

## **Review Study: Business Intelligence Concepts and Approaches**

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### **Abstract**

In today's challenging business environment, it is a vital for organization to access useful information and knowledge. Business Intelligence (BI) is an umbrella concept for tools, techniques and solutions that helps managers to understand business situation. And BI tools can support informational knowledge needs of organizations. With respect to increasing trend of BI researches in BI concepts and applications, in this paper, recent researches and papers of academic journals in this field is systematically review to classify and prioritize the concepts and approaches of business intelligence. Consequently researches was classified in three, managerial, technical and system enables approaches to BI, and specification of each approach and future research quid was described.

**Keywords:** Business Intelligence; Enterprise Systems; Review Study; Business Intelligence Approaches

### **1. Introduction**

Today, in the rapidly changing environment, need to correct and just-in-time information is not only necessary for success but also is required for remaining in competition.

Business intelligence (BI) refers to a managerial philosophy and a tool used to help organizations manage and refine business information with the objective of making more effective business decisions (Ghoshal & Kim, 1986; Gilad & Gilad, 1986).

Different organizations with different tasks context and dimensions may meet some problems in efficiency use of the existing data in their systems such as Sale, financial and storage. (Mehrani, 1388).Data can be a valuable resource for extracting knowledge and making important managerial decisions in different business scopes. Regarding to increase data in organizations, today, using these data and analyzing that has become one of the most modern management tools. Making on-time and

correct decisions requires the domination on real and comprehensive information, that the traditional information systems can't generate such reports to the desired.

Management Dashboard, because bringing all of data together on one page and easily interpreting those using charts and forms for managers and employees, is a valuable tool in today's competitive environment. Managers of organizations that utilize dashboards, instead of wasting time to read the contents of complex and incomprehensible reports, and extracting information from them, allocate their time to achieve to simple and accurate decisions also they use their competitive advantage which implies through rapid reaction and changes to conditions. Nowadays the organizations that realized the value of getting on-time information, using this modern and valuable technology and that is way this phenomenon is utilized increasingly.

There are three approaches in use BI that depends on the goal of usage BI and the required focus, these approaches are:

1. Managerial approach with focus on improving management decision making.
2. Technical approach by focusing on tools supporting the processes associated with intelligence in management approach.
3. Enabling approach by focusing on value-added capabilities in support of information.

In the first and second sections of this paper the concept of business intelligence is introduced. Section 3 -Research method- systematically reviews the research process and research papers covering areas of Business Intelligence and in section 4 definitions and approaches are reviewed and shown in tables 1 and 2. In section 5 -Researches' review and analysis- Business intelligence papers are categorized and studied in three approaches: the managerial, technical and enabler view.

BI definitions are extracted and regarding available approaches, each definition is assigned in related approach category. Also, exploring published papers in the field, descriptive data analysis is conducted in terms of frequency and percentage of each approach, published year and etc, illustrated in a schematic scheme using pie and bar charts.

In the last part of this paper, an attempt has been made to express BI concepts and its different approaches in organizations. Classifying definitions and different managerial approaches supports creating positive thinking in organizations, extolling levels of attention assigning tasks and etc.

Finally, by accomplishing this review research, concepts related to business intelligence are classified in three groups: Managerial with focus on excellence of decision-making, Technical with focus on tools supporting business intelligence and Enabler with focus on value-added capabilities in supporting shared information.

## 2. Business Intelligence

Business Intelligence, often referred to as BI, is a popularized, umbrella term introduced by Howard Dresner of the Gartner Group in 1989 to describe a set of concepts and methods to improve business decision making by using fact-based computerized support systems (Nylund, 1999). The term is sometimes used interchangeably with briefing books and executive information systems. A business intelligence system is a data-driven DSS that primarily supports querying of an historical database and production of periodic summary reports. Data-driven DSS have been called various names over the years including data-oriented DSS (Alter, 1980), retrieval-only DSS (Bonczek, Holsapple, & Whinston, 1981), Executive Information Systems, OLAP systems and Business Intelligence systems.

Business Intelligence (BI) is a set of abilities, tools, techniques and solutions that help managers to understand business situation. BI tools get a view of previous, now and future situation to people. With implementation BI approaches the existing contact information gap between top managers and middle managers will disappear and managers required information in each levels and any time acquire with high quality, also experts and analysts can improve their activities with simple tools and obtain better results.

BI implement base on a goals: "Improving performance by create a suitable context to make decision in organization". When the manager's view to organization data is comprehensive can be certain of made decisions and sure that these decisions keep organization in competitive environment, also the defined goals will gain. But for complete usage of BI capabilities, BI must be flexible and can provide various facilities for employees, teams and total organization levels. Also BI must be uses all structured and unstructured data to make decision.

Fast access to data and analysis them regarding to users need is critical for modern organizations. BI is a new approach in business and organization architecture. BI means identification and grouping hidden concepts relevant to decision and mass of business data to improve aware of business environment and help to organization decisions.

BI is an organized and systematic process by which organizations acquire, analyze, and disseminate information from both internal and external information sources significant for their business activities and for decision making. (Lönqvist & Pirttimäki, 2006)

The BI is software that analyzes data from different sources and provides a kind of view, pattern and useful interface.

The BI term refer to:

1. Relevant information and knowledge describing the business environment, the organization itself, and its situation in relation, to its markets, customers, competitors, and economic issues.
2. An organized and systematic process by which organizations acquire, analyze, and disseminate information from both internal and external information sources significant for their business activities and for decision making. (Lönqvist et al .2006)

Several related terms include competitive intelligence (CI), market intelligence, customer intelligence, competitor intelligence, strategic intelligence, and technical intelligence. In North American literature, the term CI is frequently used and the external environment and external information sources are emphasized (Cottrill, 1998; Fuld, 1995; Kahaner, 1996; Vibert, 2004). In European literature, the term BI is considered a broad umbrella concept for CI and the other intelligence-related terms mentioned above. Nevertheless, almost all the definitions share the same focus, even if the term has been defined from several perspectives (Casado, 2004), and they all include the idea of analyzing data and information.

The purpose of BI is to aid in controlling the vast flow of business information inside and outside of organization by first identifying and then processing the information into condensed and useful managerial knowledge and intelligence. As such, the BI task includes new topics, addresses very old managerial problems and it is one of the basic tasks among the many management tools: analyzing the complex business environment in order to make better decisions.

Organizations have collected information about their competitors since the dawn of capitalism (Gilad & Gilad, 1986). The real revolution is in the efforts to institutionalize intelligence activities. BI presents business information in a timely and easily consumed way and provides the ability to reason and understand the meaning behind business information through, for example, discovery, analysis, and ad hoc querying. (Azoff & Charlesworth, 2004).

The BI literature suggests that much benefit can be derived from using BI (Thomas, 2001). However, applying BI takes resources, and the benefits actually occurring in practice are not always clear. The measurement of business performance has long traditions in organizations. In the BI literature, authors have identified BI measurement as an important task (Solomon, 1996; Viva Business Intelligence Inc., 2000), but a common view among scholars is that it is difficult to carry out (Gartz, 2004; Hannula & Pirttimäki, 2003; Simon, 1998). According to a recent survey, only a few organizations have any metrics in place to measure the value of BI. (Marin & Poulter, 2004).

### 3. Research Method

Definitions and approaches related to business intelligence, in order to help make better organizational decisions and enhance efficiency in a number of papers which published in journals surveyed, grouped and after determined instances and search terms research process on the basis of figure 1 has been carried out

The research papers collected in 3 phases, in gathering papers step (step1) after studying the sources, the bases were targeted by the relevant articles were extracted. In extraction and classification definitions step (step2) selected articles and definitions related to the study of intelligence were extracted and then classified and similar articles were extracted and in final step classification of approaches.

First to introduce this approach to classification definitions, approaches and ultimately we analyze the results and conclusions, and eventually paid.

### 4. Business Intelligence: Definitions & Approaches

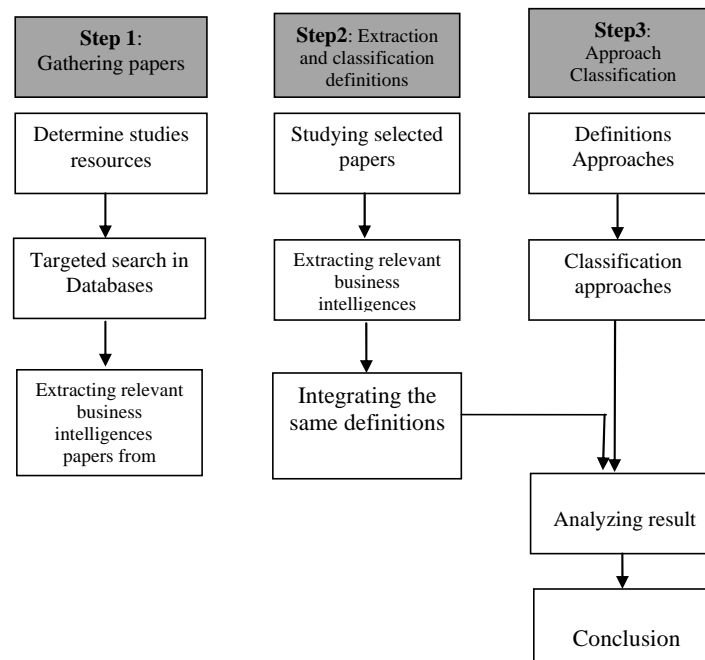
Business intelligence is the process of using information and analyzing them in order to support decision-making and using different methods helping organizations to forecast the behavior of competitors, suppliers, customers and environments to stay alive and survive in global economy.

Also by using of tools such as data mining and data warehousing, helps to make decision and achieve competitive advantage, and by coordinating personal and organizational goals leads to create synergy and improved performance.

A literature review around the theme business intelligence (BI) shows “division” in endeavor to define this concept or division in attempts at defining this concept: Technical and managerial approaches, tracing two broad patterns:

The managerial approach sees BI as a process in which data gathered from inside and outside the company are integrated in order to generate information relevant to the decision-making process. The role of BI here is to create an informational environment in which operational data gathered from transactional systems and external sources can be analyzed, in order to reveal “strategic” business dimensions.

**Figure 1: Research Method**



**Table 1:** Business Intelligence; Enterprise Systems; Review Study; Approaches

Definition/Approach	Researchers/year	Row
Help organizations manage and refine business information with the objective of making more effective business decisions	(Ghoshal & Kim, 1986; Gilad & Gilad, 1986)	1
Relevant information and knowledge describing the business environment, the organization itself, and its situation in relation to its markets, customers, competitors, and economic issues/ An organized and systematic process by which organizations acquire, analyze, and disseminate information from both internal and external information sources significant for their business activities and for decision making	(Lönnqvist & Pirttimäki, 2006)	2
BI presents business information in a timely and easily consumed way and provides the ability to reason and understand the meaning behind business information through, for example, discovery, analysis, and ad hoc querying.	(Azoff & Charlesworth, 2004)	3
BI process increases customer value, those processes are only increasing expenses. The role of BI is to track and manage customer transactions in real-time to identify the opportune time to make customers the offer they are likely to accept, to increase the products they buy, or to retain them as customers of each product A BI system driven by changes in customer behavior has been an important element in the IT	(Gessner & Linda, 2005)	4
The process is composed of methods that organizations use to develop useful information, or intelligence, that can help organizations survive and thrive in the global economy. The product is information that will allow organizations to predict the behavior of their “competitors, suppliers, customers, technologies, acquisitions, markets, products and services, and the general business environment” with a degree of certainty.	(Vedder, Vanecek, Guynes, & Cappel, 1999)	5
Increases in revenue and produce cost savings equivalent to a 1000% return on investment(ROI)	(Watson, Wixom, Hoffer, Anderson-Lehman, & Reynolds, 2006).	6
achieve some measurable financial benefit	(Watson et al., 2008)	7
Covers diverse subjects ranging from practical applications of neural networks, to end-user satisfaction, to the use of clustering as a business strategy to gain a competitive advantage.	(Baesens, Rudy, Mues, & Vanthienen, 2003; Chen, Soliman, Mao, & Frolick, 2000; Porter, 1998)	8
Describe a set of concepts and methods to improve business decision making by using fact-based computerized support systems	(Dresner, 1989)	9
A business intelligence system is a data-driven DSS that primarily supports querying of an historical database and production of periodic summary reports.	(Power, 2008)	10
Increasingly gaining in visibility and relevance within the business realm	(Gartner Group, 2006)	11
Infrastructure that enables holistic decision support, handle, refine, and analyze unstructured data, an integrated management support infrastructure.	(Baars & Kemper, 2008)	12
One class of frameworks is build around the concept of the “data warehouse” and focuses on the technical processing of structured data.	(Devlin, 1996; Kimball & Ross, 2002) ;Inmon, 2005)	13
An approach to structuring BI is to take a broad organizational and demand-driven view. This naturally leads to the requirement of incorporating unstructured data—but without focusing on concrete components and solutions for the relevant integration tasks.	(Negash, 2004)	14
Providing a (partial) structure for a specific approach	(Sukumaran & Sureka, 2006; Sullivan, 2001)	15
Business intelligence is an analysis mechanism by which automated decision-making regarding business status, sales analysis, customer demand, product preference, etc. is provided for enterprises through large database system analysis as well as mathematical, statistical, artificial intelligence, data mining and on-line analysis processing (OLAP).	(Berson & Smith, 1997; Thomsen, 2002)	16
The management of transferring internal messages in the enterprise environment, BI is to provide users with the best possible assistance in the process of decision-making. Apart from delivering the right information to right person during the right time, providing some tools such as production reporting tools, end-user query and reporting tools, on-line analysis processing, dashboard/scorecard tools, data mining tools, planning and modeling tools.	(Wayne, 2005; Back, 2002)	17

**Table 1:** Business Intelligence; Enterprise Systems; Review Study; Approaches - continued

BI as their highest rating technology issue; as they focus on projects that enable users to positively affect financial and business performance.	(Gartner Group, 2007)	18
BI is a set of concepts, methods, and processes to improve business decisions.	(Maria, 2005)	19
Business Intelligence enables the comprehension, understanding and profit from experience. Business data and information is the soil that grows Business Intelligence, which provides the capability to reason, plan, solve problems, think abstractly, comprehend ideas and language, and learn from business data and information. Business intelligence is fueled from the utilization of information aligned with business performance	(Green, 2007)	20
Better decision making; better customer handling; faster response to key business issues; improved employee skills; improved productivity; increased profits; sharing best practices;. Reduced costs; increased market share; creation of new business opportunities; and .improved new product development	(KPMG, 2000)	21
Create synergy and enhance business performance with the coordination of individual objectives with organizational goals	(Davenport & Probst, 2001)	22
(BI) tools to collect, analyze, and disseminate information so that knowledge workers are able to make informed decisions. The use of BI applications aids a knowledge enterprise by promoting efficiency within an organization, particularly by using analytical methods to provide valuable decision-making knowledge to minimize operating costs and to accurately forecast market trends.	(Hedgebeth, 2007)	23
help organizations make decisions [by] using technology for reporting and data access	(Power, 2007)	24
Business intelligence applications use a structured sub-grouping of data and an accompanying object model to create mapped relationships known as ontology's.	(Daconta, Obrst & Smith, 2003)	25
Business intelligence (BI), seen as a response to current needs in terms of access to relevant information through intensive use of information technology (IT). the core of BI is the gathering, analysis and distribution of information, and (b) the goal is to support the strategic decision-making process. By strategic decisions we mean decisions related to implementation and evaluation of organizational vision, mission, goals and objectives, which are supposed to have medium- to long-term impacts on the organization, as opposed to operational decisions, which are day-to-day in nature and more related to execution.	(Petrini & Pozzebon, 2008)	26
BI systems have the potential to maximize the use of information by improving the company's capacity to structure a large volume of information and make it accessible, thereby creating competitive advantage, what Davenport calls "competing on analytics"	(Davenport, 2005)	27
BI methods involves those methodologies focusing on identification of strategic information which needs to be integrated into data warehouses and BI applications.	(Miranda, 2004)	28
Focus on the process of gathering data from internal and external sources and of analyzing them in order to generate relevant information.	(Liautaud , 2000; Luckevich, Vitt & Misner, 2002; Schonberg, Cofino, Hoch, Podlaseck & Spraragen,2000;Kalakota & Robinson ,2001)	29
Focus on the technological tools	(Kudyba & Hoptroff , 2001; Watson, Goodhue & Wixon, 2002;Scoggins, 1999;Hackathorn , 1999; Dhar & Stein , 1996 ; Giovinazzo,2002)	30
The technical view of BI usually centers on the process of, or applications and technologies for, gathering, storing, analyzing and providing access to data to help make better business decisions. The managerial view of business intelligence (BI) is getting the right information to the right people at the right time so they can make decisions that ultimately improve enterprise performance.	(Bose, 2009)	31

**Table 1:** Business Intelligence; Enterprise Systems; Review Study; Approaches - continued

“Business intelligence” (BI) was created in response to dramatic changes in the IT market, the growing IT support for business, process execution, and the extensive, world-wide diffusion of internet technology.	(Gluchowski & Kemper, 2006; Anandarajan, Srinivasan, & Anandarajan, 2003)	32
Support organization management, analysis data from data warehouse, traditional BI is primarily aimed at supplying employees at the management level of an organization with relevant information in order to support tactical and strategic decision making	(Bucher ,Gericke & Sigg, 2009)	33
The purpose of BI is to provide users with the best possible assistance in the process of decision-making.	(Wayne, 2005)	34
In the harsh environment, high-level management needs business intelligent information to efficiently manage corporate operations and support their making of decisions	(Cheng , Lu , Sheu, 2009)	35
help to use interactive data	(Lee , Lau & Ho, 2009)	36
OLAP tool is a kind of business intelligence tools that allows analyst to explore; create and manage multidimensional enterprise data for analysis	(Peterson,2000; Thomsen,1999)	37
Use a business intelligence (BI) technique to discover significant attributes useful to building a decision tree. business intelligence (BI) to provide further in-depth analysis of the current data, mine data at different levels , help to achieve their objectives of analysis and generate their desired output, help to identify best or near-optimal solutions to the problem.	(Lim & Lee, 2010)	38
BI proposes a range of software tools for extracting and transforming data for statistical analysis and for presentation in displays such as dashboards and scorecards.	(Soderlund ,1990;Seeley & Davenport, 2006)	39
BI is the conscious, methodical transformation of data from any and all data sources into new forms to provide information that is business-driven and results-oriented, transform from an environment that is reactive to data to one that is proactive, automate and integrate as many steps and functions as possible in business, analysis and integrate powerful capabilities in business event	(Ranjan, 2008)	40
Provide data for analytics	(Biere, 2003)	41
Defined as specialized tools for data analysis and query, the ability to analyse business information in order to support and improve management decision making across a broad range of business activities , large data infrastructure investments (e.g. ERP systems) made by firms, and have the potential to realise the substantial value locked up in a firm's data resources and enables organizations to reduce marketing costs by targeting customers	(Elbashir , Collier, & Davern , 2008)	42
BI systems refer to an important class of systems for data analysis and reporting that provide managers at various levels of the organization with timely, relevant, and easy to use information, which enable them to make better decisions.	(Hannula & Pirttimäki , 2003)	43
BI systems has been targeted at enhancing performance in both primary and supporting activities	(Grayson, 2006; Pirttimäki,Lönnqvist ,& Karjaluo , 2006; Head, 2004; Williams & Williams, 2003)	44
BI systems are strategic information systems that organizations deploy in order to improve decision making and competitive advantage	(Thomas, 2001; Nemati & Barko, 2001; Werner & Abramson, 2003)	45
Help to achieve competitive advantage	(Cottrill, 1998;Thomas, 2001;Williams & Williams, 2003)	46
BI systems for tactical and operational process improvements	(Williams & Williams, 2003;Elbashir & Williams, 2007)	47
Discover trends and patterns that can be derived from their inherent business rules, pull the data in ERP systems and then perform various analyses and deliver superior reporting, provide a visual interface for accessing and navigating through multidimensional data sources that stored in transactional systems, obtain more detailed information to generate best- or worst-case scenarios for business planning, empower their employees' decisions capability in a faster and reliable way	(Chou, Tripuramallu,& Chou, 2005)	48

**Table 1:** Business Intelligence; Enterprise Systems; Review Study; Approaches - continued

Strategic approach for systematically targeting, tracking, communicating and transforming relevant weak sings into actionable information on which strategic decision -making is based.	(Rouibah & Ould-ali , 2002)	49
BI is surfacing to deal with the large volume of information available but which are often misleading in accurate and untimely	(Martinsons, 1994;Futures Group, 1997;Attaway,1998;Herring,1998 ;Freeman, 1999;Groom & David,2001)	50
Information systems that enhance strategic decision -making and that support the competitive strategy of an organization	(Wiseman; 1988)	51
A mixture of tools, databases, and vendors in order to deliver an, infrastructure that not only will deliver the initial solution, but also will incorporate the ability to change with the business and current marketplace	(Sahay & Ranjan,2008)	52
a term that encompasses a broad range of analytical software and solutions for gathering, consolidating, analyzing and providing access to information in a way that is supposed to let an enterprise's users make better business decisions	(Adelman,Moss,& Barbusinski, 2002)	53
Malhotra (2000) points out BI benefits that facilitate the connections in the new-form organization, bringing real-time information to centralized repositories and support analytics that can be exploited at every horizontal and vertical level within and outside the firm.	(Malhotra, 2000)	54
Allow tactical and operational decision-makers to tune their actions according to the company strategy.	(Golfareelli, Rizzi & Cella, 2004)	55
An enterprise architecture for an integrated collection of operational as well as decision support applications and databases, which allows make accurate business decisions, technically much broader tools, that includes potentially encompassing knowledge management, ERP, decision support systems and data mining	(Gangadharan & Swamy, 2004)	56

The technical approach presents BI as a set of tools that support the process described above. The focus is not on the process itself, but on the technologies that allow the recording, recovery, manipulation and analysis of information. (Petrini & Pozzebon, 2008).

Definitions are provided in Table 2 based on the classification of business intelligence managerial approach, technical approach and business intelligence as an enabling organizational system have been partition:

**Table 2:** BI's Definitions classification

Researches	Focus	Approach
(Gilad&Gilad, 1986), (Goshal&kim, 1986), (Lönqvist&Pirttimäki, 2006), (Green, 2007), (Wayne, 2005), (Back, 2002), (Gessner&Linda, 2005), (KPMG, 2000), (egash, 2004), (Baars&Kemper, 2008), (Sukumaran&Sureka, 2006), (Sullivan, 2001), (Petrini, 2009), (Hedgebeth, 2007), (Power, 2007), (Petrini&Pozzebon, 2008), (Liautaud , 2000), (Kalakota&Robinson, 2001), (Luckevich et al., 2002), (Ranji, 2009), (Schonberg, 2000), (Gluchowski& Kemper, 2006), (Anandarajan et al., 2003), (Bucher et al., 2009), (Cheng et al.,2009), (Lee et al. ,2009), (Peterson, 2000), (Seeley&Davenport, 2006), (Thomsen, 1999), (Hannula&Pirttimaki, 2003), (Lim&Lee, 2010), (Biere, 2003), (Martinsons, 1994), (Chou et al., 2005), (Rouibah&Ould-ali, 2002), (Futures Group, 1997), (Attaway, 1998), (Herring, 1998), (Groom&David, 2001), (Freeman, 1999), (Adelman et al., 2002), (Malhotra, 2000), (Golfareelli, 2004),(Gangadharan&Swamy, 2004)	Excellence of management decision making	Managerial approach
(Berson&Smith, 1997), (Azoff& Charlesworth, 2004), (Dresner, 1989), (Green, 2007) , (Berson&Smith, 1997), (Thomsen, 2002), (Devlin, 1996), (Kimball, 2002), (Inmon, 2005), (Daconta, 2003), (Kudyba&Hoptroff, 2001), (Watson, 2002) , (Scoggins, 1999), (Hackathorn, 1999), (Dhar&Stein, 1996), (Giovinazzo, 2002), (Soderlund, 1990), (Elbashir et al.,2008), (Gangadharan&Swamy, 2004)	Tools supporting the processes associated with intelligence in management approach	Technical approach



**Table 2:** BI's Definitions classification - continued

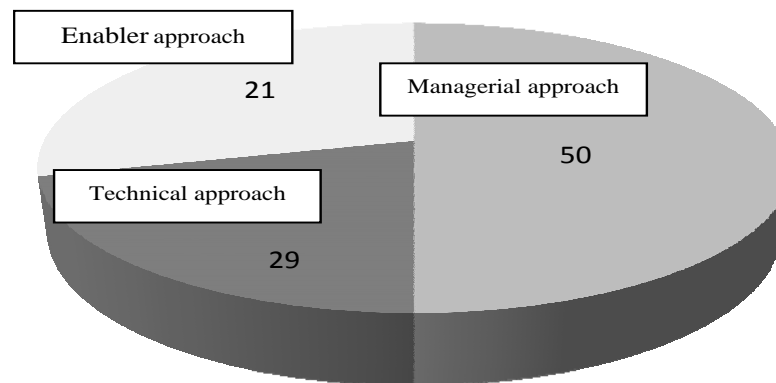
(Lönnqvist&Pirttimäki, 2006), (Power, 2008), (Davenport, 2001), (Gessner&Linda, 2005), (Watson et al. 2006), (Watson et al., 2008), (Baesens et al.,2003), (Chen et al., 2000), (Porter, 1998), (Gartner, 2006), (Darius, 2007), (Davenport, 2005), (Miranda, 2004), (Ranjan, 2008), (Elbashir et al.,2008), (Grayson, 2006), (Head, 2004), (Williams&Williams, 2003), (Thomas, 2001), (Nemati&Barko, 2001), (Werner&Abramson, 2003), (Cottrill, 1998), (Chou et al, 2005), (Wiseman, 1988), (Rouibah&Ould-ali, 2002), (Sahay&Ranjan, 2008)	Value-added capabilities in support of information	Enabler approach
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## 5. Researches' Review and Analysis

After studying the 85 articles on business intelligence, they are categorized in three approaches: the managerial, technical and enabler view.

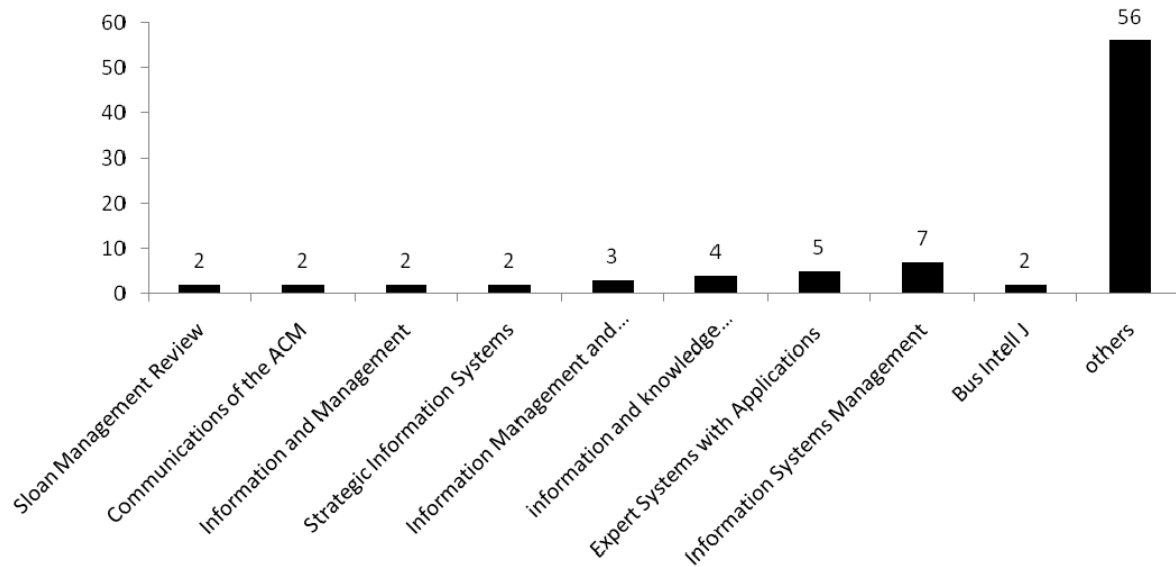
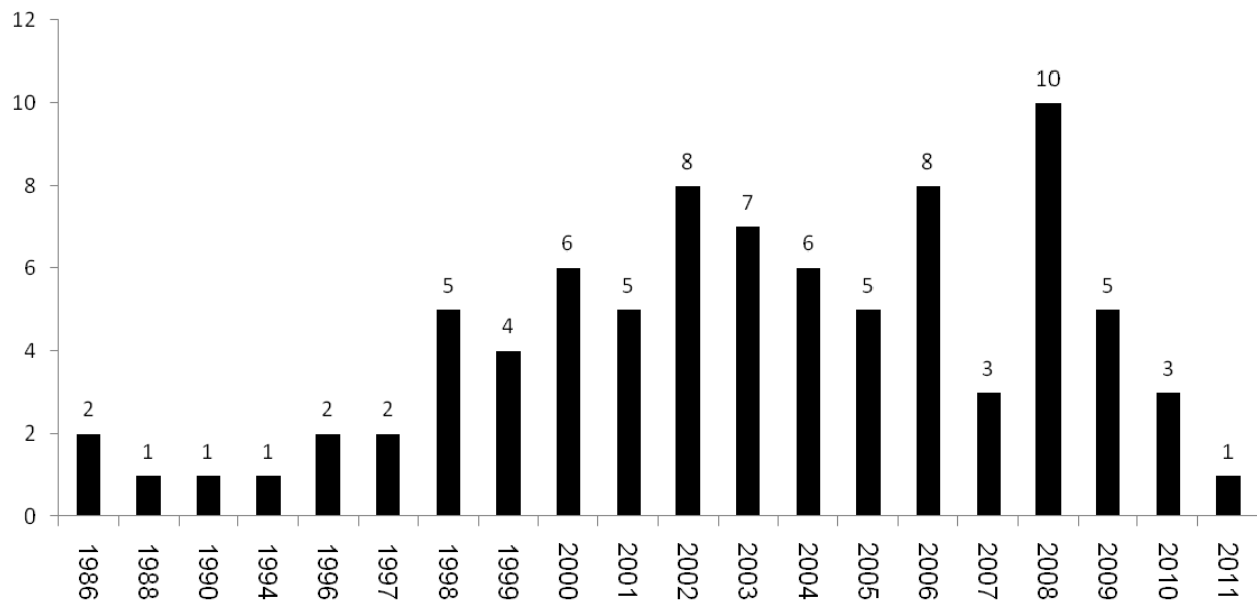
In figure2 the pie chart shows the percent of each approach in studied papers. It is observed that the managerial approach reserves highest level of contribution and the role of BI in this view is to create an informational environment in which operational data gathered from transactional systems and external sources can be analyzed, in order to provide strategic knowledge to support making instructional organization decisions. This means that 50% of the definitions focus on excellence of decision making process and optimal decision making and reserves highest level of contribution.

The technical approach with focus on tools that support processes related to BI in managerial approach has the second rank. This means that this approach, by using tools such as data mining, database etc., helps to decision making process improvement and information analysis. Also the enabler approach with a share of 21% by focusing on value-added capabilities to informational support helps to successful development of organizations and achieving competitive advantages.

**Figure 2:** Percent of Each Approach in Various Articles

Important BI papers of the last 10 years have been studied. Figure 4 reflects the fact that published papers in 2008 which mainly have been printed in " Information Management Systems" journal -a journal with managerial view and focus on excellence of management decision making process- have the highest level of contribution to introduction and cultivation of business intelligence on the base of managerial approach and focus on excellence and managerial decision making and the BI has been mentioned as a support for organizations in managing and revising enterprise information in order to make more effective and efficient decisions.

The main focus of papers that have been published before 2005 is on either technical approach and tools that support knowledge process or enabler approach. But after 2005, focus is on managerial approach. The peaks of attention to BI is mainly related to 2008 that started with focus on managerial approach has been directed toward enabler approach.

**Figure 3:** Comparing the number of articles to define business intelligence in different journals**Figure 4:** Comparing the number of articles to define business intelligence in different years

## 6. Conclusions

Business intelligence is a managerial concept which refers to a set of programs and technologies that provide capabilities of gathering, analyzing and accessing data of organization's processes. BI helps to organizations which having comprehensive knowledge about business affecting factors, such as standards in selling, production and internal organization's processes. The ultimate goal of business intelligence systems in any organization is to help making optimal decisions as soon as possible and in all organization's levels.

In this paper, an attempt has been made to express BI concepts and its different approaches in organization. Classifying definitions and different managerial approaches supports creating positive thinking in organizations, extolling levels of attention assigning tasks, etc.

At the end, by accomplishing this review research, concepts related to business intelligence classied in three groups: Managerial with focus on excellence in decision-making, Technical with focus on tools supporting business intelligence and Enabler with focus on value-added capabilities in support of shared information. Although the focus was at first on managerial approach, but over time and by doing more researches, focus shifted to technical approach and ultimately enabler approach.

Finally, recommend to researchers for improve organization systems such as Enterprise Resource Planning (ERP) consider making-decision support requirements in Business intelligence.

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