



## RE-READING AND ANALYSIS OF MANAGEMENT PRACTICES IN THE CONTEXT OF STARTUPS: A CASE STUDY FROM THE CONSTRUCTIVE PERSPECTIVE<sup>1</sup>

*Rogério Tadeu de Oliveira Lacerda<sup>2</sup>*

*Mayara Lucia Bernardes<sup>3</sup>*

*Anelise Stangarlin<sup>4</sup>*

### ABSTRACT

It is important to recognize that effective management practices in established companies are often ineffective when applied to startups, due to the higher levels of uncertainty inherent in the context in which they are inserted. Therefore, this research analyzes two cases of technology-based startups from Santa Catarina, where the needs to adapt management practices to the needs of these companies were identified. Thus, this research uses a qualitative approach to collect data through participant observation and its results presented in the form of a case study. As results, it is evident that the use of approaches oriented to discoveries by the entrepreneurs has become an instrument that allows to obtain data on actions and results from experiments, in a fast way, even in conditions of high uncertainty. The strategies for validating business premises resulted in important information for the quick and precise strategic adaptation of the startup to the dynamic environment, thus maximizing business performance. Thus, the necessary adaptations of management practices to act in line with the dynamic environment are fundamental in building a management model according to the reality of each startup, thus improving organizational performance.

**Keywords:** Entrepreneurship. Startups. Uncertainties. Dynamic environments.

### 1. INTRODUCTION

Established companies generally have different objectives than nascent companies, which focus on improving management capacity with an emphasis on cost reduction, quality improvements and incremental innovations in existing products and processes. Thus, it is important to recognize that effective management practices in established companies are often ineffective when applied to start-up companies, in the case of this research, startups, due to the higher levels of uncertainty (O'CONNOR; RICE, 2013).

Startups are organizations created to develop a scalable and reproducible business model in conditions of extreme uncertainty (BLANK; DORF, 2014). In these organizations, resource limitations are common, the absence of a clear hierarchical system and the presence

---

<sup>1</sup> This work was carried out with support from CNPq, National Council for Scientific and Technological Development - Brazil and with support from the Coordination for the Improvement of Higher Education Personnel - Brazil (CAPES) - Financing Code 001.

<sup>2</sup> rogerlacerda@gmail.com - Federal University of Santa Catarina-UFSC

<sup>3</sup> mayaralbernardes@gmail.com - Federal University of Santa Catarina-UFSC

<sup>4</sup> stangarlin.anelise@gmail.com - Federal University of Santa Catarina - UFSC

of ambiguities (MIRANDA, et al. 2015). Thus, understanding the characteristics inherent to these nascent companies and the nature of the uncertainty they face is essential for the development of appropriate management practices (O'CONNOR; RICE, 2013).

Uncertainty is an important and determining dimension that influences entrepreneurs' decision-making (AREND, 2014). According to Artinger (2015), the term refers to situations in which a decision maker does not know all possible decision options, as well as their consequences and probabilities. However, practices based on rational choice are still very present in the management literature, where it is assumed that all important information for decision making is available to the decision maker (O'CONNOR; RICE, 2013; ARTINGER, 2015).

That is, in the complex, uncertain and limited information environment in which these startups are inserted, the difficulty faced by entrepreneurs is in the adoption of management practices that adapt to the reality of the company (SOMMER et al., 2009; ARTINGER, 2015) In this context, complexity refers to the number of decision variables that the entrepreneur has to consider and the number of interactions between these variables for decision making (SOMMER et al., 2009).

Soon, This research analyzes two cases of technology-based startups from Santa Catarina, where the needs to adapt management practices to the needs of these companies were identified. Thus, this research has the following specific objectives: (i) Present characteristics necessary for the management of organizations in dynamic and uncertain environments; (ii) Conduct two case studies in Santa Catarina startups in the adoption of traditional management practices; (iii) evidence the adaptations made to apply these practices; (iv) Perform a comparison between the results of the case studies and the factors of analysis.

## **2. THEORETICAL REFERENCE**

The following is a theoretical framework of the themes of this research: Dynamic environments and Startups management.

### **2.1 DYNAMIC ENVIRONMENTS AND STARTUP MANAGEMENT**

Dynamic environments are associated with high rates of uncertainty and complexity (WIKLUND; SHEPHERD, 2005). More specifically, uncertainties can arise from constant changes in technology, markets, people and rules (DE MEYER et al., 2002) or the introduction of new products, services or enterprises (MCMULLEN; SHEPHERD, 2006). Uncertainty is

also inherent in the business domain, where timely decisions generally need to be made where the entrepreneur does not have knowledge and data from past experiences (ARTINGER, 2015)

In this way, it is possible to notice that companies inserted in dynamic environments behave differently from those inserted in environments with relative stability, since such environments interact directly with the company's strategy, modifying it (WIKLUND; SHEPHERD, 2018). And in this way, it is possible to identify the first theoretical construct of this research:

**CONSTRUCT 1: In dynamic environments, startups must always be adapting to changes in their context in order to guarantee competitive advantage in wide horizons of time.**

With regard to uncertainties, O'Connor and Rice (2013) present a categorization of four types of uncertainty, the market, technological, organizational and resource. The first category of uncertainty covers market aspects such as changes in customer needs, the size of the intended market, its distinctive characteristics, among others.

Technical uncertainties refer to the technical knowledge underlying the company, whether it is involved and can be converted into a reliable, economical and manufactureable product / service. Organizational uncertainty involves the risk of advancing new substitute technologies or creating new market spaces and the organizational structure. Finally, resource uncertainty refers to the attraction of the necessary resources - financial and skills - for the development and commercialization of the product / service (O'CONNOR; RICE, 2013).

From these uncertainties, it is evident that the replications of classic managerial practices are not sufficient for the management of startups (SOMMER et al., 2009). In this sense, McGrath (2010) highlights that in highly uncertain, complex and fast-moving environments, such management practices need to consider and be based on entrepreneurial insight, rapid experimentation and evolutionary learning.

Conventional predictive planning approaches suffer from an incompatibility between the knowledge that a company actually has and the knowledge that its planning systems assume it has (MCGRATH, 2010). In this sense, conventional practices based on planning and prediction in scenarios do not present the same results in environments of high uncertainty. In this way, entrepreneurs increasingly adopt discovery-oriented approaches to the detriment of conventional ones based on planning and prediction (KERR et al., 2014).

The goal of a discovery-oriented approach is, therefore, to learn as much as possible at the lowest possible cost. McMullen and Shepherd (2006) point out that discovery-oriented planning processes require that business model assumptions be articulated and tested. Having

had an idea that an executive thinks represents an opportunity, the next step is to validate whether it can really deliver a satisfactory result for the company. Another contribution of this approach is to consider the initial phase of a new business as a step to reduce uncertainty through experiments, in which value is created when entrepreneurs convert assumptions into learning (KERR et al., 2014).

From the information presented, the second theoretical construct stands out:

**CONSTRUCT 2: Under conditions of high uncertainty, startups should prioritize discovery-oriented approaches over approaches with an emphasis on predictive planning.**

Therefore, due to the unique characteristics of startups, their management must be carried out considering such particularities, therefore, the management of startups will be addressed in the scope of business process management, project management, organizational performance assessment and product development and strategy.

Business Process Management (BPM) still follows a unique approach that does not distinguish external or internal contingencies and can thus lead to major setbacks in relation to the internal support of BPM in the organization (LACERDA, et al. 2016). Therefore, the proper way to manage business processes in startups is through recognition of the specific context in which the organization is inserted. (VOM BROCKE et al. 2014).

Regarding of project management, it has traditionally been aligned with the hard paradigm coined in positivist philosophies and the view of organizations as mechanistic, focused on structure and centralized control (DE MEYER et al., 2002). In contrast, some authors have understood that the soft approach has positive impacts on the managerial aspect when (i) technological uncertainty is high and the long-term consequences are diffuse; (ii) the project is susceptible to external factors and (iii) the complexity of the project's scope and context is high. These conditions more faithfully represent the dynamic environment in which startups are inserted, thus requiring traditional project management approaches to adapt to these specificities. (LACERDA et al., 2017b; LACERDA et al., 2018).

Another aspect of start-up management is the assessment of organizational performance, where when using this tool, it should be considered that startups have greater uncertainty about the environment and the acceptability of their products and services than traditional companies (MIRANDA et al., 2015). In this context, it is necessary to expand the understanding of entrepreneurs to build indicators that will continuously legitimize their planning premises, reach expectations and, subsequently, to a superior performance and competitive advantage over wide time horizons (MIRANDA et al., 2015).

In view of this, the third theoretical construct of this research is highlighted:

**CONSTRUCT 3: The performance evaluation method in dynamic environments should support entrepreneurs to expand their understanding of their context and use dynamic, adjustable performance indicators, continuously revised to adjust changes in the external and internal context.**

With regard to product development and strategy in the management of startups, it is noted that the constant changes in the business environments mean that companies are increasingly inserted in dynamic and / or competitive environments and these environments open niche markets, in which companies strive to provide products that can generate income by capturing and thus satisfying the client's demand for those niches (SCHREIBER et al., 2016). Therefore, in this scenario, companies that have an orientation to seek new opportunities improve their performance, as these companies have an adjustment between their strategic orientation and the environment. (WIKLUND; SHEPHERD, 2005).

This adjustment between the dynamic environment and the strategy of the entrepreneurs is paramount and complex, since the entrepreneurs generally encounter difficulties in strategic decisions. Such decisions include, for example, choosing between advancing in terms of knowledge or technology and incorporating these advances into new products or pursuing a greater return through a more efficient production system for the product that is already on the market. (MIRANDA et al., 2015).

### **3. METHODOLOGICAL PROCEDURES**

This research uses a qualitative approach for data collection through participant observation and its results presented in the form of a case study.

The case study of this article is based on the sequence for conducting the case study proposed by Miguel (2007) with the following steps being contemplated: (i) Definition of a theoretical-conceptual structure; (ii) case planning; (iii) data collection; (iv) data analysis; and, (v) preparing the report.

The stage of defining a conceptual - theoretical structure consisted of defining the theoretical framework resulting in a mapping of the literature on the subjects dynamic environments and management of startups, where it was possible to identify gaps in which the research can be justified, as well as made it possible to extract the results. constructs.

In the case planning stage, it was determined that this study will be based on multiple cases. In addition, it was established that in the collection and analysis of data, interviews, document analysis and participant observation will be considered.

After the planning, the data collection stage takes place, counting the entrepreneurs interested in participating in the project and the data recording according to the established planning.

The data analysis stage consists of a detailed description of the cases, followed by the construction of a demonstrative panel of the whole set, allowing to draw valid conclusions from these data. Then, a cross-analysis of the cases was carried out, identifying convergence and divergence between the sources of evidence.

In the last step, the entire set of activities from the previous steps is summarized in a research report. This report is the generator of this article.

Thus, using the exposed methodology as a basis, two cases of technology-based companies covered by the SolutionUp project will be reported in order to highlight the operationalization of the theoretical constructs explained in this research.

#### **4. CASE STUDIES**

The SolutionUp project is an extension activity at the Federal University of Santa Catarina - UFSC, which integrates a technology-based company and students from different undergraduate courses. These students aim to solve a management problem of this startup in the period of 8-12 weeks, through an active learning process described by Marquardt (2005).

The steps consist in the formation of the project team followed by the prospecting of the entrepreneur, after the selection of these authors the project team conducts an interview with the entrepreneur in order to identify the problem, after this interview the planning of activities in which the students are encouraged to organize themselves in groups according to their interest in areas of knowledge that corroborate for the solution of the determined problem (LACERDA et al., 2017a).

The project follows an iterative cycle where the phase of debates and reflections returns until the stabilization of the propositions and recommendations, this being the closing of the project.

##### **4.1. DUE CASE**

DUE, is a company from Santa Catarina that develops, produces and markets cutting and marking machines laser. It is one of the startups incubated by Institute for Support to Innovation, Incubation and Technology - INAITEC, and founded by engineers in the year 2015.

Entrepreneurs sought the project in order to resolve complaints about the strategy for launching a new product. The launch of the new machine would take place within 3 months at

a national level event focused on handicraft and related microentrepreneurs. However, in the first moment of contact with the problem, after the interview with the entrepreneur, elementary complaints were identified in relation to the product launch strategy, such as for example not having a well-defined target audience, lack of advertising about the new product, product design problems, high costs to produce the machine, lack of trained suppliers and low production capacity.

Thus, given the various problems identified and the complaint made by the entrepreneur, the project team sought to study areas of knowledge that can be used to understand the difficulties faced.

Therefore, the project team was divided into smaller groups, called commissions, and each of them was responsible for exploring in depth the following themes: strategic planning and product launch. After the presentation of these commissions, there was a period of debate and arguments from which relevant doubts about the competitive edge of DUE and its business model emerged. Thus, due to the lack of information and information that is often ambiguous, such as the sending of two versions of the canvas of value proposals by the company, the project team proceeded for another cycle of exploration in order to identify the problem of this .

Therefore, after understanding how the company works, the project team decided to make a technical visit since there was a need to understand more about the production process of the new product. From this visit, it is worth mentioning some testimonials from the project's students, highlighting the difficulties faced by the company that affect the strategy of launching the new product.

Therefore, based on the observations and studies carried out, the problem label was defined as “The lack of a strategic model for product launch”. From this label, the project team sought to understand what would be a strategic model for Due and how the product launch is taking place. Therefore, based on specific literature, knowledge about strategic models was sought, in this aspect the Management Excellence Model - MEG (FERREIRA, 2009;SARTORI; SILUK, 2011; MARCONDES, et al. 2015) and also, regarding the product launch strategy, the project team explored the Product Development Process - PDP (SALGADO, et al. 2010).

Under the aspect of the Management Excellence Model - MEG, it is based on a set of eight principles and values, called Fundamentals of Excellence, they are systemic thinking, organizational learning and innovation, transformative leadership, commitment to stakeholders, adaptability, sustainable development, process orientation and value generation. Regarding the

analyzed company, the project team identified two extremely important principles for the construction of a strategic model for product launch, namely organizational learning and innovation, and commitment to stakeholders.

Regarding the product development process methodology, there is a flow of steps that are pre-development, product development and post-development. All of these steps aim to develop a product that meets market expectations, in a timely manner, at the cost of a compatible project and with ease of production.

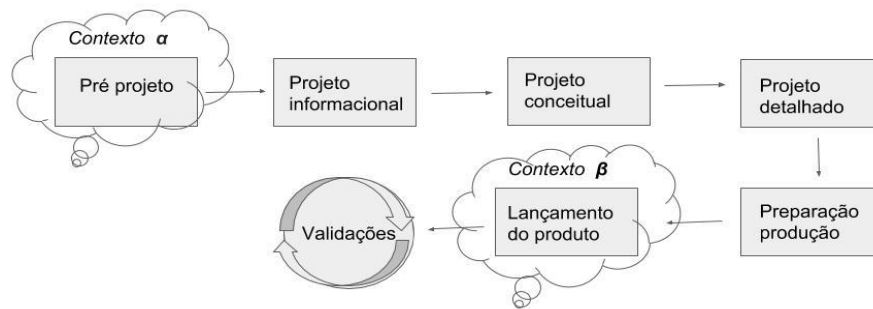
Therefore, a comparison of the stages of this methodology with the reality of the company was carried out, where it is possible to identify the gap in the product development stage, specifically in the product launch phase, as there is a difference of two years between the beginning of the project. product and its launch. This scenario leads to new analyzes of the internal and external context, such as the validation of the project premises established at the beginning of the project, that is, two years ago.

The DUE followed a linear product development model and after two years of building the new product, the project team verified that the target audience established at the beginning of the project, context  $\alpha$ , would not be ideal for the end of the project, context  $\beta$ . In addition, in one of the interviews with the businessman when asked by the project team about the difference between the target audience of the existing product and the new one, he replied “The target audience will be the same, there will only be the possibility of purchasing a machine more powerful and that works better with your material”. Therefore, it is noted that the linear model of work established in the company imposes static assumptions, which are at variance with the dynamic environment in which the company is inserted.

As shown in Figure 1, a schematic representing the product development stage at DUE is exemplified. Note the development of linear planning stages in the DUE, the different contexts experienced and the cyclical validation stage, proposed later by the project team.



Figure 1 - Product development stage at DUE



Source: Research data (2018)

Therefore, there is a limitation of this way of working in dynamic environments and, therefore, it was necessary to adapt the product development process methodology for the DUE, in order that this new way of working was consistent with the high rates of change. characterized by this environment.

Under the search for a new way of working in accordance with the reality of the company, the project team selected three main themes from the MEG to build the strategic model for product launch at DUE, these being innovation, customers and suppliers.

The themes were presented to the entrepreneur in order to obtain their validation, therefore, the entrepreneur mentioned that it was not necessary to prioritize the innovation part, as they were already working with this through the implementation of PMBok, in addition he stressed that he would prioritize the theme arising from the model of excellence in Customer and Supplier management. However, through a series of debates and arguments with the entrepreneur, the project team decided that for the product validation stage in the DUE, quick learning cycles and findings would be necessary. Based on this analysis, the project team chose to select a tool from the Innovation theme, accelerated prototyping, and another from the Customer theme, the communication plan. Soon,

Therefore, two communication plans prepared by the project team were presented to the entrepreneur, one using Facebook Ads as the communication channel and the other Google Adwords. These communication plans were built with the following structure, composed of plan objectives, specific target audience; communication channel; appropriate message and frequency of communication. Follows Chart 1 with the communication plans prepared by the project team.

Table 1 - Summary of the communication plan at Due

Communication plan	Facebooks Ads	Google Adwords
Specific audience	Women, aged between 30 and 60, residing in Brazil. With areas of interest in: design and custom; wood products and DIY; arts and crafts.	Different personas were defined, each one at a point in the shopping journey. The stages of the purchase journey were defined based on the sales funnel, which are: consideration of the solution, recognition of the problem and purchase decision
Communication channel	Facebook	Google
Message	“STARTING YOUR BUSINESS! Have you thought about customizing your creations? Learn the best ways to turn your products into something unique, let your creativity flow using Due Laser's portable cutting machines. ”	Keywords such as laser cutting machine, laser marking and laser cutting were used.
Communication frequency	It was decided to carry out prototyping three days a week, excluding Friday, Saturday and Sunday.	It was decided to carry out prototyping over four days, including Friday, Saturday and Sunday.
Success factor	The best target audience was defined as the one that sent the most inbox messages to Due.	The best target audience was defined as the one with the highest number of clicks per ad.

Source: Research data (2018)

Given the communication plans proposed and validated with the entrepreneur, the project team proceeded to the execution approach through accelerated prototyping. The accelerated prototyping method consisted of defining statements, goals, methods and measurement of the statement made. Thus, the established measurements generate confirmation of the initial statement or the discard of it.

Therefore, from the results generated in the prototyping of the communication plans, the project was finalized and it was possible to conclude that the *Facebook* is the most recommended communication channel for the company and also that Due's target audience is composed of women aged 45 to 54 years, with an area of interest in DIY and wood products. Such conclusions guide new courses of action for the marketing strategies of the new product.

In addition, some of the recommendations made by the team were not to discard the Google Adwords tool as a possible communication channel, as it has great potential, however it requires further study to master the use of this tool.

#### 4.2. LIVTI CASE

LIVTI was founded in 2012 and is a Santa Catarina technology and information security startup, whose core business is technology management applied to the strategic objectives of organizations, it offers solutions through the application of information technology in the areas of monitoring, security, virtualization etc.. In 2017, it was incubated at the Institute of Support to Innovation, Incubation and Technology - INAITEC and that same year was part of the SolutionUp project.

The company sought the project in order to add process improvement, however, at the first meeting, the project team identified that the entrepreneur presented other adversities such as the customer's difficulty in identifying the added value of the product, difficulty in prioritizing problems, disruption of internal processes and poor distribution of internal functions and tasks. In view of the various problems exposed, in order to build the label of the problem, two commissions were organized, these being the complementary documents committee, which would seek all the necessary documentation to understand the listed problems and the problems structuring committee, which was responsible for compile and document all possible problems proposed by the team.

Therefore, from the analysis and subsequent discussion of these studies, two possible aspects of the label for the problem were constructed, namely: unstructured internal processes and deficient management.

In the second interview with the businessman, it is possible to evidence difficulties encountered in the management of the company that corroborate the listed labels. This evidence includes the fact that the company does not have well-documented and well-defined internal goals, the difficulty in resolving conflicts due to horizontal management, and it was also seen that there is no list of all activities that must be carried out with the client interfering directly on the quality of the service offered. Given these facts, the project team concluded that both aspects presented confer a very comprehensive theme. Under this bias, an in-depth investigation about the company became necessary in order to promote greater specificity of the label in view of the context of LIVTI and its specificities.

In this way, a technical visit was made in order to understand how day-to-day life is established at LIVTI. In this enriching visit, the project team obtained insights such as the fact that the processes are stored only in the employees' memories and not described in nowhere, moreover, the company pointed out the lack of personnel as points of attention, which causes the forgetfulness of tasks, since they are left without responsible, and yet, the speech of one of

the entrepreneurs stands out when asked about how to deal with their problems: “In an agile and fast way (we have nothing planned to deal with this in our planning)”.

Therefore, in order to understand the fundamentals about planning and executing processes, BPM (Business process management) and complementary to BPM, it was found about KPI (Key Performance Indicator), thus obtaining knowledge regarding metrics, and, there were explorations about the Lean Service methodology with the purpose of assimilating more about this philosophy of waste reduction, which is extremely pertinent to the reality of uncertainties and resource limitations of a startup.

Thus, based on reflections, data and arguments, the project team concluded that the two sides of the problem come together in one only big problem is the lack of process management.

Therefore, from the identification of the problem label, the proposals to solve it are built collaboratively with the entrepreneur, through the presentation of propositions from the project team and recommendations for improvement or validation of the entrepreneur. In this regard, the project team proposed the use of the BPM methodology segmented in stages based on the work of Jeston and Nelis (2014), which are the definition of strategic objectives; process architecture; process management project; understand; innovation; team alignment and implementation. It is expected that with the use of this methodology, LIVTI will be able to plan, develop, verify and continually adjust its processes according to its strategy and business objectives. About this proposition,

Therefore, aiming at a more efficient approach to the label solution, it became essential to customize the BPM model so that it is in accordance with the reality of LIVTI. Such adaptations resulted, for example, in the use of methodologies such as KPI for the definition of strategic objectives, followed by the construction of the process architecture, where all the company's internal processes aim to satisfy the customer and the importance of the customer's preferences is evident. in the company's internal processes.

Subsequently, the process management project used the Scrum methodology in their management and planning, since this methodology enables an agile framework for managing complex tasks and meets the way of working at LIVTI.

In addition, the project team identified the risk of BPM not being institutionalized in the company. Thus, it was seen that it is essential for BPM to have a common understanding, that is, there must be the incorporation of BPM in the organizational structure, given the relevance that employees are aware of the process so that they can also be part of it through continuous improvement. .

Based on these notes, the project team proceeded to the final stages of BPM, with these being understand, innovation, team alignment and implementation, therefore, the project team ran a workshop with the company where a shared value of this methodology was created through joint construction of some stages of the BPM. In this workshop, quick wins were identified, which are simple changes in processes which have a great potential for improving the process after its implementation. Therefore, the identification and execution of quick wins at LIVTI highlights the importance of obtaining rapid improvements, which are constantly identified and implemented.

Still on the workshop held, the project team analyzed all the process indicators and generated recommendations for improvements. Therefore, one of the recommendations pointed out refers to the indicator analyze demand, where it was seen that the activity of analyzing demand was not well defined, therefore, it was proposed to create a technical opinion template to carry out the activity in a systematic way, thus ensuring that there will be no lack of information.

Thus, the completion of the project at LIVTI culminated in the delivery of a BPM model adapted to the company's reality, which is in line with the label of the established problem. In addition to this delivery, the inclusion of entrepreneurs in the discussions for the construction of this model and the training given to the company aim to establish a culture of process management and also allow LIVTI to be able to continuously adjust its processes according to the its strategy and business objectives over long time horizons.

## 5. DISCUSSION OF CASES

Therefore, given the proper theoretical bases on the cases studied and the synthesis of the entrepreneurs' trajectory, where the main difficulties experienced by them were evidenced, it is possible to discuss the cases through the comparison between the results of the case studies and the factors of analysis previously identified, such notes are shown in Chart 2.

Chart 2 - Constructs and evidence from Due and LIVTI cases.

Construct	Due Evidence	LIVTI evidence
1) In dynamic environments, startups need to be always adapting to changes in their context in order to guarantee competitive advantage over wide time horizons.	At Due, through the analysis of customer feedback collected during the accelerated prototyping process, a creative process emerges to create alternatives that do not currently exist, such as new	In structuring the architecture of LIVTI's processes, which is a design of the company's process structure, the client is related to the outputs of all processes, as shown in Figure 2.

	target audiences or a new value proposition.	
2) Under conditions of high uncertainty, startups should prioritize discovery-oriented approaches over approaches with an emphasis on predictive planning.	<p>During the product launch stage, product requirements became hypotheses that need to be confirmed with facts and data from business experiments. In this way, changes in plans are seen as learning and not as failures.</p> <p>At Due, the alignment between the dynamism of the environment was sought with a strategy for validating assumptions about the quick product launch and which allowed the interpretation and analysis of feedback information correctly.</p>	<p>In view of the uncertainties regarding the results of the BPM phases at LIVTI, the project team in the understand phase proposed a process of developing knowledge about how the company's processes are being executed, thus generating a report with possible improvements.</p> <p>At LIVTI, the use of the Scrum methodology in project management proposes iterative activities and divided into cycles called Sprints, thus imposing a fast and constant pace on the work package delivery team.</p>
3) The performance evaluation method in dynamic environments should support entrepreneurs to expand their understanding of their context and use dynamic, adjustable performance indicators, continuously reviewed to adjust changes in the external and internal context.	<p>In the development of the product launch stage during the validation of the hypotheses, the performance indicators used throughout the accelerated prototyping were particular for each experiment, contained metrics consistent with the company's reality and were constantly reviewed.</p>	<p>The project team held a workshop on the BPM understand phase with LIVTI and at this event all process indicators were analyzed, generating recommendations for improvement.</p>

Source: Prepared by the authors.

With regard to construct 1 “In dynamic environments, startups must always be adapting to changes in their context in order to guarantee a competitive advantage over wide time horizons”, it appears that in dynamic environments the changes inherent to the context in which these companies are inserted happen in an accelerated and recurring way.

And, in these dynamic and rapidly changing environments, the entrepreneur, in many situations, fails to identify the various variables and alternatives that must be considered in his analyzes. That is, in the decision-making process, the entrepreneur often does not have all the necessary information, characterizing a state of limited rationality.

Such findings are evidenced, for example, by the accelerated prototyping method presented to Due, which established a new creative process, where there was a search for other alternatives of audiences not previously considered, such as designers, and even a reflection on a possible change in its business model, moving from machine sales to service sales. These innovations aim to guarantee your competitive advantage in the market.

With regard to LIVTI, the new structuring of the proposed process architecture seeks to provide the company with greater dynamism in its decision-making process, and provides a greater speed of adaptation to changes both internal and external to the company.

Regarding the second construct, "Under conditions of high uncertainty, startups should prioritize approaches oriented to discoveries to the detriment of approaches with an emphasis on predictive planning", analyzing the evidence exposed in the DUE case, it is noted that due to the conditions of high uncertainty the product requirements established became hypotheses which were confronted with the performance indicators previously established during the accelerated prototyping, resulting in findings when the hypothesis is taken as truth, or learned in case the hypothesis does not reach the established indicators. Therefore, the use of discovery-oriented approaches has become an instrument that allows obtaining data on actions and results, quickly, even in conditions of high uncertainty.

Thus, in the Due case, the company's strategy for validating assumptions about the product launch was quick and found facts and data assumed, thus allowing the strategic adaptation of the startup in an agile and precise way to the dynamic environment, therefore maximizing business performance.

Still on the notes made by construct 2, it is possible to note that the identification and execution of quick wins at LIVTI highlights the importance of obtaining rapid improvements in dynamic environments. In this way, due to the difficulty of establishing cause and effect relationships between action and result, the identification and implementation of quick wins allows the achievement of successes or learnings in wide time horizons.

In the case of LIVTI, the adoption of an agile project management methodology such as Scrum, institutes a fast and steady pace of results delivery. This way of working quickly provides a strategic adjustment between the project management of the startup and the environment in which it is inserted, because the regularity of work package deliveries, the reduction of time spent on task management and project planning in small phases allow an improvement in the startup's performance.

Thus, it is necessary for the entrepreneur to recognize that he does not have knowledge of all the variables that will influence his business and, therefore, the premises of his business must consider the dynamic characteristics of the context, change and uncertainty must be treated as essential and therefore, learning must be continuous (TEECE, 2010).

Regarding construct 3 "The performance evaluation method in dynamic environments should support entrepreneurs to expand their understanding of their context and use dynamic,

adjustable performance indicators, continuously reviewed to adjust changes in the external and internal context” , it is proved that both startups have dynamic performance indicators. In the case of Due, during the validation of the hypotheses, the performance indicators of each experiment were particular and were elaborated with metrics according to the history and reality of the startup, as well as they were continuously reviewed and improved for each prototyping cycle.

Regarding construct 3 in the case of LIVTI, the project team during the workshop held at the company analyzed all the process indicators and generated recommendations for improvements, signaling that such proposals for improvement in the performance indicators are extremely relevant in a startup, because these are dynamic and must be continuously reviewed. One of the recommendations mentioned, for example, is related to the indicator analyzing demand, so it was identified that the activities that should be carried out related to this indicator were generic, and it was proposed to create a technical opinion template to carry out the activity to analyze the demand in a precise and systematic way, thus ensuring the adjustment of this performance indicator in line with the requirements of the process and the startup.

The use of performance indicators associated with BPM is the basis for building understanding and improving business processes. Thus, the analysis of these processes is focused on the search for bottlenecks, that is, the comparison between the current situation of the company and the goals defined in the development of performance indicators. Thus, without the definition of performance indicators, the use of BPM would become a bureaucracy for the company, providing slowness in the decision-making process and causing difficulties in adapting the company to internal and external changes in the context.

## **6. FINAL CONSIDERATIONS**

The present article reported two cases of Santa Catarina startups that experienced adaptations of management methodologies to their reality, through this discussion the objective was (i) To present necessary characteristics for the management of organizations in dynamic and uncertain environments; (ii) Conduct two case studies in Santa Catarina startups in the adoption of traditional management practices; (iii) evidence the adaptations made to apply these practices; (iv) Perform a comparison between the results of the case studies and the factors of analysis.

Thus, with regard to the first objective exposed, this could be observed in the information presented in the theoretical reference section, highlighting the characteristics



inherent to the management of organizations in dynamic environments through the theoretical constructs. These aspects must be observed when implementing management tools. Therefore, knowing the dynamic environment in which startups are inserted and how they have characteristics such as a high level of uncertainty and flexibility is essential for the construction of strategic courses that facilitate management in these organizations.

Regarding the second objective, through the case reports presented it was possible to notice the adaptations made by these startups, as proposed by the third objective. Therefore, in the Due case the linear model proposed by the product development methodology - PDP(SALGADO, et al. 2010)it was adapted in cyclic stages of accelerated prototyping, which made it possible to obtain hits or errors quickly, reducing the effects of the high uncertainty index experienced by the startup. Under the second case reported, in the construction of a BPM model for LIVTI it was necessary to insert agile management methodologies such as Scrum given the exposed weaknesses of the company such as the lack of time in planning activities.

With regard to the fourth objective of the present article, the studies of the exposed cases allowed the comparison between the exposed theory on management of startups and dynamic environments and its operationalization in the reality of Due and LIVTI.

However, it is important to point out the limitations of this research as the fact that it is limited to the case study of two startups from Santa Catarina. Thus, it is suggested to apply the same methodology in other contexts to broaden the understanding of this important issue that affects the development of startups' businesses, as well as the national innovation systems. Therefore, the necessary adaptations of the traditional management methodologies for them to act in line with the dynamic environment of startups are fundamental in building a peculiar management model in accordance with the reality of each startup, thus improving their performance in the work environment. Business.

## REFERENCES

AREND, RJ Entrepreneurship and dynamic capabilities: how firm age and size affect the 'capability enhancement – SME performance' relationship. *Small Business Economics*, v. 42, n. 1, p. 33-57, 2014.

ARTINGER, F. et al. Heuristics as adaptive decision strategies in management. *Journal of Organizational Behavior*, v. 36, n. S1, p. S33-S52, 2015.

BLANK, S .; DORF, B. The Startup Owner's Manual: The Step-By-Step Guide for Building a Great Company. [SI]: K & S Ranch, 2014.

DE MEYER, ACL; LOCH, CH; PICH, MT Managing project uncertainty: from variation to chaos. MIT Sloan Management Review, v. 43, n. 2, p. 60, 2002.

FERREIRA, AR Model of excellence in public management in the Brazilian government: importance and application. XIV CLAD International Congress on State Reform and Public Administration, Salvador de Bahia, Brazil. 2009.

JESTON, J .; NELIS, J. Business process management. [SI]: Routledge, 2014.

KERR, WR; NANDA, R .; RHODES-KROPF, M .. Entrepreneurship as experimentation. Journal of Economic Perspectives, v. 28, n. 3, p. 25-48, 2014.

LACERDA, RT de O .; BERNARDES, ML; SIMON, B. Innovation Clinics: A Program to Promote University Entrepreneurship. Journal of Entrepreneurship, Innovation and Technology, v. 4, n. 2, p. 140-170, 2017a.

LACERDA, RTO et al. Research opportunities in business process management and performance measurement from a constructivist view. Knowledge and Process Management, v. 23, n. 1, p. 18-30, 2016. DOI: 10.1002 / KPM.1495

LACERDA, RTO et al. Innovative integration between incubated startups and universities to achieve continuous competitive advantages in dynamic environments. Navus-management and technology magazine, v. 7, n. 2, p. 78-96, 2017b. doi: 10.22279 / NAVUS.2017.V7N2.P78-96.497

LACERDA, RTO et al. Research perspectives on performance evaluation and project management. Management and Secretariat Review, Vol. 9, n. 2, p. 96-125, 2018. DOI: <https://doi.org/10.7769/gesec.v9i2.680>

MARCONDES, JL, et al. The management excellence model (MEG) in learning organizations. Business. v.1, n. 10, 2015.

MARQUARDT, M. The power of action learning: how to solve problems and develop leaders in real time. Translation Anna Lobo. Rio de Janeiro: Ed. Senac Rio. 2005.

MCGRATH, RG Business models: A discovery driven approach. Long range planning, v. 43, n. 2-3, p. 247-261, 2010.

MCMULLEN, JS; SHEPHERD, DA Entrepreneurial action and the role of uncertainty in the theory of the entrepreneur. Academy of Management review, v. 31, n. 1, p. 132-152, 2006.

MIGUEL, PAC Case study in production engineering: structuring and recommendations for conducting it. Production Magazine. v.17, p. 216-229, 2007.

MIRANDA, JQ, et al. The influence of environmental and organizational variables on the performance of startups. *Small Business Management and Entrepreneurship Magazine*, v.5, n.1, 2016.

O'CONNOR, GC; RICE, MP A comprehensive model of uncertainty associated with radical innovation. *Journal of Product Innovation Management*, v. 30, p. 2-18, 2013.

PRAJOGO, DI The strategic fit between innovation strategies and business environment in delivering business performance. *International Journal of Production Economics*. v. 171, p. 241-249, 2016.

SALGADO, EG, et al. Reference models for product development: classification, analysis and suggestions for future research. *Online Production Magazine*. v. 10, p. 886-911, 2010.

SARTORI, T .; SILUK, JCM Model of Excellence in Management (meg): Application in a Software Company in Santa Maria (rs). VIII Symposium on Excellence in Management and Technology, SEGeT, 2011.

SAUNILA, M. Performance measurement approach for innovation capability in SMEs. *International Journal of Productivity and Performance Management*. v. 65, p. 162-176, 2016.

SCHREIBER, D. et al. IN THE GAME OF THE MARKET: THE CASE OF A STARTUP GAÚCHA. *REAd-Revista Eletrônica de Administração*, v. 22, n. 2, 2016.

SOMMER, SC; LOCH, CH; DONG, J. Managing complexity and unforeseeable uncertainty in startup companies: An empirical study. *Organization Science*, v. 20, n. 1, p. 118-133, 2009.

TEECE, DJ Business models, business strategy and innovation. *Long range planning*, v. 43, n. 2-3, p. 172-194, 2010.

VOM BROCKE, J., et al. Ten principles of good business process management. *Business process management journal*. v. 20, p. 530-548, 2014.

WIKLUND, J .; SHEPHERD, D. Entrepreneurial orientation and small business performance: a configurational approach. *Journal of business venturing*. v. 20, p. 71-91, 2005.

WIKLUND, J., et al. Impulsivity and entrepreneurial action. *Academy of Management Perspectives*. v. 32, p. 379-403, 2018.