Seminar Report

Business Intelligence Through Data Analysis Using Spotfire.

Submitted

BY

Mr.Hrishikesh Hemke
V SEM/A
Roll No:45

Month, 2018-19

Department of Computer Technology

YESHWANTRAO CHAVAN COLLEGE OF ENGINEERING, Nagpur

(An Autonomous Institution Affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

YESHWANTRAO CHAVAN COLLEGE OF ENGINEERING
NAGPUR
(An Autonomous Institution Affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

Department of Computer Technology

(2018-19)

Certificate

This is to certify that the Seminar Report titled "Business intelligence through data analysis using Spotfire" is submitted towards the partial fulfillment of requirement of course CT1328 - Seminar in V Semester, B.E. (Computer Technology), degree awarded by Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur.

Submitted by:

Mr .Hrishikesh Hemke (Roll No: 45)

is approved.

Seminar Guide

Mr. Nikhil S. Mangrulkar

Seminar Coordinator

Mr. Nikhil S. Mangrulkar

Head, Department of Computer Technology

Mrs. G. M. Dhopavkar

Date: 02/Aug/24

Place: Nagpur

Abstract

Font In trendy business, increasing standards, automation and technologies have LED to ocean amounts of information. But the matter of business method} process has become difficult. Ancient information system has been unable to fulfill the prevailing state of affairs. An in depth investigate the various structure operates suggests that Business Intelligence (BI) will play an important role in virtually each function. It will gives uprising new and sometimes different insights concerning customer behavior; thereby helping the retailers meets their dynamic wants and wishes. This paper reviews the literature of progress in Business Intelligence (BI) system analysis. On the offer aspect, Bi will facilitate retailers establish their best vendors and confirm what separates them from not thus smart vendors.

Due to the rapid growth of new technologies, the Business Intelligence (BI) market is growing as well that forces the corporations to adopt their offerings to the needs of the customer. Adoption of Business Intelligence system has become one of the most important technological and organizational innovations in modern organization that promote knowledge diffusion, and cornerstone of business decision making processes. Since the way of BI integrated and implemented is quite different among organizations, it is important to approach BI literature by adaption of BI application and its implementation, BI architects, and enabling factors in BI projects. Furthermore, we are also going to discuss how technological capabilities such as user access, data quality and the integration of BI with other systems in the firm, as well as organizational capabilities such as flexibility and risk management support, are essential for BI success, regardless of the decision environment. Last but not least, this paper will also discuss how the idea of BI has been built on the school of thought. We expect that results could create the value and input for enterprises that plan to implement a BI application in their organization.

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1. INTRODUCTION

The data economy puts a premium on top quality unjust information - specifically what Business Intelligence (BI) tools like information deposition, data processing, and OLAP will offer to the retailers. A detailed investigate the various retail structure performs suggests that bismuth will play an important role in virtually each function. It will offer new and infrequently shocking insights regarding client behavior; It will offer retailers higher understanding of inventory and its movement and conjointly facilitate improve front operations through higher class management. Through a number of analyses and reports, BI may also improve retailers' internal structure support functions like finance and human resource management.

As quite sensitively delineated within the picture show, the massive chain superstores have nearly forced tiny freelance retailers to shut down. At an equivalent time, these massive retailers have gained extensive power within the offer chain. They are progressively dictating terms to the retailers and inventing new ways in which of attracting customers. But to carry the customer's thoughts for long has remained an indefinable dream. Dynamic tastes and preferences, increasing competition, demographic changes, and also the easy "let's effort one thing new" angle have all been infernal for customer infidelity. Technology has contended a key role in retailers' effort to compete during this volatile market. Refined retailers have quickly evolved from fundamental automation to hug like CRM, business intelligence (BI), etc. This paper explores the varied applications of business intelligence within the retail business and to form a literature review of Progress in Business Intelligence System research. Business intelligence refers to a bunch of technologies like information deposition, online analytical process (OLAP), and data processing AI which seek to flip information into unjust data.

Present day association settings are very convoluted and continually evolving. Organizations, in both public and private sector, are under extraordinary pressure for offering an explanation to the top management about change condition and innovation. To do so, it requires an organization to possess strategic, operational and tactical decisions;

however, they are complicated and are taken rapidly. The basic leadership requires a lot of data, information, and knowledge. One ought to process this data as required basic leadership and fast, on time and ongoing preparing is expected to end up modernized (Turban et al, 2010). Furthermore, nowadays business life cycle has turned out to be shorter. Henceforth, to gain the competitive advantage organization must have quick and proper decision making. Decision maker indeed needs good data, to make the right decision at the right time and place (Farjami, 2015). -2- The concept of BI existed during the 1950s and it grew out from a technology called decision support. Decision support is still used by many companies to come up with decisions that would help them to gain competitive advantage amongst their competitors. BI has grown strong during the recent years mainly due to increased data collection and better technology with greater storage capacity. Due to the improvement of technology, the company can use BI to store a large amount of data with cheaper rate. Companies have access to a lot of data in the form of smartphone, internet records, social media activities and so on. BI can sift through these data to find patterns and trends (Raisinghani, 2004). In any organization regardless its size, the business activities include the administration of extensive amounts of data from both inner and outside business conditions; all these data identified with interior operations, advertise, clients, providers, economic assets, and so forth., historically cumulated, on action times of the organization, shape the reason for some complex and greatly helpful economic and money related problems in the organization's administration decision making process (Mihaelia and Rozalia, 2012).

Associations battle in gathering data, recovering information and making decisions in view of the separated information. A decision making strategy comprises of building judgments identifying with numerous speculations and assets upheld the quantitative and subjective data. Decisions in any association are made by people and not by frameworks and thus introduction of data assumes a noteworthy part inside the decision making process. While using this application, department users and mahaonline users face difficulty analysing the candidate information and the recruitment process. Thus we are going to provide them with a Business Intelligence Dashboard Utility which is a tool to view and analyse data using dashboards. Maharecruitment application mainly deals with candidate registration, profile creation, criteria verification, payment of fees and application for exams. Once the user criteria is verified and the payment is done the candidate is applicable for the exam. Mahaonline has such huge amounts of data stored in the government databases as well as

the data collected through various applications. Collecting and analysing vast quantities of data has become a tedious process. Thus the goal of our project is to provide mahaonline with a business intelligence tool which can be used over several applications to get an overview over the data collected and the processing of the application. Our dashboard utility would provide some data visualization tools like pie charts, graphs, customization and drill-down. Our criteria of success would be determined by using this Business Intelligence dashboard utility to successfully implement and deploy a dashboard for the maharecruitment application.

1.1 DASHBOARDS OVER THE EXISTING SYSTEM

Business Intelligence Dashboard could be a screen that consolidates vital performance metrics all in one place, creating it simple for users to remain perpetually updated on the data most vital to their business. In our system dashboard is designed for the job recruitment department of govt. of Maharashtra in which the database will consist of the user applications/form which will be filled by the applicants. This data will be then segregated and stored in the database. The dashboard will be consisting of different facts such as the no of applicants filled the form for the exam, district wise enrolment of applicants for particular exams, paid and unpaid applicants. Dashboard which is created will allow the government officers to have a quick look for the applicants enrolled for a particular exam and take proper decisions about the arrangement for the applicants, their payment process, district wise arrangements for their examination centres. Instead of going through each applicant and making a note of it manually a dashboard will give a quick look for what information is needed by the officer. This will save a lot of manual work as well as will save time and give the information quickly. This will help in making decision within no time avoiding the delay caused due to manual segregation of data.

2. LITERATURE SURVEY AND BACKGROUND KNOWLEDGE

The earliest known use of the term *business intelligence* is in Richard Millar Devens' *Cyclopia of Commercial and Business Anecdotes* (1865). Devens used the term to describe how the banker Sir Henry Furnese gained profit by receiving and acting upon information about his environment, prior to his competitors:

Throughout Holland, Flanders, France, and Germany, he maintained a complete and perfect train of business intelligence. The news of the many battles fought was thus received first by him, and the fall of Namur added to his profits, owing to his early receipt of the news.

— *Devens, p. 210*

2.1 History

The ability to collect and react accordingly based on the information retrieved, Devens says, is central to business intelligence.

When Hans Peter Luhn, a researcher at IBM, used the term business intelligence in an article published in 1958, he employed the Webster's Dictionary definition of intelligence: "the ability to apprehend the interrelationships of presented facts in such a way as to guide action towards a desired goal."[7] Business intelligence as it is understood today is said to have evolved from the decision support systems (DSS) that began in the 1960s and developed throughout the mid-1980s.DSS originated in the computer-aided models created to assist with decision making and planning

In 1989, Howard Dresner (later a Gartner analyst) proposed business intelligence as an umbrella term to describe "concepts and methods to improve business decision making by using fact-based support systems." It was not until the late 1990s that this usage was widespread.

Critics[see BI merely as an evolution of business reporting together with the advent of increasingly powerful and easy-to-use data analysis tools. In this respect it has also been criticized as a marketing buzzword in the context of the "big data" surge.

2.2 Defination

According to Forrester Research, business intelligence is "a set of methodologies, processes, architectures, and technologies that transform raw data into meaningful and useful information used to enable more effective strategic, tactical, and operational insights and decision-making."[11] Under this definition, business intelligence encompasses information management (data integration, data quality, data warehousing, master-data management, text- and content-analytics, et al.). Therefore, Forrester refers to *data preparation* and *data usage* as two separate but closely linked segments of the business-intelligence architectural stack.

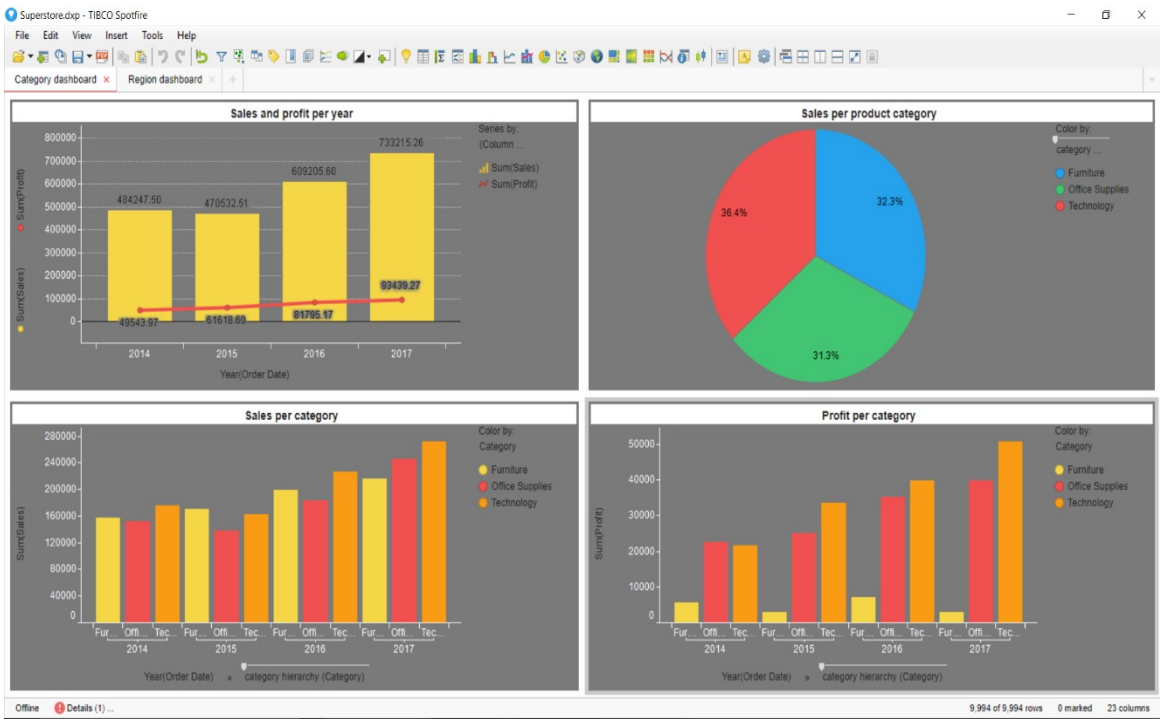
2.3 Spotfire

TIBCO Spotfire is a smart, secure, governed, enterprise-class analytics platform with built-in data wrangling that delivers AI-driven, visual, geo, and streaming analytics. It was a business intelligence company based in Somerville, Massachusetts that was bought by TIBCO in 2007.

Spotfire's origins trace back to the University of Maryland Human-Computer Interaction Lab at the University of Maryland, College Park where, a visiting student from Sweden in the early 1990s, Christopher Ahlberg, worked with Ben Shneiderman to develop applications of dynamic queries. Ahlberg returned to Sweden and developed an enhanced UNIX implementation of his visual data analysis tool, the Information Visualization and Exploration Environment (IVEE). Spotfire was launched in mid-1996 by IVEE Development, which was renamed Spotfire Inc.[1]

On May 2, 2007 it was announced that TIBCO would buy the company.[2][3] In November 2011, Tibco launched latest version of its business intelligence (BI) and analytics software Spotfire 4.0 with Microsoft SharePoint integration.

2.4 Characteristics of dashboard



2.4.1 No more fragmented data

Dashboards lively sync 24/7/365. Every business engages with customers, partners, vendors, employees and other stakeholders via various digital touch points. A plethora of unstructured and structured data is generated due to these multi-directional conversations. The ability to extract data from all these sources, cleansing them and making it ready to perform deeper analysis is possible only with an integrated data environment. Only with the integrated data, a business will be able to analyze customer sentiments, employee re-tention, campaign performance, Return on investments, value adding vendors, next best employees etc. in a holistic manner. Today, Dashboarding platforms come with advanced data

connectors to integrate social, mobile, ad syndication platforms and even custom da-ta sources such as excel sheets, SQL databases etc.

2.4.2 Configurable advanced filters

The process of extracting valuable insights doesn't end with stashing volumes of pro-cessed data in an integrated data environment. You should be able to slice and dice through the data with multiple dimensions and parameters. Smarter Dashboard platforms offer advanced capabilities to use filters, validation criteria, formatting and present gener-ated insights in a visually consumable manner. Filters make the job of skimming through volumes of structured data, compare present data with historical data, drill down to demo-graphic, regional segmented data so easy and saves enormous amount of time. There are platforms that allow importing of custom database queries to extract data and filter specific data sets from integrated data sources. Usage of filters in Dashboards unearths strategic questions and offers newer perspectives of the same data.

2.4.3 Secure Data Access and Administration

Modern analytics platforms go beyond relying on single sign-on authentication (SSO) se-curity solution. or multi-factor authentication techniques. Enable security tokens to estab-lish an extra layer of assurance along with multi-factor authentication.

Data integrity is an essential ingredient within analytics platforms that protects data from within the organization by unauthorized deletion or manipulation of valuable data. En-cryption is another favorable security feature to encrypt data while storing and retrieval.

Advanced mobile friendly security measures for protecting mission critical data such as Personal Identification numbers (PIN) and One time Passwords (OTP), security certifi-cates are highly recommended to protect data of competitive importance and regulatory compliance.

2.4.4 Omni-channel alerts and status updates

Business users are glued to their smartphone, tablet or web browsers to stay on top of fac-tors that drive their business performance. Dashboards present responsive view of ac-tionable information across these devices. Smarter dashboards allow users to write cus-tom business rules-based alerts for real-time decision making across critical business functionalities such as revenue management, customer growth, product availability, etc. Alerts trigger automated workflows, demand timely decision making across devices, browsers, platforms and initiates follow-up actions to mapped stake holders in a globally distributed team.

If your dashboard has the above discussed characteristics you are right on in enabling real-time decision making. If you think your dashboards could be made even more smart-er, then start enabling those new age functionality with in-house expertise or by taking help of a value adding technology service provider.

3.0 Advantages and Limitations

3.1 Advantages

1. Get insights to make accurate and timely business decisions. Eliminate guesswork. Many times, executives make decisions based on their best guess and on their gut feeling. Often, these decisions are proven inaccurate because they were not completely informed. Using Business Intelligence, your decisions will be data and insight-driven, not taken by gut feeling. You will be able to analyze data in real-time for making immediate decisions.

2. Identify new revenue opportunities. By being able to analyze all your data, you will

obtain insights about potential opportunities you might have missed in the past. You can create new offers to adjust to the current market situation and to better satisfy your customers.

3. Successfully track KPIs by getting alerts and notifications every time data changes regarding a specific KPI. If the data changes, you get notified and can drill down to see why it happened and what can you do to fix it.

4. Get answers to all your questions, plus extra answers (insights) to questions you did not even think of yet. This is the beauty of automated insights, they avoid our natural observational biases and give us 'answers' to issues we haven't even noticed.

5. Allow different types of users to access data and dashboards. With self-service solutions, business users don't have to depend on IT entirely to be able to access data and create dashboards, rather, they can access key metrics and reports. If you use a governed self-service BI tool, then you allow all users to benefit from BI, but maintain only one version of the truth.

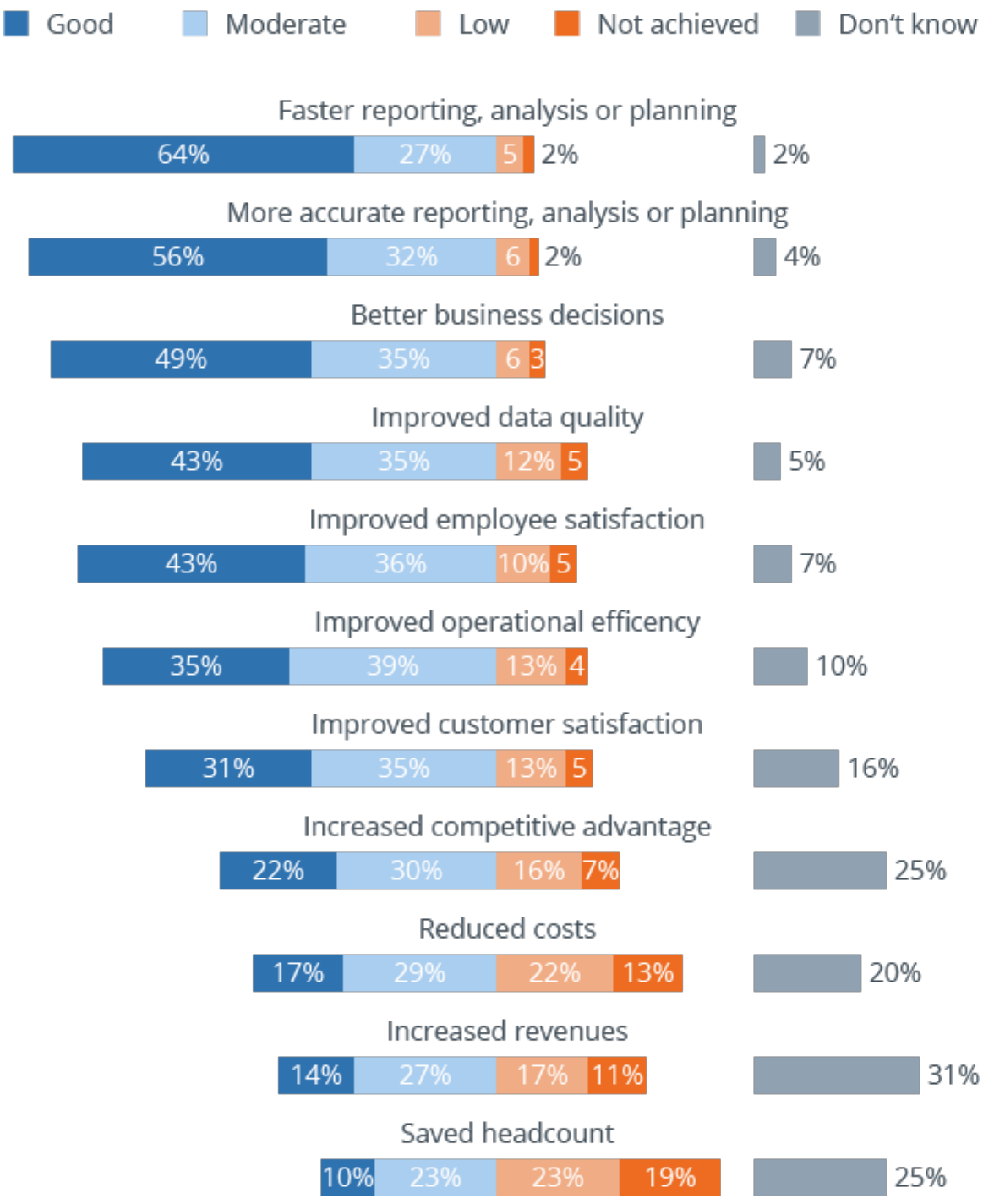
6. Get a 360° view of your customers. You will understand customer behavior better and use it to provide the customer with customized offers. Knowing what customers buy or don't, at what time and where, enables you to turn this information into profit.

7. Better inventory management. BI can help you manage the amount of inventory you order, the logistics for a correct management, and detect any anomalies in the inventory data.

8. Improve efficiency. Your BI solution will save you a lot of time by giving you insights within seconds. Long gone are the days of reporting that took weeks. You and your team can now get answers faster.

9. More accurate resource allocation. You will know which areas of the business need more resources. BI allows you to analyze exactly how each business unit is doing and gives you insights as to how to improve them.

10. Take advantage of your team's potential. By collaborating and being able to create discussions with other team members when you spot a change in data, you can make better decisions together. Find out who are the relevant people for a specific issue and create an ad-hoc team to solve it



3.2 Limitations:

1.Piling of Historical Data

The major objective of Business intelligence system is to stockpile past data about a firm's deals and reveal it in such a way that it permits professionals in decision making. On the flip side, this information generally amounts to a small portion of what the firms actually require to function, besides its restrained worth. While in other situations, the user may not have interest in historical data as many markets that the company regulates are in frequent alteration.

2.Cost

Business intelligence at times can be a little too much for small as well as for medium sized enterprises. The use of such system can be expensive for basic business transactions.

3.Complexity

Another disadvantage of BI could be its complexity in implementation of data. It can be so intricate that it can make business techniques rigid to deal with. In the view of such premise, many business experts have predicted that these intricacies can ultimately throttle any business.

4. Muddling of commercial settings

Business Intelligence can cause commercial settings to turn out to be much more muddled.

5. Limited use

Like all improved technologies, business intelligence was first established keeping in consideration the buying competence of affluent firms. Even today BI system cannot be

afforded by most of the companies. Although, traders in the past few years have started modifying their services towards medium and small sized industries, but the fact is that many of such firms does not consider them to be highly essential, for its complexity.

6. Time Consuming Implementation

Many firms in today's fast paced industrial scenario are not patient enough to wait for the execution of Business intelligence in their organization. It takes around 18 months for data warehousing system to completely implement the system.

4.0 APPLICATIONS

Business intelligence can be applied to the following business purposes:[22]

1. Performance metrics and benchmarking inform business leaders of progress towards business goals (business process management).
2. Analytics quantify processes for a business to arrive at optimal decisions, and to perform business knowledge discovery. Analytics may variously involve data mining, process mining, statistical analysis, predictive analytics, predictive modelling, business process modelling, data lineage, complex event processing and prescriptive analytics.
3. Business reporting can use BI data to inform strategy. Business reporting may involve data visualization, executive information system, and/or OLAP
4. BI can facilitate collaboration both inside and outside the business by enabling data sharing and electronic data interchange
5. Knowledge management is concerned with the creation, distribution, use, and management of business intelligence, and of business knowledge in general. Knowledge management leads to learning management and regulatory compliance.

5.0 Conclusion

Retailers are acknowledged for innovation. the foremost innovative retailers of nowadays are people who are exploitation business intelligence to realize sustained competitive advantage. The wisdom, gathered by analysing large quantity of information, and will achieve each angle of the organization. This paper reviews relies on a literature on a business intelligence approach. The last objective is to convert this knowledge into effective action. And for this the whole organization should be ready to leverage the business intelligence network.

Even though the concept of BI just emerged several decades ago, it now is becoming a major concern for enterprises regardless of its size to take it into consideration whether they should invest in this system or not in order to satisfy the customer needs and wants. Nowadays, BI establishes a real business value of data asset and provides remarkable improvement in recognizing and taking advantage of business opportunities. Many multinational corporations have adopted BI system, but some of them failed in adapting this system. Operational and organizational factors such as strategy, human capital, leadership, culture, quality management and strategic orientation of a firm significantly affect BI system's implementation and integration. Understanding capabilities of both technological and management aspect is a key success in adopting BI system in the firm.

6.0 References

1. Zhang Hai. 2009. Research Automated Negotiation Framework for Business Intelligence Systems. International Conference Networking and Digital Society. ICNDS „09. Digital Object Identifier. Page(s): 292 – 295 IEEE Conferences

2. https://en.wikipedia.org/wiki/Business_intelligence#History

3. XV Dan Rarte. “An Induction to Business Intelligence”. www.techrepublik. Com.

4. Bernard Liautaud, “Mark Hammong. Intelligence: Turning In2 formation Into Knowledge into Profit”. USA McGraw – Hill Companies, lnc, 2001. [7] Nikos Karayannidis, ArisTsois, PanosVassiliadis, and TimosSellis, “Design of the ERATOSTHENES OLAP Server”.

5. Rust, R., Zeithami, Lemon, “Driving Customer Equity: How Customer Lifetime Value is Reshaping Corporate Strategy”, New York: Simon &Schuster, 2000.

6. FalakmasirM.H.et al.2010. Business intelligence in eLearning :(case study on the Iran University of science and technology dataset. Software Engineering and Data Mining (SEDM).2nd International Conference. Page(s):473 – 477. IEEE Conferences

7. Pirnau, M et al. 2010. General information on business Intelligence and OLAP systems architecture. Computer and ICNDS'09. International Conference Networking and Digital Society on Volume: 2 Digital Object Identifier. Page(s): 288 – 291 IEEE Conferences. Stefano Vic, N. and Stefano Vic, D. 2009. Supply Chain Business Intelligence: Technologies, Issues and Trends.