

Organizational Innovativeness in 21st Century: First Decade Construct Analysis

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Abstract— This research study explores the dimensions of the capacity to innovate of the organizations (innovativeness) related to the transformation industry. The literature review concerning innovation and the capacity to innovate, consisting of theoretical development plus empirical studies, allowed authors to develop a three-dimension model to operationalize the organizational innovativeness construct: a) Stimulus or Incentive to Innovate/Reward for Innovation; b) Generation and Selection of Ideas; c) Adoption and Use of Ideas. Additionally, we observed the adherence of this three-dimensional model in Brazilian manufacturing companies.

Keywords— Capacity to Innovate, Innovation, Organizational Innovativeness, Transformation Industry.

I. INTRODUCTION

The search for innovations brings about challenges and dilemmas for the organizations [1]. Executives and academics of the business world face many examples and questions while searching for innovations, such as: When should they invest in an idea? When should they give up on an invention? Where should they innovate? For whom or with whom should they develop innovations? When should they innovate? How can they innovate? These questions arise because there are several uncertainties concerning the implementation and the return that something new may bring.

Alternatives to try to reduce these uncertainties have been proposed both by academics and businessmen. These alternatives explore many different approaches: studying innovation success stories [2], looking at sources of innovations in the companies [3], considering proposals of frameworks for innovations [4] and diffusion of innovations [5], analyzing the innovation process in the companies [6], among other approaches.

However, there has been little attention dedicated to exploring the characteristics – and dimensions – that involve an organization's capacity to innovate [58][59], which is the opportunity we explore in this study.

Besides this brief introduction, the article presents a bibliographical review concerning the organizations' innovativeness as well as a proposal for measuring it, goes on to detail the methodology used in the study, and concludes by presenting the results and application of the method.

II. ORGANIZATIONAL INNOVATIVENESS: THE CAPACITY TO INNOVATE OF THE COMPANIES

Academic literature presents various studies that in some way approached, but didn't conceptualize the theme of organizational innovativeness in an objective manner [7]; [8]; [9]; [10]; [11]; [12]; [13]; [14]; [15]. However, an implicit definition found by all of these authors includes an organization's capacity to innovate as a competence that is intimately tied to the process of innovation.

Rogers and Shoemaker [16] (p. 27) initially defined innovativeness as “the degree of adoption (sooner or later) of new ideas by an individual related to the other members of the system.”

More than three decades later, the same [5] (p. 267) confirmed that definition, but added the adoption of new ideas, not only by an individual but by "any other unit of adoption," for example, a group. Thus, in the opinion of these authors, the term innovativeness is more related to the capacity of diffusion of innovations than to the capacity of generation of innovations.

Another concept similar to Rogers, but with a greater emphasis on services, is proposed by Parasuraman[17] when he defines the “technology readiness” construct (p. 308). To this latest author, this concept refers to people's propensity for using new technologies to reach their personal and professional goals. Thus, he also emphasizes the diffusion of innovations. Additionally, [17] suggests that the capacity to innovate works as a driver for the technological readiness studied in his research.

Lumpkin and Dess[18], in their research study, also touched on the capacity to innovate of the company, however, their main focus was directed toward the study of the entrepreneurial orientation of the organizations. These authors identified some of the drivers for entrepreneurial orientation on the part of the company, and its ability to innovate was among those drivers. In this way, the company's capacity to innovate reaches the status of key-component of its entrepreneurial orientation, because this capacity reflects an important way in which an organization seeks for new opportunities.

Carolyn Solo[19] (p. 417), on the other hand, views a company's capacity to innovate as a "normal" part of its activities and its business. For the author, the act of innovating is nothing more than "ordinary business activity."

In the next decade, Lawrence Mohr[20] (pg.112) defined the capacity of an organization to innovate as the capacity of accomplishing a successful introduction, into a real situation, of means or ends that are new to that particular situation in question.

Mohr[20] had also already identified several studies concerning inventively or creativity in the organization, pointing in several well-defined directions. Nevertheless, there was little consensus concerning the capacity to innovate of the organizations in the studies consulted by him, and this gap is pointed out even to this day ([21]; [22]; [12]. However, [20] found indications that both creativity and the level of informality in an organization influence the company's capacity to innovate.

Concerning creativity, an extensive study conducted by [21] deserves recognition. These authors sought to conceptualize the term organizational creativity and found definitions for innovation similar to those given by other authors ([20]; [5]; [23]). Yet, in the proposal of [21], innovation gives place to organizational creativity, transforming innovation into a sub-set of the wider theme of organizational change, which is the central focus of these authors' research.

[24] also suggested a definition tied to the creativity of the company. These authors defined innovativeness as the capacity of a company to use all of their creative resources to the maximum. However, they relate the theme exclusively to the development of new products and processes.

Among the authors who proposed a definition for a company's capacity to innovate as a construct, we would like to cite Wang and Ahmed[25] (2004). In their work, these authors defined a company's capacity to innovate as the "innovative ability of a company" in the introduction of new products on the market, or opening of new markets, using combinations of strategic orientations combined with an "innovative process and behavior" ([25], p. 304). Although these authors propose five dimensions for the innovation capacity, which are: product, market, process, behavioral and strategy; the theoretical cut they present refers almost exclusively to new products as the main agent and determinant of a company's capacity to innovate.

The [25] were not the only ones who attempted to define the dimensions of a company's capacity to innovate. Eight years earlier, [26] had already evidenced the need to analyze the innovativeness construct from a multidimensional perspective, just as the theme of innovation is also multidimensional. These authors presented two dimensions that, in their view, explained the capacity to innovate; they were: the administrative dimension and the technical dimension. Despite the originality of these proposals of multidimensionality, neither [26] nor [25] made any kind of distinction concerning the typologies and dimensions of innovation related to an organization's capacity to innovate, treating them as synonyms in their studies.

Recently, [27] also proposed a definition for the capacity to innovate a company. According to the authors, "innovativeness is universally perceived as exploring something new that has not existed before" (p.556). Similarly, this definition is the conceptualization given by [22]. These authors classified the capacity to innovate of a company according to its propensity to support and participate in new ideas, experimentations and creativity for the development of new processes.

Table 1. Characteristics of the Definitions of Organizational Innovativeness

DEFINITION OF ORGANIZATIONAL INNOVATIVENESS			SOURCE
PREDOMINANT CHARACTERISTIC	OBJECTIVE	IMPLICIT	
Adoption of Innovations	X		[28]
	X		[29]
	X		[30]
	X		[31]
Adoption/Execution of new Tasks		X	[7]
	X		[32]
Creation of Something New		X	[8]
		X	[33]
		X	[9]
		X	[10]
		X	[11]
		X	[12]
		X	[13]
	X		[34]
		X	[14]
		X	[35]
	X		[25]
	X		[27]
		X	[36]
Culture to Innovate		X	[37]
	X		[38]
	X		[39]
	X		[40]
	X		[22]
Development of New Products and Processes	X		[24]
	X		[41]
	X		[42]
		X	[43]
		X	[15]
Innovation Diffusion		X	[7]
First – to -market	X		[44]

Based on the analysis of the bibliographical sources consulted, we were able to observe that almost as many as half of the authors never proposed an objective definition for the theme of organizational innovativeness. Many of these authors implicitly associated the theme with the

ability of the company to create something new; while the other half of the authors proposed some objective definition – many of which we have presented in the preceding paragraphs. Thus, it is possible to enumerate the predominant and most outstanding characteristics

employed by these authors in their definitions, whether objective or not, concerning the organizational capacity to innovate. These characteristics are shown in Table 1.

As illustrated in Table 1, the academic literature presents several studies that, in some way, approached the theme of organizational innovativeness, but did not conceptualize it in an objective manner (e.g. [7]; [8]; [9]; [10]; [11]; [12]; [13]; [14]; [15]). However, an implicit definition found by all of these authors includes an organization's capacity to innovate as competence which is intimately tied to the process of innovation.

A counterpoint to studies that evaluated the capacity to innovate of companies from an intra-organizational perspective must be given. In this sense, the studies of Grodal[45] emerge. According to [45], studies concerning the innovative competence of the firm have traditionally been linked to some of the company's internal factors, particularly to investments in Research and Development (R&D). The author claims that the alliances between (or among) companies also play a central role in determining the innovative competence of the firms, demonstrating that innovation occurs in the value chains in companies which are immersed in multiple contexts[45].

Thus, the inter-organizational perspective also needs to be taken into consideration. In the words of [45]: "innovation is not a sole consequence of organizations but also of networks of organizations". Nevertheless, the present study will not be using the value chain as a unit of analysis. Instead, we will use the company as a unit of analysis, as will be shown in detail in part 3 of this research study.

III. MEASURING ORGANIZATIONAL INNOVATIVENESS

We find it necessary to make some comments concerning the use of patents as proxies for innovation, as was done by various authors, such as [46], [47], [48], or even [49] himself.

According to [50], patents have been used for over fifty years as indicators of technological activities. Some of the difficulties for using patents are associated with the fact that the companies vary in their propensity to generate patents, and this fact ends up limiting the generalization of

the conclusions of the research studies that use them. Even for the companies that use patents, they do not reflect the amplitude of their innovations or even their effort to innovate, because, according to [50], a significant number of innovations occur out of the scope of the areas and activities of R&D in the companies, and are not patented. Thus, they are not considered in the measurements of innovations that make exclusive use of patents.

Another difficulty lies in the need for understanding which type of activities the patent measurements are related to. In some cases, the patents may exclusively measure inventions, instead of innovations, as was alerted by [50] (, p. 513), "in some cases, patent statistics are assumed strictly to measure invention, as distinct from innovation". According to [51], the invention is the idea, or the knowledge, which precedes the development, commercial exploration and diffusion of new products and processes. In other cases, the activities related to patents may be considered "an intermediate output of resource inputs in activities of R&D" ([50], p. 513).

Therefore, "patents may be applied to every cycle of the development and commercialization of innovations," and, thus, a source of bias for more ample analysis ([50], p. 514). In any case, after considering these limitations, statistics based on patents can be powerful study tools that allow for inferences and verifications which are relevant for specific cases in innovation studies.

An analysis of the bibliography proposed in Table 1 (shown previously) permits the detailing of each article related to the measurements, sample, and methods used by each author. This data is presented in Table 2. It is worth noting that, in the studies consulted, there is a strong orientation toward the firm as a unit of analysis, as well as toward the use of surveys, both primary and secondary data, for the observation of the organizational innovativeness construct. Another conclusion that seems to jump out at you when analyzing the studies concerning the organizational capacity to innovate is the treatment given to the innovativeness construct, which is many times dealt with as a synonym of innovation.

It is also possible to observe from Table 2 that the empirical studies for the measurement of the capacity to innovate vary, particularly related to their proxy.

Table 2: Previous Studies about the Organizational Innovativeness

UNITY OF ANALYSIS	METHOD	SAMPLE/SECTOR	SOURCE
Company	Case Study	4 Companies (with the same manager) / Civil construction	[9]
	Case Study	Small and medium-sized companies / Diverse	[36]
	Survey	71 / Hospitals	[7]
	Survey	382 companies / Diverse	[28]
	Survey	1450 companies/manufacturing (Germany)	[12]
	Survey	181 companies(revenue superior to US\$100.00 MM/year /diverse	[42]
	Survey	148 companies / Diverse (totaling 5 countries)	[44]
	Survey	228 small and medium-sized companies / Diverse	[39]
	Survey	Approx. 200 companies / Diverse (Great Britain)	[25]
	Survey	102 companies/technology service providers	[22]
	Survey	233 companies/manufacturing (Holland)	[15]
	Survey (4 statements)	93 companies / Diverse	[38]
	Survey (4 statements)	453 companies / Diverse (USA)	[40]
	Survey (5 statements)	107 companies/manufacturing and services (Taiwan)	[34]
	Survey (adoption of innovations)	182 / Hospitals	[52]
	Survey (3 statements)	1818 companies / diverse (three countries in Europe)	[32]
	Survey (2 statements)	169 companies/computer - HW (Taiwan)	[41]
	Survey (number of innovations)	134 / banks (USA)	[8]
	Survey (R&D)	76 R&D companies	[35]
	Survey (Patent)	143 companies/pharmaceutical	[41]
Survey (Fortune Magazine Ranking)	Approx. 1000 companies / diverse (except financial)	[27]	
Survey (Innovation Ranking)	50 companies/shoes	[14]	
Company and business units	Survey	101 companies or units / Service and Manufacturing	[24]

Company and employee	Survey (one statement)	616 supply chain managers / diverse	[31]
	Survey	247 employees in 19 companies / diverse	[29], [30]
Employee	Survey	871 engineers / diverse (Singapura)	[13]
	Survey (one statement)	110 public managers in 58 countries/public	[37]
Innovation National System	Theoretical Analysis		[10]
			[11]
New Product project	Case Study	12 large companies / varied (Sweden)	[33]

In some cases, measurements for innovation diffusion are used (e.g. [7]), in others, measurements related to the generation and implementation of ideas, products and processes are applied (e.g. [24]; [42]), or even the measurement which considers market response time (e.g. [44]).

Much has been published concerning the factors which contribute to the “innovative success” of the companies ([1]; [53]; [54], to mention only a few). These factors may be related to aspects of the culture and structure of the organizations, composition of project groups, transference and flow of information and knowledge (inside the organization and the groups), leadership and management abilities, or even, attitudes toward changes, among other things. All of these are aspects to which it is difficult to have access within the companies, as observed by [54].

The need to define both the construct as well as the conditions for its outlines, operationalization and application is imperative to obtaining better results.

[27] also alerted us to the difficulty in collecting data in quantity about the capacity to innovate of the organizations. The solution found by [27] was the use of a secondary database consisting of the Fortune magazine ranking for the issues concerning the innovation capacity of the companies.

In their research about the identification of dimensions of the companies’ innovation capacities, [25] prepared a questionnaire which included the 5 dimensions for analysis proposed by them. The authors made use of a research protocol with statements on a 7-point Likert scale, ranging from 1 = “totally disagree” to 7 = “totally agree”. The population was composed of 1500 companies in Great Britain with at least fifty employees each. The research protocols were sent by mail in the form of a letter (reply paid) to directors or senior executives in the organizations. The return rate was around the order of 14%.

[19], [22] and [55], on the other hand, used proxies such as new products, new processes or patents in their attempt to measure how innovative a company was.

Related to the measurement of the culture, stimulus, and rewards for innovation, [56] attempted to operationalize an organization’s capacity to innovate by measurements connected to the culture to innovate.

Based on everything we have seen thus far which is related to organizational innovation capacity, the dimensions proposed for its analysis in this research are:

- Stimulus (Incentive)/Reward for Innovation: The conditions of the internal or external environment of the company which permits and facilitate the appearance of novelties (innovations).
- Generation and Selection of Ideas: the initial stage of the development process of something new, focusing on the generation of novelties (innovations).
- Adoption and Use of Ideas: the final stage of the development process of something new, focusing on the implementation of novelties (innovations).

Next, the characteristics of the sample and the methodology used for collecting the data will be presented.

IV. METHOD

The Sample

One of the most complex stages of this work was the identification of the organizations to be studied. They not only needed to be companies whose importance was recognized in the sector of the transformation industries, but they also needed to be at least significantly representative of their segment.

Additionally, another critical aspect was the constitution of a group which, because of its diversity, would be representative of a wide spectrum of the business world, specifically related to the transformation industry.

Another fundamental characteristic would be the ease of access to the information, not only through publications but, especially, by the voluntary opening of the company doors to the researcher. Thus, 9 manufacturing companies were willing to cooperate with the present research and permit the adherence tests of the three-dimensional model proposed as the construct of this research.

Based on the OECD classification, [57] proposes that studies involving the measurement of innovation be divided into 4 categories according to the intensity of their activities of research and development (p. 157):

- a) High-technology industries (e.g. aviation, pharmaceutical, telecommunications equipment, electro-medical, etc.)
- b) Medium-technology industries (e.g. electrical equipment, vehicles, chemical industry, etc.)
- c) Medium-low technology industries (e.g. coke, oil refinement, rubber and plastic products, fabrication of metal products, etc.)
- d) Low-technology industries (e.g. wood, cellulose, paper, recycling, products for printing and publication, food products, textiles, etc.)

For this research study and to facilitate the analyses and conclusions, as a starting point, we used the classification proposed by OECD and by [57], with the grouping of the medium-high and medium-low technology forming a new group called medium technology.

Therefore, Table 3 shows the three groups that we made use of in this research, illustrating the number of companies in each group that were used as objects of study for the analyses, as well as associating them to the identified complexity level of their products.

Table 3: Classification of the Companies of the Sample

GROUP	SAMPLE
High Technology – HT (high-complexity products)	3 large companies
Medium Technology – MT (medium-complexity products)	2 large companies
Low Technology – LT (low-complexity products)	4 companies (3 large and 1 medium)
TOTAL (Transformation Industry)	9 companies

The Collection of Data

This stage of the methodology constituted of intensive direct observation techniques, in the form of semi-structured interviews conducted with key people directly involved in the process and the innovation activities of the company.

To guarantee the validity of the answers on the part of the respondents, we opted for selecting those who occupied medium or high management positions in the companies of the sample. In some cases, it was possible to ensure that the high management representative of the company be the president himself. However, in most cases, the representatives were directors or managers.

Moreover, as a form of support to the research and observations, we consulted two key persons in FIESP (São Paulo State Industry Federation Organization – high and medium management) who acted as a yardstick of the opinions and views of the transformation industry segment as a whole. Table 4 represents the list of those interviewed in each organization.

Table 4: List of interviews

GROUP	LEVEL OF THOSE INTERVIEWED
High Technology – HT (high-complexity products)	3 medium management + 3 operational
Medium Technology – MT (medium-complexity products)	2 medium management + 2 operational
Low Technology – LT (low-complexity products)	3 high management + 1 medium management + 2 operational
FIESP (Sao Paulo State Industry Federation Organization)	1 medium management + 1 operational

Otherwise, it is worth noting an important point concerning the possible bias that high and medium management can bring to the study. One of the gaps pointed out by [5](p. 409) in research studies about the theme of organizational innovativeness concerns the fact that they are mostly concentrated on data obtained from the high management of the organization, which, according to the author, may not reflect the opinion of the organization as a whole in regards to innovation. To minimize this problem, the analyses, whenever possible, sought to collect evidence from other levels of the organizations consulted.

V. RESULTS AND CONCLUSIONS

The analyses related to the innovation capacity of the companies are presented below. For this analysis, we made use of the measurements proposed for each of the three dimensions related to a company's capacity to innovate:

- Stimulus (Incentive)/Reward for Innovating.
- Generation and Selection of Ideas.
- Adoption and Use of Ideas.

These analyses are detailed in the topics below.

Stimulus (Incentive) and Reward for Innovating

All of the companies in the three groups (HT, MT, and LT) claimed and agreed that they have incentives for innovation; however, the HT and MT groups indicated that they have some reservations in the sense that those incentives are sometimes not very well explored or used to the maximum of their potential to generate knowledge and to develop innovations.

Another point that emerged concerning this subject concerns the remuneration for the innovations and ideas of the employees. We observed that the remuneration actions are on very different levels of maturity in the companies of the sample. While some companies are concerned about reviewing and possibly revising their policies for acknowledgment and remuneration of ideas, as was cited by a company in the HT group: "We are always thinking of the best way to be able to acknowledge these ideas," others, such as one of the companies in the LT group, already make use of events and non-monetary awards for ideas that have been implemented.

On the other hand, the scenario is completely inverted regarding the existence of processes that support innovations or various initiatives. The HT and MT groups, besides citing examples of processes, methodologies and innovation programs in their companies, also stated that there are various processes in place to support initiatives and ideas. This differs from the LT group, which stated that it has some innovation programs, however, they are too little adherent to be able to act as efficient support for innovations, except for two of the organizations in this group whose responses and arguments were similar to those given by the HT and MT groups. One of these two organizations of the LT group said, "We have an innovation program [by means] of the generation of incremental ideas (...) and, it has already brought a return of R\$ 19,00 for every R\$ 1,00 invested in innovation."

It is interesting to note that all of the companies in the three groups cited some program of suggestions as an example of an innovation program; according to the words

of one of the high management members of one of the companies of the LT group, "stimulating and keeping up the generation of ideas is important, but being concerned about the accomplishment of those ideas is equally important."

One of the companies of the same LT group, in particular, has obtained large numbers of ideas from employees (several dozen ideas/year); and the company has implemented at least half of the ideas generated, having found it necessary to develop an IT (information technology) platform capable of withstanding and managing this flow of suggestions. The practical results are some incremental innovations that have been implemented in the whole scope of the company (products, services, processes and the business as a whole), in addition to more significant innovations that have generated dozens of patents in Brazil and around the world.

The innovation process implies "experimentation, and there is no guarantee of permanent success," according to one of the people interviewed. Thus, the issue concerning the treatment of the non-successes of ideas and initiatives is relevant to an environment of either stimulus or repression of innovations. Only one of the companies in each group (HT, MT, and LT) stated with conviction that the non-successes were transformed into learning experiences. One of those companies explicitly states that mistakes or failures in innovations represent nothing more than investment in training (learning experiences).

It is noteworthy that two of the companies of the LT group are starting to engage in and disseminate an orientation program for innovation in their respective organizations. From the words of one of those interviewed, "the innovation process as a whole is a relatively new process; the company is still learning to deal with the successes and non-successes of ideas."

However, none of the companies widely discloses or publicizes these non-successes internally. According to the words of one of the people interviewed, these non-successes "are disclosed to an interest group," normally made up of managers.

An important point brought up by the companies in the sample (especially in the HT group) is that the difficulties do not lie only in the area concerning the care in registering and storing past information and experiences. The difficulty lies in creating mechanisms – according to those interviewed – which make it "faster and easier to consult" this information, concerning both successes and non-successes.

In general, situations that offer greater stimulus seem to be concentrated more in the HT group than in the MT and

LT groups, with some exceptions that have already been pointed out in the LT group.

Comments on the dimension of the generation and selection of ideas in the three groups in the qualitative study have been made below.

Generation and Selection of Ideas

Concerning the clients and suppliers as sources of innovation generation, we were able to observe distinct differences, both from one source to another, as well as among the groups analyzed.

Clients have greater relative importance than suppliers as to the inspiration for ideas and novelties of any nature in the companies researched. Combined with this understanding, all of the cases identified opportunities for the generation of value and ideas from their suppliers, as one of those interviewed explained, "With the suppliers, we are still on the brink of evolution; we can still extract even more value from them than we are extracting today as sources of innovations and information for products and processes."

Yet, in the three groups studied, HT, MT, and LT, there is a variation of the relative importance for both agents – clients, as well as suppliers – from one group to another. The HT Group is the one that places greater emphasis on the use of clients and suppliers as sources of inspiration and novelties. On the other hand, the relative importance of these agents is greater in the group of MT companies than in the LT.

There is only one company in the LT group which seems to be an exception to previous analyses. This company, in particular, pointed to the little use and exploration of ideas and novelties in a systematic way, coming either from clients or from suppliers, as one of its deficiencies. One of those interviewed in the company stated, "We practically never use clients and suppliers as sources of innovation; this is a point we are working on." In a complementary way, the president of this same company also stated that "The clients [in this market] are good followers, but not innovators."

In addition to the clients and suppliers as sources of ideas, the people interviewed also pointed to the employees of the companies themselves, the exchange of information (formally and informally) among them, and participation in discussion forums, congresses, and different events as essential factors for the generation and selection of ideas. From the words of one of the respondents, "Actually, there are various [sources of innovations]; the company team itself produces the elements and is induced to look at novelties wherever they may be."

It is an entirely different situation when we analyze the role of the leadership in the generation, sharing and selection of ideas. The LT group places greater emphasis (than the MT and HT groups) on the role of the managers in the stimulus and exchange of ideas and suggestions, promoting an interchange of initiatives among colleagues, including those of different areas. In this aspect, the HT group "spoke in unison" when stating that "Managers stimulate an innovative environment, but there is always room for more [stimulus]," to borrow the words of one of those interviewed.

On the other hand, when analyzing the dimension of generation and selection of ideas in terms of innovations of products, services, processes or of the business as a whole, the companies in the HT, MT and LT groups show similar behavior, as has been detailed in the following paragraphs.

In the HT group, the efforts for a generation of ideas/novelties are more oriented toward products or services and processes than toward the business as a whole, as was illustrated by the words of one of the respondents in this group: "I see innovation in everything [in products, services, processes, and the business], but to establish a ranking, the innovation in product and process would be ahead of the others. Today, the innovation of a business model is fundamental, however, no one changes their business model every year, therefore, product innovation stands out more." The efforts of the MT group for the generation of ideas/novelties are more markedly orientated toward products and services, and not so much toward processes or the business as a whole. In the LT group, the efforts for the generation of ideas/novelties are more directed toward processes than was found in the other groups. An example of this last group can be illustrated by the following statement which was extracted from the interviews in this group: "We greatly innovated a product in the past and it was very good. It would be worth it for the company to focus on that product and increase its scalability and margins; from that point, we began intensifying efforts towards more improvements in processes."

Finally, the last dimension we analyzed concerning the innovation capacity of the companies (detailed in the following topic) can be illustrated by the following statement, given by one of those interviewed: "What we believe is that innovation does not simply happen; it needs to be generated, stimulated and encouraged, or it will not happen. You also need the time to create it, and there is the time to implement it."

Below, we explore the dimension for adoption and use of ideas for the three groups in the qualitative study.

Adoption and Use of Ideas

Complementary to what was presented in the previous topic, the efforts for the generation of ideas/novelties, particularly related to processes, are translated into innovations that are not only adopted in the companies that introduced them but also are referenced in the sectors in which they act. This is the specific case of the LT group, as explained by one of the respondents: "We practically changed the market with the innovation we made in the production process, and we continue to make improvements."

However, in the HT and MT groups, this scenario is not the same. Companies in both of these groups did not identify the recent innovations in their processes as being references in the segments in which they act. Some of those interviewed pointed to the fact that, in some moments, the companies in which they act are benchmarking in processes, and in others, they are not. This perception can be illustrated by the following sentence: "Many times, companies come to us wanting to know things [in the context of processes], and, other times, we are the ones who go to them."

About the development and implementation of innovations in products, all of the companies consulted, in some way, described themselves as being among the main "companies of reference" in their respective sectors. In this regard, we found no distinction among the groups studied. It is interesting to point out that none of the companies described itself as a company of reference in innovations of products/services in its sector, even if it had been one month or years before. Even companies that usually launch new products before the competitors did not call themselves companies of reference. This fact was observed in more than one case study, where the people interviewed were cautious when it came to set themselves up as a reference for product innovations, making sure to also give credit to their competitors. "Concerning product innovation, the competition has also done a good job in these last two years," one of those interviewed said.

On the other hand, regarding the adoption and use of ideas and later launching of products, we observed a clear distinction among groups. The companies of the MT and LT groups took a shorter period for the "maturation" of ideas and the launching of products than that of their competitors, as was explained by one of the respondents: "The company's strategy is to occupy this market [niche]; basically, the strategy is to create products before the competitors do. It [the company] tries to avoid competition." This does not mean that their products are all necessarily more innovative than those of their

competitors, but that they are launched – on average – before those of the other competitors.

The companies of the HT group, on the other hand, showed more signs of inertia when it came to the launching of products ahead of their competitors. The companies of this group have been more cautious concerning launching new products ahead of the competitors, whereas their strategies include being quick followers, as illustrated by one of the interviews given: "There is always something that the market launches before us; the decisive process here in this company is not always the fastest; but, for example, if the company notices that some [new product] launched by a competitor worked, it will many times follow by launching a product that is more innovative."

VI. DISCUSSION AND CONCLUSION

This research study purposed to explore the dimensions of the innovation capacity of the organizations belonging to the transformation industry, composed of manufacturing companies in the state of São Paulo, Brazil.

As seen previously, the literature concerning innovation and the capacity to innovate, through its theoretical development and empirical studies, allowed the author of this present study to propose a model made up of three distinct dimensions to operationalize the organizational innovativeness construct:

- Stimulus (Incentive)/Reward for Innovation: The conditions of the internal or external environment of the company which provides and facilitate the appearance of novelties.
- Generation/Selection of Ideas: Initial stage of the development process of something new, focusing on the generation of novelties.
- Adoption and Use of Ideas: Final stage of the development process of something new, focusing on the implementation of novelties.

Additionally, we observed the adherence of this three-dimensional model in the empirical studies conducted in the three study groups: High, Medium and Low Technology.

Also, it is important to examine some of the limitations of this study which could contribute to framing the structure of future studies. The first limitation, evident in this kind of work, is concerning the use of a base of only 9 companies, which could be expanded, increasing the size and extension of the base in the future, to permit other inferences and observations.

Otherwise, although the innovation capacity has been treated as an independent variable in most of the discussions in this research, it is important for the decision-makers in the companies that the innovation capacity of the organizations also be treated as a dependent variable, focusing on methods for its creation and maintenance, with variables different from those treated in the present study.

Finally, through these analyses, we sought to contribute to the knowledge in the area of Business Administration, more specifically, to expand the empirical studies of Brazilian companies under the aegis of innovation.

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