chen, 2009) because these two constructs are strongly related to processes and routines that are systematically implemented to achieve specific objectives.

1.3. DISSERTATION STRUCTURE

This dissertation will be structured as follows: (1) introduction; (2) theoretical background – concepts on CRM, DCs and IC (3) research methodology; (4) results; (5) discussion; and (6) final considerations.

2. THEORETICAL BACKGROUND

In this chapter, I present the theoretical concepts regarding the three main constructs on which this research is based upon: CRM, DCs and IC.

2.1. CUSTOMER RELATIONSHIP MANAGEMENT

More and more organizations need to find ways to reduce costs, to maximize profits and to sustain competitive advantage. In this scenario, CRM can be a very useful mean to keep organizations in advantage (Pedron et al., 2016; Soltani & Navimipour, 2016).

According to a report developed by Software Advice CRM (Verrill, 2013) – a company of Gartner Inc. specialized in research and reviews of software applications - organizations have adopted CRM for different objectives such as the automation of sales force and marketing processes, as well as the improvement of customer services. Besides that, organizations implement CRM systems to improve their efficiency
(Verrill, 2013).

The growing investments on CRM as well as the increasing interest of academics in this theme have demonstrated the relevance of CRM in organizations. For instance, in a bibliometric analysis of publications in CRM research area, I found that publications on CRM have been increasing considerably since the 2010's (Araújo, Pedron, & Picoto, 2016). Figure 1 illustrates a graph of publications on CRM from 2000 to 2015.

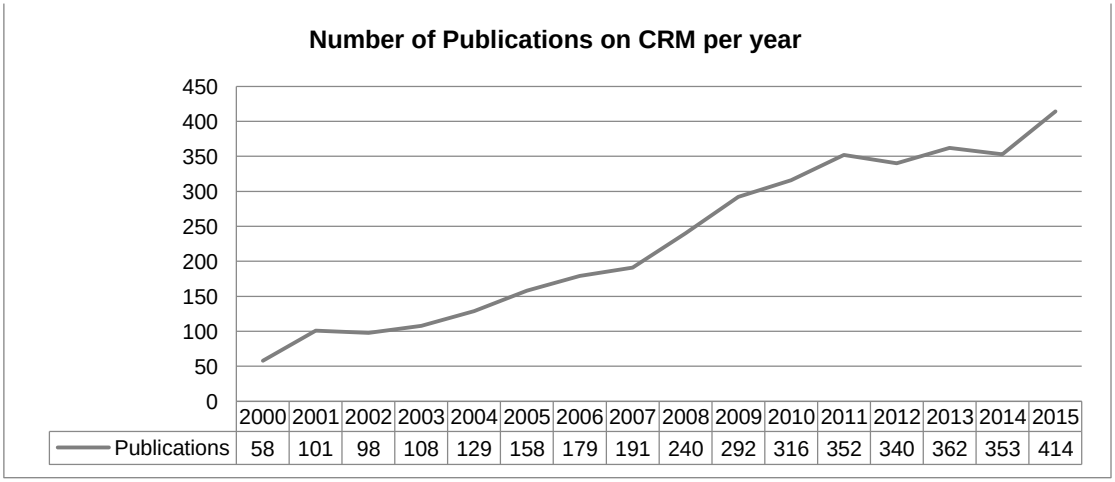

Figure 1: Graph on the number of publications on CRM per year
Source: Adapted from Araújo et al. (2016)

As CRM is strongly grounded on the theory of relationship marketing, it is important to present some basic concepts regarding this theme. The following subchapter presents these concepts.

2.1.1. Relationship Marketing: the theoretical basis of CRM

Basically, relationship marketing "refers to all marketing activities directed towards establishing, developing, and maintaining successful relational exchanges" (Morgan & Hunt, 1994, p. 22). The expression "relationship marketing" appeared in the 1980's. In 1983, Leonard Berry wrote a book on marketing of services and entitled one of its champers as "Relationship Marketing". Then, in 1985, Barbara Jackson used the expression "relationship marketing" in an article published in the Harvard Business Review (Brito, 2011).

Relationship marketing does not focus on the establishing relationships with customers. Relationship marketing has a broader perspective. Relationship marketing involves developing social, economic and technical relationships different stakeholders – customers, employees, suppliers, etc. (Kotler and Keller, 2012).

Relationship marketing started gaining more relevance as globalization encouraged organizations to become more service-oriented (Hunt, Arnett, & Madhavaram, 2006) and to provide customized services to customers (Berry, 1995). Moreover, factors such as the continuous growth of competitiveness among brands and the advent of new business models boosted the study on relationship marketing (Brito, 2011; Hunt & Morgan, 1994).

As for the theoretical foundation of relationship marketing, three areas contributed for the formation of the relationship marketing theory. The theory of **distribution channels** refers to the existing conflicts between buyer and seller. The studies on distribution channels focus on the inter-organizational relationships, on the social aspects of economic transactions as well as on economic policies (Brito, 2011). The literature on **industrial marketing** focuses on the interactions between organizations and the networks created in these interactions (Cooke, 1986). The last basis for relationship marketing is the stream of research on **services marketing**. Service marketing researchers defended that customers should participate not only consume products but also to participate in the production process (Brito, 2011; Gwinner, Gremler, & Bitner, 1998). The main contributions of service marketing literature are the concepts of quality management and customer satisfaction (Gwinner et al., 1998).

The shift from transactional marketing towards relationship marketing implied a deep change in the marketing strategy of organizations. By adopting a relational policy, marketing strategy was no longer focused on specific functionalities, but on

crossfunctional relationships (Payne, 2005). Figure 2 illustrates the transition from traditional transactional marketing to relationship marketing.

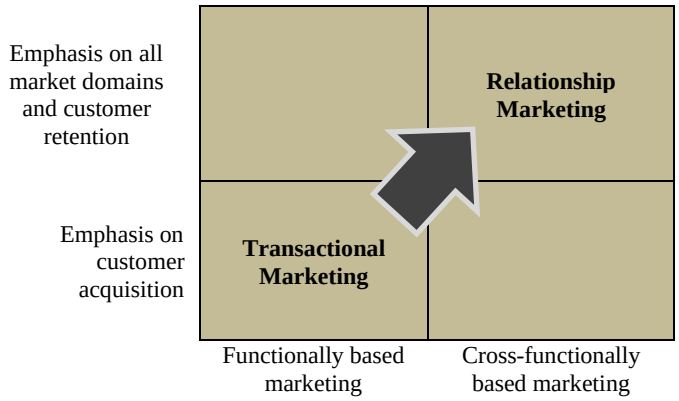

Figure 2: Transition from transactional marketing to relationship marketing
Source: Payne (2005, p. 8)

As for the primary elements of relationship marketing, I can point out three: identifying and understanding customers, selecting customers and adapting product and services according to the customers' needs and expectations (Brito, 2011).

It is important to mention that, such to implement relationship marketing, organizations need to observe fundamental factors. In their model on relationship marketing, Palmatier, Dant, Grewal, and Evans (2006) affirm that factors such as training, specialized expertise, mutual commitment and communication are fundamental in relationship marketing.

It also important to note that, as the solutions in information technology (IT) increased, the costs on relationship marketing diminished (Berry, 1995). As a consequence, organizations begin to use IT systems to create new marketing initiatives as the assessment of customers' consumption patterns, service customization, more complex pricing systems (Berry, 1995).

There are many different definitions of CRM in literature (Payne, 2005). For this reason, it is important to introduce these definitions and to describe the theory on which this research is grounded.

2.1.2. The different definitions and perspectives of CRM

First, it is important to note that to write this subchapter on the existing definitions of CRM, I focused on eight of the most used references in CRM research area. In our bibliometric analysis, I analyzed 3974 publications on CRM and their cocitations. As a

result of this analysis, I distributed the most used references into seven categories - more details about the bibliometric analysis are presented in the methodology chapter. The category of **theoretical conceptualization of CRM and its implication on organizational performance** includes 8 articles with definitions and perspectives of CRM (Araújo et al., 2016). As I analyzed the articles contained in this category, I realized that it refers to studies on the fundamental theoretical aspects of CRM. For this reason, I used the 8 articles in the theoretical background of the thesis: Boulding et al. (2005), Jayachandran, Sharma, Kaufman, and Raman (2005), Mithas, Krishnan, and Fornell (2005), Payne and Frow (2005), Reinartz et al. (2004), Rigby et al., 2002, Srivastava, Shervani, and Fahey (1998), and Zablah et al. (2004).

As the complexity of market demands has grown and new technologies have appeared, CRM emerged as a technological response to the demands of relationship marketing strategy (Payne, 2005). The newness and the broadness of CRM have spurred the emergence of different definitions of CRM. For Payne (2005), CRM is "a strategic approach concerned with creating improved shareholder value through the development of appropriate relationships with key customers and customer segments" (Payne, 2005, p. 22).

Reinartz et al. (2004) define CRM as a customer-facing and systematic process that manages customer relationship at initiation, maintenance, and termination phases in order to maximize the value of customer relationships (Reinartz et al., 2004). In fact, the research of Reinartz et al. (2004) has been the most used in CRM research and was categorized among the articles for theoretical foundation of CRM (Araújo et al., 2016). Reinartz et al. (2004) provide an instrument to measure CRM process and analyze functional and organizational competences necessary to achieve success in CRM implementation.

In turn, for Garrido-Moreno et al. (2010) CRM is a business strategy established to build and maintain strong relationships with customers in order to gain their loyalty and preference. These relationships are built upon the knowledge accumulated via CRM systems that enable the organization to gather information regarding customers' consuming behavior, preferences, credit history and other relevant data (Garrido et al., 2010).

All these definitions indicate customer relationship at the center of marketing strategy. Likewise relationship marketing, CRM establishes customer knowledge as an important source of organizational learning and innovation (Garrido-Moreno et al., 2010).

Zablah et al. (2004) conducted an analysis of existing definitions of CRM. For Zablah et al. (2004), CRM definitions are distributed into four perspectives: CRM as a process, as a strategy, as a philosophy, as a capability and as a technology.

Under the perspective of **CRM as a process**, CRM is defined as a macro level perspective of CRM infers that CRM must evolve as customers' demands and needs evolve over time (Reinartz et al., 2004; Zablah et al., 2004).

The perspective of **CRM as a strategy** emphasizes the fact that organizations need to apply resources according to customers' value to their strategy and competitiveness. It means that, when deciding to invest on building and maintaining relationships, organizations need to assess the lifetime value of these customers continuously. This perspective also infers that organizations can choose to cease relationships that are no longer valuable or profitable (Zablah et al., 2004). In fact, Ngai, Xiu, and Chau (2009) focus on CRM strategy as they define CRM as a set of processes and systems that support business strategy which are structured into four main processes: customer identification, customer attraction, customer retention and customer development.

CRM as a philosophy means that CRM conveys the idea that rather than viewing marketing as business transactions, organizations should build relationships in to attain customer loyalty (Zablah et al., 2004). As in the perspective of CRM as a process, viewing CRM as a philosophy advocates that organizations need to constantly learn customer needs and demands so they are able to respond accordingly (Pedron & Saccol, 2009; Zablah et al., 2004).

Regarding the perspective of **CRM as a technology,** Zablah et al. (2004) advocate that most CRM authors are against viewing CRM only as a technological tool that builds customer relationships (Zablah et al., 2004). On the other hand, Zablah et al. (2004) recognize that CRM is strongly related to the use of technology. For instance, CRM technology aims to support the processes of initiating, maintaining and terminating customer relationships. In fact, the role of technology is to provide the tools to enable CRM to result in competitive advantage to the organization (Reinartz et al., 2004). Besides, CRM systems and databases are intended to improve customer knowledge and services quality (Pedron & Saccol, 2009). The idea that is CRM technology is just one

component of the whole strategy, successful CRM implementation does not necessarily requires sophisticated technology (Boulding et al., 2005).

Based on their analysis of perspectives of CRM, Zablah et al. (2004, p. 480) propose the following definition of CRM: "CRM is an ongoing process that involves the development and leveraging of market intelligence for the purpose of building and maintaining a profit-maximizing portfolio of customer relationships."

Besides analyzing the different perspectives of CRM, Zablah et al. (2004) review the differences between the definition of CRM and relationship marketing. In their view, a distinction between the definitions of CRM and relationship marketing is that while relationship marketing focuses only on building and maintaining customer relationships, CRM focuses also on building a profitable portfolio of customer relationships (Zablah et al., 2004).

Jayachandran et al. (2005) developed an extensive study on the relationship between relational information and CRM. Jayachandran et al. (2005) focus more on the marketing processes that create information to create customer relationship. Some of fundamental processes of relational information are information capture, which refers to processes used to capture updated information about customers; information integration, which focuses on integration customer information generated through the different interactions between the organization and customers; and information access, which refers to providing an easy and fast access to customer information to all functional areas (Jayachandran et al., 2005).

It is interesting to mention that as CRM is related to market-driven strategy, CRM assumes that customer relationship is a market-based asset, and a market-based asset customer relationship can result in faster market penetration, more effective pricing systems, lower costs and higher levels of customer loyalty and customer retention (Srivastava et al., 1998).

In their study on CRM, Mithas et al. (2005) present the important factor of dual value creation. As organizations use CRM, they not only add value to services and products, but also get advantage and profits from valuable customer relationships (Mithas et al., 2005). Moreover, by adding more value to customer, organizations can increase the level of customer satisfaction and customer participation on product development (Mithas et al., 2005).

Even though CRM can lead to business success (Rigby et al., 2002), there are examples of CRM implementations that did not improved organizational performance (Boulding et al., 2005).

There is a close relationship between CRM success and effective integration between CRM and organizational processes and capabilities. An effective implementation of CRM also requires integration between CRM, marketing channels, customers and employees (Boulding et al., 2005).

Payne's and Frow's (2005) article is another one in this group of the eight most used references in CRM publications. When comparing the definition proposed by Payne and Frow (2005) with the previous definitions, I believe that their definition is the most appropriate for this research. It follows:

> ***"CRM is a strategic approach that is concerned with creating improved shareholder value through the development of appropriate relationships with key customers and customer segments. CRM unites the potential of relationship marketing strategies and IT to create profitable, long-term relationships with customers and other key stakeholders. CRM provides enhanced opportunities to use data and information to both understand customers and cocreate value with them. This requires a cross-functional integration of processes, people, operations, and marketing capabilities that is enabled through information, technology, and applications."*** (Payne & Frow, 2005, p. 168)

Finishing this chapter on definitions and perspectives of CRM, I would like to mention that CRM strategic can be divided into different activities. Lin et al. (2010) show that the most common CRM activities are information sharing, customer involvement, long-term partnership, joint problem solving, and technology-based CRM. **Information sharing** is related to retaining and distributing customer information among organization's members. **Customer involvement** relates to involving customers in the creative process of product creation, improvement of existing products and value generation. The CRM activity of **long-term partnership** focuses on building a valuable, lasting and mutual relationship with customers. **Joint problem solving** relates to CRM activity of involving costumers on problem solution. The last activity, **technology-based CRM,** involves implementing IT solutions (customer information data bases, data mining, CRM systems) to operationalize CRM strategy (Lin et al., 2010).

The following subchapter presents the some of the perils in implementing CRM in organizations. As Payne (2005) affirms, despite of investments on CRM, many times organizations do not succeed on obtaining positive results from the implementation of CRM.

2.1.3. The benefits and perils of CRM

Besides the benefits already mentioned in this chapter (product customization, customer value, valuable customer relationships, higher levels of competitiveness, customer satisfaction, service quality, market penetration), CRM strategy can bring other advantages to organizations such as improvement of product development, increasing of business intelligence, market differentiation, improvement of production processes, a holistic view of customers, and more integration with customers and suppliers (Chen & Popovich, 2003; Richards & Jones, 2008).

Despite of all these advantages, researches have shown that, in many occasions, CRM has not brought as many positive results to organizations as expected (Payne, 2005). Indeed, studies reveal that organizations do not make the most use of CRM systems potential to obtain valuable customer knowledge (Khodakarami & Chan, 2014). In this scenario, Rigby et al. (2002) present a very interesting study on the most frequent causes of CRM failure in organizations. According to Rigby et al. (2002), frequently organizations do not align their strategies before buying a CRM solution. That happens because many vendors sell the idea that CRM products can solve customer-related problems automatically, without mentioning that CRM solutions cannot be effective without a customer-oriented strategy (Rigby et al., 2002). It is fundamental to align CRM system, organizational strategy and IT infrastructure (Pedron et al., 2016; Soltani & Navimipour, 2016). Using CRM implies building an **organization-wide** strategy that focuses on building profitable relationships with valuable customers (Reinartz et al., 2005; Rigby et al, 2002).

Not only is necessary to set a customer-oriented strategy, but also to adjust organizational processes, structure and procedures in order to ensure CRM success (Pedron et al., 2016). That includes departmental structure, physical installations, job prescriptions, employee assessment measures, compensation systems, trainings and organizational culture (Rigby et al., 2002).

In fact, Rigby et al. (2002, p. 104) affirm that the organizations that achieve CRM success were those that "have worked for years at changing their structures and systems before embarking on CRM initiatives." It is interesting to note that when organizations consider adjusting their organizational structure before implementing CRM, they understand that it is necessary to educate employees accordingly (Jayachandran et al., 2005; Rigby et al., 2002).

Another important fact that impacts on the CRM strategy is the involvement of top executives (Chen & Popovich, 2003). The involvement of top executives is essential as they are responsible for changing organizational structure and for creating a culture that encourages employees to engage in a more customer-drive strategy (Day, 1994; 2003).

Building a good relationship with CRM providers is another factor that can surely enhance the likelihood of success; after the implementation of a CRM system, CRM providers are the ones responsible for giving technical support and instructions on how to make the most use of CRM system (Pedron et al, 2016).

Moreover, CRM refers to organizational strategy, appropriate use of information technology, creation and sharing of customer knowledge and development of profitable and long relationship with specific customers or customers segments (Boulding et al., 2005). Reinartz et al. (2004) also alert against the excess of formalization. Formalizing CRM initiative may cause the rigidity of processes, as organizations over-emphasize compliance to the specification, rather than the efficiency of CRM on building a value customer portfolio (Reinartz et al., 2004).

Organizations need to consider the kind of relationship customers want to have. Some customers value having a close relationship with organizations, while others can criticize seeing organizations storing information about their consumption habits. Therefore, it is important to consider this aspect; otherwise, organizations may risk building relationships with the wrong customers or building bad relationships with the right customers (Rigby et al., 2002).

Another important factor to obtain positive results from CRM is to disseminate customer knowledge across the organization (Day, 1994). Customer knowledge is essential for the work of front-line employees who deal directly with customers such as those in sales department, call centers, customer service and customer support. To be able to take the right decisions and to provide accurate solutions to customers, these employees

need to have precise information regarding customers' consumption patterns, demands and needs (Brito, 2011; Day, 1994; Pedron et al., 2016).

Finally, organizations ought to adapt to the new technological trends. Internet and social media have changed the way customers relate to organizations. Social CRM (also called CRM 2.0) has emerged in response to this new scenario (Wongsansukcharoen, Trimetsoontorn, & Fongsuwan, 2015). Malthouse, Haenlein, Skiera, Wege, and Zhang (2013) argue that social media needs to be integrated to CRM in order to increase customers engagement. Organizations can even use YouTube,
Facebook, Wikipedia and Twitter to collect raw data from customers' preferences and opinions, as well as to create a new communication channels (Malthouse et al., 2013).

Customer segmentation is another approach that has emerged in organizations as they want to maximize the effectiveness of resources allocation. Based on this approach, the new technique of customer portfolio management (CPM) appeared. Many times, maintaining some customers are not only disadvantageous, but also costly and demanding (Thakur & Workman, 2016). The CPM came, then, to expand the scope of CRM as it emphasizes how organizations can use customer information captured on
CRM to draw a strategic plan on how to allocate resources (Thakur & Workman, 2016).

The following chapter covers the second construct of this research, dynamic capabilities.

2.2. DYNAMIC CAPABILITIES

In this chapter, I present the main definitions and theoretical aspects of DCs..DCs can be understood as an extension of the resource-based view on strategic management (Eisenhardt & Martin, 2000). Teece et al. (1997) apply the influence of the dynamism of markets in the theory of RBV perspective. In their view, resources evolve over time in order to adapt to market changes. The perspective of DCs emerged to explain how organizations are able to survive and to keep leadership in unstable environments by rearranging competences, assets and abilities, which was not covered by the RBV perspective. For this reason, the DCV can be considered an extension of RBV that addresses some of the limitations of its antecessor (Ambrosini & Bowman, 2009; Bowman & Ambrosini, 2003). Therefore, it is relevant, to point out some important concepts on RBV.

2.2.1. The Resource-Based View (RBV) in strategic management

The seminal work of Barney (1991) is one of the foundations of RBV in strategic management research (Shafique, 2013). The importance of Barney's (1991) study is such that it is already has 51,618 citations on Google Scholar*. Unlike Porter's (1985) framework of the Five Forces that focuses on the external conditions that hinder or leverage organizational performance, the RBV of strategic management emphasizes the internal factors that can be used to achieve superior performance (Barney, 1991). Besides, Barney (1991) affirms that organizations have distinct resource bases which can be used to achieve competitive advantage.

Before Barney (1991), the book of Penrose (1959) had already addressed the impact of internal factors on organizational performance. For her, organizations can create value by how they use and deploy their resource base. Penrose's work (1959) definitely contributed to the foundation of the RBV, and consequently to the foundation of DCV (Ambrosini & Bowman, 2009).

According to the RBV, organizations can achieve sustainable competitive advantage by strategically developing and managing resources that are *valuable*, *rare*, *inimitable* and *nonsubstitutable* which are also named VRIN attributes (Barney, 1991; Wernerfelt, 1984). As researchers started studying the RBV in dynamic markets, some argued that sustainable competitive advantage (SCA) is difficult to achieve in dynamic markets (Eisenhardt & Martin, 2000; Teece et al., 1997).

Wernerfelt's (1984) article is another seminal paper in the RBV research in strategic management. It has been cited 25,794 times according to Google Citations*. In a bibliometric analysis on publications in innovation field, it was ranked in the 27th position as the most cited articles during the period of 1988 and 2008. This article has also been explored in CRM research field a lot. As I analyzed the co-citations of 3974 articles in CRM field, I concluded that the Wernerfelt's (1984) article has been greatly used due to its contribution to resource-based perspective in strategic management (Araújo et al., 2016).

In his paper, Wernerfelt (1984) analyzes how organizations can make the most of their resources in order to surpass competitors and how they can identify the most valuable resources to create value. Wernerfelt (1984) also points out the need for a balance between the exploration of existing resources and the creation of new resources

*Number of citations extracted from Google Scholar on May, 5th 2017

in order to achieve profit and better performance. It is interesting to note that Wernerfelt (1984) mentions the acquisition organizations as a way to acquire useful and valuable resources. The option of acquisitions to develop organization's resource is later included in the DCV (Eisenhardt & Martin, 2000; Teece et al., 1997).

As Barney (1991), Wernerfelt (1984) emphasizes the advantages that can be developed by arranging and exploiting internal resources efficiently. In opposition to Porter's Five Forces (1985) that teaches external barriers to new entrants, he explains that organization can set barriers on resource positions in order to overcome current or potential competitors. For instance, if an organization possesses a resource that affects the costs and revenues of the market faster than its competitors, this organization has the protection of a resource position barrier. Certainly, creating a resource position barrier is a way to build competitive advantage. However, it is important to note that "an entry barrier without a resource position barrier leaves the firm vulnerable to diversifying entrants, whereas a resource position barrier without an entry barrier leaves the firm unable to exploit the barrier" (Wernerfelt, 1984, p. 173). Organizations can reinforce resource barriers as well as sustain their competitive advantage by making difficult for others to achieve their core resources (Barney, 1991; Collis, 1994; Prahalad & Hamel, 1990). Organizations can take advantage of attractive resources as well, as for example customer loyalty – which is also one of the bases for relationship marketing (Brito, 2011; Day, 1994).

To understand the concept of DCs, it is relevant to see the definitions of key elements on the theory of DCV: resources and organizational capability.

2.2.2. Definition of resource and organizational capability

Barney (1991) offers a didactic definition for resources. For him,

> "firm resources include all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness. In the language of traditional strategic analysis, firm resources are strengths that firms can use to conceive of and implement their strategies" (Barney, 1991, p. 101).

For Teece et al. (1997, p. 516), resources are "firm-specific assets that are difficult if not impossible to imitate. Trade secrets and certain specialized production facilities and engineering experience are examples. Such assets are difficult to transfer among firms because of transactions costs and transfer costs, and because the assets may contain tacit knowledge."

Resources can be classified into three types (Barney, 1991; Wernerfelt, 1984): (1) **physical capital** resources (technological structure, physical plant, equipment, geographic location), (2) **human capital** resources (training, experience, judgment, competences, expertise, tacit knowledge and explicit knowledge), and (3) **organizational capital** resources (organizational structure, planning, management systems, alliances, interrelationship with other organizations), trade contracts, procedures.

Bowman and Ambrosini (2003) did an interesting explanation to deepen the understanding on the VRIN attributes of resources. To be **valuable**, a resource has to generate rents. To be **rare**, a resource has to be scarce or not commonly found in the market. To be **inimitable,** a resource has to be difficult to be replicated by competitors To be **non-substitutable,** a resource cannot be easily replaced by other resources; in order words, competitors cannot create similar nor different resources that generate the same result. VRIN resources are fundamental to achieve sustainable competitive advantage (Barney, 1991).

Assets "are the resource endowments the business has accumulated (e.g., investments in the scale, scope, and efficiency of facilities and systems, brand equity, and the consequences of the location of activities for factor costs and government support)" (Day, 1994, p. 38). On the other hand, capabilities involve the processes and capabilities that allow organizations to integrate these assets and to make most use of them.

It is important to mention that some authors use the words "asset" and "resource" interchangeably, referring to the same ideas. Teece et al. (1997) and Teece (2007) use the "asset" to refer to organizational resources that are difficult to imitate as trade secrets, organizational routines, competences and technological know-how. In turn, Barney, (1991) and Wernerfelt (1994) name these organizational assets as resources.

An organizational capability is a "high-level routine (or collection of routines) that, together with its implementing input flows, confer, upon an organization's management a set of decision options for producing significant outputs of a particular type" (Winter,

2003, p. 991). This definition emphasizes that capability is not an *ad hoc* intervention to solve specific problems. An organizational capability comprises defined processes and routines that are implemented purposefully to achieve a specific goal (Ambrosini & Bowman, 2009; Winter, 2000; Winter, 2003). It is important to note that capabilities cannot be bought in the market. Instead, capabilities are developed by the organization itself (Ambrosini & Bowman, 2009; Eisenhardt & Martin, 2000).

A capability has intended and specific purposes. Besides, when we say that an organization has a capability it implies that the organization has the capacity to carry out a specific activity in a repeated, reliable and satisfactory fashion (Helfat & Winter, 2011). Another important feature of organizational capability is that a capability does not belong to a single unit, individual or equipment. The capacity to perform a specific activity belongs to organization as a whole and is part of its experience (Helfat & Winter, 2011).

Organizational capabilities have three sources of vulnerability: "(1) erosion of the capability as the firms adapts to external or competitive changes, (2) replacement by a different capability, and (3) being surpassed by a better capability" (Collis, 1994, p. 147). It is interesting to note that, in order to make capabilities more difficult to imitate, organizations are inclined to build them upon ambiguity and tacit knowledge. However, this ambiguity can cause the corrosion of these capabilities, since as organizations adapt to environment or threats, part of important tacit knowledge can be lost during the process.

Winter (2003) divides capabilities into ordinary (or operational) capabilities and DCs. A DC implies changing, an ordinary capability focuses on doing the something (e.g. a process, routine) that "keeps organization earning its living" (Winter, 2003, p. 992). Operational capabilities are the zero-level capabilities, while DCs are the higher level capabilities. For instance, according to Winter (2003), the capability to create a new product, a new market or a new acquisition is a dynamic capability (DC). On the other hand, the capability to produce the same product to the same group of customers is an operational capability.

Regarding the relationship between DCs, competitive advantage and organizational performance, it is important to note that authors present some different perspectives on this theme. For Barney (1991), to have competitive advantage organizations need to ensure that their strategy to create value is "not simultaneously being implemented by any other current or potential competitors." Above that, to achieve **sustainable** competitive advantage organizations need to ensure that current and potential

competitors are not able to replicate the results delivered by their strategy. SCA is not related to the period of time in which an organization holds competitive advantage over its competitors. SCA is based the fact that the organization's core competences and value creation strategy is not replicated by current and potential competitors. Finally, many may misunderstand the definition of SCA as they believe that it lasts forever. But it is not true. Having SCA means that the organization is not swept away from the market due to its competitor ability to duplicate their core competences. Yet, changes on economy, legal or governmental interventions or shifts on customer demands can make a valuable product or service to lose its worth in the market (Barney, 1991).

For Eisenhardt and Martin (2000), DCs are sufficient to achieve SCA. Teece, (2007, p. 1344) corroborates this position as he affirms "if an enterprise possesses resources/competences but lacks DCs, it has a chance to make a competitive return (and possibly even a supra-competitive return) for a short period; but it cannot sustain supracompetitive returns for the long term except due to chance" (Teece, 2007, p. 1344).

However, other authors point out to risk of overestimating DCs and their impact on competitive advantage (Winter, 2003). Even though DCs can help organizations to achieve better performance (Eriksson, 2014), an organizational capability, whether operational or dynamic, does not guarantee SCA (Collis, 1994). A capability should be inimitable in order to sustain competitive advantage (Prahalad & Hamel, 1990); however, competitors can imitate leaders' core capabilities, and even, change the rules of the game (Collis, 1994). Zahra et al. (2006) also alert that DCs does not ensure superior organizational performance. Again, it is difficult to measure the effects on DCs on performance. However, the more DCs are used, the better they get (Kraatz and Zajac, 2001; Zahra et al., 2006).

2.2.3. Comparing the definitions of DCs

It is known that authors have not reached a consensus regarding the definition of DCs. In fact, even one of the "fathers" of DCV recognizes that the theory on DCs lacks more precise and consistent definition and identification (Easterby-Smith et al., 2009). As I analyze studies on the DC, I could observe the need for research to evaluate the applicability of DCs in organizations, as stated by Takahashi, Bulgacov, Bitencourt, and Kaynak (2017).

One reason for these conflicting perspectives might be the fact that definitions reflects author's point of view of DCs (Easterby-Smith et al., 2009). For instance, in two of his articles in DCs Winter (Winter, 2003; Zollo & Winter, 2002) emphasizes that DCs are routines that evolve according to economics; Eisenhardt and Martin (2000) define DCs define DCs as processes that vary according to the dynamism of the market. On the other hand, Teece (Teece et al., 1997; Teece, 2007) depicts DCs as microfoundations that have effect on competitive advantage and organizational performance.

Due to this lack of consensus regarding the definitions of DCs, I decided to compare some definitions of DC found during the systematic literature review (as detailed in the Methodology chapter). In this processes, I selected some of the main papers on DCs and on the sequence, I analyzed definitions for DCs provided by the authors of these papers. Table 1 describes the comparison of these different definitions.

Based on Teece's (2007) framework, I compared the definitions of DCs according to some theoretical factors: if the definitions affirms that DC leads to innovation; if the definition depicts DCs as organizational routines and processes; if the definition affirms that DC ensures competitive advantage; if the definition assumes that DC is the capacity to adapt and/or influence the environmental and market changes; if the definition alleges that DCs result on changing operational capabilities; if the definitions alleges that DCs result on changing the organization's resource base; if the definition attests that DCs are intentionally implemented in accordance to organizational strategy; and if the definition relates DC with organizational learning, as some authors argue that DCs foster organizational learning (Ali et al., 2012).

Table 1: Analysis of existing definitions on dynamic capabilities

Authors	Definition of DCs	Cit*	Innovation	DCs as routines/ processes	Competitive Advantage	Direct Impact on Org. Perform.	Enables to Adapt to Environ. /Market	Change oper. Capab. (processes)	Change Resource Base	Strategic	Org. learn
Ambrosini & Bowman (2009)	"…dynamic capabilities are organizational processes in the most general sense and that their role is to change the firm's resource base… dynamic capabilities describe intentional efforts to change the firm's resource base." (p. 33)	979		X					X	X	
Ambrosini et al. (2009)	"Dynamic capabilities are built rather than bought in the market. They are organizational processes in the most general sense or routines which may have become embedded in the firm over time, and are employed to reconfigure the firm's resource base by deleting decaying resources or recombining old resources in new ways." (p. S11)	557		X					X		
Bowman & Ambrosini (2003)	"The dynamic capabilities view (DCV) focuses on the capacity an organization facing a rapidly changing environment has to create new resources, to renew or alter its resource mix. If we assume that resources are situated primarily at SBU level, processes that reshape and augment these resource bundles can conceivably operate both at SBU level, and at corporate level." (p. 292)	415		X			X		X		
Cepeda & Vera (2007)	"Dynamic capabilities involve a transformation process of the firm's knowledge resources and routines, and the output of dynamic capabilities is a new configuration of resources and operational routines." (p. 427)	482		X				X	X		

Authors	Definition of DCs	Cit*	Innovation	DCs as routines/ processes	Competitive Advantage	Direct Impact on Org. Perform.	Enables to Adapt to Environ. /Market	Change oper. Capab. (processes)	Change Resource Base	Strategic	Org. learn
Doving & Gooderham (2008)	"dynamic capabilities are best conceived as enduring routines, systems, and processes that are visible, known, and managerially intended as a means to achieving new resource configurations." (p. 845)	251		X					X		
Eisenhardt & Martin (2000)	"The firm's processes that use resources – specifically the processes to integrate, reconfigure, gain and release resources – to match or even create market change. Dynamic capabilities thus are the organizational and strategic routines by which firms achieve new resources configurations as markets emerge, collide, split, evolve and die" (p. 110)	12601		X			X	X	X	X	
Helfat & Peteraf (2003)	"Dynamic capabilities do not directly affect output for the firm in which they reside, but indirectly contribute to the output of the firm through an impact on operational routines...like operational capabilities, dynamic capabilities consist of routines." (p. 999)	3331		X				X			
Helfat et al. (2007)	"A dynamic capability is the capacity of an organization to purposefully create, extend, or modify its resource base." (p. 4)	2626							X	X	
Helfat & Winter (2011)	"…dynamic capability is one that enables a firm to alter how it currently makes its living. This can include altering operational capabilities, or… the resource base of the organization (broadly denoting those things on which firms draw to perform activities), or features of the external environment or ecosystem. (p. 1244-1245).	461		X			X	X	X		

Authors	Definition of DCs	Cit*	Innovation	DCs as routines/ processes	Competitive Advantage	Direct Impact on Org. Perform.	Enables to Adapt to Environ. /Market	Change oper. Capab. (processes)	Change Resource Base	Strategic	Org. learn
Oliver & Holzinger (2008)	“Dynamic capabilities allow a firm to leverage its internal assets, not only to satisfy current environmental demands so that these demands correspond with the firm’s strengths or requirements.” (p 504)	449					X		X		
Teece (2007)	"Dynamic capabilities enable business enterprises to create, deploy, and protect the intangible assets that support superior long- run business performance. The microfoundations of dynamic capabilities—the distinct skills, processes, procedures, organizational structures, decision rules, and disciplines—which undergird enterprise-level sensing, seizing, and reconfiguring capacities are difficult to develop and deploy." (p. 1319)	5661	X	X	X	X		X	X		
Teece et al. (1997)	“We define dynamic capabilities as the firm’s ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments. Dynamic capabilities thus reflect an organization’s ability to achieve new and innovative forms of competitive advantage given path dependencies and market positions.” (p. 516)	28344	X	X	X	X	X		X		
Wang & Ahmed (2007)	“...dynamic capabilities as a firm’s behavioral orientation constantly to integrate, reconfigure, renew and recreate its resources and capabilities and, most importantly, upgrade and reconstruct its core capabilities in response to the changing environment to attain and sustain competitive advantage.” (p. 35)	1548			X		X	X	X		

Authors	Definition of DCs	Cit*	Innovation	DCs as routines/ processes	Competitive Advantage	Direct Impact on Org. Perform.	Enables to Adapt to Environ. /Market	Change oper. Capab. (processes)	Change Resource Base	Strategic	Org. learn
Weerawardena et al. (2007)	"Dynamic capabilities are the routines through which the firm learns from different sources which in our conceptualization are the market, the firm's network of relationships and the learning that is harnessed internal to the firm itself." (p. 298)	473		X			X				X
Wernerfelt (1984)	"…the optimal growth of the firm involves a balance between exploitation of existing resources and development of new ones" (p. 178)	26732					X		X		
Winter (2003)	"Defining ordinary or 'zero-level' capabilities as those that permit a firm to make a living' in the short term, one can define dynamic capabilities as those that operate to extend, modify or create ordinary capabilities" (p. 991)	3946		X				X		X	
Zahra et al. (2006)	"the abilities to reconfigure a firm's resources and routines in the manner envisioned and deemed appropriate by its principal decisionmaker." (p. 918)	1901					X	X	X	X	
Zollo & Winter (2002)	"A dynamic capability is a learned and stable pattern of collective activity through which the organization systematically generates and modifies its operating routines in pursuit of improved effectiveness" (p. 340)	5918		X		X		X		X	X

Zott (2003)	"dynamic capabilities are indirectly linked with firm performance by aiming at changing a firm's bundle of resource, operational routines, and competencies, which in turn affect economic performance. More specifically, dynamic capabilities are embedded in routine organizational processes that guide the evolution of a firm's resource configuration and operational routines." (p.98)	1458		X				X	X		

**Note: ***Number of citations extracted from Google Scholar on May, 5th 2017
Source: Author

As I analyzed the definitions some aspects are brought to the fore: only one definition (Teece et al., 1997) directly relates DCs with innovation; only two definitions (Weerawardena, Sullivan, Liesch, & Knight, 2007; Zollo & Winter, 2002) relates DC with organization learning; other three affirm that DC is directly related to competitive advantage (Teece et al, 1997; Teece, 2007; Wang & Ahmed, 2007); three definitions affirm that DCs have direct impact on organizational performance (Teece et al., 1997; Teece, 2007; Zollo & Winter, 2002). While few definitions relate DCs with innovation, competitive advantage and organizational performance, a significant number of definitions associate DCs with change on operational capabilities (11), capacity to adapt and/or influence environmental and market changes (9); and reorganization and changes on resource base (15).

Finally, one aspect that is important to highlight is that 14 out of 19 definitions depict DCs as processes and routines, as it is emphasized by many authors (Ali et al. 2012; Helfat & Peteraf, 2003; Helfat et al., 2007).

Based on this analysis I propose the following definition for DCs:

> ***Dynamic capabilities are intentionally and strategically implemented processes and routines that enable organizations to change their operational capabilities and their resource base in order to adapt and influence environmental changes. As organizations rearrange their resources and change their operational capabilities, they could achieve superior performance, sustain competitive advantage and develop the capability to innovate.***

This definition emphasizes the idea that DCs do not impact organizational performance directly and that DCs do not ensure SCA and innovation by themselves. Organizations develop DCs to change their operational capabilities and resource base, and by doing so, they can achieve better operational performance, SCA and innovation.

Following, I present more details on Teece's (2007) framework.

2.2.4. Teece's (2007) framework on DCs

Teece's (2007) framework on DC has been widely used on researches on strategic management and DCV (5,300 citations according to Google Scholar*). In this article, Teece revisits his previous work on DCs (Teece et al., 1997) to improve the concepts he and his colleagues have introduced years later. Here, Teece (2007) divides DCs into three classes: capabilities to **sense and shape opportunities**, capabilities to seize opportunities and **capabilities to manage threats and reconfiguration** of organizational assets in order to maintain competitive advantage.

To sense and shape opportunities organizations need to implement processes of scanning, searching and exploring market knowledge – which include knowledge on customers, competitors and providers, technology opportunities, market trends and demands. To do, constant investment on research initiatives is fundamental (Teece, 2007). Different from the earlier theoretical paper on DCs (Teece et al., 1997), Teece (2007) separates DCs from its elements, which he names as the microfoundations of DCs. The microfoundations are the processes, procedures, activities, structures that are part of each class of DCs.

The class of DCs to **sense** opportunities comprises systems and processes to analyze information about the environment and the market. These capabilities enable organizations to learn, to filter and to shape opportunities in order to build competitive advantage. The microfoundations of these capabilities are processes of R&D initiatives, processes to develop new technology and to leverage innovation. Besides that, sensing opportunities also involve process to identify market segments and customer demands. It is interesting to note that Teece (2007) emphasizes the need for knowledge management and also the need for sensing customer demands and expectations in order to anticipate market trends. In fact, as organizations develop sensing capabilities they are able to mold customers' demands by creating new products and services (Prahalad & Hamel, 1990). These DCs are fundamental to leverage IC.

The DCs of **seizing** opportunities involve processes to delineate customer solutions and business model. In addition, seizing opportunities involve processes to elaborate decision-making protocols and delimitate enterprise boundaries. Being able to do effective and assertive decision-making protocols as well as to delimit enterprise boundaries is fundamental in market with rapid technological changes (Teece, 2007). Finally, seizing opportunities involve the process to build loyalty and commitment within the top management, managers and employees. Developing an innovation culture within the whole organization is essential to develop seizing capabilities, as members need to have the expertise and the drive to see opportunities and to develop way to take advantage of them.

DCs that enable organizations to **manage threats and to transform assets** refer to the continuous alignment of tangible and intangible assets. This class involves the ability to identify and develop complementary assets to create value and profitable products, integrating and coordinating competences. Again, knowledge management is important element to manage threats and reconfigure organizational assets: organizational learning, integration and disseminations of knowledge as well as intellectual property (Teece, 2007). Figure 3 illustrates Teece's (2007) framework.

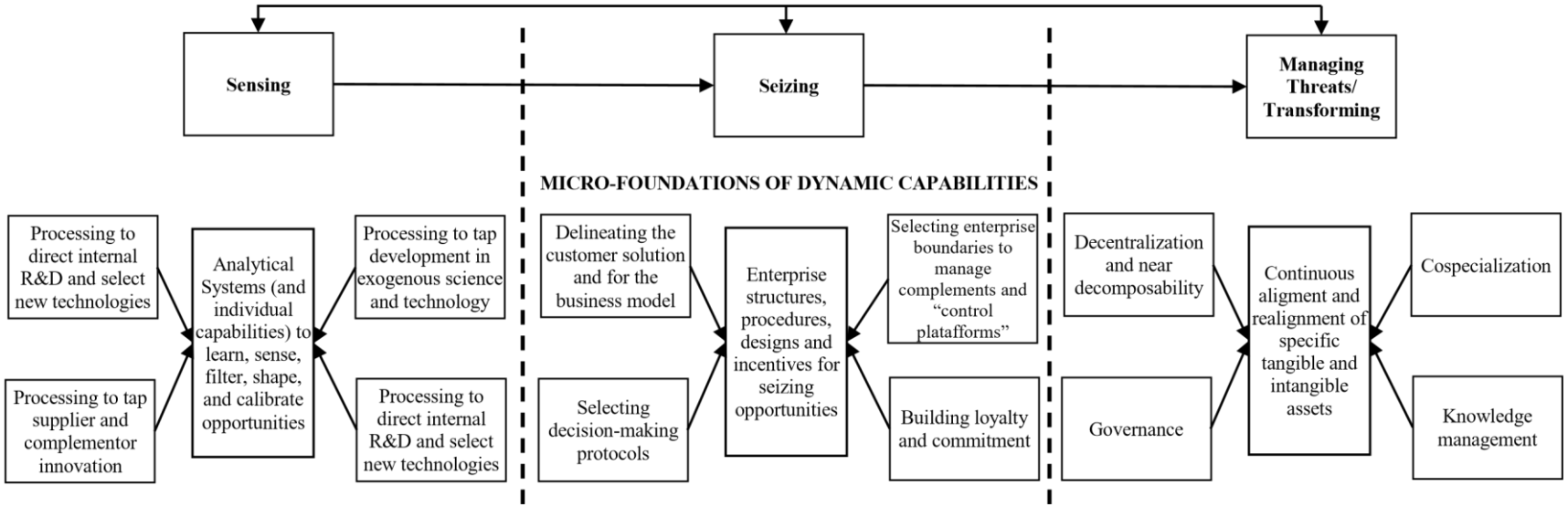

Figure 3: Foundations of dynamics capabilities and business perform
Source: Adapted from Teece (2007)

Following, I present other aspects on this theory that were used to delimit the scope of this research.

2.2.5. Other important aspects regarding dynamic capabilities

We can divide capabilities into two types: operational and dynamic (Winter, 2003). Operational (or ordinary) capabilities enable organizations to "make a living in the present (...) using more or less the same techniques on the same scale to support existing products and services for the same customer population" (Helfat & Winter, 2011, p. 1244). On the other hand, DCs enable organizations to change their *status quo* and to create new ways to profit (Helfat & Winter, 2011).

Even though we can point out differences between operational and DCs, we must admit that it is difficult to define a concrete line to distinguish these two types of capabilities. Helfat and Winter (2011, p. 1245) give three reasons for that:

> "1) change is always occurring to at least some extent; 2) we cannot distinguish dynamic from operational capabilities based on whether they support what is perceived as radical versus non-radical change, or new versus existing businesses; and 3) some capabilities can be used for both operational and dynamic purposes."

We cannot say promptly that a specific capability is not dynamic because it did not produce changes. Many times, changes take time to become perceptible and concrete. For instance, engaging in researches to develop new products affects manufacturing processes. However, measuring interventions in a short period of time is useless because the effects of Research & Development (R&D) investments on manufacturing processes need time to produce results (Helfat & Winter, 2011).

For Teece et al. (1997, p. 515), a DC "refers to the capacity to renew competences so as to achieve congruence with the changing business environment". These authors emphasize that DCs play a fundamental role on strategic management as they enable organizations to adapt, to integrate and to reconfigure their internal and external resources to respond to changes in the environment.

Some DCs integrate resources, for example, when organizations combine their expertise and employees' background to combine skills to develop products and services (Eisenhardt & Martin. 2000). DCs can also reconfigure resources as managers use routines to transfer, copy and recombine knowledge-based competences (Eisenhardt & Martin. 2000). They can also be related to gain and release resources. These types of DCs

have routines that create new knowledge and release new rationale. Capabilities like these are fundamental in industries such as pharmaceuticals and oil (Eisenhardt & Martin. 2000). Besides being related to the ability of rearranging resources, DCs are also related to the ability of acquiring and releasing resources. DCs also include acquisition and alliance activities (Eisenhardt & Martin, 2000).

Teece et al. (1997), as well as Eisenhardt and Martin's (2000), highlight the impact of environment on organization performance as well as the necessity to adapt to environment in order to sustain competitive advantage. Both papers attest that DCs are related to unstable environments. However, other authors such as Ambrosini and Bowman (2009) point out that DCs can be also developed in stable environments, as DCs are not about the dynamism of the environment, but about organization's capacity to adapt to environmental changes.

Besides enabling organizations to survive and to adapt to environment changes DCs also enable organizations to create environmental changes in order to surpass competitors and to shape markets in accordance to their strategy and core competences (Oliver & Holzinger, 2008; Prahalad & Hamel, 1990).

Developing DCs involves a long-term commitment to allocate specific resources, specialized and full-time personnel, financial and others kinds of investments. Therefore, organizations need to evaluate all costs related to developing any DC, because the enterprise might not be worthwhile (Winter, 2003). The value of a specific DC depends on the context. Sometimes a DC can be substituted by an *ad hoc* initiative that demands lower investments (Collis, 1994; Winter, 2003). As Collis (1994), Eisenhardt and Martin (2000), and Helfat and Winter (2011) argue, developing DCs demands constant investments of time, training, finances, and structure. Therefore, investments on developing and sustaining these DCs must pay off.

Likewise in the implementation of CRM strategy, the involment of top executives is fundamental in developing DCs. Zahra, Sapienza, and Davidsson (2006) argue that DCs depend fundamentally on senior managers' and top board executives' perception of environmental changes, on their willingness to adapt to changes, as well as on their ability to take advantage from the opportunities they perceive. The perspective of Zahra et al. (2006) on the role of top management on DCs is in congruence with Eisenhardt and Martin (2000) and Teece (2007): "Dynamic capabilities reside in large measure with the enterprise's top management team" (Teece, 2007, p. 1346).

Another important aspect that must be considered is that, many times, the capability to innovate or to promote changes is seen a DC. Innovation that comes from "firefighting" actions does not imply that the organization has developed an (dynamic) capability. In order to develop a capability, the organization has to implement a repetitive and standardized process that results into creating new products, new processes or new markets. In fact, as mentioned above, Teece (2007) states that processes and routines are elements of DCs (microfoundations).

An organization does not develop capability out of improvisation, but out of logical knowledge (Winter, 2003). Besides, organizations that develop DCs use them for a long period of time. Based on that, we can even conclude that usually big organizations are more prone to develop DCs than small organizations, because the costs of developing these capabilities are too high for small organizations to afford (Helfat & Winter, 2011).

Following, I present the main theoretical aspects on IC that are used in the research.

2.3. INNOVATION CAPABILITY

Literature presents different definitions for innovation. Innovation implies implementing successfully a novelty in order to achieve results that benefit organizations in some way (Amabile, 1988; Damanpour, 1996; Downs & Mohr, 1976). As I analyzed the many definitions of innovation, I understood that for an initiative to be innovative, it has to be successfully adopted and implemented by the organization (Damanpour, 1991; Freeman & Engel, 2007; Van de Ven, 1986). Innovation also involves changing the current state of products, services, processes and structures. For this reason, innovation can be either technological or non-technological; even though innovation is generally related to new technology, innovation involves scientific, organizational, financial and commercial initiatives (OECD, 2005).

Baregheh, Rowley, and Sambrook (2009) conducted a detailed analysis of the many existing definitions of innovation. Baregheh et al. (2009) divided definitions into the areas of study: marketing, economy, innovation, entrepreneurship, business management, technology and organizations. In table 2, I mention some of the definitions from business management area.

Table 2: Different definitions of innovation found in literature

Author	Definition of Innovation

Becker & Whisler (1967, p. 462)	"the first or early use of an idea by one of a set of organizations with similar goals."
Damanpour (1991, p. 556)	"An innovation can be a new product or service, a new production process technology, a new structure or administrative system, or a new plan or program pertaining to organizational members. Thus, innovation is defined as adoption of an internally generated or purchased device, system, policy, program, process, product, or service that is new to the adopting organization."
Damanpour (1996, p. 694)	"Innovation is conceived as a means of changing an organization, either as a response to changes in the external environment or as a pre-emptive action to influence the environment. Hence, innovation is here broadly defined to encompass a range of types, including new product or service, new process technology, new organization structure or administrative systems, or new plans or program pertaining to organization members."
Freeman & Engel (2007, p. 94)	"Innovation refers to a process that begins with a novel idea and concludes with market introduction."
Klein & Sorra (1996, p. 1057)	"an innovation is a new product or service than an organization, developer, or inventor has created for market."
Knight (1967, p. 478)	"An innovation is the adoption of a change which is new to an organization and to the relevant environment."
McGrath et al. (1996, p. 390)	"Innovation is one mechanism through which a firm gains superior insight about, and access to, firm-specific resources with positive future value."
Mone et al. (1998, p. 117)	"any action that either puts the organization into new strategic domains or significantly alters the way the organization attempts to serve existing customers or constituents."
Shepard (1967, p. 470)	"when an organization learns to do something it did not know how to do before, and then proceeds to do it in a sustained way."
Trott (2005, p. 15)	"Innovation is the management of all the activities involved in the process of idea generation, technology development, manufacturing and marketing of a new (or improved) product or manufacturing process or equipment."
Van de Ven (1986, p. 590)	"Innovation is defined as the development and implementation of new ideas by people who over time engage in transactions with others within an institutional order."

Source: Author

Based on these definitions, I can conclude that innovation aims to bring about newness, improvement and changing on organizational assets aiming to gain competitiveness and differentiation in the market.

The terms "innovation" and "innovation capability" are frequently used interchangeably in literature (Hogan, Soutar, McColl-Keneddy, & Sweeney, 2011).

Besides that, there are authors that use the term "innovativeness" as a synonym for IC (Hult et al., 2004; Panayides, 2006; Wang and Ahmed, 2004). For this reason, it is useful to point out that this research focuses on "innovation capability" and not on "innovation". The reason for this position is that I aim to measure the effect of CRM and DCs on organizations' capability to innovate, not on the innovation itself.

I adopt the definition found in the Oslo Manual: "an innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations" (OECD, 2005, p. 46).

Authors emphasize that developing IC is fundamental for organizations to survive in volatile environments (Panayides, 2006). In fact, IC facilitates the external orientation of organizations and enables them to create innovative products and services that can help them to gain market leadership (Santos-Vijande, Río-Lanza, SuárezÁlvarez, & Díaz-Martín, 2013) and to take advantage of market changes (Koc, 2007). It is worth mentioning that may authors associate IC to processes and procedures. For Chen (2009), IC is grounded on organizational processes and structure, which can be designed and applied in a way to create innovative products and processes.

Based on this suggestive fact, I can conclude that IC is an organization capability, not a resource. IC involves a set of repeated actions that are executed to bring about a predefined goal (Hogan et al., 2011; Ngo & O'Cass, 2009; Winter, 2003).

Relating IC with processes, routines and "repeated actions" constrasts with the idea that innovation is related to newness (Van de Ven, 1986). However, such as for DCs, for organizations to develop IC they have to do it "intentionally". In fact, Chen (2009, p. 94) emphasizes tha IC is "grounded in the processes, systems, and organizational structure". Without a systematized approach, innovation is generated on *ad-hoc* initiatives or firefighting actions.

As an organizational capability, IC enables organizations to generate innovation that will help sustaining competitive advantage (Weerawardena & McColl-Kennedy, 2003) and achieving better performance (Hurley & Hult, 1998). Besides that, taking into consideration the objectives of innovation, IC involves developing new products and services in response to market demands and effectively applying internal processes to develop these new products and services (Adler & Shenhar, 1990).

According to Day (1994, p. 38), an organizational capability involves "complex bundles of skills and accumulated knowledge". In literature, IC is frequently and strongly connected to organizational knowledge and learning. IC is the capability that enables organizations transform knowledge into innovation (Flatten, Engelen, Zahra, & Brettel, 2011). That constant transformation of knowledge will result on benefits to the organization and its stakeholders (Lawson & Samson, 2001; Ngo & O'Cass, 2009).

IC is also related to creation of **new** knowledge to develop new services and products (OECD, 2005). Indeed, to develop IC organizations need to organize their knowledge in a way that will generate new insights and new applications of existing knowledge. Researches show that organizational learning can have direct impact on innovation (Camisón & Villar-López, 2011; Gibbons et al., 1994).

Different factors can facilitate or inhibit IC in organizations. For instance, factors such as organization size, availability of resources, formality, complexity, organizational hierarchy can influence the development of IC. Besides that, organizations settled dynamic markets are more likely to innovate (Downs & Mohr, 1976).

It is interesting to see that the definitions of DCs and IC have elements in common. For instance, Hult et al. (2004) analyze IC under the perspective of RBV (the perspective that preceded the DCV. Hult et al. (2004) argue that IC is the ability to innovate on the way organizations use their resource base and that this capability improves as organizations become more market-driven. Besides, the knowledge that feeds IC is generated as the organization absorbs and interprets the knowledge they absorbed from the environment (Hult et al., 2004).

In fact, learning from the market is one of the key factors to develop IC. Organizations should constantly observe the market in which it is inserted in order to identity and to take advantages of new business opportunities and new customer demands (Chang & Lee, 2008; Levitt, 1960; Weerawardena, 2003). Weerawardena (2003) affirms that organizations that are more advanced on their market knowledge are more likely to develop radical changes on products, services, methods and managerial processes (Plessis, 2007).

Other authors who analyze IC through the lens of RBV are Ngo and O'Cass (2009). They affirm that IC is "the glue that combines, develops, and transforms the resources to create value offering for customers" (Ngo & O'Cass, p. 49).

Additionally, for Wang and Ahmed (2007), IC is an essential component factor of DCs. IC connects the organizations to the market opportunities, as it enables the organization to respond to market demands by developing innovative products, services and processes (Wang & Ahmed, 2007).

Following the same steps described in chapter on DCs, I decided to compare some definitions of IC: I selected some of the main papers on IC and, then, analyzed the different definitions for IC. In this processes, I observed some similarities between the

definitions for IC and DCs. For example, just as DC, IC is identified as a capability that involves processes and routines (Winter, 2003), adaptation to changes in the market/environment (Teece, 2007) and organizational learning (Camisón & VillarLópez, 2011). Table 3 presents the result of this analysis.

Table 3: Analysis of existing definitions on innovation capability

Authors	Definition of IC	Cit*	IC's as routines/processes	Develop new products /services	Changing/ creating processes	Direct Impact on Competitive Advantage	Direct Impact on Org. Performance	Enables to adapt to environ./ market	Change Resource Base	Org. learning
Chen (2009)	"Innovative capabilities refer to firm's capabilities, grounded in the processes, systems, and organizational structure, which can be applicable to the product or process innovation activities." (p. 94)	166	X	X	X				X	
Guan et al. (2006)	"The ability to introduce new products and adopt new processes in shorter lead time has become an imperative competitive tool." (p. 972)	320	X	X	X	X	X		X	
Hult et al. (2004)	"the capacity to introduce of some new process, product, or idea in the organization." (p. 433) "Organizations without the capacity to innovate may invest time and resources in studying markets but are unable to translate this knowledge into practice. (p. 430)	1584	X	X	X			X	X	X
Hurley & Hult (1998)	"The capacity to innovate...is the ability of the organization to adopt or implement new ideas, processes, or product successfully." (p. 44)	3772	X	X	X	X	X		X	X
Keskin (2006)	"which refers to that portion of a firm's culture that promotes and supports novel ideas, experimentation, and openness to new ideas. (p. 399)	485		X	X					X
Lawson & Samson (2001)	"An innovation capability is therefore defined as the ability to continuously transform knowledge and ideas into new products, processes and systems for the benefit of the firm and its stakeholders." (p. 384)	1001	X	X	X	X	X	X	X	X

Authors	Definition of IC	Cit*	IC's as routines/processes	Develop new products /services	Changing/ creating processes	Direct Impact on Competitive Advantage	Direct Impact on Org. Performance	Enables to adapt to environ./ market	Change Resource Base	Org. learning
Lin & Chen (2008)	"The first views it as a behavioral variable, that is, the rate of adoption of innovations by the firm. The second views it as an organization's willingness to change." (p. 87)	36		X	X					
Lin (2015)	"The innovation capability of a retailer has been noticed mostly because of the growing evidence that they have more ability to offer new products, services and promotions to satisfy their customers." (p. 35)	5		X	X	X		X		
Lin et al. (2010)	"Innovation capability refers to the implementation or creation of technology as applied to systems, policies, programs, products, processes, devices, or services that are new to an organization. Innovation capability is also the ability of firms to assimilate and utilize external information for transfer into new knowledge" (p. 113)	176	X	X	X			X	X	X
Nasution & Mavondo (2008)	"Organisational innovativeness refers to the level of development and implementation of new ideas, and represents a latent capability of firms, which is composed of two critical parts: (1) technological; and (2) behavioural" (p. 484)	212	X	X	X				X	X
Ngo & O'Cass (2009)	"the integrative process of applying the collective knowledge, skills, and resources of the firm to perform innovation activities pertaining to technical innovations (products and/or services, and production process technology) and nontechnical innovations (managerial, market, and marketing)." (p. 48)	163	X	X	X			X	X	X

Authors	Definition of IC	Cit*	IC's as routines/processes	Develop new products /services	Changing/ creating processes	Direct Impact on Competitive Advantage	Direct Impact on Org. Performance	Enables to adapt to environ./ market	Change Resource Base	Org. learning
Romijn & Albalade (2002)	“skills and knowledge needed to effectively absorb, master, and improve existing technologies, and to create new ones.” (p. 1054)	926		X	X		X		X	X
Schweitzer (2014)	“establish shared routines and procedures that support creativity and experimentation, in developing new processes, and introducing the latest knowledge and technology…in order to research, develop, and introduce new products and services.” (p. 452)	15	X	X	X				X	X
Szeto (2000)	"continuous improvement of the overall capability of firms to generate innovation for developing new products to meet market needs." (p. 150)	163	X	X	X		X	X		
Vicente et al. (2015)	"According to these definitions, innovation capability emphasizes the capabilities to develop new products or processes by combining firm’s innovativeness, strategy, and technology." (p. 32)	9	X	X	X				X	
Wang & Ahmed (2004)	“an organisation’s overall innovative capability of introducing new products to the market, or opening up new markets, through combining strategic orientation with innovative behaviour and process” (p. 304)	757	X	X	X			X	X	
Wang & Ahmed (2007)	"the firm's ability to develop new products and/or markets, through aligning strategic innovative orientation with innovative behaviours and processes...innovation capability explains the linkages between a firm's resources and capabilities with its product market" (p. 38-39)	1548	X	X	X	X		X	X	X

**Note: ***Number of citations extracted from Google Scholar on May, 5th 2017
Source: Author

In this analysis, 7 out of 17 definitions mention that IC is a set processes and routines. IC is implemented to develop and change products and services (17 out of 17) as well as to create new and to change existing processes (17 out of 17). One of the goals of IC is to change or recombine the resource base (processes, skills, people) to implement innovative initiates that will help organizations to adapt to changes in the environment (8 out of 17). Certainly, organizations develop IC to achieve competitive advantage and better performance.

Based on this analysis, I propose the following definition of IC:

Innovation capability is an organizational capability that enables organizations to continuously apply collective knowledge, internal processes and structure to develop or to improve products, services or processes in order to respond effectively to market changes and demands. As organizations introduce new or enhanced versions of current products/services to customers, they could achieve better performance and sustain competitive advantage.

As in the proposed definition of DC, IC may not have direct impact on organizational performance directly and does not guarantee advantage. Organizations can achieve better performance and competitive advantage as they change and create new products, services and processes (Hurley & Hult, 1998; Weerawardena, 2003b). Finally, a correlation between DCs and IC is understandable as Teece et al. (1997) – one of the seminal works on DC - argue that DCs are aimed to generate innovation.

Following, I present the conceptual model and hypotheses proposed on this research.

3. CONCEPTUAL MODEL AND HYPOTHESES

The conceptual model of this research argues that CRM has effect on the development of IC, and that DCs mediate this relationship. Figure 4 illustrates the conceptual model.

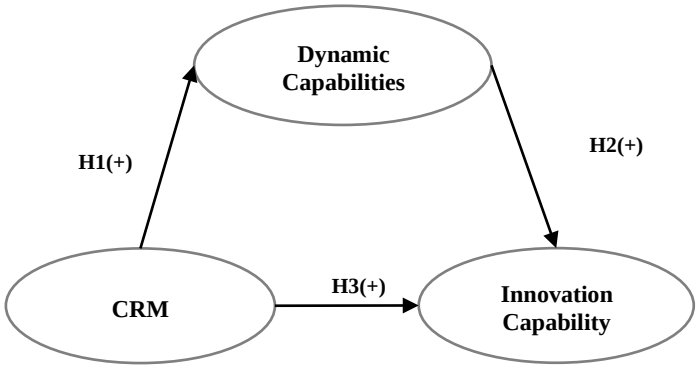

Figure 4: Conceptual model

Recall that in this research, I assume that CRM is a strategic approach in which organizations use CRM technology, processes and people to improve customer relationship and to profit from it (Payne & Frow, 2005). CRM technology is expected to boost the ability of an organization to sustain profitable customer relationships by enabling information to be integrated and shared smoothly across the organization (Day, 2003). Jayachandran et al. (2005) argue that CRM involves capturing, integrating and sharing customer information, in a way that the organization can design its strategy in accordance to customer needs.

The knowledge generated by CRM is surely a resource that can improve the capability to sense and seize opportunities in the market, which is a characteristic of DCs (Teece, 2007). Moreover, the efficient adoption of CRM enables organizations to adjust their processes, resources and structure in order to respond to demands of the market by offering customized and differentiated products and services (Day, 1994; Zablah et al., 2004). It is interesting to add that, according to Zablah et al. (2004), the effective use of CRM allows organizations to combine (and recombine) their resources in order to respond to market demands. Desai et al. (2007) affirm that DCs and CRM processes are strongly related since both create value organizations and customers, as they intend to create resources that are valuable, rare, inimitable and non-substitutable (VRIN) (Eisenhardt &

Martin, 2000). Panayides (2006) says that by getting a better understanding of customer's needs and by being more receptive to customer's

feedbacks, organizations can become more innovative and effective which enables them to improve and develop new products and services. In fact, Desai et al. (2007) present a framework in which they relate CRM with the development of DCs.

It is important to remember that in his framework, Teece (2007) divides DCs into three classes: sensing, seizing and transforming. The first class of DCs involves the role of analytical systems gaining knowledge about the market in order to identify, filter and, even, shaping market segments and trends. In fact, for these capabilities, Teece (2007) highlights the need for customer knowledge to anticipate market trends. In the class of seizing opportunities, Teece (2007) points out the microfoundations related to the capability of shaping solutions, selecting market segments, decision-making and building customer loyalty. In turn, the class of DCs related to managing threats and transforming (Teece, 2007) focuses on the organizations' capability to continuously align their resources and competences, and on the ability to create new products. All these aspects of Teece's (2007) framework reinforce the assumption regarding the effect of CRM on the development of DCs.

Therefore, this research proposes that:

H1: CRM positively impacts the development of dynamic capabilities.

Teece et al. (1997) show the linkage between DC and IC. For them, DCs enables organizations to achieve new forms to compete in the market and to renew their competences. As mentioned above, in his framework, Teece (2007) affirms that DCs enables organizations to create new products as well as to recombine resources and assets in order to sustain competitive advantage. In fact, Teece (2007) affirms that DCs allows organizations not only to adjust to the market but also to influence and even to create new markets (Oliver & Holzinger, 2008). Teece (2007, p. 1320) advocates that

DCs enhances organizations' capability to innovate as "innovation is about much more than new products. It is about reinventing business, processes, and building entirely new markets that meet untapped customer demand." In addition, developing DCs means that organizations do an effective knowledge management (Zollo & Winter, 2002), which is fundamental component of IC (Hult et al., 2004; Lawson & Samson, 2001).

Both DCs and ICs need to evolve over time in order to reflect the changes in the market and to incorporate cumulated knowledge (Zollo & Winter, 2002). Besides, Makkonen,

Pohjola, Olkkonen, and Koponen (2014) argue that DCs allows organizations to change, which consequently leads to innovation. Again, authors note the linkage between IC and organization's ability to respond and to adjust to the market.

Santos-Vijande et al. (2013) emphasize that in order to innovate, organizations need to understand market's behavior and to respond to it appropriately.

It is interesting to note that some authors even establish IC as a DC. In the systematic review performed for this research, I found some scales to measure IC in which authors use the perspective of DCs to build the construct of IC (Agarwal & Selen, 2013; Schweitzer, 2014). In fact, Schweitzer (2014) names IC as one of the seven dimensions of DC (see Appendix B). Ngo and O'Cass (2009) view IC through the lens of RBV. Once again IC is presented as a capability that enables organizations to create and recombine resources in a way to achieve competitive advantage. One of the results of resource reconfiguration is that organizations can implement innovation in products, services, processes and organization structure.

On top of that, DCs enables organizations to create and reconfigure their competences and assets in order to develop innovative ways to achieve competitive advantage and better performance (Teece et al., 1997; Teece, 2007).

Based on these arguments, I propose:

H2: Dynamic capabilities positively impact the development of innovation capability. As mentioned above, Lin et al. (2010) provide a model that assesses the relationship between CRM practices (information sharing, customer involvement, longterm partnership, joint-problem solving and CRM technology) with IC development. In general, according to the research of Lin et al. (2010), the implementation of these CRM practices can have positive effect on product innovation, process innovation, marketing innovation and service innovation. Based on their research findings, Lin et al. (2010) claim that CRM is fundamental to develop IC in organizations. Boulding et al. (2005) show that an effective implementation of CRM can capture customer knowledge, and as this new knowledge is integrated to product development and production processes, organizations can create innovative initiatives as well as innovative products and services that will add value to customer and to the organizations themselves.

As mentioned above, CRM implies sharing information across the organization so that employees who deal with customers directly can have access to useful and precise information that will help them to build profitable relationships with customers, to enhance customer satisfaction as well as to present creative solutions to customers (Jayachandran et al., 2005; Wongsansukcharoen et al., 2015). In fact, as organizations capture and use customer knowledge effectively, they are able to sense and seize

opportunities in the market, which can lead to innovation (Teece, 2007). In addition, the knowledge provided by CRM can help organizations to anticipate market demands and to introduce innovative products and services in the market (Day, 1994; Zablah et al., 2004). CRM has become fundamental in business sectors in which innovation is constant (Rogers, 2005).

Finally, CRM allows organizations to have their business and structure more customer-oriented, as they emphasize building profitable relationships with customers (Jayachandran et al., 2005; Rigby et al., 2002). In doing so, organizations encourage customers to suggest new products and services, and other innovative initiatives (Lukas & Ferrel, 2000; Belkahla & Triki, 2011). Based on these previous researches, I propose that:

H3: CRM positively impacts the development of innovation capability.

In the definition proposed in this research, DCs are ***intentionally and strategically implemented processes and routines that enable organizations to change their operational capabilities and their resource base in order to adapt and influence environmental changes.***

In turn, in the perspective adopted in this research, CRM is a strategy that emphasizes investing resources and processes to build profitable relationship with customers (Zablah et al., 2004). CRM also implies setting processes, systems and procedures to be used in the purpose of customer relationship (Ngai et al., 2009). As in the definition adopted in this research, CRM demands processes, people, procedures and capabilities as well as technology (Payne & Frow, 2005). One of the benefits of CRM is the improvement of product development and production processes (Chen & Popovich, 2003; Richards & Jones, 2008), which can lead to innovation (OECD, 2005).

As alerted by Rigby et al. (2002), to have success in the implementation of CRM, organizations need to build an organization-wide strategy that integrates customer knowledge with organizational processes, procedures and structure. In the same way, as in the definition proposed in this research, IC demands a systematic deployment of processes, structure, resources and knowledge in order to develop innovative products, services or processes.

Even though DCs do not have a direct impact on IC, there are researches that indicate that DCs enhances innovation in organizations (Teece et al, 1997; Teece, 2007). For Teece (2007), DCs are intended to develop and implement innovative organizational

and managerial initiatives. For this reason, I believe that DCs explains the relationship between CRM and IC. In other words, as long as organizations have developed DCs, CRM will result on developing IC.

As mentioned above, analyzing DCs as a mediator factor between CRM and IC is a great contribution to empirical studies on DCs. Few studies have analyzed the mediating effect of DCs, as for example, Alegre et al. (2011) which studied the mediating effect of DCs in the relation between knowledge management practices and innovation performance; Han and Li, (2015) that analyzed the effect of DC on the relationship between intellectual capital and innovative performance; Camisón and Puig-Denia (2015) which analized the positive effect of quality management practices on process innovation performance, when it is mediated by DCs; and finally Fernández ‐Mesa et al. (2013) that studied the mediating effect of design management capability (identified as a DC) on the relation between organization learning capability and product innovation performance. However, none of these researches have analyzed the mediating role of DCs on the relationship between CRM and IC.

It is good to point out that DCs can be viewed as mediatior (instead of moderator) as literature indicates that, even though adopting CRM can result in innovative solutions and products, this cannot be possible without proper adjustment of organization's structure, strategy and processes (Rigby et al., 2002). Therefore, I can imply that, in the relationship between CRM and IC, DCs can have causal effect on IC, explaining then, why CRM can result in the development of IC.

Besides that, identifying DCs as a mediator on the relationship between CRM and IC considers the fact that CRM provides business intelligence and customer knowledge (Khodakarami & Chan, 2014) that can be used to improve product development and to align organization's strategy with market demands (Chen & Popovich, 2003; Richards & Jones, 2008). Based on that, I can imply that DCs can be one of the results of CRM.

Based on these assumptions, this research offers the following hypothesis: **H4:** Dynamic capabilities have a mediating effect on the relationship between CRM and the development of innovation capability.

The following chapter presents the methodology applied in this research.

4. METHODOLOGY

As mentioned above, this research aims to analyze the relationship between CRM, DCs and IC. Having this in mind, I adopted the epistemology that would better suit research goals.

Epistemology consists of the theory of knowledge that sustains the theoretical perspective and the methodology adopted in a specific research (Crotty, 1998). In other words, epistemology explains how researchers *understand the world* and how they choose *to transmit what they know* about the world (Crotty, 1998). In turn, the theoretical perspective refers to the theoretical point of view that justifies the methodology and methods. Finally, methodology is the strategy that researchers adopt to achieve a specific objective and methods are the techniques and procedures researchers use (Crotty, 1998). To better explain the distinctions and the linkage between these four elements, I present table 4, extracted from Crotty (1998, p. 4).

Table 4: Epistemology, theoretical perspectives, methodologies and methods

Epistemology	Theoretical Perspective	Methodology	Methods
Objectivism	Positivism (and postpositivism)	Experimental Research	Sampling
Constructivism	Interpretativism - Symbolic interactionism - Phenomenology - Hermeneutics	Survey Research	Measurement and scaling
Subjectivism (and their variants)	Critical inquiry	Ethnography	Questionnaire
	Feminism	Phenomenological research	Observation - participant - non-participant
	Postmodernism	Grounded theory	Interview
		Heuristic inquiry	Focus group
		Action research	Case study
		Discourse analysis	Life story
		Feminist standpoint research	Narrative
			Visual ethnographic methods
			Statistical analysis
			Data reduction
			Theme identification
			Comparative analysis
			Cognitive mapping
			Interpretative methods
			Document analysis
			Content analysis
			Conversation analysis

Source: Crotty (1998, p. 4)

As I intended to have a concreted and objective understanding of the relationship between CRM, DCs and IC, I adopted the objectivism as the epistemological foundation of the research. “Objectivism epistemology holds that meaning, and therefore meaningful reality, exists as such apart from the operation of any consciousness” (Crotty, 1998, p. 8). It means that I intend to depict the reality as it is, with as little intervention as possible.

In objectivism, as its names suggests, objects have their meaning regardless researcher’s point of view. All that the researcher has to do is discover the already existing meaning of the object that is being analyzed (Crotty, 1998).

Positivism is definitely associated to objectivism since this theoretical perspective teaches that the researcher is an observer of the reality that has to uncover the meanings of his/her object of study (Cohen, Manion, & Morrison, 2007). Under the perspective of

positivism, likely in natural sciences, social science researchers are observers of social reality that are supposed to give a generalizable explanation of the social phenomenon (Cohen et al., 2007). In social sciences, positivism takes

organizations as “real entities with a life of their own” (Cohen et al., 2007, p. 10). That being said, figure 5 presents the research design I adopted.

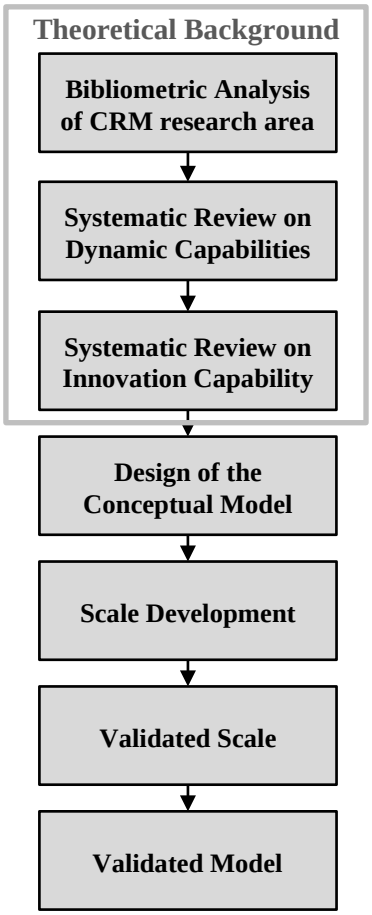

Figure 5: Research design
Source: Author

In table 5, I present a synthesis of research objectives and their linkage with the model hypotheses, and the statistical procedure that will be used to validate the research hypotheses.

4.1. BUILDING THE THEORETICAL BACKGROUND

As already mentioned, the bibliometric analysis was used to identify a literature gap as well as to explore the references that have grounded researches in CRM field.

Besides, the bibliometric analysis of publications on CRM was useful to provide the theoretical foundation to write the scale items to measure the exogenous variable of CRM. This bibliometric analysis was published in the proceedings of the XL ANPAD Conference (Araújo et al., 2016). Appendix E presents some details on the bibliometric analysis.

To build the theoretical background on DCs and IC, I conducted a systematic (literature) review. Besides contributing to the theoretical background of the research, another objective of performing a systematic review was to identify the existing scales to measure DCs (Appendix A) and IC (Appendix B). Performing a systematic literature review was important because it involves building a critical review and a detailed analysis of results provided by existing studies (Geraldi, Maylor, & Williams, 2011) on DCs and IC.

After performing all these steps to build the theoretical background of the research, I was able to design a conceptual model, as illustrated on figure 4.

4.2. SCALE DEVELOPMENT

To design the procedure to develop the new instrument as proposed in the research, I followed the procedures suggested by Churchill (1979). This article has been used for many researchers (15,149 citations according to Google Scholar*) and has become seminal work about instrument development. Figure 6 illustrates the procedures I am conducting in order to develop the new scale.

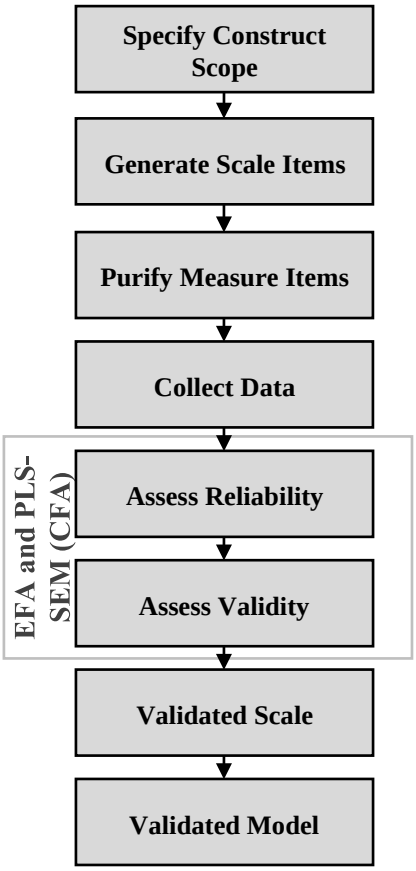

Figure 6: Procedure to develop the new scale
Source: Adapted from Churchill (1979)

As recommended by Churchill (1979), the first step in the developing the new instrument was **specifying the scope** of the constructs. To do so, I conducted a thorough review of the literature. As already mentioned, I used the results of a bibliometric analysis to collect theory on CRM. In this bibliometric analysis, I could also find existing scales to measure CRM. In turn, to specify the scope of DCs and IC as well as to find existing scales to measure these two constructs, I conducted a systematic review. Systematic (literature) review consists of using systematic methods to review of studies on a specific theme in order to identify and evaluate the relevant studies on a specific

theme (Petticrew & Roberts, 2006). Systematic reviews are useful to avoid a biased selection of literature as well as answer a single hypotheses or set of hypothesis (Petticrew & Roberts, 2006).

In this systematic review, I extracted data from two databases, Web of Science (WoS) and Scopus.

To extract articles on DC from WoS, I used the keywords “dynamic capabilities” and “scale”. Then, I filtered the search result by research categories. In this filter, I kept only the articles from management and business research categories. After that, I did another extraction on WoS using keywords “dynamic capabilities” and “quantitative”. To filter this result, I did the same procedure as I did on the first extraction. After this refinement process, it remained 146 articles on the extraction from WoS. On

Scopus, I performed a similar process as I did on WoS. I did two extractions; one using key words “dynamic capabilities” and “scale”, and the other using keywords “dynamic capabilities” and “quantitative”. To refine the search on Scopus, I filtered the search result by selecting articles from “business, management and accounting” research area. In total 162 articles were extracted from Scopus database.

To find the items to measure IC, I did the same steps as I did to find scales on DC. I extracted articles from WoS and Scopus. Again I did two extractions, one using keywords “innovation capability” and “scale”, and another using “innovation capability” and “quantitative”. Here, I also refined the extracting by filtering the search by research area. On WoS I kept only the articles from management and business research categories. After this refinement, 280 articles remained. On Scopus, I extracted articles with the same keywords and refined the results by selecting only articles from “business, management and accounting” research area. In total, 235 articles were extracted from Scopus database.

After the extraction, I analyzed the abstract, keywords and the indexed keywords of the 823 articles (308 on DC and 515 on IC). In this analysis, I verified if the articles really contained scales to measure the constructs. It is important to mention that in some instances this analysis also included reading some sections of the articles as introduction, methodology and references, since, occasionally, keywords and abstracts did not depict the content of the papers. For example, even though some articles contained the construct of DCs, authors preferred to refer to DCs as the “dynamic perspective on RBV”. Another important note is that some authors use the term “innovativeness” with the same meaning and implication as for “innovation capability”

(i.e. Keskin, 2006). After this analysis, I found 42 scales to measure DCs and 41 to measure IC. By analyzing the scales to measure DCs and IC, I could notice that efforts to develop instruments to measure these two constructs are recent.

In the step of **generating the items of the scale** I considered the scope defined in the previous step. As the previous step provided a consistent list of existing scales to measure the three constructs, I selected and combined items extracted from previous studies. To measure CRM, I selected some items of the scale designed by Jayachandran et al. (2005), Sprafke, Externbrink, and Wilkens (2012) and Herrmann, Gassmann, and Eisert, (2007).

To measure DCs, I selected some items from the scales of Makkonen et al. (2014), Flatten et al. (2011), Verreynne, Hine, Coote, and Parker (2016), Wu, Melnyk, and Flynn (2010), Danneels (2016), Villar, Alegre, and Pla-Barber (2014), Schweitzer (2014) and Janssen, Castaldi, and Alexiev (2015).The selected items are intended to measures DCs regarding the definition presented earlier, that emphasized the fact that DCs consist of processes and routines, as well as a set of collective and individual behaviours and abilities (Meirelles & Camargo, 2014).

Finally, to measure IC, I selected some items from the scales developed by Hogan et al. (2011), Zhang, Jiang, Shabbir, and Du (2015), Schlosser & McNaughton (2009), Santos-Vijande et al. (2013), Hakimi, Triki, and Hammami (2014), Belkahla & Triki (2011), Flatten et al. (2011) and Herrmann et al. (2007).

After selecting the items of the existing scales, I did some adjustments on the items in order to improve the clarity of the sentences and to make them closer to today's reality in organizations. For instance, the scale Jayachandran et al. (2005) is more than 10 years old, and some sentences did not include the use of Internet and social media on CRM.

After choosing the items of the instrument, I presented the scale to experts and academicians on CRM (as recommended by Churchill, 1979; DeVellis, 2003) so they could give suggestions and recommendations. On the sequence, these suggestions were analyzed and the scale was changed accordingly. The suggestions including more items to measure IC, including items that measures practical initiatives to develop DCs and reduction the number of items to measure CRM.

As the survey will be conducted among Brazilian organizations, there are two versions of the scale, one in English (Appendix C) and another in Portuguese (Appendix D). For this reason, the instrument had to be "adapted culturally to maintain the content validity of the instrument at a conceptual level across cultures" (Beaton, Bombardier, Guillemin, & Ferraz, 2000, p. 3186). For this reason, to ensure the cross cultural equivalence (Weidmer, 1994), I had a professional native-speaker English translator, who is also fluent in Portuguese, translating the version in Portuguese back to English. This technique is called back translation and is highly recommended in scale development

(Beaton et al., 2000; Slavec & Drnovesek, 2012) in order to ensure that the translated version have the same meaning as the original source. It is very fundamental to perform the back translation as, in English, words can compress different meanings, and then, to keep the conceptual equivalence it is necessary to use several words or sentences to maintain the concept of the original idea (Weidmer, 1994). At this point, the current version of the scale contains 52 items, as described in Appendixes C and D.

To **purify the measure**, I conducted a pre-test with population that represents the unit of analysis of this research. A pre-test is recommended not only by Churchill (1979), but also for other authors (Beaton et al., 2000; DeVellis, 2003; Slavec & Drnovesek, 2012). In a pre-test, it is recommended to collect 30 to 40 responses from the target population (Beaton et al., 2017). I used a 7-point Likert-scale format that range from 7 (strongly agree) to 1 (strongly disagree) in the questionnaire. The same 7point Likert-scale was used in the phase of data collection. The period of the pre-test was from April, 4th to April 8th, 2017. I conducted the pre-test using the cloud-based tool Survey Monkey*. During this period I collected 78 responses.

In the pre-test, I included textboxes in each item so that respondents could write their comments regarding the sentences. These comments were evaluated and changes in the scale were done, as I evaluated the relevance of the comments.

Respondents pointed out some minor errors in the instrument. For example, in online survey, I missed including the seven points and their respective captions on item IC9 (see Appendix D). Another minor error was found on item IC8, in which the description “strongly disagree” was missing. Due to the comments collected in the pretest, some items were reworded in order to ensure better clarity. I changed the voice

of the sentence in item CRM4 from passive to active voice. In item DC8, a respondent commented that he/she did not understand the job rotation work practice. For this reason, I included a brief description of job rotation in the sentence. Finally, a

*Homepage: https://pt.surveymonkey.com/ 69

respondent suggested that I included a textbox for respondents to write their e-mail address in case they were interested in receiving research results as well as that I included a comment textbox at the end of the survey instead of little textboxes in each survey item. I also implemented these suggestions in the final version of the survey.

Finally, in order to draw a profile of respondents profile and of the organizations they work at, I included extra questions: What is your gender?; What is your level of education?; In which position do you work currently (or worked)?; What is your age?; In which department do you word (or worked)?; What is the type of organization you work (or worked) at?; What is the size of the organization you work (or worked) at?; and What is the sector of the organization you work (or worked) at?

The options for the question regarding the size of the organization were based on the classification provided by the BNDES (Banco Nacional de Desenvolvimento Econômico e Social, in English, *National Bank for Economic and Social Development*). This classification is based on the gross income of the organization (BNDES, 2015), as following: *microbusiness*, an organization with gross income below or equal R$ 2.4 million; *small business*, an organization with gross income greater than R$ 2.4 million and less than, or equal to R$ 16 million; *medium-sized business*, an organization with gross income greater than R$ 16 million and less than or equal to R$ 90 million; *medium-large business*, an organization with gross income greater than R$ 90 million and less

than or equal to R$ 300 million; and *large business*, an organization with gross income greater than R$ 300 million.

I started **collecting data** just after evaluating the 78 responses of the pre-test and correcting the online survey at Survey Monkey. The period of data collection was from April 9th to May 7th.

Finally, it is important to add that collecting data from professionals working in organizations which **used CRM systems was indispensable**. Integrated databases, high-speed communication channels and systems that facilitate the daily work of employees are some of the examples of how IT can enhance the potential of CRM (Day, 1994; Jayachandran et al., 2005; Reinartz et al., 2004). For this reason, I included a dropdown-format question at the very beginning of the survey asking the name of the CRM system used in the organization. Besides including the name of well-known CRM systems, I included the options "none" and "I don't know the name of the CRM system the company uses". Then, I configured this question with a filter that, in case the chosen option was "none" or I don't know the name of the CRM system the company uses",

respondents were redirected to end of the survey. Consequently, these responses were not valid for analysis.

To reach as many professionals as possible I used social networks: WhatsApp, Facebook and LinkedIn. At WhatsApp I sent the link of the online survey to all contacts I knew that worked in large business with CRM systems. On Facebook, I posted the link on groups of professionals from IT and marketing sectors. Again, I focused on professionals that work on marketing and IT as they are more **prone to work on organizations that use CRM**. In fact, on LinkedIn, I only added professionals with CRM skills on their profiles. In total, I sent the online survey to approximately 3,500 people.

Another restriction that I included during the data collection was regarding the experience of professionals. Literature indicates that top executives, managers and senior employees are fundamental for the success of CRM (Chen & Popovich, 2003; Teece, 2007) as well as for the dissemination of knowledge across the organization (Day, 1994). Not only are senior professionals fundamental for CRM success, but also are they fundamental for the development of DCs (Eisenhardt & Martin, 2000). For this reason, from the total responses, I discarded the responses from trainees, assistants and junior analysts. By doing do, I ensured that the collected data contained only responses from experienced professionals.

During the period of data collection 407 responses were gathered. From these I excluded: 25 responses regarding organizations that did not use a CRM system, 31 regarding people who did not know the name of the CRM system, 106 regarding incomplete responses; and 11 regarding professionals with low experience (trainees, assitants and junior analysts). Consequently, out of these 407 responses, 234 were valid. As my target population was restricted, I also adopted the snowball sampling method. Snowball sampling, also called chain referral sampling, is a method on which researchers make use of respondents' referrals to collect more responses or participants. This method is frequently used on researches in sociology area, especially on researches in which it is difficult to gather sufficient data sample such as researches about drug use, or other controversial themes (Biernacki & Waldorf, 1981; Heckathorn, 1997). To **assess the reliability and the validity** of the scale I did multivariate analysis which means that various statistical methods are executed simultaneously to analyze multiple variables (Hair, Hult, Ringle, & Sarstedt, 2014). According to Hair, Black, Babin, and Anderson (2009), multivariate analysis includes all multivariable and multivariate (multiple combinations of variables) techniques. Some of the multivariate analysis

techniques are factor analysis, multiple regression, multiple correlation, multiple discriminant analysis, canonical correlation analysis, multivariate analysis of variance and covariance.

Being more specific, I performed confirmatory factor analysis to assess the reliability and validity of the scale (Churchill, 1979; DeVellis, 2003; Silva & Simon, 2005). The main objective of factor analysis is "to define the underlying structure among the variables in the analysis" (Hair et al., 2009, p. 93). In other words, factor analysis assesses the correlations between the variables (i.e. items in a scale, test scares). By assessing the correlation between the variables, a factor analysis groups the variables into factors. In exploratory factor analysis (EFA) the factors derive from the loadings of the variables not from theory. When researchers apply EFA, they can only name the factors, after performing the technique. On the other hand, in confirmatory factor analysis (CFA), researchers determine the factors and assign the variables to their specific factors before performing the technique. To do so, researchers use previous theory, or even the results of EFA. CFA tells researchers how well the factors and variable relate to together. For this reason, CFA is commonly used to confirm or reject a predefined theory or model (Hair et al., 2009).

To perform the CFA, I used the SmartPLS 2.0* as recommended by Ringle, Wende, & Will (2010). I performed this process based on the works of Ringle, Silva, and Bido (2014) and Hair et al. (2014).

4.3. STRUCTURAL EQUATION MODELING (SEM)

To perform the CFA in this research, I adopted PLS-SEM. Researchers can choose between two approaches as they adopt the structural equation modeling (SEM). The Covariance-based SEM (CB-SEM) is often used to confirm or rejects already established theories. This type of SEM confirms the validity of a model by estimating the covariance matrix of a specific sample (Hair et al., 2014). On the other hand, the partial least square SEM (PLS-SEM), also named PLS path modeling is recommended for exploratory researches (Hair et al., 2014). In the PLS-SEM method, the path relationships are estimated to minimize the residual variances of the endogenous variables. PLS-SEM is very indicated for this research, as I want to explore a new model (Hair et al., 2014).

*https://www.surveymonkey.com

The PLS method originated from the work of Herman Wold in 1966 in which he present two procedures of least squares (LS) estimation. In 1977, Wold completed his work and introduced what we know as partial least square method (Chin, 1998). The PLS method has been used more and more by researchers in all areas of study: strategic management, management information systems, e-business, organizational behavior and marketing (Henseler, Ringle, & Sinkovics, 2009).

In the structural equation modeling (SEM), the diagram that represents the relationships and hypotheses is called path model (Hair el al., 2014). The path model consists of two parts: the structural model and the measurement model. The structural model shows the relationships between the latent variables, and the measurement model; the relationships between each latent variable and its respective indicators (Hair et al., 2014). Figure 7 illustrates the proposed path model.

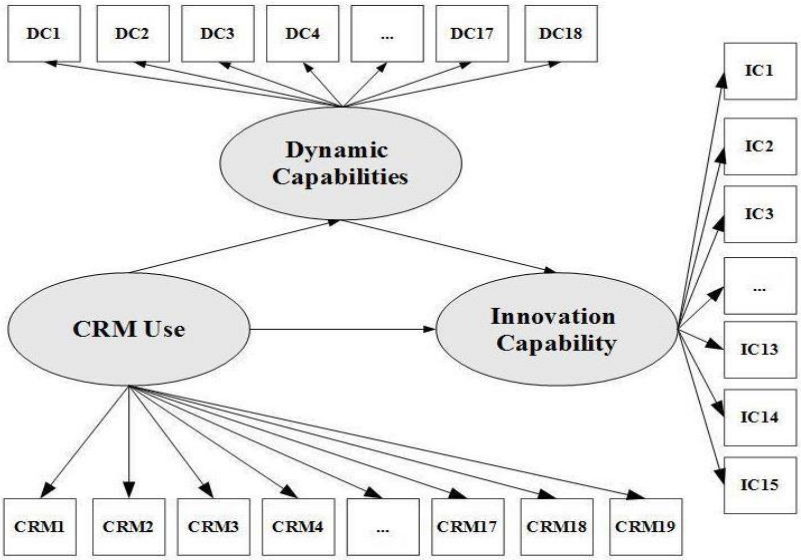

Figure 7: Proposed Path model
Source: Author

There are two types of measurement models, formative and reflective (Henseler et al., 2009). In the reflective model, the variable causes the measurement (covariation) of the indicators. In this case, the arrows point from the variable to its indicators. In the formative model, the indicators cause the measurement or predict the existence of the variable. In this case, the arrows point from the indicators to the variable (Hair et al., 2014). It is important to highlight that PLS-SEM is recommended for both reflective and formative models (Henseler et al., 2009).

In this research, I present a reflective model, since I assume that the indicators are consequences of the latent variables (Hair et al., 2014; Rossiter, 2002). Literature indicates that CRM allows organizations to collect and integrate information on customers to be used in building profitable relationships (Jayachandran et al., 2005). In turn, the development the DCs allow organizations to rearrange and change their resources, adapt to the changes of the environment and even to anticipate trends and demands of customers (Janssen et al., 2015; Makkonen et al., 2014). Finally, the fact that organizations develop IC result on developing the capacity to create better ways of working, to develop initiative solutions, and to create more value to customers (Hogan et al., 2011; Nasution & Mavondo, 2008; Zhang et al., 2015).

As recommended by Hair et al., (2014), since the proposed model is reflective, it was necessary to assess the following aspects of the model: reliability, validity, internal consistency, indicator reliability, convergent validity (average variance extracted – AVE) and discriminant validity. To evaluate the structural model, it was necessary to evaluate the coefficient of determination (R^2) of the endogenous variables. The coefficient of determination (R^2) is the most used measure to assess the structural models in PLS-SEM. The R^2 refers to the effects of exogenous variables on endogenous variables. This measure "also represents the amount of variance in the endogenous constructs explained by all of the exogenous constructs linked to it" (Hair et al., 2014, p. 175). I assessed other elements: the significance and size of path coefficients (path relationships), predictive relevance (Q^2), and the effect size (f^2). The predictive relevance (Q^2), also known as the Stone-Geisser Indicator (Q2), indicates how accurate the model predicts the reality. According to Hair et al, the value for Q^2 needs to be greater than zero. In turn, the effect size (f^2) of the model indicates how relevant each construct is to the quality of the model.

To assess the internal consistency reliability, the criteria is Cronbach's alpha of the variables. It is important to note that the Cronbach's alpha is sensitive to the number of indicators.

The convergent validity refers to the correlation between the other indicators of the same variable. In this aspect, the variance of the indicators in the same indicator should be proportional. In this criterion, it is recommended to check the AVE and the outer loading of the indicators (Hair et al. 2014).

The discriminant validity evaluates if the latent variables of the model are truly distinct from each other. One way to assess the discriminant validate in PLS-SEM method

is to evaluate the cross loadings of the indicators. It means that the outer loading of the indicator on its original variable should be greater than the outer loadings of this indicator on the other variables (Chin, 1998; Hair et al., 2009; Hair et al. 2014).

Another way to assess discriminant validity is to use the Fornell-Larcker criterion. According to Fornell-Larcker requisite, the square root of the variable's AVE has to be greater than the correlation of between this variable and the others. The idea is that the variance of a variable with its indicators is higher than the variance of this same variable associated with other indicators (Hair et al., 2009; Hair et al., 2014).

4.4. ASSESSING THE MEDIATING EFFECT OF DYNAMIC CAPABILITIES

Since one of the objectives of the research is to evaluate the mediating effect of DCs on the relationship between CRM and IC, it is useful to differentiate the definitions of moderators and mediators.

"A moderator is a qualitative or quantitative variable that affects the direction and/or strength of the relation between an independent or predictor variable and dependent or criterion variable" (Baron & Kenny, p. 1174). On the other hand, a mediator receives all the "inputs" of the exogenous variables and, then, generates an output, the endogenous variable. The fundamental difference between mediators and moderators is that "…whereas moderator variables specify when certain effect will hold, mediators speak to how or why such effects occur" (Baron & Kenny, p. 1176).

To test the mediating effect of the variable of DCs on the relationship between CRM and IC, I followed the recommendations of Hair et al. (2014). Firstly, it was necessary to check the direct relationship between the variable of CRM and IC. This evaluation is done through bootstrapping.

After checking if the direct path between CRM and IC is significant, I will include the variable of DC in the analysis of the path model. It is important to note that the direct effect of CRM on IC has to be significant. This condition facilitates the calculation of the mediating effect of DCs on the relationship between CRM and IC.

To check if the indirect effect of CRM on IC was significant I calculated the path between CRM and DCs and the path between DCs and IC. After checking if these paths were significant, the mediating effect of DCs was calculated by using the bootstrapping procedure. The significance of these two paths is a required condition to calculate the

mediating effect of DCs (Hair et al., 2014). If both paths were significant, the product of these paths would be calculated. The product of these paths refers to the mediating effect of DCs. Hair et al. (2014) instructs that if the indirect effect is significant, the mediating variable (DCs) will absorb some of the direct effect between CRM and IC.

To find out how much mediating variable (DCs) absorbs the impact of exogenous latent variable (CRM) on the dependent variable (IC), it is necessary to calculate the variance accounted for (VAF). By calculating the VAF, researchers can assess "the extent to which the variance of the dependent variable is directly explained by the independent variable and how much of the target construct's variance is explained by the indirect relationship via the mediator variable" (Hair et al., 2014, p. 225). If the VAF is less than 20%, it means that even though the indirect relationship between the exogenous variable and the dependent variable is significant, the mediating variable does not absorb any of the effect of this relationship. In order words, the mediating effect does not exist. On the other hand, if the VAF is equal or greater than 80%, it means that the mediating variable absorbs all the effect of the relationship between the exogenous variable and the dependent variable. In order words, in this case there is a full mediation. If the value of VAF is between 20% and 80%, it means that there is a partial mediation (Hair et al., 2014).

4.5. THE SAMPLE SIZE

Authors have different positions regarding how to determine the minimum sample size to validate a model. Hair et al. (2009; 2014) suggest that one of the alternatives is to use the 10 times rule. The sample should be at least 10 times the number of formative indicators of the variable or the sample can be at least 10 times the largest number of path relationships direct to one variable. DeVellis (2003) recommends that the size of the sample should be calculated based on the number of items of the measure instrument. In this research, I used the software G*Power, as recommended by (Ringle et al., 2014). In this software, the researcher sets the parameters according to the level of robustness he/she wants the model to have. Then, G*Power, executes the calculation considering the desired statistical power and the effect size (Faul, Erdfelder, Buchner, & Lang, 2009; Hair et al., 2014).

To set the parameters, Ringle et al. (2014) recommend considering the latent variable that has the highest number of arrows pointed to it. In this case, the latent variable that receives the highest number of arrows is IC, which has two arrows pointed to it (from

the variables of CRM and DCs). I chose a power test of 80% (0.80) as recommended by Hair et al. (2014). Figure 8 shows the result of the execution of G*Power to calculate the sample size to perform the CFA. The results on G*Power indicate that the minimum of responses to perform the CFA is 68. As instructed by Ringle et al. (2014), my objective was to collect at least twice the number calculated by G*Power, which corresponds to 136.

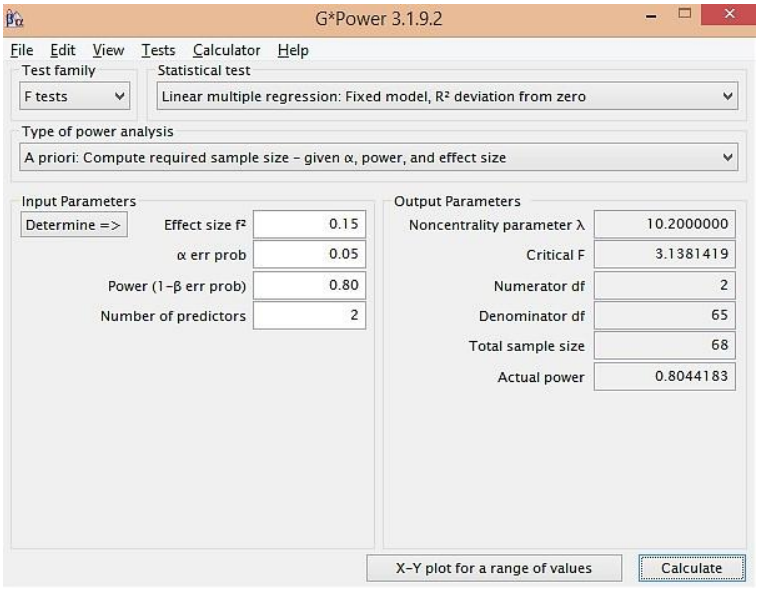

Figure 8: Calculation to determine the minimum sample size to perform the CFA
Source: Author

Thankfully, during the period of data collection, I collected 234 valid responses, which surpasses the minimum sample size required to perform the CFA. In the next session, I present and discuss results obtained in the research.

5. RESULTS

In this chapter, I present the results I obtained in this research. Firstly, I present a descriptive view of the collected data. Secondly, I present the results of CFA that I performed in order to validate the model and to validate the hypotheses I proposed. Lastly, I discuss the results on the light of the literature.

5.1. DEMOGRAPHIC ANALYSIS OF RESPONDENTS

I collect 407 responses. Out of these 407 responses, 106 were incomplete. In order to ensure the validity of the sample, I excluded 25 responses in which professionals claimed working in organizations without a CRM system. I also excluded responses in which participants did not know the name of the CRM system used in the organizations (31 responses). Apart from that, as literature indicates that more experienced professionals are more aware of the implications of DCs in the organizations (Eisenhardt & Martin, 2000), I exluded responses of professionals with low experience (trainees, junior analysts and assistants), which accounted for 11 responses. In total, the number of resposes used to validate the model and the instrument was 234.

As mentioned above, in the survey, I collected some information regarding the respondents and the organization where they worked. Very interesting information was gathered. For instance, among respondents, the majority of them was male (79.06%). Only 20.94% of participants were women.

Another important data is that the most used CRM software in organizations (of the sample) is SAP (33.76% of the 234 answers), followed by Microsoft Dynamics 365 (18.80%), and Salesforce (12.39%). Besides that, 15.38% of respondents informed that the CRM software used in their organization was developed internally. Figure 9 shows the ranking of CRM software mentioned in the survey.

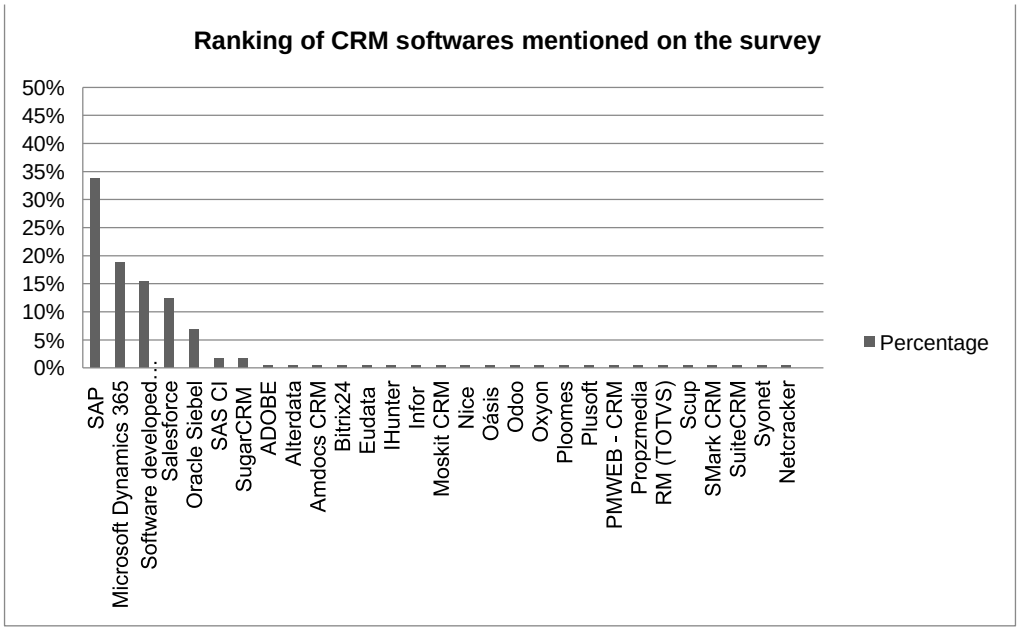

Figure 9: Ranking of CRM software mentioned in the survey
Source: Author

Regarding the level of education, more than half of respondents have a postgraduate degree (52.99%), while 30.77% have a undergraduate degree. Within participants, very few have not completed an undergraduation degree (3.42%, 8 participants). Figure 10 shows the distribution of respondents according to their level of education.

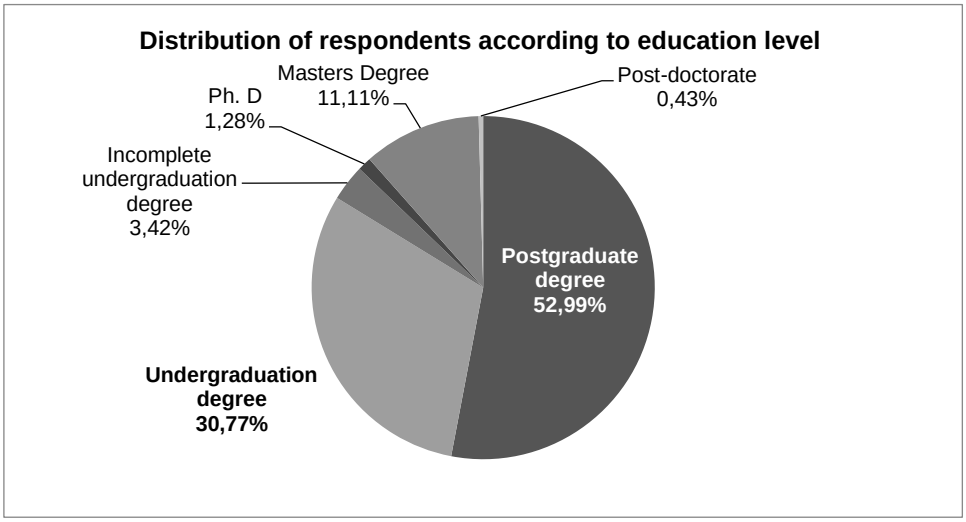

Figure 10: Distribution of respondents according to their level of education
Source: Author

In turn, most of respondents are in their thirties (40.17%). In fact, the sample presents a population of more mature professionals: only 18.80% are in the age range between 21 to 30 years. Figure 11 illustrates the distribution of respondents according to age range.

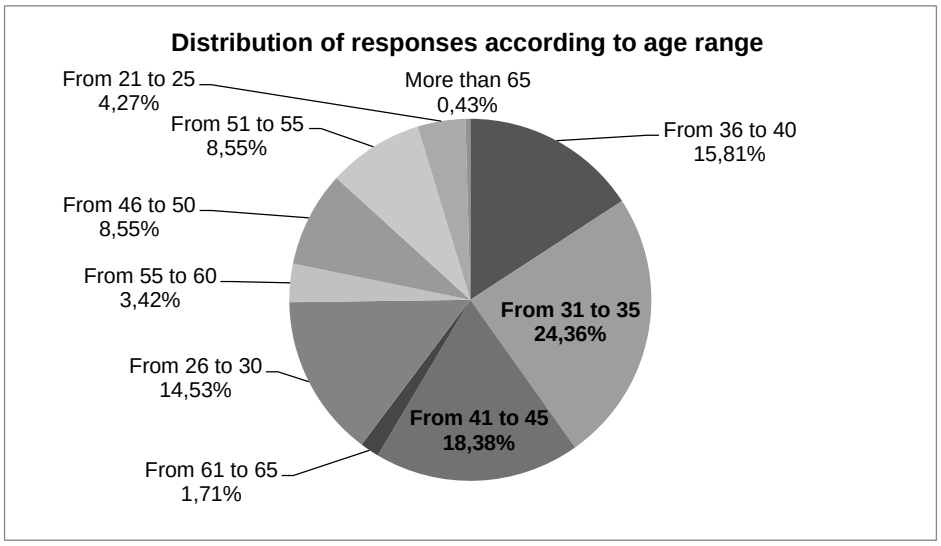

Figure 11: Distribution of respondents according to age range
Source: Author

After excluding the least experienced professionals (trainees, assistants, junior analysts), the distribution of respondents according to their job position is: 40.17% occupy senior positions (senior analysts, analysts, consultants, experts), 9.40% work as coordinators, 25.64% are managers, 10.68% are directors, and 4.70% are team leaders. Among participants, there were even company presidents (2.14%). Figure 12 shows the numbers regarding the position level of those who participated in the survey.

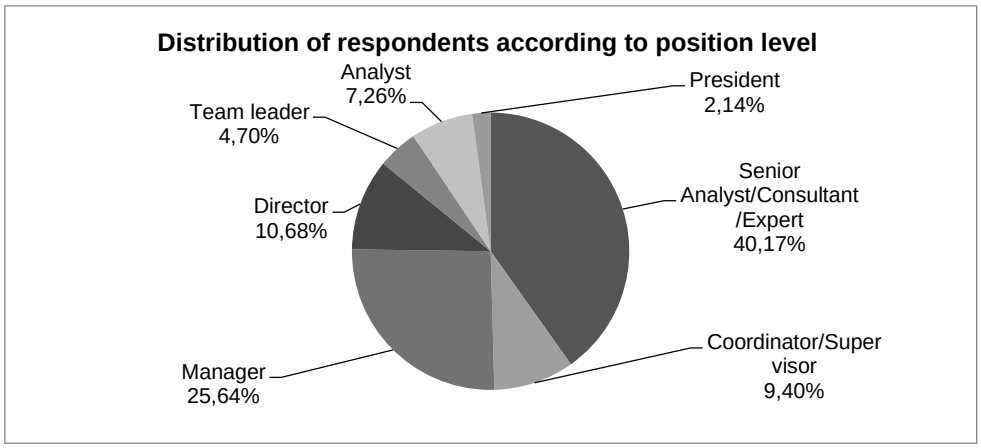

Figure 12: Distribution of respondents according to position level
Source: Author

In relation to the profile of the organizations where participants work, some relevant data was collected. The majority of professionals work on private organizations (94.87%), while only 3.42% work on public companies.

In regards to company size, figure 13 shows that more than half of participants work in large companies (organizations with gross income greater than R$ 300 million).

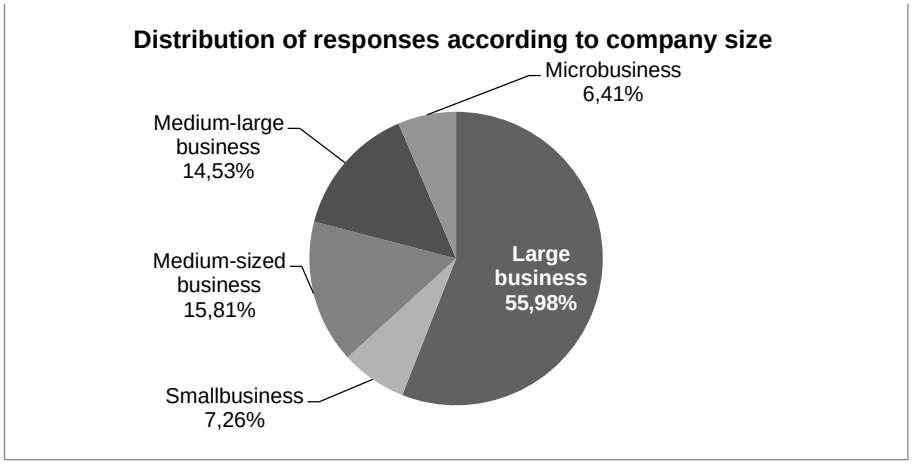

Figure 13: Distribution of respondents according to company size
Source: Author

Finally, most of participants work in technology organizations (44.44%). Other businesses sectors with significant numbers in the collected data are telecommunications (10.68%), banking and financial (10.26%), and consulting and service sector (8.12%).

5.2. RESULTS OF THE STRUCTURAL EQUATION MODELING (SEM)

The first aspect I assessed as I performed the SEM was the convergent validity of the model. As recommended by Hair et al. (2014) and Ringle et al. (2014), to validate the convergent validity I checked AVE of the three constructs (CRM, DCs, and IC). The value AVE has to be greater than 0.50 (Henseler et al., 2009; Ringle et al., 2014).

On the sequence, I assessed the discriminant validity of the model. In this processes, firstly, I evaluated the cross loadings of the indicators, as recommended by Chin (1998) and Hair et al. (2009). In this analysis, I confirmed that the outer loadings of the indicators ware greater in their original construct. Table 9 shows the indicators' cross loadings. Then, I applied the Fornell' and Larcker's (1981) criteria, as recommended by Ringle et al. (2014).

After performing the convergent validity and discriminant validity (checking the cross loadings and the Fornell's and Larcker's criteria, 15 indicators were excluded. Table 5 lists the indicators excluded from the instrument. Most of excluded indicators belong to DCs and IC variables. That happened because the constructs were very correlated, based on the responses collected. The high correlation between these constructs was anticipated as in literature the definitions of DCs and IC present many similarities. In fact, some authors argue that IC is a DC (Cheng & Chen, 2013; Schweitzer, 2014).

Table 5: List of indicators excluded from the model after adjustments

Excluded Items	Description of the item
CRM5	Our organization is structured based on customer profiles, segments and demands, rather than on products or organizational functions.
CRM8	Our organization collects customer information from external sources such as market research agencies, syndicated data sources and consultants.
DC2	Our organization systematically brings together creative and knowledgeable people in order to search for new opportunities in the market.

DC5	Our organization constantly encourages employees to improve their competences through trainings, knowledge transfer, conferences, etc.
DC6	In our organization, employees are strongly encouraged to learn from their positive and negative experiences.
DC7	Our organization has implemented routines that enable employees to create of ideas for new products/services.
DC9	Our organizations' competitiveness depends greatly on the constant change of processes and resources.
DC12	Our organization has developed routines that enable employees to participate in generating ideas for changing production processes or organizational procedures.
IC1	Our organization provides customers with unique and superior products/services.
IC3	Our organization always offers innovative solutions to customers.
IC4	To sustain competitiveness, our organization systematically implements innovative initiatives.
IC7	In our organization, customers are co-creators of new solutions.
IC10	Innovation is a fundamental part of our organization's culture.
IC12	Our organizations constantly draw upon customers' feedbacks to launch new products/services.
IC13	To seek for innovative ideas, every now and then, our organization meets with customers to talk about their interests, problems and needs (e.g. focal groups, opinion research).

Source: Author

Regarding the discriminant validity, table 6 presents the cross loadings of the remaining indicators.

Table 6: Indicators' cross loadings

Indicators/Constructs	CRM	DCs	IC
CRM1	0.763377	0.556617	0.552192
CRM10	0.706755	0.520673	0.470231
CRM11	0.748388	0.433926	0.456979
CRM12	0.758987	0.515422	0.487629
CRM13	0.809516	0.524377	0.550145
CRM14	0.760715	0.445887	0.459922
CRM15	0.723575	0.456421	0.396886
CRM16	0.733714	0.469077	0.442484
CRM17	0.617471	0.364591	0.454295
CRM18	0.735329	0.615251	0.556632
CRM2	0.746474	0.601612	0.594759
CRM3	0.565106	0.546868	0.460201
CRM4	0.782409	0.653181	0.640166
CRM6	0.683927	0.523658	0.413278
CRM7	0.620023	0.285948	0.270276
CRM9	0.663537	0.467436	0.462907
DC1	0.571139	0.724076	0.552584
DC10	0.623380	0.811693	0.673314
DC11	0.593162	0.809573	0.696974
DC13	0.472472	0.688963	0.463319
DC14	0.556974	0.822157	0.661886
DC15	0.531273	0.843126	0.581445
DC16	0.578760	0.849021	0.654793

DC17	0.635004	0.846951	0.702044
DC18	0.609550	0.767216	0.584568
DC3	0.439611	0.626908	0.428654
DC4	0.560051	0.826769	0.646753
DC8	0.377795	0.600700	0.439526
IC11	0.517357	0.591865	0.804628
IC14	0.603758	0.613025	0.755635
IC15	0.591208	0.561838	0.718000
IC2	0.588370	0.663449	0.874704
IC5	0.503077	0.639474	0.770222
IC6	0.524866	0.576380	0.834532
IC8	0.535887	0.706020	0.829058
IC9	0.401096	0.463379	0.652452

Source: Author

Table 7 presents the result of the Fornell's and Larcker' criteria.

Table 7: Fornell's and Larcker's Criteria

	CRM	**DCs**	**IC**
CRM	0.716653		
DCs	0.713848	0.772668	
IC	0.685309	0.775316	0.782764

Source: Author

To assess the internal consistency reliability, I assessed the Cronbach's Alpha of the constructs (Hair et al., 2014). The Cronbach's Alpha needs to be greater than 0.70. Again, the values were within the recommended values: CRM equal to 0.93623, DCs equal to 0.93709 and IC equal to 0.90827. The composite reliability was also assessed and all values were greater than 0.70, as recommended by Ringle et al. (2014) - CRM (0.94368), DCs (0.94614) and IC (0.92628).

After assessing the discriminant validity and internal consistency, I evaluated the coefficient of determination (R^2) of the endogenous variables of the model. The R^2 value of DCs was 0.50958 and the R^2 of IC was 0.63656. According to Ringle et al. (2014), these values indicate that the model has these two variables are highly explained by the proposed model as in social sciences, a R^2 value of at least 26% indicates that the model has high effect on the variable.

After the adjustments on the model, from the initial number of 51 items, 36 items remained. Table 8 shows the factor loadings of the final version of the instrument and the AVE of the three constructs.

Table 8: Construct indicators/measurement items, their respective loadings and AVE

Indicators	Measurement items	Loadings
CRM: AVE = 0.513592		
CRM1	Our organization gives high priority to customer relationships.	0.76338
CRM2	Our organization encourages employees to focus on customer relationships.	0.74647
CRM3	Our organization gives employees bonus and awards based on customer satisfaction rates.	0.56511
CRM4	In our organization, business processes are designed in order to improve our relationship with customers.	0.78241
CRM6	Our customers have many channels to contact our organization (social media, customer service, e-mails, telephone, call center, etc.).	0.68393
CRM7	Our organization regularly collects information on customers.	0.62002
CRM9	In our organization, customer information is 100% accurate.	0.66354
CRM10	In our organization, customer information is updated periodically.	0.70676
CRM11	Our organization integrates the customer information collected by its different departments (e.g. marketing, sales, credit).	0.74839
CRM12	In our organization, customer information collected internally is completely integrated with customer information collected from external sources.	0.75899
CRM13	Our organization, customer information collected internally is integrated with information collected from our different communication channels (social media, e-mails, fax, customer service, call center)	0.80952
CRM14	Our organization uses customer information to develop customer profiles.	0.76072
CRM15	Our organization uses customer information to segment markets.	0.72358
CRM16	Our organization uses customer information to customize our offers.	0.73371
CRM17	Whenever we need customer information to execute our tasks, we can visualize it in simple and fast manner.	0.61747
CRM18	Our organization periodically measures customer satisfaction.	0.73533
Dynamic Capabilities: AVE = 0.597016		
DC1	Our organization systematically searches for new business ideas.	0.72408
DC3	Our organization systematically consults with external people that can assist on searching for new business opportunities.	0.62691
DC4	Our organization systematically recombines resources (people, processes, machinery, equipment) to create of new business opportunities.	0.82677
DC8	Our organization encourages exchange of personnel within departments (job rotation) to attend to new market demands.	0.60070
DC10	Our organization systematically recombines processes and resources to respond to market changes.	0.81169
DC11	Our organization has developed routines that enable employees to participate in generating ideas for new production processes or organizational procedures.	0.80957
DC13	Our organization works along with R&D institutions such as universities and technological institutes in order to create new business opportunities.	0.68896
DC14	Our organization systematically improves existing products/services.	0.82216
DC15	Our organization is usually the first to introduce new initiatives in the market.	0.84313
DC16	Our organization always anticipates new trends.	0.84902
DC17	Our organization systematically evaluated customer needs to anticipate market trends.	0.84695

DC18	Our organization constantly implements new initiatives such as new distribution channels, new sales forces, new marketing campaigns and new pricing strategies.	0.76722

Indicators	Measurement items	Loadings
Innovation Capability: AVE = 0.612719		
IC2	In our organization, we are encouraged to innovate in the way we solve customer problems.	0.87470
IC5	In our organization, executives are always willing to take risks to seize and explore business opportunities.	0.77022
IC6	Our organization encourages employees to implement new and better ways to work.	0.83453
IC8	In our organization, executives work actively on the implementation of innovative initiatives.	0.82906
IC9	Our organization does not penalize those employees that implement new ideas that ultimately do not succeed in the market.	0.65245
IC11	Our organization always encourages employees to use the knowledge gained from previous experiences with customers.	0.80463
IC14	In our organization, information is quickly and accurately communicated throughout all business units and departments.	0.75564
IC15	Our organization keeps an active after-sales service to collect feedbacks from customers.	0.71800

Source: Author

Then, I performed the t student test. To do so, I used the bootstrapping module of SmartPLS software. I set the number of cases with the number of responses (234) and number of samples as 5000, as recommended by Hair et al. (2014). Figure 14 shows the result of the bootstrapping.

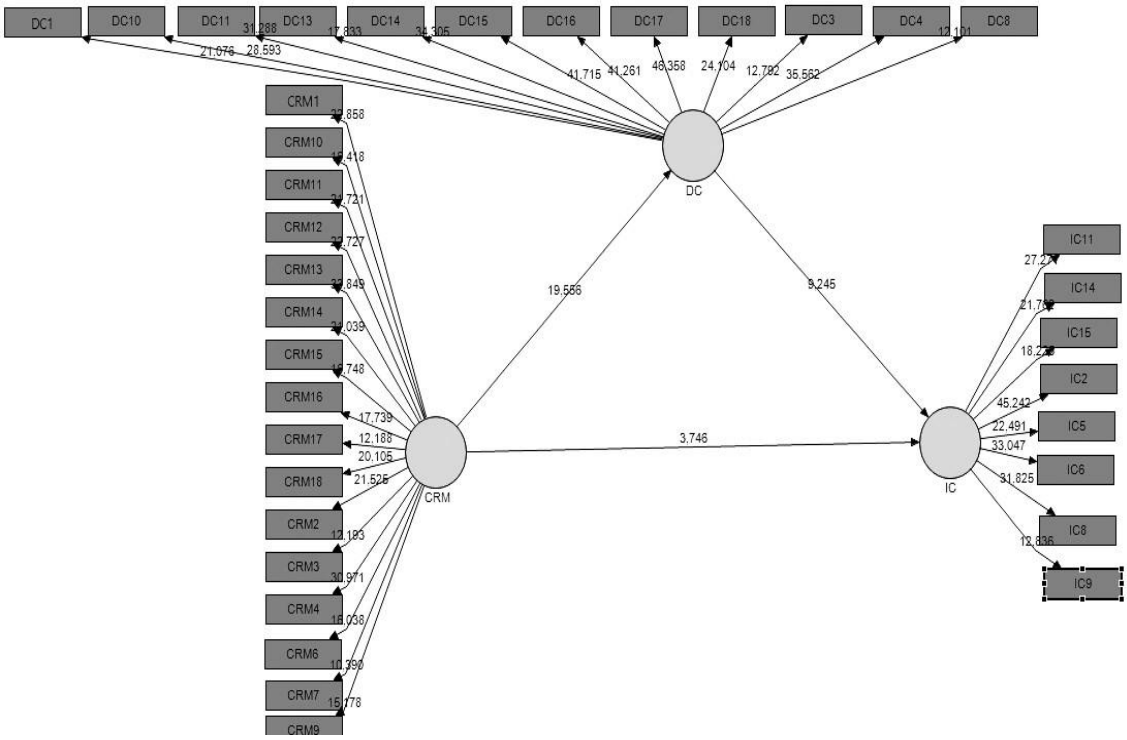

Figure 14: Model with bootstrapping results
Source: Author

As we see in figure 14, the values of relations between observable variable (CRM) and latent variables (DCs, IC) and between the two latent variables (DCs and IC) are greater than the recommended value of 1.96 (Ringle et al., 2014). The values are 19.556, 3.746, and 9.245, respectively.

After that, I assessed the predictive relevance (Q^2) or Stone-Geisser indicator and the effect size (f^2) of the model, using the blindfolding module of SmartPLS software. According to Ringle et al. (2014), the value for Q^2 should be greater than zero. Regarding the effect size (f^2), a value of at least 0.35 indicates that a large effect size. Figure 15 shows that predictive relevance of the model was confirmed ($Q^2 > 0$, as the values for CRM, DCs, and IC are 0.44825, 0.28976, and 0.37480 respectively) and the effect size of each construct to the model is large ($f^2 > 0.35$ as the values for CRM, DCs, and IC are 0.44825, 0.51615, and 0.49100 respectively).

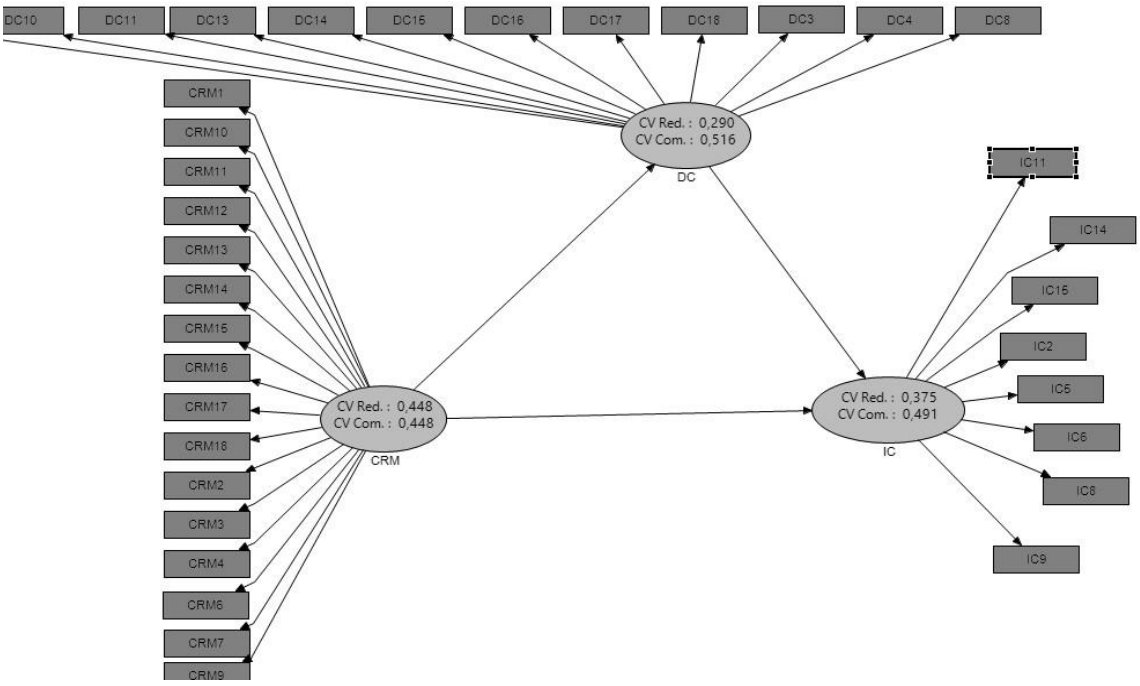

Figure 15: Model with blindfolding results

Source: Author

Finally, I calculated the Goodness of Fit (GoF) – the geometric mean between the median R^2 and the mean of AVE. According to Ringle et al. (2014), the value of GoF has to be at least 0.36. The value of the calculated value of GoF was 0.573071, which is an adequate value for the model. After the adjustments and values assessment, the path coefficients between the constructs of the model are: between CRM and DCs 0.71385, between CRM and IC 0.26885, and between DCs and IC 0.58340. Figure 16 shows the final model that resulted from SEM.

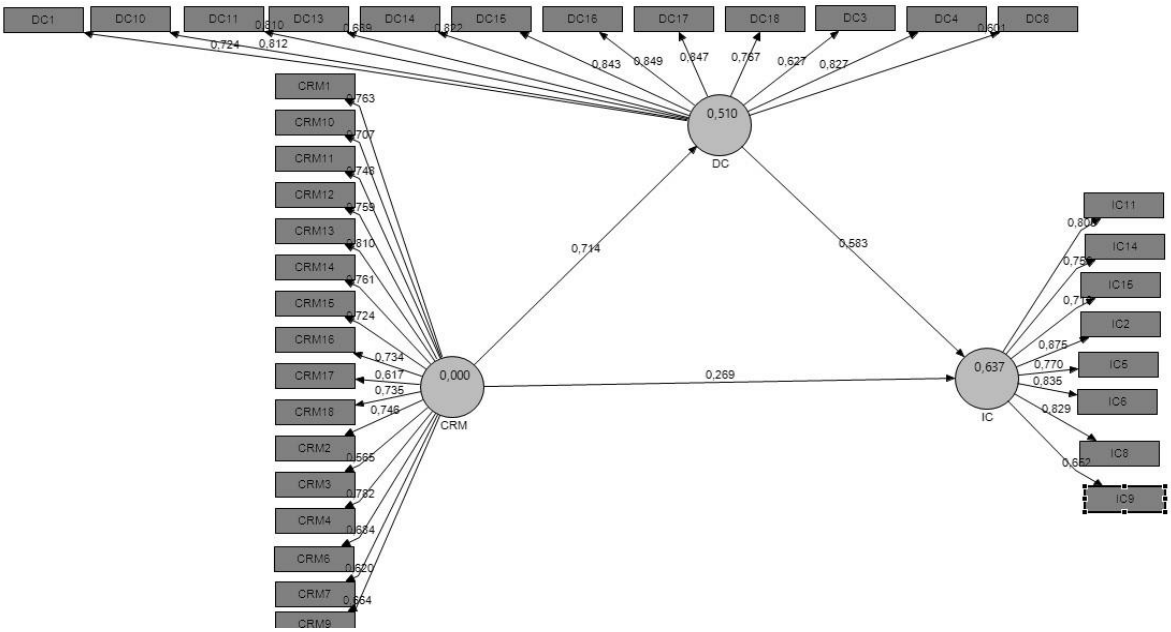

Figure 16: Final model

Source: Author

5.3. VALIDATION OF MEDIATING EFFECT OF DYNAMIC CAPABILITIES

As recommended by Hair et al. (2014), I firstly assessed the significance of the direct effect (*p*) between CRM and IC, without including the mediator variable (DCs). As figure 17 illustrates, the direct effect between CRM and IC (without the mediator) was significant (0.724).

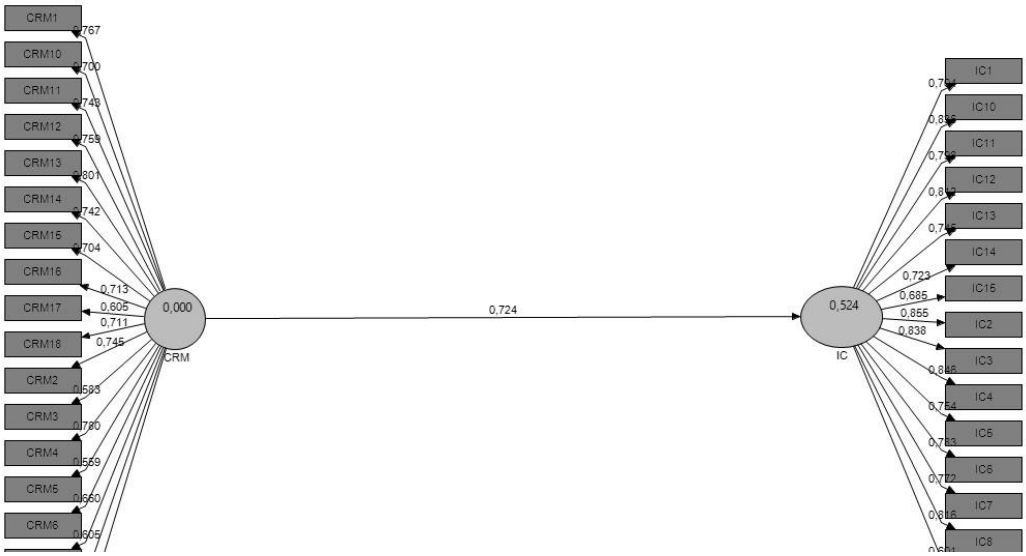

Figure 17: Round of SEM between CRM and IC without the mediator variable

Source: Author

After assessing the significance of the direct effect between CRM and IC, I rerun the PLS, including the variable of DCs. The description of the PLS results and path coefficients of the complete model is found in the previous session. Figure 11 illustrates the final model, after the adjustments of the SEM. I used the path coefficients of the adjusted model to assess mediation effect of DCs on the relationship between CRM and IC. At this point I calculated the indirect effect of CRM on IC. As instructed by Hair et al. (2014), the indirect effect is the product of the path coefficient between CRM and DCs and the path coefficient between DCs and IC. The calculation of the indirect effect was, then: 0.71385 * 0.58340 = 0.41646. As the indirect effect of CRM on IC was significant, I continued the process to calculate the mediation effect of CRM on IC, which demanded performing the bootstrap module and the calculation of the VAF to see how much of the direct effect between CRM and IC the mediating variable (DCs) absorbs.

I performed the bootstrapping using 5,000 samples, as recommended by Hair et al. (2014). Then, I copied the results of the path coefficient of the 5,000 samples on an Excel spreadsheet to calculate the indirect effect between CRM and IC for the 5,000 samples. Then, I calculated the standard deviation of the 5,000 values of indirect effect (0.055185), which refers to the bootstrapping standard error. In the sequence, I calculate the *t* value of the indirect effect CRM and IC, by dividing the original value of indirect effect (0.41646) by the bootstrapping standard error. The *t* value was 7.54656 which indicated that the mediation effect of DCs was significant ($p > 0.01$).

Finally, I calculated the value of VAF, by dividing the original indirect effect by the total effect. The total effect is the sum of the indirect effect and direct effect (0.41646 + 0.26885 = 0.68531). Then, the value of VAF was 0.60769. Since the value of VAF was between 20% and 80% (Hair et al., 2014), I can conclude that this model presents a partial mediation of DCs on the relationship between CRM and the IC.

5.4. HIPOTHESES VALIDATION

At this point, I can present the validation of the hypotheses proposed in this research. The first hypothesis proposes that CRM positively impacts the development of DCs. As described in the results of the SEM and as illustrated on figure 11, the path coefficient of the relationship between CRM and DCs is significant (path coefficient = 0.70461, $p < 0.001$). **These results support hypothesis 1.**

The second hypothesis argues that DCs positively impact the development of IC. Again, as shown in figure 11, the path coefficient of relation between DCs and IC is significant, 0.815398 ($p < 0.001$), which **supports hypothesis 2.**

Hypothesis 3 says that CRM positively impacts the development of IC. Results of the SEM show that path coefficient of the relationship between CRM and IC is 0.131777, which is significant. Surely, regarding the relationship between CRM and IC, we need to consider the mediator effect of DC. **Regardless, research findings support hypothesis 3.**

The fourth and last hypothesis proposes that DCs have a mediating effect on the relationship between CRM and the development of IC. This was one of the great contributions of the proposed model as the analysis of DCs as a mediator between CRM and IC had not been approached yet. As mentioned above, the indirect effect of CRM on IC was significant. Besides, results indicate that DCs absorb a great part of this effect. The calculated VAF was greater than 80% which indicates a full mediation of DCs on the relationship between CRM and IC. **Therefore, I can conclude that findings support hypothesis 4.**

6. DISCUSSION

As already mentioned, the goal of this research is to identify the relationship between CRM, DCs and IC. As I studied researches on the CRM I could observe that implementing CRM can be a great source of valuable knowledge that can be used to create new product and services, and to develop better solutions to customers (Day, 1994; Pedron et al., 2016). At the same time, developing the capability to innovate involves creating new knowledge and using it effectively in order to obtain new insights and new applications to existing knowledge (Camisón & Villar-López, 2011; Gibbons et al.,

1994). In fact, I propose that IC **is an organizational capability that enables organizations to continuously apply collective knowledge, internal processes and structure to develop or to improve products, services or processes in order to respond effectively to market changes and demands.**

Apart from that, the role of DCs in this relationship is fundamental. The definition of CRM adopted in this research argues that CRM can only lead to the development of IC if the implementation of CRM is followed by the integration of internal processes, organization members and operations (Payne & Frow, 2005). In fact, the success of CRM is strongly tied to the effective integration between CRM and organizational processes (Boulding et al., 2005).

At the same time, I define DCs as **intentionally and strategically implemented processes and routines that enable organizations to change their operational capabilities and their resource base in order to adapt and influence environmental changes**. Besides, I propose that, **as organizations rearrange their resources and operational capabilities, they develop the capability to innovate**.

Based on this line of reasoning, that would make sense that DCs could mediate the relationship between CRM and the development of IC, meaning that, without having the capability to implement processes and routines that change and rearrange resources and operational capabilities, all the benefits of using CRM (Mithas et al., 2005; Rajola, 2013) - customer knowledge, positive relationship with customers, knowledge on customers' needs and demands – cannot lead to IC.

Therefore, this research proposed four hypotheses. Firstly, literature indicates that CRM can provide valuable inputs such as customer knowledge, sensing of market demands and other valuable information that can drive the rearrange of organization's structure and procedures (Bolding et al., 2005; Payne & Frow, 2005). Then, I propose:

H1: CRM positively impacts the development of dynamic capabilities.

This hypothesis was confirmed by research findings. Results show that according to respondents' perspective, as organizations prioritize improving customer relationship, customer satisfaction and producing as well as using precise customer information, organizations more prone to rearrange their processes and resources to obtain competitive advantage.

Apart from that, it is important to remember that in his framework, Teece (2007) divides DCs into three classes: sensing, seizing and managing threats/transforming (see

figure 3). The first class of DCs involves the role of analytical systems gaining knowledge about the market in order to identify, filter and, even, shaping market segments and trends. In fact, Teece (2007) highlights the need for customer knowledge to anticipate market trends. That certainly leads to the linkage between CRM and DCs. As some of the results of CRM is creating a valuable base of customer information and business intelligence (Reinartz et al., 2005, Jayachandran et al., 2005) as well as customer segmentation (Thakur & Workman, 2016), it makes good sense to infer that CRM can enable organizations to develop DCs. Results corroborate this perspective.

In the class of seizing opportunities, Teece (2007) points out the microfoundations related to the capability of shaping solutions, selecting market segments, decision-making and building customer loyalty. These processes and routines (microfoundations) are the ones by which organizations will make the most use of opportunities they identify in the market. Again, we can infer that CRM affects the development of DCs, since CRM can be used to build valuable relationships with customers, to increase customer loyalty and customer satisfaction (Ribgy et al., 2002).

Besides that, CRM can be used to customize solutions according to customers' demands.

Secondly, previous studies argue that DCs support superior performance and as organizations rearrange their competences, procedures, routines, structure and capabilities, they are able to develop capabilities that enable then to create new products and services (Teece, 2007), achieving then, innovative ways to obtain competitive advantage (Teece et al., 1997). For this reason, I proposed the following hypothesis:

H2: Dynamic capabilities positively impact the development of innovation capability.

Again, research results confirm the hypothesis. Results indicate that organizations' ability to rearrange processes and resources is correlated to organizations' ability to create an environment that spurs innovation within their members as we as to develop innovative solutions to respond to market demands.

Moreover, based on the definition of the class of DCs of sensing opportunities, I could infer the linkage between DCs and IC. Teece (2007) affirms that the microfoundations of this class of DCs have a tied to R&D initiatives in order to leverage innovation. On top of that, I could infer that DCs can affect the development of IC as the microfoundations related to seizing opportunities can enable organizations to create new and innovative solutions. In fact, Teece (2007) emphasizes that this class of DCs can help organizations achieving competitive advantage in innovative ways. Research findings indicate this relationship as well.

Thirdly, among many of the advantages of using CRM, such as product customization, higher levels of customer satisfaction, customer value, valuable customer relationships, keener ability to gain market share, and better service quality, using CRM strategy enables organization to improve their processes of product development (Chen & Popovich, 2003; Richards & Jones, 2008). Besides, CRM creates a new venue that invites customers to participate in value creation (Payne & Frow,
2005). These factors can surely boost organization's ability to create innovative ways to obtain and sustain competitive advantage. Therefore, I propose that:

H3: CRM positively impacts the development of innovation capability.

Once more, research findings point out a significant correlation between CRM and the development of IC. It is interesting to see that, as respondents report organizations' ability to create customer information and the organization's ability to build positive customer relationships, they report that the organization is able to create innovative solution to customer demands as well as to create an environment that allows employees to innovate.

Finally, a very important proposal of this research is analyzing DCs as a mediating variable in the relationship between CRM and the development of IC. According to Meirelles and Carvalho (2014), as organizations develop DCs, they promote organizational changes and develop innovation. Besides that, as organizations engage on continuing learning (from customers, providers, etc.), organizations can transform this knowledge into new products, better processes and customer value (Lawson & Samson, 2001).

Based on that, I concluded that DCs could play a mediating role in the relationship between CRM and IC. Then, in order to provide a useful contribution to strategic management area, I propose that:

H4: Dynamic capabilities have a mediating effect on the relationship between CRM and the development of innovation capability.

Results indicate a partial mediation of DCs (VAF = 60.77%) and a positive effect on the relationship between CRM and IC. These results corroborate what we find on Teece's framework. For instance, the class of DCs related to managing threats and transforming focuses on the organizations' capability to continuously align their resources and competences according to market changes and demands (Teece, 2007). These capabilities are, consequenty, related to create innovative products, processes and

activities. In parallel, as the class of manage threats and transforming are related to the continuous ability to rearrange resources and assets (Teece, 2007), these DCs involve developing the capability to innovate on the way organizations deal with the market, their customers and competitors.

Again, viewing DCs as a mediator implies that CRM provides business intelligence and customer knowledge (Khodakarami & Chan, 2014) that can be used to improve product development and to align organization's strategy with market demands (Chen & Popovich, 2003; Richards & Jones, 2008).

An interesting finding is that 55.98% of respondents work on large organizations. These numbers confirm an important aspect on DCs. As investing on the development on DCs usually costs organizations a great deal of investiment of money, personell and time, developing DCs is more viable for large rather than for small/middle-sized organizations (Eisenhardt & Martin, 2000; Winter, 2003). We can infer that these 55.98% of respondents would have a better understading of organizations ability to rearrange resources and procedures to adapt to market changes and demands, as their organizations have conditions to do so.

Results also show that organizations need to allocate customer information, customer relationships, customer channels, and specialized personell not only to ensure CRM success (as affirmed by Rigby et al, 2005 and Pedron et al., 2016), but also to enable organizations to develop DC and IC.

Table 9 presents a summary of the results of hypotheses validations and their respective implications.

Table 9: Summary of hipotheses results

Hypothesis Tested	Hypothesis Relationship	Result of Statistic Validation	Implications
H1	CRM positively impacts DCs	Supported	Customer relationship can enable organizations to rearrange their processes and resources to obtain competitive advantage Customer knowledge is useful to anticipate market trends CRM can be used to leverage customer loyalty which is an important aspect the DCs of seizing opportunities

H2	DCs positively impact IC	Supported	Rearranging processes and resources is can spur innovation DCs of sensing opportunities can develop IC DCs of seizing opportunities can help organizations achieving competitive advantage in innovative ways
H3	CRM positively impacts IC	Supported	Customer information and customer relationships enables organizations to create innovative solutions Customer information allows employees to innovate.
H4	DCs mediates the relation between CRM and IC	Supported	As DCs of managing threats/ transforming are related to the continuous ability to rearrange resources and assets, they are related to IC Viewing DCs as a mediator implies that CRM provides customer knowledge that can be used to improve IC and to align organizations with market demands

Source: Author

7. CONCLUSION

As I presented earlier, CRM can provide several benefits to organizations: product customization, customer value, valuable customer relationships, higher levels of competitiveness, customer satisfaction, service quality, market penetration. Not only CRM strategy can help organizations achieving these important elements of organizational performance, but it can also improve business intelligence, strengthen the relationship with providers and other stakeholds and, specially, improve innovation (Chen & Popovich, 2003; Richards & Jones, 2008).

However, for organization to make the most of CRM potential, CRM systems and processes need to be aligned with strategy (Rigby et al., 2002). Vendors may sell the idea that by buying their CRM solutions, organization's structure will be aligned to market and customers' demand automatically (Rigby et al., 2002). Yet, it is fundamental that organizations align their CRM systems with their strategy and IT infrastructure (Pedron et al., 2016; Soltani & Navimipour, 2016).

Authors have not reached a consensus regarding the definitions of DCs (Easterby-Smith et al., 2009). For this reason, I performed a systematic analysis of previous definitions of DCs and then proposed that DCs *are intentionally and strategically implemented processes and routines that enable organizations to change their operational capabilities and their resource base in order to adapt and influence*

environmental changes. As organizations rearrange their resources and change their operational capabilities, they could achieve superior performance, sustain competitive advantage and develop the capability to innovate.

I also performed a systematic analysis of previous definitions on IC, an observed that the definitions of DCs and IC have elements in common. For Hult et al. (2004) the knowledge that feeds IC is generated as the organization absorbs and interprets the knowledge absorbed from the environment. Bases on the analysis of these definitions of IC and on the similiarities between the definitions of the two constructs led me to propose that IC *is an organizational capability that enables organizations to continuously apply collective knowledge, internal processes and structure to develop or to improve products, services or processes in order to respond effectively to market changes and demands. As organizations introduce new or enhanced versions of current products/services to customers, they could achieve better performance and sustain competitive advantage.*

Concluding, this research aimed to answer **what is the effect of CRM and dynamic capabilities on the development of innovation capability in organizations?** As I presented and discussed research findings, I identified the positive effect of CRM as well as of the DCs on the development of IC.

As regard to the main objective of the research - to identify the relationship between CRM, DCs and IC, I can conclude that the researched achieve its objective as it fulfilled its specific goals. Firstly, I reviewed literature in order to conceptualize and delimit the scope of the three constructs. Secondly, I developed a model to test the relationship between the three constructs. Thirdly, I developed and validated an instrument to measure the three constructs. Finally, I measured the mediating effect of DCs on the relaltion between CRM and IC.

Definitely, the correlation between the three constructs is high: CRM can explain 63.65% of IC and 50.95% of DCs. Finally, I measured and confirmed the mediating role of DCs on the relationship between the use of CRM and IC.

Besides, analyzing DCs as a mediator variable in the relationship between the use of CRM and IC is significant contribution to theory. Few studies have analyzed the mediating effect of DCs, but none had analyzed the mediating role of DCs on the relationship between CRM and IC. Results indicate a partial mediation of DCs on the relationship between CRM and IC: while the direct effect of the use of CRM on IC is 0.2688, the total effect of DCs on the relationship between CRM and IC is 0.6853 with VAF (Variance Accounted For) of 60.77%.

Concerning managerial implications of research findings, I can point out the importance of integrating CRM with strategy, processes and routines. Using CRM can definitely bring benefits to organizations. However, if organizations do not adjust their processes, resources, and operational capabilities according to CRM strategy, they will not be able to transform the input from CRM into innovation. Executives need to understand that CRM is not only about installing IT software. CRM strategy demands changing organizational structure and creating a culture that encourages employees to use customer knowledge to develop innovative solutions. For this reason, the involvement of top executives is fundamental. They are the ones with the authority to spur these initiatives.

Another implication for managerial practice is that using CRM can provide valuable knowledge that can help organizations to adjust to market efficiently. CRM provides information from customer demands and needs, which can be used to rearrange processes, operational capabilities, and resources. Besides, this information can help organization to develop the capability to innovate as they develop new products new solutions and new services. In this aspect, analytical CRM (Ngai et al., 2009) is strategic.

Results also corroborate the fact that DCs and IC involve a set of repeated and intentionally implemented actions as mentioned by (Chen, 2009; Hogan et al., 2011Winter, 2003). Relating DCs and IC with processes and routines may constrast with the common sense that DCs and IC are newness. However, it is important to understand that organizations to develop these capacilities have to do it “intentionally” in order to achieve a specific goal.

One of the main contributions of this study is to show, that for itself CRM cannot leverage IC. For organizations to develop IC they need to combine CRM with DCs: as organizations are able to rearrange their resources and process, they can develop IC.

Another contribution of this research is the development a new instrument to measure CRM, DCs and innovation capability. In fact, many criticisms have been addressed to DCV as DCs are difficult to measure and to operationalize. Therefore, the fact that this research delivers an instrument to measure DCs is an useful initiative to consolidate DCV on strategic management research area.

Limitations of this research are the fact that I could not do a specific analysis of the how organizations use CRM according to the business sector they are inserted. Not only can the role of CRM change according to business sector, but also how organizations view DCs and IC. Another limitation is the fact that I could not address the survey

exclusively to top executives, as this research aimed to have overview of the phenomena from the perspective of professionals from across all the levels of organizations. Finnaly, the sample does not allow generalization.

For future studies, I believe that conducting a longitudinal analysis of the development of DCs and IC on organizations. Easterby-Smith et al. (2009) even attest the need for more longitudinal studies on DCs. Therefore, it is important to observe the evolution of organizations' DCs and IC and, also how organizations use their resources to develop these capabilities. Another future study should focus on the models of CRM maturity as taking the full advantage of CRM benefits demands organizations to evolve on their CRM strategy. Finally, another aspect to be addressed in the future is to build a model considering the constructs of DCs and ICs as multidimentional variables.

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APPENDIX A – EXISTING SCALES TO MEASURE DC

Authors	Journal	Research Objective	Perspective on DC	Scale validation and statistical tests	Research main results	Citations*
Agarwal & Selen (2013)	Journal of Management & Organization	To analyze and assess the cumulative effect of dynamics capabilities on service innovation.	The scale evaluates dynamic capabilities on network environments. It also evaluates the DCs oriented towards organization's relationship with partners, the DCs for organizational learning and the DCs of innovation capability.	Authors validate the scale by applying exploratory and confirmatory factor analysis. This scale is an improved version of the one designed by Agarwal & Selen (2009).	According to research, the relationship between organizational relationship capital and elevated service offering is mediated by collaborative innovative capability and collaborative organizational learning.	18
Alegre et al. (2012)	Technology Analysis & Strategic Management	To examine the effect of organizational learning capability on export intensity and product innovation.	The scale evaluates organization's interaction with the environment and the effect of this interaction on organizational learning capability.	Authors applied multivariate analysis to assess the scale's reliability and its content, discriminant and convergent validity. Authors applied confirmatory factor analysis.	Research results show the positive effect of organizational learning on export intensity. They also demonstrate that organizational learning capability drives product innovation.	24
Biedenbach & Müller (2012)	International Journal of Project Management	To analyze the relationship between absorptive, innovative and adaptive capabilities on project and portfolio performance of R&D projects on pharmaceutical and biotechnology organizations.	Scale assesses absorptive capabilities distributed on categories: knowledge recognization, knowledge assimilation, knowledge maintenance, knowledge reactivation, knowledge transformation and knowledge application. It also assesses innovation and adaptation capabilities.	The proposed model and scale were validated through multiple regression analysis. Canonical correlation analysis was also used to evaluate the relationship between innovative, absorptive and adaptive capabilities and project performance.	Results show a positive effect of absorptive capabilities on project and portfolio performance during early phases of project. They also show that innovative capabilities of early project phases can impact on project long term success.	68
Camisón & Fores(2010)	Journal of Business Research	To measure the impact of absorptive capabilities on knowledge management.	The scale is divided into two categories potential absorptive capacity and realized absorptive capacity.	The scale is based on the research of Zara & George (2002). Then, the scale is validated by applying confirmatory factor analysis based on structural equations modeling (SEM).	This study shows absorptive capacity as a dynamic capability. It also shows the different approaches between potential and realized absorptive capacity and their correlation.	301

Authors	Journal	Research Objective	Perspective on DC	Scale validation and statistical tests	Research main results	Citations*
Cheng & Chen (2013)	Journal of Business & Industrial Marketing	To examine relationship between dynamic innovation capabilities and open innovation activities in breakthrough innovation.	Authors designed the research as well as the measurement instrument from the absorptive capacity perspective and also based on organizational inertia theory, and open innovation. It is worth mentioning that authors set innovation capability as a dynamic capability. .	To validate the instrument and the hypotheses proposed on the research, authors collected 218 valid responses. Authors assessed the construct validity and reliability by assessing the Cronbach's Alpha. To identify the factor structure, they used the Varimax rotation. They also assessed the convergent and discriminant validity. Finally, they validated results by performing the confirmatory factor analysis (CFA).	Findings support that dynamic innovation capabilities have an inverted relationship with breakthrough innovation. Besides, results show that initiatives of open innovation strengthen the positive effects of dynamic innovation capabilities on breakthrough innovation.	45
Costa & Porto (2014)	RAE - Revista de Administração de Empresas	To evaluate how technological governance affects dynamic capability of innovation and cooperation on Brazilian multinationals.	The scale evaluates aspects of dynamic capabilities related to the organization's capability to rearrange existing resources and its capability to create new resources.	The scale was validated by applying the multiple regression analysis and other statistical tests (e.g. Cronbach's Alpha).	Research results show that knowledge management and cooperation practices influence technological aspects of cooperation.	3
Danneels (2016)	Strategic Management Journal	To validate an instrument that measures second-order competences (capabilities). The scale is based on the tripod of sensing, seizing and reconfiguring proposed by Teece (2007).C9	The scale evaluates the dynamic capability of assessing new markets and the dynamic capabilities related to R&D. It also assesses the relationship between dynamic and operational capabilities.	The scale was validated by applying confirmatory factor analysis and multiple regression analysis.	Results show that market capabilities allow organizations to accumulate new products (resources). They also demonstrate that R&D capabilities also lead organizations to create new products and new technological resources.	16

Authors	Journal	Research Objective	Perspective on DC	Scale validation and statistical tests	Research main results	Citations*

Desai et al. (2007)	Vikalpa: The Journal for Decision Makers	The objective of the article is to analyze and to identify the drivers of dynamic capabilities that improve CRM processes in order to achieve customeroriented organizational performance.	The scale measures aspects of organizational features (market orientation, resource configuration and social network) and their influence on customer relationship-oriented dynamic capabilities. Besides, the scale measures the indirect effect of these organizational features on CRM performance, as well as the direct effect of dynamic capabilities on CRM performance.	The scale items were adapted from existing scale on market orientation, CRM, and dynamic capabilities. Then, the scale was evaluated by experts. On the sequence, authors conducted a pilot test with 82 executives. The final version of the scale was used in a survey that collected 334 responses from executives of 29 Indian companies from banking, telecom and retail sectors. To assess the reliability of the instrument, authors used EFA and tested the Cronbach's alpha. In order to confirm the proposed hypotheses, they use the least square regression.	Among the main findings of the paper is the fact that dynamic capabilities are fundamental in the dynamic Asian market. Besides, results show social networking and market orientation are important drivers to maximize the development of dynamic capabilities. Finally, results show that when dynamic capabilities are absent, the use of CRM technology does not result on positive organizational performance; on the contrary, in this scenario, CRM technology can even hinder performance.	20
Gligor & Holcomb (2014)	The International Journal of Logistics Management	To study the role of logistics capabilities on supply chain agilities under the dynamic capability perspective of RBV.	The scale was designed to test the theoretical model proposed by the authors. It focuses on supply chain capabilities related to organization's ability to sense and seize opportunities in the market as well as within customers and partners.	The scale was validated by applying exploratory and confirmatory factor analysis (CFA).	Results demonstrate that logistics capabilities positively impact supply chain agility. They also show that logistics capabilities help organizations to respond timely and effectively to market demands.	20

Authors	**Journal**	**Research Objective**	**Perspective on DC**	**Scale validation and statistical tests**	**Research main results**	**Citations***

Hakimi et al. (2014)	European Journal of Innovation Management	To propose a scale to measure organization's capacity to introduce new products and services based on customer knowledge management.	The scale measures the integrative and structural capacities in managing customer knowledge and their influence on product development.	The scale was validated by applying exploratory and confirmatory factor analysis. Initially the scale contained 57 items. The final version of the scale contains 16 items.	Research results show that knowledgebased capabilities help organizations to sustain competitive advantage. They also show that dynamic capabilities can integrate innovation and customer knowledge practices.	6
Herrmann et al. (2007)	Journal of Engineering and Technology Management	To propose a model to identify the antecedents of radical product innovation.	The scale measures the impact of dynamic capabilities on the transformation of product and services as well as on the transformation of markets on radical product innovation.	In the first phase, the model was tested by using partial least square modeling (PLS). In the second phase, the scale was tested by applying the confirmatory factor analysis.	Findings indicate that some organizational and cultural characteristics are necessary to develop dynamic capabilities for transformation. They also indicate that dynamic capabilities positively impact organization's ability for radical product innovation.	165
Janssen et al. (2015)	R&D Management	To operationalize specific dynamic capabilities for service innovation, based on Teece's (2007) framework.	The scale measures the dynamic capabilities and their impact on service innovation. The scale items are structured according to the three classes of dynamic capabilities (sensing, seizing, transformation) (Teece, 2007).	The scale was tested by performing exploratory and confirmatory analysis. Authors also performed structural equation modeling (SEM) to assess the construct correlation.	Findings demonstrate that sensing user needs and sensing technological option depend on specific organizational processes.	8

Authors	**Journal**	**Research Objective**	**Perspective on DC**	**Scale validation and statistical tests**	**Research main results**	**Citations***

Jantunen (2005)	European Journal of Innovation Management	To study how absorptive capability of processing organizational knowledge impact innovative performance.	The scale focuses on the organization capability of knowledge processing (which is divided into knowledge acquisition, knowledge utilization and knowledge dissemination). It also assesses the relationship between knowledge processing capabilities and environment dynamism, in order to evaluate the organization ability to adapt to the environment.	The scale was validated by applying exploratory factor analysis. The innovative factor was assessed by performing hierarchical linear regression analysis.	Findings show that not only organizational knowledge but also the flow organizational knowledge are important to sustain innovative performance.	320
Jin et al. (2014)	International Journal of Production Economics	To analyze the relationship between supply chain flexibility, competitive performance and IT-enabled sharing capabilities. Authors denote that IT-enables sharing capabilities comprise the organization's capability to use IT infrastructure to deal with intangible information and to build a network to share information internally and externally.	The scale measures the dynamic capabilities of ITenabled sharing capabilities that allow organizations to adapt to dynamic context of supply chain.	The authors performed confirmatory factor analysis (CFA) to validate the scale and also performed Structural Equation Modeling (SEM) to validate the model and hypotheses.	Research findings indicate that ITenabled capabilities impact on organization's capability to be flexible to attend supply chain demands, and consequently impacts competitive performance.	41
Kandemir et al. (2006)	Journal of the Academy of Marketing	To demonstrate that organization's orientation to alliances can help it to scan the environment for better opportunities which can result on new partnerships and better alliance strategies.	The scale was developed to measure the dynamic capabilities of alliance scanning, alliance coordination and alliance learning. The scale measures the relationship between these capabilities, market orientation and environment turbulence	The scale was validated by performing confirmatory factor analysis (CFA).	Findings show that alliance orientation impacts alliance network performance and market performance. They also show that environment turbulence moderates the relationship between alliance orientation and alliance network performance.	253

Authors	Journal	Research Objective	Perspective on DC	Scale validation and statistical tests	Research main results	Citations*
Karayanni (2015)	Journal of Business-to-Business Marketing	To examine the impact of communication on network relationships and organization performance.	The scale measures the capability of sharing information with partners and within organization members and as well as the capability of adapting to the environment.	The scale was validated by applying confirmatory factor analysis; the proposed model, by performing structural equation modeling (SME).	According to research findings, marketing-oriented communication has little impact on inter-organizational cooperation. On the other hand, networkoriented communication positively impacts inter-organizational cooperation.	2
Kim et al. (2013)	Industrial Marketing Management	To analyze how organizations can increase customer value creation (a) by exploring relationships with supply chain partners, (b) by building internal integration and (c) by developing the dynamic capabilities in order to respond to customer demands. Authors analyze this phenomenon by applying the theory related to relationship marketing and the dynamic capability perspective of RBV.	The scale measures the dynamic capability of relationship-enabled responsiveness which is the organization capability to respond to environment demands by combining resources from multiple parties in supply chain.	The scale was validated by performing confirmatory factor analysis (CFA).	Results suggest that building relationship with supply chain partners motivates inter-organizational integration and collaboration. Consequently, focusing on better relationships with supply chain partners enhances relationship-enabled responsiveness and customer value creation.	31
Lin & Wu (2014)	Journal of Business Research	To investigate the influence of dynamic capabilities on organization's capacity to develop valuable, rare, inimitable and nonsubstitutable resource in the pursuit of better performance. To achieve this objective, authors employed a survey with 1000 Taiwanese companies.	The scale measures four constructs: VRIN resources, non-VRIN resources, dynamic capabilities and performance. The items about VRIN resources focuses on organization's know-how, firm reputation and experience on cooperative alliance experience. To measure dynamic capabilities, authors adopted the studies of Teece et al. (1997) and Eisenhardt and Martin (2000).	In order to assess data validity, authors tested the Mahalanobis distance, which checks outliers in a sample. To assess the validity of the constructs, authors assessed the Cronbach's alpha value of these constructs. Authors also validate the model and the instrument, by using the analysis of variance (ANOVA) and structural equation modeling (SEM). LISREL was the SEM technique adopted by the authors.	Findings show that dynamic capabilities have a mediating effect on the relationship between VRIN resources and organizational performance. The dynamic learning capability has a strong correlation with performance. Finally, results confirm that as organizations develop VRIN resources they can improve their performance.	117

Authors	Journal	Research Objective	Perspective on DC	Scale validation and statistical tests	Research main results	Citations*
Lisboa et al. (2013)	International Marketing Review	To analyze the effects of export market exploitation and exploration on export performance.	The scale measures the capability of scanning export market for opportunities and for new customers. It also measures the organization's capability of adapting to market turbulence as well as the organization capability of rearranging resources.	The instrument was validated by applying confirmatory factor analysis (CFA).	Export market exploitation and exploration are positively and negatively related to export performance, respectively. Findings also show that export market exploration enhances export performance under high levels of market turbulence.	19
Maijanen & Jantunen (2016)	International Journal of Business Excellence	To study how dynamic capabilities of sensing, seizing and reconfiguring are developed in organizations and how they relate to each other.	The scale measures the sensing, seizing and reconfiguring capabilities in organizational context. The scale is based on the Teece's (2007) framework. It also measures the relationship between these capabilities and change performance in work units.	The scale was validated by applying multivariate analysis. To test the hypotheses, authors performed ANOVA tests.	Results indicate that organizational context affects how dynamic capabilities relate to each other and how they affect performance. Besides, the sensing capability affects change indirectly. This relationship is mediated by seizing and reconfiguring capabilities.	1
Makkonen et al. (2014)	Journal of Business Research	To analyze the relationship between dynamic capabilities and environmental crisis as well as to study how organizations use dynamic capabilities during unstable periods. This study was conducted under the perspective of the financial crisis of 2008.	In this scale, dynamic capabilities are measured in different dimensions: reconfiguration routines, leveraging, learning, knowledge creation, sensing and seizing and knowledge integration.	Authors validated the instrument by applying confirmatory factor analysis (CFA).	Findings show that organizations can develop the capacity to adapt to environment changes and demands, and that this capacity leads to better performance. However, the adaptation to environment is not an easy task.	71

Authors	Journal	Research Objective	Perspective on DC	Scale validation and statistical tests	Research main results	Citations*

Mitrega et al. (2012)	Industrial Marketing Management	This study proposes the construct of networking capability (NC) as a dynamic capability. To accomplish this goal, authors proposed and tested a model.	The scale focuses on the capabilities related to the relationship between the organization and its business partners (suppliers and customers). Authors named these capabilities as networking capabilities.	Authors adopted a threestage process of scale development, which included qualitative and quantitative phases. Firstly, the items emerged based on literature and interviews. Secondly, authors validated the scale items by conducting focus groups, and finally, after applying a online survey, authors validated the scale by performing exploratory and confirmatory factor analysis. Initially, the scale contained 41 items. After the confirmatory factor analysis, only 17 items remained	Results show that organizations prioritize conflicts with customers, but not conflicts with suppliers. Besides, organizations do not present a predefined process to terminate relationships with customers and suppliers.	74
Nitzsche et al. (2016)	International Journal of Innovation Management	To examine the relationship between organization's openness, absorptive capacity and innovation capability in the in-bound open innovation environment.	In their scale, authors focus on innovation success based on the theory of absorptive capacity and dynamic capabilities.	Authors wrote the items of the scale based on literature review. Then, they got feedbacks from experts about the scale. On the sequence, authors conducted a pre-test. Afterwards, authors applied a survey using the scale. To test the validity and reliability of the instrument, they applied the exploratory factor analyzed (EFA) on the collected data.	Findings show that dynamic capabilities view and the theory of absorptive capacity can be applied in the context of open innovation.	2

Authors	**Journal**	**Research Objective**	**Perspective on DC**	**Scale validation and statistical tests**	**Research main results**	**Citations***

Ouakouak et al. (2014)	European Management Journal	To measure the mediating role of organizational capabilities on the relationship between middle managers, middle managers' autonomy and organizational performance.	The scale measures the organizational capabilities under the perspective of dynamic capabilities by including statements regarding organization's capability to respond and to adapt to environmental changes.	The scale is based on previous studies on innovation capability. Authors applied discriminant and convergent validity tests, and checked the values of KMO (Kaiser–Meyer–Olkin) and Cronbach's alpha.	Results show that organizational capabilities mediate the middle manager's role on achieving organizational performance. These capabilities also affect middle manager's autonomy.	30
Paiva et al (2012)	Journal of Knowledge Management	To analyze the manufacturing strategy process (MSP) under the perspective of RBV.	The scale measures dynamic capabilities as organization's resource-based orientation. This scale measures organization's capabilities to manage knowledge in order to rearrange its resources in order to sustain competitive advantage.	Scale was applied to Brazilian and Spanish participants. The scale was validated by applying confirmatory factor analysis (CFA).	Results suggest that knowledge is a fundamental resource in the manufacturing strategy process. They also show that Brazilian organizations are more resource-based oriented than Spanish organizations.	7
Plattfaut et al. (2015)	International Journal of Innovation Management	To develop and test a theoretical framework that explains how information technology can contribute to service innovation performance. The framework is based on the dynamic capability theory of Teece (2007).	The scale measures how dynamic capabilities of sensing, seizing and transforming can influence service innovation performance. In this study, service innovation performance is considered a dynamic capability as well.	Authors used partial least squares (PLS) to validate the model.	According to research results, IT can support sensing, seizing and transforming capabilities. These capabilities, then, affect the performance of service innovation.	4
Pratono (2016)	Business Process Management Journal	To propose technical turbulence as a primary contingency factor in the relationship between strategic orientation and firm performance. Author analyzes thy phenomenon under the perspective of resource-based view (RBV).	The scale measures the organization's capability to respond to technological turbulence as well as the influence of this capability on performance. It also measures the influence of strategic orientation on organizational performance.	Author uses partial least squares (PLS) for data analysis and statistical validation.	This research shows that technological turbulence affects the relationship between dynamic capabilities and organizational performance. Technological turbulence also affects the relationship between strategic orientation and organizational performance.	1

Authors	Journal	Research Objective	Perspective on DC	Scale validation and statistical tests	Research main results	Citations*
Rungi (2015)	International Journal of Managing Projects in Business	To analyze the process of capability development in project management settings.	The scale measures the capability to create and rearrange resources in the context of project and portfolio management.	Authors wrote the scale items based on previous literature. After collecting data through a survey, to assess the collected data authors performed the Levene test and checked Cronbach's alpha values. Authors do not mention a specific statistical process to validate the scale.	As the quality of business capabilities decreases, the quality of project-related capabilities increases. Another interesting finding is that capabilities themselves are more important than the process to develop these capabilities.	0
Sangari & Razmi (2015)	The International Journal of Logistics Management	To study the role of business intelligence in supply chain agility context by analyzing the relationship between business intelligence, competence, agile capabilities and supply chain agility.	The scale measures the dynamic capability of rearranging resources in order to achieve supply chain agility. It also measures the capability of sensing and responding to environmental changes and demands.	The instrument was validated by applying confirmatory factor analysis (CFA).	Results support the conceptualization of supply chain business intelligence competence (capability). They also confirm that supply chain business intelligence is fundamental to achieve supply chain agility.	9
Santos-Vijande et al. (2013)	Journal of Business Research	To develop a multidimensional scale to measure brand management systems in three dimensions: brand orientation, internal branding and strategic brand management. Besides, authors conceptualize brand management system as a dynamic capability.	The scale measures brand orientation and brand management as a dynamic capability. Scale also measures the relationship between brand orientation, organizational innovation capability and customer and business performance.	The scale was validated by applying confirmatory factor analysis (CFA).	Findings show that brand management system capability helps organizations to outstand their competitors in performance. Besides, results indicate that market orientation and innovation capability are antecedents of system development.	56

Authors	Journal	Research Objective	Perspective on DC	Scale validation and statistical tests	Research main results	Citations*

Schlosser & McNaughton (2009)	Journal of Services Marketing	To develop of a multidimensional scale to measure the individuals' market-oriented behavior in organizational settings.	The scale measures marketoriented behavior through the lens of dynamic capability perspective. The construct of market-oriented behavior is divided into three dimensions: information acquisition, information sharing and strategic response.	The scale was validated by applying exploratory (EFA) and confirmatory factor analysis (CFA). After performing the multivariate analysis, 20 items of the scale remained.	Authors concluded that market-oriented behavior is a latent construct divided into three dimensions: information acquisition, information sharing and strategic response.	26
Schweitzer (2014)	Leadership & Organization Development Journal	To examine whether the heterogeneity in alliance capability development can be attributed to some specific leadership behaviors. The research also intends to confirm that transformational leadership has positive influence on the development of some strategic dynamic capabilities. Besides, the research aims to test if transformational leadership allows organization to sustain operational capabilities.	Author designed the scale for dynamic capabilities based on literature review. He divides dynamic capabilities into seven dimensions: proactiveness, innovativeness (innovation capability), risk taking, competitive aggressiveness, relational capital, knowledge, and learning. The scale also measures the capabilities of task control and task proficiency.	The scale was validated by performing partial least squares (PLS).	Results indicate that transformational leadership positively impacts dynamic and operational capabilities. Results also indicate that transactional leadership positively impacts the development of innovation capability.	15

Authors	**Journal**	**Research Objective**	**Perspective on DC**	**Scale validation and statistical tests**	**Research main results**	**Citations***

Shafia et al. (2016)	Technology Analysis & Strategic Management	To examine the relationship between dynamic capabilities (DCs) and technological innovation capabilities as well as to analyze the impact of technological innovation capability on organization's competitiveness. The research was conducted among Iranian large public organizations.	The scale measures the relationship between dynamic capabilities and innovation capabilities. The items that measure dynamic capabilities are based on Teece's (2007) framework. The items that measure innovation capability cover capabilities related to organizational learning, R&D, resource allocation, manufacturing, marketing, organizing and strategic planning.	The scale was designed based on literature review. After writing the scale items, authors conducted a survey among technology organizations. To validate the instrument, authors used confirmatory factor analysis (CFA) under structural equation modeling (SEM) approach.	Results confirm technologic innovation capability and dynamic capabilities can improve organizational competitiveness. They also indicate that innovation capability mediates the relationship between dynamic capabilities and organizational competitiveness.	1
Sirén (2012)	The Learning Organization	To build a multidimensional instrument to measure strategic learning process.	The scale measures strategic learning process which is divided in four subprocesses: strategic learning creation, distribution, interpretation and implementation. The scale measures strategic learning as a dynamic capability.	Author validated the scale by performing exploratory and confirmatory factor analysis. After the statistical validation, the number of items reduced from 24 to 19.	Results suggest that strategic learning is a multidimensional construct manifested through the sub-processes of strategic knowledge creation, distribution, interpretation and implementation.	15
Sprafke et al. (2012)	A Focused Issue on Competence Perspectives on New Industry Dynamics Research in Competence-Based Management	To propose the idea that individual, managerial and team-related initiatives directly impact dynamic capabilities.	The scale measures sensing capabilities on organizations, teams and individuals.	To validate the scale, authors analyzed the component factor and factor loadings of the variables. To validate the internal consistency of the scale, they verified the Cronbach's alpha. To test the research hypotheses, authors used multiple regression analysis.	Results indicate that organizational dynamic capabilities are strongly related to employees' individual dynamic capabilities. Findings also indicate that teams, managers and individuals contribute to develop dynamic capabilities in organizational settings.	18

Authors	**Journal**	**Research Objective**	**Perspective on DC**	**Scale validation and statistical tests**	**Research main results**	**Citations***

Storer et al. (2014)	The International Journal of Logistics Management	To examine the management of supply chain and innovation. Another objective is to analyze the relationship between strategic supply chain, supply chain capability and industry-led innovation.	The scale measures strategic supply chain capability as an dynamic capability. It also measures supply chain performance, supply chain synchronization and industry-led innovation utilization. Supply chain capability was divided into two dimensions: reconfiguration and adaptation.	To validate the instrument, authors used confirmatory factor analysis (CFA) under structural equation modeling (SEM) approach.	According to research findings, supply chain capability has a minor influence on the organization's capability to make profits from innovation. Results also indicate that organizations underestimate the benefits of developing a strategic supply chain management since they do not fully understand the impact supply chain on innovation.	6
Tollin & Shimidt (2015)	Marketing Intelligence & Planning	To measure the impact of the chief marketing executives' mindsets on marketing capabilities as well as the impact of marketing capabilities on performance.	The scale measures crossfunctional and dynamic marketing capabilities. The scale also measures chief marketing executives' mindsets regarding marketing capabilities. The items are based on Teece's (2007) framework.	To validate the model, authors compare the degree of variance of the constructs, their Cronbach's alpha and their correlation. Authors also perform a cluster analysis to validate the model. Authors do no mention if they applied statistical analysis to validate the scale specifically.	Results indicate that mindsets that oriented to integration and rejuvenation have a high impact on organizational performance. Hence, organizations in which chief marketing executives prioritize brand management, product development, customer relationship management and dynamic marketing capabilities will outperform organizations that do not share this same mindset.	2
Urhahn & Spieth (2014)	IEEE Transactions on Engineering Management	To evaluate if portfolio management governance enhances firm performance. Authors conduct the study based on the dynamic capability perspective of resource-based view.	The scale combines some items from existing scales. Authors added other items to measure portfolio management governance. The instrument measures portfolio management as a dynamic capability even though scale items do cover some basic aspects of the dynamic capability theory.	The model was validated by applying structural equation modeling (SME).	Results indicate that portfolio management governance is an antecedent of new product portfolio innovation capability. In turn, new product innovation capability mediates the relationship between portfolio management governance and firm performance.	10

Authors	**Journal**	**Research Objective**	**Perspective on DC**	**Scale validation and statistical tests**	**Research main results**	**Citations***

Verreynne et al. (2016)	Journal of Business Research	To develop a measurement scale of dynamic learning capabilities.	The scale measures dynamic capabilities on the perspective of dynamic learning capabilities. The scale also measures how the organization's capability to rearrange resources affects knowledge.	To validate the scale, authors used exploratory (EFA) and confirmatory factor analysis (CFA), with structural equation modeling (SME) approach.	Findings confirm that dynamic learning capabilities can be measured empirically.	2
Vicente et al. (2015)	International Marketing Review	To study innovation capability in the context of export market. Authors also intend to develop a scale to measure innovation capability in exporting organizations. The name of the scale is the INNOVSCALE.	In the scale focus on new product development. Authors designed the scaled base on the work of Calantone et al. (2002). The scale also strategic capability, technological capability and investments on R&D initiatives.	Authors wrote the scale items based on literature review. On the sequence, they applied a survey among 471 exporting manufacturing organizations. To test the validity and the reliability of the scale, authors performed structural equation modeling (SME).	The findings reveal that innovation capability is a higher-order construct formed by four dimensions: product development capability, innovativeness, strategic capability, and technological capability. The results also indicate that these four dimensions are positively and significantly related to export venture performance.	9
Villar et al. (2014)	International Business Review	To analyze the role of knowledge management by focusing on knowledge management practices and on the dynamic capabilities oriented to knowledge management.	The scale measures the constructs of knowledge management practices and knowledge management capabilities.	To validate the measurement instrument, authors performed structural equation modeling (SME)	Results suggest that dynamic capabilities mediate the relationship between knowledge management and exports performance. Dynamic capabilities are necessary to reconfigure the capabilities and practices related to knowledge management.	65
Whitten et al. (2012)	International Journal of Operations & Production Management	To theorize and validate a model that addresses the Triple-A (agile, adaptable, aligned) supply chain as an antecedent of supply chain performance, and supply chain performance as antecedent of organizational performance.	The scale measures organizations' capabilities to sense and to adapt to market changes and the relationship between these capabilities with supply chain agility and organizational performance. In this scale, organizational performance was divided into two dimensions financial performance and marketing performance.	To validate the scale, authors performed confirmatory factor analysis (CFA) with structural equation modeling (SME) approach.	Results indicate that Triple-A supply chain positively impacts supply chain performance. In turn, supply chain performance positively impacts organizational performance.	78

Authors	Journal	Research Objective	Perspective on DC	Scale validation and statistical tests	Research main results	Citations*
Wu et al. (2010)	Decision Sciences	To study the role and definition of operational capabilities as well as to identify the difference between operational and dynamic capabilities. Authors also aimed to develop a measurement instrument of operational capabilities.	The scale measures the relationship between operational and dynamic capabilities. The scale focuses on the capabilities related to innovation and product. The scale also measures the capabilities related to organization's capacity to respond to and to take advantage of environmental changes.	To validate the scale, authors performed confirmatory factor analysis (CFA) with structural equation modeling (SME) approach.	Results show that operational capabilities are fundamental to sustain competitive advantage. Results also show that despite the importance of operational capabilities, managers usually overlook them.	131
Zheng et al. (2011)	Journal of Knowledge Management	To understand the concept of dynamic capabilities from a knowledge-based perspective and to assess the impact of dynamic capabilities on innovation performance.	The scale measures dynamic capabilities divided into three dimensions: knowledge acquisition capability, knowledge generation capability and knowledge combination capability.	To validate the instrument, authors conducted a survey on China on which they obtained 218 valid responses. They validated the construct validity and reliability by assessing the Cronbach's Alpha. They also performed the structural equation modeling (SME) using the AMOS 7.0 software.	Findings indicate a significant relationship between dynamic capabilities and innovation performance. They also indicate the mediating effect of knowledge combination capability on the relationship between dynamic capabilities and innovation performance.	84

**Note: ***Number of citations extracted from Google Scholar on May, 5th 2017

APPENDIX B – EXISTING SCALES TO MEASURE IC

Authors	Journal	Research Objective	Perspective on IC	Scale validation and statistical tests	Research main results	Cit.*
Agarwal & Selen (2013)	Journal of Management & Organization	To analyze and assess the cumulative effect of dynamics capabilities on service innovation	The scale evaluates dynamic capabilities on network environments. It also evaluates the DCs oriented towards organization's relationship with partners, the DCs for organizational learning and the DCs of innovation capability.	Authors validate the scale by applying exploratory and confirmatory factor analysis. This scale is an improved version of the one designed by Agarwal & Selen (2009)	According to research, the relationship between organizational relationship capital and elevated service offering is mediated by collaborative innovative capability and collaborative organizational learning.	18

Angkanurakbun & Wanarat (2016)	International Journal of Innovation Management	To analyze the mediating role of product innovation capability on the relationship between entrepreneurial proactiveness and hotel performance. The research was conducted among hotels in Thailand.	To measure innovation capability, authors used items from the instruments developed by Nasution et al. (2011) and Liao et al. (2010). The scale assessed the impact of IC on hotel performance as well as the impact of entrepreneurial proactiveness on IC	To validate the instrument, they conducted a thorough process that consisted of pre-test, survey with managers in service and hotel industry, and, a statistical validation of the proposed model and hypotheses. In the statistical validation, authors performed structural equation modeling (SEM).	Research findings show that product innovation capability directly and significantly impacts hotel performance. Besides, findings indicate that product innovation capability moderates the relationship between entrepreneurial proactiveness and hotel performance.	0

Authors	**Journal**	**Research Objective**	**Perspective on IC**	**Scale validation and statistical tests**	**Research main results**	**Cit.***
Belkahla & Triki (2011)	Journal of Knowledge Management	To propose a measurement instrument of customer knowledge-enabled innovation (CKEI) capability.	The scale measures customer knowledge-enabled innovation capability based on the knowledgebased view (KBV), which is an extension of the resource-based view (RBV). The scale has three dimensions. The dimension of integrative capacity refers to the organization's ability to involve customers on the innovation process. The second dimension is the structural capacity which is the organization's ability to organize customer knowledge to create useful knowledge. The third dimension refers to the internal management capacity that reflects a customer and innovationoriented organizational culture. It is important to note that the scale has a considerable emphasis on CRM.	The scale was developed following the steps recommended by Churchill (1979). The constructs and the items were delineated based on a qualitative analysis of data collected in in-depth interviews conducted with managers in the areas of new product development, R&D, CRM and marketing. The scale contains 60 items. Since the paper covers the qualitative and exploratory phase of the scale development process, the quantitative validation of the instrument is not described.	Due to the scope of the paper results are considerably raw, results indicates a need for further work to validate the model and to assess the relationship between customer knowledge management and innovation capability.	47

Biedenbach & Müller (2012)	International Journal of Project Management	To analyze the relationship between absorptive, innovative and adaptive capabilities on project and portfolio performance of R&D projects on pharmaceutical and biotechnology organizations.	Scale assesses absorptive capabilities distributed on categories: knowledge recognization, knowledge assimilation, knowledge maintenance, knowledge reactivation, knowledge transformation and knowledge application. It also assesses innovation and adaptation capabilities.	The proposed model and scale were validated through multiple regression analysis. Canonical correlation analysis was also used to evaluate the relationship between innovative, absorptive and adaptive capabilities and project performance.	Results show a positive effect of absorptive capabilities on project and portfolio performance during early phases of project. They also show that innovative capabilities of early project phases can impact on project long term success.	71

Authors	**Journal**	**Research Objective**	**Perspective on IC**	**Scale validation and statistical tests**	**Research main results**	**Cit.***
Cheng & Chen (2013)	Journal of Business & Industrial Marketing	To examine relationship between dynamic innovation capabilities and open innovation activities in breakthrough innovation.	Authors designed the research as well as the measurement instrument from the absorptive capacity perspective and also based on organizational inertia theory, and open innovation. It is worth mentioning that authors set innovation capability as a dynamic capability. .	To validate the instrument and the hypotheses proposed on the research, authors collected 218 valid responses. Authors assessed the construct validity and reliability by assessing the Cronbach's Alpha. To identify the factor structure, they used the Varimax rotation. They also assessed the convergent and discriminant validity. Finally, they validated results by performing the confirmatory factor analysis (CFA).	Findings support that dynamic innovation capabilities have an inverted relationship with breakthrough innovation. Besides, results show that initiatives of open innovation strengthen the positive effects of dynamic innovation capabilities on breakthrough innovation.	45
Costa & Porto (2014)	RAE - Revista de Administração de Empresas	To evaluate how technological governance affects dynamic capability of innovation and cooperation on Brazilian multinationals.	The scale evaluates aspects of dynamic capabilities related to the organization's capability to rearrange existing resources and its capability to create new resources.	The scale was validated by applying the multiple regression analysis and other statistical tests (e.g. Cronbach's Alpha).	Research results show that knowledge management and cooperation practices influence technological aspects of cooperation.	3

Dadfar et al. (2013)	Total Quality Management and Business Excellence	To analyze the relationship between innovation capability, product development and organizational performance within small and medium enterprises (SMEs) in the pharmaceutical sector.	In this study, authors analyze the innovation capability that oriented to product and technology development.	Authors only performed a descriptive analysis of the model. They do employ statistical procedures to validate the model and the instrument.	Results show that innovation capability positively effects organizational performance. For this relationship to exist, there must be an effective management, an appropriate strategy, and an organizational structure that focuses on learning, innovative processes and customer relationship.	29

Authors	**Journal**	**Research Objective**	**Perspective on IC**	**Scale validation and statistical tests**	**Research main results**	**Cit.***
Flatten et al. (2011)	European Management Journal	To propose and to validate a multidimensional measure instrument of absorptive capacity.	Authors' scale is divided into four dimensions of absorptive capacity: knowledge acquisition, knowledge assimilation, knowledge transformation and knowledge exploitation.	To develop the scale, firstly authors conducted a literature review on absorptive capacity based on the publications of ten management journals - Academy of Management Review, Administrative Science Quarterly, Management Journal, Academy Journal of Management, Journal of Management Studies, Management Science, Organization Science, Strategic Management Journal, MIS Quarterly and European Management Journal - published from 1990 to 2007. After that, they conducted three pre-tests with executives and surveys with CEO's of German companies. Surveys were divided into two samples. Authors analyzed the collected Data using factor analyses with Promax rotation and confirmatory factor analysis (CFA). This multivariate analysis was executed with AMOS 17.0 software.	Findings indicate that managers can influence organizations' absorptive capacity as they conduct their teams focusing on improving this capacity.	265

Authors	**Journal**	**Research Objective**	**Perspective on IC**	**Scale validation and statistical tests**	**Research main results**	**Cit.***

Gates & Langevin (2010)	Accounting, Auditing & Accountability Journal	To evaluate human resource (HR) professionals' perceptions and their expectations regarding human capital assessment. Another objective is to understand the relationship between the perceptions and expectations of these HR professionals, organizational strategy and performance.	The instrument intends to assess their perception of HR professionals regarding the development of human capital. The construct of HR professional perception is divided into three sub-constructs performance, HR strategy and human measures. The scale also measures cost reduction and innovation capability. Innovation capability is measured by assessing innovation indicators such as capacity to identify new opportunities and implement changes.	To validate the proposed model and ensure the validity of the instrument, authors conducted a survey with 104 HR executives. Then, they conducted a quantitative analysis in which they checked component distribution.	Results confirm that on the perception of HR managers, the more the organizations improve human capital the more the higher is organizations' performance.	69
Gomezelj & Anton (2015)	Journal of Business Economics and Management	The paper presents two objectives (1) to examine the impact of employees' knowledge on organizations' human capital and to analyze how organizations can measure employees' knowledge. Authors performed the research among small and medium enterprises (SMEs).	The instrument assesses the relationship between employees' competencies, work attitude and innovation capability. The instrument also assesses the impact of these constructs on employees' knowledge.	To build the measure instrument, authors conducted a literature review to grasp a better understand of the construct of human capital. Based on this review, they designed a model to assess employees' knowledge in small and medium enterprises. To validate the model, authors conducted a survey with 173 Slovenian SMEs. To assess the reliability and validity of the scale, authors used structural equation modeling (SEM) and performed exploratory factor analysis (EFA).	Results show that employees' knowledge can be explained by five factors: innovation capability, willingness to learn, attitude, job qualification, formal education and work experience. Findings also suggest that employees' innovation capabilities can be considered as their capacity to find new markets. This capacity is developed as they gain marketing knowledge and create ideas to help the organization to adapt to market changes.	2
Grawe et al. (2009)	International Journal of Physical Distribution and Logistics Management	To analyze how organization's strategic orientation affects service innovation capability as well as to evaluate the impact innovation capability on market performance.	The instrument developed on this research evaluates three main constructs strategic orientation, service innovation capability and market performance. Authors focus on the capability to engage on service innovation.	To validate the instrument, authors applied structural equation modeling (SEM), by performing a confirmatory factor analysis (CFA) to validate the model they generated based on literature. The data was collected by conducting a survey among supply chain executives	Findings indicate a relationship between customer orientation and competitor orientation and service innovation capability. They also confirm that service innovation capability affects market performance.	161

Authors	Journal	Research Objective	Perspective on IC	Scale validation and statistical tests	Research main results	Cit.*
Guan et al. (2006)	European Journal of Operational Research	To analyze the relationship between technological innovation capability and competitiveness by applying a quantitative technique called data envelopment analysis (DEA).	Authors a framework to evaluate innovation performance and competitiveness. The framework and the scale used to validate the framework include seven dimensions of capability: learning capability; R&D capability; manufacturing capability; marketing capability; resource exploiting capability; organization innovating capability and strategic planning capability. In authors' perspective, organizational innovating capability refers to the organization's capacity to integrate departments, culture, processes, and methods in order to achieve innovation and seize new opportunities. The overall proposal of the framework is that technological innovation capability affects organization's competitiveness performance.	To develop the framework and the scale, firstly authors performed a literature review on technological innovation capability. After developing a first version of the instrument, authors conducted a pilot study with 16 large organizations. Then, they executed a questionnaire survey with innovative manufacturing organizations in Beijing. In the sequence, authors the technique of DEA to validate the model. They also used the ANOVA test to validate the measurement instrument.	Findings show some inconsistencies between organizational innovation capability and competitiveness in many of the participating organizations. Results also indicate that organizations' ability to integrate their processes and internal aspects is not as efficient as expected in the pursuit of technological innovation capability	320
Hakimi et al. (2014)	European Journal of Innovation Management	To propose a scale to measure organization's capacity to introduce new products and services based on customer knowledge management.	The scale measures the integrative and structural capacities in managing customer knowledge and their influence on product development.	The scale was validated by applying exploratory and confirmatory factor analysis. Initially the scale contained 57 items. The final version of the scale contains 16 items.	Research results show that knowledgebased capabilities help organizations to sustain competitive advantage. They also show that dynamic capabilities can integrate innovation and customer knowledge practices.	6

Authors	Journal	Research Objective	Perspective on IC	Scale validation and statistical tests	Research main results	Cit.*

Hogan et al. (2011)	Industrial Marketing Management	To present a reconceptualization of the construct of innovation capability by analyzing in the context of knowledgeintensive service. The research unit was professional service firms (PSFs).	The scale contains items to measure the following aspects of innovation capability: clientfocused innovation, technologyfocused innovation, behavioral and operational processes, marketingfocused innovation, service and product innovation.	Authors employed a rigorous scale development process that consisted of 37 in-depth interviews and survey with professionals of PSFs (which included lawyers, accountants, consulting engineers and management consultants). Authors got 463 valid responses to the survey. To validate the scale, authors performed exploratory (EFA) and confirmatory factor analysis (CFA). During the process of scale validation, authors assessed the scale reliability as well as content, convergent, discriminant and nomological validity.	The scale development process resulted on a model that divided the construct of innovation capability into three dimensions: client-focused, marketing-focused, and technologyfocused innovation capability.	84
Hurley & Hunt (1998)	Journal of Marketing	To analyze the relationship between innovativeness (innovation capability), organization's market orientation, and organizational learning.	Authors focus on the capacity to innovate in order to respond to market demands. In this article, authors analyze the cultural aspects that affect innovation capability.	Firstly, authors conduct a survey among 9,648 employees from an agency of the US federal government. After collecting the data, they tested the factor structure of the proposed model. They examined item-to-total correlation, Alpha's coefficient of the factors, and factor structure by performing Varimax rotation. Then, authors performed confirmatory factor analysis (CFA) using LISREL technique.	Results indicate that organizations that have an organizational culture oriented to flexibility, continuous learning, collective decision-making and innovation are more prone to develop innovation capability (innovativeness).	3772

Authors	**Journal**	**Research Objective**	**Perspective on IC**	**Scale validation and statistical tests**	**Research main results**	**Cit.***

Keskin (2006)	European Journal of Innovation Management	To examine the nomological relationship between marketorientation, learningorientation and innovation capability of small medium enterprises (SMEs) in developing countries. It is important to note that the author uses the term "innovativeness" referring to the organization's capacity to innovate.	The scale developed by the author contains items to assess marketorientation, learning-orientation and innovation capability. Learning-orientation is seen as the organization's orientation to create and use knowledge to enhance competitive advantage. This construct is set as a second-order factor that contains four components: commitment to learn, shared vision, open-mindedness, intraorganizational knowledge sharing. Firm innovativeness is organizational openness to create and implement new ideas. To assess firm performance the items contains indicators regarding market share, growth rate and profitability.	To collect data to validate his model and instrument, author conducted a survey with managers of SMEs located in Turkey. The survey got valid 157 valid responses. Author validated the reliability, unidimensionality of the scale as well as its discriminant and convergent validity. The adopted statistical approach was structural equation modeling (SEM). The multivariate method that was chosen by the author was confirmatory factor analysis (CFA). To do execute the CFA, he used the AMOS 4.0 software.	Results show that organizational innovation capability positively impacts organizational performance. Results also indicate that learningorientation positively influences innovation capability. Besides that, author concluded that learningorientation mediates the relationship between organization's marketorientation and organization's innovation capability. Finally, statistical analysis indicate that market-orientation indirectly impacts organizational performance through organization's innovation capability and learning orientation.	485
Koc (2007)	Computers & Industrial Engineering	To identify which organizational factors have more effect on innovation capability in organizations of software development.	Authors focus on innovation capability in software development settings.	Firstly, authors performed a factor analysis. In this process, they used Varimax rotation. Then, they performed multiple regression analysis to confirm the model generated in the previous process.	Findings indicate that in software development organization the factors that have more effect on innovation capability are factors related to the generation of ideas, human resources (HR) and cross-function integration.	100
Kumar & Rose (2010)	Journal of Arts, Science & Commerce	The purpose of this paper is to present an in-depth analysis of the Islamic work ethic (IWE) and its impact on innovation capability in organizations of the public sector.	The scale measures employees' perspective on the IWE and the impact of this perspective on their organizational innovation capability.	Authors conducted a survey with 472 employees from Malaysian public organizations. To validate their model and the measure instrument, authors analyzed the collected data by executing statistical tests using the SPSS software. In this process authors verified the constructs' Cronbach's alpha.	Results indicate that the IWE is highly adapted in public organizations. Results also indicate that IWE positively impacts innovation capability. An explanation for these results is that employees' commitment to the IWE facilitates the implementation of HR initiatives to promote innovation	75

Authors	**Journal**	**Research Objective**	**Perspective on IC**	**Scale validation and statistical tests**	**Research main results**	**Cit.***

Lin & Chen (2008)	International Journal of Organizational Analysis	To examine the effect of internal and external integrations on three types of shared knowledge. In this study, authors categorized knowledge on three types: knowledge of internal capabilities, customer knowledge and suppliers' knowledge. Authors also aim to evaluate the effect of these three types of shared knowledge on innovation capability and competitive advantage.	Authors focus on innovation capability oriented to new product development teams.	To validate the proposed model, authors conducted a survey among 245 high technology organizations in Taiwan. To assess the validity and reliability of the measurement model, authors perform confirmatory factor analysis (CFA).	Results show that internal and external integrations positively impact the three types of shared knowledge. Results also indicate that shared knowledge can improve innovation capability and competitive advantage.	36
Lin (2015)	Journal of Retailing and Consumer Services	To develop and validate a measure instrument to assess consumers' perception on retailers' innovation capability.	The scale measures innovation capabilities under four dimensions: perceived product-innovation capability, perceived servicerelated innovation capability, perceived experience-related innovation capability and perceived promotion-related innovation capability.	The process of scale development contained two phases, a qualitative and a qualitative phase. In the qualitative phase, authors generated the scale items by executing six focus groups with young undergraduate students, part-time workers, middle-age people, retirees, middle and senior managers. After that, authors conducted an empirical research with 486 consumers of 7Eleven and Carrefour stores in Taiwan. To test the scale and to assess its convergent, discriminant validity as well as its dimensionality, authors performed exploratory (EFA) and confirmatory factor (CFA) analysis of the collected data. It is important to note that authors used the term firm innovativeness to refer to innovation capability.	Results suggest that consumers' perceptions of retailer innovation capability can be evaluated by assessing their emotions, cognitions and behavioral responses. Organizations can stimulate their consumers' emotional responses through specific services and marketing initiatives.	5

Authors	**Journal**	**Research Objective**	**Perspective on IC**	**Scale validation and statistical tests**	**Research main results**	**Cit.***

Lin et al. (2010)	Industrial Management & Data Systems	To investigate the effects of CRM on innovation capability.	The scale divides CRM into five dimensions: information sharing, customer involvement, long-term partnership, joint problem-solving and technology-based CRM. Innovation capability is divided into five categories: product innovation, process innovation, administrative innovation, marketing innovation and service innovations.	Authors conducted a literature review to select the items of the scale. After that, authors conduct a survey with Taiwanese computer manufacturers. In this process, they collected 107 valid responses. Authors, then, performed multiple regression analysis to validate the model. They also perform factor analysis do attest the internal consistency of the constructs and their respective dimensions.	Findings indicate that the effect of CRM and process innovation, administrative innovation and marketing innovation is not significant. Results also indicate a considerable correlation between technology-based CRM on innovation capability.	176
Nasution & Mavondo (2008)	European Journal of Marketing	To examine the relationship between organizational capabilities and customer value.	There are 15 items related to innovation capability in the scale. The scale items measure three types of innovation: process, product and administrative innovation.	In the scale, the part that was designed to measure innovation capability was based on the works of Hurley and Hult (1998), Mavondo et al. (2005), Song and Xie (2000), and Zahra (1996). This part of the scale contains 15 items. Authors tested the discriminant validity of the scale by following the work Fornell and Larcker (1981). However, authors do not present any details on how they assessed the convergent, discriminant and dimensionality validity of their scale. The lack of information on validation process jeopardizes the credibility of the instrument measure.	Results indicate market orientation and entrepreneurship have significant impact on customer value. Findings also show that HR practices and innovation capability are strongly related to customer value.	212

Authors	**Journal**	**Research Objective**	**Perspective on IC**	**Scale validation and statistical tests**	**Research main results**	**Cit.***

Ngo & O'Cass (2009)	Industrial Marketing Management	To propose a model for business value creation business model based on resource-based capabilities.	In this article, innovation capability is depicted as a resource-based capability that enables organization to create value to its customers.	To create the scale items, authors followed the Churchill's (1979) procedures. To access the reliability and validity of the model, authors used partial least square (PLS). In this process, they also validated items' loadings and average variance explained (AVE). Authors also assessed convergent and discriminant validity.	Findings show that in order to create superior value to customers, organizations should invest on resource-based capabilities. One of these fundamental resource-based capabilities is innovation capability.	163
Nitzsche et al. (2016)	International Journal of Innovation Management	To examine the relationship between organization's openness, absorptive capacity and innovation capability in the in-bound open innovation environment.	In their scale, authors focus on innovation success based on the theory of absorptive capacity and dynamic capabilities.	Authors wrote the items of the scale based on literature review. Then, they got feedbacks from experts about the scale. On the sequence, authors conducted a pre-test. Afterwards, authors applied a survey using the scale. To test the validity and reliability of the instrument, they applied the exploratory factor analyzed (EFA) on the collected data.	Findings show that dynamic capabilities view and the theory of absorptive capacity can be applied in the context of open innovation.	2
Palacios-Marqués et al. (2016)	Journal of Knowledge Management	The purpose of this paper is to explore the effect of online social networks and competency-based management on innovation capability.	Authors designed the construct of innovation capability based the work of Calantone et al. (2002).	To test the model and the measurement instrument, authors conduct an empirical research with biotechnology and telecommunications industries in Spain. Unfortunately, the paper lacks important details about the methodological process applied in the research. This limitation compromises the reliability of the measure instrument.	Results confirm that the use of online social networks on internal and external cognitive processes positively impacts knowledge transfer.	3

Authors	**Journal**	**Research Objective**	**Perspective on IC**	**Scale validation and statistical tests**	**Research main results**	**Cit.***

Panayides (2006)	European Journal of Innovation Management	To examine the antecedents and results of innovation capability in logistics service providers (LSPs).	In this article, authors analyze innovation capability oriented to logistics.	Authors collected data by conducted a survey among LSP in Hon Kong. Then, they used the data to validate the instrument and the mode. To do so, they performed structural equation modeling (SEM) by using the LISREL approach.	Findings indicate a linkage between market orientation and innovation capability. They also show that innovation capability improves service quality and organization performance in LSPs.	143
Romijn & Albaladejo (2002)	Research Policy	To analyze the determinants of innovation capability among small organizations in electronics and software development sectors.	In this article, authors assess the determinants of innovation capability. They focus on the internal factors (managers' experience, teams' competencies, willingness to innovate) and the external factors (network intensity, proximity within the network, institutional support) that improve the development of innovation capability.	To validate the model, authors only evaluated the correlation coefficients between the constructs. This fact indeed affects the validity and reliability of the instrument.	Findings show that managers' experience, willingness to innovate and the intensity and proximity of a business network are strongly related to innovation capability in technology organizations.	926
Santa María et al. (2010)	Investigaciones Europeas de Direccion y Economia de la Empresa	To propose a model for business competitiveness and the internal organizational factors that impact this variable. Authors also intend to identity which internal factors that impact business competitiveness the most.	Authors refer to innovation capability as one of the organizational capability that can impact organization's competitiveness.	Authors perform confirmatory factor analysis (CFA) to validate the model. To perform the CFA, they use the software EQS 6.1.	Findings show that organizations should invest on marketing capability, innovation capability and quality capability in order to improve and sustain business competitiveness.	45
Santos-Vijande et al. (2013)	Journal of Business Research	To develop a multidimensional scale to measure brand management systems in three dimensions: brand orientation, internal branding and strategic brand management. Besides, authors conceptualize brand management system as a dynamic capability.	The scale measures brand orientation and brand management as a dynamic capability. Scale also measures the relationship between brand orientation, organizational innovation capability and customer and business performance.	The scale was validated by applying confirmatory factor analysis (CFA).	Findings show that brand management system capability helps organizations to outstand their competitors in performance. Besides, results indicate that market orientation and innovation capability are antecedents of system development.	60

Authors	**Journal**	**Research Objective**	**Perspective on IC**	**Scale validation and statistical tests**	**Research main results**	**Cit.***

Saunila & Ukko (2014)	Journal of Engineering and Technology Management	To study the intangible aspects of an organizational innovation capability by assessing small and medium enterprise (SMEs) in Finland.	The scale measures innovation capability under the aspects of support culture, employees' skills, employees' innovativeness, employees' welfare, leadership practices, development of individual knowledge and processes to managing ideas. The scale also measures the impact of innovation capability on strategic goals.	Firstly, authors conducted a literature review to delineate the scope of the constructs and to define scale items. After this step, the scale was analyzed by experts. To validate the model and the instrument, authors applied the analysis of variance (ANOVA) and Kaiser–Meyer–Olkin (KMO) test.	Results indicate that the organization's size does not define its innovation capability. Besides, small organizations tend to be more innovative than medium-sized ones because in small organizations the influence of leadership on innovation capability is higher.	30
Schweitzer (2014)	Leadership & Organization Development Journal	To examine whether the heterogeneity in alliance capability development can be attributed to some specific leadership behaviors. The research also intends to confirm that transformational leadership has positive influence on the development of some strategic dynamic capabilities. Besides, the research aims to test if transformational leadership allows organization to sustain operational capabilities.	Author divides dynamic capabilities into seven dimensions: proactiveness, innovativeness (innovation capability), risk taking, competitive aggressiveness, relational capital, knowledge, and learning. The scale also measures the capabilities of task control and task proficiency.	The scale was validated by performing partial least squares (PLS).	Results indicate that transformational leadership positively impacts dynamic and operational capabilities. Results also indicate that transactional leadership positively impacts the development of innovation capability.	15

Authors	**Journal**	**Research Objective**	**Perspective on IC**	**Scale validation and statistical tests**	**Research main results**	**Cit.***

Shafia et al. (2016)	Technology Analysis & Strategic Management	To examine the relationship between dynamic capabilities (DCs) and technological innovation capabilities as well as to analyze the impact of technological innovation capability on organization's competitiveness. The research was conducted among Iranian large public organizations.	The scale measures the relationship between dynamic capabilities and innovation capabilities. The items that measure dynamic capabilities are based on Teece's (2007) framework. The items that measure innovation capability cover capabilities related to organizational learning, R&D, resource allocation, manufacturing, marketing, organizing and strategic planning.	The scale was designed based on literature review. After writing the scale items, authors conducted a survey among technology organizations. To validate the instrument, authors used confirmatory factor analysis (CFA) under structural equation modeling (SEM) approach.	Results confirm technologic innovation capability and dynamic capabilities can improve organizational competitiveness. They also indicate that innovation capability mediates the relationship between dynamic capabilities and organizational competitiveness.	1
Shan & Jolly (2012)	International Journal of Innovation and Technology Management	To study if technological innovation capabilities have impact on competitive performance of Chinese electronic information companies.	The scale items that measure technological innovation capability are based on Lall's (1992) framework. The scale measures three aspects of innovation capability, investment capability, production capability and linkages capability.	Authors wrote the scale items based on literature review. After writing the scale items, authors conducted a survey in which they obtained 215 valid responses. To validate the model the instrument The collected data was submitted to exploratory factor analysis (EFA). Besides, authors evaluated the Varimax rotated matrix of the model variables and performed multiple linear regression analysis.	Findings show that capability to build internal and external linkages has positive impact on organizational performance. Consequently, results indicate that innovation capability positively affects organizational performance.	10

Authors	**Journal**	**Research Objective**	**Perspective on IC**	**Scale validation and statistical tests**	**Research main results**	**Cit.***

Subramanian et al. (2016)	Industrial Management & Data Systems	To propose a framework that conveys the relationship between the collaborative operational capabilities of 4th party logistics service providers and industrial clusters.	The constructs that are measured by the scale are synergy of logistics, supply chain, financial capability, creativity, innovation capability, cooperation with other organizations,	Authors conducted a two-phase research. In the qualitative phase, they analyzed four organizations: a clothing designer, a clothing manufacturer, and two home appliances' manufacturers. Based on the analysis of the data collected in the qualitative phase, authors wrote the scale items. The scale contains 33 items. In the quantitative phase, authors conducted a survey with service providers and industrial clusters. To validate the model, authors used the "importanceperformance matrix analysis". It is worth noting that the lack of concrete and well-based methodology compromises validity and reliability of the scale.	Results suggest high-tech focus, highcreativity focus, development of new technology as well as patents to develop new products affect the development of innovation capability.	1
Vicente et al. (2015)	International Marketing Review	The papers aims to study the innovation capability in the context of export market environment. The research is based on RBV theory. Thus, the scale to measures innovation capability is based on the RBV theory. The name of the scale is the INNOVSCALE.	The scale measures innovation capability in the context of new product development. The scale also measures organization's ability to create innovation. The scale is based on the work of Calantone et al. (2002). The items to measure innovation capability also measures strategic and technological capability as well as on investments in R&D initiatives.	Authors wrote the items of the scale based on literature review. Then, authors applied a survey with 471 exporting manufacturing firms. On the sequence, authors performed structural equation modeling (SME) to test the validity and reliability of the scale. Statistical tests attest that the scale has composite reliability, convergent and nomological validity.	The findings suggest that innovation capability is a higher-order construct formed by four dimensions: product development capability, innovativeness, strategic capability, and technological capability. The results also indicate that these dimensions are positively and significantly related to performance in export venture settings.	9

Authors	**Journal**	**Research Objective**	**Perspective on IC**	**Scale validation and statistical tests**	**Research main results**	**Cit.***

Wang & Ahmed (2004)	European Journal of Innovation Management	To examine the role of organizational innovativeness in the process of achieving competitive advantage. It is important to note that authors use the construct of organizational innovativeness referring innovation capability.	The scale measures innovation capability under five perspectives: product innovativeness, market innovativeness, process innovativeness, behavioral innovativeness and strategic innovativeness.	Authors designed the scale based on literature review. The scale contains 29 items. After designing the scale, authors conducted a survey among 1,500 organizations in England, Wales and Scotland. In this process, authors collected 231 valid responses. To test the validity of the scale, authors performed analysis of variance (ANOVA) and confirmatory factor analysis (CFA).	Findings indicate that innovation capability is fundamental to organizations' ability to create new products.	757
Wu et al. (2010)	Decision Sciences	To study the role and definition of operational capabilities as well as to identify the difference between operational and dynamic capabilities. Authors also aimed to develop a measurement instrument of operational capabilities.	The scale measures the relationship between operational and dynamic capabilities. The scale focuses on the capabilities related to innovation and product. The scale also measures the capabilities related to organization's capacity to respond to and to take advantage of environmental changes.	To validate the scale, authors performed confirmatory factor analysis (CFA) with structural equation modeling (SME) approach.	Results show that operational capabilities are fundamental to sustain competitive advantage. Results also show that despite the importance of operational capabilities, managers usually overlook them.	131
Xu et al. (2008)	Journal of Small Business and Enterprise Development	To investigate the characteristics business networks on small and medium-sized enterprises (SMEs). Authors also aim to analyze the relationships between network characteristics and the innovation capability of organizations involved in this business network.	This article focuses on the innovation capability developed by organizations that are part of business networks.	To validate the model, authors perform multiple regression analysis. It is important to note that the process of instrument validation is not described as well as expected.	Findings indicate that the characteristics that impact innovation capability in a business network are density, multiplicity, betweeness, nonredundancy, reciprocity, and intensity.	48
Authors	**Journal**	**Research Objective**	**Perspective on IC**	**Scale validation and statistical tests**	**Research main results**	**Cit.***

Yang et al. (2014)	Internet Research	To develop a measurement instrument that assesses innovation capability in blog service settings.	The scale covers the following aspects of innovation capability: system-operation-related innovation, service-privacy-related innovation, web-page-related innovation, social-technologyrelated innovation and diversification-related-innovation.	Firstly, authors wrote items of the scale based on literature review. Then, they applied a pre-test among 88 respondents. On the sequence, authors conducted a survey. In this survey, they obtained 255 valid responses. To validate the instrument, authors performed multivariate analysis. In this process, authors assessed the reliability as well as content, construct validity, discriminant and convergent validity. The methods they used to do so were exploratory (EFA) and confirmatory factor analysis (CFA).	Findings indicate that to gain positive results on service innovation, social media organizations should deliver personalized, simple and interactive services. Results also indicate that in social media context, information sharing is fundamental to develop innovation.	13
Zhang et al. (2015)	Industrial Marketing Management	To examine the impact of organizational capabilities on brand equity and on value co-creation. To achieve this objective, authors analyzed the relationship between organizational capabilities, value co-creation, customer value and brand equity development in business-tobusiness (B2B) market.	The scale measures the following constructs: innovation capability (technical and non-technical innovations); marketing capability (organization's ability to design and implement marketing programs); networking capability (coordination, relational skills and partner knowledge); value cocreation; customer value; brand equity (divided into four aspects brand awareness, perceived quality, brand association, brand loyalty).	Initially, authors selected the scale items from previous studies. Then, authors conduct in-depth interviews to refine the instrument. On the sequence, authors conducted a survey among 212 Chinese organizations in B2B market. To assess the validity and the reliability of scale, authors performed a panel review, a pilot test and multivariate analysis - exploratory factor analysis (EFA) and confirmatory factor analysis (CFA).	Research findings indicate that marketing capability and networking capability have direct and indirect impact on brand equity. Besides, value co-creation and customer value strongly affect brand equity. Results also suggest that innovation capability indirectly affects brand equity as innovation helps organizations to improve value co-creation and customer value.	6

**Note: ***Number of citations extracted from Google Scholar on May, 5th 2017

APPENDIX C – INSTRUMENT USED ON THE ONLINE SURVEY

Construct	Original sentences	Code	Author's adapted version	
CRM Use	Our senior management emphasizes the importance of customer relationships.	CRM1	Our organization gives high priority to customer relationships.	Jayachandran et al. (2005)
	Our employees are encouraged to focus on customer relationships.	CRM2	Our organization encourages employees to focus on customer relationships.	
	In our organization, employees receive incentives based on customer satisfaction measures.	CRM3	Our organization gives employees bonus and awards based on customer satisfaction rates.	
	In our organization, business processes are designed to enhance the quality of customer interactions.	CRM4	In our organization, business processes are designed in order to improve our relationship with customers.	
	We organize our company around customer-based groups rather than product or function-based groups.	CRM5	Our organization is structured based on customer profiles, segments and demands, rather than on products or organizational functions.	
	We provide our customers with multiple ways to contact the organization.	CRM6	Our customers have many channels to contact our organization (social media, customer service, e-mails, telephone, call center, etc.).	
	We collect customer information on an ongoing basis.	CRM7	Our organization regularly collects information on customers.	
	We collect customer information using external sources (such as market research agencies, syndicated data sources, and consultants).	CRM8	Our organization collects customer information from external sources such as market research agencies, syndicated data sources and consultants.	
	The information collected from customers is updated in a timely fashion.	CRM9	In our organization, customer information is 100% accurate.	
		CRM10	In our organization, customer information is updated periodically.	
	We integrate customer information from the various functions that interact with customers (such as marketing, sales, and customer service).	CRM11	Our organization integrates the customer information collected by its different departments (e.g. marketing, sales, credit).	
	We integrate internal customer information with customer information from external sources.	CRM12	In our organization, customer information collected internally is completely integrated with customer information collected from external sources.	

Construct	Original sentences	Code	Author's adapted version	

CRM Use	We integrate customer information from different communication channels (such as telephone, mail, e-mail, the Internet, fax, and personal contact).	CRM13	Our organization, customer information collected internally is integrated with information collected from our different communication channels (social media, e-mails, fax, customer service, call center)	Jayachandran et al. (2005)
	We use customer information to develop customer profiles.	CRM14	Our organization uses customer information to develop customer profiles.	
	We use customer information to segment markets.	CRM15	Our organization uses customer information to segment markets.	
	We use customer information to customize our offers.	CRM16	Our organization uses customer information to customize our offers.	
	In our organization, relevant employees can access required customer information even when other departments/functional areas have collected it.	CRM17	Whenever we need customer information to execute our tasks, we can visualize it in simple and fast manner.	Jayachandran et al. (2005)
	I have access to the strategic information I need to do my job well.			Sprafke et al. (2012)
	We frequently measure customer satisfaction.	CRM18	Our organization periodically measures customer satisfaction.	Herrmann et al. (2007)
Dynamic Capabilities	We systematically search for new business concepts through observation of processes in the environment.	DC1	Our organization systematically searches for new business ideas.	Makkonen et al. (2014)
	We systematically bring together creative and knowledgeable persons within the firm to identify new business opportunities.	DC2	Our organization systematically brings together creative and knowledgeable people in order to search for new opportunities in the market.	
	We systematically bring together creative and knowledgeable persons from outside the firm to help identify new business opportunities.	DC3	Our organization systematically consults with external people that can assist on searching for new business opportunities.	
	Our firm systematically transfers resources to the development of new business activities.	DC4	Our organization systematically recombines resources (people, processes, machinery, equipment) to create of new business opportunities.	
	The firm emphasizes the need to increase the level of competence among employees.	DC5	Our organization constantly encourages employees to improve their competences through trainings, knowledge transfer, conferences, etc.	
	The firm strongly encourages employees to learn from their experiences.	DC6	In our organization, employees are strongly encouraged to learn from their positive and negative experiences.	
	We have developed routines to enable employees' active participation in generating ideas for new products or services.	DC7	Our organization has implemented routines that enable employees to create of ideas for new products/services.	
	For projects our management supports temporary exchange of personnel between departments.	DC8	Our organization encourages exchange of personnel within departments (job rotation) to attend to new market demands.	Flatten et al. (2011)

Construct	**Original sentences**	**Code**	**Author's adapted version**	

Dynamic Capabilities	Our competitiveness depends on constant change to our processes and resources.	DC9	Our organizations' competitiveness depends greatly on the constant change of processes and resources.	Verreynne et al. (2016)
	We reconfigure (combine/release) resources to respond to market changes.	DC10	Our organization systematically recombines processes and resources to respond to market changes.	Wu et al. (2010)
	We have developed routines to enable employees' active participation in generating ideas for new production processes or organizational procedures.	DC11	Our organization has developed routines that enable employees to participate in generating ideas for new production processes or organizational procedures.	Makkonen et al. (2014) Danneels (2016)
		DC12	Our organization has developed routines that enable employees to participate in generating ideas for changing production processes or organizational procedures.	
	Ability to create knowledge through co-operation with R&D institutions such as universities and technological institutes.	DC13	Our organization works along with R&D institutions such as universities and technological institutes in order to create new business opportunities.	Villar et al. (2014)
	We seek to introduce improved, but existing products/services for our market.	DC14	Our organization systematically improves existing products/services.	Verreynne et al. (2016)
	We anticipate new trends and are normally the first to introduce new initiatives in the market.	DC15	Our organization is usually the first to introduce new initiatives in the market.	Schweitzer (2014)
		DC16	Our organization always anticipates new trends.	
	We systematically observe and evaluate the needs of our customers.	DC17	Our organization systematically evaluated customer needs to anticipate market trends.	Janssen et al. (2015)
	Setting up new distribution channels./ Setting up a new sales force./ Developing new advertising or promotion strategies./Developing new pricing strategies.	DC18	Our organization constantly implements new initiatives such as new distribution channels, new sales forces, new marketing campaigns and new pricing strategies.	Danneels (2016)
Innovation Capability	Provide our clients with services/products that offer unique benefits superior to those of competitors.	IC1	Our organization provides customers with unique and superior products/services.	Hogan et al. (2011)
	Solve clients' problems in very innovative ways.	IC2	In our organization, we are encouraged to innovate in the way we solve customer problems.	Hogan et al. (2011) Baker & Sinkula (1999)
	Provide innovative ideas and solutions to clients.	IC3	Our organization always offers innovative solutions to customers.	Hogan et al. (2011)

Construct	**Original sentences**	**Code**	**Author's adapted version**	

Innovation Capability	Innovate with our marketing programs to keep ahead of the market.	IC4	To sustain competitiveness, our organization systematically implements innovative initiatives.	Hogan et al. (2011)
	Key executives of our firm are willing to take risks to seize and explore “chancy” growth opportunities in market.	IC5	In our organization, executives are always willing to take risks to seize and explore business opportunities.	Zhang et al. (2015)
	In this alliance, team members are encouraged to actively identify new and better ways of working,	IC6	Our organization encourages employees to implement new and better ways to work.	Schweitzer (2014)
	I jointly develop solutions for customers with members of our customer/adviser relationship team	IC7	In our organization, customers are co-creators of new solutions.	Schlosser & McNaughton (2009)
	Management is actively seeking innovative ideas.	IC8	In our organization, executives work actively on the implementation of innovative initiatives.	Santos-Vijande et al. (2013)
	Our firm does not penalize those employees who promote and develop ideas for new services but which ultimately do not succeed in the market.	IC9	Our organization does not penalize those employees that implement new ideas that ultimately do not succeed in the market.	
	The development of innovations is a fundamental part of the culture of our firm.	IC10	Innovation is a fundamental part of our organization's culture.	
	You tend to learn from your previous experiences with customers to succeed in innovation projects.	IC11	Our organization always encourages employees to use the knowledge gained from previous experiences with customers.	Hakimi et al. (2014)
	You draw upon customers’ suggestions to launch new products and services.	IC12	Our organizations constantly draw upon customers’ feedbacks to launch new products/services.	Hakimi et al. (2014)
	We always meet with customers to talk about their interests, problems and needs during the innovation process.	IC13	To seek for innovative ideas, every now and then, our organization meets with customers to talk about their interests, problems and needs (e.g. focal groups, opinion research).	Belkahla & Triki (2011)
	In our company there is a quick information flow, e.g., if a business unit obtains important information it communicates this information promptly to all other business units or departments.	IC14	In our organization, information is quickly and accurately communicated throughout all business units and departments.	Flatten et al. (2011)
	We pay close attention to after-sales service.	IC15	Our organization keeps an active after-sales service to collect feedbacks from customers.	Herrmann et al. (2007)

APPENDIX D – SCALE ITEMS TRANSLATED TO PORTUGUESE

Code	Scale item written in Portuguese
CRM1	A empresa em que trabalho dá alta prioridade ao relacionamento com o cliente.
CRM2	A empresa em que trabalho motiva os funcionários a focarem no relacionamento com o cliente.
CRM3	A empresa em que trabalho oferece bônus e prêmios aos seus funcionários baseado nos índices de satisfação dos clientes.
CRM4	A empresa em que trabalho organiza seus processos internos focando no aprimoramento do relacionamento com seus clientes.
CRM5	A empresa em que trabalho é estruturada de acordo com os perfis, segmentos e demandas dos clientes, ao invés de ser estruturada de acordo com os produtos ou funções organizacionais.
CRM6	Os nossos clientes têm vários canais para se comunicar com a nossa empresa (redes sociais, serviço de atendimento ao consumidor, telefone, call centers, etc.).
CRM7	A empresa em que trabalho sempre armazena as informações dos clientes.
CRM8	A empresa em que trabalho coleta informações dos clientes através de fontes externas como agências de pesquisa de mercado, banco de dados de bancos e consultorias.
CRM9	Na empresa em que trabalho, as informações dos clientes são 100% precisas.
CRM10	Na empresa em que trabalho, as informações dos clientes são atualizadas periodicamente.
CRM11	A empresa em que trabalho integra as informações de clientes que são coletadas pelos diferentes departamentos (por exemplo: marketing, vendas, crédito).
CRM12	Na empresa em que trabalho, as informações dos clientes coletadas internamente são devidamente integradas com as informações coletadas a partir de fontes externas.
CRM13	Na empresa em que trabalho, as informações de clientes coletadas internamente são devidamente integradas com as informações coletadas a partir dos diferentes canais de comunicação (redes sociais, e-mails, atendimento ao consumidor, call centers).
CRM14	A empresa em que trabalho utiliza as informações dos clientes para desenhar o perfil de seus clientes.
CRM15	A empresa em que trabalho utiliza as informações dos clientes para fazer a segmentação de mercado.
CRM16	A empresa em que trabalho utiliza as informações dos clientes para customizar a oferta de produtos/serviços.
CRM17	Na empresa em que trabalho, quando precisamos de informação do cliente para executar nossas tarefas, conseguimos acessá-la de modo simples e rápido.
CRM18	A empresa em que trabalho mede a satisfação de seus clientes periodicamente.
DC1	A empresa em que trabalho sempre procura por novas oportunidades de negócio.
DC2	A empresa em que trabalho sempre emprega pessoas criativas e com habilidade para encontrar novas oportunidades no mercado.
DC3	A empresa em que trabalho sempre consulta pessoas de fora da empresa que possam auxiliar no processo de busca de novas oportunidades no mercado.
DC4	A empresa em que trabalho sempre faz diferentes arranjos de seus recursos (pessoas, processos, maquinaria, equipamentos) no intuito de criar novas oportunidades de negócio.
DC5	A empresa em que trabalho constantemente motiva seus funcionários a aprimorar suas competências através de treinamentos, transferência de conhecimento, conferências, etc.
DC6	Na empresa em que trabalho, os funcionários são fortemente encorajados a aprenderem de suas experiências passadas, sejam elas positivas ou negativas.
DC7	A empresa em que trabalho tem implementado rotinas que possibilitam aos funcionários criar ideias para novos produtos/serviços.
DC8	A fim de atender as demandas do mercado, a empresa em que trabalho encoraja o rodízio de funcionários entre diferentes departamentos. (rodízio de funcionários, também chamado de *job rotation* é uma prática de rodízio de trabalho em que o funcionário atua em diferentes funções ou departamentos por um período determinado. O objetivo da prática de job rotation é aumentar o aprendizado e compartilhamento de conhecimento).

DC9	A competitividade da empresa em que trabalho depende da constante mudança de seus processos e recursos.
DC10	A fim de atender às mudanças do mercado, a empresa em que trabalho sempre faz diferentes combinações de seus processos e recursos.
Code	**Scale item written in Portuguese**
DC11	A empresa em que trabalho desenvolveu rotinas que permitem aos funcionários participar do desenvolvimento de novos processos de produção ou práticas de trabalho.
DC12	A empresa em que trabalho desenvolveu rotinas que permitem aos funcionários implementar mudanças nos processos de produção ou práticas de trabalho existentes.
DC13	A fim de criar novas oportunidades de negócio, a empresa em que trabalho atua em conjunto com instituições de pesquisa e desenvolvimento (P&D) como universidades e institutos de tecnologia.
DC14	A empresa em que trabalho sempre aprimora seus produtos/serviços.
DC15	A empresa em que trabalho geralmente é a primeira a introduzir novas iniciativas no mercado.
DC16	A empresa em que trabalho sempre se antecipa às novas tendências do mercado.
DC17	A empresa em que trabalho sempre avalia as necessidades dos clientes de modo a antecipar as tendências do mercado.
DC18	A empresa em que trabalho constantemente implementa novas iniciativas como por exemplo novos canais de distribuição, novas forças de vendas, novas campanhas de marketing e novas estratégias de precificação.
IC1	A empresa em que trabalho oferece aos seus clientes produtos/serviços diferenciados.
IC2	Na empresa em que trabalho, somos sempre encorajados a inovar no modo como resolvemos os problemas dos nossos clientes.
IC3	A empresa em que trabalho sempre oferece soluções inovadoras aos clientes.
IC4	A fim de manter a competitividade, a empresa em que trabalho sempre implementa iniciativas inovadoras.
IC5	Na empresa em que trabalho, os executivos estão sempre dispostos a tomar riscos, a fim de aproveitar oportunidades de negócio.
IC6	A empresa em que trabalho sempre encoraja seus funcionários a melhorar as práticas de trabalho existentes.
IC7	Na empresa em que trabalho, os clientes participam do processo de criação de novas soluções.
IC8	Na empresa em que trabalho, os executivos trabalham ativamente no processo de implementação de iniciativas inovadoras.
IC9	A empresa em que trabalho não penaliza os funcionários que implementam ideias que não alcançam sucesso no mercado.
IC10	Inovação é parte fundamental na cultura da empresa em que trabalho.
IC11	A empresa em que trabalho sempre encoraja seus funcionários a usar conhecimento adquirido a partir experiências anteriores com clientes.
IC12	A empresa em que trabalho sempre se baseia nos feedbacks dos clientes na hora de lançar novos produtos/serviços.
IC13	A fim de encontrar ideias inovadoras, de tempos em tempos, a empresa em que trabalho tem encontros com clientes para saber dos seus interesses, problemas e necessidades (por exemplo: grupos focais, pesquisas de opinião).
IC14	Na empresa em que trabalho, o fluxo de informações é rápido e preciso.
IC15	A fim de coletar os feedbacks dos clientes, a empresa em que trabalho mantem um serviço de pós-venda ativo.

APPENDIX E - BIBLIOMETRIC ANALYSIS

Bibliometric is quantitative method used to trends and patterns on academic publications as well as to evaluate scientific production among countries (Vanz & Stumpf, 2010; Macias-Chapula, 1998).

Firstly, I extracted a list of all publications about CRM from WoS database (database maintained by Thomson Reuters). The key word used in the search was "customer relationship management". To limit the number of articles to analyze, I excluded books, manuals and conference proceedings. The final number of articles in the search was 3974, covering the time period between 1983 and 2016.

After that, I created a matrix of co-citations the BibExcel (Vanz & Stumpf, 2010). To create the matrix of co-citations, I selected the 100 most cited sources. Using the matrix of co-citations created on the BibExcel, I performed an exploratory factorial analysis (EFA), using SPSS software to group the co-citations intro factors (categories) (Silva & Simon, 2005). During the EFA, 9 references were excluded duo low factor loadings and low values on Kayser-Meyer-Olkin test (KMO) (Williams & Brown, 2010).

The EFA grouped the co-citations into 7 factors (categories). Then, I analyzed the abstract or summaries of the references contained in each factor to identify the words and elements the publications had in common. Then, I named each factor (category) based on this analysis.

The most used references in the CRM area were grouped into these categories: (1) tools to develop new models and theory; (2) relationship marketing (buyer-seller, organization-customer relations) as well as relationship between organization and its suppliers; (3) antecedents and consequences of service quality, customer satisfaction, customer loyalty and customer perceptions; (4) implications and consequences of market-oriented focus; (5) theoretical conceptualization of customer management relationship and its implication on organizational performance; (6) resource-based view (RBV); and (7) customer value. Appendix F presents the sources and their respective category number.

The first category, tools to develop new models and theory, grouped 26 out of the 91 sources. It included seminal works such as Fornell's and Larcker's article (1981) entitled "Evaluating Structural Equation Models with Unobservable Variables and

Measurement Error" and "Multivariate Data Analysis" (Hair, Black, Babin, & Anderson, 1987). The second category, relationship marketing (with customers and with suppliers), grouped 21 studies. In this category, there are three highly cited publications: "The Commitment-Trust Theory of Relationship Marketing" by Morgan and Hunt (1994), which has 21,950 citations*; "Exchange and Power in Social Life" (Blau, 1964), which has 23,614 citations*; "Markets and Hierarchies: Analysis and Antitrust Implications - A Study in the Economics of Internal Organization" (Williamson, 1975); and which has been cited 37,294 times*. The third category, which was named as antecedents and consequences of service quality, customer satisfaction, customer loyalty and customer perceptions, includes 21 researches; and the fourth category, implications and consequences of market-oriented focus, includes 7 articles.

Among these seven articles, there is Day's (1994) article "The Capabilities of MarketDriven Organizations", cited 7,449 times according to Google Scholar*.

In turn, the fifth category refers to the theoretical conceptualization of customer management relationship and its implication on organizational performance. As I analyzed the articles contained in this category, I realized that it refers to studies on the fundamental theoretical aspects of CRM. For this reason, I **used the 8 articles** in the theoretical background of the thesis (Boulding et al., 2005; Jayachandran et al., 2005; Mithas et al., 2005; Payne & Frow, 2005; Reinartz et al., 2004; Rigby et al., 2002; Srivastava et al., 1998; Zablah et al., 2004). The sixth category is related to resourcebased view (RBV). This category includes 3 articles: "A resource-based view of the firm" by Wernerfelt (1984), "Dynamic capabilities: what are they?" by Eisenhardt and Martin (2000) and "The Core Competence of the Corporation" by Prahalad and Hamel (1990). Again, I **used the three articles**, since theory of RBV is greatly relevant to the understanding of DCs. Finally, the seventh category refers to works on customer value. It includes the book written by Rust et al. (2000), "Driving Customer Equity: How Customer Lifetime Value is Reshaping Corporate Strategy" and the article "A Dynamic Model of the Duration of the Customer's Relationship with a Continuous Service Provider: The Role of Satisfaction", by Bolton (1998).

*****Number of citations extracted from Google Scholar on May, 5th 2017 157

APPENDIX F –THE MOST USED REFERENCES IN CRM RESEACH AREA

Author	Title	Source Type	Category
Fornell and Larcker (1981)	Evaluating Structural Equation Models with Unobservable Variables and Measurement Error	Article	1
Hair et al. (2009)	Multivariate Data Analysis	Book	1
Nunnaly & Bersntein (1978)	Psychometric Theory (McGraw-Hill Series in Psychology)	Book	1
Anderson and Gerbing (1988)	Structural equation modeling in practice: A review and recommended two-step approach.	Article	1
Podsakoff et al. (2003)	Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies	Article	1
Armstrong and Overton (1977)	Estimating Nonresponse Bias in Mail Surveys	Article	1
Bagozzi and Yi (1988)	On the evaluation of structural equation models	Article	1
Barney (1991)	Firm Resources and Sustained Competitive Advantage	Article	1
Baron and Kenny (1986)	The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations.	Article	1
Churchill (1979)	A Paradigm for Developing Better Measures of Marketing Constructs	Article	1
Podsakoff and Organ (1986)	Self-Reports in Organizational Research: Problems and Prospects	Article	1
Teece et al. (1997)	Dynamic capabilities and strategic management	Article	1
Vargo and Lusch (2004)	Evolving to a New Dominant Logic for Marketing	Article	1
Dyer and Singh (1998)	The Relational View: Cooperative Strategy and Sources of Interorganizational Competitive Advantage	Article	1
Bollen (1989)	Structural Equations with Latent Variables	Book	1
Hu and Bentlerb (1999)	Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives	Article	1
Aiken and West (1991)	Multiple Regression Testing and Interpreting Interactions	Book	1
Frohlich and Westbrook (2001)	Arcs of integration: an international study of supply chain strategies	Article	1
Gerbing and Anderson (1988)	An Updated Paradigm for Scale Development Incorporating Unidimensionality and Its Assessment	Article	1
Cohen and Levinthal (1990)	Absorptive Capacity: A New Perspective on Learning and Innovation	Article	1
Bagozzi et al. (1991)	Assessing Construct Validity in Organizational Research	Article	1
Nonaka and Takeuchi (1995)	The Knowledge-creating Company: How Japanese Companies Create the Dynamics of Innovation	Book	1
Pfeffer and Salancik (1978)	The External Control of Organizations: A Resource Dependence Perspective	Book	1
Flynn et al. (1994)	A framework for quality management research and an associated measurement instrument	Article	1
Diamantopoulos and Winklhofer (2001)	Index Construction with Formative Indicators: An Alternative to Scale Development	Article	1

Hulland (1999)	Use of partial least squares (PLS) in strategic management research: a review of four recent studies	Article	1
Morgan and Hunt (1994)	The Commitment-Trust Theory of Relationship Marketing	Article	2

Author	Title	Source Type	Category
Dwyer et al. (1987)	Developing Buyer-Seller Relationships	Article	2
Ganesan (1994)	Determinants of Long-Term Orientation in Buyer-Seller Relationships	Article	2
Anderson and Narus (1990)	A Model of Distributor Firm and Manufacturer Firm Working Partnerships	Article	2
Doney and Cannon (1997)	An Examination of the Nature of Trust in Buyer-Seller Relationships	Article	2
Crosby et al. (1990)	Relationship Quality in Services Selling: An Interpersonal Influence Perspective	Article	2
Garbarino and Johnson (1999)	The Different Roles of Satisfaction, Trust, and Commitment in Customer Relationships	Article	2
Verhoef (2003)	Understanding the Effect of Customer Relationship Management Efforts on Customer Retention and Customer Share Development	Article	2
Moorman et al. (1992)	Relationships between Providers and Users of Market Research: The Dynamics of Trust within and between Organizations	Article	2
Anderson and Weitz (1992)	The Use of Pledges to Build and Sustain Commitment in Distribution Channels	Article	2
Blau (1964)	Exchange and Power in Social Life	Book	2
Gwinner et al. (1998)	Relational benefits in services industries: The customer's perspective	Article	2
Berry (1995)	Relationship marketing of services—growing interest, emerging perspectives	Article	2
Palmatier et al. (2006)	Factors Influencing the Effectiveness of Relationship Marketing: A Meta-Analysis	Article	2
Williamson (1975)	Markets and Hierarchies: Analysis and Antitrust Implications: A Study in the Economics of Internal Organization	Book	2
Cannon and Perreault (1999)	Buyer-Seller Relationships in Business Markets	Article	2
Wulf et al. (2001)	Investments in Consumer Relationships: A CrossCountry and Cross-Industry Exploration	Article	2
Hakansson (1982)	International Marketing and Purchasing of Industrial Goods: An Interaction Approach	Book	2
Moorman et al. (1993)	Factors Affecting Trust in Market Research Relationships	Article	2
Webster (1992)	The Changing Role of Marketing in the Corporation	Article	2
Sirdeshmukh et al. (2002)	Consumer Trust, Value, and Loyalty in Relational Exchanges	Article	2
Parasuraman et al. (1988)	SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality	Article	3
Zeithaml et al. (1996)	The Behavioral Consequences of Service Quality	Article	3
Reichheld and Sasser (1990)	Zero defections: quality comes to services	Article	3
Bitner (1990)	Evaluating Service Encounters: The Effects of Physical Surroundings and Employee Responses	Article	3
Parasuraman et al. (1985)	A Conceptual Model of Service Quality and Its Implications for Future Research	Article	3

Zeithaml (1988)	Consumer Perceptions of Price, Quality, and Value: A Means-End Model and Synthesis of Evidence	Article	3
Anderson et al. (1994)	Customer Satisfaction, Market Share, and Profitability: Findings from Sweden	Article	3
Oliver (1997)	Satisfaction: A Behavioral Perspective on the Consumer	Book	3
Heskett (1994)	Putting the Service-Profit Chain to Work	Article	3

Author	Title	Source Type	Category
Oliver (1999)	Whence Consumer Loyalty?	Article	3
Cronin and Taylor (1992)	Measuring Service Quality: A Reexamination and Extension	Article	3
Fornell et al. (1996)	The American Customer Satisfaction Index: Nature, Purpose, and Findings	Article	3
Fornell (1992)	A National Customer Satisfaction Barometer: The Swedish Experience	Article	3
Dick and Basu (1994)	Customer loyalty: Toward an integrated conceptual framework	Article	3
Heskett (1997)	The Service Profit Chain: How Leading Companies Link Profit and Growth to Loyalty, Satisfaction, and Value	Book	3
Anderson and Sullivan (1993)	The Antecedents and Consequences of Customer Satisfaction for Firms	Article	3
Oliver (1980)	A Cognitive Model of the Antecedents and Consequences of Satisfaction Decisions	Article	3
Hartline and Ferrell (1996)	The Management of Customer-Contact Service Employees: An Empirical Investigation	Article	3
Woodruff (1997)	Customer value: The next source for competitive advantage	Article	3
Mittal and Kamakura (2001)	Satisfaction, Repurchase Intent, and Repurchase Behavior: Investigating the Moderating Effect of Customer Characteristics	Article	3
Boulding et al. (1993)	A Dynamic Process Model of Service Quality: From Expectations to Behavioral Intentions	Article	3
Cronin et al. (2000)	Assessing the effects of quality, value, and customer satisfaction on consumer behavioral intentions in service environments	Article	3
Rust et al. (1995)	Return on Quality (ROQ): Making Service Quality Financially Accountable	Article	3
Porter (1980)	Competitive Strategy: Techniques for Analyzing Industries and Competitors	Book	4
Kohli and Jaworski (1990)	Market Orientation: The Construct, Research Propositions, and Managerial Implications	Article	4
Narver and Slater (1990)	The Effect of a Market Orientation on Business Profitability	Article	4
Jaworski and Kohli (1993)	Market Orientation: Antecedents and Consequences	Article	4
Day (1994)	The Capabilities of Market-Driven Organizations	Article	4
Deshpande et al. (1993)	Corporate Culture, Customer Orientation, and Innovativeness in Japanese Firms: A Quadrad Analysis	Article	4
Slater and Narver (1995)	Market Orientation and the Learning Organization	Article	4
Han et al. (1998)	Market Orientation and Organizational Performance: Is Innovation a Missing Link?	Article	4

Reinartz et al. (2004)	The Customer Relationship Management Process: Its Measurement and Impact on Performance	Article	5
Payne and Frow (2005)	A Strategic Framework for Customer Relationship Management	Article	5
Boulding et al. (2005)	A Customer Relationship Management Roadmap: What Is Known, Potential Pitfalls, and Where to Go	Article	5
Jayachandran (2005)	The Role of Relational Information Processes and Technology Use in Customer Relationship Management	Article	5
Zablah et al. (2004)	An evaluation of divergent perspectives on customer relationship management: Towards a common understanding of an emerging phenomenon	Article	5
Mithas et al. (2005)	Why Do Customer Relationship Management Applications Affect Customer Satisfaction?	Article	5
Author	**Title**	**Source Type**	**Category**
Srivastava et al. (1998)	Market-Based Assets and Shareholder Value: A Framework for Analysis	Article	5
Rigby et al. (2002)	Avoid the Four Perils of CRM	Article	5
Wernerfelt (1984)	A resource-based view of the firm	Article	6
Eisenhardt and Martin (2000)	Dynamic capabilities: what are they?	Article	6
Prahalad and Hamel (1990)	The Core Competence of the Corporation	Article	6
Bolton (1998)	A Dynamic Model of the Duration of the Customer's Relationship with a Continuous Service Provider: The Role of Satisfaction	Article	7
Rust et al. (2000)	Driving Customer Equity : How Customer Lifetime Value is Reshaping Corporate Strategy	Book	7