



Conceptual analysis of business intelligence

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The literature review shows that business intelligence (BI) has a long history even though its systematic use in the business context is more recent. Despite the importance of systematic BI, the concept is still trying to find a footing in both academia and the business world. From the literature review, one sees that there are numerous intelligence concepts and that their categorization is ambiguous. The BI concept is also multidimensional as there is no precise or universal conception of what BI is. The article aims to provide an analysis of BI definitions and related intelligence concepts, such as the content of each key concept, what it describes and how intelligence concepts relate to each other. Another objective of the article is to increase the academic understanding and status of this recent field of research on intelligence activities.

Key words: Business intelligence, conceptual analysis, definition, intelligence concepts

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1 Introduction

1.1 Identification of the research issue

Business terminology has been conversant with numerous business intelligence (BI) concepts since the late 1990s. Among these are complexity, references to the accelerating pace of change, globalization, information flow, new economy, networking and proactivity. These terms, and the new ways of thinking and acting that may be associated with them, have had a hand in the movement of society from a capitalist-driven to a knowledge-driven economy. In addition to the changes in society, advancing technologies and applications have wreaked remarkable change on traditional business models and operations. According to Pietersen (2002:9), running a business is now harder than ever because of the new rules of competition and the greater complexity and accelerated rate of change in the new economy. Because a good portion of economic theory dates from the time of industrialization, both the business and academic world are seeking new ways of increasing their business awareness and know-how in the information society.

Up-to-date information is a strategic resource for companies' and the basis for competitiveness in today's ever-changing business climate. Companies are forced to utilize information more effectively than before, and this is not possible without systematic information management. Information management consists of identifying what information is needed, how it should be gathered, how it should be organized, where it should be stored and who in the company should have access to it (e.g. Choo 1998; Tiwana 2002). The goal of information management is to maximize the usefulness of a company's information resources and to assess their value when making business decisions. BI is an approach for processing and enriching the essential information in the managerial context.

1.2 Research objectives

There is no common conception of the content of BI (Gilad 1996:4). Some scholars think of BI as being more like market intelligence (MI) or competitor intelligence that aim to gather and analyse useful information concerning the external business environment of a company only, for example the market situation, customers and competitors (Collins 1997:14; Mendell 1997:115–118; Sawka 1996:47–52). On the other hand, some ICT-focused actors in the information system market have used a BI-related concept in naming, for example, their data warehouse products (Kalakota and Robinson 2001; Moss and Atre 2003).

Fleisher and Blenkhorn (2005:281) state that intelligence research and education have been dwarfed by older and more established approaches in, for example, business, management, marketing and strategy studies. Overall, the academic research field of intelligence activities seems still to be very much in an emergent state (Badr and Madden 2006; Fleisher and Blenkhorn 2001; Prescott 1995) and there is a need to adopt more systematic methodologies before intelligence theories can begin to attain an established position and professional status.

A literature review and conceptual analyses are needed to understand the basis of BI and to place BI in the right context. The main objective of this research was to provide an analysis of BI definitions and the related intelligence concepts. Because several intelligence concepts are often used to describe the same phenomenon, the content of each key concept was examined, including what it described and how intelligence concepts related to each other. Also, the objective of this research was to increase the academic understanding and status this recent field of research.

1.3 Research method

The general aim of conceptual research is to construct and develop conceptual frameworks or systems that have no significance in themselves, but that serve a specific purpose. Conceptual frameworks, for example, are needed for describing new phenomena or categorizing and organizing information. According to Emory (1985:24), the describing or classifying is difficult because it is not easy to develop concepts that are accessible to others. Precise analysis and definition are required before a phenomenon can be quantified or measured. Hence, exactly defined concepts are a necessary starting point for successful scientific research. It is, however, noteworthy that, in everyday life, criteria for the definition of concepts in terms of their form and presentation are not as exacting as they are in science (Näsi 1980:5–7).

Typically, the methods used in conceptual research are thinking and analytical comparisons with existing literature and knowledge. Näsi (1980:17, 33) and Lukka (1991:167) state that a conceptual–analytical part is included in all research projects but that conceptual analysis can also be used as an independent research approach. Literature and conceptual research was done for this study to find theoretical foundations related to the research issue. A theoretical framework is provided in the article by analysing key definitions of BI and how BI relates to other intelligence concepts.

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2 Different views on business intelligence

2.1 Basis for a multidimensional concept

Typically, BI is defined as a managerial concept or a tool that is used to manage and enrich information and to produce up-to-date knowledge and intelligence for operative and strategic decision making (Ghoshal and Kim 1986; Gilad and Gilad 1986). The concept is not unambiguous but is at least dualistic, referring to the:

- **refined information and knowledge** that describe the business environment, a company itself, and its state in relation to its markets, customers, competitors and economic issues; and
- **process** that produces insights, suggestions and recommendations (i.e. the refined information and knowledge described above) for the management and decision makers.

In addition, **the information technology based systems** used in analysing raw data and information and in storing and sharing valuable information and knowledge are considered an important part of BI (Moss and Atre 2003). Some even see the technological approach as being just about all there is to BI (Kalakota and Robinson 2001:349–350; Raisinghani 2004:x–xv). In addition to the differences regarding the content, the definition of BI varies if the concept is defined from the perspective of an end-user or a BI supplier, for example. Because almost every author promotes his own idea of the content and meaning of BI, various definitions are discussed below.

2.2 How to define business intelligence

Although the BI concept has related to some kind of trend-like phenomenon since the 1990s, there is no generally accepted conception regarding what BI is. Mendell (1997:115–118) remarks that BI has always been an important part of the competing business world and therefore the core activities of BI are far from new. After all, the main idea behind BI

addresses very old managerial problems and the activities include nothing new: it is one of the basic, most self-evident tasks of most management tools. The roots of BI lie in, among other areas, military planning and thinkers (Sun Tzu 1988). Intelligence has been a significant factor in military success for thousands of years (McCandless 2003:46) and military plans and strategies have typically been based on monitoring, scouting and analyses (Prescott 1995; Bavendamm 1998). The genesis of BI is, however, more recent in the context of commerce and business (Fleisher 2001:4).

In the 1980s, Ghoshal and Kim (1986:49) considered BI an activity within which information about competitors, customers, markets, new technologies and broad social trends is gathered and analysed. Around the same time, Tyson (1986:9) identified the BI concept as an analytical process by which raw data are converted into relevant, usable and strategic knowledge and intelligence. In his definition, Tyson emphasizes the need for the continuous monitoring of customers, competitors, suppliers, actors and forces in other fields. According to him, BI comprises a variety of types of intelligence:

- Customer intelligence
- Competitor intelligence
- Market intelligence
- Technological intelligence
- Product intelligence
- Environmental intelligence.

Collins (1997:4) recognizes BI as a process by which information about competitors, customers and markets is systematically gathered by legal means and analysed to support decision making. The raw data gathered are converted into accurate and focused analyses. Miller (2000:13) defines BI as including the monitoring of developments in the external business environment. According to Prior (2004:4), BI is a combination of any data, information and knowledge concerning a company's operational environment that leads to decisions creating competitive advantage for the company, while Sawka (1996:47–52) states that BI specially focuses on the gathering of external information and the prediction of changes in the markets.

The aforementioned definitions neglect the importance of internal information. Besides screening the external environment, BI involves the information inside a company. According to Brackett (1999:1), BI is a series of concepts, methods and processes that enable, for example the monitoring of economic trends and effective utilization of information in strategic and tactical decision making. The required information is gathered from both internal and external information sources, and Brackett issues a reminder of the value of information concerning the experiences and hypotheses of employees. Barndt (1994:22) emphasizes the role of internal information in BI, because, in his opinion, decision making is based mainly on a company's strategy, resources and operational opportunities. Herring (1992:54–60) stresses that BI yields information for both internal and external information needs. The definition of Hackney (2000:39–42) focuses solely on internal information. He states that BI includes all activities through which internal information is analysed, stored and shared. In summary, **the main idea in BI lies in identifying information needs and processing the data and information gathered, into useful and valuable managerial knowledge and intelligence.**

According to Vitt, Luckevich and Misner (2002:13–22), BI is more than a management philosophy or an enabling technology. They consider BI an ongoing cycle; it is a performance management framework via which a company sets goals, analyses development, gains insight, takes action, measures success and begins all over again. They define a BI cycle as a progression from analysis to insight to action, and finally to

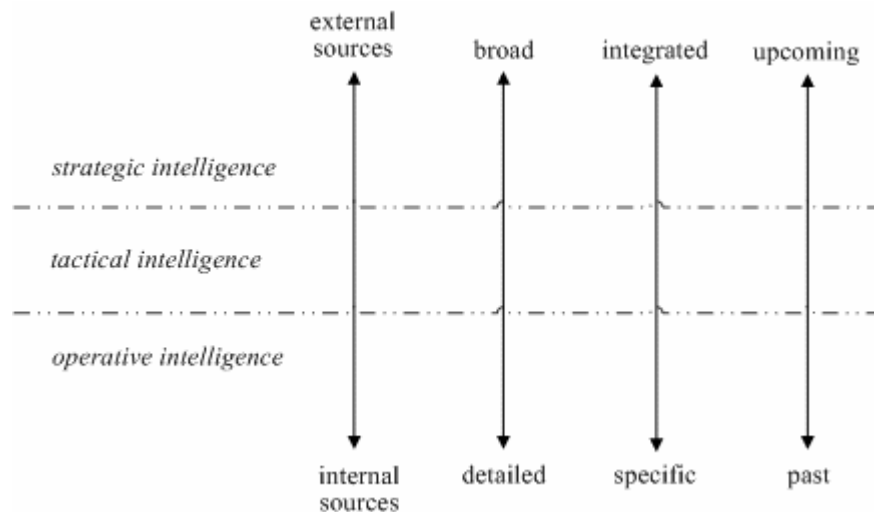
measurement. Vitt *et al.* (2002:14–16) state that BI is an attitude toward problem solving and rational management and, in addition, they emphasize the relationship between BI and strategy. The role of human-source intelligence should not be dismissed, although rationality is emphasized in their definition. Also, Thomas (2001:48–49) defines BI as, above all, a systematic process that gathers, analyses and classifies the flow of significant information. He emphasizes that a BI cycle is a process wherein sources of information, including published information and information from human sources, play a central role. In addition, he states that the development of information and communication technology has increased the value of BI in decision-making processes but that BI as a way of action was found much earlier.

The perspective of Kalakota and Robinson (2001:161) differs from the former definitions. They define BI as a group of applications that enable both the active and passive delivery of information. Data and information are collected from large databases, providing an enterprise and its managers with timely answers to mission-critical questions. In other words, the objective of a BI system is to turn raw data into actionable intelligence. Kalakota and Robinson argue that the growth of BI stems mainly from the demand for more competitive business knowledge and growth in electronic data capturing and storage. Their view is supported by Thierauf (2001:xi–xii), who points out that a BI system converts captured data, information and knowledge into valuable intelligence. Thierauf considers BI systems to be the latest thrust in information systems. A BI system is an effective aid to decision makers for getting the full picture of a company's capabilities and external operating environment. The perspective applied in Raisinghani's (2004:x) definition is also technology oriented. He defines BI as a common noun for technical applications, software and tools that enable the more effective processing of information.

2.3 Levels of business intelligence

Waters (1996:41) defines BI as a legal and ethical tool in examining strategic changes and options. According to him, BI is becoming a necessity in forming a holistic picture of the business environment. While Waters (1996), Gilad and Gilad (1986:53) and Buskard, Glassey, Mollot Richards (2000:46–47) emphasize the strategic role of BI, Buskard *et al.* (2000:46–47) remark that BI is not a separate technology or application but a series of productions that includes both analytic tools and the information required. McGonagle and Vella (1996:18) illustrate the different roles of BI by dividing BI into three levels: strategic intelligence, CI and MI. Also, Thierauf (2001:66–67) categorizes BI into three groups: strategic intelligence, tactical intelligence and operational intelligence, as illustrated in Figure 1.

Figure 1 Levels of BI (McGonagle and Vella 1996:18; Thierauf 2001:66)



According to Thierauf (2001:66), the information needed varies with the BI level but financial intelligence is required at every level. Thierauf defines the character of the information needed more exactly than McGonagle and Vella (1996:18) in their illustration. Thierauf states that strategic decision makers most need extensive and enriched information to manage upcoming operations and steer the course of a company. At the operative level, more detailed, history-specific information is required to implement daily activities. Between the strategic and operative level is the tactical level, where the data are gathered and enriched.

Thierauf uses the grouping of internal and external information in his framework: information from external sources is emphasized in strategic decision making, whereas the focus of the operational level is on internal sources. On the other hand, information from internal sources is also needed in strategic decision making and external information sources at the operative level. For example, strategic decision makers have to perceive resource sharing and management in the context of long-term strategic planning, which necessitates that they have enough information from internal as well as external sources. At the operative level, the marketing and research and development departments need information from external – not just internal – sources on, for example, markets, trends and customers.

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3 Concepts related to business intelligence

3.1 Business intelligence, competitor intelligence, or competitive intelligence?

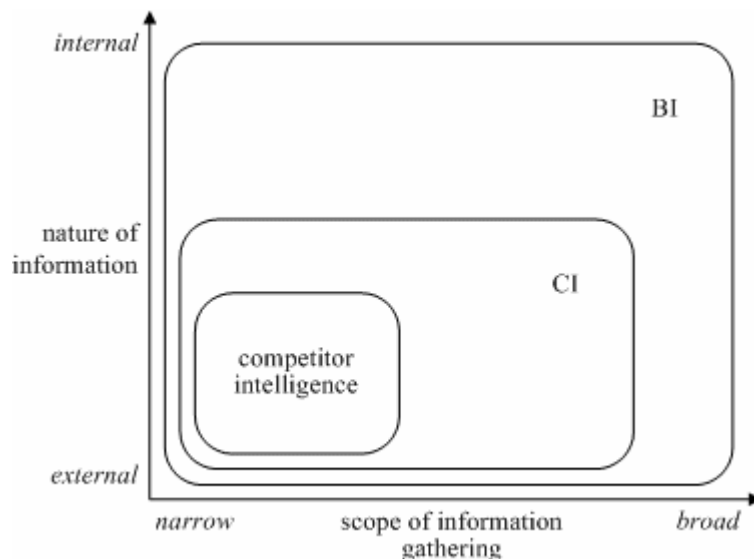
Related intelligence concepts include, for example, CI, competitor intelligence, customer intelligence, MI, strategic intelligence, product intelligence and environmental intelligence. Lately, the counterintelligence and technology intelligence concepts have appeared more and more often in the context of BI. Several of these intelligence concepts are sometimes used in a context similar to BI. However, most of them focus mainly on the external environment and gather information from external sources (Cottrill 1998; Fuld 1995; Kahaner 1996; Vibert 2004). The content of BI is generally defined as more extensive, with other intelligence concepts considered to be subgroups of BI (Fleisher 2001; McGonagle and Vella 1996; Tyson 1986). On the other hand, almost all of those intelligence concepts share the same purpose as BI (Weiss 2003:49; Casado 2004:127) and aim to turn raw data and information into valuable knowledge and intelligence (McGonagle and Vella 1996:202; Tyson 1986:9). **The difference between BI and related intelligence concepts often vacillates because the way intelligence is managed and enriched stays mainly the same**

and the term applied refers to the specific type of intelligence required in a particular company or situation. Hence, activities in managing and enriching information and knowledge remain essentially the same regardless of the designation.

In the literature, Combs and Moorhead (1992:3) and Gilad (1996:4) define CI as an alternate concept for BI, whereas Mintzberg (1994), Pirttilä (2000:13, 20–21, 186), Choo (2002:86–87) and Weiss (2003:49) consider CI a part of BI because the scope of BI is broader than CI's. Miller (2005) states that CI includes competitor and market information but also information concerning a company itself and its possibilities and weakness. This description is very similar to the definition of BI in that it also involves the perspective of internal information.

McGonagle and Vella (1996:40) present CI as having been known as BI earlier. They define CI as a process by which external information is gathered from external sources and that CI includes information concerning a competitive situation, competitors, market and strategy. The definition put forth by Cook and Cook (2000:5) is similar, but they emphasize the role of competitor information in CI. Bernhardt (1994:13) states that CI is strategic information about the competitors' plans and that, therefore, a company needs market and industry information rather than just competitor information. Mintzberg (1994), in turn, uses the concept of competitor intelligence as a synonym for CI. Typically, however, competitor intelligence is discussed as a sub-activity of CI because CI is considered to involve competitive and market information in addition to competitor information (Choo 2002:86). In Figure 2, the relationship between BI, CI and competitor intelligence is illustrated.

Figure 2 Relationship between BI, CI and competitor intelligence (based on Choo 2002:88; Fleisher 2001:4–7; Fleisher 2003:62; Weiss 2003:49)



According to Choo (2002:86–88), BI has the broadest scope among intelligence concepts. It needs information from several sources and its uses are various. In addition, strategic, long-term decisions are based on information produced by BI. In the left top corner of Figure 2, narrow internal information includes company-specific information such as key figures and financial accounting information. Hence, BI covers the whole relevant environment of a company, not just the company itself, while the scope of CI is narrower, covering several elements of the external environment, such as competitor, industry and market; CI mainly helps a company to assess the competition and market conditions. Choo (2002:86–88) states that competitor intelligence literally focuses just on competitors. Because the information gathered is narrowly focused, competitor intelligence aims to facilitate decision making

especially at tactical level. Competitor intelligence is typically something that interests the sales and marketing functions, but it can be used in strategic decision making also. Fleisher (2003:62) and Weiss (2003:49) also position CI somewhere between BI and competitor intelligence because the focus of CI is especially on the competitive environment and the improvement of a company's competitiveness.

3.2 More intelligence concepts

The most popular term worldwide for systematic activities to collect and analyse information related to the external environment is 'market research' (Global Intelligence Alliance 2005). Waters (1996) states that BI is not equivalent to market research because market research primarily estimates what customers might buy on the basis of past habits. According to Fleisher and Bensoussan (2003:181), MI is industry-target intelligence that mainly focuses on the dynamic developments related to place, price, product and promotion and thereby aims to find more profitable market segments. Hence, the focus of MI and market research is on a specific information need and the time horizon is typically short, varying from days to months, whereas BI aims to find out what kinds of changes may occur in the various aspects of a company itself and its business environment and how they will affect the company's business in the long term. In addition, the results of MI and market research are not distributed as widely as BI and CI products; typically they are used by marketing and sales managers (Fleisher 2003).

The content of the customer intelligence concept does not differ notably from that of market research and MI. In simple terms, all examine the buying behaviour and profitability of customers and products. However, the view of customer intelligence is not as broad because it includes information about individuals. Collins (1997:95) defines customer intelligence as 'knowledge of customers' organisation, requirements, purchasing activities, strategies and plans as it relates to the products or services offered by a company and to particular purchase decisions.' According to Davis (2003:147), customer intelligence aims to measure the profitability of customers, products, services and advertisements.

According to Miller (1996:200) and Liebowitz (2006:14), 'strategic intelligence' (SI) is a term used in strategic planning and strategic management. It aims to understand where a company is going, how it can retain its competitiveness in view of future challenges and changes in the long term (Thierauf 2001:191, 195) and how it can make the best strategic decisions for maximizing its success (Liebowitz 2006:14, 22). Hence, SI especially addresses the intelligence needs of high-level strategic decision makers and the focus is mainly on proactive activities. The concepts of environmental, product and technology intelligence are not yet in wide use but intelligence related to these concepts is valuable nonetheless in decision making and the creation of successful strategies.

Although there are several intelligence concepts, all of the terms emphasize the role of ethics and the legality of intelligence activities (Cook and Cook 2000:7–8; Fleisher 2001:4–5; Hamilton and Fleisher 2001; McGonagle and Vella 2002:35; Miller 2005). Miller (2005:3) states that an intelligence activity is a failure if there is any sign of industrial espionage. The basic principle of intelligence activities is to gather information only from open and ethical sources. Even if industrial espionage is generally considered unethical, a company has to notice that there may be some intelligence work acting against its interests. The concept of counterintelligence has become more general in recent years. It refers to activities protecting against the loss of critical information (Dutka 1999:295; Nolan 1997:58). With counterintelligence, a company can realize which information is most valuable and critical for its business and protect it against attacks by competitors (Barrett 2001:29; Pattakos 1997:72–73). Hence, counterintelligence activities are partly contrary to BI activities, with the focus being on protection of information assets. It is noteworthy that a company can

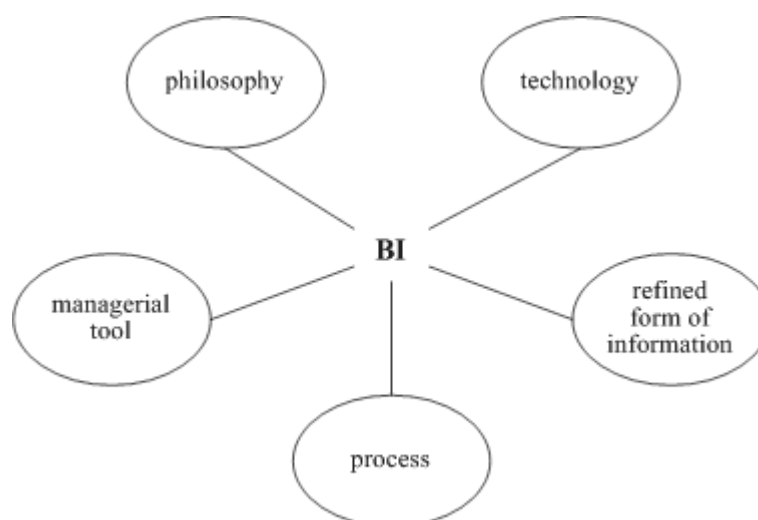
spread disinformation. This, too, involves counterintelligence activities and thus a company must be critical enough as well as ethical.

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4 Conclusion

Amid today's rapid change, timely and relevant information has to be gathered and processed for business decisions and for business evaluation and strategy in a systematic way instead of in random and haphazard ways. Despite the importance of systematic intelligence activities, they are still trying to find a footing in both academia and the business world. From the literature review, one sees that there are numerous intelligence concepts and that their categorization is ambiguous. Also, the concept of BI is multidimensional. There is no precise or universal conception of what BI is; on the contrary, each author has promoted his own idea of its connotations. In this article BI is defined as **an intelligence process that includes a series of systematic activities, being driven by the specific information needs of decision makers and the objective of achieving competitive advantage**. Other intelligence concepts are considered as components of BI. In Figure 3, the most typical viewpoints of BI are illustrated.

Figure 3 Main areas of BI (Pirttimäki 2007)



The conceptual analysis shows that the content of BI definitions has not varied much from the 1980s to the present, although there is no established or widespread definition and the choice of content is writer-specific as authors tend to promote their own emphases. Newer definitions are in line with the old, although the possibilities provided by information technology have developed a great deal. This may be a sign that **BI is more like management philosophy or a managerial tool and that technology is indeed an enabler of BI**. Technological advances add considerable value to information management and thus their significance is certain, but BI cannot be utilized effectively through the application of technical solutions alone. It is also noteworthy that, since each company is unique and BI is highly situational and company specific, it is important to view BI within its own setting.

BI has much to do with a company's ability to refine raw data and information efficiently into relevant and valuable knowledge and intelligence. It is important to note that the role of BI is not only to provide a solution when a specific decision has to be made but also to help decision makers find the right questions to ask and to aid them in questioning prevailing assumptions and opinions. The need to continue the study of BI seems to be obvious from both the academic and business perspective. There is especially a strong need to confirm the

academic research done in the field of BI because of the resistance to accept theoretical frameworks. Additional value comes mainly from efficient methods and practices in improving and systematizing information management and decision making.

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