Use of Business Intelligence in Decision Making & Forecasting

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Abstract

The easy access to information and knowledge offers several advantages to various factors like the socio-economic environment where individuals, who can obtain news more rapidly, access services more easily and perform on-line commercial and banking transactions; enterprises, which has ability to develop innovative products and services that makes user satisfied.

We can achieve competitive advantages from effective use of the knowledge gained; the public administration, which can improve the services provided to citizens using e-government applications, such as on-line payments of tax contributions, and e-health tools, by considering each patient's medical history, thus improving the quality of healthcare services. The enterprises that are capable of transforming data into information and knowledge can use them to make quicker and more effective decisions and thus to achieve a competitive advantage. it is possible today to extract from the huge amounts of data available, knowledge which can then be used by decision makers to aid and improve the governance of the enterprises and the public administration.

Companies have realized the importance of imposing achievements of the goals defined by their business strategies through business intelligence concepts. It defines the visions on the role and requirement of real time BI by studying the business needs. The paper explores the concepts of BI, its components, BI methodology, Decision Making using and forecasting using BI and BI tools available for Decision Making and business forecasting

1. Introduction

Business intelligence is the human intelligence applied to various business activities. This is a new field of analysis for application of human cognitive faculties and AI technologies to the management and decision support system in different business problems. Intelligence relates also as information extraction for adding value to business. It has expertise in information, knowledge and technologies that can be used efficiently in the organizational management and individual business. Business intelligence is a broad category of applications and technologies for data collection, providing access to data, and analysing it for the purpose of helping enterprise users to make better business decisions. BI implies to have a thorough knowledge of factors that affect the business. It provides depth knowledge about factors like customers, competitors, business partners, economic environment, and internal operations to make effective and efficient business decisions. Business intelligence enables organizations to make effective and timely decisions. A specific field of business intelligence known as competitive intelligence focuses only on the external competitive environment. Information is gathered based on various actions of competitors and decisions are made based gathered and analysed information. Today businesses with increased standards, automation, and technologies lead to huge amount of data to make available. Data warehouse technology has ability to repositories to store this data. Advanced Extract, transform, load (ETL) and recent Enterprise Application Integration tools have increased the rapid collection of data. OLAP reporting technologies have allows quick generation of new reports which analyse the data. Business intelligence have become the ability of filtering through large amounts of data, extracting significant information, and converting this information into knowledge upon which actions can be taken.

This paper explores the concepts of BI, its components, BI methodology, Decision Making, Business Forecasting and available tools for Business Forecasting.

2. Business Intelligence

Business intelligence can be defined as a set of mathematical models and analysis methodologies that utilize the available data to generate information and discover knowledge that is useful for complex decision-making processes.

BI (Business Intelligence) is a set of processes, architectures, and technologies that converts raw data into meaningful and useful information that derives useful business actions.

It is a collection of software and services that transforms data into actionable intelligence and knowledge. BI has a direct impact on organization's strategic, tactic and operational business decisions. BI supports fact-based decision making using historical data instead of just making assumptions and gut feeling.

The primary purpose of BI system is to provide knowledge workers with tools and methodologies that allow them to make effective and timely decisions.

Business intelligence combines business analytics, data mining, data visualization, data tools and infrastructure, and best practices to help organizations make further data-driven decisions. Enterprises have problems and goals. To get solutions for these problem and track performance against these goals, BI systems gather the required data, analyse it, and determine set of actions that helps to reach their goals.

BI platforms offer various data visualization tools, which converts data into charts or graphs, and presenting these visuals to key stakeholders or decision-makers.

3. Business Intelligence Methodology

Business intelligence is the huge domain that covers the processes and methods of gathering, storing, and analysing data from various business operations or activities to optimize performance of business processes. These processes come together to create a complete view of a business to help experts make better and actionable decisions. Over the past few years, business intelligence has evolved to include more processes and activities to help improve performance. These processes include:

- **Data preparation:** Gathering data from multiple data sources, identifying the dimensions and measurements, and preparing it for data analysis.
- **Data mining:** Using databases, statistics, and machine learning to explore trends in large datasets.
- **Reporting:** Sharing data analysis to stakeholders so they can make conclusions and help in taking decisions.
- **Performance metrics:** Comparing current performance data with historical data to track performance against goals, using dashboards and visualization tools.
- **Descriptive analytics:** Using primary data analysis to find out what happened.
- **Querying:** Querying database to extract useful information from the data sets
- **Statistical analysis:** Taking the results from descriptive analytics and further exploring the data using statistical techniques to identify trends.
- **Data visualization:** representing data in visual representations like charts, graphs, and histograms etc.

4. Decision Making

As a business owner, to make decisions that have a great impact on the success of the business. Decision-making is an important aspect to sustain the business for longer duration. Decision-Making Process generally uses predictive analytics checking.

The decision-making process can be of following three steps:

1. Analysis of the current situation.
2. Presentation of the data to the managers or decision makers (experts).
3. Implementing the final decision.

Decision Making Process Using Business Intelligence (Bi) System

Companies use tools to explore their data and better understanding of their customers. Business Intelligence (BI) is a set of tools used by organizations to analyse data using various data analytics tools, gaining valuable insights, and make better and informed decisions using Business Intelligence reports.

Business intelligence has become popular tool for decision-making. It ensures that managers and executives make better decisions so that businesses can run more effectively and efficiently. BI is about accessing the right information at the right time to the right people.

Steps involved in Decision-Making Process that Uses BI

- **Data Collection**

  Data needs to be collected from various data sources. This data is generally collected from internal and external sources of an organization.

- **Design and Analyse**

  ETL process is applied on the collected data to build the data warehouse. Various Datamart are then prepare from data warehouse, which are then undergoes through different analytical techniques like data mining, data visualization, machine learning for patter or trend recognition etc.

- **Business Forecasting**

  Analysed data can be queried using tools like Ad-hoc query, What-If Analysis used for used in business intelligence to help make decisions and to do the business predictions.

- **Performance evaluations**

  Using dashboards and reports experts may identify key performance indicators, make comparisons between data sets. It helps in identifying opportunities to improve the business. These tools can be used for evaluating performance, encouraging staff, and improving the customer experience.

5. Business Forecasting

Business forecasting is the process of predicting future market trends using BI tools and forecasting methods to analyze historical data.

Business forecasting is a estimate of future developments of an organization based on trends and patterns identified by comparing past and present data.

This business practice helps to determine resource allocation and plan strategically for upcoming projects, business activities, and budgets. Forecasting empowers organizations to manage resources, achieve their goals with present trends, and increase their chances of surviving and staying competitive.

The purpose of forecasts is to develop better strategies and project plans using available, relevant data from the past and present to secure your business's future.

Business forecasting involves forecasting tools and techniques to help businesses predict certain developments, like revenue, sales, growth etc.

Businesses can create various types of predictions with business forecasting strategies. Because historical data and market trends affect so many aspects of business, comprehensive predictions can help prepare almost every element of organization.

- **General business forecasting** predicts overall market trends and external factors that affect your business' success.
- **Accounting forecasting** creates projections of future business costs.
- Budget forecasting makes predictions for allocating the budget needed for future projects or addressing potential issues. Budgeting and forecasting software is an indispensable tool if you're looking to forecast for budgeting your business activities.
- **Financial forecasting** projects a company's monetary value as a whole. You can use the current assets and liabilities from your balance sheet to help you make a prediction.
- **Demand forecasting** predicts the future needs of your target customer base.
- **Supply forecasting** works with demand forecasting to allocate the necessary resources for fulfilling upcoming customer demands.
- **Sales forecasting** predicts the expected success of the company offerings and how it'll affect future sales and cash flow.

Major Business forecasting Methods

There are two main types of business forecasting methods: quantitative and qualitative. While both have unique approaches, they're similar in their goals and the information used to make predictions – company data and market knowledge.

- **Quantitative forecasting**

  The **quantitative forecasting** method relies on historical data to predict future needs and trends. The data can be from your own company, market activity, or both. It focuses on cold, hard numbers that can show clear courses of change and action. This method is beneficial for companies that have an extensive amount of data at their disposal.

  There are four quantitative forecasting methods:

1. **Trend series method** This referred to as time series analysis, this is the most common forecasting method. Trend series collects as much historical data as possible to identify common shifts over time. This method is useful if your company has a lot of past data that already shows reliable trends.
2. **The average approach** This method is also based on repetitive trends. The average approach assumes that the average of past metrics will predict future events. Companies most commonly use the average approach for inventory forecasting.
3. **Indicator approach** This method follows different sets of indicator data that help predict potential influences on the general economic conditions, specific target markets, and supply chain. This approach would be the most effective for companies whose sales are heavily affected by specific economic factors.
4. **Econometric modelling** This method takes a mathematical approach using regression analysis to measure the consistency in company data over time. Regression analysis uses statistical equations to predict how variables of interest interact and affect a company. The data used in this analysis can be internal datasets or external factors that can affect a business, such as market trends, weather, GDP growth, political changes, and more. Econometric modelling observes the consistency in those datasets and factors to identify the potential for repeat scenarios in the future.

- **Qualitative forecasting**

The **qualitative forecasting** method relies on the input of those who influence your company's success. This includes your target customer base and even your leadership team. This method is beneficial for companies that don't have enough complex data to conduct a quantitative forecast.

There are two approaches to qualitative forecasting:

1. **Market research:** The process of collecting data points through direct correspondence with the market community. This includes conducting surveys, polls, and focus groups to gather real-time feedback and opinions from the target market. Market research looks at competitors to see how they adjust to market fluctuations and adapt to changing supply and demand. Companies commonly utilize market research to forecast expected sales for new product launches.

2. **Delphi method** This method collects forecasting data from company professionals. The company's foreseeable needs are presented to a panel of experts, who then work together to forecast the expectations and business decisions that can be made with the derived insights. This method is used to create long-term business predictions and can also be applied to sales forecasts.

6. BI Tools for Decision Making and Forecasting

BI tools are all about helping you understand trends and extracting insights from available data so that organization can make tactical and strategic business decisions. BI Tools also help to identify patterns in the available data that helps business to grow.

BI Tools

- **SAP** Business Objects is a business intelligence software which offers comprehensive reporting, analysis and interactive data visualisation. The platform focuses heavily on categories such as Customer Experience (CX) and CRM, digital supply chain, ERP and more.

- **Datapine** is an all-in-one business intelligence platform that facilitates the complex process of data analytics even for non-technical users.

- **MicroStrategy** is an enterprise business intelligence tool that offers powerful (and high speed) dashboarding and data analytics, cloud solutions and hyperintelligence. With this solution, users can identify trends, recognise new opportunities, improve productivity and more.

- **SAS** ensures high-level data integration and advanced analytics & reporting. They also have a great text analytics feature to give you more contextual insights into your data.

- **Zoho Analytics** business intelligence tool has automatic data syncing and can be scheduled periodically.

- **Sisense** is a user-friendly data analytics and business intelligence tool that allows anyone within your organisation to manage large and complex datasets as well as analyse and visualise this data without your IT department getting involved.

- **Microsoft Power BI** is a web-based business analytics tool suite which excels in data visualisation. It allows users to identify trends in real-time and has brand new connectors that allow you to up your game in campaigns.

- **Tableau** is a Business Intelligence tool specialised in data discovery and data visualisation. With the software you can easily analyse, visualise and share data, without IT having to intervene. Tableau supports multiple data sources such as MS Excel, Oracle, MS SQL, Google Analytics and SalesForce.

- **Oracle BI** is an enterprise portfolio of technology and applications for business intelligence. This technology gives users pretty much all business intelligence capabilities, such as dashboards, proactive intelligence, ad hoc, and more
- **IBM Cognos Analytics** is an AI-fueled business intelligence platform that supports the entire analytics cycle. From discovery to operationalisation, you can visualise, analyse and share actionable insights about your data with your colleagues.

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