

The Relationship between Business Intelligence and Business Success: An Investigation in Firms in Sharjah Emirate

Rashad Al Saed

Skyline University, Sharjah, UAE

The aim of this study is to analyze the extent to which there is relationship between business intelligence and Business Success. Four dimensions of business intelligence as Environmental Intelligence (EI), Consumer Intelligence (CI), Market Intelligence (MI) and Organizational Intelligence (OI) are measured, using survey data from (49) managers of different firms in Sharjah Emirate, UAE, the ninth surveys were cancelled because they were incomplete. We used regression and correlation analysis to test the relationship between business intelligence and business success. The results indicate that there is a positive relationship between the business intelligence and business success. Managers are in general satisfied with the business intelligence system in their organization but they are mainly unsatisfied with marketing activities done by their marketing departments, study gives insight to important of business intelligence to a success of business and it implies that marketing intelligence is critical dimension in business intelligence.

Key Words: Business intelligence, competitive intelligence and perceived business success

Introduction

Today's success does not tomorrow success. Indeed, as D'Aveni (1995) suggests, it is most likely that success follow failure than success follows another success. This probability of failure may be associated with an increased in recent years, from environmental disturbances and an increase in competition or intense competition. This increase in the unrest, competition, uncertainty and is a key ingredient for the emergence of Business Intelligence (Cavalenti, 2005) environment produces the forces of the significant impact that can determine the success or failure of the enterprise. History provides many examples.

It is essential that senior managers are committed to the concept of market orientation and fully understand the role of market information and sound overall intelligence. Strategy formulation and implementation necessitates the active participation and commitment of staff throughout an organization (Clark, 2000). Companies need intelligence-gathering capabilities to keep up the pace with technology development including both formal processes and information systems and informal systems that involve employees and senior managers to have the responsibility to the company to gather, disseminate and interpret technological information (Tyler, 2001) Information is considered the most valuable asset of any organization regardless of the size of that organization. Every operation that organizations perform generates many raw data. For instance, a simple sale of any product

could generate huge amounts of data, like date of sale, price, discount, customer name, address, other demographic details like age, gender, which sales representative sold the product, when the product was manufactured, raw materials, supplier information, and so on. This raw data has to be converted into useful information for the decision makers in order to improve performance of the organization. Considering the fact that there are numbers of different business processes within any organization, there is a definite need of a sophisticated information system. Secondly, the availability of the right information on the right time to the right person is another most challenging goal for any organization. It is therefore interesting to ask what leads the organization down the road to success and factors that contribute to this success. With this in mind, the goal of this paper is to explore the relationship between Business Intelligence and Business Success and which factors of intelligence business contribute directly to business success, beside that to check if the results of this study comply with other previous studies

Literature Review

To examines the evolution of Business Intelligence and its links with Strategic Foresight and Futures Studies techniques in pragmatic applications. Scholars distinguish between four key intelligence categories. In order to evaluate the application of BI and its

linkage to many techniques in the organizations, following literature summary was consulted. There was no literature available few years back but now to this rapid magnitude of BI, the literature available on the following area:

- Competitor Intelligence focuses on inter-firm rivalries for brand and strategic positioning.
- Competitive Intelligence (CI) is defined by Ian Gordon as a method 'to develop strategies to transfer market share profitably. John McGonagle Jr. and Carolyn Vella believe that CI orientates managers to 'fine tuning your business planning process. Leonard Fuld defines CI as 'highly specific and timely information about a corporation.
- Business Intelligence (BI) uses information systems and transaction databases to provide decision-making support and transform data into intelligence within a rational management framework Herbert Mayer, vice chairman of the Central Intelligence Agency's National Intelligence Council, defines BI as the 'radar for business
- Social Intelligence (SI), spearheaded by University of Lund professor Stevan Dedijer, tracks the diffusion of these capabilities into broader social contexts and across longer timeframes.

BI and CI writings dominate popular writings on business management. Companies use these techniques as a form of market intelligence that 'focuses on monitoring trends in the market to identify future problems and opportunities, and provides a company with the information necessary to maneuver in advance of the change in the market. Defensive intelligence targets blind-spots by 'analyzing your own business's activities as your competitors and others see them. Convergent technologies including e-mail, pagers and cell phones have been used by one-to-one marketers as proactive intelligence. Company executives also have growing awareness of the need for counterintelligence against competitors and industrial espionage Global companies use risk analysis to assess the 'general background that a company needs to know to operate securely in an unfamiliar environment. There exist many professional definitions of BI; however none of them is a standard. Business Intelligence is rather an umbrella term for a broad category of applications and technologies for gathering, storing, analyzing, and providing access to the data, there is little research available on BI but not enough to comprehend the standard as required by modern companies as its supported by Turban, et al. 2006, 423). Definitions usually encompass personal and group DSS, EIS, data warehousing, and knowledge management systems. Despite the tremendous interest in business

intelligence, there is no generally accepted definition. BI has been used in at least two different contexts: as a system and a process. As a system, BI has been equated with decision support systems and executive information systems (Gray, 2005). As a process, BI has been defined by the Data Warehousing Institute as a process of turning "data into information and information into knowledge and plans that drive effective business activity" (Eckerson, 2003, p.5). While there are merits to both perspectives, a more complete view of BI is that it is a discipline that can be described by both a process and a system, although the system is broader than a traditional decision support or executive information system. This discipline is distinguished by the use of data analysis tools and analytical approaches designed to understand, predict, optimize, and take action based on current and future business activity. This work employs technologies such as data and text mining, geographic information systems, language translation, statistical analysis, predictive modeling, simulation and advanced visualization. This broad view of BI allows companies to transform data into actionable insight to achieve strategic goals in customer relationship management (CRM), supply chain management (SCM), and quality assurance such as Six Sigma. Support for the discipline view of BI can be found in the BI competence center being established in leading global corporations (Beal, 2005). For organizations contemplating BI initiatives, unfortunately, there is little published research that describes the practices and prescribes solutions that are supported by empirical data. Currently, only a few white papers authored by practitioners have examined BI from the perspective of IT professionals (Eckerson, 2003; KCR Research, 2004). However, BI has evolved beyond just an IT issue and requires organizations to consider the people and business issues involved (Betts, 2005). In a comprehensive review of the literature, Jourdan, Rainer, and Marshall (2008) noted that theory formulation/literature review had been the dominant research strategy in the last decade. They call for more survey research, especially research on the benefits of business intelligence.

Business intelligence is required to support different organizational activities. Corporate managers consider BI as of their top solutions in dealing with modern management setup. as supported and identified by (Prescott & Miller, 2001). The Society of Competitive Intelligence Professionals defines intelligence as a process of ethically collecting, analyzing and disseminating precise pertinent, specific, opportunistic, predictable and actionable information about the business environment, competitors and the organization itself (SCIP, 2003). The essence of intelligence begins with environmental scanning activities, also known as

surveillance. The essence of this process is a transformation of data, information and knowledge into intelligence as a final product. Unfortunately differences of opinions among intelligence professionals and business managers may be hindering the development of business intelligence. Academics and intelligence professionals appear more concerned about process and technical aspects while business managers are more interested in the results of intelligence activities, and their impact on business (Prescott and Miller, 2001; Herring, 1999). (Vezmar, 1996); vital for strategy (Pepper, 1999; Gieskes, 2000; Hovis, 2000; Marceau and Sawka, 1999; Tessun, 1997); fundamental for proactive behavior and competitive advantage (Miller, 2000); an absolute imperative for business (Prescott and Miller, 2001); and fundamental for the success of business (Herring, 1999, Flynn, 1996; Shaker and Gembicki, 1999; Lackman et al., 2000bh; Hart et al., 1999). It is possible that this acceptance of intelligence activities is associated with positive results. However, environments with higher levels of turbulence necessitate an increased ability to undertake intelligence activities or manage weak signals (Ansoff and McDonnell, 1993). This fluctuation in turbulence gives rise to an important pursuit - organizational equilibrium as measured by the difference between external and internal velocity changes. To maintain equilibrium, internal velocity should be increased and follow modifications to the environment. In this regard, role of business intelligence is to change managerial focus from a reactive stance to a proactive one.

In addition, business intelligence supports administrative activities in a much different way than traditional mechanisms. On the other hand despite these apparent benefits; the practice of business

intelligence may not be meeting expectations. Corporate managers are still not completely satisfied with their intelligence systems (Prescott and Miller, 2001; Lackman et al., 2000; Harkleroad, 1998; Miller, 2000), even if the problem is sometimes related to conjectural conditions, to intelligence professionals, to users or to business itself (Miller, 2000; Betts, 1989; McGonagle and Vella, 1999; Breeding, 2000; Marceau and Swaka 1999). Yet, insight from the management literature suggests a positive correlation between business intelligence and business development. Therefore, the underlying quest of this study is to explore the relationship between business intelligence and business success. This leads to the first hypothesis Business intelligence results from efforts to capture, analyze, and interpret information relevant to the many functions of a business operation. Oliveira and Cavalcanti (2002) captured this idea by suggesting that behaviors, which signal the practice of BI, include monitoring the business environment, avoiding surprises, proactively seeking out opportunities and, above all, improving one's competitive advantages. Therefore, the aims of this study is to examine the relationship between business intelligence and business success.

Research Model and Hypotheses

Based on literature review and different concepts of researchers, the author proposed the following framework to get results of the research, the framework explores if there is a relationship between four components of Business Intelligence and Business Success? And which of these components contribute directly on the success of business?

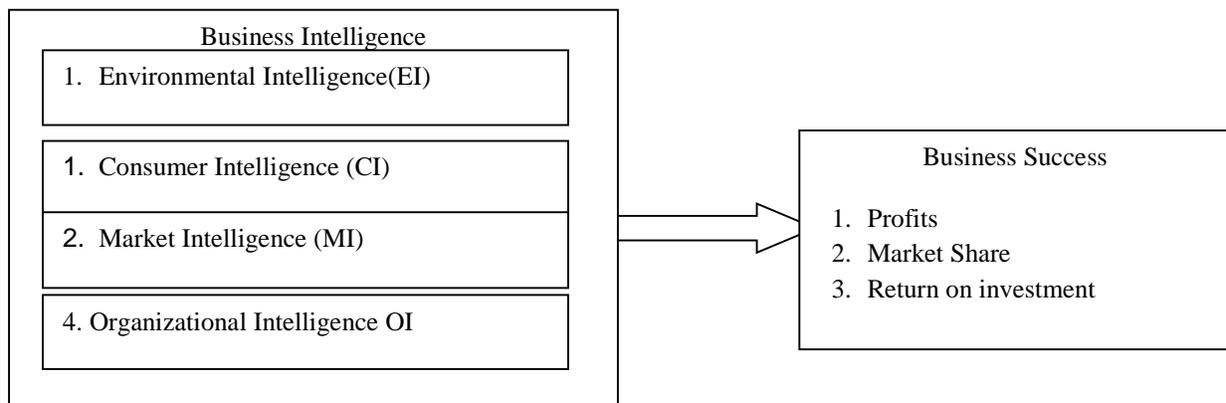


Figure .1 Conceptual Frameworks.

From the above framework fig 1 one main hypotheses and four sub-hypotheses were derived.

- H1 –The relationship of Business intelligence is positive to business success.

The above main hypotheses lead to four sub-hypotheses, which are:

- H1a: The Environmental Intelligence is positive with business success
- H1b: The Market Intelligence is positive with business success
- H1c: The Consumer Intelligence is positive with business success
- H1d: The Organizational Intelligence is positive with business success

Methodology

This study was conducted in 40 firms in the Sharjah emirati. This sample contained almost 50% of different firms working in sharjah Emirate. These firms were chosen due to a higher probability of involvement in the phenomenon being studied (Analoui and Karami, 2002). The Cavalcanti and Oliveira model (Cavalcanti, 2002; Oliveira and Cavalcanti, 2002) formed the basis of the study. This model offers elements to measure the level of business intelligence activities and contains the following variables:

- Environmental Intelligence(EI) refers to the economic, technological, social, political, legal and natural environments;
- Market Intelligence (MI) refers to direct competitors, indirect competitors, suppliers and partners, distributors, products, market structure, and market conjecture;
- Consumer Intelligence (CI) refers to present day transaction clients, real consumers, potential clients, demographics, psychographics, interchange of information and knowledge, and rising tendencies of the targeted public;
- Organizational Intelligence (OI) refers to the marketing and sales, production, research and development, finance, human resources, and general administration functions;
- Business Intelligence (BI) refers to EI, MI, CI, and OI grouped together.

For each of the variables an ordinal Likert scale of Five points was used, varying from 1 – no level of

intelligence to 7 – high level of intelligence. Using a quantitative approach, the research also used qualitative methods to evaluate the relationship between the levels of business intelligence and the perceived success of the business. The unit of analysis was the organization, represented by the perceptions of top managers. The collected data was analyzed by quantitative and qualitative means. Each hypothesis was tested using at least two statistical procedures.

Limitations

The researcher faced a lot of problems in collecting data due to the following factors

1. There is no fixed statistical bulletin as reference for the total number of the largest enterprises in Emirate Sharjah.
2. The response remained very weak from 80 surveys sent to 80 managers, only 49 managers respond, nine surveys cancelled because it was incomplete.

Sample and data collection

Sample Collection

The sampling frame was taken from the CD-ROM database, which includes all incorporated UAE companies in Sharjah Emirate. We randomly sampled independent firms from four sectors—knowledge-intensive manufacturing, labor-intensive manufacturing, professional services, and retail. A total 80 business managers from the sampling frame were contacted of which first 40 responded to a telephone interview and then to a mail questionnaire. Hence the sample size for the present study has to be treated as 40. The final sample, therefore, consists of Small business managers (overall response rate of 50 percent.

Reliability and validity

Reliability of the multi-item scale for each dimension was measured using Cronbach alphas and composite reliabilities measures. Both measures of reliability were above the recommended minimum standard of ([Bagozzi and Yi, 1988], [Baker et al., 2002] and [Nunnally, 1978]). For all twelve dimensions, both measures of reliability are below in table.1

Table 1 summarizes all measurement items, Cronbach alphas, composite reliability, and their scales for all the items which indicates positive

Table 1: Measurement items and reliabilities.

Construct	Dimension	Item	Cronbach alpha	Composite reliability			
Entrepreneurial orientation Business Intelligence (BI)	Environmental Intelligence (EI)	Understanding the changes of economic situation leads to business success	0.75	0.76			
		Understanding and using the new Technology leads to Business success	0.75	0.76			
		Understanding the social needs leads to business success	0.75	0.76			
	Market Intelligence (MI)		Good knowledge and information about competitors leads to Business success	0.828	0.83		
			Knowing the competitors strategies, campaigns leads to business success	0.828	0.83		
			Understanding the direct competitions and indirect competitions, activities leads to business success	0.828	0.83		
			Understanding the Competition market structure leads business success, administrative techniques, operating technologies, etc	0.828	0.83		
			Good knowledge and information about suppliers and distributors leads to business success	0.828	0.83		
			Consumer Intelligence (CI)		Understanding the real customer's number and their needs leads to business success	0.77	0.79
					Understanding the potential customer's number and their needs leads to business success	0.77	0.79
Knowing the demand volume of the market influenced my business success	0.77	0.79					
Organizational Intelligence (OI)		Demographic and psychological factors of customers information leads to the business success	0.77	0.79			
		Responding measures of our customers is very important for business success	0.77	0.79			
		The activities of the different departments in this business unit are well coordinated	0.73	0.74			
		Data on customer satisfaction are disseminated at all levels in this business unit on a regular basis	0.73	0.74			
		Marketing personnel in our business unit spend time discussing customers' future needs with other functional departments	0.73	0.74			
Business Success (BS)	Return on investment	When we find that customers would like us to modify a product or service, the departments involved make a concerted effort to do so	0.73	0.74			
		There is minimal communication between marketing and manufacturing departments concerning market developments	0.73	0.74			
	Market Share	When one department finds out something important about competitors, it is slow to alert other departments	0.73	0.74			
		Relative to other products of our firm, this one has a better return on investment	0.842	0.86			
	Profit	Return on investment	Relative to our competitors' products, this one has a better return on investment	0.842	0.86		
		Market Share	This new product has succeeded in achieving its main objectives	0.842	0.86		
	Market Share	Relative to our competitors' products, this one has a better growth in sales volume	0.842	0.86			
	Profit	Relative to our competitors' products, this one has a better profits this year	0.842	0.86			

Analysis and results

The results of table 2 show that the Marketing intelligence is the lowest result which (3.61) compared to other results variables this indicates that the managers of organizations are not satisfied with their business intelligence system they have. Mainly with

Marketing intelligence which represent the internal environment. This results did not match the other results of other studies, (Harkleroad,1998) and (Elmano,2005) which shows the lowest result for customer intelligence that mean managers are not satisfied with customer intelligence system.

Table 2: The Median and Standard Deviation of Business Intelligence and Business Success

intelligence	N	Median	Standard Deviation	Valor	
				Min	Max
BI	36	3.78	0.77	1	5
EI	36	4.15	0.78	2	5
MI	36	3.61	0.89	1	5
CI	36	3.98	0.84	1	5
OI	36	3.90	0.94	1	5
BS	36	3.9	0.81	2	5

The above result of table 3 show that person R for business intelligence variables are (.046,0.46,0.044 and 0.44), Kendall results are (0.016,0.049,0.016and 0.046) and spearman results are (0.044,0.045,0.038

and 0.042) which are less than 5 percent. So there is a relationship between the business intelligence and the business success, beside that the business intelligence variables show similar results.

Table 3: Relationship between Business Intelligence and Business Success

Intelligence	N	Person		Kendall		Spearman		Relationship
		R	Sig	T	Sig	Rho	Sig	Yes (P<0.05)
BI								Yes (P<0.05)
EI	36	0.148	0.046	0.122	0.016	0.139	0.044	Yes (P<0.05)
MI	36	0.178	0.046	0.158	0.049	0.164	0.045	Yes (P<0.05)
CI	36	0.154	0.044	0.135	0.016	0.155	0.038	Yes (P<0.05)
OI	36	0.153	0.044	0.131	0.046	0.198	0.042	Yes (P<0.05)

Testing hypotheses

From table-4, it can be inferred that the F value of 6.115 is found to be significant at 5 percent level. This confirms that the Business intelligence system of the firm related with Business Success. Out of the above all influencing factors the t value of 1.75 for Consumer intelligence (CI) and the t value of 1.746 for organizational intelligence (OI) were found to be significant at 5 percent level. Also from the adjusted R

square value of 0.406, it can be confirmed that 46 percent of the Business intelligence are defined by four major factors of business intelligence such as Environmental Intelligence (EI), Market intelligence (MI), Consumer intelligence (CI) and organizational intelligence (OI). Based on these results the main hypothesis and its sub-hypotheses are accepted which mean that there is relationship between the business intelligence and business success.

Table 4: Testing Hypotheses:

Model 1		Un standardized Coefficients	Std. Error	Standardized Coefficients	t	Adjusted R Square	F
		B		Beta			
	Constant	30.76	5.422		5.671*	0.406	6.115*
	Environmental Intelligence (EI)	0.561	1.381	0.450	0.423		
	Market Intelligence (MI)	0.316	1.097	0.133	0.240		
	Consumer Intelligence (CI)	1.112	1.040	0.130	1.750*		
	Organizational Intelligence (OI)	1.134	1.140	0.129	1.746*		

*Significant at 5 percent level.

Findings

In general terms, hypothesis 1, which suggested, that the Business intelligence system of the firm related with Business Success was supported with data in table 4 which shows that out of the above influencing factors the t value of 1.75 for Consumer intelligence (CI) and the t value of 1.746 for organizational intelligence (OI) were found to be significant at 5 percent level. Also from the adjusted R square value of 0.46, it can be confirmed that 46 percent of the Business intelligence are defined by four major factors of business intelligence such as Environmental Intelligence (EI), Market intelligence (MI), Consumer intelligence (CI) and organizational intelligence (OI). Based on these results the main hypothesis and its sub-hypotheses are accepted which means that there is a positive relationship between the business intelligence and business success. The Median and Standard Deviation of Business Intelligence and Business Success was supported by the data in table 2 which shows that the Marketing intelligence scored lowest (3.61) which compared to other results variables, indicating that managers are satisfied with the overall business intelligence system but they are unsatisfied with Marketing intelligence which represent the internal environment marketing activities done by their marketing departments.

Conclusion

These results did not match the other results of other studies, (Harkleroad, 1998) and (Elmano, 2005) which shows the lowest result for customer intelligence that mean managers are not satisfied with customer intelligence system. Organizational intelligence contributes directly to business success. A reason for this may be because it is the most structured form of intelligence. New management paradigms imposed by environmental changes may be the best explanation for the relationship encountered above. As Ansoff and McDonnell (1993), and D'Aveni (1995), suggest organizations seek mechanisms useful for pursuing a close equilibrium with the environment. Prescott and Miller (2001), and McGonagle and Vella (1996) argue that business intelligence is a means to satisfy this need. The study gives insight to important of business intelligence to a success of business and it implies that marketing intelligence is critical dimension in business intelligence.

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