

## COMPETITIVE INTELLIGENCE MATURITY DEGREE: A STUDY IN SAN PEDRO VALLEY COMMUNITY STARTUPS

### GRAU DE MATURIDADE EM INTELIGÊNCIA COMPETITIVA: UM ESTUDO NAS STARTUPS DA COMUNIDADE DE SAN PEDRO VALLEY

**Eloísa Helena Guimarães Rodrigues**  
Faculdades Pedro Leopoldo-MG  
[eloisa.guimaraes@fpl.edu.br](mailto:eloisa.guimaraes@fpl.edu.br)

**Ester Eliane Jeunon**  
Faculdades Pedro Leopoldo-MG  
[ester.jeunon@fpl.edu.br](mailto:ester.jeunon@fpl.edu.br)

**Patrícia Silva Ribeiro**  
Faculdades Pedro Leopoldo-MG  
[patsilvaribeiro@gmail.com](mailto:patsilvaribeiro@gmail.com)

**Frederico César Mafra Pereira**  
Escola de Ciência da Informação – ECI – UFMG  
[professorfredericomafra@gmail.com](mailto:professorfredericomafra@gmail.com)

**Submissão:** 03/04/2023  
**Aprovação:** 20/09/2023

#### ABSTRACT

Competitive Intelligence is a quite regular topic in organizations that are willing to have a greater position on the market in general, as well as to be ahead of future trends and scenarios, and also to obtain a better assertiveness in processes that require making a decision. Organizations such as startups, known as highly scalable companies which have a forward-looking model of business with a low initial cost, are also constantly searching for a sustainable growth in the long run. The research aims towards identifying how mature is the level of Competitive Intelligence in Startups in the community of San Pedro Valley, headquartered in Belo Horizonte, Minas Gerais. Applying a Quantitative Method, a descriptive investigation was performed seeing a survey sent online directly to the managers. The bibliographic research allowed to maintain the intelligence cycle's choice proposed by Mafra, Carvalho and Jordão (2016) in the analysis of each stage. According to the definitions of maturity by Rodrigues and Riccardi (2007) and Zuquette and Beltrame (2012), a new proposal was developed to measure in a quantitative way the level of excellence of the organizations. From level one (informal) through level four (advanced), it was identified that the maturity of competitive intelligence in the related startups is situated between the level two (basic) and level three (intermediary). These results are expected and common if the context and the structure of these companies (which act with a sense of urgency, lean structure and flexibility) are taken into account.

**Keywords:** Competitive Intelligence. Level of Maturity; Startups of Community of San Pedro Valley; Entrepreneurship; Strategic Intelligence.

## RESUMO

Inteligência Competitiva é um tema bastante regular em organizações que desejam ter um posicionamento maior no mercado em geral, bem como estar à frente de tendências e cenários futuros, e também obter uma melhor assertividade em processos que exijam tomada de decisão. Organizações como as *startups*, conhecidas como empresas altamente escaláveis e que possuem um modelo de negócios voltado para o futuro e com baixo custo inicial, também buscam constantemente um crescimento sustentável no longo prazo. A pesquisa visa identificar o quão maduro é o nível de Inteligência Competitiva em Startups da comunidade do San Pedro Valley, sediada em Belo Horizonte, Minas Gerais. Aplicando um Método Quantitativo, foi realizada uma investigação descritiva através de uma pesquisa enviada on-line diretamente aos gestores. A pesquisa bibliográfica permitiu manter a escolha do ciclo de inteligência proposto por Mafra, Carvalho e Jordão (2016) na análise de cada etapa. De acordo com as definições de maturidade de Rodrigues e Riccardi (2007) e Zuquette e Beltrame (2012), foi desenvolvida uma nova proposta para medir de forma quantitativa o nível de excelência das organizações. Do nível um (informal) ao nível quatro (avançado), identificou-se que a maturidade da inteligência competitiva nas startups relacionadas está situada entre o nível dois (básico) e o nível três (intermediário). Esses resultados são esperados e comuns se levados em consideração o contexto e a estrutura dessas empresas (que atuam com senso de urgência, estrutura enxuta e flexibilidade).

**Palavras-chave:** Inteligência Competitiva. Nível de Maturidade; Startups da Comunidade do San Pedro Valley; Empreendedorismo; Inteligência Estratégica.

## 1 Introduction

Competitive intelligence (CI) structured in cycles supports organizations in decision making aiming at good results and market performance. With the accelerated pace in the development of new technologies, the need to monitor, adapt, and innovate in the business environment grows. Its use consists of a set of methodologies for the production of knowledge about markets, competitors, products, technologies, and several other points of relevance that arise from a need of the organization (TEIXEIRA; SOUZA, 2017).

In Brazil, CI practices gained strength when companies became weak due to the difficulties of facing strong international competition (GOMES; BRAGA, 2004). The 1990s represented a period of great changes in Brazilian society under the backing of globalization (GENNARI, 2012).

For the organization's processes to integrate CI, it is essential to develop a methodology that allows access to useful and relevant information (GOMES; BRAGA, 2004). This work logic is known as the Competitive Intelligence System (SIC) and suggests processes organized in cycles that allow monitoring the business.

The development of a competitive intelligence system helps companies to overcome environmental uncertainties (RODRIGUES; VOLP; RECHZIEGEL, 2014), since it allows, with a methodology, access to the key information of their ecosystem. The systematization of CI, at any level, is part of the structure of most companies, mainly large companies in competitive markets. This scenario is not common in start-up organizations with just under five years of creation, such as, for example, startups.

To face a market of uncertainties, startups unite in business networks to strengthen the conditions of competition. Thus, partnerships with government programs emerge, allied with accelerators, create societies, and form communities. There are several networks of startups that feed the innovation ecosystem throughout Brazil. Specifically in Minas Gerais, the San

Pedro Valley community establishes a culture of entrepreneurship and innovation that strengthens the business environment.

The community is based in the center of Belo Horizonte and is part of the innovation ecosystem of the state of Minas Gerais. It has more than 300 associated startups and was created in 2011 by a group of informal entrepreneurs. It aims to identify opportunities, needs, and incentives and keep the startup's ecosystem in the state of Minas Gerais active.

In this context, the objective of this work was to evaluate the degree of maturity of the competitive intelligence of startups in the San Pedro Valley community.

For the presentation of the research and its results, this article is divided into five sections: Introduction, Theoretical Framework, Methodological procedures, Presentation of the results and the conclusion of the work concerning the fulfillment of the general objective of the research.

## 2 Theoretical Framework - Competitive Intelligence

The speed with which changes take place in the competitive environment requires that organizations have the care and expertise to monitor their organizational environment. Campelli, Barbejatt, Casarotto and Stefano (2001) attest to the relevance of the subject when they state that the development of CI research proves to be a matter of national sovereignty since competitive environments increasingly require strategies and methodologies for survival. The need to transform information about competitors into practical intelligence has never been greater (PRESCOTT; MILLER, 2002). More than controlling all actions in the present, it is crucial to anticipate future scenarios.

Thus, the challenge for organizations to transform data into information that enables the executive to make decisions grows. This process is known as competitive intelligence. For Prescott and Miller (2002) the application of CI makes executives have few excuses to be surprised by competitors, regulatory bodies, and revolutionary technologies. Along the same line of reasoning, Campelli *et al.* (2011) justify that CI is a tool that helps organizations to stay ahead of the frequent uncertainties of fierce competition. Gomes and Braga (2004) suggest that the strategic level is one that can, with a product of a CI system, potentially change the nature of the business, in the medium and long term, and focus on an analysis of new products, new markets.

The development of a competitive intelligence system helps companies to overcome environmental uncertainties (RODRIGUES *et al.*, 2014), since it allows, through a methodology, access to useful and relevant information about their business. Changes cannot happen randomly, at the risk of becoming conflict. To have its desirable effects, it needs to be planned and with clearly defined goals. It is easier and safer for a company to reach its objectives when there is a plan that obeys a model, scheme, process, or method (RODRIGUES; FERNANDEZ, 2006).

Campelli *et al.* (2011) understand that a SIC encompasses all legal and ethical means to monitor the steps of the competition. More than that, it is strongly associated with the ability of companies to monitor environmental information to respond to the growing challenges and opportunities that happen daily (RODRIGUES *et al.*, 2012).

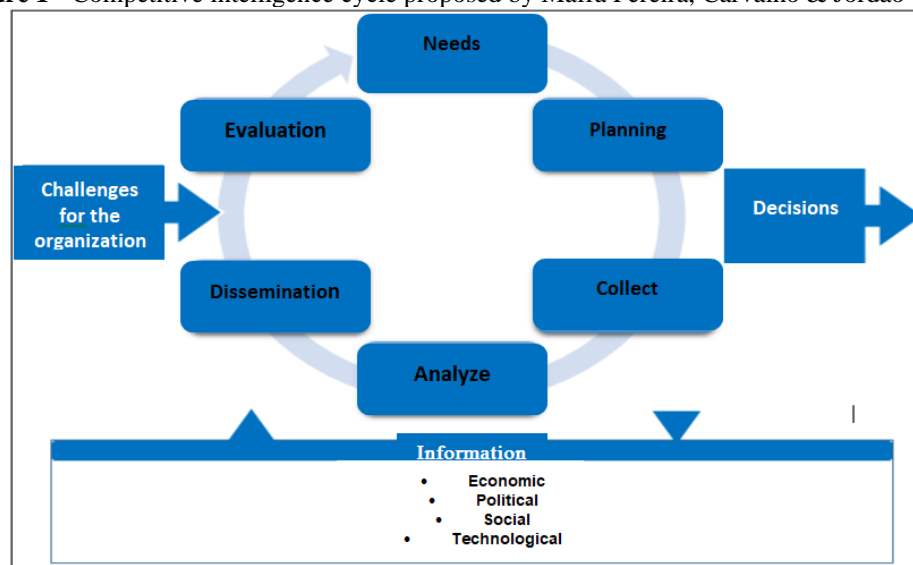
A SIC needs to have the strength within an organization for its product to offer added value. Prescott and Miller (2002) argue that to gain credibility from users, three key positions are necessary: a) to execute a job framed by an analytical tool, therefore, the intensive use of information technology is essential; b) the process must have effective communication to dominate the analysis; ci) it is recommended that there are no technical failures, at the risk of losing total confidence.

Based on this, it is important to have a clear understanding of the role that human capital plays in the operation of CI. More significant than machines (hardware) and data and applications (software), it is the people who manipulate such instruments (CAMPELLI *et al.*, 2011). Oliveira, Gonçalves and Mendes de Paula (2011) believe that an adequate structure of processes and professionals must be able to provide the necessary insights for the organization to maintain sustainable growth over time. For this reason, "professionals are seen as experts in demonstrating skills in processes, applying a specialized set of knowledge, skills, and attitudes" (AMARAL *et al.*, 2016, p. 7).

For these individuals to build an intelligence capable of guaranteeing companies' competitiveness, it is necessary to use methodologies that guarantee assertive analyzes. Thus, Amaral *et al.* (2016, p. 3) consider that "it is possible to represent the CI production process as a cycle of activities that depends on different roles and functions of a work team". Some authors have systematized competitive intelligence to structure the strategic process of organizations.

Several authors have proposed a systematized model in stages (GOMES, BRAGA, 2004; MOTTE, 2007; RODRIGUES, RICCARDI, 2007; AMARAL *et al.*, 2008; DISHMAN, CALOF, 2008; OLIVEIRA *et al.*, 2011). This work used the model by Mafra Pereira, Carvalho and Jordão (2016) (Figure 1) adapted from the model by Amaral *et al.* (2008), considering that its application is the most appropriate for the reality of the research described here.

**Figure 1** - Competitive intelligence cycle proposed by Mafra Pereira, Carvalho & Jordão (2016).



Source: Mafra Pereira, Carvalho, & Jordão (2016).

In this model, the challenges of organizations serve as fuel for the beginning of the cycle, which is based on economic, political, social, and technological information. On the other hand, it is expected that decisions will be made based on the completion of the cycle, which has six stages.

In Step 1, the identification of information needs, the model defines the information requirements of users and the strategic and relevant issues to effectively support decision making (GOMES; BRAGA, 2004). All the effectiveness of the process is related to the delimitation of the lack of information for decision making, known as key topics of intelligence (KIT). Herring (2001) argues that the users' real needs are "management needs" or "intelligence topics", characterized as the critical success factor in any intelligence operation. Prescott and Miller (2002) follow the same logic and argue that a KIT process

ensures a practical mechanism for determining the intelligence needs of executives. This definition is the beginning of the SIC and provides the necessary guidelines for conducting the intelligence operation.

Canongia *et al.* (2001) delimit the construction of the KIT into three functional categories: strategic decisions and actions, lovely warning themes (competing initiatives, technological surprise, and government actions) and description of the main actors (their skills and the level of external resources needed to meet the real intelligence needs of the organization).

Mafra *et al.* (2016) describe the three categories of KIT: the first, strategic decisions and actions, seeks to extract data that are and / or can be used in strategic or tactical decision processes. The second, lovely warning themes, aims to seek information that will allow the organization to anticipate critical market events. The third seeks to assist in understanding the most relevant actors in the organization's business environment. The authors also reinforce that these categories are mutually exclusive and must be worked together.

The model proposed by Mafra Pereira *et al.* (2016) contrasts with that of Canongia *et al.* (2001) and Herring (2001) when suggesting that there is a planning stage of the activities to be carried out after the KIT definition. Thus, Step 2, Planning, is marked by planning the information needs of decision-makers and defining guidelines for the remaining steps (GOMES, BRAGA, 2004; OLIVEIRA *et al.*, 2011; RODRIGUES *et al.*, 2012). At this stage, there are predictions of activities and definition of information sources for the data collection stage (MAFRA PEREIRA; JEUNON; BARBOSA; DUARTE, 2018).

At this point in the competitive intelligence cycle, companies must develop CI employment strategies given the organization's objectives. For Mafra Pereira *et al.* (2018), it is also necessary to define methods of analysis, the team involved deadlines for deliveries and the resources (human, financial and structural) necessary for the execution of the cycle.

Planning helps the manager to focus his effort and give a sense of direction to the members of the institution. This phase ensures that the process happens by reducing the impacts of external environments and maximizing the efficiency of the competitive intelligence cycle.

After planning, step 3 begins, which collects the necessary data for analysis, observing the criteria of accessibility, multidisciplinary, cost, quality of content, coverage, and comprehensiveness (CANONGIA *et al.*, 2001). With the structured script and the data collected, the professionals involved proceeding with a simple division of the typology of information into formal and informal. The first represents those already registered and validated as articles, books, newspapers, reports, etc.; the second corresponds to that information that has not been registered and that, in general, has yet to validate communications between people.

Gomes and Braga (2004) reinforce that the collection of information can be categorized by parameters. The first one is about the origin: the information can be internal or external to the organization; then, about the content: primary (those that provide unchanged facts directly from customers, consultants, suppliers, etc.) and secondary (altered facts, generated from ideas that were obtained from primary sources). As for the structure: formal (conversations, conferences, etc.) and textual (books, magazines, etc.). Last but not least, regarding the level of reliability: high risk (trustworthy, but it must be controlled), subjective trust (trustworthy at times and not at times), and highly trustworthy (valid information, but it must be monitored).

Reliability can be classified into three levels (MOTTE, 2007): In the first, the source emits the information and, as a consequence, it is a more reliable source. The second transmit the data, less reliable because it can give an interpretation of the initial information. And the third level receives from a second-degree source and transmits. At any of the levels, no source



is completely reliable, since it is always important to check how true the information is. Validating data is essential for the effectiveness of the CIS, even if it is information that has not yet been treated by CI specialists.

In step 4, Analysis of information, all knowledge generated by the previous step needs to be analyzed before being communicated to users (PRESCOTT; MILLER 2002). This step is responsible for transforming all information into a complete, reliable assessment (GOMES; BRAGA, 2004) and relevant for strategic decision-makers (OLIVEIRA *et al.*, 2011). It can be said that this stage is the heart of competitive intelligence.

According to the KITs defined in the first stage, those involved in the process stipulate the analysis models, which are structures that hold data and information (GOMES; BRAGA, 2004). At this time, it is common to use software and statistical models that demonstrate the relationships between the patterns and trends raised (OLIVEIRA *et al.*, 2011). But for Gomes and Braga (2004), nothing replaces the human capacity to think and put all these items together in a complete solution for the objective to be achieved.

The evaluation of an SCI occurs in several points: concerning the performance of each of the stages, such as the choice of analysis methods, sources of information, product format, etc. (GOMES; BRAGA, 2004), and if the CI activity fulfilled what was planned in terms of the work process and deliveries (MAFRA PEREIRA *et al.*, 2016). Thus, it is necessary to evaluate the effectiveness of using CI in the organization's decision-making processes and its strategic use by users (MAFRA PEREIRA *et al.*, 2016). This view of CI as an incentive for decision-making processes can vary in young, mature, or more advanced companies in the business life cycle (RODRIGUES *et al.*, 2014). Competitive intelligence, therefore, reaches different levels of maturity according to these parameters.

## 2.3 Maturity in competitive intelligence

The performance of the CI process requires the organization to make an arduous commitment to standardize and standardize its procedures to expand the maturity of the SIC (RODRIGUES *et al.*, 2014). The relevance of CI activities leads to the success and maturity of the system. Rodrigues *et al.* (2014) report that a study conducted at a financial institution indicated that the efficiency of products is low in areas where little importance is given to their institutional function; in places where the processes are outsourced this is even more aggravating. However, in the departments in which CI is articulated more consistently, its circumstantial and structural value for the business guarantees more efficiency in decision making.

There are multiple ways for the practice of CI to be effective within an organization. Some factors are essential for CI to reach an adequate level of maturity for decision-makers, such as technology, effective communication, professionals specialized in CI, etc. The higher the degree of maturity, the greater the competitive capacity of a company due to the information provided (OLIVEIRA, SOUZA, ARENHARDT, NIVEIROS, 2017; RODRIGUES, RICCARDI, 2007). Oliveira *et al.* (2017) highlight that maturity is a concept of structure, formed by parts that define the area of interest. Thus, each stage of the CI process makes up the scope of CI maturity.

Chi-Yen (2018) believes that CI is directly linked to organizational performance. His study shows that there is a relationship between competitive intelligence and the executive information system: when improved, top management is encouraged to build concepts and methods for collecting information and environmental scanning of competitors. Also, his research revealed that managers' prior knowledge generates superior performance indicators for the organization.

Rodrigues and Riccardi (2007) attribute the success of the maturity progress in CI to the conception of the innovation architecture designed for it. But Hedin and Thieme (2010) argue that outsourcing the collection, structuring, and analysis of information reduces the time and resources needed to carry out the steps. With this, the internal resources are concentrated in the management of the organizational knowledge and the adequate integration of the CI products to the business. Each time a company optimizes and matures the SIC, it increases its IC expertise and, as a consequence, its competitive capacity (RODRIGUES; RICCARDI, 2007).

### 3 Methodology

This section describes the methodological processes used to achieve the research objective, which was to assess the degree of maturity in competitive intelligence at startups in the San Pedro Valley community.

The type of investigation was descriptive, aiming to describe, analyze, and establish relationships between the degree of maturity in competitive intelligence and startups. There are several factors related to maturity in competitive intelligence that require analysis together with the aspects that make up the universe of startups. Thus, descriptive research is ideal to expose these characteristics and discover the existence of an association between variables (UTSUMI; CAZORLA; VENDRAMINI; MENDES, 2007). This type of investigation is concerned with practical action, similar to that of exploratory research (GIL, 2008). It involves local truths and interests, in this case of the San Pedro Valley community startups, as well as the development of knowledge for problem-solving (SILVEIRA; CÓRDOVA, 2009).

The study was quantitative, as it is ideal for measuring variables related to the degree of maturity in competitive intelligence at startups. The use of statistical techniques allows quantitative research to describe in numbers the opinions and information to be related and analyzed (RODRIGUES, 2007). From a sample, it is possible to establish the classification and relationship between variables and their causal relationship between phenomena (RAUPP; BEUREN, 2006). This gives the researcher a degree of generality that allows him to understand, through a part, the behavior of a population.

The research universe was the Startups of the San Pedro Valley Community. According to data from StartupBase (<https://startupbase.com.br/stats>), the number of startups in Brazil reached 12,867 in total. The state of Minas Gerais is the second with the largest number, with 1,093 projects, of which 604 are part of Belo Horizonte, which makes the city and the state a reference for the sector.

The research sample consisted of leaders from the San Pedro Valley startups, such as CEO - general manager or president of the company; CIO - director of information technology; CTO - responsible for directing technological and/or scientific actions; COO - communication director; CMO - marketing director; or a general director, if there was that role. The justification for this selection is that these people are responsible for determining the company's strategic guidelines, which ensured the achievement of the objectives outlined for the research.

The unit of analysis of this work refers to San Pedro Valley, a community with more than 400 startups, based in Belo Horizonte and metropolitan region. The community emerged intending to promote the sharing of experiences among some entrepreneurs of startups. Initially, they organized informal meetings at the end of the day around a bakery or bars located in the São Pedro neighborhood, in the south-central region of Belo Horizonte. The space for cooperation grew and new entrepreneurs joined the group. Since 2011, a milestone of its beginnings, the group has expanded and exceeded the geographical limits of the region. Today the San Pedro Valley community represents all startups in the metropolitan area of Belo Horizonte. The group does not have an official leader; in fact, it is configured as a

culture, a mentality, and therefore has no legal formalization. These are companies that help each other independently, similar to Silicon Valley, a region of California teeming with technology companies like Google, Facebook, and Apple.

The survey sample forms the leaders of the San Pedro Valley startups. Questionnaires were sent to people who performed strategic functions, such as CEO - who would be the company's general director or president; CIO - who serves as director of information technology; CTO - responsible for directing technological and/or scientific actions; COO - who serves as the communication director; CMO - in the role of marketing director; or a general director, if there was that role. The selection of these functions is justified by the fact that they are responsible for determining the company's strategic guidelines and ensuring that the objectives are achieved.

That said, the survey data collection method was the self-administered questionnaire electronically. Thus, there is no way to ensure that the respondent is the one to whom the form was sent or another who occupies one of the functions required in the survey (BATISTA; CAMPOS, 2007). Also, there may be a double interpretation in understanding the questions that may change, depending on the circumstances at the time of the answers (GIL, 2008). On the other hand, the use of a self-administered questionnaire makes it possible to reach a representative number of people in extensive geographic areas, which guarantees the anonymity of responses and allows people to respond at the time they deem convenient (GIL, 2008).

The construction of the questionnaire was based on discussions of the theoretical framework. The form contained 22 objective questions using the Likert scale since this type of scale gives more answers to the answers and facilitates their processing. Respondents chose response options that ranged from "strongly agree" to "strongly disagree", in five grades (BATISTA; CAMPOS, 2007). The questionnaire contained three sections: section 1, which sought to characterize the company; Section 2, with 17 questions based on the competitive intelligence cycle; Section 3, with the last five supplementary questions.

The survey started with a database of 452 startups listed on the San Pedro Valley community website. Of this universe, 33% had no contact information. Of these 148 companies, it was possible to obtain the data of 24% when researching on the internet, however, 9% - which corresponds to 41 startups - had no trace on the internet. Thus, the final universe resulted in 307 startups. To reinforce the request for a response to the questionnaire sent, the researcher sought contact with each of these companies, through several resources: individual messages to 221 startups through the Facebook communicator (Messenger); with four contacts were made via chat on the company's website; with three, through the WhatsApp chat app; with a company, via telephone; with 78 startups, there was no other form of communication than via e-mail. A new message was sent to the e-mail address.

The link to answer questions was available through the Google Forms platform for exactly 30 days. Ninety-three responses were collected, but six respondents did not assume a strategic position in the organization. Thus, it was possible to obtain 87 valid responses.

To perform the analysis of the collected data, descriptive statistical analysis was applied. The techniques of statistical analysis contribute to the characterization and summary of the data, in addition to establishing the study of the relationships that exist between the variables (APOLINÁRIO, 2006).

#### **4 Analysis of results**

In this research, we sought to map how the managers of the startups of the San Pedro Valley community follow/monitor their business environment. After a study of the competitive intelligence cycles to find out which is the most appropriate in response to this objective, the intelligence cycle proposed by Mafra Pereira *et al.* (2016). Its arrangement is



structured in six stages, namely: needs, planning, collection, analysis, dissemination, and evaluation. For the authors, the path of competitive intelligence results from the challenges faced by the organization, and economic, political, social, and technological information sustains the entire cycle.

To establish relationships between the variables, it was necessary to analyze the data obtained in the research and characterize the behavior of each of the variables in the set of observations in isolation (GIL, 2008). These processes make it possible to characterize what is typical of the group, to verify how individuals position themselves about some variables, and to establish some correlations between them.

#### 4.1 Maturity radar

Because of the results obtained by the managers' responses, it was possible to establish some parameters to propose a model for assessing the degree of maturity of competitive intelligence in startups. The grouping of responses allowed to obtain a macro view of the entire competitive intelligence process:

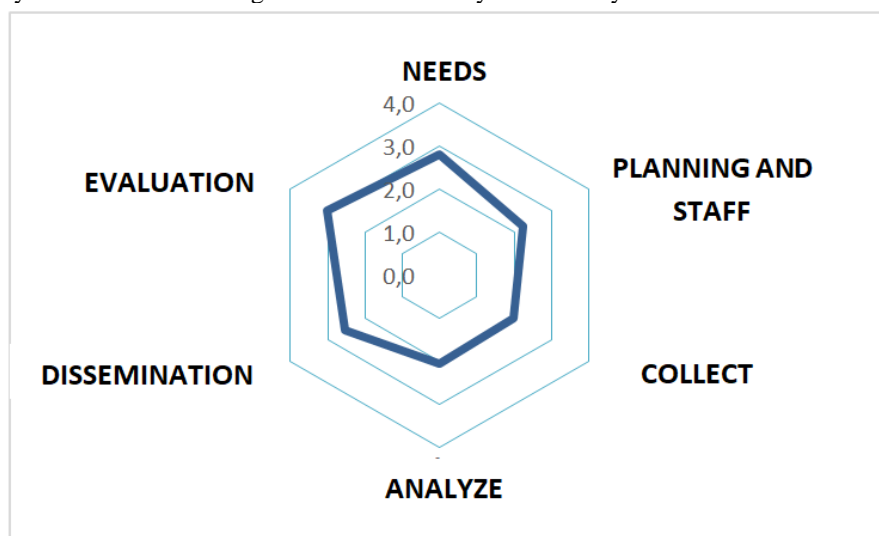
**Table 1 - Competitive intelligence cycle**

Needs	2,8
Planning and staff	2,3
Collection	2,0
Analysis	2,1
Dissemination	2,5
Evaluation	3,0

Source: research data (2019).

The CI cycle used in this research was the model proposed by Mafra Pereira *et al.* (2016) derived from Amaral *et al.* (2008). For each of the phases, questions were applied on a scale from zero to four, where zero expressed total disagreement with the statement and four suggested total agreement with the proposal. Thus, a radar was created to assess the degree of maturity of each phase of CI in the startups of the San Pedro Valley community:

**Figure 2 - CI Cycle dimensions average – San Pedro Valley Community**



Source: research data (2019).

In each stage, averages were obtained in comparison with the five levels of response (zero to four). The results obtained can be justified according to the context and business

model of startups. According to Blank (2014), these organizations use agile and incremental development methodologies to build a minimum viable product (MVP) and obtain immediate feedback from customers. From that return, they build their products/services at a speed that allows them to work with the sense of urgency intrinsic to every startup.

The first axis of needs was 2.8, close to the three maturity levels. In other words, most of them have defined procedures and standards and are on the verge of establishing quantitative objectives given better performance in the market. Entrepreneurs are used to mapping their hypotheses/needs and validate them with customers in the field. This further explains why it is easy to define strategic and relevant issues. To advance in this regard, it is necessary to plan for the future and focus outside the micro-business environment (ZUQUETTO; BELTRAME, 2012).

Regarding planning and teams, the result was 2.3, closer to axis two. This indicates that there are studies on demand (*ad hoc*), evolving towards the elaboration of defined procedures and standards. Mafra Pereira *et al.* (2018) emphasize that in this stage the methods of analysis are defined, the team involved, the deadlines for delivery, and the human, financial and structural resources.

Startups operate with scarce resources and many rely on angel investors to boost their business. Therefore, much of the investments are not directed to intelligence processes. Hedin and Thieme (2010) believe that at the beginning of the activities of a SIC, there is only one CI manager, and then evolve to a complex configuration of management groups, internal and external networks for collection, analysis teams and information technology support.

Regarding data collection, the startups of the San Pedro Valley community positioned themselves in axis 2, which suggests that the collection of information is basically from primary and secondary sources and carried out in a centralized manner. For Canongia *et al.* (2001), criteria such as accessibility, multidisciplinary, cost, quality of content, coverage, and scope influence data collection. To satisfy these parameters, the startup needs to invest in the systematization of the search for information and in the validation of the data to verify how true the information is (MOTTE, 2007). These activities take time and these companies operate with a sense of urgency to carry out most of their actions.

The heart of intelligence is the analysis of information. Gomes and Braga (2004) recognize that the data collected in the previous step is classified as gross intelligence, needing to be worked on to present a higher value. The average of the San Pedro Valley community startups in this regard was 2.1, indicating that there is an analysis of the information, only in an amateur way (ZUQUETTO; BELTRAME, 2012).

In general, these companies operate with a lean structure. Thus, it is a fact that leaders from different areas work more closely. This is an interesting point and in favor of startups, because to prevent SIC failures it is important to ensure, in addition to good technical performance, also to keep managers close, since they know the process as a whole.

This phase requires the human capacity to think and gather information in a complete solution for the investigated objective and that support the decision-makers. With this, startups have two possibilities: invest in internal resources to qualify in this area or hire specialist companies (third parties). These two options require time and financial resources to execute them, and neither of these alternatives is very viable for these types of organizations.

For the analysis stage to reach higher levels of CI maturity, startups are required to make in-depth diagnoses, personalized presentations, and reports, as well as qualitative investigations. Investment in software and statistical models can also ensure that CI analysts use their time in activities that add more value to intelligence.

After the analysis stage, the companies proceed to disseminate the results obtained. It is a step that must take place at the right time. For Janissek-Muniz *et al.* (2017), it has factors such as disclosure of actions and results based on good guidance and leadership by managers.

In the maturity rating, from zero to four, the value of 2.5 represents the conjuncture of startups in the dissemination of information. According to the definition of Zuquetto and Beltrame (2012), this means that there must be a portal on the Web, which may even be specific to CI, and that startups are moving towards a structure for generating alerts and producing fully integrated content. to users' needs.

Although the synergy between employees is characteristic of these companies, they noticeably lack professionals who make periodic deliveries of the analyzes, with comments and integrated with the key business decisions. At least one member is needed who can develop regular summaries and newsletters, a portfolio containing intelligence products for different purposes and different target groups.

For the competitive intelligence cycle to evolve throughout its execution, evaluations must be carried out at the end of each delivery to understand whether the product added to the managers' decision making. This concept of continuous improvement is something that is part of the daily lives of startups since they are used to launching a product/service and then getting feedback from customers for improvement. As a result, the result of this phase was 3.0 on a scale of zero to four.

This value indicates that the decision-making process is supported by timely information, with parameters and performance indicators, and inspection of the product's relevance (ZUQUETTO; BELTRAME, 2012). This was the best-evaluated point among the other stages. This is because in the context of startups it is common for hypotheses to be validated. And if the feedback is negative, they interpret it as a learning event and an opportunity to change the business and not as a crisis. That is, the act of evaluating is an activity that is part of the routine of these companies because they need to quickly obtain results through their actions.

According to the definition of Zuquetto and Beltrame (2012), to reach an advanced level of maturity it would be necessary to have an Intelligence fully integrated with the decision-making process, with analyzes carried out on quantified and statistical data, in addition to a culture that fosters the continuous improvement inherent in the process.

## 4.2 Degree of maturity

By analyzing each stage of the cycle, it is possible to assess the degree of maturity of startups in the San Pedro Valley community. Some authors have presented qualitative and subjective proposals to assess the level of maturity, such as the publications by Rodrigues and Riccardi in 2007 (Competitive intelligence: in business and organizations); by Zuquetto and Beltrame in 2012 (Maturity model in competitive intelligence); and Janissek-Muniz *et al.* (2017) (Critical success factors in conducting strategic intelligence projects); and so many others who contributed to the understanding of each response from startups.

In response to the last specific objective, we sought to evolve the definitions of the literature, mostly qualitative, and propose a quantitative model to measure the degree of maturity of the organizations surveyed. This proposal was prepared based on the benchmark of maturity levels already published, as shown in Table 2:

**Table 2 - Degree of maturity in CI**

Level 1	Informal (ad hoc)	0,0-1,4.
Basic Level 2	(Beginner)	1,5-2,4.
Intermediate Level 3	(Structured)	2,5-3,4.
Advanced Level 4	(Optimized)	3,5-4,0.

Source: research data (2019).

The values of each level refer to the scale from zero to four applied in the questionnaire. Level one, called informal (ad hoc), suggests organizations in which competitive intelligence meets only a few needs, which are carried out on demand. There are no resources, scope, and process. At this point, are the organizations that obtained values from zero to 1.4. Level two, entitled basic (beginner), comprises the first steps towards the development of HF. At this level, there is standardization and users already have a perception of roles and functions. They can study some basic aspects of the business environment but still operate on demand. At this stage, the expertise in accessing information, analysis, and distribution was not recorded. Also, companies at this level have a low degree of future orientation and CI culture. Therefore, they are considered as basic maturity, between values 1.5 and 2.4. Level three, intermediate (structured), characterizes the company that has internal CI processes based on an intelligence network that includes it in the demands of organizational decision-making.

In this scenario, it is possible to notice that there is already a culture of CI strongly marked by the establishment of indicators to evaluate its operationalization and effectiveness. At this level are companies that reached values of 2.5 to 3.4. The last level, four, qualified as advanced (optimized), reflects the reality of a company that has experience in CI processes, supports all decision-making processes, and strategic innovation: a culture based on the discipline of observance, with the participation of all and support at the highest level. Intelligence is integrated with key organizational processes and based on sophisticated products, with a high degree of future orientation. And to be considered experts in CI, companies must reach values of 3.5 to four.

In this degree measurement proposal, considering the average of each model dimension, the result of the degree of CI maturity of startups in the San Pedro Valley community was around 2.4. It was classified as basic yet beginner in CI, evolving to level 3, intermediate. This value confirms the perception obtained from the individual analyzes of each stage of the competitive intelligence cycle.

## 5 Conclusions / Final considerations

Based on obtained results of such study, it is considered that all results were properly fulfilled. In general, SPVC *startups* have shortly and not formalized CI practices. The Highlighting is for “Information Needs Identification” and “Information Evaluation”, among CI Cycles six levels. However, smallest averages corresponded to “Information Collect” and “Data Analysis” showing that such critical levels of CI process are not performed according to referred literature.

According to proposed model for SPVC *startups*, CI maturity degree inquiry, 2,4 grade was obtained meaning the edge between basic (starter) and intermediate (structured) levels, reflecting a regular grade due to such companies show more organic and less structured features in terms of management. It's worth noting that traditional methods of management do not apply to *startups* context, since such companies are designed to hold reduced structure, limited budget and high sense of urgency. Thus, the obtained result cannot be seen as disturbing and thought provoking question emerges: how far SPVC *startups* should reach maturity high levels in CI? Flexibility in *startups* contexts is essential, because changes are performed in reply to feedback obtained from market, not worth having rigid structures, and even less processes that reduce flexibility of actions and strategies. Thus, having CI maturity degree in the edge between basic (starter) and the intermediate (structured) level could be enough in guaranteeing suited support to CI principles to competitive growth of *startups*. It is essential having the knowledge about CI and its advantages to business evolution.

Nevertheless, *startups* may improve processes related to collect and data analysis and also information, taking advantage of technologies already acquired. Being technological based ventures, in general, show sources allowing development of solutions able to not solely collect, but process data in real time and perform complex analysis and scenario projections for more assertive decisions. Then, maturity degree in CI may be higher without that being necessary high financial investments and time.

Proposition of model for maturity degree in CI inquiry and consequent measurement scale constituted the main contributions of such study allowing quantitative and subjective criteria. According to the deed of such study, it is possible to earn more assertive results. Such proposition evidently needs validation (see SHAPHIE, 2021) also in other *startups* communities, as well as in organizations of different sizes, and of different management model from the *startups* adopted ones, being such one of the most important recommendations for future studies. In addition, the obtained results also contribute, as expected, for the academic community once generating knowledge about use and degree of CI application in *startups* context, as a counterpoint to majority of researches about CI being concentrated in large size companies or with traditional business model ones, even being small sized. Also contributes to *startups* management model improvement, highlighting the innovative CI practices in systemic and informal way, aiming more assertive decision making for competitive advantage, more sustainable and lasting, with efficient results measured and systematical managed. Yet, permit experiment scientifically, about SPVC *startups* strategic informational practices and also knowledge of their entrepreneurs relating to innovative practices of strategic informational management that may lead to competitive advantage.

As constrains of such study, difficulty into contacting the whole SPVC *startups* entrepreneurs must be emphasized even being depleted all the ways such, what restricted the final sample. The accuracy of avoiding generalization of obtained results was a proviso, although such cooperate to diverse theoretical and practical fields of theme, data obtained considering startups context, IT segment representatives.

Further research is recommended in an attempt to validate the model created to meet the objectives of this research. It is important to apply it to other communities of startups, other companies with different business models, traditional large and small organizations, etc. From each study, it is possible to ascertain and contribute to the proposal to quantify, through a scale, the maturity levels in competitive intelligence.



## 6 REFERENCES

- AMARAL, R. M. et al. Panorama da inteligência competitiva no Brasil: os pesquisadores e a produção científica na plataforma Lattes. *Perspectivas em Ciência da Informação*, v. 21, n. 4, p. 97-120, 2016.
- AMARAL, R. M. et al. Modelo para o mapeamento de competências em equipes de inteligência competitiva. *Revista Ciência da Informação*, v. 37, n. 2, p. 7-19, 2008.
- APOLINÁRIO, F. *Metodologia da Ciência: filosofia e prática da pesquisa*. São Paulo: Pioneira Thomson Learning, 2006..
- BARBOZA, J. S.; ROJO, C. Diagnóstico estratégico em uma empresa do setor moveleiro através das análises swot, matriz bcg e 5 forças de porter/strategic diagnostics in a company of the moveleiro sector through the swot analysis, bcg matrix and 5 porter forces. *Revista da Micro e Pequena Empresa*, v. 9, n. 1, p.103-116, 2015.
- BATISTA, M. N.; CAMPOS, D. C. *Metodologias de pesquisa em ciências: análises quantitativa e qualitativa*. Rio de Janeiro: LTC, 2007.
- BLANK, S.; DORF, B. *Startup: Manual do Empreendedor*. São Paulo: Alta Books, 2014.
- CAMPELLI, M. G. R. et al. Perspectivas da inteligência competitiva no Brasil. In: *CONGRESSO BRASILEIRO DE EDUCAÇÃO EM ENGENHARIAS – COBENGE, Anais...* Blumenau, SC, 2011.
- CANONGIA, C. et al. Convergência da inteligência competitiva com construção de visão de futuro: proposta metodológica de sistema de informação estratégica (sie). *DataGramaZero*, v. 2, n. 3, A02-0, 2001. Recuperado de: <http://www.brapci.inf.br/v/a/1236>
- CHI-YEN, Y. Measuring organizational impacts by integrating competitive intelligence into executive information system. *Revista Intelligent Manufacturing*, v. 29, n. 3, p. 533-547, 2018.
- DISHMAN, P. L.; CALOF, J. L. Competitive intelligence: A multiphasic precedent to marketing strategy. *European Journal of Marketing*, v. 42, n. 7, p. 766-785, 2008.
- FRIEDRICH, M. P. et al. Alternativas para a saúde no Brasil. *Revista Pensamento Contemporâneo em Administração*, p. 31-43, 2017.
- GENNARI, A. M.. Globalização, neoliberalismo e abertura econômica no Brasil nos anos 90. *Pesquisa & Debate* (PUCSP. 1985. Impresso), v. 13, p. 30 - 45, 2002.
- GIL, A. C. (2008). *Como elaborar projetos de pesquisa*. (4a. ed.). São Paulo: Atlas, 2008.
- GOMES, E.; BRAGA, F. *Inteligência competitiva: como transformar informação em um negócio lucrativo*. Rio de Janeiro: Elsevier, 2004.
- HEDIN, H.; THIEME, J. (2010). From firefighters to futurists: A practical roadmap for CI development. *Competitive Intelligence Magazine*, v. 13, n. 1, p. 25, 2010.

- HEKIS, H. R. et al. Ferramentas de benchmarking como diferencial competitivo em empresas de fastfood na cidade de natal: rn/tools of benchmarking to start a competitive differential in fastfood companies in the natal- brazil. *Holos*, v. 29, n. 3, p. 51-66, 2013.
- HERRING, J. P. Key intelligence topics: A process to identify and define intelligence needs. (4. ed). *Competitive Intelligence Review*, p.4-14, 2001.
- JANISSEK-MUNIZ, R. et al. Fatores críticos de sucesso na condução de projetos de inteligência estratégica. In: SEMINÁRIO EM ADMINISTRAÇÃO – SEMEAD, 20, 2017, São Paulo, *Anais...* p.1-17, 2017.
- MAFRA PEREIRA, F. C.; CARVALHO, R. B. DE; JORDÃO, R. V. D. Análise do ciclo de inteligência competitiva em arranjos produtivos locais: estruturação e implantação do bureau de inteligência do APL de software de Belo Horizonte. *Revista Inteligência Competitiva*, v. 6, n. 1, p. 139-164, 2016.
- MAFRA PEREIRA, F. C. et al. Inteligência competitiva como suporte à estratégia empresarial em micro e pequenas empresas: um estudo da aerotrópole de Belo Horizonte. *Revista Ibero-Americana de Estratégia - RIAE*, v. 17, n. 1, p. 93-111, 2018.
- MOTTE, M. *Relatório do Seminário Internacional Inteligência Estratégica*, 2007. Recuperado de: <https://pt.scribd.com/document/35626799/Inteligencia-estrategica>.
- OLIVEIRA, J. R. et al. Nível de Maturidade da Inteligencia Competitiva: Um estudo nas empresas Agropecuárias de Rondonópolis que possuem Controladoria. In: VI SIMPÓSIO INTERNACIONAL DE GESTÃO DE PROJETOS, INOVAÇÃO E SUSTENTABILIDADE (VI SINGEP). São Paulo, *Anais...*2017.
- OLIVEIRA, O. V. et al. Atirou no que viu, acertou no que não viu. *Revista Alcance* (Online), v. 24, n. 1, p.129-146, 2017.
- OLIVEIRA, P.; GONÇALVES, C.; MENDES DE PAULA, E. Diretrizes para a condução de uma atividade de inteligência competitiva: uma análise preliminar. *Revista Inteligência Competitiva*, v. 1, n. 3, p. 257-272, 2011.
- PRESCOTT, J. E.; MILLER S. H. *Inteligência competitiva na prática: estudos de casos diretamente do campo de batalha*. Rio de Janeiro: Campus, 2002.
- RAUPP, F. M. ; BEUREN, I. M. *Metodologia da pesquisa aplicável às ciências: Como elaborar trabalhos monográficos em contabilidade - teoria e prática*. São Paulo: Atlas, 2006.
- RODRIGUES, L.; FERNANDEZ, M. Alinhamento estratégico da tecnologia de informação e inteligência competitiva. *Revista Gestão Industrial*, v. 2, n. 1, 2006.
- RODRIGUES, L. C. et al. Inteligência competitiva como instrumento de inovação nos processos de negócio. *Revista Gestão Organizacional*, v. 5, n. 2, p. 229-241, 2012.
- RODRIGUES, L. C.; RICCARDI, R. *Inteligência competitiva: nos negócios e organizações*. Maringá: Unicorpore, 2007.

- RODRIGUES, L. C.; VOLPP, J.; RECHZIEGEL, W. Maturidade organizacional em inteligência competitiva: o caso de uma instituição financeira brasileira. *Revista de Ciências da Administração*, v. 16, n. 38, p. 126-139, 2014.
- RODRIGUES, W. C. (2007). *Metodologia científica*. Faetec/IST, Paracambi, p. 2-20, 2007.
- SERVIÇO BRASILEIRO DE APOIO ÀS MICRO E PEQUENAS EMPRESAS. SEBRAE. *Canvas: como estruturar seu modelo de negócio*, 2019a. Recuperado de: <https://www.sebraepr.com.br/como-estruturar-seu-modelo-de-negocio/>.
- SERVIÇO BRASILEIRO DE APOIO ÀS MICRO E PEQUENAS EMPRESAS. SEBRAE. *Saiba o que é customer developent*, 2019b. Recuperado de: <http://www.sebrae.com.br/sites/PortalSebrae/artigos/entenda-o-que-e-customer-development,40feb2a178c83410VgnVCM1000003b74010aRCRD>.
- SILVEIRA, D. T.; CÓRDOVA, F. P. *Unidade 2—a pesquisa científica: métodos de pesquisa*. Porto Alegre: UFRGS, p. 31-42, 2009.
- TEIXEIRA, R.; SOUZA, C. Evolução da inteligência competitiva com base em estudo métrico de sua literatura. *Perspectivas em Ciência da Informação*, v. 22, n. 1, p. 170-185, 2017.
- UTSUMI, M. C. et al. Questões metodológicas dos trabalhos de abordagem quantitativa apresentados no GT19-ANPED. *Educação Matemática Pesquisa*, 9(1), 2007.
- VARGAS, K. S. et al. A cadeia de valores e as cinco forças competitivas como Metodologia de planejamento estratégico. *Revista Brasileira de Estratégia*, v. 6, n. 1, p.11-22, 2013.
- ZUQUETTO, R. D.; BELTRAME, A. Modelo de maturidade em inteligência competitiva. *Revista Global Manager Acadêmica*, v. 1, n. 2, 2012.