

Business Intelligence Application Model in Hedge Funds Supporting Knowledge-Based Companies

Farzad Tarhani¹ & Omid Zare Ameli²

¹ Ph. D in strategic management knowledge, Malek -e- Ashtar University, Iran

² Master of Commercial Management, Islamic Azad University of Buin Zahra, Iran

Correspondence: Farzad Tarhani, Ph. D in strategic management knowledge, Malek -e- Ashtar University, Iran.
E-mail: esfahani.mohamad3@gmail.com

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Abstract

Nowadays, organizations having a more profound understanding as well as evaluation of their area of activities and acquiring more competitive advantages will be successful in the competitive environment. Organizations have excelled over their rivals and acquired a special status in the arena of competition with the help of increased competitive intelligence and organizational intelligence as well. The present research deals with presenting a business intelligence (BI) application model in hedge funds supporting knowledge-based companies to promote their performance. The present study is developmental, from the perspective of purpose, and descriptive survey, from that of research method. The statistical population of the study constitutes the employees of the hedge funds in Tehran; however, due to the limited scope of the statistical society, counting all method was used to choose the sample size. Questionnaire was used as the research tool. The validity and reliability of the questionnaire was confirmed using, respectively, Thurston method and Cronbach's alpha. Furthermore, SPSS19 software was used to analyze data. Investigation of the data revealed that business intelligence has a significant impact upon the funds in supporting knowledge-based companies. Amongst the indicators of business intelligence, the highest effectiveness was dedicated to analytical data warehouse indicator followed by corporate dashboards and data mining indicators, respectively.

Keywords: businessintelligence, organizational performance, knowledge-based companies

1. Introduction

Business environment where organizations operate, are increasingly changing and developing; therefore, organization, whether private or public, undergoes the high pressure enforcing them to respond the ever changing condition and to operate more innovatively (Turban et al., 2008, p. 3). Information management systems (IMSs) have supported organizations for years in performing their various tasks; however, nowadays, information management systems fail to meet the expectations of organization decision makers, particularly in issues such as emergency decision making, competition monitoring, information acquisition with different perspectives, performing consistent analysis on abundant data, and considering different variables related to organizational performance (Olszak & Ziemba, 2007, p. 136). The existing reasons are representative of the inappropriate techniques to attain, analyze, discover, and interpret data. Information management systems are required for organizations to promptly respond to environmental changes and provide causal analysis about either organization or environment (Koronios & Yeoh, 2010, p. 23).

Contrary to many consider business intelligence as a system or a tool, business intelligence is an architecture composing a series of analytical applications, enables to make decision for business intelligence activities based on operational and analytical databases. In an organization embedded with business intelligence, managers are able to extract costs informations from the organization, become aware of the costs, make decisions to mitigate and remove such costs, predict future and find appropriate solutions for theirs problems. Nowadays, organizations having a more profound understanding as well as evaluation of their area of activities and acquiring more competitive advantages, will be successful in the competitive environment. Organizations have excelled over their rivals and acquired a special status in the arena of competition with the help of increased competitive intelligence and organizational intelligence as well. In the present era, merely focusing upon events and reviewing past events may no longer work; but it is peer investigation of environment and information

acquisition of what is happening, that sustain the organization life (Lin et al., 2008, p. 4136).

Finally, in addition to the informational parameters mentioned above, there is other management information for decision making in organizations that needs to be identified. Business intelligence technology is a solution to use such data and create a sense of intelligence in managers to consciously decide based on realities and with a conscious understanding of current and future changes and using records in organization (Carver & Ritacco, 2006, p. 6).

Intelligence will be affective in this business, provided that standards and functional, strategic, operational, and analytical programs are used in business intelligence. When performance is carefully appraised and organizational culture commences to be shaped among users, intelligence enacts the role of a leverage in business. Eventually, to attain such a purpose, business intelligence and its competences are deployed in the organization body. Appropriate exploitation of the collected data, is one of the most significant applications of business intelligence, directly affects the performance of funds in supporting knowledge-based companies. Marketing is assumed to be one of the most seminal applications of the business intelligence in the hedge funds that have a direct effect on the organization performance. The marketing unit of the hedge funds can apply business intelligence in acquiring intuition about managers and recognizing the preferred products and services of the users and presenting products and services highly demanded by users rather than wasting money for services failing to be embraced by them. This study presents a strategy to apply new tools in the hedge funds of the country that eventually can present methods to increase the effectiveness of the hedge funds through augmenting the improvement of services, and resources management and attraction. Therefore, the most significant question addressed in this study is: how business intelligence affects the performance of funds in supporting knowledge-based companies?

2. The Theoretical Principles and the Research Background

In today competitive and highly dynamic world, data collection, processing and analysis are essential to understand the way businesses operate, to predict outcomes, and to efficiently improve the business processes. Nowadays, organizations including hedge funds require IT due to its potential to manage an overwhelming amount of data. Indeed, understanding and integrating data at all levels are considered to be a challenge of great importance for the hedge funds. Moreover, developing measurement scales, keeping data up to dated, comparing them as well as focusing them upon the country hedge funds is a lifelong problem; however, the entrance of business intelligence system into the organization may put an end to all these problems. Nowadays, organizations having found the value of timely data acquisition, exploit such a novel and valuable technology; otherwise, they may face difficulties often stemming from factors including huge mass of data, analysis complexity, and decision outcomes. To help the aforementioned problems removal, business intelligence provides organization with new opportunities due to the structure forms for it. Business intelligence not only removes the problems, but also extensively changes working condition by time and cost savings (Popovic et al., 2010, p. 7).

Business intelligence: business intelligence includes a wide range of commercial processes, applications, and technologies through which informative data are gathered, stored and analyzed, and finally, the results may be available for the respective user (Esat et al., 2007, p. 106).

3. Business Intelligence Constitutes Different Aspects Includes

Data mining: data mining refers to the investigation of data in the warehouse of an organization to identify, extract, and analyze the patterns and procedures facilitating decision making for organization (March & Hevner, 2005, p. 1039).

Analytical warehouse: warehouse is a store of data, which is built to support decision making (Pareek, 2007, p. 71).

Organizational dashboards: management dashboards are the visual tool for key data, provide a vast series of management processes analyses in terms of required issues of the respective employees and enable them to effectively measure, monitor, and manage the organization efficiency (Zarin, 2009, p. 8).

Organizational performance: organizational performance is a process including a series of organizational activities and measures by reliance on which managers are able to effectively meet the organization objectives (Ang, 2007, p. 13).

4. Organizational Performance Has Two Dimensions as Follows

Resource attraction: resource attraction is considered as key, fundamental and strategic objective of organizations.

It also enacts a special role in services provided by these companies and considered to be a significant index in evaluating the success of these companies (Mousavian, 2002, p. 52).

Service delivery improvement: providing the service appraisal for customers to evaluate services provided by organizations and companies takes place at the time of interaction. The way of service provision encompasses different concepts such as the way of responding, the way of providing service, reliability, service variation, and speed and accuracy of services (Venus & Safaeian, 2002, p. 223).

Rahnemai et al. (2013) suggested that there is a relation between management accounting information system based on decision support and business intelligence in different levels, and the performance variables. Lajevardi & Rahimipor (2012) also indicated that business intelligence in combination with Key Performance Indicators (KPIs) may help executive managers in achieving the continual improvement and timely qualitative reports and making strategic decisions. Haghghat & Rezaie (2011) observe that supporting organizational efficiency, integrating informational needs of business operators, and supporting decision making in the organization are the most important effective indicators on business intelligence performance appraisal in the organization. Hajari (2010) in a study entitled "investigating the impact of business intelligence on the promotion of Health Care System performance in Sina hospital" indicated that using business intelligence in hospitals may lead to better decision making in strategic and tactic level and finally may promote the hospital performance. Adbi et al. (2010), with the purpose of applying business intelligence in healthcare sector, found that in the under-scrutiny hospital there is separated information in terms of human, financial and caring forces operating separately with low interaction. They concluded that using business intelligence in healthcare sector has useful impacts as follows:

- 1) Reduced costs;
- 2) Increased profit margins;
- 3) Increased patients' satisfaction;
- 4) Improved care.

Moreover, it can be a good supporter for manager's decisions. The results of the researches mentioned above are in concordance with the main hypothesis of the present study. Hosseini (2004) argued that business intelligence is assumed to have a strategic importance in industries like banking (in terms of facilitating the process of monitoring, eliminating the different way of abuses, optimally monitoring the resource allocation). The results of the research "Towards a framework implementation for business intelligence in healthcare" by Foshay & Kuziemy (2014), showed that business intelligence may provide informational requirements (related, exact, timely and in-depth) in terms of special processes of healthcare. The findings resulted from "The impact of Business Intelligence systems on stock return volatility" by Rubin and Rubin (2013) demonstrated that business intelligence systems may reduce the fluctuations of stock returns and financial risk. In their study "A Model of Customer Relationship Management and Business Intelligence Systems for catalogue and On-line Retailers", Phan & Vogel (2009) indicated that using Customer Relation Management (CRM) and business intelligence may help the customer satisfaction and interaction. The latter, per se, may lead to the business success. Elbashir et al. (2008) concluded that there is a significant relation between using business intelligence system, business process performance, and organizational performance, whether service organizations or non-service ones.

5. The Research Hypotheses

The main hypothesis is as follows:

- 1) Business intelligence has a significant impact on the performance of funds in supporting knowledge-based companies.

The secondary hypotheses are as follows:

- 2) Data mining has a significant impact on the performance of funds in supporting knowledge-based companies.
- 3) Analytical warehouse has a significant impact on the performance of funds in supporting knowledge-based companies.
- 4) Organizational dashboard has a significant impact on the performance of funds in supporting knowledge-based companies.

6. The Conceptual Model of the Study

The conceptual model of the study derived from the research theoretical principles and the identification of the existing models in terms of business intelligence including the model presented by Albashir et al. (2008). After

selecting the research models, the aspects and indicators of the model were investigated, and the impacts of intelligence upon the organizational performance were extracted. Finally, after reviewing, criticizing and reforming the existing indicators, the considerable points of the model were taken into account by the researcher; afterwards, the model indicators were chose. The aspects and indicators were chosen and reviewed by the experts finally selecting them.

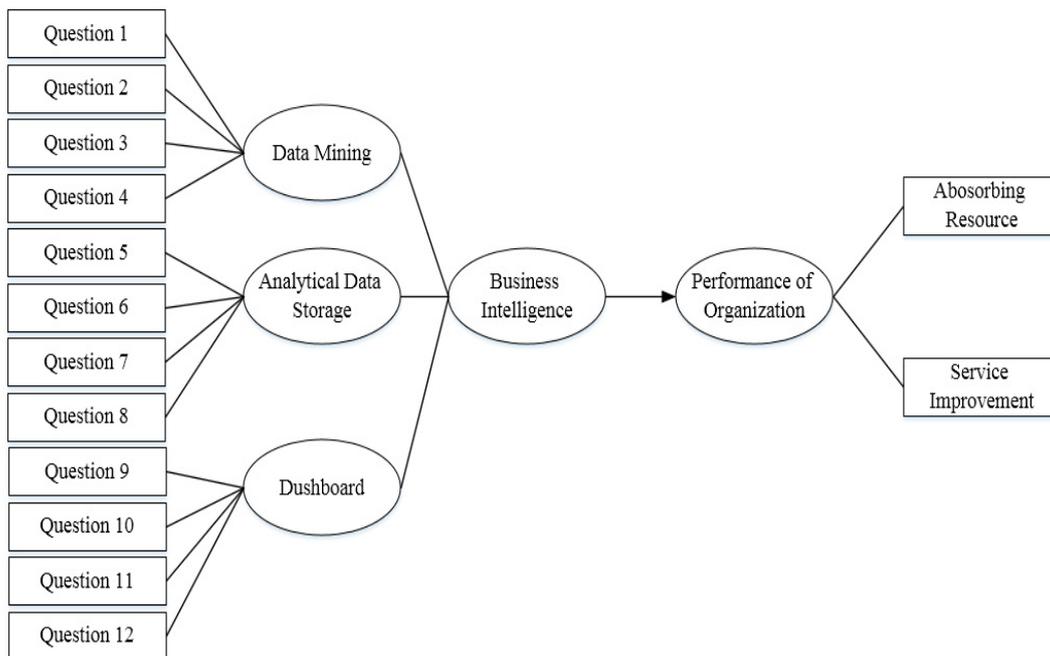


Figure 1. The conceptual model of the study (adapted from Elbashir et al. (2008)

7. Methodology

Due to dealing with a model, the present study is developmental, from the perspective of purpose, and descriptive survey, from that of research method. The research variables include business intelligence and organizational performance. The statistical population of the study constitutes the employees of one of the hedge funds in Tehran; however, due to the limited scope of statistical society, counting all method was used to choose the sample size. Questionnaire was used as the research tool. The validity of the questionnaire was determined based on the comments made on behalf of experts and Thurston method as well. To investigate the reliability of business intelligence and organizational performance questionnaires, Cronbach's alpha being respectively, 0.859 and 0.774, was used. The statistical analysis was performed both descriptively and inferentially. SPSS19 software, Pearson, and univariate regression tests were also used to analyze data.

8. Data Analysis and Research Findings

Main hypothesis: business intelligence has a significant impact on the performance of funds in supporting knowledge-based companies.

Firstly, according to the normality of the variables, the Pearson correlation test was used to investigate the relation between two variables. Then, given the existence of relation between two variables, univariate regression test was used to determine the intensity of the impacts of two variables.

Table 1. Correlation test of the main hypothesis

P-value	Sample size	The performance of funds in supporting knowledge-based companies
0/001	30	0/486
		Business intelligence

Given the P-value ($p < 0.05$), it can be suggested that there is a significant relation between these two variables. Therefore, there is a significantly positive relation between business intelligence and the performance of funds in supporting knowledge-based companies. Thence, it can be concluded that the increased value of business intelligence indicator may augment the performance of funds in supporting knowledge-based companies. Regarding the relation between two variables, regression test was used to determine the intensity of the impacts of two variables. The results are presented as follows:

Table 2. Regression analysis of business intelligence on the performance of funds in supporting knowledge-based companies

R ²	Beta	p-value	Observed F-value	
0/237	0/486	0/006	8/679	Business intelligence regression on the performance of funds in supporting knowledge-based companies

The observed F-value is 8.679; therefore the research hypothesis is confirmed with 99% confidence at the significance level of 0.001. As the P-value is lower than 0.01, the relation between two variables is confirmed, i.e. business intelligence has a significant impact on the performance of funds in supporting knowledge-based companies. Beta coefficient (0.486) indicates that the increased value of business intelligence indicator may augment the performance of funds in supporting knowledge-based companies. The findings show that the value of determination coefficient is low, consequently business intelligence only predicts 23.7% of dependent variable changes (the performance of funds in supporting knowledge-based companies).

The findings are consistent with the researchers presented by Hejazi (2010); Abdi et al. (2010); Mirinejad et al. (2010); Rubin & Rubin (2013); Elbashir et al. (2008); Phan & Vogel (2009).

Secondary hypothesis 1: data mining has a significant impact on the performance of funds in supporting knowledge-based companies.

Firstly, according to the normality of the variables, the Pearson correlation test was used to investigate the relation between two variables. Then, given the existence of relation between two variables, regression test was used to determine the intensity of the impacts of two variables.

Table 3. Correlation test of the secondary hypothesis 1

P-value	Sample size	The performance of funds in supporting knowledge-based companies	
0/001	30	0/404	Data mining

Given the P-value ($p < 0.05$), it can be suggested that there is a significant relation between these two variables. Therefore, there is a significantly positive relation between data mining and the funds performance in supporting knowledge-based companies. Thence, it can be concluded that the increased value of data mining indicator may augment the performance of funds in supporting knowledge-based companies.

Regarding the relation between two variables, regression test was used to determine the intensity of the impacts of two variables. The results are presented as follows:

Table 4. Regression analysis of data mining on the performance of funds in supporting knowledge-based companies

R ²	Beta	p-value	Observed F-value	
0/163	0/404	0/027	5/449	Data mining regression on the performance of funds in supporting knowledge-based companies

The observed F-value is 5.449; therefore the research hypothesis is confirmed with 99% confidence at the significance level of 0.001. As the P-value is lower than 0.01, the relation between two variables is confirmed, i.e. data mining has a significant impact on the performance of funds in supporting knowledge-based companies.

Beta coefficient (0.404) indicates that the increased value of data mining indicator may augment the performance of funds in supporting knowledge-based companies. The findings show that the value of determination coefficient is low, consequently data mining only predicts 16.3% of dependent variable changes (the performance of funds in supporting knowledge-based companies).

The findings are consistent with the researchers presented by Hejazi (2010); Abdi et al. (2010); Mirinejad et al. (2010); Rubin & Rubin (2013); Elbashir et al. (2008); Phan & Vogel (2009).

Secondary hypothesis 2: analytical warehouse has a significant impact on the performance of funds in supporting knowledge-based companies.

Table 5. Correlation test of the secondary hypothesis 2

P-value	Sample size	Performance of funds in supporting knowledge-based companies	
0/001	30	0/73	Analytical warehouse

Given the P-value ($p < 0.05$), it can be suggested that there is a significant relation between these two variables. Therefore, there a significantly positive relation between analytical warehouse and the performance of funds in supporting knowledge-based companies. Thence, it can be concluded that the increased value of analytical warehouse indicator may augment the performance of funds in supporting knowledge-based companies.

Regarding the relation between two variables, regression test was used to determine the intensity of the impacts of two variables. The results are presented as follows:

Table 6. Regression analysis of analytical warehouse on the performance of funds in supporting knowledge-based companies

R2	Beta	p-value	Observed F-value	
0/533	0/73	0/001	31/914	Business analytical warehouse on the performance of funds in supporting knowledge-based companies

The observed F-value is 31.914; therefore, the research hypothesis is confirmed with 99% confidence at the significance level of 0.001. As the P-value is lower than 0.01, the relation between two variables is confirmed, i.e. analytical warehouse has a significant impact on the performance of funds in supporting knowledge-based companies. Beta coefficient (0.73) indicates that the increased value of analytical warehouse indicator may augment the performance of funds in supporting knowledge-based companies. The findings show that the value of determination coefficient is low, consequently analytical warehouse only predicts 53.3% of dependent variable changes (the performance of funds in supporting knowledge-based companies).

The findings are consistent with the researchers presented by Hejazi (2010); Abdi et al. (2010); Mirinejad et al. (2010); Rubin & Rubin (2013); Elbashir et al. (2008); Phan & Vogel (2009).

Secondary hypothesis 3: organizational dashboard has a significant impact on the performance of funds in supporting knowledge-based companies.

Table 7. Correlation test of the secondary hypothesis 3

P-value	Sample size	Performance of funds in supporting knowledge-based companies	
0/001	30	0/471	Organizational dashboards

Given the P-value ($p < 0.05$), it can be suggested that there is a significant relation between these two variables. Therefore, there a significantly positive relation between organizational dashboards and the performance of funds in supporting knowledge-based companies. Thence, it can be concluded that the increased value of organizational dashboards indicator may augment the performance of funds in supporting knowledge-based

companies.

Regarding the relation between two variables, regression test was used to determine the intensity of the impacts of two variables. The results are presented as follows:

Table 8. Regression analysis of organizational dashboards on the performance of funds in supporting knowledge-based companies

R ²	Beta	p-value	Observed F-value	
0/222	0/471	0/009	7/974	Business organizational dashboards on the performance of funds in supporting knowledge-based companies

The observed F-value is 7.974; therefore the research hypothesis is confirmed with 99% confidence at the significance level of 0.001. As the P-value is lower than 0.01, the relation between two variables is confirmed, i.e. organizational dashboard has a significant impact on the performance of funds in supporting knowledge-based companies. Beta coefficient (0.471) indicates that the increased value of organizational dashboard indicator may augment the performance of funds in supporting knowledge-based companies. The findings show that the value of determination coefficient is low, consequently organizational dashboard only predicts 22.2% of dependent variable changes (the performance of funds in supporting knowledge-based companies).

The findings are consistent with the researchers presented by Hejazi (2010); Abdi et al. (2010); Mirinejad et al. (2010); Rubin & Rubin (2013); Elbashir et al. (2008); Phan & Vogel (2009).

9. Discussion and Conclusions

The present research deals with presenting a business intelligence (BI) deployment model in supporting bodies of knowledge-based companies to promote their performance. The investigations shed some light on the fact that business intelligence has a significant impact upon the performance of funds in supporting knowledge-based companies. According to the intensity of the business intelligence impact, it is observed that business intelligence with the impact intensity of 0.486, has a significant effectiveness. Amongst the indicators of business intelligence, the highest impact is dedicated to analytical warehouse with the impact intensity of 0.73, followed with organizational dashboard and data mining with, respectively, 0.471 and 0.404 impact intensity. Given the impact of business intelligence on the performance of funds in supporting knowledge-based companies, the following items can be regarded as the results and implications of this research:

Hedge funds managers could have more financial investments to develop and improve business intelligence systems in organizations to approach the expectations and needs level of both users and organizations. In its way to development, the aforementioned system has to be mostly focused upon the more in-depth and thorough recognition of users needs and expectations. By this way, the system may augment its chance to success towards fulfilling its objectives the most significant one is to promote the level of services quality provided to people with the help of information technology (IT).

Using data mining, organizational dashboards, analytical warehouse, and reviewing the architecture of system information, investigating the input, process and output system information, and increasing the quality of organization information systems, managers are able to improve the system performance in terms of operational and decision making needs and to promote it in the organization.

The organizations are recommended to promote their performance through improving business intelligence system and managing their interactions. Using business intelligence through establishing the users data bases, paves the way for organization to implement one-to-one pervasive marketing and to lead organization to better interaction with people. It is a bed that not only helps the people not to be forgotten, but also records all the information and their communications with the organization. The speed to access the required data is a matter of great importance and complexity in each area. Regarding the current state of data traffic, the aforementioned system may provide a competitive advantage for organizations to better service their customers, hence the long-term planning in this area is highly recommended.

Organizations are expected to be looking for guidelines in designing business intelligence to help the decision making improvement. Decision quality is the most important issue the business intelligence is expected to improve.

In the present study the attempt was made to analyze and to identify all aspects and indicators of business

intelligence. Unfortunately, few field studies performed in the academic community, especially inside the country, in terms of business intelligence; however, expensive future research may improve the designed measure through identifying and modifying items and factors by extending the range of their studies. Moreover, the other influencing variables on the performance of funds in supporting knowledge-based companies can be addressed as a mediating variable.

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