

THEY KNOW WHAT THE CUSTOMER WANTS! PROPOSAL AND VALIDATION OF A SCALE TO EVALUATE THE SALES FORCE INTEGRATION INTO THE PRODUCT DEVELOPMENT PROCESS

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ABSTRACT

Objective: To propose and test a scale to measure the salesperson's integration into the product development process (PDP), considering the perspective of salespeople.

Methodology: The data were collected through a survey applied to 258 salespeople from medical device industry and analyzed using exploratory and confirmatory factor analysis.

Main results: The analysis of the scale's psychometric properties was satisfactory, with good reliability and validity parameters.

Contributions: The study provides an instrument for measuring salesperson's integration into the PDP, considering the perspective of salespeople, since much of what is in the literature is based on managers and supervisors' opinions. Also, the study can help organizations design PDPs that effectively integrate the salesperson, covering a range of meaningful information for the company, as well as helping to maintain employees with a broader view of sales activity.

Relevance / originality: Lack of clarity regarding sales force integration into the PDP indicates that the salesperson may receive non-effective training, resources may be invested incorrectly, and worthy information may be lost simply because there is no understanding on the part of the salesperson that they are part of the product development process.

Keywords: Salesforce. Product development process. Salesman and product development. Salesforce and PDP.

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**ELES SABEM O QUE O CLIENTE QUER! PROPOSTA E VALIDAÇÃO DE UMA ESCALA PARA
AVALIAR A INTEGRAÇÃO DA FORÇA DE VENDAS AO PROCESSO DE DESENVOLVIMENTO
DE PRODUTOS****RESUMO**

Objetivo: Propor uma escala para mensurar a integração do vendedor ao Processo de Desenvolvimento de Produtos (PDP), considerando a perspectiva deste profissional.

Metodologia: Por meio de técnicas de análise fatorial exploratória e confirmatória e estudos de validade foram analisados dados colhidos de 258 vendedores do segmento médico-hospitalar.

Principais resultados: A escala desenvolvida apresentou propriedades psicométricas adequadas para a finalidade proposta, com bons parâmetros de confiabilidade e validade.

Contribuições: Proposta de uma forma de mensuração da integração do vendedor ao PDP, segundo a perspectiva desse ator, uma vez que muito do que há na literatura se baseia na opinião de gerentes e supervisores. Paralelamente, o estudo poderá ajudar as organizações a projetar e implantar PDPs nos quais a integração do vendedor possa se dar de maneira efetiva, cobrindo uma gama de informações significativa para a empresa, assim como ajudá-la a manter funcionários com uma visão ampliada a respeito da atividade de vendas.

Relevância / originalidade: A falta de clareza quanto à integração da força de vendas ao PDP, indica que o vendedor pode receber treinamentos que eventualmente sejam desperdiçados, recursos podem ser investidos nele incorretamente e informações muito ricas podem ser perdidas simplesmente porque não há entendimento por parte do profissional de vendas de que ele é um elemento integrante do processo.

Palavras-chave: Força de vendas. Processo de desenvolvimento de produtos. Vendedor e desenvolvimento de produto. Força de vendas e PDP.

INTRODUCTION

The importance of sales force participation in the product development process (PDP) is a continuous and current discussion. There are two key roles for salespeople: facilitating access to market information and selling new products. In this respect, Kuester and Rauch (2016) demonstrate that the use of marketing intelligence by the sales force in the PDP positively influences the market performance of the new products and that the PDP depends on the sales force to systematically generate relevant information from the market. Evidence shows that incorporating the information brought by the sales force into the PDP is crucial for the success of new products, which is corroborated by authors such as Kuester, Homburg, and Hildesheim (2017). The authors prove that the sales force plays a key role in linking the organization to the various market elements, such as customers, and advocate for the integration of the sales force into the PDP.

Several authors affirm that the sales force is an important element in the structure of the companies for this exchange of information. The studies indicate that the sales force positively contributes to the product development process, bringing to the process information obtained from the relationship with the customers, such as the knowledge about their needs, desires and routines (Borsboom, 2015; Cross, Hartley, Rudelius, & Vasse, 2001; Gordon, Schoenbachler, Kaminski, & Brouchous, 1997; Joshi, 2010; Judson et al., 2006, 2009; Kuester & Rauch, 2016; Lambert, Marmorstein, & Sharma, 1990; Malshe & Biemans, 2014; Rochford & Wotruba, 1993; Webster Jr., 1965).

However, the literature on the relation between Sales and PDP rarely emphasize the salesperson's perspective, i.e., the professional directly relating with the customer (Beltramini, 1988; Fu, 2009; Lambert et al., 1990). The studies are usually based on the view of sales managers and supervisors, whose daily routine is often more distant from the customers (Cross et al., 2001; Ernst, Hoyer, & Rübsaamen, 2010; Gordon et al., 1997; Judson et al., 2009). Thus, the literature fails to answer questions such as: is the salesperson considered part of the PDP? Does the salesperson understand that the PDP is one of the activities they can contribute to, as part of their routine work? How do they see themselves in the company's PDP? Is it enough to have a consensus in the company around the participation of the salesperson in the PDP, if the salesperson is not aware of the importance of this participation?

This scenario indicates the lack of knowledge on the salesperson self-evaluation regarding their participation in the PDP, which leads to this study that focuses on the salesperson's point of view about the process, offering theoretical and managerial

contributions taking into consideration the importance of this professional.

Thus, this study proposes a scale to measure, from the point of view of the salesperson, their integration into the product development process.

Product development process (PDP)

Product development is one of the most important dynamic capabilities of a company (Harmancioglu, McNally, Calantone, & Durmusoglu, 2007; Kuester & Rauch, 2016), and a significant element for the organization's growth (Flint, 2002; Frishammar & Ylinenpaa, 2007; Judson et al., 2009, 2006; Zahay, Griffin, & Fredericks, 2004). Research in this area has been predominantly focused on large, consolidated organizations, with a well-established product portfolio and well-defined product development practices (Marion, Friar, & Simpson, 2012; Sousa Mendes & Toledo, 2012a). However, these same practices are not always adequate for smaller organizations or for those that are entering the market (Sousa Mendes & Toledo, 2012a).

With the fierce competition in the contemporary business environment, many companies are challenged to increase efficiency, innovate, and to be ahead of competitors, prioritizing the rapid and efficient sale of new products (Kim & Wilemon, 2003), and focusing on the design and implementation of PDPs (Harmancioglu et al., 2007). On the other hand, business dynamics make it difficult to establish a safe and accurate definition of a product from the beginning to the end of its development. Often customers do not have a clear idea of what they want (or need), and it is impossible to get an accurate significance about the product before its full development. Interacting with customers or users is a requirement for every stage of the process so that the product may be adapted during its development (Cooper, 2014). Thus, the earlier in the process pertinent questions are posed – elaborated from the constant exchange of information with the customer – the greater the chances of an efficient transition from an idea to a product, and the easier the probability of sale (Frishammar & Ylinenpaa, 2007; Judson et al., 2009).

It is worth mentioning that the PDP is related to the context, and the process can vary according to the industries, technologies, and levels of innovation, which bring differences to its management (Marion et al., 2012). Thus, there are situations in which what is seen as a substantial innovation in one industry is interpreted by another as the adaptation of an existing product in the company's portfolio. Jansen, Bosch, and Volberda (2006) pointed out that, as competition intensifies and the pace of change accelerates, companies need to reinvent themselves, by using their existing competences (exploitative innovation) and

exploring new competences (exploratory innovation). According to the authors, organizations need to become 'ambidextrous' and develop exploratory and exploitative innovation simultaneously in different business units. The units using exploratory innovation must seek new knowledge and develop new products and services, while units using exploitative innovation evolve based on existing knowledge and adapt their current products and services (Gilsing & Nooteboom, 2006; Jansen et al., 2006). For the purpose of this study, these two situations were considered for the PDP, considering a totally new product, as well as an extension of an existing product line, the improvement of a product's tangible quality, the addition of resources and associated services to an existing product, or finding a new use or market for a product already commercialized (Judson et al., 2009).

The literature is rich in the discussion of the differences and similarities between products and services (Covenat, 2016; Edvardsson, Johnson, Gustafsson, & Strandvik, 2000; Ha, Lee, & Kim, 2016; Nijssen, Hillebrand, Vermeulen, & Kemp, 2006). Services are activities typically produced in an interactive process in which customers play an important role in achieving the result. In contrast, products result from a selection process involving the separation and accumulation of parts or materials, and their various combinations, which meet the needs of the production units and the final generation of a product. Unlike services, product activities occur outside the customer's view and what emerges from this process is a heterogeneous supply of alternatives from which choices are made (Edvardsson et al., 2000). According to Nijssen et al. (2006), there are many similarities between the product development process and the service development process. Following this line of thought, this study does not make a specific distinction between the development process of products and services, including both in the notion of PDP.

Cooper (2003, 2013) identified that companies produced less real innovations regarding product development when comparing the years 1990 and 2000. The author observed that in 2000 the companies added more elements to the existing product lines and improved and modified products already in the market. According to the author, much of this situation was related to the need to react to the requests from customers and salespeople for products, not 'new' in the sense of disrupting the market, but new from the point of view of the day-to-day user. Often it was a matter of re-packaging, or making small modifications or adjustments to the specific needs of the customer, i.e., projects that did not consume many resources, but that collectively put the company in advantageous situations when compared to its competitors, which confirms the findings presented by Gordon et al. (1997) and corroborated by Judson et al. (2009, 2006).

Therefore, the PDP, via the development of a new product or adaptation of an existing one, is a two-way road, which means that the process can be an initiative of the company or the customer. Working with projects inspired by customers or Sales can be an alternative to a lack of truly innovative ideas, innovations that could be disruptive in the market regarding new technologies and products (Cooper, 2014). This process simply needs to be well oriented so that the resources employed are not wasted due to lack of basic information or incorrect interpretations of the customers' real desires and needs.

As for the customers' satisfaction, suppliers must modify existing products and develop new ones in order to keep strategic customers, whose desires and needs change over time and as businesses evolve (Flint, 2002). The focus is on anticipating what specific customers will give value to and when. Failure to anticipate these changes forces suppliers to act reactively, where success is determined by how quickly one can respond to new desires as they arise (Flint, 2002). As new products take time to develop, the earlier suppliers can foresee the changes customers will value, the better. In this sense, having a professional in the team, continuously close to the customers, listening to them and observing them, can make a difference in anticipating expectations (Flint, 2002).

Salesperson's integration in the PDP

The use of multifunctional teams is an important element for success in product improvement. The literature has shown that well-established companies use these teams with positive effects on project duration and performance since they remove barriers that are perceived as 'feudal' and that inhibit innovative solutions (Cooper & Kleinschmidt, 2007; Malshe & Biemans, 2014; Marion et al., 2012). Multifunctional teams are defined as those that have full-time members from the areas of Sales, Engineering and/or Research and Development, Marketing and Operations, working on a project under the leadership of a manager (Cooper & Kleinschmidt, 2007). Harmancioglu et al. (2007) studied the direct or indirect participation of the customer in product development to indicate whether business units listen to the "customer's voice" or the "voice of the Sales force." The authors found that integration and simultaneity in the actions of the PDP lead to success in product implementation and sale. Multifunctional structures are known for offering valuable information from different points of view, thus generating more creative solutions.

The debate on multifunctional teams has a consensus in the literature that the sales force is a rich source of information for companies when they want to understand the needs and desires of their target audience (Borsboom, 2015; Judson et al., 2009; Kuester & Rauch, 2016; Lambert et al., 1990; Lanis,

Fountain, & Peterson, 2005; Liu & Comer, 2007), contributing to product development (Borsboom, 2015; Cross et al., 2001; Gordon et al., 1997; Joshi, 2010; Judson et al., 2009, 2006; Kuester & Rauch, 2016; Lambert et al., 1990; Malshe & Biemans, 2014; Webster Jr., 1965). The benefits of the salesperson participation include: better understanding of the customers' needs and desires; collection of information; experience of customers' routines and situations that would not be verbalized in a market research; better understanding of the distribution channels' acceptance of the products; better perception of competitors' actions and sales tactics; a greater desire to sell a product when the salesperson was involved in its development; and, finally, the professional's creativity, which can be useful in the process of generating ideas of products (Gordon et al., 1997; Judson et al., 2009, 2006; Lambert et al., 1990; Malshe & Biemans, 2014; McDougal & Smith, 1999; Wang & Netemeyer, 2004; Webster Jr., 1965).

Product development is a resource consuming process that presents an inherent level of risk, considering that the acceptance by the market will only be verified after the product is presented to the customers (Kim & Wilemon, 2003). This means that any information that can be obtained before the product conceptualization process is valuable to the organization (Marion et al., 2012; Rochford & Wotruba, 1993). Thus, it is not surprising that professionals involved in the company's R&D department expect to receive as much information as possible from those who are in direct contact with customers, which helps them make the best choices about the products to be developed. Therefore, the importance of integrating the salespeople in the PDP is clear, considering that they can monitor the customers' behavior and are more likely to observe the first signs of change. The salespeople need to be trained in different skills, such as in-depth interviews and participant observation, sometimes playing the role of a market researcher (Flint, 2002). Beltramini (1988) pointed out that when learning these skills, the salesperson already has in mind the product development. The salesperson does not want to pass on a negative image to customers and wishes to demonstrate that they work for a trustworthy organization, rather than an organization that reacts to the movements of the competition. Thus, training salespeople in skills related to market research can yield positive results for the PDP.

There is an element related to the professional in sales that is highlighted in the academic literature involving sales force and product development. Invariably, the literature focuses on managers and sales supervisors, and gives little or no space to the salesperson, even though these professionals are the ones in the field, in direct contact with the customers.

The salesperson is the one expected to be alert to potential opportunities in terms of product development, whether the opportunities are formally expressed or a result of the observation of the customers' daily routines (Borsboom, 2015; Gordon et al., 1997; Judson et al., 2009, 2006; Kuester & Rauch, 2016; Lanis et al., 2005; Liu & Comer, 2007; Webster Jr., 1965). In other words, despite the importance of the sales force in product development, few studies have emphasized the integration of these professionals, or carried out analysis based on the salesperson's perspective (Beltramini, 1988; Fu, 2009; Lambert et al., 1990), which was considered here as an opportunity for study and theoretical contribution. A potential paradox in this observation is that sales managers may have a positive view of the salesperson's integration into the PDP, but eventually the salesperson themselves may not recognize the importance of this activity as part of their job. Thus, knowing the salesperson's integration into the PDP, from the salesperson's perspective, is crucial to contribute to the alignment of expectations between the managers and the sales force, as well as to offer a view about the relationship between sales and the PDP which is different from the one usually found in the literature. In addition, adequate training, a better investment of resources, and correct use of relevant information are significant managerial consequences of using a tool to measure how the salesperson evaluates their integration into the PDP.

BUILDING THE SCALE

Few quantitative studies working with scales and related to the salesperson's integration into the PDP were found in the literature. Some of them used formative scales and were related to how to use the information obtained by the salesperson and not to the participation of the sales force in obtaining this kind of information (Zahay, Griffin, & Fredericks, 2011). Others dealt with vendor integration with the PDP using individual rather than scaling questions to reflect a construct (Judson et al., 2009), as well as approaching sales directors and managers rather than sellers. Finally, analyzes were found for which the authors did not present an approach that involved the construction of a scale such as the one proposed in the present study, either by the construct involved, or by the professionals considered as research object (Beltramini, 1988; Cross et al., 2001; Gordon et al., 1997; Joshi, 2010; Judson et al., 2006; Lambert et al., 1990; Liu & Comer, 2007; Woisetschläger, Hanning, & Backhaus, 2016).

The scale proposed in this research was based on two sources: the work of Judson et al. (2009), who developed a study to measure the role of the sales force in the initial stages of the PDP, comparing companies with different account management systems (KAM – Key Account Management vs. non-KAM). Although

the authors did not build a proper scale and the sentences used were applied in an isolated form, the research managed to cover significant elements of the salesperson's integration into the PDP, mainly – though not exclusively – the early stages of integration. The second source was work aimed at evaluating customer/consumer participation in the development of products and services (Casaló, Flavián, & Guinalú, 2010; Ngo & O'Cass, 2013; Santos & Spring, 2015; Yi, Natarajan, & Gong, 2011; Yim, Chan, & Lam, 2012). From these sources, both the concept of customer participation in the development of products and services (Ngo & O'Cass, 2013; Santos & Spring, 2015) and the possibility of adapting the scale of customer participation in this process were considered (Casaló et al., 2010; Yim et al., 2012). The statements related to sales that formed the scale for measuring the salesperson's integration into the PDP were extracted from the sources mentioned here (Casaló et al., 2010; Judson et al., 2009; Ngo & O'Cass, 2013; Santos & Spring, 2015; Yim et al., 2012).

As the research was conducted in Brazil and in Portuguese, the statements obtained from the sources in English were translated, and submitted to specialists, doctors in the construction of scales in social sciences. The dimensions were measured using a Likert scale, varying from 1 to 7 (1 = "totally disagree"; 7 = "totally agree"), in which the respondent indicated their level of agreement with each of the statements presented (Dalmoro & Vieira, 2013).

Sample

The data were collected through a structured questionnaire, presenting 17 items about salesperson's integration into the PDP, as well as about issues related to other measures, made available to respondents by the Google Forms tool. The researchers invited 841 sales professionals from various companies in the medical device segment using the business social network LinkedIn. The interest for this segment was due to the fact that it is considered from medium to high technological complexity, independently of the size of the companies (Sousa Mendes & Toledo, 2012a), and stand out for the technological dynamics verified in the Brazilian innovation research (Toledo, Silva, Paula, Sousa Mendes, & Jugend, 2007). In developing countries, companies in this segment play an important role in import substitution through local production of products of lower technological complexity and lower cost (Sousa Mendes & Toledo, 2012b).

For the research, 'salesperson' was the professional who had direct contact with customers in their daily activities, regardless of their functional designation (salesperson, sales executive, technical consultant, educational consultant, product specialist, technical assistant, among others). The goal for the number of respondents was the minimum number to

reach the ratio of five respondents per indicator (statement) present in the data collection instrument (Bentler & Chou, 1987). Data collection was finalized with 258 completed questionnaires, totaling around 30% rate of return. When it was necessary to reiterate the invitation in order to get the respondents participation, the researchers invited three further times (one week, two weeks, and one month after the first invitation). After the third reiteration (one month after the first invitation), the respondent was not contacted further. The data collection tool used did not allow the respondent to send incomplete questionnaires, so none of the received questionnaires were disregarded.

The average age of the respondents was 37.2 years, 47.3% of them were women, and about 70% had a so-called post-graduation degree (specialization, MBA, Master's, PhD). They worked in the company on average for 4.4 years and their average time of sales experience was 10.9 years. It was noted that more than 13% of the respondents had more than 20 years of sales experience, which confirms that the activity can be a rich source for the company when it comes to capturing customer information about products. Of the companies in which sales professionals worked, almost 60% had more than 500 employees, more than 80% had sales above R\$ 6 million, with more than 70% of them having a specific R&D department, and 80% presented clear separation between Marketing and Sales in different departments.

Exploratory factor analysis

The 258 questionnaires answered were randomly divided into two groups of 129, using Excel's random number generation function (Bittencourt & Viali, 2006; Bronnemann & Silveira, 2003). This action did not affect the goal of a minimum number of respondents to the ratio of five respondents per indicator (statement), as recommended by Bentler and Chou (1987).

For a group of 129 respondents, hereafter referred to as the EFA-CFA group, the study initially conducted exploratory factor analysis using principal components analysis and Varimax rotation, in order to identify underlying dimensions of the construct and to promote items reduction. The 17 indicators were considered, using the rule "eigenvalue higher than 1.0" for the extraction of factors (Floyd & Widaman, 1995; Hair, Anderson, Tatham, & Black, 2009; Wang & Netemeyer, 2004). The statistical selection criteria adopted in the evaluation of the items were commonality values and factor loadings higher than 0.50 (Clark & Watson, 1995; Wang & Netemeyer, 2004). Items that did not meet the selection criteria were gradually discarded, followed by a new analysis of components at each exclusion. This process resulted in the elimination of four items, and the remaining 13 were associated with only one factor with an eigenvalue

higher than 1.0. The confidence analysis showed Cronbach’s alpha of 0.917, with all item-total correlations higher than 0.50, indicating potential unidimensionality and satisfactory internal consistency of the scale.

The use of a single data collection instrument to gather information from the field and applied only once, increased the risk of common method bias, influencing the response process via systematic error. This condition was a potential source of common method variance, despite all the care taken when applying the questionnaire (Casaló et al., 2010; Podsakoff & Organ, 1986; Podsakoff et al., 2003). Thus, the effect of the common method variance was tested using the partial correlation approach, as recommended by Lindell and Whitney (2001). At this stage of the study, the approach indicated the absence of common method variance.

Confirmatory factor analysis

The 13 items resulting from the exploratory factor analysis were first submitted to normality tests, considering that even data without a normal distribution may be acceptable as long as the ordinal element used in the data collection is higher than or equal to five

points, and the distribution frequencies are close to a normal curve. This characteristic gives to the variables a notion of continuity, without great distortions in the adjustment (Marôco, 2014). The univariate (for each indicator) kurtosis (Ku) and asymmetry (Sk) measures were not higher, in absolute values, than 2 and 7, respectively, indicating that there was no extreme violation of normality (Marôco, 2014).

After evaluating the normality assumptions, the 13 items were submitted to confirmatory factor analysis to check the dimensionality and eliminate problematic items. Indicators with standardized factor loadings of less than 0.50 were eliminated one by one, starting with the items with the lowest loading (Byrne, 2010; Clark & Watson, 1995; Floyd & Widaman, 1995; Marôco, 2014). In this stage, three items that were deficient in factor loadings were eliminated, resulting in a scale of ten items. The measurement model (figure 1), containing one factor and ten items, was estimated by the maximum likelihood (ML) method and evaluated considering adjustment quality indices. The result obtained was $\chi^2 = 58.001(df=35)$, $p < 0.001$, GFI = 0.911, NFI = 0.923, RFI = 0.901, IFI = 0.968, TLI = 0.958, CFI = 0.968, PCFI = 0.753, RMSEA = 0.072. These indices were adequate when compared to the literature (Byrne, 2010; Marôco, 2014).

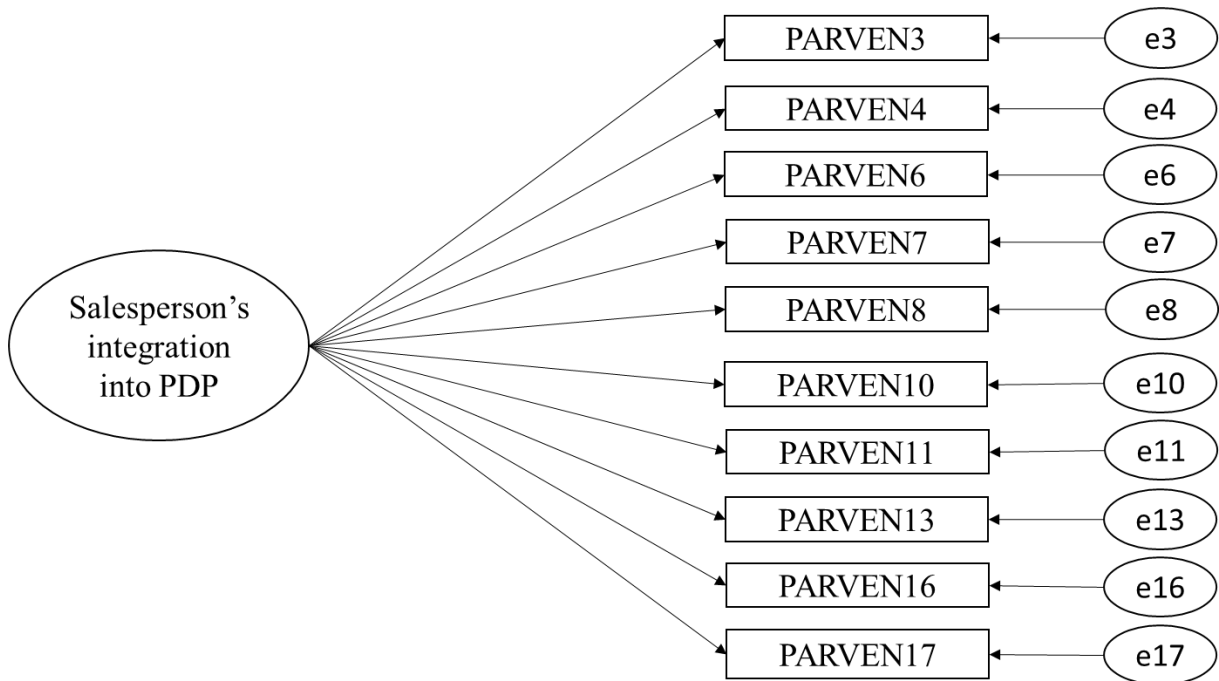


Figure 1 –Measurement model
Source: Elaborated by the authors

Table 1 lists the ten items of the final scale as well as their factor loadings and the internal consistency estimates. The standardized factor loadings

varied from 0.548 to 0.888, the estimate of average variance extracted (AVE) was 0.525 and the Cronbach’s alpha was 0.915, values that guarantee the

reliability and the factorial and convergent validity of the scale.

Code	Description	Factor loading	p-value
PARVEN3	I was formally trained to collect information from customers about ideas to develop products and services.	0.564	<0.001
PARVEN4	I understand how the products and services development process happens in the company.	0.694	<0.001
PARVEN6	I am part of the company's products and services development team.	0.823	<0.001
PARVEN7	I am an active participant in the company's products and services development process.	0.887	<0.001
PARVEN8	I provide valuable contributions to the company's products and services development process.	0.771	<0.001
PARVEN10	I work together with the Marketing team as part of the company's products and services development process.	0.548	<0.001
PARVEN11	I work together with the Research and Development team as part of the company's products and services development process.	0.645	<0.001
PARVEN13	I work together with the team responsible for the company's products and services development.	0.670	<0.001
PARVEN16	I always offer suggestions to the team responsible for the company's products and services development.	0.661	<0.001
PARVEN17	I am very much involved in the process of how the company's products and services should be developed.	0.888	<0.001
	AVE	0.525	
	Cronbach's Alpha	0.915	

Table 1 – Scale of salesperson's integration into the PDP – indicators, factor loadings and significances, Cronbach's alpha (reliability) and AVE (convergent validity)

Source: Elaborated by the authors

VALIDITY OF THE SCALE

At this stage, the relationships between the salesperson's integration into the PDP and the constructs 'discretionary effort,' 'intention to stay in the company,' and 'satisfaction at work' were examined. It was also considered how long the salesperson had worked in the company at the time they answered the questionnaire (manifest variable). The constructs and the manifest variable were used to evaluate evidence of discriminant and nomological validity of the scale proposed, being reported hereafter the assumptions used and the data found. The answers of the second group of 129 respondents, from now on called the VAL group, were used to validate the scale. Nunnally (1978) recommends that the ideal way to validate is the use of a separate sample, which was done with this second group of 129 responses. The treatments given to the scales of the other constructs were the same as those used for the scale of the salesperson's integration into the PDP regarding the translation, the Likert adopted, form of data collection, and invitation to respondents.

As new variables were considered, the normality tests conducted previously were repeated for the new set analyzed. The univariate (for each indicator) kurtosis (Ku) and asymmetry (Sk) measures

were not higher, in absolute values, than 2 and 7, respectively, indicating that there was no extreme violation of normality (Marôco, 2014).

Likewise, to evaluate the data collection's sensitivity to the common method bias, the Harman's single factor test, adapted to the confirmatory factor analysis, was performed, observing whether a single latent factor would be responsible for all the indicators used (de Almeida, Dholakia, Hernandez, & Mazzon, 2014; Podsakoff & Organ, 1986; Podsakoff et al., 2003). The test shows whether the common method variance resulting from systematic error poses a considerable risk to the analytical procedures (Craighead, Ketchen, Dunn, & Hult, 2011; de Almeida et al., 2014; Podsakoff & Organ, 1986; Podsakoff et al., 2003). In the test, using the χ^2 difference and the evaluation of the adjustment quality indices, a hypothetical single-factor measurement model (common factor model) was compared to a four-factor measurement model (the salesperson's integration into the PDP, discretionary effort, intention to stay and satisfaction at work), considered for discriminant and nomological validity, which had presented the following data: $\chi^2 = 448,585$ (df=255), $p < 0,001$, GFI = 0.795, NFI = 0.771, RFI = 0.730, GFI = 0.795, GFI = 0.795, GFI = 0.795, IFI = 0.866, TLI = 0.862, CFI = 0.883, PCFI = 0.751, RMSEA = 0.077.

The single-factor model showed the result $\chi^2 = 877.256$ (df = 261), $p < 0.001$, GFI = 0.599, NFI = 0.551, RFI = 0.484, IFI = 0.636, TLI = 0.572, CFI = 0.628, PCFI = 0.546, RMSEA = 0.136. The adjustment quality indices of this model are below the minimum recommended by Byrne (2009) and (Marôco, 2014), and the χ^2 difference test showed a significant difference between the two models ($\chi^2 = 428,671$ (df = 6) $> \chi^2$ (critical) = 14,449, $p < 0.05$), indicating that the four-factor model has a significantly better fit than the single-factor model, which is evidence of its robustness related to the common method variance.

Discriminant validity

In order to obtain evidence of discriminant validity between the salesperson’s integration scale and the other ones (discretionary effort, intention to stay,

and satisfaction at work), considering the conceptual relationship between the constructs they represent, a test was conducted as suggested by Wang and Netemeyer (2004). To do so, the correlations of the scale under study and those used for nomological validity were estimated, whose description is presented in table 2. The discriminant validity between the salesperson’s integration into the PDP and the other related scales was verified by comparing the correlation (r) between the scales and the estimated AVE of each of them, analyzed a pair of factors at a time. According to Fornell and Larcker (1981), if r^2 (squared correlation) between the salesperson’s integration to the PDP and another scale is smaller than the AVE of each of them, the discriminant validity will be guaranteed. This criterion was satisfied for all correlated scales, guaranteeing the discriminant validity of the scale under construction.

Scale	Salesperson’s integration into the PDP ^(*)	AVE ^(**)
Salesperson’s integration into the PDP	1.000	0.461
Discretionary effort	0.156	0.454
Intention to stay	0.052	0.568
Satisfaction at work	0.033	0.448

(*) Square correlation between scales

(**) Scale’s average variance extracted (AVE)

Table 2 – Scale of the salesperson’s integration into the PDP – Discriminant validity
Source: Elaborated by the authors

Nomological validity

In order to test the nomological validity of the scale, the correlations between the salesperson’s integration into the PDP, discretionary effort, intention to stay in the company, satisfaction at work and the time the salesperson works in the company were analyzed.

Discretionary effort. According to Dubinsky and Skinner (2002), discretionary effort is the performance (or behavior or activity) in which the salesperson performs beyond their obligations, exceeding the requirements, demands or expectations of their assignments. Working beyond regular hours, serving customers on weekends, or helping a less experienced colleague prepare a presentation are examples of discretionary effort (Blader & Tyler, 2009; Dubinsky & Skinner, 2002). Based on a literature review, Dubinsky and Skinner (2002) pointed out four general categories of variables that capture the main antecedents of the salesperson’s discretionary efforts, one of them called ‘customer factors’. Among the ‘customer factors’, meeting demands or fulfilling needs may be the main reason to complete a sale, which shows that the salesperson and the company performed better than the competition to fulfill the customer’s

need. Thus, satisfying a customer who has specific needs often requires the salesperson to show extra effort to complete the sale and keep the customer happy (Dubinsky & Skinner, 2002). The request for products and services development/modification is also part of these customer’s demands, needs, and expectations about the salesperson and the company. Considering that when participating in the products and services development process, the salesperson has in mind the objective of meeting customer’s demands, needs and expectations regarding the new product (which increases customer’s satisfaction and, consequently, contributes to future sales), it is fair to expect a positive relationship between the salesperson’s integration into the PDP and the discretionary effort.

Intention to stay. This construct is the extent to which an employee intends to remain within an organization (Zigarmi, Nimon, Houson, Witt, & Diehl, 2012). Chew and Chan (2008) argued that employees develop greater commitment to companies that allow them to utilize their skills and abilities better and provide an environment that corresponds more appropriately to their attributes, emphasizing that highly talented individuals often seek creative and challenging jobs. Udo, Guimãrães, and Igbaria (1997)

analyzed the direct and indirect effects of the characteristics of a task on the intention to stay. The authors' findings showed that the more challenges and autonomy are given to employees, the higher their satisfaction is, leading to a greater commitment to the organization and greater desire to remain with the company. A positive relationship is expected between the salesperson's integration into the product development process and the intention to stay, because several of the antecedents of the 'intention to stay' found in the literature (such as training, creativity in collecting and understanding the information provided by customers, and ability to observe the way customers use the products sold), are connected to the salesperson's integration into the PDP.

Satisfaction at work. Satisfaction at work is related to the analysis of specific reactions to work and can be expressed in two ways: a strictly cognitive one, in which the salesperson sees specific aspects of the work as a means to satisfy their needs; and another, in which the salesperson is led to form positive or negative feelings about the dimensions of work, depending on the perceived discrepancy between what is desired and what is obtained from the tasks developed (Bagozzi, 1980).

The intrinsic motivation theory states that people need to be competent and effective to feel good. Studies on job improvement processes suggest that jobs that require a variety of skills are more likely to motivate and satisfy employees. A work that allows and encourages more creative performance inherently increases the intrinsic satisfaction of workers (Wang & Netemeyer, 2004).

Studies indicate a positive relationship between salesperson's satisfaction at work and customer's satisfaction. This relationship is particularly strong in the case of constant interaction with customers, intense customer integration into the process of value creation, and high level of company's innovation regarding its products and services (Homburg & Stock, 2004).

Woisetschläger et al. (2016) show the importance of salespeople (called "front-line employees"), in collecting ideas from customers to contribute to product development. Also, the authors present the impact of motivators, such as satisfaction at work and the desire for upward mobility, in the collection and dissemination of ideas to be used for new products. Their results show that satisfaction at work has a positive effect on collecting ideas, which is the initial step in product development. Satisfaction at work can lead employees to search for ways to improve the company's performance and to be aware of new conceptions when contacting customers. Salespeople who are satisfied with their professional life are more likely to contribute, offering new ideas to improve processes or products (Woisetschläger et al., 2016).

One of the determining factors affecting the salesperson's satisfaction at work is the nature of the social interactions they have with the customer, the sales manager, and other significant people in the set of roles they perform at work (Bagozzi, 1980). By participating in the product development process, the salesperson increases their social interactions with customers, establishing dialogs different from those of traditional sales processes, eventually increasing their relationship possibilities and assuming a position of solution provider rather than a provider of products or services.

Another research indicates that salespeople are attracted to the challenge of selling new products in turbulent and competitive markets. This finding is consistent with the theory that challenging work, per se, is rewarding and satisfying (Hultink & Atuahene-Gima, 2000).

Considering the aspects above, it is possible to argue that the salesperson's integration into the PDP is positively associated with their satisfaction at work.

Time working in the company. The salesperson's work experience contributes to improve skills and develop a more elaborate knowledge of sales situations, types of customers, and potential sales strategies (Weitz, Sujan, & Sujan, 1986). This broad knowledge base allows salespeople to recognize activities that can enhance their relationship with customers, increasing the potential for closing sales. Thus, it is fair to assume that the experience of salespeople would positively affect their integration into product development. However, as company characteristics may affect this relationship, it was decided to measure experience based on the time the salesperson declared to have spent in the company they were working at the time they answered the questionnaire, as done in the study by Spiro and Weitz (1990).

Measures and results

Table 3 shows the sources of the scales and the number of items used to measure each construct, their reliability estimates (Cronbach's alpha - α), the correlations between the salesperson's integration into the PDP and the scales representing each construct (correlation coefficient - r), their respective levels of statistical significance (p) and sample size (n). For example, for 'intention to stay' it was used a scale originated in the study of Zigarmi et al. (2012), composed of four items, which presented $\alpha = 0.855$, $r = 0.226$ and $p < 0.05$. This form of data presentation was adapted from Spiro and Weitz (1990). As shown in the table, the scales used presented satisfactory internal consistency and the correlations with salesperson's integration into the PDP were statistically significant in the predicted directions, except for 'satisfaction at work,' which was marginally significant ($p < 0.10$),

corroborating the nomological validity of the scale constructed in this study. As in the work by Spiro and Weitz (1990), the lack of connection between the integration into the PDP and the ‘time working in the

company’ may be due to a ceiling effect. As the average working time of respondents in companies was between 4 and 5 years, they may not be differentiated in terms of knowledge gained through their experience.

Scale	Source	α	r	n	p
Salesperson’s integration into the PDP (10)	Judson et al., 2009 Yim, Chan and Lam, 2012	0.889	-	129	-
Discretionary effort (7)	Blader and Tyler, 2009 Zigarmi et al., 2012	0.844	0.394	129	<0.01
Intention to stay (4)	Zigarmi et al., 2012	0.855	0.226	129	<0.05
Satisfaction at work (4)	Bagozzi, 1980 Pruden and Reese, 1972	0.708	0.182	129	0.094
Time working in the company (1)	Authors	-	-0.103	129	0.271

Table 3 – Scale of the salesperson’s integration into the PDP – Nomological validity
Source: Elaborated by the authors

DISCUSSION AND CONCLUSIONS

Based on the academic literature on sales, which shows the importance of the sales force involvement in the product development process (Borsboom, 2015; Gordon et al., 1997; Judson et al., 2009, 2006; Kuester & Rauch, 2016; Lanis et al., 2005; Liu & Comer, 2007; Webster Jr., 1965), this study proposes the construct ‘salesperson’s integration into the PDP’. This construct represents the degree of involvement of the salesperson during the initial stages of the product development process when the professional collects information from the customers and shares it with the company’s Marketing and R&D departments. To measure it, a scale was developed following the steps recommended by Nunnally (1978) and Podsakoff et al. (2003), based on the work developed by Casaló et al. (2010), Judson et al. (2009), Ngo and O’Cass (2013), Santos and Spring (2015), Yi et al. (2011) and Yim et al. (2012). The data were collected by self-report, cross-sectionally, using structured questionnaires. The group targeted was formed by salespeople working in the medical device segment. Statistical analysis showed that the scale developed has psychometric properties, adequate for the study. Despite this, additional studies are recommended to investigate the scale’s validity further, applying it to salespeople working in different market segments and at different stages of their professional life cycles (Spiro & Weitz, 1990).

The theoretical contribution of the study lies in proposing a way of measuring the salesperson’s integration into the PDP, emphasizing the salespeople’s point of view, because much of what is in the literature are studies that bring the point of view of managers and

supervisors, but do not work on measurement (Cross et al., 2001; Ernst et al., 2010; Gordon et al., 1997; Judson et al., 2009). The underlying rationale behind these efforts was in understanding whether it is reasonable to expect a result from a professional if they are not even aware that they are part of the process that leads to such result.

The practical consequences of this study stem from drawing attention to the lack of clarity regarding the sales force’s integration into the PDP. The study indicates that salespeople may be receiving non-effective training, resources towards the sales force may be incorrectly invested, and rich information can be lost simply because the salesperson is not aware that they are part of the product development process (Gordon et al., 1997; Judson et al., 2006; Liu & Comer, 2007).

In today’s dynamic market, managers must realize that creativity is a requirement of the external competitive environment that is influenced by the internal organizational environment. Due to the close connection between salespeople and customers, it is rational and appropriate for management to encourage the sales force to think independently and creatively and train them so that they can identify customers’ needs for new products or modifications to existing ones. In this way it will be possible to serve the market better, taking advantage of ideas that arise from the needs manifested in the daily routine of the customers, who have direct contact with the products. First-hand knowledge of the customer, the market and the competition, makes the sales force a unique and valuable source of innovation or modification of products and services. Consequently, the ideas identified in the day to day of the market must be

constantly exchanged with the company through formal and informal means of communication so that these valuable inputs are not lost, and the organization can learn and improve its knowledge and strategies to compete (Wang & Netemeyer, 2004).

The company should measure the salesperson's involvement in this process, not from the perspective of managers and supervisors, but from the salespeople, who are directly involved in the activity. The expectations of the company can be enormous, but if the core agent of the process does not know their importance, they cannot contribute as expected. Measuring how they see themselves in the process is the first step to optimize it and make it more effective (Wang & Netemeyer, 2004).

Managers can benefit from the results of this work since it seeks to identify elements of integration of salespeople in product development, elements that may have been ignored during the salesperson's activity in the companies. This research can help organizations design and deploy PDPs where salesperson's integration takes place effectively, with the sales force collecting a significant amount of information for the company, helping to transform an idea into a product concept. At the same time, this effort helps to retain well-skilled employees with a wider vision regarding the sales activity.

The study of the antecedents and consequent elements of the salesperson's integration into the PDP is a promising direction for research to increase the effectiveness of the sales force, ensuring that they bring information in a standardized and systematic way for the company. In this way, it may be possible to make an action that works in an unsteady manner from seller to seller to become better structured knowledge and well applied by everyone who is in contact with customers. The availability of a scale to measure salesperson's integration into the PDP makes such propositions empirically useful (Spiro & Weitz, 1990). This research can contribute significantly to understanding the key success factors in today's dynamic sales environment. Integration into the PDP can affect work attitudes, such as intention to stay in the company and discretionary effort. Also, the salesperson's action on this process can affect the performance of the sales force and the organization. If carefully monitored, collected, refined, and disseminated, the promising ideas of salespeople can make significant contributions to innovation and knowledge development. As such, the need to study salesperson's integration into the PDP is evident, and all these areas may be explored in future research.

Future research should explore the substantial variation among organizations in the process of capturing ideas from customers. Contingency factors such as differences between market orientation, learning orientation, and organizational feedback and support mechanisms could be variables to be explored.

Another possible explanation for the intensity of gathering ideas could be the quality of the relationship between the salespeople and customers, and the study of these relationships is another suggestion for future research assessing the antecedents of gathering ideas from the market (Woisetschläger et al., 2016).

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