Individual environmental scanning as a barrier to collective processes in organizations

A view based on the illusion of control

Natália Marroni Borges and Raquel Janissek-Muniz
Escola de Administração, Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil

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Abstract

Purpose – The purpose of this paper is to understand how illusion of control (IOC) can affect the implementation of formal processes of environmental scanning in organizations.
Design/methodology/approach – Based on the proposed research question, an exploratory study was chosen, which could collaborate with future studies. There were conducted three semi-structured interviews with CEOs working in medium/large technology companies.
Findings – Behavioral traits were identified—such as overconfidence and underestimation of risks—which are directly related to the IOC's theory. The belief that there is no added value to the company in adopting organizational strategic processes—such as environmental scanning—answers the research question and contributes to the development of new studies.
Research limitations/implications – This study has as limitation the fact that it proposed the interviews to an inexpressive number of respondents, exclusively with the intention to explore better the relation between the IOC and the formal processes of environmental scanning.
Practical implications – This research advances the understanding of the difficulty in adopting formal environmental scanning practices in organizations. It can also help understand the motivations of executives for adopting (or not adopting) such practices. Finally, it is possible to know and understand the individual approach to environmental scanning, as well as its limitations.
Originality/value – This research discusses the themes of IOC and environmental scanning, demonstrating how cognitive factors can affect strategic decision making in an organization. Although the IOC is well-developed in the field of psychology, it can be very helpful in understanding business management and executive behavior.

Keywords Environmental scanning, Individual environmental scanning, Illusion of control

Paper type Research paper

1. Introduction

Information is one of the most important assets of organizations. Companies are enhancing their processes to access and interpret data, turning them into strategic advantage. If in the past years, analytics was an IT issue, currently it is considered as a part of the core business of companies (Davenport *et al.*, 2012). Despite the importance of managing the quality of internal information in organizations, information from the external environment is also relevant for strategic management, and it comprises data from all institutions that originate or operate outside the firm.

Organizations need to manage information from the external environment in order to stay competitive (Kumar *et al.*, 2001). Environmental scanning is the "collection and use of information about events, trends, and relationships in an organization's external

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environment, the knowledge that assists management in planning the organization's future course of action" (Bhardwaj and Kumar, 2014, p. 1). Part of this information, collected outside and managed internally by organizations, is known as weak signals (Ansoff, 1975).

Weak signals are mostly inaccurate, unreliable, incomplete and fragmented. So, individually, they are hardly useful (Mendonça *et al.*, 2012). However, when analyzed together, they can have a strategic potential (Caron-Fasan and Janissek-muniz, 2004; Holopainen and Toivonen, 2012; Zwicker *et al.*, 2006). Therefore, in order to turn weak signals into strategic information for organizations, it is necessary to notice, observe, collect and manage them. Weak signals are the raw material for the process of environmental scanning. The main advantage of working with environmental scanning in organizations is the ability to anticipate threats and opportunities that may affect the business environment.

Given the current uncertainty of the organizational environment, brought by the digital age, companies must adopt methods to help executives and managers in planning and decision-making. However, many organizations still lack the ability to capture, interpret and act based on the weak signals scattered in the environment (Day and Schoemaker, 2006). Much of this difficulty stems from their uncertain and imprecise character (Caron-Fasan and Janissek-muniz, 2004), which is a major source of anticipated information (Ansoff, 1975).

This perception of weak signals as incomplete and inaccurate information makes it more difficult to establish a relationship between these signals and the needs of decision-makers, who require complete and accurate information (Zwicker *et al.*, 2006). Hence, some authors have developed methods for the amplification of weak signals, to decrease the identified biases. Among these studies, the scenario technique (Schoemaker, 1995), the collective creation of meaning (Lesca, 2003), and discussions with experts (Rowe and Wright, 1999) stand out.

All these approaches help organizations to identify, manage and interpret weak signals in order to increase the accuracy of these data by treating them collectively, adding value to the organization (Lesca, 2003). Through these processes, many company members interpret the information based on their activities, experience and expertise (Blanco and Lesca, 1998; Lesca and Caron-Fasan, 1996), which generates a process of collective organizational learning and knowledge management (Caron-Fasan and Farastier, 2003). On the other hand, an individual approach brings a bias to the process, by hindering creativity, subjectivity and innovation in the process of strategic decision-making (Corso *et al.*, 2014). Finally, the distribution of information through a collective perception is more valuable to the organization than an individual approach (Rowe and Wright, 1999).

Despite the evidence of advantages in collective environmental scanning processes, we have also found references to these practices as individual, informal and proactive, done by company executives, which are attentive to external information. However, this happens without a formalized information management process. Studies mention CEOs (Jorosi, 2008), managers (Barron *et al.*, 2015) and executives (Lau *et al.*, 2012), who carry out such procedures in organizations and are responsible for them.

Literature explores discussions and arguments about the benefits of the collective against the individual approach for management. However, the theory of the illusion of control (IOC) shows the tendency of individuals to believe that they can control or influence results over which, actually, they have no power. It further demonstrates that this attitude tends to become more frequent in contexts where power relations are better established, and these individuals see themselves as holders of power and skills that foster their ability to make decisions (Langer, 1975). In addition, Sivanathan *et al.* (2008) observed that the effects of power in individuals often include a supposed ability to influence future events and, therefore, the illusion that they can anticipate them (Fast *et al.*, 2012).

Based on these studies, there are two alternatives for environmental scanning as a collective method within organizations: in the first one, collective processes are the result

(or growth) of an individual scanning (Hamrefors, 1999); in the second, individual scanning practices generate a barrier against collective processes, due to individuals' propensity to believe they have control over future events, eliminating the need for a larger process. The purpose of our research was to understand if there is evidence of barriers to collective processes of environmental scanning due to individual practices. To carry out the research, we used qualitative and exploratory methods, through interviews with executives who perform individual scanning.

2. Theoretical background

This section presents the main studies related to the topics of the present research, such as environmental scanning, IOC and individual environmental scanning.

2.1 Environmental scanning

Environmental scanning concerns the monitoring of information about events related to the company's external environment. It is knowledge that can help top management to define the company's future course of action (Aguilar, 1967). Although this author was the pioneer in conceptualizing this expression, it was Ansoff (1975) who made the connection between the practices of environmental scanning and the forecast factor, which involves not only the effective perception of the external environment but also the possibility of anticipating potential changes. In this work and in most of his subsequent studies, Ansoff suggests a succession of systematic and formal activities, which must be conducted in order to get better information for the enhancement of organizational strategic planning. There is the understanding of the organizational strategy as a set of rules for decision-making that should serve as an orientation for the organization's own behavior. And these activities should be guided by the company's executives, who become those primarily responsible for the organizational strategy.

Some authors, among them was Mintzberg (1994), criticize what is acknowledged as a rational process of strategic planning. Their considerations are based on the unpredictability of the environment and the need for managers to be sure about the results of strategies, before developing them. Sarpong and Maclean (2016) observe the importance of lower level employees' participation to increase the forecasting ability in organizations.

The concept of "environmental scanning"—practices of identification, collection and generation of knowledge based on external data, to identify threats and opportunities in anticipation—can receive different names, which we have identified during this review. Thus, we can refer to these practices as "strategic foresight" (Cunha *et al.*, 2006; Sarpong and MacLean, 2014; Sarpong *et al.*, 2013; Tapinos, 2012), which was initially defined as an organizational ability, related to a high quality, coherent and functional foresight vision that uses the insights that arise in an useful way. This idea comprises practices for the detection of adverse conditions, orientation toward organizational policies, establishment of patterns for strategy and exploration of new markets, products and services. Some authors consider these practices of "strategic foresight" as the operationalization of scenario planning, widely used by academics to refer to practices for the collection of external information, followed by interpretation and anticipation of potential future situations (Clemens, 2009; Schoemaker *et al.*, 2013). In addition, a more comprehensive term has been used to refer to studies that deal with practices of forecasting of future conditions, linked to an organizational learning process—"future thoughts" (Markus and Mentzer, 2014; Masini, 2006; Miller *et al.*, 2012).

All these approaches show the importance of collecting information from the external environment as one of the first steps to anticipate events, whether to identify opportunities, prevent threats or both. They differ in depth, but some topics are of great relevance, such as attention to the external environment (Durand, 2003a; Ramírez *et al.*, 2013; Schoemaker *et al.*, 2013), how to select the identified information (Lesca, 2003; Mithas *et al.*, 2011; Raford, 2015)

and its collection (Lesca, 2003; Du Toit, 2016; Rossel, 2012). These steps were classified in this research as a group called "scanning," referring to how organizations and individuals deal with the process of monitoring weak signals before they are noticed, captured or interpreted. After the information is effectively identified and collected, there is a stage of interpretation, which concerns information analysis (Du Toit, 2016; Kuosa, 2010; Schoemaker *et al.*, 2013; Thorleuchter and Van Den Poel, 2015) and sensemaking (Lesca, 2003; Kuosa, 2010; Liebl and Schwarz, 2010; Schoemaker *et al.*, 2013). Finally, there is a stage called "forecasting" that includes the activities of creating scenarios and anticipating events. At this phase, after collection and interpretation of information, decision-makers determine how to adapt organizations to the identified threats or opportunities.

It is worth noting that this is not just a process of looking outside the company, but rather to collect information that enables the organization to look ahead. Although the different terms refer to the same phenomenon—the activity of seeking connection between the company and potential future events, through information collected in the micro and macro organizational environment that must be understood, analyzed and interpreted—it is important to point out the complementarity between scanning, interpreting and foreseeing, which creates a rich process for investigating and anticipating events and situations in organizations. Hence, it gives these organizations the possibility to act, adapting their realities to the knowledge created by this process (Argyris, 1996). Figure 1 represents the compilation of the stages identified in the literature review, with the main steps that relate to the process of environmental scanning.

Therefore, environmental scanning addresses a company's ability to anticipate external changes. The incorporation of this information into its strategic formulation is important to ensure its survival and growth (Choo, 2001). The ideal result of this activity is one of the raw materials for the elaboration and adaptation of organizational strategic planning, which determines the relevance of this topic for the current management of organizations. In fact, previous research has proven the positive correlation between the organization's performance and its ability to scan the environment (Beal, 2000; Kumar *et al.*, 2001; Howell and Sheab, 2001; McGee and Sawyer, 2003; Garg *et al.*, 2003; Suh *et al.*, 2004).

The concept of environmental scanning crosses distinct approaches, with different applications and formats, and it fits the debate between Mintzberg (1994) and Ansoff (1991) about the nature of strategy. While we can identify some authors who consider environmental scanning as a collective and formalized organizational process (Rowe and Wright, 1999; Lesca, 2003; Schoemaker *et al.*, 2013), other studies approach the topic from an individual perspective (Ahuja *et al.*, 2005; Rohrbeck *et al.*, 2015). These practices may have some organizational support or be totally independent of the company's structure, based exclusively on the individual's initiative. There are authors who report the need for a collective process that leads to organizational learning, while others consider only the individual's behavioral issue toward these forecasting practices.

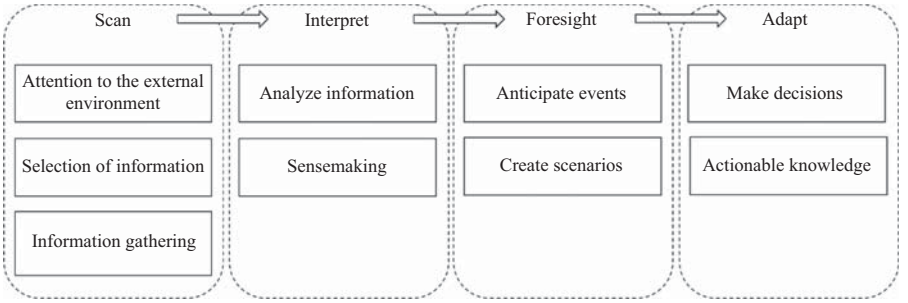

Figure 1.
Stages of environmental scanning

2.2 Illusion of control, overconfidence and individual environmental scanning

As discussed in previous sections, environmental scanning is a formal organizational process that enables the company to anticipate situations of discontinuity and change, by seeking opportunities and challenges through the identification, selection and interpretation of weak signals. Authors such as Lesca, Schoemaker, Day and Wright proposed different methodologies for applying this process in organizations, and all comprise the need for:

- collectivity;
- creation of meaning;
- attention to the external environment; and
- systematization.

These needs must be identified, so that the organization does not suffer individual bias, dependence on specific professionals or difficulties in information management. On the other hand, we find in academic literature examples of environmental scanning processes that are carried out individually, often under the responsibility of senior executives. Their assumption is that CEOs are responsible for anticipating the organization's future and making decisions about it (Ahuja *et al.*, 2005).

Strategic foresight is often presented as a managerial role and a competence (MacKay and Burt, 2015; McKelvey and Boisot, 2009) that allow organizations to "penetrate and transgress established boundaries, and seize opportunities otherwise neglected by others" (Chia, 2008, p. 27). One of the greatest difficulties in attempting to rationalize individual decision-making is that what is rational for one person may be considered irrational by another (Salancik and Pfeffer, 1977). According to Durand (2003), the intrinsic limitations of individuals can cause forecast errors, thus harming a company's predictability. A person's ability to make forecasts and his own recognition of this capacity naturally leads to its weakening. Empirical studies show that the more renowned the specialist, the less likely he is to admit that he may be wrong (Syed, 2016). In a series of experiments carried out for many years, Philip Tetlock (2016) demonstrated how predictions made by experts are often fragile and do not correspond to the facts that really happened.

As for the processes, the activity carried out individually leads to the company's dependence on this professional (Vecchiato, 2012). The inexistence of an established process results in a personal and exclusive knowledge by this employee. In addition, the process can become complex, since relationships were not previously established (Du Toit, 2016; Vecchiato, 2012). Individuals that informally carry out activities that are related to the organization as a whole, hinder the connection between the parties.

From the behavioral point of view, there are also effects on individuals. An isolated action introduces a bias on the interpretation of information (Choudhury and Sampler, 1997; Graefe *et al.*, 2010), while an organizational process generates a collective knowledge. If the professional has a position of power, this bias can make him overconfident, which obviously reduces his interpretation criteria and accuracy in foresight and decision-making (Fast *et al.*, 2012). Figure 2 shows the main effects of the IOC, based on the literature.

Biases are particularly common in situations of high uncertainty, such as executives' strategic decision-making (Das and Teng, 1999; Kahneman and Klein, 2009). In one of the

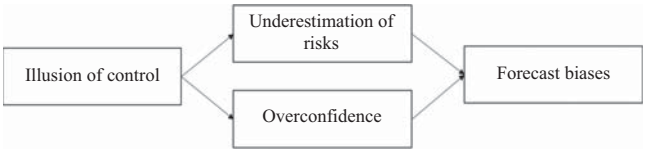

Figure 2.
Illusion of control: effects

seminal papers on forecasting biases, Schwenk (1984) distinguishes two main simplification processes in the prediction phase of strategic decision-making: IOC and attention problems. When making strategic decisions under uncertainty, executives may be influenced by a cognitive bias that systematically limits the quality of the decision (Bazerman and Moore, 2008; Kahneman and Lovallo, 1993), and this is the IOC (Barnes, 1984; Schwenk, 1984).

IOC describes the tendency of decision-makers to overestimate their influence on casual events (Langer, 1975). It weakens the analytical reasoning of the individual, which is a relevant part of the decision-making process. It leads professionals to think in terms of convictions, preventing them from working properly with complex situations, which directly affect organizational strategic planning. In everyday situations, there is evidence that people are deluded about their ability. Svenson (1981) showed that most drivers consider themselves to be more skilled than the average.

In the strategy process, IOC reduces the perceived risk (Simon *et al.*, 2000) and the forecast ability of executives (Durand, 2003), thus decreasing the overall quality of decisions (Duhaime and Schwenk, 1985). Sivanathan *et al.* (2008) showed that power affects individuals to the point of losing their ability to interact and adapt to the real world. Workplaces with well-established power relations are a proper environment for IOC to occur, and power achievement can be a trigger. For example, a professional who is promoted may act and make decisions differently from before, depending on the amount of power granted to him in the new position. Hence, by providing an illusion of personal control, power can make people lose touch with reality, leading to decisions based on overconfidence. In general, individuals affected by the IOC tend to believe that they also have control over the future.

3. Methodology

The scientific method refers to the choice of systematic procedures, which enable the description or explanation of the situation under study (Fachin, 2003). The criteria used to select the appropriate procedures depend on the study's objective. This research aimed to understand how the IOC can become a barrier to the implementation of formal processes of environmental scanning in organizations. It was an exploratory study to understand the phenomenon and assess the grounds for deepening the vision of environmental scanning under the lens of the IOC's theory. We chose an exploratory study based on the proposed research question, which should help future studies on the subject (Petty *et al.*, 2012; Mattar *et al.*, 2014). Since the study dealt with a complex topic and looked for answers to questions such as "how" and "why," the qualitative approach seemed to be an appropriate research alternative (Benbasat *et al.*, 1987).

We chose semi-structured qualitative interviews to meet the research objectives. They can be used as the only research technique, as a preliminary technique or still associated with other techniques (Fraser and Gondim, 2004). Triviños (1987) argues that a semi-structured interview has specific basic questions, supported by theories and hypotheses related to the research theme. And these questions can generate new hypotheses that arise from the interviewees' responses, around the main focus provided by the researcher. We applied a set of open questions, in order to capture spontaneous information that was not foreseen when preparing the initial interview script (Freitas, 2000). Thus, this kind of interview can unveil information more freely, and the answers are not chosen among standardized alternatives. For Manzini (2003), a semi-structured interview focuses on a subject, through a script with key questions that are complemented by others that relate to the circumstances of the interview.

Since the study is exploratory, we decided to carry out semi-structured interviews with three CEOs of technology companies located in Porto Alegre, Rio Grande do Sul. We chose the technology services sector because it is very dynamic, and whose environment demands constant attention in order to follow the main trends. The choice of CEOs and the

specific conditions to select them were based on the following requirements: strategic decision-making, lack of collective processes of environmental scanning or strategic intelligence in their organizations and operation in the area of technology services in organizations with more than 50 employees. The size of the companies was not essential for the study; however, we made this option to work with medium or large companies, which have a more complex structure and require some level of delegation and formalization of their activities.

The three selected CEOs who meet the requirements were chosen by convenience and contacted by e-mail, which provided them with explanations about the study and checked their adjustment to the established criteria. Interviews were conducted in person at the companies, with one hour duration, on average. Later, we submitted the interview reports for their approval, and carried out content analysis to treat the data.

We developed the research instrument considering three distinct blocks, in order to codify responses. In the first block, we tried to understand if there were features of IOC in the respondents' behavior. In the second block, questions referred to the possible attributes of IOC and their effects in the implementation of environmental scanning processes. The intent was to understand whether there was any potential relationship between behaviors understood as IOC and decisions about scanning processes. The third block dealt with formal organizational processes of environmental scanning, aiming to understand if the respondents trusted them, and were willing to use the resulting information (Table I).

As mentioned above, this was an exploratory research that should serve as a basis for a subsequent quantitative study; that is why we chose only three respondents. We describe the results of the three interviews in the following section, as well as the related analyses.

4. Results

This research was carried out to explore how the IOC can become a barrier to the establishment of formal processes of environmental scanning in organizations. We carried out semi-structured interviews with three CEOs of technology companies in the city of Porto Alegre. All respondents were males, aged between 35 and 45 years, and executives of

Block of questions	Objective	Questions
B1	To understand if there were attributes of illusion of control in the interviewees' behavior	How do you see the external environment of your organization? Do you believe to have any control over what happens in this environment? Do you believe that you might be surprised by an event occurring in the external environment of your organization?
B2	To understand if there was any potential relationship between behaviors seen as illusion of control and decisions on environmental scanning processes	Can you mention examples of risks that were identified, and how this was done? Was there an occurrence—or any risk of occurrence—of a situation that might not be "under control" in this context? Have you considered working with an external information support system to assist you in interpreting the external environment?
B3	To understand the respondents' confidence on environmental scanning processes, as well as their willingness to use the resulting information	What value would you assign to organizational processes that could capture and interpret information from the external environment? And what is the reason for not using these processes in your organization? What would be the necessary conditions for you to decide to use them?

Table I.
The research instrument

medium-sized companies with at least ten years in the market. The companies do not have a specific area for environmental scanning, and these activities are conducted informally and individually by the interviewees.

The first block of questions investigated the behavior related to IOC and whether this behavior was coherent with the respondents' reality, and specifically with activities related to environmental scanning. In all three cases, CEOs expressed that they know and have control over the external organizational environment, and on what might affect their organizations. When asked about the risks in the external environment that might threaten their companies, all three mentioned examples of competition, new products and fast changes in consumers' habits toward technology products. This shows an uncertain and turbulent environment, which is the context of the majority of studies about environmental scanning (Aguilar, 1967; Ansoff, 1975). On one hand, these answers demonstrate that they are attentive to the external environment and its effects on organizations; but on the other hand these answers clearly give the impression that they are in control. This means that if they pay attention to the subject and get answers to their questions, there will hardly be any strategic surprises.

When questioned about the possibility of being surprised by some unexpected event, all three answered that this option exists, given the market's dynamism. However, in two cases they argued that this would hardly occur, since their actions—talking to people in the market, observing competitors' behavior, working closely with stakeholders—made them anticipate these changes without big risks to their organizations and operations. These responses contributed to the understanding that, in their view, the external environment is under control, once they carry out the activities that they consider relevant. Confirming this assertion, all respondents see the external environment a sensitive subject, but it is under control due to their individual management (Table II).

The second block of questions concerned the effects of IOC identified in the literature, and their influence on the implementation of formal environmental scanning processes. Considering that IOC leads professionals to underestimate risks, we asked interviewees about their attitudes regarding the strategic risks related to the external environment. We also asked for practical examples of identified risks and actions they took. In all cases, they brought examples of risks that were identified and interpreted individually, and the actions that followed. However, regarding the possibility of unforeseen risks all showed an optimistic vision, claiming that this would not happen to them.

As for the individual biases, given that the events are analyzed and interpreted individually, interviewee E1 firmly said that he shared information and sought the opinion of others, for a joint interpretation, but not inside the company. The creation of meaning was done by consulting his personal contacts, his family, former co-workers and faculty, whom he considered coherent. Even colleagues in the organization could be consulted, but at the end he decided which opinions made sense to him. Respondent E2 admitted that there is a bias in interpretation, but he argues that a biased interpretation is better than no interpretation at all. Finally, Respondent E3, like E2, said that there might be more value in a collective rather than an individual process, but he did not believe in the implementation of

Table II.
Summary of responses—block 1

Question	Summary of responses E1	E2	E3
How do you see the external environment of your organization?	Turbulent	Turbulent	Turbulent
Do you believe you have any control over what happens in this environment?	Yes	Yes	Yes
Do you believe that you might be surprised by an event that occurs in the external environment of your organization?	Hardly	Possibly	Hardly

this type of process in his organization at that moment, due to the high investment value and doubtful return.

Finally, with respect to overconfidence resulting from the IOC, the three respondents said that they were confident that their companies would not be affected by unexpected external factors. Surprisingly, their answers were over 80 percent sure, even knowing the risks involved in this specific market. Given these answers, we asked a question about the expected effect (in terms of confidence) of a change in this process, turning from individual to collective. Again, the answers were surprising. For respondents E1 and E3, the level of trust would decrease with the formalization of a collective process instead of their individual activities. Only respondent E2 said that this would increase confidence, since a formalized process would give him access to information that is not currently available (Table III).

The third and final block of questions related to formal environmental scanning processes and respondents' acceptance and appreciation. First, they answered about the value assigned to formal environmental scanning and forecasting practices. E1 argued that he did not believe in formal processes for these activities. According to him, these practices could bring results, but they would not be better than those achieved by informal monitoring. For E2, these practices have value and assist in a deeper understanding of the market. There is a general belief that the organization should implement these practices, but he does not see the need to formalize them, and there is no structure for them now. E3, like E1, does not see the importance of formalizing environmental scanning processes and their potential results for the organization, because it is a high investment for reaching a result that might be intuitive and ineffective.

We then asked interviewees about the reasons why these processes were not established in their organizations. Obviously, in the cases where there was no value assignment (E1 and E3), this was the main reason. Other reasons mentioned were the need for investment and qualification, uncertainty of results, work to implement the process, need for effective participation and invasion of individual decision-making space. This last item should be highlighted because it is E3's opinion. Once the company implements a formal process of research and interpretation of the external environment, employees expect that the attained insights will be used for strategic decision-making. However, E3 thinks that the team's interpretation will not necessarily coincide with his individual view of the market, hence frustrating those who perform these functions at the company.

According to E2, who assigned value to formal processes of environmental scanning, there is no need to implement them in his organization, and there is no structure for it. Activities related to these practices and the main results achieved so far—vision of the external environment, attention to changes and identification of opportunities—can currently be done by a single person with suitable results. Table IV shows a brief summary of the answers.

Question	Summary of responses E1	E2	E3
Would you mention examples of some risks that were identified and how did it happen?	Individually	Individually	Individually
Is there an occurrence—or any risk of occurrence—of a situation that may not be "under control" in this context?	More than 80% under control	More than 80% under control	More than 80% under control
Have you considered using an external information support system that could assist you in interpreting the external environment? What would be your confidence in this kind of process?	Would decrease	Would increase	Would decrease

Table III. Summary of responses—Block 2

Question	Summary of responses E1	E2	E3
What value would you assign to organizational processes that capture and interpret information from the external environment?	Not valuable	Valuable	Not valuable
And what is the reason for not having these processes in your organization?	I do not assign value and do not know any formal processes for environmental scanning	I see no need to formalize these activities in his organization	Risk of intuitive results
What would be the necessary conditions for you to decide to use them?	Company needs to grow	Company needs to grow	Company needs to grow

Table IV. Summary of responses—Block 3

The last question was about the necessary conditions for the implementation of formal environmental scanning processes in the organizations they managed. In all three cases, answers related to the company's size. Even E1 and E3, who assigned no value to environmental scanning processes, said that if their companies grew too much, and they became overloaded and could not control all fronts, that would be a condition for hiring other people to carry out these activities. However, none of them mentioned what size this would be.

5. Discussion and conclusions

The objective of this research was to explore how the IOC can hinder the implementation of formal environmental scanning processes in organizations. To reach this objective, we conducted three semi-structured interviews with CEOs of technology companies with at least ten years in the market, which have no formal process of environmental scanning.

According to the literature review, environmental scanning comprises different activities and tasks, among which recognition and information scanning, but also the creation of meaning from what was identified and an effective activity of forecasting, anticipating events that call for decisions. In the interviews, we confirmed that in these organizations CEOs are responsible for individual environmental scanning.

First, we identified the respondents' inclination to believe that the external organizational environment is under control. This impression of control is linked to the activities carried out—observe competitors' behavior, work close to the stakeholders and always be in contact with the other players in the market. These activities are carried out with the purpose of reducing the main risks identified in the external organizational environment: competitiveness, new products, and fast changes in consumers' habits. By carrying out the listed activities, and considering personal impressions about the risks brought by the external environment, respondents believe that they have control over it, despite its dynamism and the possibility of strategic surprises.

With regard to the identified effects of IOC on individuals, we highlight three items: underestimation of risks, overconfidence and forecast biases. We identify underestimation of risks when individuals believe that some situations will not happen to them, even though there is evidence that they have already occurred with other people or companies. The answers led us to notice a little optimism toward risks. But it is not grounded on ideas or actions, and professionals do not even consider or perceive the risks. We saw excess of confidence when professionals believe that their organizations will not be affected by situations or surprises coming from the external environment, with over

80 percent certainty. But this percentage is not consistent with market' reality or its changes in recent years. Both overconfidence and risk underestimation lead to the third item, the forecast biases.

These refer to understanding and interpreting the answers from the environment, and if this is done individually, the process of interpretation and anticipation may become biased. Both issues of overconfidence and risk tolerance show that executives do not notice any bias in their interpretations or, if they do, they prefer a biased interpretation rather than no interpretation at all. There is also the recognition that collective processes could bring better results. However, there is no evidence of the need or interest in implementing this type of process in their organizations, mainly due to high investments, the need for professionals' qualification, uncertainty of results and the need to spend energy in project management and execution.

Regarding the process of environmental scanning and its activities, we observed that executives have more confidence in their own methods than in systematic patterns. This vision puts a barrier to the adoption of formal environmental scanning processes, especially when combined with other factors that may hinder this implementation, as observed by Muniz (2016).

This does not necessarily mean that executives do not assign value to specific stages of this process—such as the collective creation of meaning. However, the process as a whole (formal, systematic and collective) still does not receive the value it gets in the academic literature. The limitation of this study is the small number of interviews, which had the intention of exploring the relationship between IOC and the formal processes of environmental scanning. More substantial studies, with a higher number of respondents from distinct sectors and markets, should achieve more convincing results that could be generalized.

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Corresponding author
Natália Marroni Borges can be contacted at: natalia_marroni@hotmail.com