Information And Communication Technology an approach Toward Business Intelligence Analytical Study for Search Engine Companies on The Internet.

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Abstract:

Information and communication technology playing an active role to success most of companies, particularly those whom work in the internet environment, for example website companies and like search engine companies, in other hand Business intelligence (BI)[*] has two basic different meanings related to the use of the term intelligence. The primary, less frequently, is the human intelligence capacity applied in business affairs or activities. Intelligence of Business is a new field of the investigation of the application of human cognitive faculties and artificial intelligence technologies to the management in different business problems, The second relates to the intelligence as information valued for its currency and relevance.

It is expert information, knowledge and technologies efficient in the management of organizational and individual business. Therefore, in this sense, business intelligence is a broad category of applications and technologies for gathering, providing access to, and analyzing data for the purpose of helping enterprise users make better business decisions. The term implies having a comprehensive knowledge of all of the factors that affect the business using information and communication technology (ICT)[*] as a tool, . It is imperative that firms have an in depth knowledge about factors such as the customers, competitors, business partners, economic environment, and internal operations to make effective and good quality business decisions. Business intelligence enables firms to make these kinds of decisions through ICT in general.

The current study aims to analysis some search engines companies to access the concept and important and paradigms of business intelligence, further more; to benefit the local companies in all sections.

Key words: Information technology, search engines, business intelligence, data mining.

Introduction:

Business Intelligence (BI) is a popular and powerful concept of applying a set of technologies to turn data into meaningful information, With Business Intelligence Applications, large amounts of data originating in many different formats (spreadsheets, relational databases, web logs) can be consolidated and presented to key Business Analysts quickly and concisely. Armed with timely, intelligent information that is easily understood, the Business Analyst is enabled to affect change and develop strategies to drive higher profits.

Business Intelligence also, could be define as Applications cover a broad spectrum of corporate data analysis needs. Financial departments use it for financial reporting and managing the budgeting process without spending 80% of their time gathering the data or managing the multitude of non-interconnected spreadsheets.

The need for better information gleamed from the massive amounts of data companies collect is nothing new, in internet environment and global communications, Solutions ranging from simple query tools to full-scale data warehouses have emerged as approaches to solving the problem of turning data into information. The availability of BI tools and applications in today's market is almost overwhelming. Platform choices such as the retrieve information from internet via search engines or hardware foundation add to the complexity of choosing the "right" solution to invent or improve something new to excel.

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[*]Abbreviation referring to Business intelligence in this research.

[*]Abbreviation contract the Information and Communication Technology, and with "s" refer to plural.
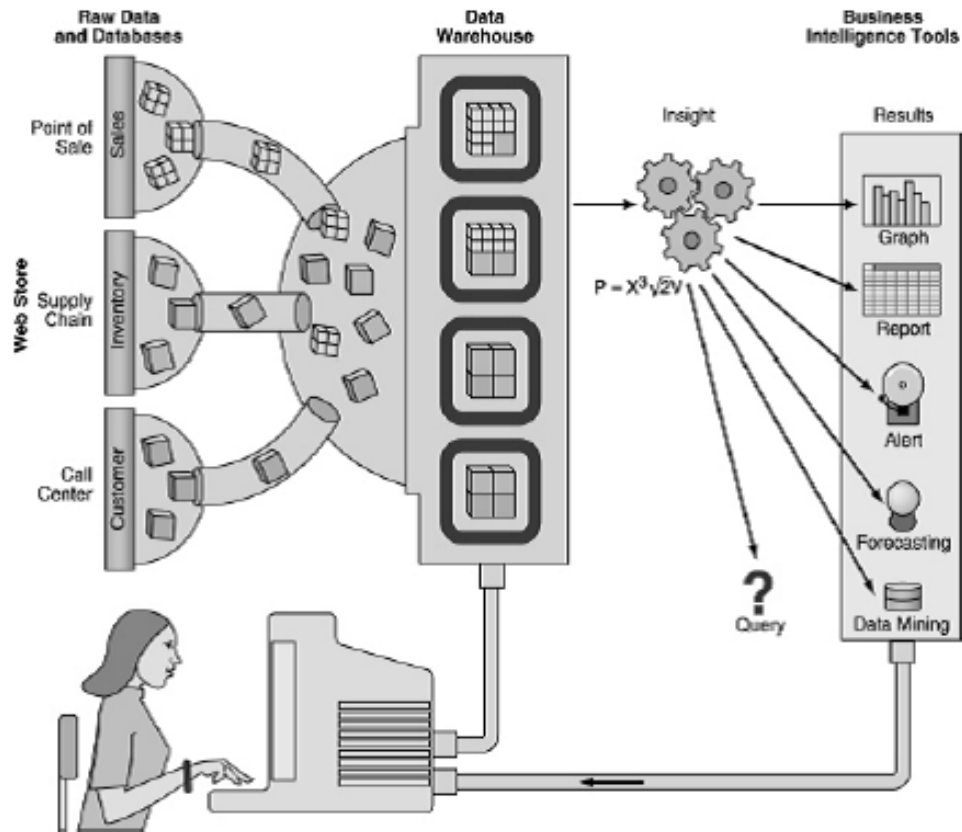
Figure (1) Simple understanding of business intelligence

Source: Jayanthi Ranjan (2009), Business Intelligence, Concepts, compounds,

Techniques And Benefits, Journal of Theoretical and Applied Information Technology, Institute of Management Technology, Ghaziabad, India.

      The Figure above, presents an understanding of business intelligence, as a system, in other words is a combination of data warehousing and decision support systems.

      The figure also reveals how data from disparate sources can be extracted and stored to be retrieved for analysis. The basic BI functions and reports are shown, the primary activities include gathering, preparing and analyzing data. The data itself must be of high quality.

      The various sources of data is collected, transformed, cleansed, loaded and stored in a warehouse. The relevant data is for a specific business area that is extracted from the data warehouse, as we can see, organization fully exploits data at every phase of the business intelligence architecture as it progresses through various levels of informational metamorphosis (Bill Prentice, 2006,13).

      Finally, the raw data is born in operational environments, where transactional data pours in from every source and every corner of the enterprise. Therefore, that is the business intelligent organization vision,

natural flow of data, from genesis to action. In addition, at each step in the flow, the data is fully exploited to ensure the increase of information value for the enterprise (Jayanthi, 2009, 64).

Information and communication technology (ICT):

Information and communication technology (ICT) can be define as connectivity (PCs and Internet) is very widespread in businesses of all sizes. As is the case with all technologies, businesses are adopt new ICTs, to benefits and firm and sector-specific strategies drive the adoption and use of ICTs. Furthermore, sectors are increasingly global and dominated most firms and the structure of their values chains and operations shape opportunities (Zixiang, A.T. and O. Wu, 2004, 18).

for small and medium size specialized in companies dot com, Principal reasons for non-adoption are lack of applicability and little incentive to change business models when returns are unclear.

In keeping with their complex nature and multiple applications, information and communication technologies (ICTs) may be viewed in different ways, The World Bank defines ICTs as "the set of activities which facilitate by electronic means the processing, transmission and display of information" , ICTs refer to technologies people use to share, distribute, gather information and to communicate, through computers and computer networks, ICTs are a complex and varied set of goods, applications and services used for producing, distributing, processing, transforming information, including telecoms, TV and radio broadcasting, hardware and software, computer services and electronic media as well, ICTs represent a cluster of associated technologies defined by their functional usage in information access and communication, of which one embodiment is the Internet (Rodriguez and Wilson, 2000).

Hargittai, defines the Internet technically and functionally as follows: "the Internet is a worldwide network of computers, but sociologically it is also important to consider it as a network of people using computers that make vast amounts of information available (Hargittai,1999, 27).

Depending of the above, we can say that information and communication technology support more than one aspect in our life, like commodities (good and services) or coordination structure, as the following diagram shown (Mayo. Timley, 2001, 73):
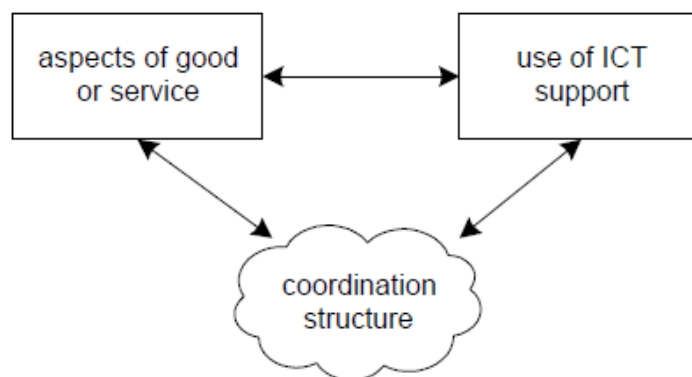
Figure (2) ICT supporting coordination structure.

Source: Mayo. Timley, (2001), The Information Society: The conceptual View, Cambridge, Polity Press, England.

Concept of Business intelligence:

Business intelligence (BI) has two basic different meanings related to the use of the term intelligence. The primary, less frequently, is the human intelligence capacity applied in business affair or activities. Intelligence of Business is a new field of the investigation of the application of human cognitive faculties and artificial intelligence technologies to the management and decision support in different business problems (Tigre, P.B, 2003, 23).

Business intelligence define as the process of taking large amounts of data, analyzing that data, and presenting a high-level set of reports that condense the essence of that data into the basis of business actions, enabling management to make fundamental daily business decisions view BI as way and method of improving business performance by providing powerful assists for executive decision maker to enable them to have actionable information at hand. BI tools are seen as technology that enables the efficiency of business operation by providing an increased value to the enterprise information and hence the way this information is utilized (Stackowiak et al, 2007,2).

Also Business Intelligence (BI) can be defined as a tool that includes effective data warehouse and also a reactive component capable of monitoring the time critical operational processes to allow tactical and operational decision-makers to tune their actions according to the company strategy (Golfarelli et.al, 2004, 17).

In other hand some author define BI as the result of in-depth analysis of detailed business data, including database and application technologies, as well as analysis practices, and widen definition of BI as technically much broader tools, that includes potentially encompassing knowledge management, enterprise resource planning, decision support systems and data mining (Swamy, 2004, 28).

And if we speak about software we can say that BI includes several of software for Extraction, Transformation and Loading (ETL), data warehousing, database query and reporting, multidimensional on-line analytical processing (OLAP) data analysis, data mining and visualization (Berson et.al, 2002, 13).

Finally The concept of Business Intelligence (BI) is brought up by Gartner Group since 1996. It is defined as the application of a set of methodologies and technologies, Web Services, XML, data warehouse, OLAP, Data Mining, representation technologies, to improve enterprise or company operation effectiveness, support management decision to achieve competitive advantages, Business Intelligence by today is never a new technology instead of an integrated solution for companies, within which the business requirement is definitely the key factor that drives technology innovation. How to identify and creatively address key business issues is therefore always the major challenge of a BI application to achieve real business impact (Curt Hall, 1999, 13).

Reasons of business intelligence:

Customers today are demanding better service, lower prices, and higher quality goods. With such a volatile economy in recent years and with so many businesses competing for the same customers, it is imperative for companies to continually improve their customer service or else risk falling victim to their competitors. This is one reason why many organizations are rethinking how they do business. For years, they have accumulated valuable information as a by-product of production while failing to put it to good use. When a company knows its customers' buying patterns, interests, and demographics, it provides a distinct competitive advantage. This knowledge has become so critical in recent years that the process of managing information has become an industry of its own (Bill Prentice, 2006,3).

According to above, Business Intelligence enables organizations to make well informed business decisions and thus can be the source of competitive advantages. This is especially true when firms are able to extrapolate information from indicators in the external environment and make accurate forecasts about future trends or economic conditions. Once business intelligence is gathered effectively and used proactively then the firms can make decisions that benefit the firms. The ultimate objective of business intelligence is to improve the timeliness and quality of information. Timely and good quality information is like having a crystal ball that can give an indication of what's the best course to take. Business intelligence inspire the following (Don Hatcher,2009,11):
1. The position of the firm as in comparison to its competitors.
2. Changes in customer behavior and spending patterns
3. The capabilities of the firm
4. Market conditions, future trends, demographic and economic information
5. The social, regulatory, and political environment
6. What the other firms in the market are doing.

Benefits of business intelligence:

Business intelligence, provides many benefits to companies utilizing it. It can eliminate a lot of the guesswork within an organization; enhance communication among departments while coordinating activities, and enable companies to respond quickly to changes financial conditions, customer preferences,
and supply chain operations. BI improves the overall performance of the company using it (Scally, T., M., 2001, 29).

Information is often regarded as the second most important resource a company has (a company's most valuable assets are its people). So when accompany can make decisions based on timely and accurate information, the company can improve its performance. BI also expedites decision-making, as acting quickly and correctly on information before competing businesses do can often result in competitively superior performance. It can also improve customer

experience, allowing for the timely and appropriate response to customer problems and priorities (Swamy, 2004, 76).

The firms have recognized the importance of business intelligence for the masses has arrived. Some of them are listed below.

1. With BI superior tools, now employees can also easily convert their business knowledge via the analytical intelligence to solve many business issues, like increase response rates from direct mail, telephone, e-mail, and Internet delivered marketing campaigns.
2. Determine what combinations of products and service lines customers are likely to purchase and when.
3. It can identify their most profitable customers and the underlying reasons for those customers' loyalty, as well as identify future customers with comparable if not greater potential, and also Identify promising new molecular product compounds.
4. Analyze potential growth customer profitability and reduce risk exposure through more accurate financial credit scoring of their customers.

The Four Key to access intelligence (Ronaldo,2005, 2):

There are four key dimensions of any company that must evolve together to avoid an unhealthy tension in the enterprise, and access business intelligence as well, that can be describe as below:

1. People: Who is involved, throughout the organization, in the use of information?
2. Process: What information-related activities must be performed?
3. Culture: How do things get done in the information environment?
4. Infrastructure: What are the information-related technologies, tools, policies, and governance involved?

They were considered to be great technology (infrastructure), but quickly became shelf ware because the people, process, and culture were not ready to effectively use them. This four dimensions evolutionary continuum ranges from a basic operational focus on the low end to an extremely innovative focus allowing companies to exploit information creatively on the high end. Most organizations today would rank somewhere in the middle to lower levels, eventually we access business intelligence by collaboration of the four above dimensions.

Future of Business Intelligence:

In this rapidly changing world consumers are now demanding quicker more efficient service from businesses. To stay competitive companies must meet or exceed the expectations of consumers. Companies will have to rely more heavily on their business intelligence systems to stay ahead of trends and future events. Business intelligence users are beginning to demand Real time Business Intelligence] or near real time analysis relating to their business, particularly in frontline operations. They will come to expect up to date and fresh information in the same fashion as they monitor stock quotes online. Monthly and even weekly analysis will not suffice (Jayanthi Ranjan, 2009, 77)

In the not too distant future companies will become dependent on real time business information in much the same fashion as people come to expect to get information on the internet in just one or two clicks.

Also in the near future business information will become more democratized where end users from throughout the organization will be able to view information on their particular segment to see how it's performing. So, in the future, the capability requirements of business intelligence will increase in the same way that consumer expectations increase, It is therefore imperative that companies increase at the same pace or even faster to stay competitive.

Intelligence business for Search engines companies:

The web creates new challenges for information retrieval, because the amount of information on the web is growing rapidly sizably and variety, as well as the number of new users inexperienced in the art of web research, So, People are likely to surf the web using its link graph, often starting with high quality human maintained indices such as Yahoo! or AltaVista, or others search engines. Human maintained lists cover popular topics effectively but are subjective, expensive to build and maintain, slow to improve, and cannot cover all esoteric topics (Sergey Brin and Lawrence Page, 1996, 4).

Automated search engines that rely on keyword matching usually return too many low quality matches, and to make matters worse, some advertisers attempt to gain people's attention by taking measures meant to mislead automated search engines, So, the owner and operator of the website and particularly search engines find them self against new era or new generation of methodology to communicate with huge amount of data of the internet, that we called inelegance business (Roborts, 2003, 56).

The increased use of Web resources has created a need for more efficient and useful search methods, So, current mechanisms for assisting the search and retrieval process are quite limited, mainly because they lack access to documents' semantics and because of the underlying difficulties in providing suitable search patterns.

Recent advances in intelligent search suggest that these limitations can be partially overcome by providing search engines with more intelligence and with the user's underlying knowledge. In this sense, intelligence is seen as the ability of systems to interact with users by natural language dialog so that the engine can learn user profiles and likes. User behavior suggests that feedback in terms of natural dialog interactions can play a key role in decreasing information overload and getting accurate search results (world Bank, 2005,19).

Most of companies on the internet have built a large-scale search engine which addresses many of the problems of existing system, It makes especially heavy use of the additional structure present in hypertext to provide much higher quality search results, depending on high usage of intelligence business to discover new marketplace and users (Sergey Brin and Lawrence Page, 1996,7).

The main goal of most search engines is to improve the quality of search, In 1994, some people believed that a complete search index would make it possible to find anything easily and smothery with minimum use of software, like Netscape navigator or internet explorer, which embedded in operating system as windows or Unix.

A search engine recently, can readily testify that the completeness of the index is not the only factor in the quality of search results, often wash out any results that a user is interested in. In fact, as of November 1997, only one of the top four commercial search engines finds itself One of the main causes of this problem is the number of documents in the indices has been increasing by many orders of magnitude, but the user's ability to look at documents has not. People are still only willing to look at the first few tens of results (Leonardo, 2000,18).

Despite of this, as the collection size grows, we need tools that have very high precision number of relevant documents returned, like in the top tens of results, Indeed, we want our notion of "relevant" ton only include the very best documents since there may be tens of thousands of slightly relevant documents, This very high precision is important even at the expense of recall, There is quite a bit of recent optimism that the use of more hyper-textual information can help improve search and other applications (Inmon, W.H., 2007, 11).
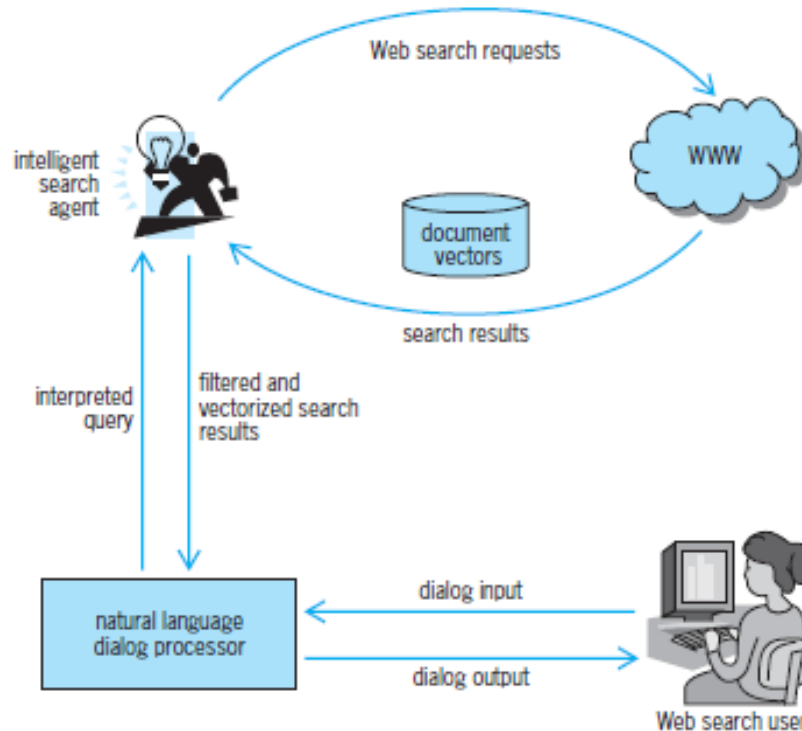
Figure (3), search engines fundamental
Source: Inmon, W.H. (2007), Fundamental of the search engines, Stanford University, Stanford, USA

Discussion and Conclusions:

We can discuss the relationship between information and communication technology for side and business intelligence form another side, by showing the aspects and effect of each other, particularly on companies working on the internet like search engines that adopt business intelligence using information to do the right things, such as giving a formulation of software to a program, or to make the right decision, such as making an investment in a company, or open and enter new market using technological tolls.

Anyway Basically Business Intelligence is a IT process understood by the management and presented with non-technical terminology, they will give the possibility to analyze organization's data , forecast trends and evaluate various business problems.

Any new-form organization now a days experience is the value chain, which is set of primary secondary activities that create value for customers, examines several critical activities related to value chain. Without effective BI to target process-oriented organizations for supporting, this is not possible.

According to literatures review BI is 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.

within and outside the firm, BI describes the result of in-depth analysis of detailed business data, including database and application technologies, as well as analysis practices, technically much broader, potentially encompassing knowledge management, enterprise resource planning, decision support systems and data mining

search engines companies like google or altavista, introduced an enhanced BI architecture that covers the complete process to sense, interpret, predict, automate and respond to business environments

and thereby aims to decrease the reaction time needed for business decisions, to efficient the performance across the four corner of the globe, proposed an event-driven IT infrastructure to operate BI applications which enable real-time analytics also across corporate business processes, notifies the business of actionable recommendations or automatically triggers business operations, and effectively closing the gap between Business Intelligence systems and business processes.

Enterprises are building business intelligence systems that support business analysis and decision making to help them better understand

their operations and compete in the marketplace, and Businesses no longer want what has happened but they want to know the underlying reasons.

The use of high-level software for business applications, More specifically, the collection of cutting-edge technologies that help to make systems more intelligent, through Innovation in data storage technology is now significantly outpacing progress in computer processing power, all of that can be a sort of business intelligence that enforced by infrastructure from information and communication technologies, so we can use ICT as a Key toward business intelligence across the globe.

Recommendations:

Each methodology of information and communication technology designing and implementing should be characterized by certain canons. In case of BI systems particular attention ought to be paid to the following issues:

• BI systems should be rapidly implemented, which is quite difficult because such systems are specific for each enterprise. Although basing on standard components shortens time required to build BI, each implementation necessitates adjusting of a particular system to specific requirements of an enterprise. While choosing ready to use BI solutions, it is necessary to be very careful; Building and Implementing Business Intelligence Systems.

• BI solutions ought to be flexible. As soon as business changes, organizations should adjust their BI systems to new conditions;

• BI systems ought to be independent of their hardware and software platforms. Hence, it is recommended that a system of multidimensional analyses should co-operate with different bases (e.g. DB/2, Oracle, MS SQL Server or Informix and search engines) and work in already tested and commonly applied operation systems (e.g. Windows NT, Unix or OS/400). Such solutions will allow for better adjusting the system in question to information technology related infrastructure of an enterprise; that whom work through the internet.

• While creating BI systems, it should be necessary to pay some attention to the fact that there are different information technology systems in search engines organizations

• BI solutions have to be scaleable. Flexibility and open architecture allow for easy expansion f the system. It is necessary in a situation when there are new informational needs or when an amount of information to be processed remarkably increases).

• BI systems should be based on modern technologies. It is necessary to pay much attention to solutions provided by household names of the computer industry. Only then, it is possible to expect stability and reliability of purchased technologies.

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