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The rise of a new competitive intelligence
Need of real-time competitive intelligence and the impact on decision-making

Sofie Gundersen

Dissertation report presented as partial requirement for obtaining the Master's degree in Information Management at Nova IMS and in Management at Nova SBE

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Instituto Superior de Estatística e Gestão de Informação
Universidade Nova de Lisboa

THE RISE OF A NEW COMPETITIVE INTELLIGENCE

NEED OF REAL-TIME COMPETITIVE INTELLIGENCE AND THE IMPACT ON DECISION-MAKING

by

Sofie Gundersen

Dissertation presented as partial requirement for obtaining the Master's degree in Information Management at Nova IMS, with a specialization in Knowledge Management and Business Intelligence, and the Master's degree in Management at Nova IMS with specialization in Digital Business.

Advisor: Afonso Almeida Costa

Co Advisor*:* Luís Madureira

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ABSTRACT

In a highly turbulent competitive environment, organisations are increasingly advised to stay agile in order to quickly adapt to threats and opportunities. To do so, competitive intelligence is of the most relevance, but as this work shows, it is apparent that the competitive intelligence field must adapt to the changing environment as well. Drawing up on various literature and the insights and knowledge from experienced executives and CI professionals through in-depth interviews, this work establishes the need for *real-time competitive intelligence* and how it can improve decision-making in organisations. It finds that real-time CI can contribute to a competitive advantage by enabling highly informed and timely decision-making in organisations and provide immense value for companies' performance.

KEYWORDS

Competitive intelligence; real-time competitive intelligence; competitive advantage; decision-making

Contents

1 Introduction

The observable competitive environment is affected by increased globalisation, an interconnected economy and rapid changing technology (Hitt, Ireland, & Hoskisson, 2007, p. 6). Competition is fierce and firms are continuously faced with a highly uncertain environment (Cunha, Clegg, & Kamoche, 2012), characterised by complex and ambiguous problems (Bennett & Lemoine, 2014; Hitt, Keats, & DeMarie, 1998; Sun, Cegielski, Jia, & Hall, 2016). To stay competitive, managers and organisations are advised to respond quickly to changes (Chen & Miller, 2015; Hitt et al., 1998; Mikalef & Pateli, 2017). Nonetheless, they need to have actionable insights to do so, which is a responsibility provided by the field of Competitive Intelligence (CI). This area has gained increased importance over the last few years and can be described as having actionable insights on the competitive environment, which includes everything from customers and competitors to technology (Dishman & Calof, 2008). With the current competitive environment, the traditional CI method is too slow (Calof, Richards, & Smith, 2017a), as the production of insights is outpaced by changes in the environment. It is argued that any information that is not gathered in close to real-time will become useless (Calof et al., 2017a).

Real-time CI can allow for companies to have the right intelligence, to the right people at the right-time, which can provide immense value for their performance (Chen & Miller, 2015). Arguably, it can enable agile organisations by early anticipation of constantly changing market conditions to pursue opportunities and threats in the environment (Lu & Ramamurthy, 2011). Thus, it can improve decision-making in both short- and long-term (Bergeron & Hiller, 2002). However, implementing real-time CI alone will not make an organisation agile. There are several factors that can have an impact on the decision-making, for instance, executives' attitudes towards intelligence or the culture within the organisation.

Despite the rapid changing environment, the need of being agile and advancement of CI, there is a paucity of literature that addresses the need of real-time CI, nor a clear definition of what it concerns. In cases where it is addressed, it is mostly seen as subsets within the CI field (Dey, Haque, Khurdiya, & Shroff, 2011; Jeffery, Lindstrom, Pattie, & Zerzan, 2017; Kietzmann, Hermkens, McCarthy, & Silvestre, 2011; Obreja, Hart, & Bednar, 2016; Zubiaga,

Spina, Martinez, & Fresno, 2015). The objective of this thesis is therefore to explore if there is a need of real-time CI and how it can potentially impact decision-making in organisations. In order to do so, the experience of experts from various fields of the business environment are needed.

The outline of the thesis is as follows:

- ❖ Firstly, a thorough review of the literature will be addressed. In this part, the environmental factors and the resulting competitive environment will be reviewed to subsequently study the need of real-time CI. Hence, an applicable definition of real-time CI will be derived, as there is no clear definition in the literature. This is followed by real-time CI's impact on decision-making in organisations and a discussion on real-time CI as a source of competitive advantage.
- ❖ Secondly, a selected number of executives, academics and CI-practitioners from various fields will be interviewed to explore the need of CI. Ideally, these responses will provide information that can be identified with the discussed literature. The results of these responses will be followed up by a discussion and conclusion.
- ❖ Finally, a review of limitations that might have impacted the interviews and the study will be addressed, in addition to recommendations for future work.

2 A review of the literature

2.1 Transformations in the general environment

Analysis of the organisational environment has existed as a part of the business landscape for decades. Fleisher and Bensoussan (2003) described the organisational environment as the broad set of external forces that can affect a company's competitive performance. To review some of the external factors that currently affects the competitive environment and give rise to the need of real-time CI, the STEP framework is used. This considers the societal, technological, economic and political environment.

2.1.1 Societal

Societal transformations are giving rise to the need of real-time CI as the new "*social consumer*" has come to stay (Acker, Gröne, Akkad, Pötscher, & Yazbek, 2011). The major cause is the rapid usage of mobile phones (Cisco Systems, 2016), social media and internet

of thing (IoT) (Statista, 2017). Social consumers have adapted to a wide range of new technology which covers various spectres of their lives. Everything from ratings, communication, preferences, locations sharing etc., is shared in a real-time consistent manner from a vast amount of users (He et al., 2015). Full transparency is given in companies prices, and ratings and reviews are the most important part a customer's purchasing process (Acker et al., 2011). Salesforce's (2016) research shows that:

- ❖ Consumers frequently share product reviews and opinions on social media;
- ❖ The majority are more likely to purchase products with positive reviews;
- ❖ Half of the consumers would change brand if communication is not personalised or their need is not satisfied.

This tells us that the social consumer imposes several threats and risks for companies, and can simply ruin companies with a tiny click, share or review, if not taken care of (Acker et al., 2011; Kietzmann et al., 2011).

Fortunately, real-time monitoring of the social web (Kietzmann et al., 2011) can allow for companies to succeed by continuously focusing on consumers' needs, trends and feedback. This can be done through careful analysis of the gathered information and transformation into intelligence that can be used for be used for strategies and decision-making (Acker et al., 2011).

2.1.2 Technological

A vast amount of data combined with new technological tools can provide insights to the environment in a real-time manner (Obreja et al., 2016; Ram, Zhang, & Koronios, 2016). A common analogy is to say that "data is the new oil". However, oil must be refined to have any value and the same accounts for data – only in terms of processing (Agrawal, Gans, & Goldfarb, 2018; Goldfein & Nguyen, 2018; Marr, 2018).

There is a vast potential for data collection. Obreja et al. (2016) states that the surface web, i.e. information accessed through traditional search engines, only accounts for 10 percent of the total web, whereas the deep web can provide real-time monitoring of potentially "300+ billion database driven pages" (Obreja et al., 2016). However, data is now complex and requires different methods for value extraction. With new technologies, social media and IoT, 80 percent of the data available is provided as unstructured and semi-structured (Di,

He, & Li, 2014). This data can be everything from videos, sound files, discussions, searches, etc., which all require different ways and methods to be turned into intelligence. All this large and complex data has led to the concept of "Big Data", which is most often characterised by having significant volume, a lot of variety and high velocity (Ram et al., 2016). Statista (2017) estimates a Big Data growth of 40 percent each year and an expected increase in Big data revenue of 150 percent by 2018. This is mainly driven by the spread of social media, IoT and smart devices (Statista, 2017).

At the same time, computing power advances rapidly, which leads to further progression in the field of Artificial Intelligence (AI) (Statista, 2017, p. 28). AI is increasingly used for business purposes (Statista, 2017, p. 7), but there are still limitations in the field of management and social sciences (Søilen, 2016). For instance, current AI models have difficulties adapting to different circumstances. Even though two use cases are very similar, a given model can only be applied to one of the cases (Chui, Manyika, & Miremadi, 2018).

Furthermore, it is observed that approximately 90 percent of all data available comes from the social media (Sharma, Tim, Wong, Gadia, & Sharma, 2014). Social media data can provide several opportunities for companies, especially by analysing it in real time (Dey et al., 2011; He et al., 2015; Kietzmann et al., 2011). Analysing social media data in real time does not only create benefits in terms of discovering customers changing mood and discovering market trends. For instance, it can also provide early warning signals of the external environment, e.g. use twitter to give early warning signals of natural disasters such as earthquakes (Dey et al., 2011), or use the mood of twitter to forecast stock market indexes (He et al., 2015).

The major growth of data combined with new technological tools, can enable companies to extract data in a real-time manner (Obreja et al., 2016; Ram et al., 2016) and therefore identify opportunities and threats, which subsequently can create significant business value (Sun et al., 2016).

2.1.3 Economic

The economic environment is highly relevant for a firm's success and it should continuously be studied to identify changes and trends (Hitt et al., 2007, p. 45). The world economy is characterised by larger interdependencies among countries because of globalisation. As a

result, there is an increased flow of goods, services, financial capital, knowledge and technology across national borders (Hitt et al., 2007, p. 8, 1998), whereas the two latter ones are particularly emphasised in the global outlook (International Monetary Fund, 2018).

In general, most parts of Europe (Decressin, 2017) and the rest of the world are experiencing positive economic growth and outlook, whereas the above mentioned factors are evaluated to be key reasons for the positive growth state (International Monetary Fund, 2018). However, there are volatilities in oil, natural gas, metal and agricultural prices which have considerable effect on nations, and therefore, their business economies (International Monetary Fund, 2018, pp. 57–58). Even though the global and European economy is currently considered as stable, there are nations that can have significant impact on trade patterns, investment and consumption, for instance Brexit, and therefore on economies of different businesses and other nations (Decressin, 2017, p. 22).

Information from the economic environment can give enterprises insights to the competitive environment, and provide identification of growth opportunities, cycles and likelihood of an organisation's forecasts (Läsiluoto, 2014). Thus, companies should continuously map the economic environment as changes can happen fast and unexpected (e.g. shocks, political instability, environmental disasters) which in turn can have substantial impact on a nation's economy and therefore influence a company's success (Hitt et al., 2007) and strategic planning (Läsiluoto, 2014).

2.1.4 Political

Political aspects such as new laws and regulations, political stability and potential changes, consumer protection, trade control and consumer protection, are an important set of environmental factors (Hitt et al., 2007, p. 47).

Concerning the political instability, Brexit is currently imposing high uncertainty for both UK and European countries (Giles, 2017; Wilson, 2018), and are still awaiting the political outcome of the post-Brexit negotiations. Without any trade-agreement it can potentially lead to disruption in various sectors and have a negative impact on several nations' economies (Decressin, 2017, p. 22). Additionally, there are questions and potential worries due to the U.S. administrations' different actions against free trade (The Economist, 2018).

The current largest political impact on the business environment is the new European General Data Protection Regulation (GDPR) that became enforceable the 25th of May 2018. The law implies a new jurisdiction for data privacy in the European Union (EU) and follows an accountability principle for countries outside the EU who processes data of EU citizens. Legal collection of data is more important than ever due to the GDPR, and if violated, it can lead to substantial fees (GDPR EU.org, n.d.) that can have major impact on European and foreign companies' performance and reputation.

Instability and unpredictable outcomes in the political environment increases the organisations' need of being continuously up-to-date and prepared for potential changes, and therefore the need of real-time CI.

The reviewed STEP factors are highly connected with each other. They are shaping the competitive environment and highlight some of the challenges companies must face in order to stay competitive. Cunha, Clegg and Kamoche (2012) describe a competitive environment that is imposing high uncertainty on companies and their actions. Due to this uncertainty, they make guesses, and act on these guesses in order to learn from them (Cunha et al., 2012). However, real-time CI can potentially reduce the uncertainty of actions and provide companies with more trustworthy insights from the competitive environment.

2.2 Implications on the competitive environment and competition

The current landscape that was just described is often considered as a *new competitive environment,* mainly facilitated by globalisation and shifting technology, which in turn leads to blurring industry boundaries, i.e. globalisation of markets (Hitt et al., 1998; Siggelkow & Levinthal, 2003; Whittington, Pettigrew, Peck, Fenton, & Conyon, 1999; Withers, Ireland, Miller, Harrison, & Boss, 2018). In this landscape, firms' assumptions of stability are replaced by "notions of inherent instability and change", which is defined as a state of *hyper-competition* (Hitt et al., 2007, p. 7). Observably, new products are being launched and new enterprises are established every day, but there is a significant shortened life cycle for both enterprises and products (Eurostat, 2017; World Economic Forum, 2016). Additionally, the applications for patents has increased with over 126 percent from year 2000-2016 (WIPO, 2016). As such, there are clear indications that companies find it difficult to survive in the competitive landscape and try hard to innovate to – so to speak, stay in the game. To face

this challenging competitive environment, companies must be on the alert to adapt their strategy to continuous and unpredicted changes (Cunha et al., 2012; Hitt et al., 1998).

In this new environment, many authors argue that *agility* is the key ability needed to survive and respond to market changes (Bennett & Lemoine, 2014; Doz & Kosonen, 2008; Gilad, 2016; Hitt et al., 2007; Lu & Ramamurthy, 2011; Mikalef & Pateli, 2017; Sharp, Irani, & Desai, 1999; World Economic Forum, 2016). Research has found that nearly 90 percent of managers recognises agility as the key to success (Glenn, 2009). In business terms, agility can be described as a company's ability to anticipate constantly changing market conditions early enough and pursue "unforeseen and emerging business opportunities" (Lu & Ramamurthy, 2011). The ability of being agile is closely related to the *awareness-motivation-capability* framework (Chen, 1996; Yu & Cannella Jr, 2007), which simply described, is that a company will not be able to respond to any action in the market unless "it is aware of the action, motivated to react and capable of responding" (Chen & Miller, 2015, p. 2). Therefore, acquisition of knowledge from the environment and stakeholders is a necessity, but only valuable if the right knowledge is provided to the right decision maker at the correct time (Chen & Miller, 2015).

To stay competitive a firm must respond quickly to market changes and continuously scan the environment to pursue opportunities and avoid potential downfalls. As Kietzmann et al. (2011) describe the environment, firms must be aware of changes and incidents, so they can act on it quickly instead of solely using hindsight. For instance, if a customer posts a bad rating of a restaurant-meal on Twitter and the branch manager becomes aware of the issue before the customer has left the restaurant, the issue can potentially be resolved (Kietzmann et al., 2011).

However, gaining the right knowledge from the competitive environment is not straightforward and companies find it increasingly difficult (Obreja et al., 2016). For instance, with the globalisation of markets, companies are facing competition outside their national border (Chen & Miller, 2012). First off, this implies that firms must gather information on stakeholders and the environment in other countries where there can be different trends, culture or even information in a different language (Calof et al., 2017a). Secondly, they must at the same time ensure that data is lawfully collected to comply with the new GDPR, even though the data is publicly available (Obreja et al., 2016). These are just

two examples to illustrate how varied and multifaceted data and the collection process can be. For all this complex data to be advantageous, it must be processed in a highly timely manner, filtered by trustworthiness and then turned into actionable insights (Wamba, Akter, Edwards, Chopin, & Gnanzou, 2015). The only way to do it is to perform extensive search and use all sources available (Obreja et al., 2016), which again can reflect upon companies and their environment from numerous points of view (Bulger, 2016). This will allow for understanding of the competitive environment, and moves, strengths and weaknesses of competitors and stakeholders (Di et al., 2014). As for now, most companies do not have the skills or capabilities to do so, even though the technology to provide for this actually exists (He et al., 2015). One of the issues is naturally the limitation of processing power available at companies, but the main issue lies within limited skills and capabilities in handling unstructured and semi-structured data (Ram et al., 2016).

2.3 Towards real-time CI

Previous work has found that executives are seeking easier access to real-time information (Glenn, 2009). Furthermore, The Economist Intelligence unit discovered that 61 percent of executives view rapid decision-making and execution as essential factors for a company's success, and 34 percent consider the ability to access the right information at the right time as key factors for a company's success (Glenn, 2009). Hence, there is a growing need of a more advanced CI function, that can combine complex and foreign data from multiple sources in a timely manner to provide efficient decision-making (Calof et al., 2017a).

Nonetheless, the traditional process of CI is found time consuming and will not provide leaders, nor organisations, with timely intelligence that is needed to actually take advantage of it (Calof et al., 2017a; Marin & Poulter, 2004). As Bernhardt stated in (1994), CI must be actionable, in other words – help companies to get an advantage in the market. However, in today's changing competitive landscape most intelligence is not actionable unless it is provided in a timely manner, as the value diminishes over time (Fleisher & Blenkhorn, 2001, p. 16). Companies are required to frequently and with precision, map the threats and opportunities in a market to allow for actionable insights and efficient decision-making (Calof et al., 2017a; Chen & Miller, 2015; Mikalef & Pateli, 2017). Therefore, it must be delivered from a variety of sources and on a daily manner to reflect the rapid changing environment.

These rapid changes require the CI field to adapt as well. The concept of CI is generally accepted as a term, but due to the changing environment and the vast amount of data that comes with it, scholars are exploring how to broaden the concept (Calof et al., 2017a). For instance, Bulger (2016) defines a new CI that consists of integrating different intelligence to gain proper insights, as each intelligence provide a different point of view on specific topics. Ram, Zhang and Koronios (2016) discuss how the use of unstructured and external data in CI, i.e. Big Data, can lead to a more complete view of reality and therefore unbiased decision-making. Calof, Richards and Smith (2015) suggest to integrate business analytics, CI and foresight, also supported by Søilen (2016). Finally, and more importantly for the purpose of this thesis, Calof, Richards and Smith (2017a) state that *real-time* CI is of pure necessity if you are to address the challenges in the market environment – mainly speed of change, growth of international activities and increasing data complexity. However, real-time CI is a topic that is barely addressed in the literature, and if mentioned, then usually as subsets of real-time CI. This includes topics such as real-time social media analysis (Dey et al., 2011; Kietzmann et al., 2011; Zubiaga et al., 2015), real-time monitoring of the deep wide web's billions of webpages (Obreja et al., 2016) or real-time analysis of the financial market (Jeffery et al., 2017).

Currently there are no clear or general definitions of real-time CI. To discuss the topic in depth, it is essential to make a short review of (1) the concept of CI, (2) the closely related topic of real-time business intelligence (BI) and (3) the meaning of *real-time*.

2.3.1 What is Competitive Intelligence?

A broad consensus is that CI is about gathering information from the competitive environment and transforming it into actionable insights or foresight, i.e. intelligence, that can be used to enhance competitive advantage (Bernhardt, 1994; Fuld, 1994; Kahaner, 1997; Pellissier & Nenzhelele, 2013; J. E. Prescott, 1999). CI involves a process that consists of identifying needs, collection, analysis, dissemination and feedback (Bose, 2008; Herring, 1999; Pellissier & Nenzhelele, 2013). While some authors view CI as intelligence that mainly concerns competitors (Bernhardt, 1994), it seems that most authors view it as a broader term that includes various types of intelligence (Bulger, 2016; Calof, Arcos, & Sewdass, 2017b; Gilad, 2016; Kahaner, 1997; J. E. Prescott, 1999; Rouach & Santi, 2001; Wright, Pickton, & Callow, 2002). A range of authors stress that CI must be done and provided in a

timely manner in order to extract the most value (Bose, 2008; Calof et al., 2017b; Fleisher & Blenkhorn, 2001, p. 16; Gilad, 2016; Herring, 1999; Marin & Poulter, 2004; J. E. Prescott, 1999). CI can be defined as:

> *The process by which enterprises gather actionable information about competitors and the competitive environment and, ideally, apply it to their planning processes and decision-making in order to improve their enterprise's performance* (Brody, 2008, p. n.p.)*.*

2.3.2 What is real-time business Intelligence?

Contrary to real-time CI, *Real-time BI* has been widely discussed in literature (B. Azvine, Cui, Majeed, & Spott, 2007; Behnam Azvine, Cui, & Nauck, 2005; Ben Azvine, Cui, Nauck, & Majeed, 2006; Ranjan, 2006; Sahay & Ranjan, 2008). BI can be defined as the method "to capture assess, understand, analyse and turn one of the most valuable assets of an enterprise [...] into actionable information to improve business performance" (Behnam Azvine et al., 2005; Ben Azvine et al., 2006). *Real-time BI* can be defined as the traditional definition, but where the goal is to "minimize the time [i.e. the latency] from the business event happening to a corrective action or notification being initiated" (Sahay & Ranjan, 2008). Real-time BI was established to satisfy the need of companies by providing accurate and timely information, and therefore allowing them to stay competitive and increase performance in the turbulent and fast-changing environment (Behnam Azvine et al., 2005; Sahay & Ranjan, 2008). Some authors consider CI to be a part of BI (Kimble & Milolidakis, 2015; Negash, 2004; Ram et al., 2016) or BI to be a part of CI (Bergeron & Hiller, 2002), which is intuitive considering the previously mentioned objective. Nevertheless, CI is not found included in any terms when it comes to literature on real-time BI (Behnam Azvine et al., 2005, 2005; Sahay & Ranjan, 2008). Compared to CI, BI can be described as something that concerns the *internal* information of the organisation, while CI concerns the *external* information of an organisation.

2.3.3 What is real-time CI?

The term *real-time* has different meanings depending on who you ask. Azvine (2005, pp. 215–216) identifies four different definitions;

1. "that a process has access to information whenever it is required";

2. "that a process provides information whenever it is required by management";

3. "the requirement to obtain zero latency";

4. "the ability to derive key performance measures that relate to the situation at the current point in time".

The two latter ones are clearly more applicable to BI as it considers key performance measures that are related to the internal processes of an organisation and the ability of achieving zero latency (Behnam Azvine et al., 2005). From a CI point-of-view, information must be processed and turned into intelligence (Pellissier & Nenzhelele, 2013). This analytical process does in most cases still need some human intelligence, as the AI tools are still not able to have a "common sense" or differentiate between use cases (Chui et al., 2018; Fleisher & Wright, 2010). However, there are tools that allow for instant data collection (Dey et al., 2011; Obreja et al., 2016; Ram et al., 2016), which fulfils definition (1) and (2). As such, the real-time related to CI builds upon Eisenhardt's definition (1989, p. 549) "for which there is little or no time lag between occurrence and reporting". Based on the previous literature and definitions, real-time CI can be defined as:

> *The process of developing actionable insights from the competitive environment to enable timely and informed decision-making and strategy development. The objective is therefore to provide the right intelligence to the right people at the right time.*

2.4 Impact on firms' decision-making

Gilad (2016) states that the largest return on investment derived from effective CI is a company's ability to quickly adapt to changing market conditions. This will improve the competitive position of a firm and allow it to create and capture more value in markets (Nayyar & Bantel, 1994). In order to adapt to changing market conditions, there are naturally continuous processes of decisions that must be made.

Decision-making can broadly be divided into tactical and strategic actions (Miller & Chen, 1994). *Tactical* actions involve smaller decisions required to answer immediate questions or problems that arise, and is therefore related to the more short-term goal of an organisation (Bergeron & Hiller, 2002; Miller & Chen, 1994). *Strategic* actions concern decisions that have a more long-term impact on an organisation (Miller & Chen, 1994), which is naturally more

time-consuming than the tactical actions. Both strategic and tactical decision-making and planning are reasoned to be improved by implementing CI in the organisation (Bergeron & Hiller, 2002; Wright & Calof, 2006). And, if you have access to real-time information on the competitive environment, both are argued to be improved in terms of quality and speed (Eisenhardt, 1989, 1990). As such, real-time CI can be reasoned to be an essential source of an agile organisation, as it enables decision-makers to respond faster to market changes. However, the skilful implementation of real-time CI is crucial to make an organisation agile. There are several factors that have, or can have, an impact, such as managements' attitudes, information flow, structure and culture, which will also have an impact on the success of real-time CI.

Decision-makers' commitment and trust towards CI is recognized as essential abilities to achieve competitive success, and that potential CI representatives have a seat at the decision-making table (Calof et al., 2017a; Fleisher & Wright, 2010; J. F. Prescott & Miller, 2002). The importance is shown in the case of the worldwide telecommunications firm, Ericsson, and its failure of adapting to the competitive environment. Søilen (2017) found that Ericsson's CI representatives used too much time on convincing the decision makers of the potential value of CI and that their intelligence was correct. Another example is Gilad and Fuld's (2016) research, which found that only 55 percent of companies actually use the collected CI, and in decisions where CI actually was included, disclosed aspects where (1) the manager was interested in the whole picture, (2) CI collected was a "sign-off" in major decisions, (3) the CI-analyst was involved in product launches or (4) when the analyst outlaid a more proactive action.

Some authors argue that in addition to having intelligence systems that aim at increasing an organisation's resilience, firms must decentralize decision-making such that decisions can be made by people who are experienced or familiar with the field they are gathering insights from (Cunha et al., 2012; Hayek, 1945). Decentralization could potentially reduce the aforementioned issues as real-time insights would be directed instantly to the decision-makers who are familiar with the specific area and have the knowledge of "relevant changes and […] resources immediately available to meet them" (Hayek, 1945, p. 524).

All of the previous elements relate to one important factor – that of having informed decision-making within the organisation. Research shows that decision-makers that have

greater insights on the competitive environment, and that are more sensitive to market changes, tend to have more competitive firms that are better equipped at making decisions (Fleisher & Wright, 2010). However, there are cases where executives perform uninformed decisions, which can have a negative impact on the firms. For instance, there can be ambiguous problems that require managers to make guesses on what changes to make due to uncertainty (Cunha et al., 2012) or possibly the lack of information. In other, and potentially worse cases, decision-making is uninformed because of biased executives. The latter part is related to the term *blind spots,* which was firstly introduced by Porter (1980), and are areas where executives are biased or ignorant towards the environment (Gilad, Gordon, & Sudit, 1993). Many authors throughout time have revealed several blind spots within the decision-making of executives, such as overweighting threats and opportunities or using one single source to advocate a decision (Dickson, 1992).

Even if uninformed decisions are due to lack of information or biased decision makers, it is proven that executives who ignore or discharge intelligence, will make poorer competitive decisions (Gilad et al., 1993). CI collected from a wide range of sources and collection methods will improve the trustworthiness of the intelligence (He et al., 2015; Obreja et al., 2016) and potentially reduce the bias of decision makers and uncertainty in decision-making. Intuitively, if a decision maker receives an alert that a competitor is going to launch a product, and there are three pieces of evidence from reliable sources that confirms it, it will be more difficult to outweigh the option. Therefore, it can allow executives to make decisions that they normally would not make due to ignorance or bias (Obreja et al., 2016).

3 Real-time CI as a source of competitive advantage

Competitive advantage is one of the main explanatory factors behind firms' differences in performance and is therefore an important subject to address when it comes to real-time CI. A firm has a competitive advantage when it "implements a strategy competitors are unable to duplicate or find too costly to try to imitate" (Hitt et al., 2007, p. 4).

Collection and exploration of data for analysis of the market is increasingly viewed as a source of competitive advantage (West, Ford, & Ibrahim, 2015) and is largely impacted by how companies access information, what conclusions they draw from it and how fast they can make use of it (Søilen, 2017). A better understanding of the competitive landscape, i.e.

an understanding of opportunities and threats, will allow decision makers to move faster in developing strategies to maximize their competitive advantage (Bose, 2008; Wright & Calof, 2006). For real-time CI, the first-mover advantage is the most obvious mechanism that can provide a competitive advantage. In other words, taking the first competitive action to improve market position or to defend existing position (Chen & Miller, 2015; Hitt et al., 2007, p. 147). Secondly, by collecting information continuously, in addition to analysing and disseminating it to decision makers with minimal time and effort, a company can potentially mitigate threats and opportunities before competitors. However, research has not found that any information technology (IT) tool alone will lead to a *sustainable* competitive advantage, as IT in most cases can be imitated by competitors (Melville, Kraemer, & Gurbaxani, 2004; Mikalef & Pateli, 2017).

According to the resource-based view (RBV), a competitive advantage is only sustainable if the resources of a firm are valuable, rare, imperfectly imitable and non-substitutable (VRIN) (Barney, 1986, 1991, 2014). Literature suggests five ways of testing if a resource is VRIN by considering the resource's *(1) competitive superiority, (2) inimitability, (3) substitutability, (4) durability and (5) appropriability* (Zack, 1999, pp. 28–32).

Competitive superiority evaluates if the resource is superior to that of competitors (Zack, 1999, pp. 31–32). For real-time CI this will most likely depend on whether it will become a "must-have" or a differentiating factor for the organisation, and subsequently, if there will be differences in firms' real-time CI capabilities. Information from the vast amount of data is considered as cheap (Hitt et al., 2007, p. 10), but as previously mentioned, companies still lack the ability of handling the data (Obreja et al., 2016; Ram et al., 2016). At a first stage, real-time CI can potentially be a differentiating factor as it requires investment in different IT and the ability to turning data into intelligence. On the other hand, with the rapid diffusion of new technology, including information technology, the product life cycle becomes shorter and technology becomes more available (Hitt et al., 2007, p. 11). Thus, as real-time CI becomes more accessible for firms, for instance through increased real-time CI offers by third parties, it can result in a *must-have* over time and will potentially lose some of its competitive superiority.

However, other factors can increase the superiority such as the resource's level of *inimitability.* Early adoption of real-time CI can result in an early-mover advantage as

learning is gained over time (Zahra, Ireland, & Hitt, 2000), for example, in form of analytical capabilities or the ability to trust the provided intelligence to improve decision-making. It should also be mentioned that effective and functional CI is in general dependent on having managers' trust and support, and a culture that allows for collaboration and a structure that enables information flow (Søilen, 2017). These factors are difficult for competitors to disentangle or re-create. In other words, these are elements of causal ambiguity that make a competitive advantage based on a well-executed real-time CI strategy hard to imitate (Zack, 1999, p. 29).

In line with what was previously stated, IT depreciates relatively fast due to frequent innovative advancements. Real-time CI capabilities and technologies can therefore be subject to low *durability* and potentially be easily *substituted* (Zack, 1999, p. 31). As AI develops further and computational power increases exponentially (Statista, 2017), advancement in business tools can quickly outdate or advance real-time CI. Moreover, Calof et al. (2017a) suggest different ways of making CI more effective, for example by concurrent analyses that allow for simultaneous collection, analysis and sharing with stakeholders in a frequent manner, or structures that encourage fast information flow, data sharing and communication with a short gap to decision-making. Thus, the real-time CI defined in this thesis can potentially be substituted and it can erode in the same speed as technology advances. Real-time CI must therefore be continuously developed so that it does not become outdated and maintains its competitiveness.

Diving deeper into theory evolving from the resource-based view comes the concept of *dynamic capabilities,* which are considered to add a greater dynamic component compared to the RBV (Eisenhardt & Martin, 2000). Dynamic capabilities can be described as "the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments." (Teece, Pisano, & Shuen, 1999, p. 516). Dynamic capabilities are highly related to the notion of *IT enabled dynamic capabilities* that will allow for a sustainable competitive advantage by "allowing a firm to rapidly reposition itself when conditions require it" (Mikalef & Pateli, 2017, p. 1). There has been extensive research in the recent years on how IT enabled dynamic capabilities can provide sustainable competitive advantage to companies (Mikalef & Pateli, 2017; Olszak, 2014). Mikalef and Pateli (2017) and Teece et al. (1999) describe five underlying abilities of these capabilities:

- ❖ Sensing: To discover, interpret and pursue opportunities in the environment by gathering information on "market needs, competitor moves, and new technologies to proactively reposition its strategic offerings" (Mikalef & Pateli, 2017, p. 2)

- ❖ Coordinate: To "easily identify complementarities and synergies, reduce task redundancies, and promote effective collaboration" (Mikalef & Pateli, 2017, p. 2)

- ❖ Learning: To "acquire, assimilate, and exploit new knowledge that enables informed decision making" (Mikalef & Pateli, 2017, p. 2)

- ❖ Integrating: To enable "evaluation of firm and partner resources and capabilities and the capacity to embed and exploit them in new or revamped operational capabilities" (Mikalef & Pateli, 2017, p. 2)

- ❖ Reconfiguring: The ability to rapidly "effectuate strategic moves" to meet the environmental changes (Mikalef & Pateli, 2017, p. 3)

All these factors map quite well on essential capabilities needed for successful CI. However, real-time CI alone is mainly a contributor to the sensing-, learning- and reconfiguring-capabilities. Considering these three factors, real-time CI fulfils them by enabling firms to rapidly pursue opportunities or act on threats by gathering information from the environment and transforming it into knowledge, i.e. intelligence. The knowledge enables informed decision-making and planning, both on a tactical and strategic level (Bergeron & Hiller, 2002; Wright & Calof, 2006).

Having reviewed both the RBV and dynamic capabilities, it is evident that real-time CI by itself cannot be argued to provide a sustainable competitive advantage. As Qiu (2008) states, it takes more than scanning on the environment to enable competitive advantage as firms must be able to actually adapt to the market. Nonetheless, real-time CI can be viewed as an essential contributor to a sustainable competitive advantage by enabling dynamic capabilities.

4 Methodology

Until this point, there has been a thorough review of relevant literature related to real-time CI and a theoretical discussion of its implications for competitive advantage. As real-time CI is a topic that is barely mentioned in scientific literature, there was a necessity of getting experienced managers, CI practitioners view and insight on this thesis' topics to evaluate if

there is an actual need of real-time CI. As such, I present the result of several in-depth interviews (IDI) of experienced executives, CI-professionals and one academic. IDIs are a very effective way of getting human insights to research problems by providing their experience and opinion towards a specific topic (Mack, Woodsong, MacQueen, Guest, & Namey, 2005, p. 29; Milena, Dainora, & Alin, 2008). Furthermore, they provide more detailed information compared to other methods such as surveys (Boyce & Neale, 2006).

The objective of these interviews is to investigate if there is a need for CI in real-time, given the benefits of CI and timely decision-making.

In order to get a greater number of insights and perspectives, the targeted people had the following characteristics: (1) experienced executives, CI practitioners and/or academics and (2) work location in different parts of the world. Recruiting people for IDIs can be a time-consuming and difficult task, but it is a method that many people find interesting to be a part of as they can share their own experience on something they are interested in, and they are often able to access the results and insights of the research (Mack et al., 2005, pp. 29–33). The targeted people are normally quite busy and contacted daily with different offers, recruitment, several emails, etc. and it was therefore important to differentiate the contact method. LinkedIn was used to find and contact interviewees as it enables filtered searches which then could be used to find people who have some experience and interest in the field or similar field, such as SCIP[1] members, marketing, CI, BI and so forth, and it allows you to connect and message people directly.

 30 people were contacted of which 8 people were willing, or had the possibility, to participate within the project's time frame. All eight respondents have had between 6 to 32 years of experience as managers for medium to large companies, wherein one is an academic with a long executive background. Four of the interviewees can be considered as CI-practitioners. Most interviewees have had international work experience. The interviewees are based in Portugal, Spain, Sweden and United States, and work in industries

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[1] SCIP stands for the Strategic and Competitive Intelligence Professionals, and is a "global non-profit community of business experts across industry, academia, and government who come together to build and share strategic intelligence, research decision-support tools, processes and analytics capabilities" ('About SCIP - Strategic and Competitive Intelligence Professionals (SCIP)', n.d.).

such as IT, tourism, consulting, banking, retail real-estate and telecommunication. The interviews were performed over Skype or face-to-face, depending on the interviewees preference, and were performed over a timeframe of 30 days. The interview consisted of 9 more or less open-ended questions shown in the appendix ("10.1. Questionnaire") which considered strategy and decision-making in the competitive environment, directed towards real-time CI. All interviewees were presented with the previously proposed real-time CI definition before the interviews began. Every interview was recorded and transcribed. Naturally, these transcripts are quite long and some of the responses included direct linkages to the specific company or interviewee. An excerpt of each response is therefore represented in the appendix ("10.2 Responses").

5 Results

The following is a summary of the main findings, which will be further discussed in the section after.

- ❖ **Organisational survival:** All interviewees view information as a critical ability for survival in the competitive environment.
- ❖ **Time-limitations:** All interviewees had experienced or observed situations where poor decisions were made because of time pressure, and most of them expressed that not getting sufficient information or intelligence was the main cause of the poor outcome. Most respondents acknowledge necessary improvements when it comes to timely and systematic transformation of information to intelligence, either for their own company or in general.
- ❖ **Rapid decision-making:** All interviewees experience or observe the need of easier access to real-time information for *rapid* decision-making and execution. Half of them emphasise the need on a tactical horizon.
- ❖ **Insufficient information:** Time pressure was also the main cause of having no or limited information available for decisions. Four respondents emphasise that in some situations or industries there is no, or only limited, information available to support the decision-making.
- ❖ **Ignorance/bias:** All interviewees, except one that was in doubt, acknowledged that ignorant or biased decision-makers can, and have been, the cause of poor decisions.

❖ **Improved performance:** All respondents agree that a real-time CI system could improve the performance of companies. Four respondents emphasised that it depends on the data, of which three highlighted the improvement it can have on a tactical/operational level. One stressed that managements skills are essential. Another emphasised that it can improve trust towards data and therefore performance.

❖ **Integration vs. outsourcing:** Most respondents would prefer real-time CI integration in their own company or in general. Three respondents would outsource or argue for positive outcomes by outsourcing.

❖ **Differentiation vs. must-have:** Most people stated that real-time CI is a must-have but can be a differentiating factor because everyone does not have the means or resources to develop or acquire it.

❖ **Need of real-time CI:** All respondents agreed that there is a need of real-time CI.

6 Discussion

There is no doubt that executives around the world view informed and timely decision-making as a critical capability for the survival of organisations. Some stress the ability to quickly adapt to the rapid changing environment, the awareness of unknown factors, and ability to view and consider different perspectives. Others draw attention to a broader perspective in which information of the market is not sufficient, for instance having employees that are willing to take risks by acting on insights. Even so, the different viewpoints are interconnected as they are built upon abilities on how to adapt to a highly dynamic competitive environment through access of information. More importantly, they all advocate the need of real-time CI.

In line with previous literature and responses from the interviewees, four following subjects will be discussed to examine the potential need of real-time CI given the benefits of timely decision-making and CI: (1) Misinformed, unenlightened and time-pressured decisions, (2) tactical vs. strategic decision-making, (3) adoption of real-time CI, i.e. if real-time CI will be a "must-have" or differentiating factor, and (4) outsourcing vs. integration of real-time CI.

6.1 Misinformed, unenlightened and time-pressured decisions

Experienced executives, academics and CI-practitioners are arguing that decision makers choose to stay ignorant towards information which in turn leads to poor decisions. This is not just assumed but observed in various industries in the business landscape, and also supported by research (Fleisher & Wright, 2010; Gilad et al., 1993). In the first question, concerning the abilities for organisational survival, one interviewee emphasised that the most important ability is to minimize blind spots. As the previous literature states, blind spots are areas where the decision maker is biased or ignorant towards the environment (Gilad et al., 1993). Some respondents argue that this ignorance or bias derives because decision makers are focusing more on their own beliefs or having the wrong focus, as opposed to contradictory information from the market. However, one interviewee emphasised that it is more of a legacy problem – that people who work in the same company for too many years become biased because they have already formed their opinions and rely more on a network they have built up and exploited over time, instead of staying informed with the current environment. As with the case of Ericsson, Søilen (2017) explained that decision makers might be reluctant towards intelligence coming from another employee, e.g. the CI analyst. This is because the executives are paid for "their knowledge and decision-making skills", and if the intelligence is provided by another party, it "only" leaves the executives the decision-making (Søilen, 2017), which in some sense, lose their pride and sense of responsibility.

Real-time CI can mainly contribute with two factors that can potentially lessen the ignorance or bias in decision-making. That is to reduce uncertainty and increase trust in insights, which is also emphasised by some of the interviewees. Furthermore, real-time CI can provide insights from multiple sources when these are actually needed and can therefore be argued to improve the trustworthiness of the intelligence (He et al., 2015; Obreja et al., 2016). Nonetheless, executives must be open towards the intelligence. No matter how trustworthy and timely the intelligence is, it will not be of any benefit if the decision-maker is determined to rely on its own support-network or gut-feeling, instead of the provided intelligence.

There are other noteworthy factors that can impact the ignorance of decision-makers, such as having the capabilities, culture, processes and management that supports the CI function

in the company (Calof et al., 2017a; Fleisher & Wright, 2010; J. F. Prescott & Miller, 2002). This can be illustrated by one of the interviewee's experience, who stated that a lot of intelligence reports are made by non-experts on the field they are analysing. Hence, managers will eventually ignore the reports as they provide little value to the decision-making and additionally lead to ignoring intelligence in general. Another interviewee argued that you must dare to risk by acting on the intelligence, but this is of little value unless it is good and correct intelligence. Yet again, it highlights the importance of analysts' capabilities and the impact they have on the decision-making process (e Cunha et al., 2012; Fleisher & Wright, 2010; Søilen, 2017).

Lastly, there is no question that respondents view time as a critical and often also a problematic factor in the process of decision-making. Most of them acknowledged the need for more timely and systematic intelligence processes, which is probably linked to why time is a problematic factor. Short deadlines can result in the lack of information, and subsequently, enable poor decisions. In some cases, and with specific industries, interviewees elaborate that these decisions can lead to significant financial losses, even when postponing the decisions to gather more information. For instance, several interviewees have experienced or observed time-pressured situations when opening in new or existing markets. Reluctance to expand due to limited information can lead to lost opportunities or the advantage of being first-movers (Chen & Miller, 2015; Hitt et al., 2007, pp. 147–283), but expanding with limited information can potentially lead to failure. In either case, having sufficient and good intelligence on the market at the right time can increase the success rate of decisions and avoid potential losses. Thus, failure of adapting to the changing environment can be due to the lack of speed (Cunha et al., 2012) and real-time CI can potentially reduce bad outcomes resulting from time-pressure.

6.2 Tactical versus strategic decision-making

The respondents had distinguishable views in where real-time CI can be of the most value. All of them agreed that real-time CI in general can provide significant value for companies. However, half of them indicated that it is especially valuable in situations that require rapid decision-making, i.e. more on a tactical or operational horizon. As one interviewee responded, "you can empower your employees with their own CI, so they can affect their own decision-making and course correct daily". This example was especially related to sales

departments, but it highlights how valuable real-time CI can be for decisions that must made in a frequent manner. It is not a secret that CI is very popular in tactical decision-making, for example, in product launches where companies are the most worried about the actions of competitors (Gilad & Fuld, 2016).

Nevertheless, decisions made today will have an impact on more long-term plans (Calof et al., 2015; Calof & Smith, 2010), which covers the strategic actions taken by a firm. This was also emphasised by another interviewee who reasoned that by tackling operational efficiency first, this will contribute to decision-making on a more strategic level. The example the interviewee gave was related to improving shopping centers operations on a daily basis, for example, by knowing that it rains, the traffic flow will increase by x-percent. By doing this, it can contribute to a more strategic level by, for example, managing the relationship with the suppliers in a better way.

To broaden the understanding of plausible futures, firms must continuously evaluate threats and opportunities and adapt long-term strategies to this changing environment. This will enable them to stay agile and build resilience (Calof et al., 2015; Cunha et al., 2012). As such, actionable insights are needed for immediate use on a tactical level, but also for adapting strategies to plausible futures and decision-making, on a more strategical level. Both factors can potentially be enabled by having real-time CI.

6.3 Adoption of real-time CI

Based on the literature review and the interviewees' responses, it is apparent that real-time CI can provide a competitive edge in the rapid changing environment and that there is a need of real-time CI in any firm. However, this raises the essential question if real-time CI is something that everyone will be able to adopt or a factor that will be differentiating between firms.

Two interviewees emphasised that highly competitive and financially strong companies, such as pharmaceutical, telecom or automotive, are most likely the first ones to adopt real-time CI. Evidently, traditional CI has mostly been adopted by larger firms (Bergeron & Hiller, 2002; Gilad & Fuld, 2016; J. E. Prescott, 1999), which is not surprising because of their access to greater financial resources (Bergeron & Hiller, 2002). Nonetheless, all interviewees argued that real-time CI is a must-have for *all* firms, or at least a "should-have". The main

reason for this is due to the rapid-changing environment and real-time CI's potential of acting on insights before competitors or making decisions and planning that are informed and timely. However, most of them emphasised that real-time CI will be a differentiating factor at first because everyone will not be able to adopt it unless there are sufficient financial resources or until the technology becomes more available. Evidently, Salles (2006) found that small and medium enterprises have a strong need for CI as they experience high pressure in the competitive environment. However, the pressure is also high in regards to financial resources for innovations and it can be difficult for these enterprises to prioritise CI (Salles, 2006). As the technology becomes more available (Hitt et al., 2007, p. 11), real-time CI can become more accessible, also for small and medium sized enterprises.

In either case, it is natural to ask what happens to the competitive advantage if everyone adopts it – and as one interviewee expressed: "I would not want everyone to adopt it as it would lose its advantage". This brings us back to the discussion of real-time CI as a source of competitive advantage, where it is argued that real-time data collection alone does not provide a firm with a sustainable competitive advantage. As one CI-practitioner stated, "more value can be generated if real-time data is analysed in a good and consistent manner", which again highlights the importance of the analyst's capabilities, but also access to up-to-date technology. Additionally, adopting real-time CI prior to competitors can provide a first-mover advantage due to learning and the gaining of experience, which is difficult to imitate.

Thus, in line with the responds and literature, it can be argued that real-time CI is a "should-have", but it will be a differentiating factor until the technology becomes more available. Even then, the larger companies with stronger financial "muscles" will potentially have a first-mover advantage as they have learned and gained analytical capabilities over time.

6.4 Outsourcing vs. integration

Finally, there is an important factor that should be mentioned, which is whether real-time CI is something that should be outsourced or integrated within a company. Five of the respondents would prefer it implemented as an in-house solution, either in their own company or in general. A few of them argued that in-house makes sense if most of the information can only be gathered from someone within the company. These are typically

cases where a brand-new product or service is launched that does not exist in the market, or where there are two or three firms within a specific industry. One interviewee viewed security as the main reason for an integrated solution, and if outsourcing reduces a decision-makers trust towards the intelligence, real-time CI would obviously lose some of its purpose. Another argued that tactical decision support should be managed and consumed within the company, as this relies on collaboration with different departments. In either case and as emphasised by the interviewees, an in-house solution requires a collaboration culture, a structure that allows for information sharing, effective processes, analytical capabilities and so forth. In other words, you must have the resources and capabilities to enable efficient CI (Bose, 2008), as the right combination of resources combined for real-time CI development can result in effective competitive advantage and differentiation.

The people who argued for outsourcing, considered it to be more beneficial as the outsourcing company can be more specialised, up-to-date and potentially cost-saving, which are viewed as the essential benefits of outsourcing (Hitt et al., 2007, pp. 93–94). One interviewee argued that you would potentially need at least two or three employees to only work with real-time CI for it to be effective, and for a smaller company, this is a vast amount of resources and require a change of processes. Thus, the interviewee would prefer outsourcing of real-time CI as an outsourcing company would be more specialised within the field. Even though outsourcing could increase the imitability of real-time CI, outsourcing of capabilities that a company is in the lack of can allow a firm to "fully concentrate on those areas in which it can create value"(Hitt et al., 2007, p. 93).

As some of the interviewees argued, outsourcing versus in-house clearly depends on the company, their philosophy, culture and resources. Nonetheless, the potential value provided by real-time CI, depends on whether there is trust towards the real-time CI. Outsourcing versus in-house should therefore be decided upon through a careful evaluation of how real-time CI can provide the most value.

7 Conclusion

The interviewees argue that there is a need for real-time CI and consider it as a must-have for all organisations. However, several factors must be in place for companies to adopt real-time CI, also for it to provide a sustainable competitive advantage. These entail financial

resources, management's attitudes, culture, structure and internal capabilities within the organisation. In either case, real-time CI can improve the decision-making and strategic planning in an organisation by allowing decision makers to have the necessary and trustworthy intelligence when it is actually needed. More importantly, it can enable companies to continuously adapt to the rapid changing environment and help them stay agile and competitive, not only through decision-making, but through adjustment of strategies. For instance, in product development, a decision can be to launch a product, while an adjustment of strategy can be to develop a new range of products due to an emerging need in the market place.

As this work is not alone to argue (Calof et al., 2017a), the traditional CI process tends to be too slow considering the rapid environmental changes. In this new competitive landscape that has especially taken shape due to globalisation and technological diffusion (Withers et al., 2018), the environment is volatile, uncertain, complex and ambiguous (Bennett & Lemoine, 2014). Numerous authors argue that organisations must be agile in order to stay competitive and to survive (Doz & Kosonen, 2008). To do so, companies must have sufficient, trustworthy and timely CI that can be used in decision-making and strategic planning. From a thorough literature review and several interviews, it is established that executives and CI professionals do experience or observe the need of *real-time CI*, both for tactical and strategic decision-making and planning. When companies are faced with a constant changing environment, it positions them in time-pressured situations where the intelligence appears to be outdated or insufficient, and executives must make guesses on what actions to perform (Cunha et al., 2012). Consequently, there is a need to have the right intelligence, made available to the right people, at the right time.

8 Limitations and recommendations for future works

This work argues for the need of real-time CI and how it can improve decision-making in organisations. It should be stressed that there is very little literature that actually concerns real-time CI. Thus, to argue for the need of real-time CI, most literature stems from other or related fields such as CI, BI, strategy, IT and so forth. This can be seen as a limitation, but it also highlights the importance of real-time CI as it can be connected, and is relevant, to multiple fields. Furthermore, it is observed that this work has a relatively broad focus on the

need of real-time CI and impact on decision-making, and there are several components that have a vast and interesting potential to delve deeper into. A topic that was not addressed in this work is that of *counter intelligence*, i.e. the protection of a company's own information (Marin & Poulter, 2004). This discipline is of high relevance in companies, considering the increased use of traditional CI and especially the potential use of real-time CI. Companies should be aware of how their actions result in potential useful information for competitors. Thus, counter intelligence aligned with CI is therefore topic that should receive increased attention in the upcoming years. Moreover, considering that real-time CI is a relatively new topic, the future and actual impact it has on organisations is still to be seen. For instance, if real-time CI becomes of common use in the competitive environment, it would be interesting to see how it actually impacts organisations and decision-making through different case studies and research, and possibly studies of firms that offer real-time CI solutions, as well as the technology behind it.

In regard to the interviews, it can be argued that there should have been more respondents. This was not possible due to time limitations and the difficulty of reaching out to people that are knowledgeable on the topic. However, the results from the interviews showed that all respondents argue for the need of real-time CI and that it can have significant improvement of a firm's performance, which answers to the objective of these interviews. Nonetheless, it would be interesting to see how, and if, different insights would diverge by including more people – or for instance, focusing on one specific industry, but this will be left with future research.

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10 Appendix

10.1 Questionnaire

Considering the competitive environment:

1. What do you consider to be the most important ability for an organisation's survival when it comes decision and strategy making in the long term?
2. Do you consider *informed* decision making and strategic planning as critical capabilities?
3. Have you experienced situations where a bad decision or planning was made because;
   a. Of time-pressure
   b. There was no information available to support the decision or planning
   c. The information was available, but the decision-maker was ignorant towards it
4. Do you observe or experience the need of easier access to real-time information to allow for rapid decision-making and execution?
5. Would you say that data turned into intelligence is provided in a timely and systematic manner for your company/other companies? Are there improvements to be made?

Say you had the opportunity to implement a system that would gather information on the external environment from a variety of sources and provide you with trustworthy intelligence in close to real-time

6. How do you think this could improve the performance of your company or a company?
7. Would you prefer to outsource a possible real-time CI system, or integrate the solution directly in a company? Do you see any organisational changes that must be implemented if integrated within the company (e.g. structure, process, culture)?
8. Would you say that real-time CI is going to be a differentiating factor between firms or simply a "must-have" for all firms?
9. Based on what we have been talking about and the current environment, do you see a potential need of real-time CI?

10.2 Responses

Q1	1.	Access to information. Knowledge- and information sharing routines and culture.
	2.	Minimize blind spots, i.e. be aware of unknown things, which is the most difficult issue.
	3.	Ability and culture to adapt fast to the changing environment and have the data to do so.
	4.	Strategic and quick decision-making. Focus on the fast-changing market. Challenge is to analyse the big trends in the industry and structure information in a way that it can be turned into tactics.
	5.	First *vision*, which requires understanding of a complex reality that cannot solely be extracted from the market. Secondly, the capability of extracting knowledge from the vast information that is available. Thirdly, understanding of the business and intuition isn't enough. Must build interpretation of the market, environment and competition on top of this.
	6.	Access to as much reliable information as possible from the market environment.
	7.	Creativity and the ability of taking different perspectives. Look outside your industry and have a wider perspective. Things you perhaps do not find relevant now, might be in the future.
	8.	Keep the people that are not afraid of risk. One thing is to collect, organise and analyse, but you must risk using it. If you lose these people, your organisation can be hardly affected.
Q2	1.	Yes. Assumptions of the market must continuously be questioned. Lot of companies have biased view towards the market.
	2.	Yes, in three different horizons: tactical, strategical and prospective.
	3.	Yes.
	4.	Yes. It is harder to do so now and because of that, it becomes a more relevant advantage.
	5.	Yes. Organisations that operate in competitive markets tend to be risk averse and it is therefore necessary with informed decision-making and strategy.
	6.	Yes. It is crucial to set up a strategy, vision and direction for a company. Must evaluate how strong, prepared and resourceful the company is for potential threats and opportunities that will come.
	7.	Absolutely. That is a given, also for the prior answer.
	8.	Yes.
Q3a	1.	Yes. Comprehension of a specific question is time consuming. Time pressure often makes you go with gut-feeling.
	2.	Yes. All decisions are made with short time frames and insufficient information.
	3.	Yes. Time pressure may lead to insufficient information and therefore wrong decisions.
	4.	Yes. Not one that caused big problems. It always resulted in some learning.
	5.	Yes. Opportunities come with short time frames in my industry, e.g. big decisions within 30 days where the rate of investment cost to time is high.
	6.	Yes. It is common because of time pressure. With experience from large multinational companies, my perception is that people usually think it is better to make a decision than no decision.
	7.	Yes, for me more on tactical level, but it is also seen on strategic level. From my experience in the telecom industry, strategy cycles are long and slow, as the processes are not set up to allow for rapid decision from a strategic viewpoint. Resultingly, you do not have a good decision support and you end up with time pressure.
	8.	Yes. Time-pressure can make you fail in seeing small important details, or you see them but don't have time to fix them. Time should be spared to follow up on these details.
Q3b	1.	In small industries, it can be difficult to get publicly useful information. Most information comes from specific deals, projects and human intelligence
	2.	Some of the main wrong decisions are in cases where companies target a specific market. They are not analysing in deep-sense whether it is the best opportunity or not.
	3.	You always need some information or data to identify a problem. Without it, it is difficult to make a decision.
	4.	When launching a new product that doesn't exist in the market, there is no real information about it. A decision must be made with anecdotal intelligence coming for customers, mentors and people involved in the company, without a proper intelligence.
	5.	Yes. From an acquirement of a portfolio of centers, one came out as a significant loss. The factors that influenced us was; (1) limited amount of time to study the portfolio; (2) difficulties in disassembling the portfolio; and (3) necessary information on competition to understand the feasibility of that property over time.
	6.	Very common. Especially combined with short time frame and limited information you can gather in that time. Should evaluate the extent of impact the decision has. Medium-long term, impact should postpone the decision until there is more information.
	7.	There is always some information. Poor or missing information can lead to bad decisions or planning.
	8.	That occurs quite frequently. Clients can come to me to because someone else failed to collect the information that was needed. Resultingly they either made a bad decision or postponed it because they are not confident with the data they have. It is a tricky subject, as postponing can represent millions of euros.
Q3c	1.	More about legacy than ignorance. People who have been in the same industry for e.g. 35 years, can have a biased view and rely on people or networks that aren't necessarily informed of the current state of things. For intelligence work, these people are somewhat of a disadvantage.
	2.	Yes, in many cases mainly from clients. The intelligence reports are often made by non-experts, and managers will eventually stop reading them because of the considered value and lower quality. Thus, they will not consider them for decision-making.

	3.	Very unlikely, but it may have happened.
	4.	We often suffer from the entrepreneurial optimist bias. Even though the data says one thing, it can be too much focus on the technicality of things as opposed to what the market is saying. Sometimes it goes well, but sometimes it doesn't.
	5.	Sometimes, we are not always permeable to information if it is somehow contrary to our beliefs or preconceptions.
	6.	Sometimes decision makers are biased. They base their decisions on perceptions or beliefs instead of factual information and data. Occasionally because of self-interest as the decision-maker doesn't have to risk as much from a bad decision as compared to the shareholders.
	7.	Yes. In most cases due to internal personal or political agendas, as they already made up their mind on a decision and ignore supporting evidence for contradictory decisions.
	8.	In general, it probably happens, but not in my case. Clients I deal with usually knows how to make good decisions once they have the right data.
Q4	1.	Yes. For our company, it is only possible to create this immediacy from an internal perspective. Immediate information is needed as things a moving more quickly than 10 years ago.
	2.	Only in the tactical horizon, which is oriented towards a real-time decision-making. E.g. launching of new products, changing market strategy etc. This is information that must be acted on faster than usual.
	3.	Yes, absolutely.
	4.	Yes. As an executive I am always thinking on how to access information in a seamless way that can impact my decision-making.
	5.	In an ideal world, yes. Would be interesting to the decision-making process if we could react more quickly to circumstances and detect or forecast on an earlier stage.
	6.	Yes, more and more. Trends change very fast from year to year. If they change like predicted (case of Accenture), it shows the importance of having up to date information.
	7.	Absolutely.
	8.	I do observe it often. However, you also need analysis of the real-time information and the value can increase if you do that in a more consistent way.
Q5	1.	A lot of things that happen are not on a regular basis. To respond to a problem, it takes time but will not be visible to other people. CI often lacks the real focus, also because of economic pressure.
	2.	We have our own systems for managing qualitative information to support decision-making, which is turned into intelligence in a timely and systematic manner.
	3.	Not perfectly. There is a need for tools or systems that allows me to do what I want to do in a more automated way. These tools exist, but I do not have the resources, either people or time to do it perfectly.
	4.	Not as structured as I want it to be and the processes aren't well-defined on the strategic side of things, which must be fixed in the future.
	5.	There are intelligence platforms available that can interconnect with big data and several diverse forces. I don't know of any practical examples yet. We are building it, but it takes times.
	6.	In Portugal, companies gather too little data and do not have real insights of actual status of their business. Even in large multinational software companies.
	7.	There was a tremendous lack of information in my former position.
	8.	That depends on the people doing it. Some are good at transforming information to intel, others just use figures which is not that good intel.
Q6	1.	I think it can have a phenomenal contribution. Having real-time reliable information coming in that can be considered for various workstreams can be very advantageous.
	2.	If it is considered in a time frame of one or two days, or even a week, it is very important for tactical information and consumption in a department level. It could improve the performance, especially in sales.
	3.	It depends on the type of information, but it always improves a lot. Especially in our company where we work with a lot of different countries.
	4.	Yes. The amount of value depends on the data. If you consider my direct competitors, customers, etc. it is incredibly relevant.
	5.	First on a marginal level and then strategic level. If I manage to tackle different levels of operational efficiency first, this will contribute to a more strategic level of decision-making for the company.
	6.	Depends on the skills of management and in the organisation. If you have this, and get real-time access to data, it is a big improvement in reducing the uncertainty of data, results and decisions.
	7.	If external and internal data can be accessed in real-time, it provides confidence in the data for decision support, and therefore trust. This can improve the performance.
	8.	Extremely important. With reliable and trustworthy information, you are ahead of everyone in your business if they cannot access the same information.
Q7	1.	Integrate it and have a dedicated role or half role with credibility and a solid network within the organisation that works on this. If the structure is hierarchical, it could lead to information flow problems etc.
	2.	You cannot outsource tactical decision support systems unless it includes social network management and communities in this idea. Tactical intelligence relies on collaboration between experts in a company and there must be a culture of collaboration. It is not a matter of structure.
	3.	Integrate within the company. For us, a structure must be implemented first and a process.
	4.	Outsourcing if it works well. If the only focus is on real-time CI, they would do it better than us unless we hire ten people. If integrated, there are necessary changes within the process
	5.	Integrate as we control the majority and the most important data sources, e.g. sales from tenants, foot flow and contractual data.
	6.	If integrated, you must have internal CI capabilities which requires financial and human resources. Today, these are scarce and expensive, and can become obsolete. It is easier for a third-party organisation to solely focus on real-time CI with updated system, the resources and skills. Will be more up to date than integration. If integrated, less hierarchical but more matrix structure. Must have a structure that allows for fast information flow.
	7.	Integrate it because of security issues with outsourcing. In my previous company, most systems were outsourced to an IT vendor that also was a competitor in some areas. In other words, how do you make sure they do not use the data? Integrations requires huge change management work, where processes and culture are the most important factors.
	8.	Depends on the philosophy of the company. If you subcontract to a smaller group or company that only does CI, it can be very flexible. Other companies can have a hard structure in which workers have to ask permission for every single thing. In these cases, outsourcing can be better.

Q8	1.	I do not think everyone would adopt it. It depends on who you ask, e.g. product manager would say yes, but financial manager would have to see the quantitative value.
	2.	Real-time decision-making is mainly for business sales and everyone must have it. Real-time CI is a necessity for departments working more on a strategical horizon (e.g. five months to a year), but the decision-making is not in real-time.
	3.	Must-have.
	4.	Must-have. You get attached from the market so fast which requires you to realign quickly, which is what real-time CI can do.
	5.	In Portugal, a differentiating factor. It requires investment levels that small/medium sized companies aren't capable of, probably for the next ten years.
	6.	Must-have, but it will be a differentiating factor. Not everyone will be capable of accessing it and CI is not yet perceived by all managers.
	7.	Differentiator in the short-term and must-have in the long-term when it becomes easier accessible.
	8.	Pretty soon a must-have. It will be easier adopted in industries with more resources, e.g. Pharma or Automotive. There are few and specific cases with limited information available because few people are doing it. Apart from these specific cases, all industries can use it.
Q9	1.	In specific areas. Automation is the most important factor, as it can save time and money. You cannot automate everything, but perhaps when AI grows further. If you would be able to gather targeted information, i.e. filtered, it is of high use.
	2.	There is a need of short-time decision-making within sales. There is a huge amount of information available and you need a software that automatically filters the information and allows for teams to collaborate for decision-support. For strategic decision-making, there is not as big of a need for *short-time* decision-making, but it real-time CI is still of high relevance.
	3.	I see the need of any real-time intelligence, both CI and BI.
	4.	Yes. In my work, especially for sales teams so they can get real-time CI about their prospects and potential customers. You can empower your employees with their own CI, so they can affect their own decision making and course correct daily.
	5.	Absolutely.
	6.	More and more. The amount of new data is increasing, and you must select the correct data and make treatment to give the right information. You need scrutiny and at the same time understand the fast change which can affect your business. Only if you can access this service, you will have power. Challenge is to understand the quality of information you are provided with.
	7.	Yes. Especially in tactical decisions. In strategic decisions it is also needed, but the real-time aspect is not as important as for tactical decisions.
	8.	Yes.