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Salespeople's Role In Offering Innovative Solutions To Business Customers: The Importance of Design Thinking

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SALESPEOPLE'S ROLE IN OFFERING INNOVATIVE SOLUTIONS TO BUSINESS CUSTOMERS: THE IMPORTANCE OF DESIGN THINKING

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Mohammed Alzanbagi

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To: Interim Dean William Hardin
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This dissertation, written by Mohammed Alzanbagi, and entitled Salespeople's Role in Offering Innovative Solutions to Business Customers: The Importance of Design Thinking, having been approved in respect to style and intellectual content, is referred to you for judgment.

We have read this dissertation and recommend that it be approved.

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Florida International University, 2021

DEDICATION

I dedicate this dissertation to my parents, my wife and my children.

Thank you all for your support!

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I begin and end my thanks to ALLAH who is continuously bestowing his mercy upon me. Without his mercy and guidance, I would not be able to reach to this point in life. O'ALLAH help me to keep remembering you, being thankful to you and obeying you in the best manner.

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ABSTRACT OF THE DISSERTATION

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Salespeople play important role in selling products and services of their companies. One of the important parts of the Business to Business (B2B) salespeople's role is to offer innovative solutions (i.e., a complex mix of products and services) to meet their business customers' needs. Innovation is an important individual factor to prepare B2B salespeople to sell solutions. Additionally, collaboration between different functions of the organization is important for the success of the solution selling.

The primary purpose of this dissertation to explore how a well-accepted innovation method, which is Design Thinking (DT) can predict the readiness of B2B salespeople to offer solutions. Specifically, this dissertation tests the relationship between individual level DT factors (i.e., abductive reasoning, gestalt view and tolerance of ambiguity and failure) and their interaction with an organizational level DT factor (i.e., interdisciplinary collaboration) in predicting the readiness of solution selling.

288 B2B salespeople have participated in an online survey to test six hypotheses. Results show that abductive reasoning, gestalt view and interdisciplinary collaboration have a significant positive relationship with solution provision readiness of salespeople

whereas tolerance of ambiguity and failure does not have a significant relationship with solution selling readiness. Furthermore, interdisciplinary collaboration level lowers the positive relationship between abductive reasoning and solution selling readiness whereas interdisciplinary collaboration exacerbates the positive relationship between gestalt view and solution selling readiness. Theoretical contributions and managerial implications of the above-mentioned results are discussed in the dissertation.

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CHAPTER 1: INTRODUCTION

Problem statement and significance

Firms aim to establish core competencies and build them to become sustainable sources of income. However, these firms may face business problems which need to be solved in order to be able to concentrate on the core competencies. Because solving this kind of problems is not the core business of the firm a supplier is needed to offer a solution. Solving customers' problems by offering innovative solutions is an important competitive differentiation strategy in business-to-business (B2B) markets (e.g., Biggemann et al. 2013; Raddats et al. 2019; Ulaga and Reinartz 2011). Customers along with suppliers benefit from solving these problems such that customers will be able to concentrate on core competencies and suppliers can utilize their resources and competencies in generating profits by solving customers' problems. The solution is defined as a "*customized and integrated combination of goods and services for meeting a customer's business needs*" (Tuli, Kohli, and Bharadwaj 2007).

Many suppliers position themselves as solution providers, which indicates commitment to supporting customers holistically by providing customized and integrated portfolio of products and services (i.e., solutions) (Zimmer, Salonen, and v. Wangenheim 2020). The solution's success is a result of effective integration of the supplier's and customer's resources (i.e., organizational and employees' competencies) before, during and after the development and deployment of the solution (Elgeti, Danatzis, and Kleinaltenkamp 2020; Macdonald, Kleinaltenkamp, and Wilson 2016). Chiefly, solution

provision is an organizational capability that requires engagement of different functions to utilize their employees' abilities.

Major requirement for solution provision

With the intense competition in the field of solution provision, innovation became an important competence in order to offer valuable solutions (Markovic et al. 2020; Storbacka 2011a). If a supplier could present unparalleled capability to offer a solution that a customer needs, then the supplier can gain a profitable source of income. Nevertheless, many suppliers face a difficult time selling solutions profitably (Worm et al. 2017). Missing profitability might be because the customer does not see value in the proposed solution. That is, the solution might not be an innovative solution (i.e., easily available elsewhere) or it does not address the exact need of the customer. Utilizing innovation competency that helps to offer innovative solutions, thus, is important for suppliers to offer solutions than can be bought with low price sensitivity by customers (Böhm et al. 2020).

The success of the proposed solution, also, depends highly on the ability of the supplier and customer to share information and exchange knowledge effectively in order to maximize knowledge usage (Elgeti, Danatzis, and Kleinaltenkamp 2020). Otherwise, undesirable consequences such as loss of knowledge or knowledge leakage, which refers to important knowledge that leaks outside the organization in an uncontrollable and harmful way to the company, might happen (José, Nelson, and Edwin 2020; Noordhoff et al. 2011). One way to control the knowledge transferred between the customer and the supplier is minimizing the touchpoints between the customer and supplier. But who are

the boundary spanners who are able to take this role from the supplier side? This highlights the importance of solutions' salespeople.

Solutions' salespeople are in an ideal position because of their opportunity to interact with the customer frequently in order to understand their business needs and offer suitable solutions (Bonney and Williams 2009; Panagopoulos, Rapp, and Ogilvie 2017; Ulaga and Kohli 2018). Additionally, salespeople can cooperate with Research and Development (R&D) and take a role in New Product Development (NPD) (Ernst, Hoyer, and Rübsaamen 2010; Homburg et al. 2017; Johnson and Sohi 2017). Different than other functions (e.g., marketing) sales and R&D cooperation can enhance the efficiency of the crucial elementary stages of NPD by allowing important information about customers to direct the innovation process for the best of customers (Homburg et al. 2017). How salespeople can be trained, prepared and supported to offer innovative solutions does not appear to have been studied at all. Studying the solution selling behavior and its antecedents and consequences help to uncover how to guide sales managers in helping their salesforce's solution selling skills.

A step back

Primarily, because motivation and readiness precede the action, the current research focuses on an antecedent of salespeople's solution provision behavior, namely solution provision readiness (SPR). Engaging in the complex process of solution selling requires distinctive skills and abilities, and a set of tacit and explicit knowledges by salespeople to be able to sell solutions profitably. Sales managers, also, need to consider the best salespeople to take a role in selling solutions to customers because of the high risk of solution selling projects (Worm et al. 2017). Salespeople with innovation mindsets

are expected to be more motivated and ready to engage in the complex solution-provision process (Bonney and Williams 2009; Ulaga and Kohli 2018).

Different innovation frameworks help people to learn innovation. Design Thinking (DT) is a well-accepted innovation method adopted by major companies. DT is defined as *"an analytic and creative process that engages people in opportunities to experiment, create, and prototype models, gather feedback and redesign*" (Razzouk and Shute 2012; Thompson and Schonthal 2020). DT is a "*creative and strategic process characterized by the following hallmarks: abductive reasoning, iterative thinking and experimentation, holistic perspective and human centeredness*" (Beverland et al. 2015; p.593). Nevertheless, adopting a design approach in organizations is not easy due to the centrality of reframing and abduction, which are not compatible with most of the organizational routine processes and more complex than other organizational transformation efforts (Björklund et al. 2020). Adopting DT does not mean that everybody needs to be a designer, but many people can think like a designer or support designers in order to offer value to customers (Björklund et al. 2020). Solution salespeople who do DT in an organization that offers organizational support for innovation are expected to be significantly more able to offer innovative and profitable solutions.

Scarcity in academic research

There is lack of scholarly attention to DT in the solution selling context and it is surprising for at least two reasons. Firstly, DT includes several cognitive processes such as abductive thinking and gestalt view which help in solving difficult problems (Micheli et al. 2019). However, their potential has not yet been investigated in the solution selling

research stream. Exploring the relationships between salespeople's solution selling personal abilities and innovative thinking dimensions (i.e., cognitive, attitudinal, etc.) manifested by DT is very important for salespeople and their managers.

Secondly, DT is an efficient tool for handling uncertainty and complexity in solving customers' problems (Brown 2008; Nakata and Hwang 2020). Because uncertainty and complexity significantly characterize any solution selling business (Ulaga and Kohli 2018), it is surprising that solution selling research has not utilized DT to get a clearer understanding of the solution selling process.

Research questions

This dissertation explores how to increase solution salespeople readiness in order to engage in the solution selling work. Specifically, how DT helps solutions salespeople to be ready to sell solutions is the general question answered in this dissertation. The first specific question that is going to be answered is what role does a salesperson's DT mindset play in driving such readiness? The second question is when considering the organizational context that DT is in, how organization cooperation and communication capability moderate the effect of DT on readiness to sell solutions.

The specific research questions are:

RQ1: What elements of DT most determine readiness to sell solutions?

RQ2: How a DT organizational level capability moderate the relationship between individual-level DT and solution selling readiness?

Research positioning

Research has not yet separately investigated the individual level DT mindsets and its organizational work. DT is an innovation method that requires not only work by employees who do DT but also organizational actions. There is lack of research to study these two dimensions in one context and how do they interact. Blending these two dimensions without disentangling the effect of each of them creates lack of understanding of DT and its multidimensional effect. For example, on one hand sales managers might be more interested in making salespeople ready to sell solutions by offering them training that improves their DT mindsets. On the other hand, an executive level manager wants to know how to facilitate DT culture in his/her organization to facilitate solution selling. Offering recommendations for managers from different levels is still missing in the solution selling literature. The current research tries to close this gap.

The research done up to now is still missing how these two dimensions interact. For example, in one of the most recent and of the first quantitative studies on DT (Nakata and Hwang 2020), DT's mindsets and actions were conceptualized at the individual level without consideration of the organizational part of DT. A DT scale that provides an applicable, generalizable empirical basis to study both the cognitive micro- and organizational macro-foundations of DT's behaviors and culture will be an important contribution of this dissertation to the solution-selling and DT fields.

Organization of the Dissertation

The remainder of this dissertation is organized as follows. I begin with the literature review in chapter 2, which will cover the literature of solutions business. In chapter 3, the literature on the role of solutions salespeople will be discussed. Chapter 4

will cover the literature of DT and its role in the readiness of solutions salespeople. The research hypotheses will be presented in this chapter. The study description and results will be presented in chapter 5. And finally, in chapter 6, the results discussion, research contributions and future research directions will be discussed.

CHAPTER 2: THE SOLUTIONS BUSINESS

In this chapter, I introduce the story behind offering solutions by suppliers. Specifically, why did suppliers start to offer solutions instead of products only. Also in this chapter, work from academia in studying the solutions business will be covered; how did academic research conceptualize the work of suppliers in offering solutions. Then, solution provision models and the success factors of solution suppliers will be discussed. Specifically, what are the important capabilities and resources that the supplier needs in order to succeed in offering innovative solutions. This chapter will provide a foundation for chapter 3, which will discuss in details the salespeople's role in offering innovative solutions to customers.

The story from business perspective

In 1997, Rolls-Royce had introduced to American Airlines the "Total Care" solution, which combines an engine and its servicing in a long-term contract. By that program, Rolls Royce did not only sell aircraft engines, but also its revenues from providing an integrated solution to a business buyer (Roehrich et al. 2019). Also, Xerox, the digital printing and workplace solutions company, started the business of "pay per copy" as a substitute for buying photocopy machines (Saul and Gebauer 2018). Additionally, GE helped hospitals to lease medical scanners, instead of buying them. In an attempt to differentiate themselves, firms have started to offer solutions instead of predeveloped products or services. The solution is defined as a "*customized and integrated combination of goods and services for meeting a customer's business needs*" (Tuli, Kohli, and Bharadwaj 2007). The performance of products is key, with services

provided as an “add on” if necessary (Witell and Löfgren 2013). Because of the intense competition, suppliers offer services linked to the products to protect those products because services facilitate the sale and usage of physical goods (Cusumano, Kahl, and Suarez 2015).Providing customer solutions is a major objective for market-oriented companies because the solution's objective is innovatively and profitably meeting customers’ business needs (Bonney and Williams 2009). Both, supplier and customer, should benefit from the solution. This bidirectional need urge researching how a solution can be developed, sold and deployed with consideration to the market, firm and personnel factors.

The story from an academic perspective

Research in solution selling used to tackle the issue from the supplier’s perspective who usually have a product-centric view of customer solutions (e.g., Day 2004; Sharma, Lucier, and Molloy 2002). Put differently, suppliers do not look to the solution-selling process as a relational process but as an enhanced-product selling process, creating difficulty to offer effective profitable solutions to customers (Tuli, Kohli, and Bharadwaj 2007; Ulaga and Reinartz 2011). Customers look to a relational work with suppliers that leads to effectively defining, meeting, and supporting a customer’s evolving needs (Hadjikhani 1996). It became important, thus, to consider solutions from a customer perspective. The major difference between these two perspectives is that specific phases of solution development (i.e., requirements definition and postdeployment support) were overlooked by suppliers even though customers are in high need of suppliers who take these steps seriously (Tuli, Kohli, and Bharadwaj 2007).

Table 1 shows some of the major research done on solution provision. From Table 1, it becomes clearer that most of the work done in solution selling is either conceptual or does not study specifically the work of solutions salespeople. Additionally, most of the empirical work done is qualitative, which results are difficult to generalize (exception is the work of Panagopoulos et.al 2017). Solutions salespeople's work was not covered by empirical quantitative work. Thus more generlizable quantitative research is still needed to uncover the varibales that help solutions salespeople to be ready to sell solutions.

Table 1 Solutions Business Literature

Paper	Main findings	Data type
(Shepherd and Ahmed 2000)	In the 90s, customers' needs became sharply complex because of technological advancements. This required suppliers to position themselves as solution providers. Suppliers with product focus started to experience diminishing margins for their products, requiring them to introduce higher-margin services.	Conceptual
(Brady, Davies, and Gann 2005)	Solutions providers need to develop new capabilities (e.g., system integration and operational service capabilities) as they shift from being product- or service-centric to solution-centric. This is a result of customer-centric strategies that build the solution around customers' problems. This requires innovative approaches to create value for suppliers and customers.	Conceptual
(Tuli, Kohli, and Bharadwaj 2007)	The solution is viewed differently from the supplier and customer sides. Whereas suppliers look to solutions as integrated products and services, customers expect more relational-type business. The solution finding process involves (1) defining customer requirements, (2) customization and integration of goods and/or services and (3) deployment, and (4) post-deployment support.	Empirical/interviews
(Bonney and Williams 2009)	Solutions' selling depends highly on solution salespeople's' opportunity recognition of a customer's need. That is because solution development requires an ability to recognize opportunities where the potential exists for resources to be innovatively deployed in an efficient and/or effective way.	Conceptual
(Ulaga and Reinartz 2011)	Despite the importance of adopting a solution-business model by adding services to products sold, why this model might succeed or fail was not clear. The resource-	Empirical/interviews

	based view explains that several firm capabilities (e.g., product development, product sales force and distribution network) help firms to build capabilities (e.g., design-to-service capability) to succeed in differentiation and cost leadership.	
(Storbacka 2011b)	Success in solution business requires a firm-wide initiative. Solution development and selling are not a single function's roles in the organization. The firm requires collaborative management to involve customers effectively.	Conceptual
(Macdonald, Kleinaltenkamp, and Wilson 2016)	Customers judge the solution quality based on the processes used in solution development. These processes should enhance customer-perceived consequences arising from a solution in order to facilitate the achievement of the customer's goals.	Empirical/interviews
(Panagopoulos, Rapp, and Ogilvie 2017)	Little research has examined how salesperson involvement in customer solutions can help solution selling. Solution salespeople play a distinctive role in all of the solution development phases. Also, salesperson solution involvement is positively related to increases in sales performance.	Empirical/survey research
(Worm et al. 2017)	Solutions are associated with increased return on sales for companies with higher sales capabilities and in industries less intense in technology.	Empirical/archived data and interviews
(Saul and Gebauer 2018)	Born solution providers differ from goods companies that add services later in the product life cycle. Born solution providers need dynamic capabilities, such as the ability to respond to changes in the business environment, in order to cope with market development situations in which customer needs and the competitive situation are still in a state of flux, leading to frequent changes in the business environment.	Empirical/interviews
(Salonen et al. 2020)	Positioning a firm as a solution seller has a positive effect on the customer's purchase intention in contexts where the customer is only considering the purchase of a single, product-based component.	Empirical/experiment

In the 90s, when the production technologies advanced, it became easier for companies to offer products faster and cheaper (Shepherd and Ahmed 2000). By that, suppliers started to lose competitive advantages as the unique suppliers of certain business products. Then, suppliers started the approach of combining services with products to offer integrated solutions in order to offer customers valuable propositions

(Brady, Davies, and Gann 2005). However, some suppliers found that path difficult and complex; the costs were higher than the profits. Managers then had concerns about how to develop profitable and valuable solutions.

These concerns led researchers to study what solutions need in order to be welcomed by customers and offer profitable income for suppliers. Thinking of solutions from customers' point of view was the missing part of the puzzle. Customers need solutions that are developed based on a relational business comprising (1) customer requirements definition, (2) customization and integration of goods and/or services and (3) their deployment, and (4) postdeployment customer support (Tuli, Kohli, and Bharadwaj 2007). That is unless the solution is tackling the customer's exact business need and the supplier is available after deploying the solution to offer support, the solution does not meet the expectations of the business customer. Offering such a solution requires different capabilities that suppliers should have.

Suppliers' capabilities such as new product development and design-to-service capability emerge as some of the major suppliers' capabilities (Ulaga and Reinartz 2011). Importantly, design-to-service capability helps suppliers not to overemphasize technical product features but design a solution "*such that its tangible and intangible elements interact synergistically to tap its full differentiation and/or cost reduction potential*" (Ulaga and Reinartz 2011, p 13). Solution development and selling are not a single function's roles in the organization. Success in solution business, thus, requires a firm-wide initiative and collaborative management to involve customers and offer post-deployment support effectively (Storbacka 2011).

Solution provision models

Research in conceptualizing the solution-provision process has proposed different models (e.g., Davies, Brady, and Hobday 2007; Storbacka 2011; Tuli, Kohli, and Bharadwaj 2007). One of these models is Tuli et al.'s (2007) process-centric model which comprises four distinct phases: (1) customer requirement definition, (2) customization and integration of the solution, (3) solution deployment, and (4) post-deployment support. This process shows that solution provision is a comprehensive process that begins before the solution development and does not stop by deploying the solution. This process, if followed thoroughly, satisfies the requirements of the customer and can secure profits for the supplier. Next is a highlight of these four stages.

Customer requirement definition is an important step in the solution process because the solution will not be successful without the necessary level understanding of the problem facing the customer. Additionally, the problem that is more complex and affects different layers of customers' processes requires more identification than a simpler problem in order to be solved without creating other problems. A supplier developing a solution needs to consider the customers' operations to decide on the best way to deliver the solution and know-how to carry out important maintenance if needed (Forkmann et al. 2017; Raddats et al. 2019). "*Customers frequently are not fully cognizant of their business needs and cannot easily articulate them to a supplier*" (Tuli, Kohli, and Bharadwaj 2007 p.6; Ulaga and Kohli 2018), the supplier should walk the customer through all of the reported and unreported needs for the solution to be integrated effectively with the customers' environment. Additionally, customer requirement definition requires an overall understanding of customers' strategies, internal

operations and overall market situations. Not only current needs should be defined, but also future needs should be projected by suppliers because the supplier is the primary business partner with the customer, i.e., the first one to offer a solution if a problem appears. If all the needs are clear, customizing a solution then takes place.

Customizing the solution involves designing, selecting, or modifying products and services to fit into a customer's environment (Davies, Brady, and Hobday 2007). Suppliers propose a solution that offers value for both, the customer and the supplier. Because of that, collaboration and process integration between the seller and the buyer is highly needed during this step. Effective integration requires that both parties own solution-specific organizational capabilities to facilitate collaboration and to ensure the successful articulation of customers' business needs (Elgeti, Danatzis, and Kleinaltenkamp 2020). The supplier should make sure that the customer's environment can accept the proposed solution and will not create future problems.

Once the solution is designed and prepared, the deployment phase takes place. In this phase, the solution is installed and integrated with the customer's environment. Not only operational aspects of solution deployment are dealt with, but also personnel capabilities and/or training sessions are offered by the supplier. As a general manager from a customer side commented about a successful solution deployed to his company: "*It integrated well with us. It just fit in very well with us, our people, equipment, and training requirements.*" (Tuli, Kohli, and Bharadwaj 2007, p. 7).

After installing the solution, the customer might face new requirements that need additional modifications and/or support. Postdeployment is not only offering spare parts, and routine checkups and maintenance, it indicates modifying the solution in response to

evolving requirements of a customer. This is a crucial part for customers. Customers emphasize the post-deployment support and view it as a central part of the ongoing relationship between a supplier and a customer (Tuli, Kohli, and Bharadwaj 2007).

Supplier success factors

Success in the solution business is not a linear process because of the holistic and complex nature of solution creating and delivery. Customers frequently lack the capability or readiness to adopt a solution or to utilize it effectively (Elgeti, Danatzis, and Kleinaltenkamp 2020; Treacy and Wiersema 1993). That is, persuading customers of the value of buying integrated solutions rather than their discrete components is not always easy (Zimmer, Salonen, and v. Wangenheim 2020). Understanding customers' needs and offering a customized solution is a result of deep intimate interaction with the customer, which might result in detailed customization of the solution bundle and long project duration (Artto, Valtakoski, and Kärki 2015). Because of that, the profitability of solutions might be hindered based on the customer business need or when customers have their own ability to integrate the solutions' components (Neely 2008; Ulaga and Loveland 2014). Turning customers' solutions to profits is not always easy and might have a huge opportunity cost (Neely 2008; Ulaga 2018; Ulaga and Loveland 2014). Working deeply with few customers to satisfy all of their reported and unreported needs to keep suppliers away from making several superficial relations with various customers. Thus, adopting the solution business requires careful consideration of the value that the solution offers for both parties.

Even though suppliers face more difficulty in turning a solution into profits, customers might also struggle to find the best suppliers in terms of offering solution value. The supplier selection process is at first directed by the objective of taking advantage of market competition (Lindberg and Nordin 2008). In most procurement situations, several potential suppliers are considered and evaluated before a decision is made (Elgeti, Danatzis, and Kleinaltenkamp 2020; Lindberg and Nordin 2008). Not always the cost is the main driver of supplier selection, depending on the nature of the services required, the value offered by the supplier can guide the customer to rank the potential suppliers and then choose the best offer (Lambert and Enz 2012). For instance, solutions of strategic importance associated with high supply risk are evaluated based on value, whereas cost is the most central aspect for standardized services (Lindberg and Nordin 2008). A supplier's standing as a solution provider helps the buyer by decreasing their perceived purchase risk (Zimmer, Salonen, and v. Wangenheim 2020). Further, a customer's ability to adjust and modify its processes to accommodate the provider's solution development efforts is vital for solution success (Panagopoulos, Rapp, and Ogilvie 2017; Zoltners, Sinha, and Lorimer 2011).

Supplier capabilities

A supplier's capability to offer a solution can be defined as the ability of an organization to perform a coordinated set of tasks, utilizing organizational resources, to meet customer's business needs by offering a solution (Helfat and Peteraf 2003). Solution customization might require the supplier to integrate offerings from various suppliers into one solution that fits with the processes of the customers' operations (Gerstner Jr 2009). Ordinarily, solutions require substantial effort from the seller in terms of designing and

delivering the best combination that maximizes the value over the life cycle of the solution. Suppliers who establish relational business with customers are expected to be very close to the customer in order to offer a valued solution that the customer is ready to pay for.

Innovation is an important capability that enables the firm to be responsive to the dynamic market changes by exploiting the firms' resources (Helfat and Peteraf 2003). Coping with market changes requires sensitivity to the change, designing an innovative solution and being able to deliver it effectively. Firms, thus, should consider their internal innovation resources to overcome the most demanding part of the solution selling process if a sudden movement is required (Ulaga and Reinartz 2011). Additionally, it is highly important in order to create innovative solutions that customers remain flexible so that providers have room for creativity and to make improvements (Lindberg and Nordin 2008).

Supplier resources

Resource's availability can explain why some firms fail to make profits in the solution selling field. Based on the resource-capability framework (Ulaga and Reinartz 2011), generating revenues through differentiation and/or cost advantages in service provision requires distinctive resources such as product development and manufacturing assets and product sales force and distribution network. Additionally, according to the resource-based view (Barney 1991), human, social and cultural capitals can enhance organizational performance to be able to maximize the solutions' value (Leigh et al. 2011). The human factor, for example, addresses the number of salesforces, their selling approach and expertise levels. Social networks inside and outside the organization

indicate the ability to build profitable relations with customers and the internal functions of the supplier firm. Finally, cultural capital guides employees' behavior to support the organizations' strategies with matching behaviors such as entrepreneurial actions. Ability to exploit these resources more than competitors helps to garner a strategic competitive advantage by offering competitive solutions (Helfat and Peteraf 2003; Leigh et al. 2011).

Solution selling dimensions

The solution provision process can be studied either from an organizational or functional level (e.g., sales or R&D). Put differently, how the organization in general engage is solution selling and how specific functions such as sales or R&D take part in solution selling process. Panagopoulos and colleagues (2017) have noticed that solution business research had been done mainly from an organizational perspective. That is, how organizations, in general, engage in solution selling. The organizational level's antecedents and consequences of B2B solutions are available in the literature. However, the role of specific functions, importantly sales, is crucial but was and still overlooked (Panagopoulos et al. 2017; Ulaga and Kohli 2018). The solution selling process is composed of some micro-level steps carried out by employees in different functions. Decomposing the whole solution selling process to disentangle the sales functions' role from other functions is important for managers to be aware of and apply. In other words, sales managers need to know how their salespeople should go about applying these processes. Solution salespeople are primarily responsible for interacting with customers during product and service provision (Judson et al. 2006). Specifically, solutions salespeople play important role in defining customer requirements, customizing/integrating goods/services, deploying goods/services, and providing post-

deployment customer support (Panagopoulos, Rapp, and Ogilvie 2017). Solution involvement of salespeople is beneficial in generating profits for the supplier company an effect that is enhanced if the company has a wide and deep product portfolio, the sales functions cross-collaboration with other functions is high and there is a close and reciprocal relationship between the supplier and the customer (Panagopoulos, Rapp, and Ogilvie 2017).

Summary

This chapter covered the solution business literature. It began by defining solutions and how they are different than products. Then, the chapter reviewed the solution model that is used in this dissertation. After that, resources and capabilities that are important for suppliers to sell solutions were discussed. The next chapter will cover the role of important boundary spanners namely solutions salespeople, in selling solutions.

CHAPTER 3: THE ROLE OF SOLUTIONS SALESPEOPLE

This chapter will cover solutions salespeople's responsibilities that handle as selling solutions. Also, what advantages solutions salespeople have that allow them to be in positive position, compared to other functions in the firm, when selling solutions will be discussed in this chapter. Solutions salespeople have some advantages that distinguish them for selling solutions. Nevertheless, the task of solution selling is different than other sales tasks (e.g., off-the-shelf product selling) such that it requires some distinctive skills and abilities. In essence, solution salespeople need to be trained to overcome the difficulties of the process and secure profitable income for their organizations.

Because not all salespeople are equal in their readiness to sell solutions, factors that are important for solutions salespeople to be ready to sell solutions will be discussed. Importantly, the relationship between solutions salespeople and other functions (e.g., research and development) is an important factor for the readiness of solutions salespeople. How to enhance this relationship will be discussed in this chapter. Specifically, improving the innovation of solutions salespeople is expected to help solutions salespeople to work effectively with other functions in order to sell solutions. This chapter will provide foundation for the next chapter, which will explain why DT specifically is important for solutions salespeople.

Responsibilities and advantages of solutions salespeople

Through the solution selling process, different requirements and expectations of salespeople are needed. In order to fulfill these, several skills and abilities should be utilized. Suppliers depend on salespeople to build successful relationships with customers

(Ulaga and Loveland 2014). Overall, if done successfully, salespeople's solution selling involvement is crucial, because it can enhance both their own firms' and customers' performance (Salonen et al. 2020). A successful relationship is the result of customer satisfaction and supplier profit gaining. Chiefly, solution salespeople should be able to understand the customer's demand, the supplier firm's cost structure, and the innovation process.

Value-opportunity-recognition capability (VORC) helps salespeople to capture opportunities based on the available resources of the firm (Böhm et al. 2020; Salonen et al. 2020). Value opportunity recognition means "*salesperson's ability to identify value creation opportunities in customers' business that is captured by appropriate combinations of goods and services that enhance customers' "value-in-use*" (Böhm et al. 2020). Salespeople's competency definition role in the organization allows the solution to be customized properly following the firm and market constraints.

As boundary spanners, solutions' salespeople have the opportunity and responsibility to work in parallel with the customer and related organizational functions (e.g., R&D, logistics, etc.) to lower the uncertainty that faces the customer and the supplier during the solution provision project. Solutions' salespeople play a distinct role in offering solutions that no other function in the organization can handle (Panagopoulos, Rapp, and Ogilvie 2017; La Rocca et al. 2016; Ulaga and Kohli 2018). The sales function is one of the closest functions to customers, if not the closest (Homburg et al. 2017). That is, salespeople as primary customer touchpoints spend their time between the company and the customer working on defining the customer's problem and selling products and

services to them. This twofold relationship enables salespeople to offer a solution according to the firms' capabilities, customer needs and market conditions.

Being in the field, salespeople are knowledgeable about the market and current competing solutions (Judson et al. 2006; Soscia, Bagozzi, and Guenzi 2018). This knowledge allows salespeople to define competencies and establish competitive advantages for customers and their firms through the solution (Koponen, Julkunen, and Asai 2019). Additionally, salespeople can get insights into the directions of competitors. These insights are important for the solution to be competitive and valuable. For instance, if all competitors offer a certain service such as free delivery and/or maintenance, salespeople's ability to sell a solution will be hindered if their firm is not able to offer that service or a competing offer. By their role in defining competencies, salespeople might be able to design the solution in a way that overcomes the shortage of a missing service. In other words, innovation in creating a customized solution that meets the customer need profitably is a competence that is crucially important for salespeople (Judson et al. 2006).

Firms seek to enhance their product and service innovativeness through the organizational capability to introduce solution innovations (Chandy and Tellis 2000; Dotzel, Shankar, and Berry 2013). This innovation should be with the limits of the cost expected by the customer (Lindberg and Nordin 2008). Having a sales team with high innovation capabilities and solid cost structure understanding will enhance the chance of suppliers to succeed in selling solutions. Salespeople need to have firm knowledge about the cost elements of the company. How to reduce a variable cost or eliminate a fixed cost in order for the company to succeed in selling a solution might have a strategic benefit for the organization. For example, if the cost of shipping a solution to a customer hinders the

ability to sell that solution, a salesperson might have a role in prioritizing the work of the logistics function to helps the firm in overcoming that challenge if the deal will offset the modification cost of the logistics function, which might have a future benefit for the whole firm.

Solution provision is a complex process that requires iteration, flexibility and problem-solving skills to overcome the uncertainties related to the problem and the solution (La Rocca et al. 2016). Salespeople are required to maintain the relationship with customers even after deploying the solution. Similarly, customers expect the solution salespeople to be available whenever there is a need regarding the solution. This post-deployment relationship can be enhanced if not only the original problem is solved but also if any new requirements appear on the surface, the salesperson should be ready to take care of it (Tuli, Kohli, and Bharadwaj 2007). Post-purchase evaluations and follow-ups of bought products and services are matters of great concern for customers. This concern is fueled by the nature of derived demand the business buyers face. Whenever the final customer requires a service or a product, the middle customer needs to be available (Lindberg and Nordin 2008). Salespeople, thus, should have an overall understanding of the supply chain that affects their customers. Otherwise, limited consideration of the supply chain might deter salespeople's ability to comprehend the nature of the customer's demand and solution needs.

Solution salespeople are expected to be available with customers before, during, and after the selling action. This requires salespeople to have continuous communication with the related functions in the firm. For instance, criteria such as flexibility and ability to cooperate are seen as essential for the successful implementation of solutions

(Lindberg and Nordin 2008). Not always the other departments will be cooperative. This requires salespeople to have some political skills that allow them to get the work done (Brouer et al. 2015).

Additionally, continuous innovation to overcome difficult problems is an essential part of the solution salespeople. Innovation in solutions does not have "tires to kick" (Murray and Schlacter 1990). It is difficult to blueprint a solution in advance because the knowledge needed for both problems and solutions is often tacit, and both the customer and the supplier do not have initially the necessary elements to solve the problems (Luotola et al. 2017). Instead, the solution needs to be co-created and evolve over the lifetime of the solution.

Co-creation work, between the supplier and the customer, aims to lower the uncertainties related to (1) customer needs, (2) the process of co-creating the solution, and (3) performance outcome (Ulaga and Kohli 2018). Customers cannot fully cover their needs and requirements as one of the business customers report: "*Specifying complex services might be very time-consuming. You have to cover every eventuality, but remain flexible so that suppliers have room for creativity and improvements*" (Lindberg and Nordin 2008, p.297). Next, explanation of the three abovementioned uncertainties that need to be reduced.

Firstly, uncertainty about the customer's need appears if the seller is not sure about the need or the requirement or the problem coevolves with the solution (Björklund et al. 2020). In other words, the problem might gain complexity by thinking of it from one direction. As the solution gets advanced as fresh dimensions of the problem might appear. on the other hand, by thinking deeper of the problem, additional elements of the

solution that need to be considered might appear on the surface (Björklund et al. 2020; Dorst and Cross 2001). Ill-defined needs lead to customer need uncertainty (Athaide and Zhang 2011). Salespeople are expected to help customers define and prioritize their needs. For example, different functions from the customer side might have different priorities that need to be prioritized well. That is, customers need to consider their customers' demands before buying a solution. They must be able to buy certain services on-demand whenever their final customer requires them (Lindberg and Nordin 2008). So, there are different levels of uncertainty that the supplier should deal with when selling a solution. Because time is not always enough to comprehend the needs and specifications for solutions, solution salespeople must guide customers on the best way to define the need with the best of information available (Lindberg and Nordin 2008).

Secondly, process uncertainty increases if there is a lack of confidence in the other part's ability to co-create a solution. The customer expects the seller to be able to co-create the solution, not only passing an off-the-shelf solution. Also, the seller expects the customer to offer all of the needed information to facilitate the process. Process thinking and process improvement abilities help salespeople lower the process uncertainties attached to the solution (Dickson et al. 2009). Put differently, solutions salespeople need to be aware of the customers' operations process that can help or hurt acquiring and utilizing a solution.

Thirdly, outcome uncertainty refers to what extent the seller and the customer are confident of the performance of the solution. Here, salespeople's role is assuring customers that the solution will work well and in case of any shortage, the salesperson is available for any needed modifications (Panagopoulos, Rapp, and Ogilvie 2017). Service

improvement practice (SIP) helps organizations and solution salespeople to increase service delivery performance and conformance quality and/or reducing their cost (Dickson 2015). Salespeople need to utilize some of the SIP's tolls such as satisfaction surveys and the define-measure-analyze-improve-control (DMAIC) process. Solutions can be more profitable than other service or product offerings. However, this positive effect depends highly on factors such as the sales capabilities of the supplier and the strength of the buyer (Worm et al. 2017). Focusing on how the solution can benefit the customer leads the customer to be less price-sensitive (Böhm et al. 2020).

Solution salespeople's ability to succeed in selling solutions depends to a great extent on several individual, firm, and market conditions (Fang, Palmatier, and Steenkamp 2008; Ulaga and Loveland 2014). Building on theoretical and qualitative studies, some of these requirements were suggested and introduced (e.g., Koponen, Julkunen, and Asai 2019; Ulaga and Kohli 2018). Few quantitative studies have studied some of the salespeople's requirements. However, we still lack insights into the antecedents and consequences of solution selling at the salesperson level (Böhm et al. 2020).

Solution Selling Readiness

The nature of sales is changing, which means that the nature of the salespeople and what they do should change as well (Ulaga and Loveland 2014). More business customers are asking salespeople to offer solutions instead of only products or services. However, only one-third of industrial salespeople find it easy to engage in solution selling (Ulaga and Loveland 2014; Ulaga and Reinartz 2011). The process of developing

specifications of complex solutions can be tedious and sometimes very difficult (Lindberg and Nordin 2008). This is because the process entails iterative work not only with customers, but also with other functions in the organization to ensure that the identified customer requirements can be met through the firm's resources (Sleep, Bharadwaj, and Lam 2015). Further, in its implementation, solution selling often requires nonroutine intra-organization cooperation between R&D, logistics, and customer service that need to be conceived, developed, and integrated (La Rocca et al. 2016).

This multidimensional iterative work requires salespeople, as the key boundary spanner and champion of the project, to be undertaking different tasks that are linked to the solution selling stages (Panagopoulos, Rapp, and Ogilvie 2017). Because of that, the majority of salespeople need a great deal of training to master the challenges of solution selling since it is intellectually demanding in nature (Ulaga and Loveland 2014). An organization's ability to offer customized support in the form of training, for example, that fits each salesperson's situational needs in a value creation context predicts the likability of salespeople's success in finalizing the solution provision process (Salonen et al. 2020).

However, we still lack a clear understanding of what elements managers should consider first to ensure in order for their salespeople to become a positive part of the solution selling process (Salonen et al. 2020). Existing research has focused mainly on the performance of solution salespeople with less consideration to antecedents, the drivers of better solution selling, from individual and organizational perspectives (Salonen et al. 2020). Studying what antecedes salespeople's solution involvement as a future research direction was suggested by Panagopoulos et al. (2017, p.163): "*future*

researchers should examine the antecedents of salesperson solution involvement, such as salesperson knowledge brokering or tacit knowledge transfer skills". Specifically, what management needs to know are the individual differences in aptitude that increase the likelihood that the salesperson will be a successful solution seller. They can then recruit and improve through training such skills. They also wish to know how to improve their support organization and their implementation operations, particularly what aspects of organization and operations increase the likelihood of solution seller success. Beliefs about individual abilities and organizational capabilities also determine sales managers' beliefs about the preparedness of his/her salesforce to solution selling. More specifically, before engagement in solution selling, readiness to be part of this tedious process allows managers to divide the work and establish sales territories to assign the best salespeople to the most promising projects and facilitate value-based selling, which allows heterogeneous salespeople to be engaged in solution selling through appropriate organizational support tailored to the salesperson's individual needs (Salonen et al. 2020). Namely, solution selling readiness is examined in the current research as an important antecedent to solution selling success. But why it is important to be considered by managers?

Salespeople's readiness to provide solutions can predict their true solution selling behavior (Gammoh, Mallin, and Pullins 2014; Groza and Groza 2018; Jaramillo and Mulki 2008; Krishnan, Netemeyer, and Boles 2002; Mulki, Lassk, and Jaramillo 2008). Based on the theory of self-efficacy (Bandura and Adams 1977), salespeople who perceive themselves as capable to do a job task are more expected to be able to do it. Salespeople's self-efficacy to do certain sales work was found to be a significant predictor

of their behavior (Fu, Richards, and Jones 2009; Jaramillo and Mulki 2008; Krishnan, Netemeyer, and Boles 2002). For example, Fu and colleagues (2009) have found that salespeople's self-efficacy of good performance significantly predicts effort to and performance of selling new products. In the same way, the current research concentrates on salespeople's perceived readiness to engage in solution selling. Following the same logic, salespeople who perceive themselves to be ready to engage in the complex solution selling process are expected to be more prone to success in the field.

Importance of innovation for solution selling readiness

Organizational success depends on supplying innovative and useful solutions for customers (Chonko and Jones 2005). Innovation, thus, is an important individual ability that individuals in the organization should have because innovative individuals can come up with novel and useful ideas related to the firm's products, services, processes, and operations so that the firm is better able to deal with customers and competitors (Gilson et al. 2005; Wang, Dou, and Zhou 2012). Additionally, it is an important factor in reducing resistance to innovation that the organization adopts (Cho and Chang 2008).

In the previous literature on the role of solutions salespeople (e.g., Bonney and Williams 2009; Panagopoulos, Rapp, and Ogilvie 2017; Salonen et al. 2020), there has not been an examination of the direct relationship between innovation and solution selling readiness even though innovation is an inherent requirement of the sales job. The more a salesperson is innovative, the better he/she in sales performance, job satisfaction and likelihood to promotion to management level (Wang and Netemeyer 2004). Solutions salespeople need innovative thinking to generate solutions to current problems, look to old problems from different perspectives, or detect neglected problems that are related to

different solution provision areas such as customer relationship management, logistics, or training (Wang and Netemeyer 2004). Solution selling requires salespeople to be customer need–driven and specific. As boundary spanners, should be ready to identify a problem, recall and reactivate stored information relevant to that problem and then search their internal memory and external sources to generate responses, weigh the possible responses against factual knowledge, and produce a final innovative offering (Agnihotri et al. 2014). Readiness to undertake solution selling projects requires knowledge and mindset that facilitate the work of salesperson to innovatively customize a solution in a way that creates a competitive advantage for his/her firm by the solution that does not exist in the market and is difficult to imitate (Dotzel, Shankar, and Berry 2013).

Innovative solutions salespeople are expected to be more ready to undertake solution selling because (1) customer problem solving is specific to the individual (i.e., boundary spanner) rather than the organization and (2) their service encounters will stimulate them intellectually and increase the joy they experience when performing their jobs (Agnihotri et al. 2014). Because markets evolve and technology advances, identifying the real needs of a customer, and seeking a solution to customer problems need innovative thinking (Wang and Netemeyer 2004). Ill-defined or poorly structured problems to which many potential solutions are possible to require creative attempts (Amabile 1983). The Sales-innovation relationship puts salespeople in a positive position with Research and Development (R&D) department, which its main objective is to develop new products. How salespeople can help R&D function is very important for the organization.

Sales-R&D working relationship

Importance of cross functional cooperation

Effective cross-functional relationships among managers are required in modern organizations that are composed of functionally specialized interdependent departments. An effective internal knowledge and expertise exchange between managers from different departments is required for successful exchange with external markets (George 1990). If these departments operate separately with different cultures, values and timelines, the overall organizational direction toward market competitiveness will be stalled because the resource-based view indicates that resources necessary to reach firms' objectives are dispersed across organizational functions and subunits (Ruekert and Walker 1987). For customer and market oriented companies, improving cross-functional collaboration improves the performance of innovation and NPD because the resources needed for innovation and NPD are dispersed across the organization and the best way to utilize these resources is to bring different departments in one place (Guenzi and Troilo 2006).

Market oriented firms should encourage cooperation between different functions, especially with Research and Development (R&D) because it is the most related function to innovation and NPD (Troy, Hirunyawipada, and Paswan 2008). R&D should work closely with other functions during the NPD process. The relative importance of each function in the organization in NPD depends on the nature of the NPD task. Some functions are important to be part of the early stages (e.g., sales and marketing) but some have a more prominent role in later stages (e.g., manufacturing and logistics), that is

because the activities and information needed during NPD stages are different (Cui and Wu 2017; Song, Thieme, and Xie 1998).

Marketing and sales cooperation with R&D

Researchers have explored the role of customer-focused functions (i.e., marketing and sales) in cooperation with R&D (e.g., Griffin et al. 2013; Song, Thieme, and Xie 1998). Marketing and sales can play different roles during NPD based on the nature of the market and organizational contingency factors (Ernst, Hoyer, and Rübsaamen 2010; Homburg et al. 2017). Some firms consider marketing and sales as one entity whereas others explicitly consider sales as a different function than marketing because sales and marketing employees possess heterogeneous knowledge (Homburg and Jensen 2007). Based on the latter way of organization, salespeople play different and specific role of in NPD (Van Den Berg et al. 2014; Ernst, Hoyer, and Rübsaamen 2010).

Understanding the differences between sales and marketing is important for managers to consider because it can help answer the question: “under what circumstances should the company rely on R&D-marketing versus R&D-sales cooperation?” (Homburg et al. 2017). R&D-sales cooperation refers to the "*intensity of information sharing and interaction concerning key tasks in the new-product development process between R&D and sales*” (Homburg et al. 2017). Because of the nature of salespeople’s work closely with customers, salespeople can help generate high-quality ideas for the early stages of new product development, reducing the failure rate of these new products (Homburg and Jensen 2007). Specifically, salespeople can be effective knowledge brokers in the NPD processes. Salespeople can convey knowledge of customers and market dynamics to their

fellow sales colleagues and NPD managers (Bagozzi and Verbeke 2020). The knowledge gained by salespeople about the market is considered tacit knowledge which requires political and social skills to disseminate the information effectively (Carlile 2002; Plouffe and Barclay 2007). This nature of the knowledge acquisition and dissemination requires managers to actively facilitate the work of salespeople in in the NPD projects. Also, salespeople should feel their importance in the NPD, look for and spread the information that helps create competitive advantages for their organizations.

Additionally, salespeople are able to establish unique relationships with players in social networks, that are not easily accessible by others, providing excellent access to knowledge and information needed for innovation (Van Den Berg et al. 2014). Salespeople have relationships with customers from different clusters because of the nature of salespeople's work in covering different geographic markets which embrace variation in customers' demographics and business needs. This positive point helps NPD in terms of limiting bias in the gathered ideas from marketplace (Ernst, Hoyer, and Rübsaamen 2010). During the product development stage, salespeople can nominate customers to participate in testing new products. Some customers have better technical knowledge than others whereas other customers are more innovative. Having access to different customers' groups allows the design and testing of the prototypes to be effective (Song, Thieme, and Xie 1998). All of the previous shows the importance of salespeople to R&D.

On the other hand, sales can benefit much from the R&D folks. Salespeople's technical knowledge about products and services can be enhanced with strong connections with R&D employees (Kotler, Rackham, and Krishnaswamy 2006). The

technical knowledge that customers need to know can be transferred through salespeople. Thus, it would be highly important for salespeople to have good working relationships with R&D folks. The bidirectional relationship between sales and R&D that benefit in transferring up-to-date market knowledge to R&D and important technical knowledge to sales helps NPD process to be responsive to market and technical changes (Homburg et al. 2017).

Solution salespeople depend highly on fruitful collaboration with specialized functions such as finance, manufacturing, and R&D because solutions are complex in nature and no single function can do the whole job (Leigh et al. 2011). Securing an order from a strategic customer might require cooperation from R&D managers to improve the product to meet the customer requirements. This might require R&D managers to prioritize this project and conduct the required testing to be manufactured efficiently. After deploying the solution, no significant interaction between sales and R&D is needed because of the decreased priority of the NPD (Ernst, Hoyer, and Rübsaamen 2010). However, improvements and maintenance might require the salesperson to stay in touch with his/her R&D colleagues. This continuous relationship shows the importance of the communication skill of salespeople in terms of choosing the best communication channel for solution success.

Formal and informal communication are way of disseminating knowledge among employees from different functions (Steward et al. 2010). For a sales manager to get most of the R&D manager, utilizing both formal and informal channels is the best approach. The communication channel depends highly on the nature of the project. A casual chat with a manager from another function can reveal more about the ongoing situation than a

formal exchange (Meunier-FitzHugh and Massey 2011). Formal communication, on the other hand, can reduce confusion because there are specific objectives and outcomes of these formal communication channels. For projects that need a great extent of innovation and creativity, high-quality formal communication that is credible, understandable, relevant, and useful for the task on hand is important (Menon, Bharadwaj, and Howell 1996). Bidirectional communication is a sign of high-quality communication because it indicates a reduction in dysfunctional conflict.

Enhancing the sales R&D relationship

Training salespeople on an innovation method that facilitates information sharing and innovativeness will enhance the working relationship between sales and R&D. This will help salespeople to speak the same innovation language with the R&D. Notably, Design Thinking is one of the well-accepted innovation methods that is being adopted by major corporations to create nonroutine solutions to ill-defined problems that coevolve with the solution (Björklund et al. 2020; Brown 2008; Micheli et al. 2019). However, training alone is insufficient to integrate DT into organizations' engineering- or finance driven daily processes. Trainees are first excited but end up lacking other departments' support and facing resistant which get them back to business-as-usual after completing the training (Björklund et al. 2020). DT is a comprehensive method that requires individual training and departmental support.

Summary

This chapter reviewed the literature on the role of solutions salespeople. With the importance of cross-functional collaboration with other functions, solutions salespeople

need to be trained on an innovation method that help them design and sell solutions to customers. the next chapter will cover one of the important innovation methods, namely DT, and how salespeople are expected to benefit from it.

CHAPTER 4: THE IMPORTANCE OF DESIGN THINKING

This chapter introduces the importance of DT in preparing salespeople to sell solutions. The chapter speaks about defining DT, why DT is an important innovation methodology, DT's most common procedures and the dimensions that DT can be conceptualized based on (i.e., individual and organizational levels). Then, the chapter will contrast DT with other problem-solving methodologies (e.g., Six Sigma and Stage Gate method) and discuss why DT has an advantage over these methodologies.

After that, the chapter will discuss the importance of organizational part in DT and how it is very important to integrate the work of individuals who do DT with the organizational part of DT. This will provide a foundation for the hypotheses that will be developed in this chapter. Specifically, the chapter will speak about the individual DT mindsets (abductive reasoning, gestalt view and tolerance of ambiguity and failure) that solutions salespeople need possess to be ready to sell solutions (H1-H3). Also, an important organizational DT factor (interdisciplinary collaboration) will be discussed and how it is expected to enhance the effect of individual DT mindsets on solution selling readiness (H4a-H4c).

What is Design Thinking?

Design Thinking (DT) is defined as "*an analytic and creative process that engages people in opportunities to experiment, create, and prototype models, gather feedback and redesign*" (Razzouk and Shute 2012; Thompson and Schonthal 2020). In the late 60s, Herbert Simon introduced the importance of design in understanding how things should work in comparison to natural science that are concerned with how things

are (Simon 1969). Later, Peter Rowe in 1987 distinguished between design in general and DT (Rowe 1987). Rowe's argument stated that design is a broad term used to describe the creation of something whereas DT is a narrower term that speaks about the process used by designers to create something. Speaking from an architecture perspective, Rowe explained that the design (i.e., "the what") is different than design thinking (i.e., "the how").

Richard Buchanan in his highly cited 1992 paper, argued that DT should be used in the business world and not be limited to the design field (Buchanan 1992). Because there are some commonalities between problems faced by artists and scientists, why don't scientists benefit from the way artists solve their problems? DT can help different business domains in improving their work. The four areas that identify design have close relationship with many of the contemporary business operations (Buchanan 1992). That is, the *design of symbolic and visual communication* helps marketers and specifically advertisers in creating ads that persuade customers. Also, the *design of material objects* is helpful for creating pleasant appearance of products. Further, the *design of activities and organized services* includes the design of logistics and operational processes applied by firms. Finally, and most related to selling solutions, *the design of complex systems for working, learning and living* intends not only to understand the functional analysis of the parts that compose a complex whole but also aims to capture the central idea and value of a balanced whole. By that, design can help managers to create business processes that facilitate decision making.

Importance of Design Thinking

Utilizing design approaches and practice in solving customers' problems can be a source of competitive advantage (Björklund et al. 2020). This is because design thinking can be the center of value generation and sustainable competitive advantage (Lewrick, Link, and Leifer 2018). Successful conducting of DT leads organizations to outperform their competitors, evident by the positive impact of design on business performance through different measures such as time to market, adoption rate, share of wallet, market share, revenue growth, profitability, and brand value (Rae 2016). For example, IBM succeeded to cut its time-to-market to half, reduced a third of development time, and generate a 301% return on investment by applying design thinking processes (Björklund et al. 2020). Additionally, McKinsey's Design Index shows that companies succeeded in reaching 167% higher growth in revenue over industry benchmarks by adopting design approaches (Dore et al. 2018). The enthusiasm to adopt DT in fields other than design field have created an urgent demand for clear and definite thinking about DT (Dorst 2011). But how solution selling firms specifically can benefit from DT?

Designing customers' solutions is not a linear process, rather it is a complex process. It is important for an organization that adopts a solution-provision model to be capable to test different ways to reach the optimal solution. Importantly, what differentiates DT from other innovation methods is the need to engage the customer early in the process in order to co-create the solution. Without engaging the customer effectively in the process, wrong assumptions might be carried, lowering the success chances of the solution. Customers often possess a high degree of industry-specific knowledge of conventions and regulations that solution providers are often reliant upon

(Elgeti, Danatzis, and Kleinaltenkamp 2020). Solutions can fail unless the customer can contribute the needed knowledge to the solution process.

Methodologies of Design Thinking

IDEO, the design firm, introduced in the early 2000s their innovation procedure that is considered the most common form of DT (Kelley and Littman 2001). This process emphasizes the engagement with the end user as a very essential part of the innovation process. Many companies adopted this process and many reported success stories (Brown 2008). IDEO took the initiative to scale the adoption of their innovation method in the business world. The business sector then understood that design is a primary driver for innovation (Hobday, Boddington, and Grantham 2012). However, because IDEO's methodology does not fit all businesses, different methodologies were also introduced (Micheli et al. 2019).

As Table 2 shows, these methods start from the *exploration* stage because of its importance in understanding the problem on hand. After that comes the *ideation* phase in which possible alternatives are generated. The *implementation* and *testing* stages come lastly based on prototyping and iteration. Table 2 shows the most common DT methods. These methods chiefly help managers to list the most promising solutions and champion the best (Boland and Collopy 2004). The design component is important to help decision makers generate different ideas. Along with the managers' role as decision makers, DT methodologies help to create better outcomes. To overcome the business challenges, both decision and design are necessary. Some managers misunderstand the requirements of

DT. It is not important to "*hire designers, but instead you send a developer through design thinking training, and that solves* [the] *design problem.."* (Björklund et al. 2020).

Table 2 Design Thinking Methods

Design Thinking Method	**Main Stages**
IDEO	Inspiration, ideation, implementation
Stanford Design School	Empathy, define, ideate, prototype and test
IBM	Understand, explore, prototype, evaluate

DT, as a formal procedural method, induces the solution designer to begin by defining the problem before generating different options and championing the best of them (Björklund et al. 2020). DT starts with a search for the problem anew, because the problem might be identified wrongly, and continue to revisit the search even if the innovation process proceeds to later steps (Liedtka 2015; Nakata 2020). This is appropriate for complex innovation needs, in which the problem recognition and solution generation requires strong cooperation between the players. DT is considered one of the pioneering methods to solve difficult problems creatively. That is because DT relies on collaborative and rapid experimentation (Nakata 2020).

Dimensions of Design Thinking

DT can be considered from two perspectives: individual and organizational level. In other words, DT is composed of both mindsets and actions that collectively form a complex whole (Nakata and Hwang 2020). Research about DT describes it in terms of (a) process and implementation and (b) individual-level components such as logic and cognitions (Micheli et al. 2019; Nakata and Hwang 2020). A design thinker should be trained to improve these cognitions and processes in order to set the stage for innovative

insight, prevent unintentional bias and to optimize the innovation process (Thompson and Schonthal 2020). Innovators-to-be, who seek to produce more novel, value-creating, and unparalleled ideas can face challenges because of different cognitive biases such as projecting the own world view onto others, limiting the options considered, and ignoring disconfirming data (Liedtka 2015). Notably, DT's tools and processes mitigate some of these human shortcomings and biases.

How Design Thinking is different than other problem-solving methods?

Six-Sigma method

DT is different than quality control methodologies such as Six Sigma. That is, DT concentrates on creating a solution after finding the problem whereas Six Sigma focuses mainly on isolating the defects that causes the problem so the problem does not reoccur in the future (Chesson 2017). A major difference between DT and six-sigma is that DT concentrates on finding out how people are impacted by a problem whereas six-sigma focuses on the reason of the problem occurrence.

The main source of input for DT is observations and brainstorming (Seidel and Fixson 2013). However, in six-sigma, tools such as surveys and complaint lists are the main sources to collect data (Stamatis 2019). This difference limits the ability of Six Sigma to generate new ideas that help managers in new product development projects. On the contrary, DT's ideation stage is mainly for generating as many ideas as possible to solve a problem on hand. Deductive thinking is the driver of success in Six Sigma whereas abductive thinking is more important in DT (Chesson 2017). Deductive thinking helps in solving problems because it helps to examines what exists to eliminate options

until the major contributing factor is isolated and to resolve the problem. Abductive thinking on the other hand is mainly about thinking beyond the available options to come with an innovative solution.

Stage-Gate method

Considering DT as a mindset as well as organizational actions differentiates it from other innovation methods such as Stage-Gate (SG) methodology (Nakata 2020; Nakata and Hwang 2020). SG is mostly directed toward developing new products; it is less often used to create new services, that is, because of the challenges in addressing the services' intangibility (Stevens and Dimitriadis 2004). However, DT and SG share some commonalities. They are composed of sequences of phases; each phase builds on work completed earlier and phases generally progress from conceptual exploration to tangible materialization of the innovation (Dunne 2018). Important input that design practices could bring to organizations is a formal method to concentrate on framing and reframing the wicked open problem (Dorst 2011). This is important for organizations that are struggling with open, complex problem situations. When there are opposition of views, standpoints or requirements, reframing can resolve the paradox. Thus, framing and reframing can reduce much of the uncertainty in the complex problems (Beckman 2020). Importantly, solution sellers should therefore be experienced with many systems that can work as working principles for the solutions they try to sell.

Advantage of DT

Most of the training received in colleges is a science-based, analytical-thinking training. Engineers, IT personnel and salespeople, for example, have received training that helps them to drive efficiency, manage costs, improve quality and reach sales quotas (Dunne 2018). In other words, they were trained to find the wright answer for problems. These are important skills, however, alone they are no longer enough to meet the challenges that face organizations these days. Firms face difficulties that need moving away from risk aversion and following well-developed processes that encourages risk taking, testing out of many solutions and learning from failures. Eventually, this way of solving problems enhances the organization's capability for solving adaptive challenges (Martin 2013). There is a strong need for organizations to infuse the innovation and solution-creation skills. Because of that, many organizations invested in training their employees on innovation skills such as DT.

Design Thinking in organizations

Organizations can benefit from the way designers solve complex problems because designers have been dealing with difficult, complex problems for a long time, and the design discipline have developed a professional practice to do this (Dorst 2011). Firms apply DT to explore many new possible solutions and then narrow them down to reach a final one that fits the needs of customers (Brown, 2008). Organizations and managers are prompted to adopt DT because it is a formal method that can be taught and applied by employees from different functions and fit with organizations that use structured processes to solve problems (Verganti, Dell'Era, and Swan 2019).

A macro perspective

The focus of DT has been mere adoption of one of the DT's methodologies available in the market. However, applying the method isn't enough; it is important to know the capabilities that leads the process to success (Brown 2008). Adopting DT in organizations requires developing deep (i.e., individual skills) and wide (i.e., organizational capabilities) design capabilities in order to reduce tensions between design, engineering, and business approaches (Björklund et al. 2020). These efforts help to build a shared framework in the organization regardless of the employees' backgrounds. Firms might need to (1) modify the DT process to align with the culture of the organization to match with the overall strategies of the firm and (2) train some specific functions on DT if they carry a leading role in the firm (Carlgren, Elmquist, and Rauth 2014). Thus, for solution-selling firms that look forward to offering innovative solutions, training salespeople on DT will enhance the chance to overcome the competition and help them create competitive advantages for their firms.

A micro perspective

In order for an organization to be able to apply DT successfully, individuals should embrace the needed skills and mindsets and the organization should have a set of capabilities and culture that facilitates the DT's projects (Björklund et al. 2020; Elsbach and Stigliani 2018). From an organizational perspective, fostering innovation culture indicates that employees are encouraged to be innovative by adopting the innovation mindsets (Elsbach and Stigliani 2018; Hurley and Hult 1998). Particularly, even the most innovative employees will find it difficult to be creative if the culture is not supporting.

Managers and executives have a responsibility to fertilize the innovation environment in terms of empowering employees to take part in the innovation process and welcoming promising ideas.

An integrative approach

That said, studying both, individual and organizational-level factors that facilitate innovation is important to have a gestalt perspective of how organizations support the most innovative employees to establish competencies for their firms. For example, DT can benefit the organization to redefine problems, facilitate codevelopment between the business stakeholders, and to conduct and learn from experiments (Björklund et al. 2020).

DT can help sales staff and managers alike be more effective in their own work in addition to enhance cross-functional collaboration (Björklund et al. 2020). It is important to understand the individual mindsets and organizational actions that prepare salespeople to engage in solution selling. DT begins as an individual process but transforms to a become team process (Thompson and Schonthal 2020). Ability to see the deep structure of customers' problems and not only pay attention to the surface structure, for example, is a major skill that design thinkers need (Thompson and Schonthal 2020).

Design Thinking for solutions salespeople

Solutions' salespeople should be empowered to be innovative in thinking of solutions. For instance, if a salesperson proposes a specific combination of goods and services that is not currently sold by the organization but will create value for the customer and can create a competitive advantage for the firm, this solution should be

considered and discussed. However, if the culture of the organization does not welcome such suggestions, the role of salespeople in creating competitive advantages will be hindered.

With the ongoing demand for solution selling (Biggemann et al. 2013; Tuli, Kohli, and Bharadwaj 2007; Ulaga and Kohli 2018), and since many salespeople are trying to become solution seller (Salonen et al. 2020), salespeople are expected to benefit from DT in providing an innovative solution for customers and lower uncertainties experienced by both customers and suppliers during the solution provision process. However, the important question is: what are the individual- and organizational-level capabilities needed by solution-selling organizations?

Capturing the individual level abilities is the first step in the work of developing them. As designers learned how to become designers since the beginning of their training, solution salespeople with DT mindsets are expected to be able to build the innovation muscles by following the DT framework. Organizational role helps individuals to leverage their DT abilities by setting a business environment that positively influence collaboration, risk taking, and embracing failure.

Writings on DT are quickly increasing. However, they are mostly anecdotal or descriptive in nature (Nakata and Hwang 2020; Liedtka, 2015). Additionally, and importantly, the current literature does not distinguish empirically the individual- and organizational-level of DT's mindsets and processes. It is important though for executives, middle managers and salespeople to know their roles in the DT's process for it to be beneficial in executing the organizations' strategies.

Individual mindsets

Abductive reasoning

People follow different reasoning styles, inductive, deductive and abductive, to name a few (Choi, Koo, and Choi 2007; Cramer-Petersen, Christensen, and Ahmed-Kristensen 2019). Deductive reasoning is going from the general to a specific, applying a theory to a specific situation or application. It provides a justification for a "this-will-lead-to-that" prediction and logic. Inductive reasoning is going from a specific phenomenon or several, to an abstract generalization. It informs discovery of a relationship, a generalization. Even though science and design are both hypotheses driven, design differs from the scientific hypothesis in that abduction plays a key role; scientists find out laws that direct today's reality, whereas designers try to invent a different solution (Liedtka 2015).

Unlike inductive and deductive reasoning, abductive reasoning challenges the current cause-effect explanation (Dorst 2011). It is creative thinking about a cause and effect, what else may cause it, what else can cause it – thinking essential to new solution finding. Abductive reasoning fuels creativity (Nakata and Hwang 2020). For example, developing new drugs for unmet medical conditions is a very complex process which requires scientists to take actions in spite of the enormous amount of biological information, and untangle problems in manageable ways to create a drug (Dunne and Dougherty 2016). "[Scientists] *don't have to have the whole picture before [*they*] start putting together (a product). This is biology, you'll never get to the end. So at some point you have to judge whether you know enough to start putting together the product.*"

(Dunne and Dougherty 2016). Abductive thinking helps scientists and solution provision professionals in general to overcome these challenges.

Finding the missing parts

Abductive thinking entails building on incomplete observations to reach the best attainable conclusion. This plausible conclusion cannot be verified because the building blocks of the premises are not conclusive. However, reaching this conclusion is the best available way to understand how the parts in front of the analyst can be linked (Martin 2013). A conclusion can be reached by understanding the relationship between its parts and the working principle (i.e., hypothesis, working principle) (Figure 1). For abductive thinking, the conclusion is available, but the parts and the working principle are missing, making the problem wicked, or in other word complex (Figure 2). Thus, the need to find out the two "unknowns" in the equation, leads to engage the design practices, which are quite different from conventional problem solving (Dorst 2011).

Figure 1 Argument Components

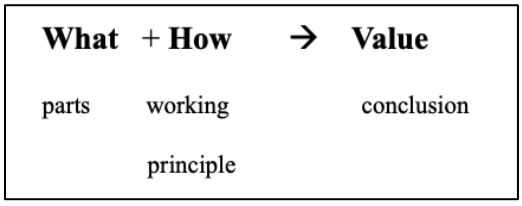
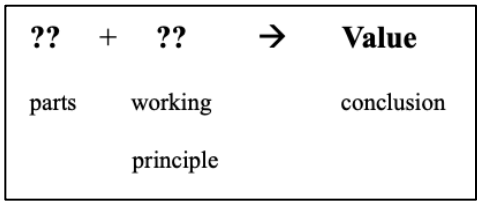


Figure 2 Abductive Reasoning



There are different ways to respond to this challenge, finding the two unknowns. One of these is reframing the problem, which entails creating an *innovative standpoint* from which a problematic situation can be tackled. This work matches a classic definition of creativity; looking at a problem from different perspectives (Anastasi and Schaefer 1971). This helps in reducing the uncertainty by looking to the problem from one viewpoint and adopt a working principle associated with that position. For example, if A affects C and it is believed that B is the mechanism, the abductive mindset allows to bring new knowledge and challenge the overall beliefs (Kolko 2010). Someone with an abductive reasoning mindset might think of a different variable, let it D, that can work instead of or in parallel to B even though there is no clear reason why D might work.

Working backward and forward

Another way to solve wicked (unstructured, missing data) problems is to work backwards then forwards (Dorst 2011). In this way, starting from the value (the last part of the equation) some frames can be developed. Then, once a promising frame is proposed, it is the turn to adopt 'the parts' (object, system, service) and a working principle. The next step then is the forward to see if the 'parts and 'working principle' combined actually perform well enough to create the value. This is similar to process thinking in which it is suggested to start from the end and think backward (Dickson et al. 2009). Then, rigorous deduction is required to check if solutions design will work (Dorst 2011). Working backward and forward iteratively helps to frame and reframe the configuration of interactions between the problem parts (Dunne and Dougherty 2016).

Framing and reframing sits at the intersection of reflective observation and abstract conceptualization (Beckman 2020). Reframing the problem allows the mind to

think of solutions that were not considered before. Thinking of the problem from a different angle can help in capturing a creative solution. That is because limiting the thinking from one direction might limit the thinker to some assumptions that hinder creativity. Framing requires context sensitivity. Because of that the observe and notice work is an important feeder to frame and reframe work (Beckman 2020). Additionally, data from observing and noticing are important input in order to be able to frame and reframe. That is, frames entail what one can or cannot see while observing and noticing.

Different assumptions are considered when thinking of the problem from different directions. For example, if the customer needs a solution that is not easy to be produced from an IT perspective because of the shortage in the supplier's IT capabilities, it might be beneficial to look at the problem through an outsourcing lens, for example. Abductive reasoning, thus, allows problem solvers to consider different ways to think of the problem and its plausible solutions. However, framing and reframing are often skipped because they are not easy to do. Capturing a new frame requires identifying facts (what is real?), antecedents (what happens first?), consequences (what follows?) and assumptions (what is taken for granted) (Beckman 2020).

Importance for solution salespeople

With abductive reasoning, solutions salespeople will be ready to make "logical leaps" to become solution sellers (Martin 2010). The "what if" mindset allows to generate new knowledge and produce multiple views (Zheng 2018). Additionally, utilizing the framing and reframing skill by using visualization techniques such as mind mapping, and customer journey mapping help to uncover patterns (Beckman 2020). Abductive

reasoning helps solution salespeople "*to ask the right questions and probe multiple stakeholders in a customer firm to identify its recognized and unrecognized needs*" (Tuli, Kohli, and Bharadwaj 2007; p.6). Salespeople with abductive mindsets are expected to be ready to create and sell solutions. Defining customer needs requires salespeople not to be limited to the assumptions described by customers. Instead, solutions salespeople need to be able to challenge these assumptions to be able to formulate the problem in a way the facilitates reaching an innovative solution.

H1: Abductive reasoning is positively related to solution provision readiness

Gestalt view

Design Thinkers need to consider the whole picture of the problem and the proposed solution (Gruber et al. 2015). That is, adopting an integrative approach will allow design thinkers to consider contexts that surround the problem to design a solution that is in harmony with the ongoing processes. For example, as one customer reported, [The solution] *is a fairly comprehensive set of software and attendant processes that go with it to solve a fairly broad problem addressing our business needs. It is not about a bunch of servers and software; it is about processes and procedures.* (Tuli et al. 2007, p 5).

Expert designers do not jump on to the details of the problem head-on but begin by focusing on issues around it and search for broader problem context for clues (Dorst 2011). Gathering clues can lead to emergence of themes, which inform the development of a frame that helps to tackle the central part of the problem and reduce uncertainty. Specifically, clues synthesize noisy information about the problem into implications for

how a problem process works, and how a solution can tackle that problem process, and manipulate some of the processes involved (Dunne and Dougherty 2016). So, solution providers benefit from the gestalt view of the problem and to prescribe the best solution. "*Some vendors could be great at conceptualizing the solution but lack the skills to execute. Others might be good at executing but not defining the requirements. For us, the ones that worked well were the ones who could manage the whole chain and not just one part or the other. It's important to remember that this is a complex chain, and you can't be good at it if you are working out only some parts and not the whole. If you can't have it all, it is not going to work.*" (Tuli et al. 2007, p 4).

Relationship with Systems Thinking

Gestalt view is close to one of the four systems thinking's basic ideas, namely emergence (Checkland 2000). Emergence is a system property that makes the whole more than the sum of its parts. The other three systems thinking ideas are hierarchy (which means that the entities follow a layered structure, some nested within others), communication (the property that allows the entities to interact and learn from each other), and control (the ability to receive and respond to stimuli) (Checkland 2000). For salespeople, the emergence ability of thinking holistically, which is very close to gestalt view, is paramount (St. Clair et al. 2018). It allows salespeople to solve complex problems for their companies with consideration to multiple stakeholders.

Thinking from a gestalt perspective allows design thinkers to consider the whole ecosystem of the customer firm (Hartmann, Wieland, and Vargo 2018). Specifically, salespeople with a gestalt view will be balanced in their analysis of the

problem and give broad attention to customers, competitors, and other factors surrounding the problem. For example, if a solution can give competitive advantage for a customer but there is no difficulty in imitating it, competitors can enter the market easily. However, if the supplier considered that issue along with other constraints, the solution might look differently.

Solution providers should not have a microscopic view to the details without considering the consequences of the chosen solution. These consequences are related to both the customer and the supplier. For instance, considering the sequence of events leads to understanding the source of the problem or the behavior of the solution. Also, thinking of what caused a problem should not only be limited to one or two potential causes. The gestalt perspective allows considering all of the potential sources of the problem. It will be important to consider the short- and long-term effects of the suggested solution.

For solution provision, salespeople need a gestalt perspective to have a broad and inclusive awareness of the solution chosen to solve the business problem. Since the process of solution provision has different stages (Tuli, Kohli, and Bharadwaj 2007), and also because the solution itself is an integrative way to solve a problem, it is crucial for salespeople who sell solutions to think about the consequences of choosing a certain mix of products and services. Gestalt view, thus, is an important mindset of solutions salespeople.

H2: Gestalt view is positively related to solution provision readiness

Tolerance of ambiguity and failure

Managers value designers' mind-set that sees failure as a meaningful experiment to enable new learning as a strategy officer said: "*Prototypes allow one to fail. If you fail, you learn from it.* [We] *do experiments with the client group, it is not a bad thing, it shouldn't be regarded as a mistake.* (Yu and Sangiorgi 2018). Solving problems requires patience and tolerance with the surrounding uncertainty, in terms of missing or incomplete information, and the possibility of failure (Ulaga and Kohli 2018). Failures happen because there might be a lack of knowledge or expertise or because of ambiguity that reduces the ability to reach a solution and requires several attempts and trials. A failure such as a rejected prototype, when it occurs early in the process of solution creation, can produce important insights toward an effective solution and should be welcomed (Nakata 2020). In the B2B field, business problems are complex because more factors have roles in defining problems. Working on solutions to these problems requires a decent level of readiness to deal with the ambiguity and motivation to learn from failures (Ulaga and Kohli 2018). If the supplier offered a preliminary solution that did not solve the problem facing the customer, the supplier should be tolerant and try to fix it and re-introduce it to the customer. Otherwise, the motivation to offer a solution will be negatively affected by the faced uncertainty (Thompson and Schonthal 2020). That is, the supplier needs to be ready to experiment with new lenses and frames.

How to face failures?

The more complex the problem is, the more the ambiguity and potential failures it might lead to, the more tolerance of ambiguity and readiness to embrace and benefit from

failures it requires. Tolerance with ambiguity and failure benefits in lowering the possibility of user-customer dissatisfaction by permitting less costly and timelier adjustments (Liedtka 2015).

In the growth mindset, individuals who are motivated to learn engage in difficult behaviors at the risk of failure. On the other hand, people with a fixed mindset avoid new challenges that may prove their skills are inadequate (Dweck, 2006). Creating physical representations of the alternative prototypes can help solution providers to hold new frames in the ideation and customization processes. Further, creation of physical artifacts facilitates the solution creation process because thinking does not happen only in heads (Beckman 2020). For example, working with a designer who rapidly sketches the ideas as they are spoken out in a brainstorming group facilitates thinking of the best solution (Beckman 2020).

Non-designers need structure to feel comfortable and competent using DT because it is a huge impediment to success (Liedtka, Salzman, and Azer 2017). Risk-averse salespeople, who fear failures to begin with and believe that there is always only one solution to a problem, need a structured innovation methodology to increase their ability to incorporate design thinking's process and tools into decision-making (Liedtka, Salzman, and Azer 2017).

Importance of tolerance

A great importance of tolerance with ambiguity and failure is the focus on starting small. This can take the form of a small project or research plan or conducting an in-depth interview with a key stakeholder that can provide important insights for innovation

(Liedtka, Salzman, and Azer 2017). In contrast, trying to avoid mistakes, totally, hampers reaching innovative solutions (Carlgren, Elmquist, and Rauth 2016). Fear of failure inhibits imaginative leaps, challenging it by welcoming mistakes leads to creative solutions (Bason and Austin 2019). The importance of failures, other than they are inexpensive at the beginning, is that they open potential opportunities for success (Nakata and Hwang 2020). Salespeople working on selling solutions are expected to be able to embrace the ambiguity and be ready to learn from failures. Risks associated with engaging in selling solutions need to be also dealt with properly (Salonen et al. 2020). Moreover, trying to solve a problem by not only selling off the shelf solution but by customizing a solution that solves the customer problem without creating another problem requires iterative work that might include failures and ambiguity. However, the benefit will be much greater than the cost and difficulty.

H3: Tolerance of ambiguity and failure is positively related to solution provision readiness

Organization Interdisciplinary Collaboration

Individual design thinking expertise is not sufficient alone. The majority of employees in solution firms do not have design capabilities and do not appreciate design directions, making design-directed employees to become excluded, invited too late in the process, or offered very narrow scopes (Björklund et al. 2020). Organizations need a common culture to allow design-oriented employees to effectively practice their work and to benefit from available expertise inside the company (Björklund et al. 2020; Micheli et al. 2019). Organizations have an important role in welcoming and facilitating

fertile environment for DT, where a heterogeneity of views are embraced. In such an environment, communication should flow freely to facilitate creative work (Engel and del-Palacio 2009). An R&D manager in a Fortune 500 industrial equipment company reported: "*designers are those who make problems for us, and engineers are good problem solvers, creating then a good combination.*" (Björklund et al. 2020).

Organizational support is crucial for innovation strategies to succeed. Similarly, successful application of DT requires organizational support (Evanschitzky et al. 2012). DT solicits early divergent thinking, delays convergent thinking to later steps in the innovation process and welcomes errors as sources of learning (Bason and Austin 2019; Liedtka 2015; Nakata 2020). Boxed-in design is one of the pitfalls in applying DT in firms because it suggests that even though investments have been made into deep design individual abilities, the width of organizational design capabilities is still behind; the organization lacks a widespread understanding and willingness to use design approaches (Björklund et al. 2020). Understanding these dynamics is important for managers and for academics.

Research on DT in the context of organizations is largely absent (Nakata 2020). That is, managers have little guidance on how to adopt and utilize DT in their organizations (Micheli et al. 2012). Some managers think that training non-designers on DT alone is enough to utilize DT. However, training on DT is not enough because many non-designers return from design thinking training with enthusiasm and inspiration but fall immediately back to business as usual because of lack of support from other functions (Liedtka, Salzman, and Azer 2017).

Organizational support can take different forms. One of them is facilitating inter-functional collaboration. Collaborative work can lead to good outcomes especially if the work team comes with different perspectives and experiences (E. Randel and Jaussi 2003). Working with team members from different functions allows access to key specialized skills and expertise needed to solve problems (Steward et al. 2010). Sometimes, formalizing inter-functional collaboration is highly needed because it allows firms to establish clear rules, procedures, and instructions that guide employees' behaviors in order to lubricate cross-functional communication. DT is highly dependent on smooth collaborative work between different functions.

DT is more congruent with firms which believe that (1) new discoveries are valued over confirming what is already known and (2) collaborative experimentation is necessary for innovation (Bicen and Johnson 2015; Engel and del-Palacio 2009; Nakata 2020). Collaborative experimentation, which engages different functions in experimentation work to find the best solution, needs effective dealing with the difficulty of the task. Because DT requires the firm to be tolerant with the delay of results, allocating tasks efficiently and engaging different functions ease reaching good results (Dunne 2018). A helpful strategy to facilitate collaborative experimentation is combining it with committed coaching, in which the leadership style facilitates employees who experience distressed emotions during innovation work (Nakata 2020). As a result, trust is exchanged among innovation workers, quick experiments challenge risks, and leaders develop welfare of employees. Specialized efficiency allows different firms' functions to work together to achieve collective goals. In such a culture, efforts are directed according to employees' knowledge, experience, and skills as the bases for task allocation.

Importance for solutions' salespeople

Organizational support is important for solution salespeople because limited number of salespeople engage in solution selling without any organizational support (Salonen et al. 2020). That is because no one salesperson likely holds all the needed requisite technical knowledge and skills to perform a solution offering sales function on his or her own (Ulaga and Loveland 2014). Internal relations can substitute for salespeople's technical knowledge in terms of offering solutions of value because extensive technical knowledge is mostly needed when salespeople have few internal relations especially with R&D (Van Den Berg et al. 2014). If salespeople can rely on relevant actors within their organization to provide pertinent information about possible specifications and applications of the company's offerings, the need for technical information decreases (Böhm et al. 2020). Thus, salespeople need strong relationships with diverse members of their organization to bring the resources of their firm to bear in their selling process.

Solution salespeople are finding that it is a central part of the solution selling process to allocate their time, to spend more time with other (non-sales) team members and members of the partner/buyer firm (Ulaga and Loveland 2014). Indeed, a central aspect of DT is integrating diverse perspectives from the organization to reach the best solution (Brown 2008). Having a strong cross-functional collaboration in the firm is expected to reflect as a positive effect on salespeople with DT mindsets to motivate them to engage in the solution selling process. Further, high-quality cross-functional cooperation leads to better processing of customer information (Jaworski and Kohli

1993). Customer information can help in identifying the problem that needs to be solved and the best solution. When different functions cooperate to bring to table the most related and up-to-date information about customers and the problem at hand, wider perspectives will be considered and different frames for problem solving can emerge. Additionally, it might be a chance to validate the information that each department has. This is crucial especially if there is a shortage and/or fallacy in the information that the most related functions to the solution provision (e.g., sales) have on file. The customer and the solution salesperson will benefit more from information integration that will help and speed up the solution provision.

Organization's moderating role on abductive thinking's effect on solution finding

Abductive thinking skill of salespeople, when designing a solution, can be enhanced by collaboration with other departments. The collaboration opens up a network resource of different suggested explanations and ways of doing things, will increase likelihood of accepted solutions and assumptions being challenged. Also, it will emerge when reframing the problem using new knowledge that would not be gained without collaborating with other departments. Collaboration with members from other departments can open the horizon on ideas about previous actions that helped in solving related problems and helps to answer questions that require specialized expertise. For example, in a cross-functional team that has a member from the IT function, thinking of a consequence of a specific solution, from an IT perspective, is easier because the expert is present. The availability of the expert will help to answer questions of the team as soon as they are raised, leading to fruitful collaboration and faster reach to the solution. Thus, the limits will be open to "makes creative leaps without tethers" (Nakata and Hwang 2020;

p.118). Also, specific assumptions of the limits of the ability to offer a solution can hinder the abductive thinking of salespeople. For instance, if the salesperson is trying to solve a problem of a customer but to think abductively there is information that if known will help to take a specific direction. However, without being around members from related departments, thinking abductively will be limited. For the previous reasons, I believe that organizational cross functional collaboration will positively enhance the positive relationship between solutions' salespeople's abductive thinking ability and solution provision readiness.

H4a: Organizational interdisciplinary collaboration positively moderates the effect of abductive reasoning on readiness to provide solutions

Moderating role on gestalt view

Gestalt view indicates the overall perspective of thinking of something. Cross-functional team-work enables the acknowledgment of multiple stakeholders and contingencies, a very basic premise of the gestalt view (Micheli et al. 2019). To be able to solve a problem effectively, it is important to consider the antecedents and consequences that affect a problem (Beverland, Wilner, and Micheli 2015). Also, how the parts of the problem work together and are connected should be in mind in order not to overlook an important part that might create future problematic issues. Joining employees from different functions in the organization when solving a problem allows each employee to understand others' perspectives and what they consider when making important decisions. This cooperative work will help create the gestalt overall picture of how the functions and features will fit together, van fit together in delivering a new

solution. Order processing, warehouse pick and packing, shipping and delivery all work together to increase order-delivery cycle unreliability. It is the entire order-delivery process that must be considered, not individual elements.

Working with teams from different departments will enhance salespeople's gestalt view's effect on readiness to sell solutions. The process of selling a solution has different stages that need knowledge about different players in the process (e.g., the customer, competitors, etc.) and require continuous support of different functions of the firm. For example, the relation between the sales and procurement functions during the solution's selling is crucial because customizing a solution to a customer might require purchasing specific material or equipment. Without arrangement with related functions to approve the needed, solution creation and selling projects will be hindered. Thus, the interdisciplinary collaboration is believed to have a positive effect on enhancing the gestalt view of the salespeople, an effect that will increase their readiness to sell solutions.

H4b: Organizational interdisciplinary collaboration positively moderates the effect of gestalt view on readiness to provide solutions

Moderating role on tolerance of ambiguity and failure

Tolerance of ambiguity and failure will be strengthened by collaboration with teams from different departments. Working with cross-functional teams increases the likelihood to think differently about problems and helps to have access to different sources of knowledge and expertise because the iterative cycle of trial and error helps to define and address the problem (Adams et al. 2011). Collaborative work helps convert

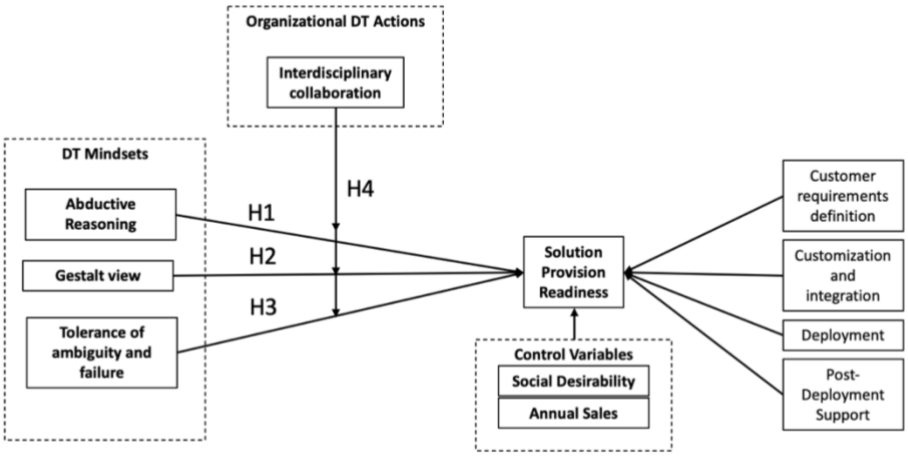
many aspects of ambiguity into identifiable, understandable, and solvable problems (Walker, Davis, and Stevenson 2017). When there is healthy genuine collaboration there will be greater acceptance of collective responsibility for failure rather than finger pointing blaming that make failure a very negative outcome for an individual or group. It increases tolerance of another functions failure to deliver and more positive and productive postmortems that get to what went wrong and how to avoid it again in the future. This further increase the collective, collaborative learning from failure. Solution salespeople can benefit much from interdisciplinary collaboration also in seeing that other employees from different functions also can make mistakes and failures.

Interdisciplinary collaboration can mitigate salespersons' risk perceptions of the difficulty of reaching a solution that addresses the customer's need (Salonen et al. 2020). The risk perception can be the result of the inability to overcome the uncertainties surrounding the problem and the solution (Ulaga and Kohli 2018). Salespeople might find it difficult to reach a clear identification of the customer's problem. This ambiguity will put the salesperson in a difficult situation when communicating the business need of the customer to the related functions of the organization. Working with other minds inside the organization opens the doors for new ideas that can be helpful when solving the issue at hand. As a result, interdisciplinary collaboration is expected to benefit solution salespeople by allowing them to be tolerant with the uncertainty and ambiguity that might arise during the solution selling process. Specifically, the salesperson might need an answer to a technical question of the customer. Failing to answer the question will put the salesperson in a difficult situation because of the probability to fail to offer an answer that might reach eventual failure to create a solution and close the sale. Thus,

salespeople working with team members from different functions to solve customer problems are expected to become more tolerant of ambiguity and failure.

H4c: Organizational interdisciplinary collaboration positively moderates the effect of tolerance of ambiguity and failure on readiness to provide solutions.

Figure 3 Conceptual Model



Summary

This chapter discussed DT, its importance in the innovation world and specifically in solution selling. Some of the DT's common methodologies were also presented in this chapter. Additionally, in this chapter the research hypotheses were developed after discussing the importance of DT to solutions salespeople and how the integration of both the individual level mindsets with the organizational level support action is very important for the success of DT in the organization. The next chapter is going to explain the research methodology that will be used to test the hypotheses developed in this chapter.

CHAPTER 5: RESEARCH METHODOLOGY

The goal of this chapter is to outline the method used to empirically test the conceptual model and hypotheses developed in Chapter 4. One study is designed to test the conceptual model and hypotheses. The study is a cross-sectional survey of business-to-business salespeople in the U.S. The research design, sampling procedures, measurement, data collection, and statistical analyses are discussed next.

Design

The study is a cross-sectional, self-reported, online survey of B2B salespeople in the U.S. Cross-sectional studies help to establish correlation among variables' measures. This is a very helpful first step for early-stage research (Spector 2019). In general, the main objective of this study is to determine if there is a significant relationship between the variables studied, specifically individual (abductive reasoning, gestalt view and tolerance of ambiguity and failure) and organizational (interdisciplinary collaboration) dimensions of Design Thinking and their relationship with Solution Provision Readiness (SPR).

Sample

A sample of B2B salespeople was drawn from the Qualtrics Premium Business Panel that verifies the professional identity of panel members. The panel's quality system certifications and programs including ISO 20252 management system certification and Mktg Inc., Media Ratings certification. Qualtrics contacted a panel of salespeople from a variety of industries (i.e., manufacturing and distribution B2B sales, Healthcare B2B sales, High tech (software/hardware) B2B sales). A cross-industry sample enhances the external validity of the findings (Maignan and Ferrell 2001). Participants were paid to

complete the survey that took between 10-20 minutes to complete. The respondents were required to answer every question thus eliminating the problem of missing observations.

For Structural Equation Modeling (SEM), it is suggested that a sample size of 100 is the minimum for the model's analysis, yet it is also recommended that researchers should target more than 200 observations (Bagozzi and Yi 2012). Because of that, I aimed to collect at least 250 completed questionnaires. Qualtrics offered us extra participants free of charge; the final sample size was 288 completed questionnaires.

Screening questions were used at the beginning of the questionnaire to make sure that the sample is representative of the study (i.e., they are part of salesforce who report to sales manager and they sell customized solutions). Respondents who did not match the screening criteria (n=703) in a screening question were filtered out from the beginning.

The sample was salespeople from multiple industries (Table 3). 41.7% of the respondents' age was between 35-45 years and 75.5%of the respondents were men. Most of the sample (26.7%) work in Information Systems, Software, and other High-Tech sectors. Approximately 45% of the respondents reported that they have earned a master's degree and 26.4% of the sample work in companies with $100-$500 million annual sales.

Table 3 Sample information

Business Sector	**%**	**Annual Sales**	**%**	**Gender**	**%**	**Education Level**	**%**	**Age**	**%**
Healthcare	5.6	Under $5 million	17.4	Male	75.7	Less than high school	.3	18 - 24	2.1
Education	7.3	$5-10 million	16.7	Female	24.3	High school graduate	8.0	25 - 34	15.6

Financial and Professional Services	20.1	$11-$50 million	24.0		Associate degree	7.6	35 - 44	41.7
Information Systems, Software and other High Tech	26.7	$50-$100 million	11.8		College degree	39.2	45 - 54	14.2
Manufacturing and Distribution	21.9	$100-$500 million	26.4		Master's degree	44.8	55 - 64	12.5
Primary Production, Agriculture, Construction, Mining, Energy	3.5	I am not sure	3.8				65 - 74	13.2
Other	14.9						75 - 84	.7

Measures

In this study, all variables are measured using multi-item scales that have been adapted from previous studies (see Table 4). A pretest was conducted to make sure that the measures were worded clearly. Fifty-nine MBA students completed the survey and were asked to provide any suggestions if any of the items were unclear. None of the respondents stated that the questions were unclear. Additionally, they were instructed to leave the question blank if it was not clear. Out of the whole survey, only five participants have left five questions blank. This indicates also that the questions were clear and ready to be used in the main survey.

Table 4 Instrument

Construct	Items
Abductive reasoning (Nakata and Hwang 2020) 7 points Likert scale	1. I push the boundaries of possible product or service ideas 2. I go beyond immediately observable solutions 3. I ask "what if" questions to discover new ideas 4. I challenge "what is" or assumed in pursuit of novelty

(1= Strongly disagree; 7=Strongly agree)	
Gestalt view (Choi, Koo, and Choi 2007) 7 points Likert scale (1= Strongly disagree; 7=Strongly agree)	1. The whole, rather than its parts, should be considered in order to understand a phenomenon. 2. It is more important to pay attention to the whole than its parts. 3. The whole is greater than the sum of its parts. 4. It is more important to pay attention to the whole context rather than the details. 5. It is not possible to understand the parts without considering the whole picture. 6. In explaining how one phenomenon causes another you have to consider how all the parts of the phenomenon combine together to create causality.
Tolerance of ambiguity and failure (Nakata and Hwang 2020) 7 points Likert scale (1= Strongly disagree; 7=Strongly agree)	1. I am tolerant with failures because they lead to new insights 2. I believe that better solutions come faster by permitting failure 3. I welcome mistakes because I can learn how to avoid them in the future. 4. I do not fear punishment for my mistakes in pursuing innovation 5. Making mistakes is part of taking risks
Interdisciplinary collaboration (Moon 2013) 7 points Likert scale (1= Strongly disagree; 7=Strongly agree)	1. My company has good connections between sales and other departments 2. In my company, interdepartmental collaboration is well organized 3. My company has a strong interdepartmental collaboration culture 4. I can call folks in development and they will get back in touch with me pretty much immediately. 5. Communication breakdown in my company can cause failure in new product/service development
Solution provision Readiness (Panagopoulos, Rapp, and Ogilvie 2017) 7 points scale (1= Not ready at all; 7=Very well ready)	The following statements refer to some activities done during the process of selling a solution to customers. We mean by solution a customized mix of goods and services that solve a customer problem. We are interested in understanding your READINESS to undertake these actions. A. Customer requirements definition 1. Develop a deep understanding of customer needs. 2. Develop a deep understanding of the broader objectives of customer firms. 3. Able to ask the right questions to identify customer needs. 4. Develop a deep understanding of customer firms. 5. Develop a deep understanding of the goods/services customers buy from other suppliers. B. Customization and integration 1. Designing goods and services that can work together as a solution. 2. Modifying goods and services so that they can work together as a solution. 3. Selecting goods and services that can work together as a solution. C. Deployment 1. Personally, taking care of the quick delivery of the proposed solution.

	2. Personally, monitoring the installation of the proposed solution. 3. Knowing the capabilities of the users of the proposed solution. 4. Providing customers with the necessary information about the solution D. Post-deployment support 1. Keeping customers updated about new developments after solution implementation. 2. Staying available after solution implementation. 3. Maintaining a continues dialogue with customers after solution implementation. 4. Calling on customers after solution implementation to verify that their needs have been met.
Social desirability/self-presentation bias scale (Ray 1984) 7 points Likert scale (1= Strongly disagree; 7=Strongly agree)	1. Have you sometimes taken unfair advantage of another person? 2. I am quick to admit making a mistake. 3. Do you sometimes try to get even rather than forgive and forget? 4. I am always courteous, even to people who are disagreeable? 5. I am always a good listener, no matter who I am talking to?
Screening Questions	I am part of a salesforce and I report to a sales manager 1. Yes 2. No
	I sell products and services to companies that require: 1. No customization, they are off-the-shelf products and services 2. Some customization 3. A lot of customization to meet the unique requirements of the customer 4. I am not in sales
Business Sector	Which of the following economic sectors do you mostly work in? 1- Healthcare 2- Education 3- Financial and Professional Services 4- Information Systems, Software and other High Tech 5- Manufacturing and Distribution 6- Primary Production, Agriculture, Construction, Mining, Energy 7- Other, please specify
Annual sales	Total sales of your company are: 1. Under $5 million 2. $5-10 million 3. $11-$50 million 4. $50-$100 million 5. $100-$500 million 6. I am not sure

Independent variables

The independent variable Design Thinking (DT) is at the individual salespeople level. On a 7 points scale, salespeople answered questions about abductive reasoning

(AR), gestalt view (GV), and tolerance of ambiguity and failure (TAF). The question prompt was: "Please indicate the extent to which you disagree or agree with the following" (1= Strongly disagree; 7= Strongly agree).

Abductive reasoning measure is adapted from (Nakata and Hwang 2020). This measure captures salespeople's ability to think outside the available constraints to generate ideas for solutions. Additionally, this measure speaks about the ability to challenge "what is" conditions and actively think about "what if".

Gestalt view's scale (Choi, Koo, and Choi 2007) measures the mindset of considering the whole picture instead of the small parts. Also, unless the overall view and surrounding contexts are considered, the small parts of the problem and building blocks of the solution cannot be integrated effectively.

Tolerance of ambiguity and failure measure is adapted from the work of Nakata and Hwang (2020). The measure speaks about the ability to learn from mistakes. Learning from mistakes is not possible unless there is tolerance for ambiguity and possible failures.

Dependent variable

Solution provision readiness (SPR) was adapted from the solution involvement scale (Panagopoulos, Rapp, and Ogilvie 2017). Specifically, the solution involvement scale captures the activities during the solution selling process. SPR's question prompt is "Please rate yourself relative to salespeople from companies that are directly competing with you in your *readiness* to offer solutions to the same customers, who are trying to solve a problem they face by acquiring a solution from your company, in terms of the

following activities". The SPR concentrates on the anteceding variable to solution involvement. SPR will be a second-order factor that encompasses the same dimensions of solution involvement, which are (1) customer requirement definition, (2) customization and integration, (3) deployment, and (4) post-deployment support (Panagopoulos, Rapp, and Ogilvie 2017).

Moderating variable

The interdisciplinary collaboration scale, adapted from (Moon 2013), measures formal and informal collaboration between sales teams and other departments, specifically product development. Also, it asks about the organization of these teams and whether the organization, in general, has a collaboration culture. On a 7-points Likert scale (1=strongly disagree; 7=strongly agree), the question is "Please indicate the degree of your agreement with each of the following statements".

Control variables

Control variables that are used in the study are social desirability and annual sales. Firstly, social desirability was found to bias responses by placing oneself in a favorable position or deny unaccepted traits (Nederhof 1985). The tendency of individuals to provide what they believe to be socially acceptable responses is a potential problem with many studies especially for survey research (Valentine and Barnett 2003). Also, because of the general tendency of different corporations to claim to apply some organizational level best practices (e.g., interdisciplinary collaboration) (Cankurtaran and Beverland 2020), it is important to study the behavior of the social desirability scale not only with the individual level variables (design thinking mindsets and solution provision readiness),

but also with the moderating variable (interdisciplinary collaboration). In order to find out if the propensity toward providing socially desirable responses was correlated with any of the variables of interest in this study, a five-item version of the social desirability scale is used (Ray 1984). Responses were mean centered after recoding the reverse items so that higher values indicate high social desirability. The values of this scale measure ranged from one to seven.

The second control variable is the company's annual sales (in millions). Greater annual sales might hinder the application of DT because of the size of the company. It is easier for salespeople to cooperate with other departments for DT in a smaller company than large ones. Smaller firms tend to have fewer customers, fewer salespeople and sales managers, and less resistance to innovation (Cross et al. 2001).

Statistical Analyses

The purpose of this section is to provide an overview of the statistical analyses used to test the conceptual model. First, I assessed the reliability of the measurement scales. Then, I used both Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) to evaluate the common method bias. Next, I employed structural equation modeling (SEM) using MPlus 8 to test the research hypotheses. Because of the difficulty in testing the relationship between all of the latent variables, additional analysis was conducted using SPSS 27.

Preliminary analyses

Preliminary analyses were conducted to test for reliability, validity, and common method bias. Reliability is defined as "the extent to which results are consistent over time

and an accurate representation of the total population under study and if the results of a study can be reproduced under a similar methodology, then the research instrument is considered to be reliable" (Golafshani 2003, p. 598). The current research uses multi-item measures. To assess the internal consistency reliability of the scales, I calculated Cronbach's coefficient alpha (Cortina 1993; DeVellis 1991). An acceptable value for Cronbach's alpha is .70 and above (Hair 2009). All of Cronbach's alpha coefficients are 0.83 and above, this shows that the scales have acceptable reliability. The results of all Cronbach's alpha are provided in Table 5.

To begin with, the correlation between social desirability and the independent, dependent and moderating variables were tested. This step is crucial before the beginning of the SEM analysis in order to remove the variance caused by social desirability variable, given that social desirability had been found to cause problems with many studies especially for survey research (Valentine and Barnett 2003). It was found that there is no significant correlation between social desirability and the independent and moderating variables ($ps>0.05$). However, there is a significant positive correlation between social desirability and the dependent variable ($r = 0.304$, $p<0.01$). This indicates that it is important before delving to fitting the SEM model and testing the hypotheses to remove the biased variance in the DV explained by social desirability. This is done by first regressing the SDe scale to each individual element of the DV's scale (SPR: 15 items). Second, each residual coefficient is saved. And third, the DV scale is composed of these residuals. Table 5 shows the correlations after removing the variance caused by SD from SPR.

Table 5 Means, Standard Deviations and Correlations

			Correlations					
	Mean	SD	**SDe**	**AR**	**GV**	**TAF**	**IC**	**SPR**
Social Desirability (SDe)	5.00	0.97	1.000					
Abductive Reasoning (AR)	5.64	1.07	-0.077	1.000				
Gestalt View (GV)	5.59	1.00	-0.065	0.766*	1.000			
Tolerance of Ambiguity and Failure (TAF)	5.53	1.11	-0.050	0.676*	0.765*	1.000		
Interdisciplinary Collaboration (IC)	5.64	1.06	0.076	0.651*	0.729*	0.667*	1.000	
Solution Provision Readiness (SPR)	5.92	0.91	0.000	0.746*	0.742*	0.663*	0.791*	1.000

*p<0.01, **p<0.05

As expected, the DT variables correlate positively with each other and with the SPR variable. Because the sample was of solution salespeople who are already in the business of customizing solutions for customers, it is expected that they might have some of the DT's mindsets because of the nature of customization and integration they are already in. Because of that, there is a strong correlation between these variables. For example, AR correlates positively with SPR (r = 0.688) and also GV correlates with SPR (r = 0. 742). Previous research has established a close correlation between DT dimensions and New Product and Service Performance (NPSP) (Nakata and Hwang 2020). For example, Nakata and Hwang (2020) found that the correlation between AR and NPSP was (r = 0.66) and between AR and Ideation was (r = 0.74).

The other control variable, annual sales either did not have significant correlation ($p > 0.05$) with the IVs and the DV or had minimal correlation ($r < 0.2$) with these variables, which means that annual sales does not cause significant issue with the other variables. Henceforth, this variable was dropped from the analysis.

Common method bias

Common method bias exists when the differences in participant responses are a function of the instrument rather than the participants' actual feeling (Wu et al. 2020). Harman's one-factor test was used to assess common method bias If the principal component extracted was explained more than 50% of the variance, common method bias might be an issue in the instrument (Podsakoff et al. 2003). The first principal component explained 45.53% of the variance, which is lower than 50% of the total variance, indicating that the likelihood of common method bias is low.

We also used confirmatory factor analysis (CFA) to test for common method bias (Podsakoff, MacKenzie, and Podsakoff 2012). The overall fit of the model can be evaluated based on Chi-square, root means square error approximation (RMSEA), and comparative fit index (CFI).

The CFA results displayed in Table 6 show that the fitting result of the nine-factors model, in which each of the independent and dependent latent factors are composed separately (χ^2/df = 1.45, CFI = 0.973, TLI = 0.963, SRMR = 0.043, RMSEA = 0.040) was better than the one factor model in which all of the items are loaded on one factor (χ^2/ df = 12.85, CFI = 0.793, TLI = 0.780, SRMR = 0.063, RMSEA = 0.095). That is because CFI and RMSEA of the nine factors model are greater than 0.9 and less than 0.06 respectively (Hu and Bentler 1999). Together, the two tests, Harman's one-factor test and CFA, suggest that the potential for common method bias is minimal (Wu et al. 2020).

Table 6 Models' comparison

Model	$\boldsymbol{\chi^2/df}$	**CFI**	**TLI**	**SRMR**	**RMSEA**
One factor	12.85	0.793	0.780	0.063	0.095

Nine factors	**1.45**	**0.973**	**0.963**	**0.043**	**0.040**

I examined the items' loadings from the CFA results to find out the convergent validity of the measures (Table 7). All the items loaded onto their intended latent variable and exceeded the recommended cutoff point 0.4, providing evidence of convergent validity (Hair 2009; Hinkin 1998). The average variance extracted (AVE) coefficients helps to judge discriminant validity for constructs. For all the constructs, AVE is greater than the suggested threshold of 0.5 (Fornell and Larcker 1981). This indicates that discriminant validity is also established.

Table 7 CFA, AVE, CR, and Cronbach's alpha results

Construct/Items	**# items**	**Factor loading**	**AVE**	**Composite reliability**	**Cronbach's Alpha**
Abductive Reasoning (AR) *(1strongly disagree, 7 strongly agree)*	4		0.660	0.886	0.83
I push the boundaries of possible product or service ideas		1.000			
I go beyond immediately observable solutions		0.860			
I ask "what if" questions to discover new ideas		1.012			
I challenge "what is" or assumed in pursuit of novelty		1.076			
Gestalt View (GV) *(1strongly disagree, 7 strongly agree)*	6		0.568	0.887	0.85
The whole, rather than its parts, should be considered in order to understand a phenomenon.		1.000			
It is more important to pay attention to the whole than its parts.		0.988			
The whole is greater than the sum of its parts.		1.030			
It is more important to pay attention to the whole		1.104			

context rather than the details.					
It is not possible to understand the parts without considering the whole picture.		0.780			
In explaining how one phenomenon causes another you have to consider how all the parts of the phenomenon combine together to create causality.		0.962			
Tolerance of Ambiguity and Failure (TAF) *(1strongly disagree, 7 strongly agree)*	5		0.652	0.903	0.86
I am tolerant with failures because they lead to new insights		1.000			
I believe that better solutions come faster by permitting failure		1.025			
I welcome mistakes because I can learn how to avoid them in the future.		1.162			
I do not fear punishment for my mistakes in pursuing innovation		0.931			
Making mistakes is part of taking risks		0.874			
Interdisciplinary Collaboration (IC) *(1strongly disagree, 7 strongly agree)*	5		0.654	0.904	0.86
My company has good connections between sales and other departments		1.000			
In my company, interdepartmental collaboration is well organized		1.115			
My company has a strong interdepartmental collaboration culture		1.145			
I can call folks in development and they will get back in touch with me pretty much immediately.		1.089			
Communication breakdown in my company can cause failure in new product/service development		0.978			

Customer Requirement Definition (SPR-CRD) *(1strongly disagree, 7 strongly agree)*	5		0.685	0.916	0.88
Develop a deep understanding of customer needs.		1.000			
Develop a deep understanding of the broader objectives of customer firms.		1.021			
Able to ask the right questions to identify customer needs.		1.043			
Develop a deep understanding of customer firms.		0.931			
Develop a deep understanding of the goods/services customers buy from other suppliers.		1.058			
Customization and Integration (SPR-CI) *(1strongly disagree, 7 strongly agree)*	3		0.768	0.908	0.85
Designing goods and services that can work together as a solution.		1.000			
Modifying goods and services so that they can work together as a solution.		1.221			
Selecting goods and services that can work together as a solution.		1.237			
Deployment (SPR-DEP) *(1strongly disagree, 7 strongly agree)*	4		0.710	0.907	0.86
Personally, taking care of the quick delivery of the proposed solution.		1.000			
Personally, monitoring the installation of the proposed solution.		1.075			
Knowing the capabilities of the users of the proposed solution.		1.144			
Providing customers with the necessary information about the solution		1.113			
Post Deployment Support (SPR-PD) *(1strongly disagree, 7 strongly agree)*	4		0.705	0.905	0.86

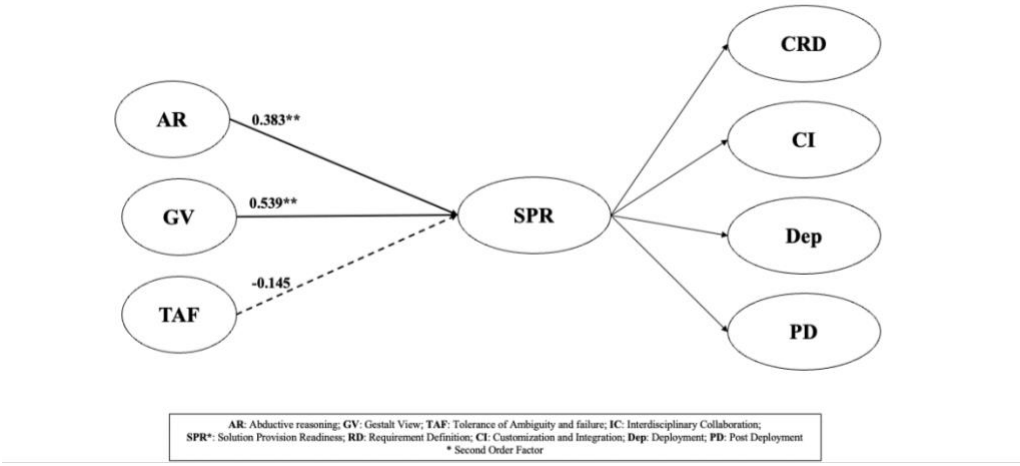
Keeping customers updated about new developments after solution implementation.		1.000			
Staying available after solution implementation.		0.910			
Maintaining a continues dialogue with customers after solution implementation.		1.183			
Calling on customers after solution implementation to verify that their needs have been met		1.024			
Solution Provision Readiness (SPR)	4		NA	NA	NA
Second Order Latent Variable					
Customer Requirement Definition (SPR-CRD)		1.000			
Customization and Integration (SPR-CI)		0.924			
Deployment (SPR-DEP)		0.988			
Post Deployment Support (SPR-PD)		0.978			

Structural Model

As a preliminary analysis a main effects model was fitted to SPR. The overall structural model's χ^2 value was 674.269 with 465 degrees of freedom ($p < .001$). CFI and RMSEA were 0.973 and 0.040, respectively. These two indices suggest that the structural model has an acceptable fit with the data (Hu and Bentler 1999).

AR and GV have significant main effects on SPR. As shown in Figure 2, AR significantly predicts SPR (β=0.383, p<0.01) and also GV significantly predicts SPR (β=0.539, p<0.01). However, TAF fails to significantly predict SPR (β=-0.145, *ns*).

Figure 4 Main Effect Results



When the moderating variable IC is introduced in the analysis, the results show that IC has a suppressor effect on both GV and TAF. That is because both GV and TAF have significant positive correlation with SPR, but when IC is introduced in the SEM model, GV and TAF's influence on SPR changes to be negative.

Figure 5 Hypotheses Test Results

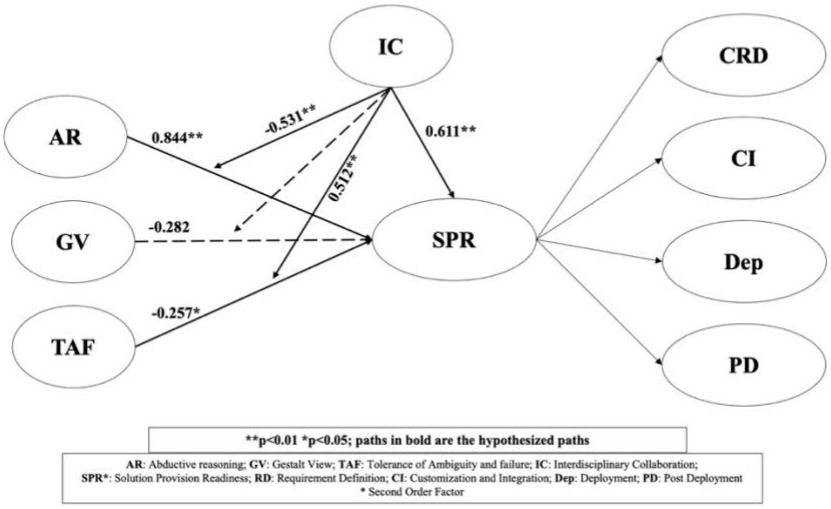


Table 8 SEM Hypotheses Testing Results

Hypothesis	**Path**	**β**	**p-value**
H1	AR → SPR	0.844	0.000
H2	GV → SPR	-0.282	0.141
H3	TAF → SPR	-0.257	0.017
H4a	AR x IC → SPR	-0.531	0.000
H4b	GV x IC → SPR	NA	NA
H4c	TAF x IC → SPR	0.512	0.000
Hypothesized path			
	IC→SPR	0.611	0.000

The switch to a negative coefficient of the relationship between TAF and SPR from the positive simple correlation means that IC contributed to the GV and TAF measure's negative relationship with SPR by suppressing variance in the GV and TAF measure (Tabachnick & Fidell, 2001). In other words, adding the IC variable to the model suppresses the effect of GV and TAF on SPR.

This suppression occurs when an important predictor variable, necessary in understanding the true relationship between the latent variables, suppresses the effect of another predictor variable (Falk & Miller, 1992). It is recommended that suppressor effects that inflate the explained variance of the model and suggest a negative relationship, when it is in fact positive, be removed and the analysis is conducted again (Akinwande. Dikko and Samson 2015; Smith, Ager and Williams 1992). From the preliminary analysis when you remove the IC moderating effect, the effect of GV is significant and positive. The effect of TAF in not.

Hypotheses testing results

In H1, I hypothesized that salesperson abductive reasoning will be related positively to salesperson solution selling readiness. The results show that this hypothesis is supported (β=0.844, p<0.01). In H2, I hypothesized that gestalt view will be related positively to salesperson solution selling readiness. The main effect result supports H2. It cannot be supported or rejected in the full moderation model because IC's moderation has a suppressor effect on GV.

In H3, I expected a positive relationship between tolerance of ambiguity and failure and salesperson solution selling readiness. It was not supported in the main effects model and because of a suppressor effect of IC on TAF could not be tested in the full model. TAF was found to negatively affect SPR (β= -0.257, p<0.05), even though the simple correlation between TAF and SPR were positive (see Table 5, simple correlations).

H4a posits that interdisciplinary collaboration will positively moderate the relationships between abductive reasoning and solution provision readiness. Results

show that this path is significantly negative and thus the hypothesis is not supported (β= -0.531, p<0.01). An explanation for this unexpected result is presented in chapter 6. H4b and H4c, the predicted positive moderating effect of IC on the GV and TAF influence on SPR could not be tested because of the observed suppression effects.

Table 9 Final Hypotheses Testing Results

Hypothesis	**Path**	**β**	**p-value**	**Support**
H1	AR → SPR	0.844	0.000	Yes
H2	GV→ SPR	0.539	0.000	Yes
H4a	AR x IC → SPR	-0.531	0.000	No
Unhypothesized path				
	IC→SPR	0.611	0.000	NA

Post Hoc analysis

In this section, AR and GV and the moderating variable IC and its interaction will be tested as antecedents of SPR using a different analysis method, namely stepwise regression. The main reason of conducting this analysis here is to confirm the SEM analysis and to study the percentage of variance of the dependent variable (SPR) explained, as SEM does not provide this model fit parameter.

All of the individual difference variables (AR, GV and TAF) were significantly correlated with SPR (Table 5). To establish how they sequentially and collectively influenced the dependent variable, a stepwise multiple regression was undertaken. AR was the first to enter with adjusted R^2 = 0.55 (55% of variance explained). Then GV entered the model, adding 0.070 (7%) of incremental explained variance. Finally, TAF

was the last to enter explaining additional 0.008 (less than one percent) of the variance. Table 10 shows the last step of the stepwise regression analysis. The total variance explained is 63.1% and as with the SEM, AR is the dominant antecedent.

Table 10 Last Step of Stepwise Regression Analysis Results

Dependent measure: SPR			
	β	**t**	**p**
AR	0.325	6.981	.000
GV	0.284	4.984	.000
TAF	0.113	2.525	.012
Adjusted R^2	**0.631**		

Adding the moderating variable IC to the model changes the results. Using the same stepwise regression analysis the first variable to enter is IC with adjusted R^2 = 0.624. Then AR enters, with R^2 change of 0.093. The last variable to enter is GV with R^2 = 0.007. In this model, TAF did not explain significantly any additional variance. Table 11 shows the results of the stepwise regression analysis. This model could explain 72.3% of the variance of the DV.

Table 11 Stepwise Regression Results After Adding the Moderator

Dependent measure: SPR			
	β	**t**	**p**
IC	0.385	10.117	.000
AR	0.265	6.582	.000
GV	0.130	2.725	.007
Adjusted R^2	**0.723**		

Next is the test of the moderating effect of IC on the significant predictors of the DV. Adding the interaction term in the regression model reveals that all of the variables

significantly predict the variance of SPR. Table 12 shows the results of this regression analysis.

Table 12 Final Regression Results

Dependent measure: SPR			
	β	**t**	**p**
AR	0.230	5.415	.000
GV	0.142	2.966	.003
IC	0.416	10.281	.000
AR*IC	-0.099	-2.398	.017
GV*IC	0.114	2.577	.010
Adjusted R^2	**0.727**		

These results indicate that AR dominates the individual level DT mindsets. However, IC dominates the individual level factors. Notice also that both GV and the moderating effect of IC on GV's effect are positive. Implications of these results will be discussed in the next chapter.

Summary

This chapter has covered the research method of the dissertation. What are the variables studied, which scales were used to operationalize the constructs and the hypotheses analyses. It also presented the model fitting results. The next chapter will discuss these results, list some of the theoretical and managerial contributions and some of the research limitations and future research ideas.

CHAPTER 6: DISCUSSION

The purpose of this chapter is to discuss the research results and implications. Following a discussion of theoretical and managerial implications, the chapter concludes with limitations and future research directions.

Discussion of Results

The effect of AR on SPR

The results show that the main individual level driver of solution provision readiness (SPR) is abductive reasoning (AR). From the correlations table below (Table 13), it becomes clearer that asking "what if" questions (AR3) is the most correlated item of the AR scale with SPR. This helps salespeople understand that in order to be ready to provide solutions to business customers, thinking about new ideas by posing "what if we did this" or "what if we did that" questions to customers helps salespeople to provide solutions to customers.

The second most correlated item of AR with SPR is that "I challenge "what is" or assumed in pursuit of novelty (AR4). This item is related to the first item. Managers need to understand that their salesforce, who are selling solutions, need to welcome and be ready to work with situations which require thinking of out of the box ideas. In general, AR allows salespeople to think outside the available constrains and offer solutions with the limited information they have on hand even if there are not enough information.

Table 13 Simple Correlation Between AR items and SPR

	(AR1)	(AR2)	(AR3)	(AR4)
I push the boundaries of possible product or service ideas (AR1)	1.00			

I go beyond immediately observable solutions (AR2)	0.548	1.00		
I ask "what if" questions to discover new ideas (AR3)	0.482	0.490	1.00	
I challenge "what is" or assumed in pursuit of novelty (AR4)	0.538	0.570	0.649	1.00
Solution Provision Readiness (SPR)	0.447	0.531	0.654	0.615

How managers can develop the ability of thinking abductively when selling solutions is, thus, important for managers to consider. Here, I will offer some suggestions. First of all, managers should understand that AR is an important antecedent of SPR. This will encourage managers to teach their salesforce the language of "what if?" and limit the use of the language of "what is". For example, if one of the salespeople is working with a customer to define their need, the manager needs to actively guide the salesperson to discuss situations that might work with them such as what if we did this and what if we did that. The communication language (i.e., in terms of "what if?" vs "what is") between the salesperson and sales manager and its effect on AR ability of salesperson thus needs further research.

Secondly, managers need to consider abductive thinking when evaluating their salespeople. That is, the more the salesperson comes with ideas that are new and out of the box, the higher the rating of him/her. This emphasizes the importance of control system that the manager adopts. One of the control systems is capability control (Katsikeas et al. 2018), in which managers evaluates their salespeople based on the provided training and guidance aimed to develop and improve a salesperson's skill sets and abilities. Guiding salespeople in the solution selling process can be used when evaluating them later. This guidance and evaluation are expected to have a positive future impact on the performance of salespeople.

Notably, the effect of AR on SPR is negatively moderated by interdisciplinary collaboration (IC). The results suggest that the effect of AR on SPR declines as IC increases. Put differently, the positive relationship between salespeople's AR and their beliefs about their SPR increases and is more important when communication and collaboration are such that other functions (especially R&D) cannot be relied on to deliver their AR as support to the salespeople out there in the field. My hypothesis was that the AR-SPR relationship would be stronger when communication and collaboration is high because this increases the prospects of AR-SPR success.

A hypothesis I did not sufficiently consider beforehand was that if communication and support is poor then the salesperson's own personal AR skills will have to be relied on in their SPR, rather than R&D engineers' AR. Thus, the personal AR's ability of the sales rep will become a more important determinant of success and thus salespeople's self-reported AR as measured above is a more important driver of beliefs about readiness to engage in solution finding.

This is an ex-ante, after the fact insight. The fact that the perceived IC has a direct effect on salespeople's self-reported readiness to provide solution is reassuring because the perception that other departments will collaborate and that they would have the salespeople's back will increase readiness. So, for organizations with strong collaboration, managers have less of a need to choose salespeople who have high AR ability because this ability will be provided by other departments. However, when there is low collaboration in the organization, the importance of self-reported AR in determining solution selling readiness increases.

The full SEM analysis leads to the conclusion that when IC is strong the salesperson feels better prepared to solution sell and the strong IC weakens the relationship between AR and SPR, When it is weak IC increases the relationship between salesperson AR and SPR.

The effect of GV on SPR

From the regression analysis, GV had a positive relationship with SPR. Looking deeper into the correlation matrix between the GV items and SPR shows that considering the whole of a phenomena rather than its parts (GV1) has the largest effect on SPR. Secondly comes the item (GV6), which is: in explaining how one phenomenon causes another you have to consider how all the parts of the phenomenon combine together to create causality. These two items shows that salespeople who consider the whole picture of things they encounter have higher readiness to provide solutions.

Table 14 Simple Correlation Between GV Items and SPR

	GV1	**GV2**	**GV3**	**GV4**	**GV5**	**GV6**	**SPR**
The whole, rather than its parts, should be considered in order to understand a phenomenon. (GV1)	1.000						
It is more important to pay attention to the whole than its parts. (GV2)	0.512	1.000					
The whole is greater than the sum of its parts. (GV3)	0.563	0.546	1.000				
It is more important to pay attention to the whole context rather than the details. (GV4)	0.491	0.652	0.517	1.000			
It is not possible to understand the parts without considering the whole picture. (GV5)	0.451	0.304	0.418	0.370	1.000		
In explaining how one phenomenon causes another you have to consider how all the parts of the phenomenon combine together to create causality (GV6)	0.527	0.425	0.567	0.407	0.424	1.000	
Solution Provision Readiness (SPR)	0.657	0.489	0.575	0.530	0.500	0.615	1.000

The above-mentioned results help managers to guide their salespeople to avoid not seeing the forest for all the trees. Salespeople should always understand the

customers' overall situation and not just the detailed issues. The effect of IC on improving the GV-SPR relationship is also important for salespeople and sales managers to consider. Salespeople, especially those high in GV, are expected to benefit from collaboration with other departments in increasing the impact of their big picture appreciation on SPR readiness to provide solutions. Managers should facilitate collaboration of salespeople who score high on GV with other departments because this will help these salespeople in providing solutions to customers.

Theoretical contribution

The current research offers several theoretical contributions to the literature. First, to the best of our knowledge, this is one of the first studies to empirically test both the individual level DT's mindset and it is organizational part. Previous research has studied DT either from design thinkers' perspective or the organizational role alone but not both. Studying DT from both dimensions offers important addition not only to the literature of innovation and new product development but also for the management and organizational behavior field. DT is dynamic way of innovation that is affected by how the organization in general collaborate to make it happen.

Second, previous research has studied solution selling involvement but not solution selling readiness. Studying the readiness of salespeople helps managers judge which of the salesforce should be assigned to which project. The results show that not all salespeople with AR ability are ready to engage in solution provision. Based on the level of the collaboration with other departments, salespeople with different levels of AR have different levels of readiness to sell solutions.

Third, this study suggests that solution salesperson's DT mindsets are not all at the same level of importance to SPR. AR is a dominant predictors of SPR, GV is a minor predictor and TAF is not a statistically significant predictor of SPR. Not all dimensions of DT are equivalent in understanding the variability of SPR of salespeople. Several DT mindsets were not tested in the current research (e.g., ability to visualize and blending rationality and intuition), and not all might be important for solution salespeople (Micheli et al. 2019). Additionally, the organizational level IC is more powerful in explaining the SPR of salespeople than the individual level mindsets. This shows that the effect of the organization in preparing salespeople to sell solutions is more effective than the individual levels mindsets.

Managerial contribution

Managers can benefit from the results of the current study. To begin with, not all salespeople can succeed in selling complex solutions. The current research help managers in specifying who are the best salespeople to take a role in selling solutions. Using the measures that are used in this study helps sales managers specify who are the best among the salesforce to be part of the solution selling process.

In order to improve this readiness, solutions' salespeople need training that helps them to be more efficient in their job. Sales managers and HR managers can find DT training and choose salespeople who have the DT mindsets to take that training. Solution salespeople might have the DT knowledge as explicit knowledge, which is learned by experience but not in a formal education classroom or workshop. Supporting this explicit knowledge by a DT course can enhance solutions' salespeople's performance.

Selling solutions can help the organization to be more profitable. Offering support for solutions' salespeople can enhance their performance and the profitability of the organization. Managers should thus cooperate to facilitate interdisciplinary collaboration in general and between solutions' salespeople and other functions. New product development managers should work closely with solutions' salespeople and sales managers to speed up new products and services development.

Limitations and future research

Some of the limitations of the current study are the following. First of all, survey research is not the best method to establish causality between constructs. However, this type of research helps in exploring the relationship between the constructs. In my research, I found that the one of the DT mindset, namely AR, helps solution salespeople to be ready to be part of the solution selling process. Future research might find out the role of specific DT training in enhancing solutions salespeople performance. Additionally, whether there are any mediating variables between DT and SPR. For example, what cognitive skills are activated by DT that help SPR.

Furthermore, the current research did not cover all of the DT mindsets in the literature (Micheli et al. 2019). What are the other DT mindsets that can help salespeople in their solution selling work? Also, what are other DT actions done by the organization to help in improving salespeople's performance? Further, would adopting DT culture in an organization helps salespeople to adopt DT mindsets and vice versa, would solutions salespeople with DT mindsets establish DT culture in the organization given the salespeople's boundary spanning role in the organization.

Finally, and importantly, other skills such as process improvement skill (Dickson 2009) and political skill are important to consider along with DT. How different is process improvement thinking skill from abductive reasoning in its influence on the readiness to sell solutions? Would one of these skills substitute each other or do they interact to offer better explanation of solutions provision readiness? My further research will explore whether process improvement thinking skill and political skill are better predictors of SPR than AR and what impact does IC have on their influence on SPR.

Conclusion

This dissertation is one of the first empirical explorations of the potential of utilizing DT in a solution selling context. Using data from an online survey of business salespeople, the current research examines design thinking as an antecedent of readiness of salespeople to take part in solution selling. This research provides important theoretical and managerial implications, yet additional research is needed to generalize our findings and to build on this dissertation's findings and extant theory.

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