



# BUSINESS INTELLIGENCE: CONCEPTS, COMPONENTS, TECHNIQUES AND BENEFITS

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## ABSTRACT

For companies maintaining direct contact with large numbers of customers, however, a growing number channel-oriented applications (e.g. e-commerce support, call center support) create a new data management challenge: that is effective way of integrating enterprise applications in real time. To learn from the past and forecast the future, many companies are adopting Business Intelligence (BI) tools and systems. Companies have understood the importance of enforcing achievements of the goals defined by their business strategies through business intelligence concepts. It describes the insights on the role and requirement of real time BI by examining the business needs. The paper explores the concepts of BI, its components, emergence of BI, benefits of BI, factors influencing BI, technology requirements, designing and implementing business intelligence, and various BI techniques.

## 1. INTRODUCTION

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/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.

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. 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.

A specialized field of business intelligence known as competitive intelligence focuses solely on the external competitive environment. Information is gathered on the actions of competitors and decisions are made based on this information. Little if any attention is paid to gathering internal information.

In modern businesses, increasing standards, automation, and technologies have led to vast amounts of data becoming available. Data warehouse technologies have set up repositories to store this data. Improved Extract, transform, load (ETL) and even recently Enterprise Application Integration tools have increased the speedy collecting of data. OLAP reporting technologies have allowed faster generation of new reports which analyze the data. Business intelligence has now become the art of sifting through large amounts of data, extracting pertinent information, and turning that information into knowledge upon which actions can be taken.

The paper explores the concepts of BI, its components, emergence of BI, benefits of BI, factors influencing BI, technology requirements, designing and implementing business intelligence, cultural imperatives, and various BI techniques. The paper would be useful for



budding researchers in the field of BI to understand the basic concepts.

## 2. BUSINESS INTELLIGENCE

Stackowiak et al. (2007) define Business intelligence 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. (Cui et al, 2007) 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.

Zeng et al. (2006) define BI as “The process of collection, treatment and diffusion of information that has an objective, the reduction of uncertainty in the making of all strategic decisions.” Experts describe Business intelligence as a “business management term used to describe applications and technologies which are used to gather, provide access to analyze data and information about an enterprise, in order to help them make better informed business decisions.”

(Tvrdíková, 2007) describes the basic characteristic for BI tool is that it is ability to collect data from heterogeneous source, to possess advance analytical methods, and the ability to support multi users demands.

Zeng et al. (2006) categorized BI technology based on the method of information delivery; reporting, statistical analysis, ad-hoc analysis and predicative analysis.

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, such as J2EE, DOTNET, Web Services, XML, data warehouse, OLAP, Data Mining, representation technologies, etc, to improve enterprise 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.

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

BI includes several software for Extraction, Transformation and Loading (ETL), data warehousing, database query and reporting, (Berson et.al, 2002; Curt Hall, 1999) multidimensional/on-line analytical processing (OLAP) data analysis, data mining and visualization.

## 3. COMPONENTS OF BI.

**OLAP (On-line analytical processing):** It refers to the way in which business users can slice and dice their way through data using sophisticated tools that allow for the navigation of dimensions such as time or hierarchies. Online Analytical Processing or OLAP provides multidimensional, summarized views of business data and is used for reporting, analysis, modeling and planning for optimizing the business. OLAP techniques and tools can be used to work with data warehouses or data marts designed for sophisticated enterprise intelligence systems. These systems process queries required to discover trends and analyze critical factors. Reporting software generates aggregated views of data to keep the management informed about the state of their business. Other BI tools are used to store and analyze data, such as data mining and data warehouses; decision support systems and forecasting; document warehouses and document management; knowledge management; mapping, information visualization,



and dash boarding; management information systems, geographic information systems; Trend Analysis; Software as a Service (SaaS).

**Advanced Analytics:** it is referred to as data mining, forecasting or predictive analytics, this takes advantage of statistical analysis techniques to predict or provide certainty measures on facts.

**Corporate Performance Management (Portals, Scorecards, Dashboards):** this general category usually provides a container for several pieces to plug into so that the aggregate tells a story. For example, a balanced scorecard that displays portlets for financial metrics combined with say organizational learning and growth metrics.

**Real time BI:** It allows for the real time distribution of metrics through email, messaging systems and/or interactive displays.

**Data Warehouse and data marts:** The data warehouse is the significant component of business intelligence. It is subject oriented, integrated. The data warehouse supports the physical propagation of data by handling the numerous enterprise records for integration, cleansing, aggregation and query tasks. It can also contain the operational data which can be defined as an updateable set of integrated data used for enterprise wide tactical decision-making of a particular subject area. It contains live data, not snapshots, and retains minimal history. Data sources can be operational databases, historical data, external data for example, from market research companies or from the Internet), or information from the already existing data warehouse environment. The data sources can be relational databases or any other data structure that supports the line of business applications. They also can reside on many different platforms and can contain structured information, such as tables or spreadsheets, or unstructured information, such as plaintext files or pictures and other multimedia information. A data mart as described by (Inmon, 1999) is a collection of subject areas organized for decision support based on the needs of a given department. Finance has their data mart, marketing has theirs, and sales have theirs and so on. And the data mart for marketing only faintly resembles anyone else's data mart. Perhaps most importantly, (Inmon, 1999) the individual departments own the hardware, software, data and programs that constitute the data mart. Each department has its own interpretation of what a

data mart should look like and each department's data mart is peculiar to and specific to its own needs. Similar to data warehouses, data marts contain operational data that helps business experts to strategize based on analyses of past trends and experiences. The key difference is that the creation of a data mart is predicated on a specific, predefined need for a certain grouping and configuration of select data. There can be multiple data marts inside an enterprise. A data mart can support a particular business function, business process or business unit.

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BI tools are widely accepted as a new middleware between transactional applications and decision support applications, thereby decoupling systems tailored to an efficient handling of business transactions from systems tailored to an efficient support of business decisions. The capabilities of BI include decision support, online analytical processing, statistical analysis, forecasting, and data mining. The following are the major components that constitute BI.

#### Data Sources

Data sources can be operational databases, historical data, external data for example, from market research companies or from the Internet), or information from the already existing data warehouse environment. The data sources can be relational databases or any other data structure that supports the line of business applications. They also can reside on many different platforms and can contain structured information, such as tables or spreadsheets, or unstructured information, such as plaintext files or pictures and other multimedia information.

#### 4. ISSUES IN BI

**Experts View:** Experts view BI in different ways. Data warehousing experts view BI as supplementary systems and is very new to them. These experts treat BI as technology platform for decision support application. The author is of opinion that to data mining experts BI is set of



advanced decision support systems with data mining techniques and applications of algorithms. To statisticians BI is viewed as a forecasting and multidimensional analysis based tool.

**Approaches in Data Warehousing:** The main key to successful BI system is consolidating data from the many different enterprise operational systems into an enterprise data warehouse. Very few organizations have a full-fledged enterprise data warehouse. This is due to the vast scope of effort towards consolidating the entire enterprise data. (Berson et.al, 2002) emphasizes that in view of emerging highly dynamic business environment, only the most competitive enterprises will achieve sustained market success. The organizations will distinguish themselves by the capability to leverage information about their market place, customers, and operations to capitalize on the business opportunities.

**Analysis of right information:** Several surveys including Gartner, Forrester and International Data Centre report that most of the firms throughout the globe are interested in investing in BI. It is to be noted that despite major investments in enterprise resource planning (ERP) and customer relationship management (CRM) over the last decade businesses are struggling to achieve competitive advantage. It is due to the information captured by these systems. Any corporate would look forward for one goal called 'right access to information quickly'. Hence, the firms need to support the analysis and application of information in order to make operational decisions. Say for marking seasonal merchandise or providing certain recommendations to customers, firms need right access to information quickly. Implementing smarter business processes is where business intelligence influences and influences the bottom line and returns value to any firm.

## 5. 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. 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.

## 6. REASONS FOR BUSINESS INTELLIGENCE

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 reveals:

- The position of the firm as in comparison to its competitors
- Changes in customer behavior and spending patterns
- The capabilities of the firm
- Market conditions, future trends, demographic and economic information
- The social, regulatory, and political environment

- What the other firms in the market are doing

Businesses realize that in this very competitive, fast paced and ever-changing business environment, a key competitive quantity is how quickly they respond and adapt to change. Business intelligence enables them to use information gathered to quickly and constantly respond to changes.

The Fig.1 presents an understanding of BI. A BI 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 in fig 1.

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. A BI organization fully exploits data at every phase of the BI architecture as it progresses through various levels of informational metamorphosis. 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: A 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. The challenge for BI, of course, is to build any organization's vision.

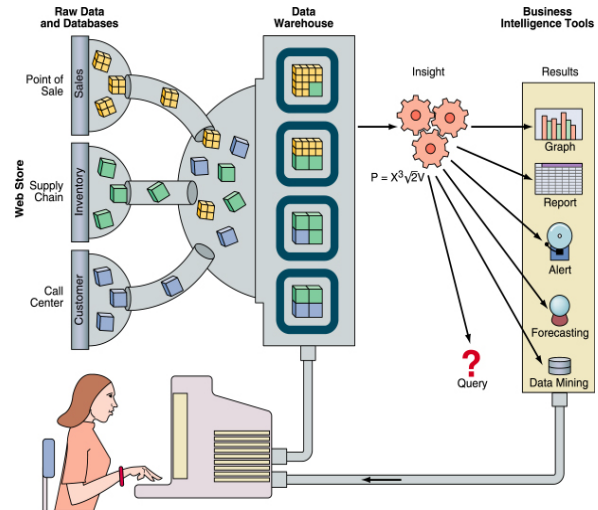


Fig 1. A basic understanding of BI

## 7. BENEFITS OF BI

BI 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 in financial conditions, customer preferences, and supply chain operations. BI improves the overall performance of the company using it.

Information is often regarded as the second most important resource a company has (a company's most valuable assets are its people). So when a company 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.

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

- 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.
- With BI, firms 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.
  - Analyze click-stream data to improve e-commerce strategies.
  - Quickly detect warranty-reported problems to minimize the impact of product design deficiencies.
  - Discover money-laundering criminal activities.
  - Analyze potential growth customer profitability and reduce risk exposure through more accurate financial credit scoring of their customers.
  - Determine what combinations of products and service lines customers are likely to purchase and when.
  - Analyze clinical trials for experimental drugs.
  - Set more profitable rates for insurance premiums.
  - Reduce equipment downtime by applying predictive maintenance.
  - Determine with attrition and churn analysis why customers leave for competitors and/or become the customers.
  - Detect and deter fraudulent behavior, such as from usage spikes when credit or phone cards are stolen.
  - Identify promising new molecular drug compounds.

Customers are the most critical aspect to a company's success. Without them a company cannot exist. So it is very important that firms have information on their preferences. Firms must quickly adapt to their changing demands. Business Intelligence enables firms to gather information on the trends in the marketplace and come up with innovative products or services in anticipation of customer's changing demands.

Competitors can be a huge hurdle on firm's way to success. Their objectives are the same as firms' and that is to maximize profits and customer satisfaction. In order to be successful firms must stay one step ahead of the competitors. In business we don't want to play the catch up game because we would have lost

valuable market share. Business Intelligence tells what actions our competitors are taking, so one can make better informed decisions.

## 8. BUSINESS INTELLIGENCE TECHNOLOGY

Business intelligence provides organizational data in such a way that the organizational knowledge filters can easily associate with this data and turn it into information for the organization. Persons involved in business intelligence processes may use application software and other technologies to gather, store, analyze, and provide access to data, and present that data in a simple, useful manner. The software aids in Business performance management, and aims to help people make "better" business decisions by making accurate, current, and relevant information available to them when they need it. Some businesses use data warehouses because they are a logical collection of information gathered from various operational databases for the purpose of creating business intelligence.

In order for BI system to work effectively there must be some technical constraints in place. BI technical requirements have to address the following issues:

- Security and specified user access to the warehouse
- Data volume (capacity)
- How long data will be stored (data retention)
- Benchmark and performance targets

People working in business intelligence have developed tools that ease the work, especially when the intelligence task involves gathering and analyzing large quantities of unstructured data. Each vendor typically defines Business Intelligence their own way, and markets tools to do BI the way that they see it.

Business intelligence includes tools in various categories, including the following:

- AQL - Associative Query Logic
- Scorecarding
- Business Performance Management and Performance Measurement
- Business Planning



- Business Process Re-engineering
- Competitive Analysis
- Customer Relationship Management (CRM) and Marketing
- Data mining (DM), Data Farming, and Data warehouses
- Decision Support Systems (DSS) and Forecasting
- Document warehouses and Document Management
- Enterprise Management systems
- Executive Information Systems (EIS)
- Finance and Budgeting
- Human Resources
- Knowledge Management
- Mapping, Information visualization, and Dash boarding
- Management Information Systems (MIS)
- Geographic Information Systems (GIS)
- Online Analytical Processing (OLAP) and multidimensional analysis; sometimes simply called "Analytics" (based on the so-called "hypercube" or "cube")
- Real time business intelligence
- Statistics and Technical Data Analysis
- Supply Chain Management/Demand Chain Management
- Systems intelligence
- Trend Analysis
- User/End-user Query and Reporting
- Web Personalization and Web Mining
- Text mining

BI often uses Key performance indicators (KPIs) to assess the present state of business and to prescribe a course of action. More and more organizations have started to make more data available more promptly. In the past, data only became available after a month or two, which did not help managers to adjust activities in time to hit Wall Street targets. Recently, banks have tried to make data available at shorter intervals and have reduced delays.

For example, for businesses which have higher operational/credit risk loading (for example, credit cards and "wealth management"), a large multi-national bank makes KPI-related data available weekly, and sometimes offers a daily analysis of numbers. This means data usually becomes available within 24 hours, necessitating automation and the use of IT systems.

## 9. DESIGNING AND IMPLEMENTING A BUSINESS INTELLIGENCE

When implementing a BI programme one might like to pose a number of questions and take a number of resultant decisions, such as:

- Goal Alignment queries: The first step determines the short and medium-term purposes of the programme. What strategic goal(s) of the organization will the programme address? What organizational mission/vision does it relate to? A crafted hypothesis needs to detail how this initiative will eventually improve results / performance (i.e. a strategy map).
- Baseline queries: Current information-gathering competency needs assessing. Does the organization have the capability of monitoring important sources of information? What data does the organization collect and how does it store that data? What are the statistical parameters of this data, e.g. how much random variation does it contain? Does the organization measure this?
- Cost and risk queries: The financial consequences of a new BI initiative should be estimated. It is necessary to assess the cost of the present operations and the increase in costs associated with the BI initiative? What is the risk that the initiative will fail? This risk assessment should be converted into a financial metric and included in the planning.
- Customer and Stakeholder queries: Determine who will benefit from the initiative and who will pay. Who has a stake in the current procedure? What kinds of customers/stakeholders will benefit directly from this initiative? Who will benefit indirectly? What are the quantitative / qualitative benefits? Is the specified initiative the best way to increase satisfaction for all kinds of customers, or is there a better way? How will customers' benefits be monitored? What about employees,... shareholders,... distribution channel members?
- Metrics-related queries: These information requirements must be operationalized into clearly defined



metrics. One must decide what metrics to use for each piece of information being gathered. Are these the best metrics? How do we know that? How many metrics need to be tracked? If this is a large number (it usually is), what kind of system can be used to track them? Are the metrics standardized, so they can be benchmarked against performance in other organizations? What are the industry standard metrics available?

- **Measurement Methodology-related queries:** One should establish a methodology or a procedure to determine the best (or acceptable) way of measuring the required metrics. What methods will be used, and how frequently will the organization collect data? Do industry standards exist for this? Is this the best way to do the measurements? How do we know that?
- **Results-related queries:** Someone should monitor the BI programme to ensure that objectives are being met. Adjustments in the programme may be necessary. The programme should be tested for accuracy, reliability, and validity. How can one demonstrate that the BI initiative (rather than other factors) contributed to a change in results? How much of the change was probably random?.

## 10. DISCUSSION

Any new-form organization now a days experience is the value chain, which is set of primary secondary activities that create value for customers. (Denison, 1997) examines several critical activities related to value chain. Without effective BI to target process-oriented organizations for supporting, this is not possible. (Davenport, 1993) describes various issues on re-engineering in business process innovation.

According to (Adelman et.al, 2002), 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. (Malhotra, 2000) describes BI that facilitates 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. BI describes the result of in-depth analysis of detailed business data, including database and application technologies, as well as analysis practices (Gangadharan and Swamy, 2004). BI is technically much broader, potentially encompassing knowledge management, enterprise resource planning, decision support systems and data mining (Gangadharan and Swamy, 2004).

(Nguyen Manh et.al, 2005) 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. (Nguyen Manh et.al, 2005) proposed an event-driven IT infrastructure to operate BI applications which enable real-time analytics 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.

(Seufert Andhreas and Schiefer Josef, 2005) suggest an architecture for enhanced Business Intelligence that aims to increase the value of Business Intelligence by reducing action time and interlinking business processes into decision making.

Businesses no longer want what has happened but they want to know the underlying reasons. Rather than knowing how many blankets were sold in December, businesses want to understand how many were sold in china during a storm. BI provides unified integrated view of business activities. A retailer knows how many blankets were sold in December across India and therefore make better purchasing and stock management decision for the upcoming year.

Enterprises are building business intelligence systems that support business analysis and decision making to help them better understand their operations and (Gangadharan and Swamy, 2004) compete in the marketplace.

Innovation in data storage technology is now significantly outpacing progress in computer processing power, heralding a new era for real-time BI. As a result, some software vendors with





superior tools offer a complete suite of analytic BI applications, tools and data models that enable organizations to tap into the virtual treasure trove of information. The tools provide easy access to corporate and enterprise wide data and convert that data into useful and actionable information that is consistent across the organization—one coherent version of the truth.

Companies still feel that BI has technology related complexities and usable only by technically savvy specialists. They also feel that BI is expensive. BI takes a long time to yield correct analysis. The firms want these analyses in real time for short-term projects. The tradition BI may not do this but a real time BI environment certainly comes into rescue. Data is finally treated as the corporate resource in a new discipline. Any operational system (including ERP and CRM) and any decision support application (including data warehouses and data marts) are BI, *if and only if* they were developed under the umbrella and methodology of a strategic cross-organizational initiative (Gangadharan and Swamy, 2004).

Traditional BI systems consist of a back-end database, a front-end user interface, software that processes the information to produce the

business intelligence itself, and a reporting system. The capabilities of BI include decision support, online analytical processing, statistical analysis, forecasting, and data mining.

Several varied sectors like manufacturers, electronic commerce businesses, telecommunication providers, airlines, retailers, health systems, financial services, bioinformatics and hotels use BI for customer support, market research, segmenting, product profitability, inventory and distribution analysis, statistical analysis, multi dimensional reports, detecting fraud detection etc.

Business Intelligence and data mining is a field that is heavily influenced by traditional statistical techniques, and most data-mining methods will reveal a strong foundation of statistical and data analysis methods. Some of the traditional data-mining techniques include classification, clustering, outlier analysis, sequential patterns, time series analysis, prediction, regression, link analysis (associations), and multidimensional methods including online analytical processing (OLAP). These can then be categorized into a series of data-mining techniques, which are classified and illustrated in [Table 1](#) (Goebel and Le Grunwald, 1999).

**Table 1: Current BI Techniques**

TECHNIQUE	DESCRIPTION
Predictive modeling	Predict value for a specific data item attribute
Characterization and descriptive data mining	Data distribution, dispersion and exception
Association, correlation, causality analysis (Link Analysis)	Identify relationships between attributes
Classification	Determine to which class a data item belongs
Clustering and outlier analysis	Partition a set into classes, whereby items with similar characteristics are grouped together
Temporal and sequential patterns analysis	Trend and deviation, sequential patterns, periodicity
OLAP (OnLine Analytical Processing)	OLAP tools enable users to analyze different dimensions of multidimensional data. For example, it provides time series and trend analysis views.
Model Visualization	Making discovered knowledge easily understood using charts, plots, histograms, and other visual means
Exploratory Data Analysis (EDA)	Explores a data set without a strong dependence on

**Table 1: Current BI Techniques**

TECHNIQUE	DESCRIPTION
	assumptions or models; goal is to identify patterns in an exploratory manner

In addition, the entire broad field of data mining includes not only a discussion of statistical techniques, but also various related technologies and techniques, including data warehousing, and many software packages and languages that have been developed for the purpose of mining data. Some of these packages and languages include: DBMiner, IBM Intelligent Miner, SAS Enterprise Miner, SGI MineSet, Clementine, MS/SQLServer 2000, DBMiner, BlueMartini, MineIt, DigiMine, and MS OLEDB for Data Mining (Goebel and Le Grunwald, 1999).

## 11. CONCLUSION

Powerful transaction-oriented information systems are now commonplace in every major industry, effectively leveling the playing field for corporations around the world. To remain competitive, however, now requires analytically oriented systems that can revolutionize a company's ability to rediscover and utilize information they already own. The business intelligence (BI) has evolved over the past decade to rely increasingly on real time data. The BI systems auto-initiate actions to systems based on rules and context to support several business processes. These analytical systems derive insight from the wealth of data available, delivering information that's conclusive, fact-based, and actionable. Enterprises today demand quick results. It is becoming essential nowadays that not only is the business analysis done, but also actions in response to analysis of results can be performed and instantaneously changes parameters of business processes. The paper explored the concepts of BI, its components, benefits of BI, technology requirements, designing and implementing business intelligence, and various BI techniques.

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