

# Competitive intelligence and strategy formulation: connecting the dots

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Received 17 January 2020  
Revised 26 March 2020  
Accepted 17 April 2020

## Abstract

**Purpose** – This paper aims to examine how competitive intelligence (CI) relates to the strategy formulation process of firms.

**Design/methodology/approach** – Due to the novelty of the phenomenon and to the depth of the investigation required to grasp the mechanisms and logics of CI, a multiple case study has been performed related to four companies located in Brazil that adopted CI practices within dedicated business units to inform and support strategic decision-making.

**Findings** – The authors provide detailed empirical evidence on the connection and use of CI practices throughout each stage of the strategy formulation process. Moreover, the study suggests that CI practices, despite their strategic relevance and diffusion, are still extensively adopted for tactical use.

**Originality/value** – This study sheds light on how CI practices may inform, support, and be integrated in the strategy formulation process, as few studies have done before.

**Keywords** Competitiveness, Strategy, Digital, Competitive intelligence, Business model, Ecosystem

**Paper type** Research paper

## 1. Introduction

Good intelligence, by itself, will not make a great strategy. (Herring, 1992, p. 57)

The markets where companies operate today are becoming ever more turbulent and uncertain due to the rapid pace of technological change (Iansiti and Euchner, 2018; Trabucchi *et al.*, 2019). This is why gathering competitive intelligence (CI) is increasingly relevant for businesses (Du Plessis and Gulwa, 2016). CI is a process that generates actionable information about the firm and its external environment to help firms in making market-related decisions (De Almeida *et al.*, 2016; Kahaner, 1996; Prescott, 1995). Its relevance goes beyond developing competitive advantage (Calof *et al.*, 2008), but rather toward enhancing the sustainability of a business (Cosway, 2018). Companies need to assess current and future competitive landscapes to survive, namely, data, information, knowledge and, mostly, intelligence become crucial resources (Markovich *et al.*, 2019). Recent advances in digital technologies and big data have increased both internal and external information



availability (Trabucchi and Buganza, 2019), which is leading to a “networked and digital economy” (Subramaniam *et al.*, 2019; Cavallo *et al.*, 2019a), extending the competitive arena from firm level to ecosystem [I] level (Iansiti and Euchner, 2018). This brings both a wide variety of opportunities and threats into managers’ agendas (Artusi and Bellini, 2020). More information should lead to better decisions, but, to make order and select the “quality” information is a critical and not trivial task. Some scholars argue that CI can be used to spot whether industry disruption is about to occur (Vriens and Soilen, 2014). Firms need to develop advanced analytical capabilities (Itani *et al.*, 2017) and make a better use of CI, now more than ever because of the extended boundaries of competition beyond and cross industries and within ecosystems (Iansiti and Euchner, 2018). Indeed, more and more businesses are investing in CI as a specific function, creating formal structures and processes (Crayon, 2019; Calof, 2014; Reinmoeller and Ansari, 2016). Despite the growing attention that scholars reserved to CI, critical gaps remain (Davison, 2001; Reinmoeller and Ansari, 2016). An ongoing and central debate is discussing whether CI can play a role in strategic planning or at a more tactical level by supporting and driving shorter-time-oriented decisions (Calof *et al.*, 2017; Arrigo, 2016; Calof and Smith, 2010). Although extant literature encompasses an extensive body of research on strategic analysis and strategy formulation (Leiblein and Reuer, 2019), the current debate still lacks of research that can provide the basis for integrating CI into the overall strategy of a company (Badr *et al.*, 2006; Arrigo, 2016; Calof *et al.*, 2017).

This study aims at contributing to such current and relevant debate, by investigating whether and how CI relates to the strategy formulation process of firms. Due to its novelty and to the depth of the investigation required to grasp the mechanisms and logics of CI and the strategy formulation process, our research aim requires a qualitative research methodology. Specifically, we conducted a multiple case study based on qualitative interviews and additional data gathered from secondary sources related to four companies located in Brasil to ensure data triangulation.

In this study, we will provide at least two contributions. First, we shed light on how CI practices may inform, support and be integrated in the strategy formulation process. Second, we offer detailed empirical evidence concerning how CI practices are performed and what factors may enhance/limit their effectiveness for companies.

## 2. Literature review

### 2.1 Defining competitive intelligence

Companies have virtually the same access to information, but it is the ones that convert such information into *actionable* intelligence that will end up winning the game (Fuld, 1995). Organizations need systems and processes to gather and analyze *reliable*, *relevant* and *timely* information about competitors and markets that is available in vast amounts (Trim and Lee, 2008). This is where CI comes to aid. Several scholars have investigated CI as business concept (Prescott and Bhardwaj, 1995; Krizan, 1999; Miller, 2000; Dishman and Calof, 2008) and various definitions have been provided (for a selection of the most significant CI definitions see Table A1 in the Appendix) (Du Toit, 2013). In accordance with Calof *et al.* (2017), we report a recent and comprehensive definition of CI provided by Bulger (2016, p. 63):

[...] the robust integration of insights from ‘intelligence pools’ that are identified across the business environment and in collaboration with other functional areas and disciplines that are synthesized to gain a comprehensive picture of a market in its current state and in its probable future state. The resulting outcome of integrated intelligence efforts is critical decisions influencing and supporting recommendations required to drive and gain a competitive advantage for an organization.

Despite the innumerable interpretations of CI, the concepts of data, information and knowledge are ever-present in its core idea of collecting fragmented data, making sense of it

and creating insights to better understand the competitive environment of an organization and to make better strategic decisions. In this perspective, information is collected for a purpose, aimed at specific actions (Erickson and Rothberg, 2015; Bernhardt, 1994). CI has been considered both a *product* (the created intelligence) and a *process* (set of activities to transform the collected data) (Bose, 2008), whose main objective is to support decision-makers into strategic planning, moving from knowledge to intelligence with some additional level of insight or understanding. Knowledge, information and/or data subjected to analysis and applied to decision-making can be considered intelligence (Erickson and Rothberg, 2015). Following, we develop further on CI practices, contextual factors and from the CI's origins to the ongoing and open debate linking it to strategy formulation process.

### 2.2 *The competitive intelligence practices*

Despite some negligible differences, the main recurrent activities of the CI production process are *planning, collection, analysis and dissemination* (Meyer, 1987; Bernhardt, 1994; Kahaner, 1996; Krizan, 1999; Miller, 2000; Dishman and Calof, 2008; Saayman *et al.*, 2008). These activities are often considered as a cycle that starts with *intelligence needs* and ends with their communication to the original inquirer. According to Dishman and Calof (2008), there is strong support in the literature for the idea that a formal and systematic CI process has a positive impact on a company's performance, but empirical studies reveal that several companies deploy informal and short-term-oriented CI practices in place of structured systems (Prescott and Smith, 1987). An effective and efficient intelligence process does not aim at collecting all possible data, but focuses on the issues that are relevant to decision-makers. As a matter of fact, CI concerns identifying *actionable* information (Aguilar, 1967; Bernhardt, 1994; Gilad and Gilad, 1985; Gilad, 1989; Herring, 1999; Porter, 1980; Prescott and Smith, 1987; Prescott, 1995; Trim and Lee, 2008). Therefore, the first stage of the CI process should encompass the identification of intelligence requirements (Meyer, 1987; Fuld, 1988; Prescott, 1989; Herring, 1999). Data are then collected from several sources including formal, informal, internal, external, published, unpublished and human sources (Aguilar, 1967; Cox and Good, 1967; Daft *et al.*, 1988; Fahey and King, 1977). Given the importance of timing, it is necessary to own mining tools (data/text/web) that allow one to rapidly extract the relevant information and provide some analytical capability (Bose, 2008; Cobb, 2003; Bose, 2008). Following this step, the data analysis stage requires creativity, intuition and insight. Pattern recognition, trend analysis, deductive and inductive reasoning are fundamental to convert information into exploitable intelligence on which strategic decisions can be made (Bose, 2008; Saayman *et al.*, 2008). For this step, Bose (2008) discerned analytical *techniques* (SWOT analysis, Porter's Five Competitive Forces, environmental analysis, PEST analysis, etc.) and analysis *tools* (data/text mining, statistical technics, visualization-based tools). Finally, the output of the CI process should be disseminated in various formats. The solution for accelerating the dissemination of the created intelligence inside and outside the company has been identified in the great enabler tool of IT.

### 2.3 *The competitive intelligence contextual factors*

The majority of the literature focuses on the technical aspects of the CI process and on the technologies available to improve it. However, Prescott and Miller (2002) define the creation and use of intelligence as a *social process*, underling that social aspects such as organizational and individual aspects, cannot be overlooked. As a consequence of this, several circumstantial and social factors have been explored in this research paper and described as contextual factors in the following.

With varying levels of intent, a number of authors have discussed the infrastructure and the organizational and behavioral factors influencing the CI process (Ghoshal and Westney, 1991; Gibbons and Prescott, 1996; Maltz and Kohli, 1996; Prescott, 2001; Rouach and Santi, 2001; Prescott and Miller, 2002; Jaworski *et al.*, 2002; Badr *et al.*, 2006; Dishman and Calof, 2008; Choo *et al.*, 2008; Saayman *et al.*, 2008; Garcia-Alsina *et al.*, 2013). The main contextual aspects in the literature can be categorized as individual, organizational and industry environment factors.

Among the individual factors, *information consciousness* represents the personal sense of responsibility for environmental scanning and the communication pattern developed by the individual (Correia and Wilson, 2001). Rouach and Santi (2001) identified five types of managerial attitudes toward CI, namely, warrior, active, reactive, sleepers. At the individual level, another relevant aspect is the *exposure to information* – the level of opportunities of contact with well-informed people and information-rich contexts – for example, the frequency, the variety and the amplitude of contact networks (Correia and Wilson, 2001; Prescott, 2001; Garcia-Alsina *et al.*, 2013). *Outwardness* – the openness of the organization to the external environment – and *information climate* – set of conditions required to access and use the information – are instead the main organizational factors (Correia and Wilson, 2001; Garcia-Alsina *et al.*, 2013), together with firm culture, management style and awareness for CI capabilities (Prescott, 2001; Saayman *et al.*, 2008; Wright *et al.*, 2002; Trim and Lee, 2008).

Ultimately, it is generally accepted that the structure and decision-making in an organization is influenced by environmental complexity and volatility (Kourteli, 2005). According to Garcia-Alsina *et al.* (2013), the industry environment encompasses two relevant factors, namely, *uncertainty* and *external pressure*. Ultimately, as pointed out by Blandin and Brown (1977), managers in environments characterized by rapidly changing constraints, contingencies and opportunities clearly adopt more of an external orientation of information than their counterparts in relatively certain environments.

#### 2.4 From origins to an open and ongoing debate

Juhari and Stephens (2006) traced the origins of CI back to 500 BC, when the awareness of the enemy in war was essential to make decisions and to be victorious. However, only since the 1960s, more formal theoretical elaborations about intelligence in companies have been presented, but the first significant empirical studies of the field were not published until the late 1980s (Fleisher *et al.*, 2007). Early conceptualizations adopted different terminologies, though often enclosing similar meanings, including:

- *Environmental scanning*: the process that seeks information about events and relationships in a company's outside environment to assist top management in its task of charting the company's future course of action (Aguilar, 1967; Fahey and King, 1977; Daft *et al.*, 1988).
- *Competitor analysis*: system to develop the profile of the nature and success of the likely strategy changes each competitor might make, each competitor's probable response to the range of feasible strategic moves other firms could initiate and each competitor's probable reaction to the array of industry changes and broader environmental shifts that might occur (Porter, 1980).
- *Corporate intelligence*: a function serving as an information aid to the chief executive officer in the execution of his broad responsibilities (Eells and Nehemkis, 1984).
- *Business intelligence (BI)*: process of five tasks from data collection to data dissemination to convert raw data about the environment into a form that decision-

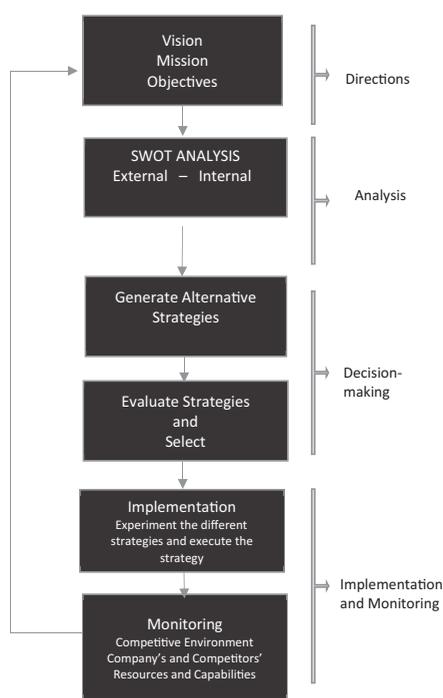
makers can use it to make important strategic decisions (Pearce, 1976; Gilad and Gilad, 1986).

- *Strategic intelligence*: systems that can aid managers in learning about the relevant environments their organization interrelates to and in raising awareness of the threats and opportunities that are posed to them (Montgomery and Weinberg, 1979).
- *Market intelligence (MI)* (Maltz and Kohli, 1996).

Entering the 2000s because of the much greater complexity (Magistretti *et al.*, 2020) of the business environment brought by the digital revolution (Sanasi *et al.*, 2020), CI practices have diffused dramatically (Green, 1998; Javers, 2010), attracting large investments leading companies to structure effective and formal CI processes, systems and tools (Reinmoeller and Ansari, 2016). In today's modern digitalized world, the web and digital information sources are increasing dramatically the amount of data potentially feeding every decision-making process (Markovich *et al.*, 2019; Du Toit, 2015), almost up to the point of generating an information overload (Saxena and Lamest, 2018). As a result, "quality" information and data are becoming much harder to find and a central issue for firms in the modern society. Moreover, the concept of competition is less bounded than in the past, moving beyond industries and toward ecosystems (Iansiti and Euchner, 2018). In a networked economy, ecosystems develop a small number of keystone organizations (Moore, 1993) having several more business connections than any other organization (e.g. Amazon, Apple, Google). These organizations shape much of the effectiveness of trade across a number of different industries (Iansiti and Euchner, 2018), while still leaving several business opportunities to innovative niche players to reach considerable scale in a short time by means of their platform infrastructure (Trabucchi *et al.*, 2018). This context makes the role of the CI process – also known as the "intelligence cycle," including planning, collection, analysis and communication (Nasri, 2011) – even more critical and strategic for organizations competing in an extended and interconnected competitive arena. As a result, across the past two decades, CI passed through different stages of sophistication, from informal to more formal structures, balancing between intelligence-oriented and strategic-tactical decisions, type and extent of analysis conducted on the data, degree of top management attention and linking of CI into the decision-making process (Prescott, 1995). From simple *competitive data gathering* – focused on data acquisition, CI has progressed to the point that its strategic relevance is accentuated. Currently CI is intended as a *core capability* linked to the *learning* process of the company and to its ability to transform data into intelligence (Itani *et al.*, 2017). John Prescott (1995) had already argued that the strategic relevance of CI goes beyond the traditional environmental scanning and market research by focusing on all aspects of the firm's environment (i.e. competitive, technological, social, political, economic and ecological) and at various levels of the firm's ecosystem (i.e. remote, industry, operating); whereas Herring (1992) had been even more explicit linking CI to strategy formulation process (Figure 1), including all the fundamental aspects to be considered in the strategic planning process to ensure that strategic objectives are developed within a realistic perspective, considering both the external and internal competitive environment.

CI may support the strategic formulation process by:

- Describing the current competitive environment and predicting its future (Porter, 1980).
- Identifying and compensating for exposed weaknesses – encompassing the internal analysis of Barney (1991).
- Challenging the strategy underlying assumptions – considering patterns influenced by external circumstances and the emergent strategy idea of Mintzberg and Waters (1985).



**Figure 1.** Strategy formulation process – based on Armstrong (1982)

- Using intelligence to implement and adjust strategy to the changing competitive environment – creating contingency plans as suggested by Armstrong (1982) for the alternative strategies' generation.
- Monitoring the strategy viability, determining when the strategy is no longer sustainable, i.e. assisting the controlling stage – learning from what went wrong as proposed by Lorange (1980).

Most fundamentally, CI is a multidisciplinary practice that can deeply contribute to the various stages of the company's strategic formulation process and, thus, in its capacity to gain competitive advantage (Herring, 1992).

Despite the increased awareness over the strategic relevance of CI and few early valuable extant contributions (Herring, 1992; Bose, 2008), the state-of-the-art research yet partially fails to capture the positioning of CI in the overall strategy of companies (Arrigo, 2016; Calof *et al.*, 2017) and within the strategy formulation process (Badr *et al.*, 2006). Finally, the urgency and relevance toward linking and shedding light on CI and the strategic formulation process becomes an even more urgent issue in a networked and digital economy (Iansiti and Euchner, 2018).

### 3. Methodology

#### 3.1 Research design

Given the early stage of development of research linking CI and strategy formulation process, adopting a qualitative approach in our study was deemed to be necessary (Gartner and Birley, 2002). In particular, we choose a multiple case methodology for three main

reasons. First, multiple case studies as empirical inquiries are suitable to “investigate a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used” (Yin, 1984, p. 23). Second, a case study allowed to better tackle the objective of this study, which is to deepen the current knowledge about an ill-defined problem, aiming to improve its understanding, suggest hypotheses and questions or develop a theory (Mattar, 1996; Meredith, 1998). Third, a multiple case study allows to contrast and compare alternative manifestations of the phenomenon under scrutiny within the theoretical sample, thus highlighting similarities, differences, common patterns or polar cases (Meredith, 1998; Eisenhardt and Graebner, 2007).

To address our research objectives, we performed a multiple case study on four firms that adopted CI through the deployment of a dedicated business unit and have the four companies were selected through purposive sampling, which allows the researchers to select information-rich cases displaying tight connections with the research objectives (Bernard, 2002; Patton, 2002), to ensure informants are proficient and well-informed with the phenomenon of interest (Cresswell and Plano Clark, 2011; Etikan *et al.*, 2016). Our rationale for selecting the cases was that they formally adopted CI practices. In line with the tenets of Maximum Variations Sampling (Etikan *et al.*, 2016), we attempted to reach sample heterogeneity to study our subject from different angles, to achieve greater understanding as follows, therefore, our cases displayed differences in industry, size and distance to headquarterd.

The selected cases are private companies located in Brazil, operating in three different industries, namely, banking, healthcare and commerce marketing. Specifically, three cases refer to market leaders – in terms of profit per year – in their respective industry of reference. A fourth case refers to a newcomer in the baking industry. Moreover, the cases selected differ in headquarters locations (Brazilian and non-Brazilian) to shed light on the implications of operating with local and global headquarters. This choice was made to increase the understanding of the implications of operating in different business environments and to gain insight from the heterogeneity at various degrees; moreover, this choice makes for findings that are more nuanced and lets contrasting evidences and polar conditions emerge. The unit of analysis of all the four cases was the CI business unit, often identified with different labels such as marketing intelligence (MI), *customer relationship management* (CRM), business intelligence (BI). To ensure anonymity and encourage candor, company and informant names will not be disclosed throughout the paper.

### 3.2 Data collection

Data were collected both from primary information sources – in the form of face-to-face semi-structured interviews – and other secondary sources (e.g. company websites, reports, press-news). This choice was made to increase the consistency and reliability of the multiple case study and the quality of the data. Multiple data collection methods indeed ensure data triangulation and provide stronger substantiation of the main constructs and results (Eisenhardt, 1989).

As primary data, a total of 28 interviews were conducted between September 2018 and March 2019. The interviews comprise six semi-structured interviews for each company involving top executives, CI Business Unit Directors and CI Analysts, so to capture different perceptions at diverse levels of seniority and to have a more complete understanding of the internal dynamics, spanning from operational to strategic. Moreover, four additional follow-up interviews (i.e. one for each company) were conducted to seek clarification on specific findings emerged in the previous interviews.

The semi-structured interviews were divided into distinct sections. The first section related to the understanding of the perception of the competitive environment, the effort it required and the adopted strategy to compete (i.e. “How does the company compete in the market?” “Which kind of data do you analyze to pursue this strategy?”); the second part explored the organization of the CI practices inside the firm (i.e. “Do you use any CI practices?” “How do you execute CI practices?”) and, ultimately, the authors investigated to what extent CI is used in strategy formulation (i.e. “To what extent do you use CI in your Strategy formulation?”).

### 3.3 Data analysis

The data analysis began with a within-case analysis for each case (Eisenhardt, 1989), which helped to cope with and manage the high volume of data. The recorded interviews were entirely transcribed and, when necessary, the informants were later contacted to ask for clarification and/or more details. Each case is contextualized and extensively described through the following relevant sections suggested by the research questions and by the existing literature:

- industry information that helped to describe the competitive panorama;
- generic strategy and positioning of the company;
- organization and structure of the CI practices; and
- contribution of CI to the company’s strategy definition.

This process helped to acquire rich familiarity with each case and, in turn, accelerated the cross-case comparison (Eisenhardt, 1989). The comparison between the cases was, indeed, executed so to describe patterns, highlight the relevant aspects discovered through the research process and address the original research objectives. Specifically, we selected the dimensions stemming from the within-case analysis and then looked for similarities and differences between the different cases through a longitudinal analysis.

### 3.4 Case description

**3.4.1 Case A.** The analyzed company is a private center operating in the healthcare segment of diagnostic intelligence and imaging (e.g. magnetic resonance, computed tomography, ultrasound, x-rays), which also offers an additional clinical analysis service (e.g. blood count, cholesterol, triglycerides). It is one of the largest players in its sector, scaling organically and by acquiring regional clinics; today it has a strong reach throughout Brazil, because of its multiple service centers and more than 5,000 employees. It merits analysis because of its pioneering in process optimization and innovation in the complex Brazilian healthcare market. The industry is affected by two specific factors, namely, the increasing technology sophistication that requires high investments, a larger elderly population and the increased longevity of the Brazilian people. Specifically, in Brazil, just 25% of the population of 208.000 million has access to health insurance. This simple piece of data, together with the documented poor public health system highlights the country’s huge deficit in providing medical care for its people. For this reason, over the past few years, the healthcare sector has seen the entrance of many new competitors offering a quasi-universal access to the public health system, but with the quality and timeliness of the private health market.

**3.4.2 Case B.** The firm is a commerce marketing company that offers online retailers the ability to serve personalized advertisements to potential consumers who have previously expressed interest in acquiring one of their products advertised on a publisher website (often a third-party advertiser). In this research paper, the Brazilian subsidiary of the global company is analyzed. The company has been analyzed because of the fast-changing competitive environment in which it operates and because of the crucial importance of real-

time data for running their core business. As in all industries driven by disruptive technologies, this sector changes rapidly and is severely influenced by the constant changes of the whole advertising market (e.g. by the evolution in the publisher sector). Moreover, this sector moves concurrently with the rapid variations in customer behavior, which have recently included the transition toward *mobile activity*, the increased involvement on *social media* with a relative jump in purchases directly from the social platforms, the concurrent use of *multiple devices* or the more recent issue of *ad blocking*.

*3.4.3 Case C.* This case refers to one of the major private Brazilian banks, a financial institution generating more than US\$5bn of profit and with more than 90 million employees – a leader in its market and one of the largest companies in the world. The company has been chosen because of the peculiarity of the Brazilian banking sector, which is highly concentrated and relatively stable, as following described.

Three private-sector leaders and three public ones – *Banco do Brasil*, *Caixa Econômica Federal* and *BNDES* – account for 82% of banking assets and 86% of loans. This just partially explains the high profitability and high interest rates of the Brazilian banks. The leaders of the sector justify the spreads with the high risk of default and the limitation of some regulations such as a ban on overdraft. Yet, the sector remains a peculiar case. More, the interviews revealed that the main players are aware of this status. The competitive landscape is described as *polarized* and dominated by the mentioned major banks.

According to the interviewed bank, the more recent Fintech trends using digital technology and lean structures are marginally relevant, even strong players like the Brazilian *Nubank* (startup offering 100% digital credit accounts) just affect small clients of the biggest banks, while many other startups have been effortlessly acquired.

*3.4.4 Case D.* The chosen Brazilian digital bank offers financial services to both individuals and businesses. It is born recently with a particular focus on agribusiness and it grew under a digitally oriented mission. The bank operates in the same previously described competitive environment dominated by the biggest private and public banks. However, according to its positioning, the company identifies its direct competitors as the small and medium financial institutions and as the FinTech startups that offer digital financial services and credit accounts without setup fees and with lower interest rates such as the mentioned *Nubank*. For this reason, the environment, that is perceived as stable by the interviewed incumbent, appears highly dynamic, fast-changing and characterized by disruptive digital technologies by this newer financial institution.

## 4. Results

### 4.1 Within-case findings

In this section, we will first discuss each case separately with the relative within-case findings. Following, the cross-case analysis will provide the groundwork for the formulation of original propositions, contributing to both the theoretical and practical grounds.

In *Case A*, the Strategic Planning area has two staff members dedicated full time to what they call MI. Only one year and half earlier there was only a single employee dedicated to MI part-time. During one of the interviews, the company declared that they realized that creating a solid network with suppliers and customers is fundamental in the dynamic competitive environment they operate. Taking from the very words of the Chief Marketing Officer:

[...] having an innovative product and keep continuously innovating may not be sufficient, we need to build a trusted network, and consider issues of our suppliers and customers just as our main ones.

Indeed, the analysts operating in the MI unit monitor the trends of the market, explore new ways to grow and explore needs and issues of their network of suppliers as well as customers. They interface mainly with the strategic planning and with the commercial business unit, analyzing both external and internal data. However, as the MI Director stressed the importance of exposing employees working on CI to information from all possible sources (“my analysts have to be ready to capture any kind of information from whatever source and they are doing it actually”).

Regarding the external environment, their focus is on macroeconomic aspects such as inflation estimation or demographic trends and on industry specific issues such as spotting growing insurance companies, projecting the health insurance beneficiaries by the end of the year, developing benchmarking analysis and monitoring their competitors’ performance with data available on public platforms. Thus, the MI analysts support managers to identify opportunities and threats in the market, providing detailed “big pictures” of the sector environment. On the other hand, the internal analysis copes with the tactical questions of the Commercial team that monitors pricing issues and controls competitors’ price strategies.

At the operational level, the daily activities are traced. There is a comprehensive broadcast of the real time operational data, which are displayed in the common work area on digital dashboards. All these activities are finally tracked, integrated and coordinated though all kinds of IT tool available we have to avoid repeating them among the various other business units.

The company has worked, as its origins to develop an integrated infrastructure driven by just four information systems, namely, Enterprise Resource Planning, CRM, a software for imaging used by the technicians and a call center platform. As matter of fact, this system simplified the complexity of running a dispersed business across the country by avoiding adaptation costs and redundant operating costs.

The firm shows a strong analytical and data driven culture, developed in a systematized infrastructure, which supports decisions at each strategic level. This turns out to be a strong differential for the company’s strategy and competitiveness.

In *Case B*, the *data analytics* (DA) unit, made of two full-time analysts, is under the direction of the operations department; yet, their main interface is the commercial area. As stressed by the DA Director, IT tools are central in their activity: “clearly, our operations may be efficient or not mainly depending on how good we are with using IT tools”. The DA unit routine consists of collecting and analyzing the *internal* data of their retailers’ consumers, i.e. the *user data* constitutes the main data asset of the company and the unique driver to make decisions at this level. This data may be transactions, events, generated sale volume or the related margin due to the retargeting company service. This data is mainly used to develop reports to help the Commercial team to set the margin goals of the next quarter. Moreover, this unit satisfies occasional on demand clients’ requests for customized market analysis, such as studying the behaviors of their retailers’ consumers.

The DA unit works on projects executing more comprehensive and massive market analysis such as evaluating the trends of *Black Friday*, specifically requested by the Marketing area. As a matter of fact, the analyzed user data are under the company’s ownership and directly available on the client’s platform, therefore, the interviewed did not express difficulties related to data acquisition. The main problems are considered *urgent and unexpected requests*, according to the manager of the unit and *technical aspects* of the BI tools for the analyst.

According to an analyst of the DA unit, web and social networks are leading them to gather large amounts of data and, thus, CI practices and activities necessarily increase to cope with continuous change characterizing their business (“our business is really

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characterized by continuous change, the web and digital technologies are both the problem and the solution to the chaos of our industry”).

As declared by the interviewees, the function copes mainly with supporting the tactical decisions of the commercial team, focusing on short and middle term issues. The unit assists in the launch of new products and/or functionalities, forecasting sales and profitability but also monitors the product/functionality performance while it is on the market; ultimately, they offer support in the enhancement of the customer relationship. Therefore, the unit contributes to the tactical strategy formulation at the local level by providing intelligence and suggestions to the commercial area’s senior managers, but primarily focuses on strategy implementation and monitoring by providing feedback about the strategy performance in the market.

Ultimately, the manager highlights that there is essentially no dialogue with headquarters, which dictates the strategic objectives with a total top-down approach, leaving the company often vulnerable to existing local competitors’ moves and new entrants.

In *Case C*, the analyzed BI unit, made of three analysts (one full-time and two part-time), uses a vast amount of data, mainly coming from the bank clients, who are a highly the most valuable data asset for the institution. Activities and practices managed by the BI unit are increasing, according to the Director because of the dynamism of the market: “our clients change much faster their habits and expectations than in the past. They look at the customer experience they have also from other ‘somehow’ distant business such as amazon delivery service and they expect same also in our contest. As results, we need to enlarge the external environment we analyzed compared to the past and more activities and practices are needed.” The Director also highlighted the relevance of IT tools to better operate their function. However, other sources of data have been mentioned by the interviewed such as those from external consulting companies, from the market and from public records and from the Central Bank. Using this data, the analysts develop monthly reports about production follow-ups (e.g. balances, cash flows), managers’ performance, new account openings and financial results of agencies. The gaps are mainly evaluated in relation to the planned budget for the year (e.g. opened accounts below expectations, costs above expectations). Moreover, they identify their various clients’ profiles and monitor the loss of clients to their competitors, thereby investigating the cause and supporting the Commercial area to define the competition strategy to defeat.

According to the interviewed, 60% to 70% of the analysts’ time is dedicated to the production of the reports accompanying the bank products and the clients, while the rest of the time they satisfy on demand requests through a more project-based approach. In this regard, according to a BI analyst interviewed, “producing properly our report requires a great sense of responsibility and proactivity, you can just wait information coming, we need to be open to all kinds of external input”.

The focus is at the tactical level as follows: around 80% of the requests and their relative outputs, have impacts in the short-medium run. According to the interviewed, in just 5% of the cases they look for new long-term opportunities. There are specific areas responsible for more strategic issues (including areas of economic forecasting, for example), but the interviewed informants did not know how their area relate to this type of activity. Their activities are wholly uncoordinated and, as a consequence, many times they experience overlapping efforts. Furthermore, this area’s contribution is substantially at the implementation and controlling levels of the strategic formulation process. The monitored data are used as an early warning system to assess success or failure of the segment strategy and the analysts provide feedback about the executed strategy and enable any adjustments to be made. This perspective is confirmed by the fact that the main activities

are developing monthly reports to accompany the products and providing suggestions to improve the bank's services.

In the last *Case D*, the analyzed CRM unit, made of two part-time employees, focuses on acquiring new clients through social networks and partnerships with other firms that own personal data; including as well, a part related to the retention of these clients offering customized products and services for each of them. As most of the newcomer companies, also C-level some time take part to CRM activities. The CRM unit collects and uses users' data to increase their pool of clients and to better serve them. According to the interviewed manager of the area, all of the other departments draw on this area's knowledge to align their strategy with reality, and therefore, make informed, fact-based decisions. They declare themselves as very *proactive* in client acquisition campaigns. In 50% of the cases, they are able to spot new opportunities and make suggestions for the other departments, in the other cases they are demanded to execute analysis, also related to likely financial regulatory issues before launching new products that they make available on the market.

According to the CRM Director, the unit supports the executives who come up with ideas," providing intelligence, which help the top managers to better understand the client, the competitive environment and the financial regulatory environment. The Chief Executive Officer, in regard to this matter stated that the CRM Director and their team had supported him "in pivoting the business model and helped to completely change the market positioning." In this regard, CRM analysts also seem to be aware of the relevance of their role and the need to be exposed to information, namely, "our job is relevant to the company, we know it and we need to be proactive, just like journalist to be in the right place in right moment and collect intelligence." The objectives are defined at the top level, but they are based on the analyzes provided by the CRM department. *Every decision is based on data*, the interviewee declared. However, the CRM department does not participate in the strategy definition directly nor actively; they mainly support decision-making via on-demand requests. According to the Founder and CEO – as they are a newcomer banking company – *our competitive environment is turbulent and needs a constant and strategic monitoring*. To this regard, the CEO underlines the need to be an open company, not only in looking for external collaborations but also in terms of overall attitude to welcome all possible external inputs to make sure *we do not loose our closeness to customer needs*.

Summing up what emerged from the interviews, CI alternatives do not focus just on the tactical level, even if client acquisition is a great part of their daily activities. They have a strategic road map ever more aligned with the different data needs at the various strategic levels and they also developed a study to understand the gaps and data requirements for each area. In [Table 1](#), the main characteristics of each case have been summarized. Following, the cross-case analysis and the critical findings are presented and discussed.

## 5. Discussion

### *5.1 Discussion of cross-case findings: a unified framework for competitive intelligence*

A cross-case comparison was performed to complement the within-case analysis and underline the main similarities and differences between the four cases in search for any patterns followed by the companies under investigation in their CI activities. Following [Eisenhardt \(1989\)](#) and in line with our research objectives, the cross-case analysis was conducted to capture the actual involvement and efforts of companies (operating in different settings) in CI activities and practices and, most fundamentally their relationship with the strategy formulation process.

**Table 1.**  
Summary of the case studies. Author's elaboration

Case Studies	Industry information	Company strategy and positioning	Organization and structure of CI practices	Contribution of CI to strategy
Case A Diagnostic imaging center	Healthcare industry diagnostic imaging High complexity and dispersion Increasing technology sophistication Increased longevity of Brazilian population Stressed supply chain (upstream and downstream) Main players, namely, Alliar, Dasa, Fleury	Differentiation Quality service and innovation <i>Doing thing differently</i>	MI unit Dedicate Personal according to strategic level Highly coordinated Data sharing and real time monitoring Four software running the whole business (ERP, CRM, Call Center, Software for executing exams)	Operational/tactical/strategical level Supporting the strategic planning and commercial units Supporting every step of the strategic formulation process (from defining strategic objectives to monitoring) Understanding the industry Monitoring competitors Spotting opportunities Supporting sale negotiations Monitoring strategy performance Local tactical level Support to the local Commercial unit Objectives defined globally and dictated with a top-down approach Support to tactical strategy definition, implementation and monitoring Routine analysis of <i>user data</i> to define margin projections Sporadic market analysis requested by the clients and/or marketing department
Case B Top player commerce marketing company	Retargeting industry Fast changing and highly competitive Disruptive technologies Evolution of Customer behavior Main players, namely, Adobe, AdRoll, Alibaba, Amazon, Criteo, Facebook, Google, Oracle	Differentiation High performance Sophisticated machine learning technology Strong partnership with publisher Will of advertiser to work jointly	CI local unit Weak coordination and support by the headquarter Users of clients' website main data asset	

(continued)

Case Studies	Industry information	Company strategy and positioning	Organization and structure of CI practices	Contribution of CI to strategy
Case C Top player private bank	Private banking Stable environment Slow changing Protected top players dominating New entrants or small players not perceived as threats Main players, namely, Bradesco, Itaú and Santander	Individual and Business banking Differentiation Quality service High interest rate	Evolution of the commercial planning area Departmentalized according to the client segment Client data value asset No data sharing High level of overlap Duplication cost	Tactical/operational level Support to the commercial unit Support to tactical strategy implementation and monitoring Analysis of production follow-ups (balances, flows, new accounts) Analysis of financial results (agencies of the segment) Service improvement and customization Monitoring the loss of clients to the competitors
Case D Small disruptive private bank	Private banking Protected top players dominating Technologies are perceived as highly disruptive and able to modify the environment, threatening the incumbents	Total digital Innovative solutions Low interest rate/setup fee Important segment of agribusiness	CRM unit Departmentalized according to the client segment Highly coordinated	Strategic/tactical level Support to various areas Client acquisition/retention Monitoring competitors in the segment Verifying financial regulation Campaign to launch new product

Table 1.

Specifically, the cross-case analysis allowed to formulate and support a set of propositions based on the insights emerged from our empirical analysis and discussed considering previous relevant literature.

While there is no common labeling for the CI business unit (as in our cases, namely, *BI*, *MI*, *CRM*, *DA*), there is a diffuse perception of the increased relevance of CI practices in all four cases, as in the past five years all the companies have established units and sets of practices dedicated to data analysis and CI creation. The cross-case analysis illustrates how companies are pushed by a fast-changing scenario to leverage more on CI practices. Companies, indeed, along the years, increased the staff dedicated to CI to scan the environment, until eventually spotting an upcoming “disruption” (Vriens and Soelen, 2014). All companies are aware that digital technologies represent a great source of opportunities and threats (Nambisan, 2017; Cavallo *et al.*, 2019b) and that there is a clear need to prepare the company to the emerging challenges. Therefore, as our findings suggest, the companies, despite their size or industry of reference, are significantly aware to work and compete in an extremely dynamic and networked environment (Iansiti and Euchner, 2018), where building relations with suppliers, customers and looking beyond their industry of reference is needed and constitutes what CI is there for:

- P1.* The evermore global, networked and turbulent competitive environment requires the development of CI practices.

Findings suggest that the heterogeneous nature of our sample is reflected also in the way they actually use CI in a strategy formulation process. While there is agreement about the strategic relevance of CI in a dynamic and turbulent world, CI units seem to focus on customer value analysis, understanding their own clients’ needs in specific markets and/or segments, leaving less attention in considering the whole and longer term “picture” (i.e. strategy) – as witnessed by statements such as “support the commercial department;” “our focus is on improving customer offer and acquiring new customers;” “we support promotion campaigns.” Companies seem to leverage on CI practices more for tactical and operational issues – as witnessed by statements such as, namely, “we have medium-term focus;” “just less than 5% of the time I deal with strategic issues;” “I focus on everyday problems.” This is consistent with Calof *et al.* (2017), whose study revealed that just 12% of CI projects looked forward more than five years.

Most fundamentally, empirical evidence shows that the majority of CI units participate in the stages of *strategic analysis* and mostly in the *stage of implementation* and *monitoring* of the strategy formulation process, not contributing or contributing little to the other “higher” stages as *defining strategic objectives* and *strategy formulation* (Calof *et al.*, 2017). However, Case D offers an interesting example of how CI practices may result useful also in defining or *redefining the overall strategy* and setting *new strategic objectives* of a company by supporting business model innovation (Cavallo *et al.*, 2019). This finding is aligned with previous research, which considers that CI goes beyond market research and enables firms to not only observe the external competitive environment by monitoring its development but also to strengthen the strategic planning process by facilitating the choice of the competitive strategies to implement (Arrigo, 2016):

- P2.* CI can have a role at every step of the Strategic Formulation Process (from setting strategic objectives to strategy monitoring) and at the various strategic levels – strategic, tactical and operational.

Moreover, in accordance with previous research (Garcia-Alsina *et al.*, 2013), evidence suggest that in turbulent times, when uncertainty is even more pressing and perceived – as

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it is for newcomer companies (Case D) – CI may play a major role in the strategy formulation process. This leads to an additional proposition:

*P2(a)*. The higher the turbulence and uncertainty perceived by companies, the more strategic will be the use of CI.

Findings revealed that there are no common standardized processes nor procedures to execute CI practices, yet the main activities of collection, analysis and dissemination have been detected in all the cases under investigation.

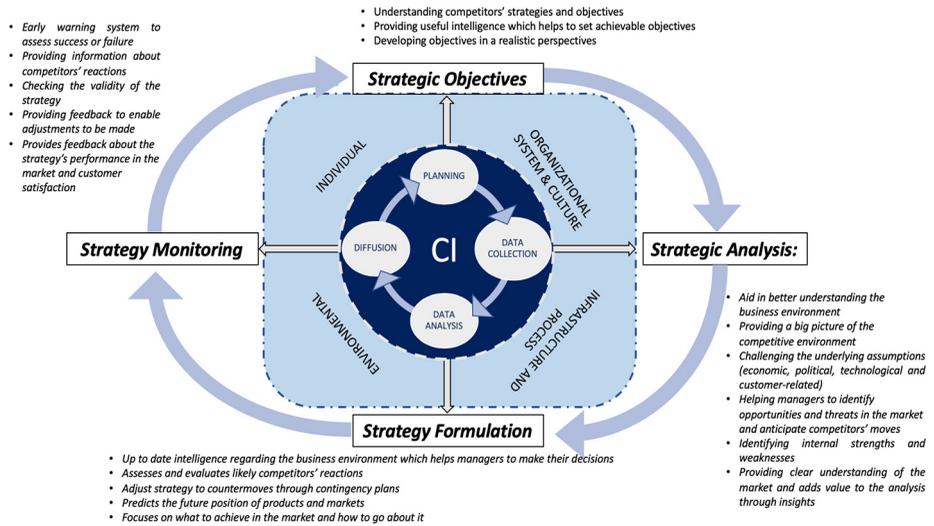
In this regard, companies use all kinds of data sources, namely, internal databases, internet websites, public databases, publications about industry trends, conferences, industry experts, client data and clients themselves are emphasized as an extremely valuable asset. Routine activities are executed for the business unit that the CI unit is serving such as the commercial unit or other business units. The planning phase encompasses both on-demand projects and routine procedures. The data collection step revealed that multiple data sources are used, *customers* are often the primary font of information, while increasingly collected through the web. This finding advances [Badr et al.'s \(2004\)](#) work, which considered the “identification of new customer requirements” as less central in CI. The new trend can be explained by the increased accessibility to customer data through open social platform ([Arrigo, 2016](#)). While there is no evident formal process for evaluating the data quality and validity and in assessing CI effectiveness, there are different methods used for dissemination, namely, emails, presentations, face-to-face meetings, written reports. All the cases under investigation illustrate the main activities of the “intelligent cycle” ([Nasri, 2011](#); [Markovich et al., 2019](#)) performed, even if with different levels of complexity and often just carried out by a few employees. In line with this argument, we propose the following:

*P3*. No matter the level of sophistication of the CI practices, these include, planning, data collection, analysis and dissemination.

The cross-case analysis also showed a pattern, that is common to all companies, embodied by the strong importance of the IT infrastructure as an enabler for the collection, analysis and dissemination phases of the CI process, confirming to what has been discussed by [Bose \(2008, p. 525\)](#):

[. . .] software technology can help the CI professionals with managing various CI projects – especially with collecting and filtering through information, analysis, continuous monitoring of database sources, and rapid distribution of CI results with the use of graphical tools.

The cross-case analysis revealed the increasing importance of the concept of CI for making data-driven decisions in all the companies that have been analyzed ([Du Toit, 2015](#)). This confirms the more recent trends, suggesting that many companies use analytics to drive decision-making and better understand their businesses, markets and customers and it is in line also with recent contributions on big data analysis ([Pigni et al., 2016](#); [Trabucchi et al., 2018](#)). A similar and common pattern regards the information consciousness and individual proactiveness. CI units seem to be aware of the relevance of their role and about the need to be “in the right place and moment” to be exposed to information from all kinds of sources. Regarding organizational structure, culture and openness to data sharing have been mentioned as inhibitor or facilitator ([Correia and Wilson, 2001](#); [Sassanelli et al., 2018](#); [Leborgne-Bonassié, et al., 2019](#); [Garcia-Alsina et al., 2013](#)) – as witnessed by statements such as, “the company is enormous and the various areas do not talk each other,” “the communication with the headquarter is really hard,” “we had troubles with a manager who



**Figure 2.**  
A unified framework  
for CI and strategic  
formulation process

did not want to share the information, using it as instrument for power,” “this company is totally driven by a data sharing culture.” As emerged in Case C and B, the company size and distance from the strategic decision may represent relevant blocker for the intelligence diffusion and the overall CI effectiveness. This is partially in contrast with [Saayman et al. \(2008\)](#). According to the authors, company size positively affects the availability of resources required to appoint CI personnel and to acquire CI tools and, therefore, the success of CI practices. Equally, according [Aguilar \(1967\)](#), this factor dictates how broad the variety of external information sources to which a company is exposed may be. Hence, it would be interesting to deepen this aspect to better understand its benefits and drawbacks. In the light of the arguments provided, we advance the following proposition:

*P4.* Individual and organizational contextual factors influence how CI practices are executed.

To summarize, findings provide the bases for theorizing about how CI practices are executed. More importantly, in line with our main research objective, we shed light over the relationship between CI and the strategy formulation process. According to [Badr et al. \(2006\)](#), although there is an extensive body of literature on strategic analysis and strategy formulation, the literature lacks a suitable framework that can provide the basis for integrating CI into the strategic formulation process and all its phases. Our research and related findings help to cope with such missing in literature. Our work shows, indeed, how CI may play a role at every stage of the strategy formulation process, as presented in the following unified framework, in [Figure 2](#).

## 6. Conclusions

This study provides contributions to the strategic management field, by shedding light on the role of CI in a company's strategy. More specifically, we direct researchers and managers attention on the relationship between CI and the strategy formulation process, through an extensive literature review and a multiple case study.

This study is not free of limitations. First, the small sample size could limit the generalization and relevance of our findings; and second, the observer bias typical of qualitative studies, which could lead to the loss of valuable information and insight and is dependent on several factors – for example, the informants' poor understanding of the researchers' questions and their inaccurate recollection of events. However, concerning these limitations, we started from the assumption that an under-investigated relationship as CI and the strategy formulation process necessarily needed a deep investigation that would be best performed through qualitative investigation of a small sample of representative cases selected through purposive sampling. Moreover, our reliance on a well-established method, which we applied throughout the data collection and analysis stages, has possibly helped to enhance the soundness of our qualitative exploration into how CI and the strategy formulation process unfold. In light of these considerations, future studies should try to replicate our research in different – and possibly broader – theoretical or even statistical samples.

Despite its limitations, this study contributes to both theory and practice in multiple ways. First, we contribute to the CI debate by exploring its relationship with the overall strategy of a company, as few studies had done before (Badr *et al.*, 2006; Arrigo, 2016; Calof *et al.*, 2017). In this regard, we also propose a unified framework that connects CI and the strategy formulation process of a company, still missing in previous research in strategy (Badr *et al.*, 2006). Second, we were able to highlight the increasing relevance that CI practices will gain for companies in a networked and digital world (Subramaniam *et al.*, 2019). This point provides a relevant addition to the extant scholarly debate, considering the limitation of current literature in considering CI in connection with recent developments within a much wider competitive arena (Iansiti and Euchner, 2018). Third, our findings also confirm and support previous and valuable studies arguing that no major changes regard the CI actual process known as “intelligence cycle” (Nasri, 2011), while no common standard, formal structures and procedures emerge (Calof *et al.*, 2017). Furthermore, we have evidence of the facilitating or inhibiting role played by organizational and individual contextual factors over the effectiveness of CI practices (Correia and Wilson, 2001; Prescott, 2001; Garcia-Alsina *et al.*, 2013). Finally, we believe that the contributions and related findings emerged in this study, as well as the framework provided, may be relevant for practice – as, for instance, in guiding top managers while setting up a dedicated CI function, defining its role, its practices and the dedicated staff across the whole strategy formulation process.

#### Note

1. An ecosystem is a complex and dynamic system hosting a number of entities. First introduced by Tansley (1935), the concept of ecosystem has been used mainly in the field of biology (Cavallo, Ghezzi and Balocco, 2019).

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Year	Author(s)	Definition
1967	Aguilar	<i>Environmental scanning is the process that seeks information about events and relationships in a company's outside environment, the knowledge of which would assist top management in its task of charting the company's future course of action</i>
1979	Montgomery and Weinberg	<i>Strategic intelligence systems can help managers to learn about the important environments with which their organization interrelates and to become aware of threats and opportunities that are posed</i>
1980	Porter	<i>The objective of a competitor analysis is to develop a profile of the nature and success of the likely strategy changes each competitor might make, each competitor's probable response to the range of feasible strategic moves other firms could initiate and each competitor's probable reaction to the array of industry changes and broader environmental shifts that might occur</i>
1984	Eells and Nehemkis	<i>Corporate intelligence serves as an information aid to the chief executive officer in the execution of his broad responsibilities, geared to the strategic questions of the chief executive officer's choosing</i>
1987	Vella and McGonagle	<i>CI uses public sources to find and develop information on competition, competitors and the market environment</i>
1992	Herring	<i>Successful strategies are derived from good intelligence concerning a company's total business environment, including the competition. That intelligence must describe both the company's current competitive situation and its most likely future competitive environment</i>
1994	Bernhardt	<i>CI is at once both a process and a product, rooted firmly in the notion that Increased understanding of competitors strengths and weaknesses leads to more effective strategy formulation'</i>
1995	Ettore	<i>CI is a process of knowing what the competition is up to and staying one step ahead of them, by gathering information about competitors and, ideally, applying it to short and long-term strategic planning</i>
1995	Fuld	<i>It is easier to describe what intelligence is not, rather than what it is. It is not reams of data base printouts. It is not necessarily thick, densely written reports. In addition, most certainly it is not spying, stealing or bugging. In its most basic description intelligence is analyzed information</i>
1995	Prescott	<i>The purpose of a CI program is to develop action-oriented implications for managers. Intelligence also needs to be delivered on a timely basis so it can be incorporated into the decision-making process</i>
1996	Kahaner	<i>CI is a systematic program for gathering and analyzing information about your competitors' activities and general business trends to further your own company's goals</i>
1998	Achard and Bernat	<i>CI managers have a role in enriching data throughout the information cycle – to transform information into exploitable intelligence, which can be used by decision-makers</i>
1999	Walle	<i>CI can help inform and strengthen the entire strategic planning process as well, yielding sound strategic plans that are more in tune with competitive circumstances and better able to withstand external pressures</i>
2000	Miller	<i>CI is information that's been analyzed to the point where you can make a critical decision</i>

(continued)

**Table A1.**  
Selected definitions from environmental scanning to competitive intelligence

Year	Author(s)	Definition
2001	Fleisher and Blenkhorn	<i>CI is the process by which organizations gather actionable information about competitors and the competitive environment and, ideally, apply it to the decision-making and planning process to improve their performance</i>
2001	Rouach and Santi	<i>CI identifies relevant information quickly and helps the make more successful technological choices. It increases the chances of patent approval. It audits a company's scientific and technical assets and compares them with its competitors. It detects market threats and opportunities and identifies winning strategies in unknown areas</i>
2002	Fleisher and Bensoussan	<i>Intelligence may be defined as the value-added product resulting from the collection, evaluation, analysis, integration and interpretation of all available information that pertains to one or more aspects of an executive's needs and, that is, immediately or potentially significant to decision-making</i>
2002	Bergeron and Hiller	<i>The collection, transmission, analysis and dissemination of publicly available, ethically and legally obtained relevant information as a means of producing actionable knowledge. Furthermore, CI is the production of actionable knowledge for the improvement of corporate decision-making and action</i>
2008	Bose	<i>CI allows a company to anticipate market developments proactively – rather than merely react to them. This in turn allows a company to remain competitive by improving its strategic decisions and leading to better performance against its competitors</i>
2008	Calof	<i>Intelligence helps your company sustain and develop distinct competitive advantages by using the entire organization and its networks to develop actionable insights about the environment (customers, competitor, regulars and technology). It uses a systematic and ethical process involving, planning, collection, analysis, communication and management</i>
2013	Du Toit	<i>CI is a strategic tool to facilitate the identification of potential opportunities and threats</i>
2016	Bulger	<i>CI is the robust integration of insights from intelligence pools that are identified across the business environment and in collaboration with other functional areas and disciplines that are synthesized to gain a comprehensive picture of a market in its current state and in its probable future state. The resulting outcome of integrated intelligence efforts is critical decisions influencing and supporting recommendations required to drive and gain a competitive advantage for an organization</i>

Table A1.

### About the authors

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