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BANGALORE · INDIA

DATA GEEK

SCHOOL OF BUSINESS AND MANAGEMENT

BUSINESS INTELLIGENCE

BY

BUSINESS ANALYTICS SPECIALIZATION

Volume 3, issue 2. September 2021

TABLE OF CONTENTS

EDITORS DESK

"Data is what you need to do analytics. Information is what you need to do business." – John Owen.

Business intelligence (BI) is the process by which organizations transform data into actionable insights that aid in strategic and tactical business decision making. BI tools pull unstructured data from varied sources , integrate and analyse the data. The analytical findings are presented in reports, summaries, dashboards, graphs, charts, and maps. BI software also ensures that the data can be queried and filtered, for timely decision making. With exponential data growth, business intelligence is going to be more important than ever.

With this, we present an enthralling Volume 3 Issue 2 of DataGeek newsletter, centered on a pivotal theme of Business Intelligence. It includes interesting articles, infographics and summer internship projects done on BI by the BA specialization students. Team would like to extend sincere thanks and gratitude to Dr. S Suresh Kumar, CTO of BrainTower for his industry insights.

I would like to extend gratitude to our Dean, Dr. Jain Mathew, Associate Deans Dr. Georgy Kurien and Dr. Jeevananda S, Head of Specialization – BA, Dr. Lakshmi Shankar Iyer for their guidance in making this issue a success. Also, a special appreciation to the newsletter team for the effort, time and inputs without which this issue would not have been possible. A thanks to all the students who have provided their valuable inputs. Once again congratulations to the entire team.

Please reach out to us for any queries or suggestions at datageek@mba.christuniversity.in

With Regards,
Dr. Tripti Mahara

FACULTY CORNER

Lakshmi Shankar Iyer
Head of Specialization
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Do you think every MBA graduate should have knowledge about Business Intelligence and why?

We are living in an era surrounded by data which is the new oil to run businesses in an efficient manner. MBA graduates are groomed to be decision makers at various levels in organizations. Technology being a game changer and ubiquitous, helps in data generation by every sector whether it is retail, banking, insurance, airline, telecom, hospitality, education, healthcare, pharma, ecommerce, sports, agriculture etc. Data generation takes place through transactions triggered through digitisation processes at the operational level in these sectors through devices. This data gets aggregated at the strategic level for business managers to make data driven decisions which could be timely, relevant, accurate and consistent. Data thus generated by the business is utilised to make decisions for the business by reports and visualization tools. In other words, Business Intelligence being a set of mathematical models and analysis methodologies exploits the available data to generate information or insights which is useful for complex decision-making by managers. This is applicable across functionalities of Marketing, Human Resources, Finance, Operations, Supply Chain and others in an organization. Hence, it is important for every MBA graduate to have knowledge about Business Intelligence.

What is the significance of Business Intelligence in the operations domain and why?

Operations is all about efficiently utilising the available resources to deliver effective solutions to meet customer requirements in both manufacturing and service organizations. In a manufacturing facility, intelligence is gathered from the past patterns of performance of machinery which helps in maintenance and failure prediction. Business Intelligence plays a role in inventory management of raw materials, work in progress and finished goods by generating reports at various levels periodically leading to optimal utility of resources. Optimal planning of manpower and materials can be achieved based on the data generated from the organization in the form of periodic and adhoc reports. Supply chain and logistics play a critical role in the organization's performance as they ensure the products reach the right customer at the right time. Based on the trends in the past an operations manager can identify the possible fluctuation in the demand, variation in the delivery mode and distribution challenges thus ensuring preventive actions. In the service sector like banking, hospitality, airline, telecom, retail - consumer behaviour trends can be observed and strategies can be worked upon to

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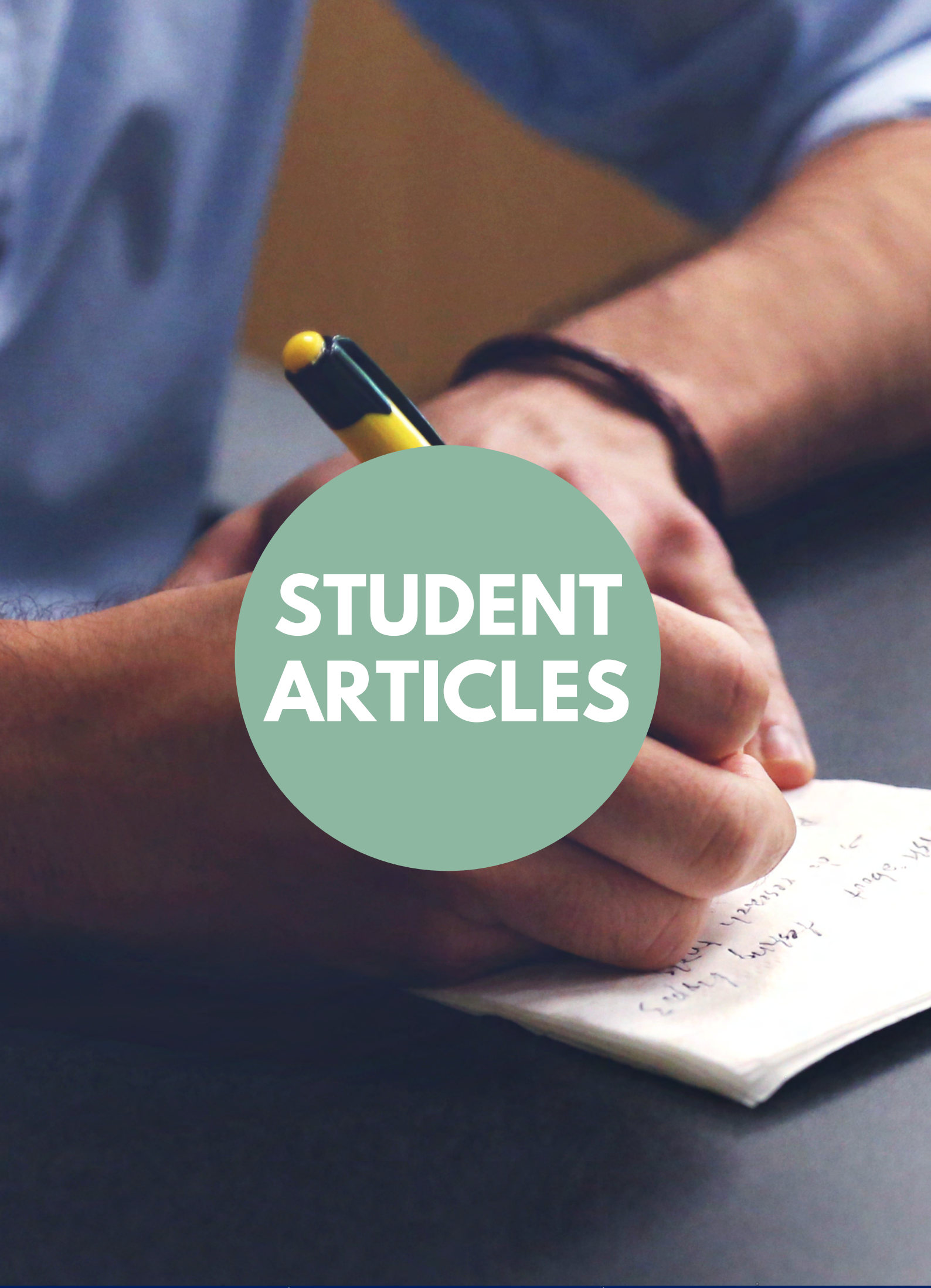
meet the needs of the consumer. These and many more applications signify the use of Business Intelligence in the operations domain.

What is the scope of BI in the corporate world?

The role of Business Intelligence in the corporate world is highly significant as it helps in organizations taking data driven decision making instead of gut-based solutioning. Organizations invest in building data warehouses by identifying and extracting data from various sources and eventually mining data from data marts. Analysts with relevant domain knowledge derive insights through querying, reporting and conducting analysis. These aspects help businesses improve their efficiency, enhance customer understanding and take pre-emptive actions.

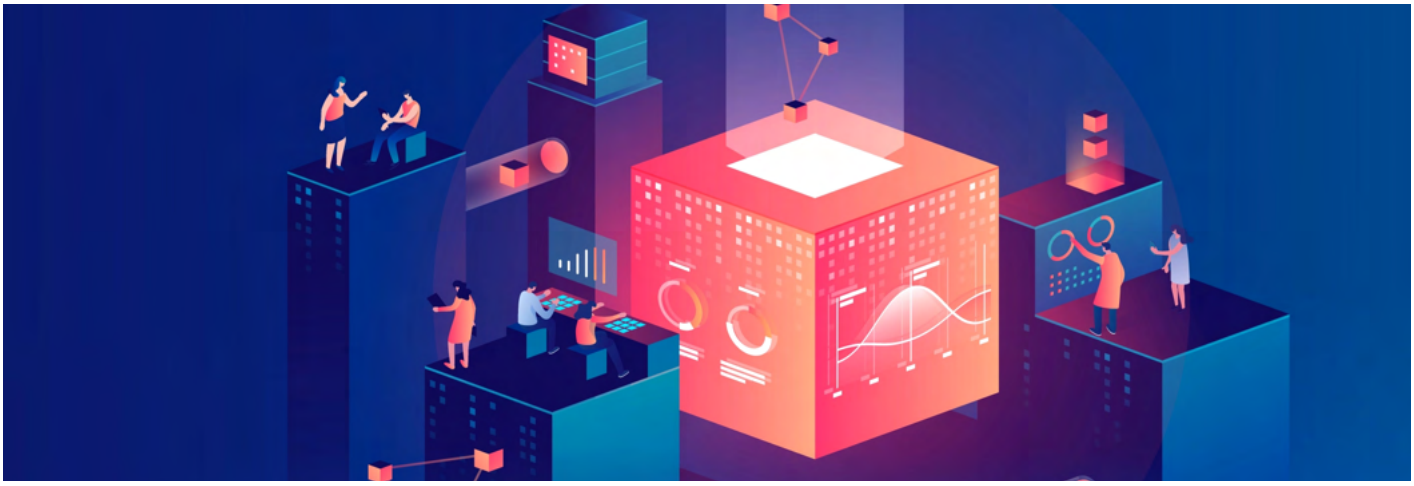
In the recent years, market is flooded with Business Intelligence tools which essentially ingests large volumes of structured and unstructured data from varied sources, transforms and helps businesses take insightful decisions. Most of the tools offer data visualization, data consolidation, dashboarding and generation of varied types of reports.

Some of the popular tools are Microsoft Power BI, Tableau, IBM Cognos Analytics, SAP BI, Qlik View, Sisense to name a few. To sum up, there is a huge scope for management students getting into the role of Business Intelligence Analysts in the corporate world.



STUDENT ARTICLES

Volume 3, issue 2. September 2021



INTRODUCTION TO BUSINESS INTELLIGENCE

Business intelligence (BI) is essential for successful data management and utilisation. It first appeared in the later half of the twentieth century and has since been an important element of smart organisations' decision-making processes for a variety of reasons, including customer service, inventory, pricing, and so on.

In a data-driven world, it's more vital than ever for organisations to understand how to get the most out of the plethora of digital information at their disposal. According to Better Buys, 85 percent of company executives believe that leveraging big data would dramatically enhance the way they operate their businesses.

Business intelligence (BI) combines business analytics, data mining, data visualisation, data tools and infrastructure, and best practises to help firms make more data-driven decisions. In practise, you have current business intelligence when you have a complete picture of your company's data and can use it to drive change, cut costs, and adapt quickly to market or supplier changes. Flexible self-service analysis, regulated data on trustworthy platforms, empowered business users, and speed to insight are all priorities in modern BI solutions.

The techniques and methods used to obtain, store, and analyse data from corporate operations or activities in order to improve performance are referred to as BI. This method has been evolving ever since with new processes as follows:

- **Data Mining:** entails using databases, statistics, and machine learning to find patterns in large datasets.
- **Reporting:** Stakeholders are given access to data analysis so they may draw conclusions and make choices.
- **Performance Metrics and Benchmarking:** Using customised dashboards to analyse present and historical performance data in order to assess progress toward goals.
- **Descriptive Analytics:** Basic data analysis is employed to describe what has happened.
- **Querying:** Through queries, BI extracts the information from the databases.

- **Statistical Analysis**: Using the results of descriptive analytics, digging further into the data using statistics throws light on why the patterns emerged.
- **Data Visualization:** Data analysis is converted into visual representations such as charts, graphs, and histograms to make data easier to comprehend.
- **Visual Analysis**: While maintaining the course of an investigation, visual storytelling is utilised to examine data and discuss insights.
- **Data Preparation**: Combining a variety of data sources, identifying dimensions and measures, and prepping the data for analysis

Business intelligence may help organisations make better decisions by employing the techniques indicated above and providing current and historical data within the perspective of their business. The following are some of the advantages of using business intelligence to assist firms in making wiser and data-driven decisions.

- Determine profit-boosting techniques.
- Analyze the customers' behavior.
- Compare your data to that of your competitors.
- Track how far you've come.
- Streamline operations.
- Determining chances of success.
- Recognize market trends.
- Identify concerns or problems.

By providing the above benefits Business Intelligence can help in business needs and technology and build business strategy. With the adoption of BI in diverse industries like retail, insurance, oil and many more leading to help for customers can track sales in near real time, find insights into consumer behaviour, estimate profitability, and much more.

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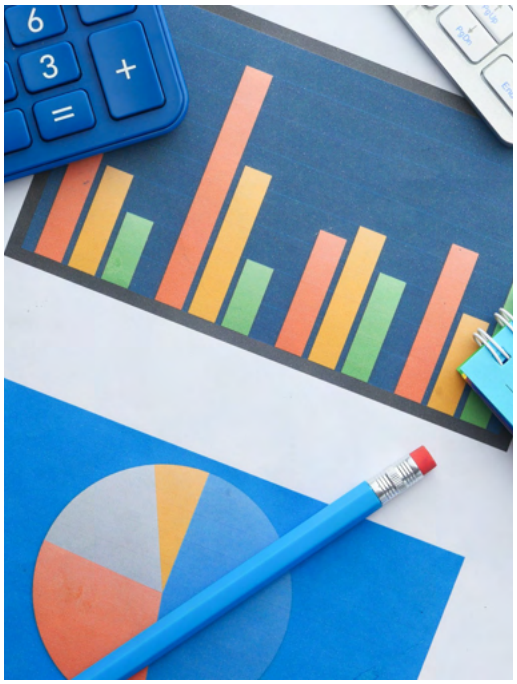
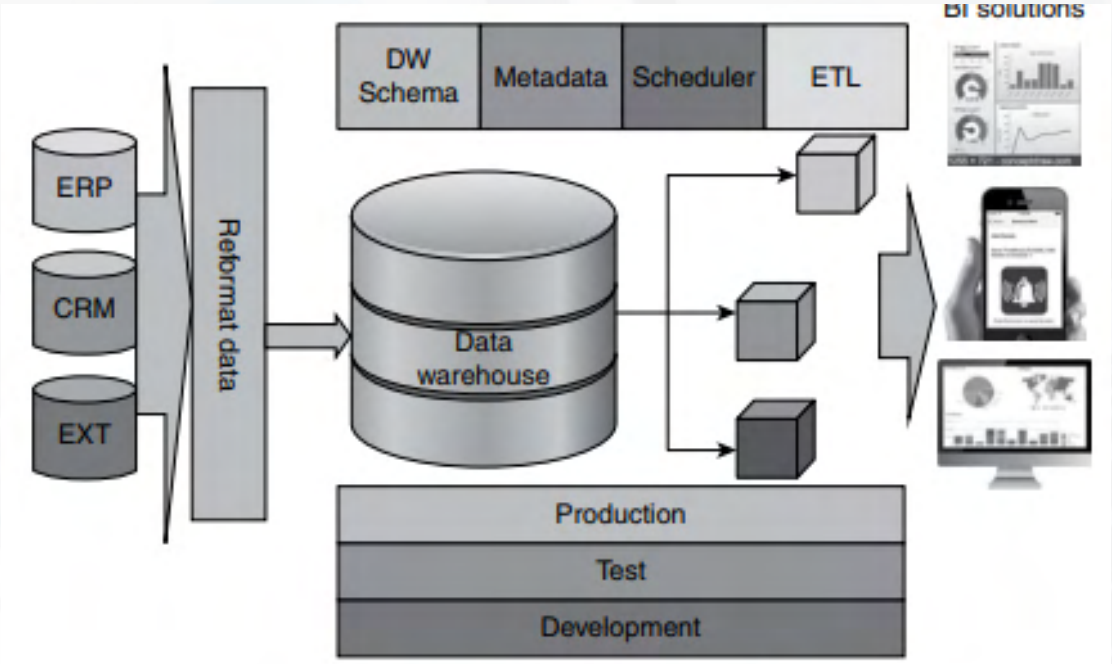
Difference between Business Intelligence and Business Analytics



Business analytics (BA) is a computational field that examines raw data in order to uncover, make findings, and communicate inferences. Business analytics focuses on inference, which is the process of drawing a conclusion based purely on what the researcher already knows. To quantify observations, analytics uses a combination of statistics, operations research, and programming. Enterprises use analytics to describe (exploratory analytics), predict (predictive analytics), and automate (prescriptive analytics) their business activities.

The term "business analytics" is increasingly being used to represent statistical and mathematical data analysis that clusters, segments, scores, and forecasts what scenarios are most likely to occur in enterprises. HR Analytics, for example, can be defined as the use of statistical techniques (such as regression, correlation, and factor analysis) and the synthesis of multiple sources to make predictions, such as the fact that employee retention in the company's office A is influenced by factors B and C.

Business intelligence (BI) refers to the concepts and approaches that help firms make better decisions to utilize information and fact-based IT systems. It encompasses core concepts such as Extract, Transform, and Load (ETL), data warehouse, data mart, metadata, KPIs, scorecards, dashboards, and OLAP reporting, as well their procedures.



Reference: R.N.Prasad, & Acharya, S. (2011). Fundamentals of business analytics (With cd). John Wiley & Sons.

A human capital management data mart, for example, will collect data from various sources and store employee related information including employee profiles, payroll, training, compensation, and project performance, as well as analyze employee productivity according to department, management level, work experience in years, gender, and qualification. To function, these data marts will require ETL, OLAP as well as reporting technologies. Larger data warehouses will store multidimensional data for multiple data marts in a consolidated location.

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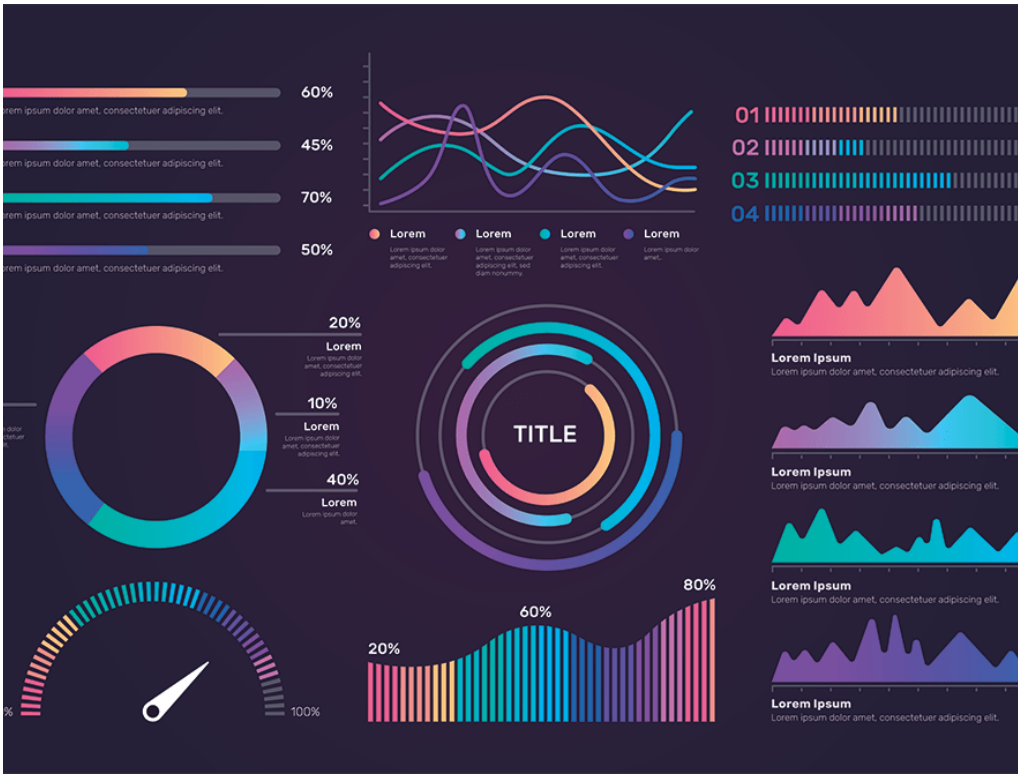

Fundamentals of Data Marts and Data Warehousing

Data is everywhere and in massive amounts and hence there is a need to store this data for future use. A data warehouse is a solution for this as it facilitates information processing by providing a stable foundation of integrated, historical data to conduct analysis. The concept of data warehousing emerged in the 1980s to aid in evaluating data stored in non-relational database systems. It gives an enterprise a single and centralised storage system. In a world of unintegrated application systems, a data warehouse provides the means for integration and is built in an incremental, step-by-step manner.

It's a combination of technology and components that allow for the strategic use of data. It is the computerised gathering of a large amount of information by an organisation for inquiry and analysis rather than transaction processing. As data warehouses are so vast and complex, there is a difficulty to extract relevant data to draw insights and answer business questions.

To perform any analysis that will help answer business questions, the analysts are not likely to need all the data. If there are large datasets, it is tough to query the whole data set to create reports. Data marts can help solve this problem. A data mart is a scaled-down version of a data warehouse. It is designed to meet the information needs of a specific user segment like a department or business unit. It provides data for each specific business unit like finance, marketing, or sales. It effectively saves costs and time and helps the business gain actionable insights within a short period. Data marts are classified into independent, dependent, and hybrid data marts.

Dependent data marts result from the top-down approach where they are created from an existing data warehouse. On the other hand, independent data marts are extracted from external sources. Hybrid data marts utilize data from either of the sources. They are a more manageable and inexpensive alternative to a data warehouse because an independent data mart can be ready for analysis in a few days. Also, they reduce the burden of data warehouses in terms of processing costs.

Data marts and data warehouses are highly organised repositories for storing and managing data until required. However, they differ in the breadth of data stored: data warehouses are designed to serve as the core repository of data for the whole organisation, whereas data marts are designed to meet the needs of a single division or business function. Several data marts can be created from a single data source (also called a data warehouse). This method is called the top-down approach. Multiple data marts can be integrated to create a data warehouse. This method is called the bottom-up approach.

Several reasons like incomplete requirements, lack of communication between stakeholders, poor data integrity may lead to the failure of a BI system. The ever-changing technology landscape, limited budget, complexity and difficulty of working with data are key considerations that require attention whenever a business plans to design and build data warehouse. The data warehousing and data mart basics presented in this article are designed to assist you in making these critical decisions. Taking these ideas into consideration will not ensure success, but will help prevent failures.

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BANKING INDUSTRY KPIS AND ITS MEASURES

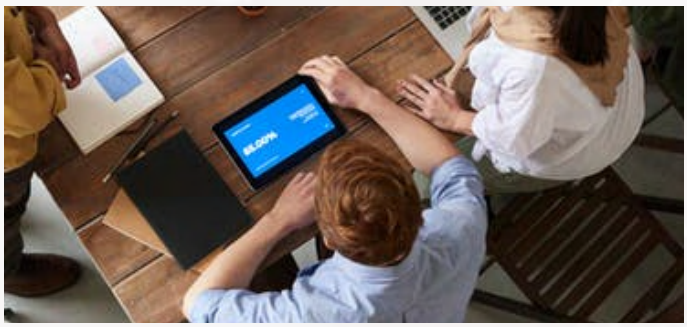
The banking industry in India has gone through various phases, covering traditional banking practices, nationalization to privatization, increasing numbers of foreign banks, modern technological methods, etc. Data generated in due course is high and allows gaining deeper insight into customer behaviour, which forces the banking industry to implement business intelligence practices. The fundamental problem associated with banking is profit, expense, performance, and customer satisfaction. To resolve these issues, there is a need to implement KPIs to measure various types of transactions and services in a bank. The KPIs and metrics of measurement identified for this purpose include:

Sales Percentage Per Branch: This can be calculated by taking the sales generated by a branch in dollars to the number of branches in a location or number of branches for a bank.

Sales % Per Branch = (Sales of a branch/ Total no: of branches)*100

All banks use a centralized system like ERP/banking software that is fully automated to monitor and coordinate their day-to-day transactional activities.

So the various branches would be taken as subsidiaries. Filtering the sales per branch and generating reports would be the easiest way. This helps to determine which branches are the best/worst-performing.



Total Loans Outstanding Balance: This refers to the unpaid interest-bearing portion of any loans.
Total Loans Outstanding = (FV of original value - FV of annuity) * Total No: of loans The related data can be tracked from loan management software/ loan management modules in ERPs. More the loans outstanding indicate financial trouble for both borrowers and lenders

Operating Profit: It is the difference between the revenue generated and expense.
Operating Profit = Revenue generated - Operating expenses. This shows the money earned by banks, excluding tax and interest.
All these details could be obtained in a click from the P & L account Balance sheet under the financial reports section in banking software/ERP that the bank maintains. Thus operating profit should be high.

Operating Profit Per Employee: This can be calculated by operating profit in dollars to the number of employees in the bank.

Operating Profit Per Employee = (Revenue – Operating Expense) / Total No. of Employees .falls under a sales rep or employee. This can be analyzed by tracking the transactional data from ERP/CRM that Operating Profit Per Employee helps to determine how much profit the bank makes from each employee.

Average Time to Close Issues: It is the average time taken to resolve from when the issue was identified.
Average Time to Close Issues = Time when issue reported - Time when issue resolved. The issues can be internal failures due to the bank's activities or external, like customer complaints. Tracking of problems or complaints registered, details of how they occurred, can be gathered from project management tracking software that the bank uses. Hence the duration taken to solve the issue must be less.

Customer Churn Rate: The difference in the number of customers left to the total number of active customers in a time interval.

Customer Churn Rate = (No:of customer at beginning - No: of customers left the bank)

No: of customer at beginning

This could be analyzed by the status of customers (active/inactive) through the systems managed in banks. The rate of churn should be low.

Customer Feedback Score:

Banks can do this to gather performance-related feedback to determine how well the bank and its employees perform. Customer Feedback score collection can be automated by sending surveys at regular intervals or enabling rating options after each transaction either through mobile devices/ telecommunication. The higher the score, the more the chances of income generation.

Conclusion:

KPIs quantify the bank's performance in tangible ways and evaluate its success for your stakeholders and leadership. Understanding, identifying, benchmarking, and measuring the right Key Performance Indicators for the banking industry is necessary, especially when customers have a wide range of choices in the market to decide which bank is suitable for their business / personal use.

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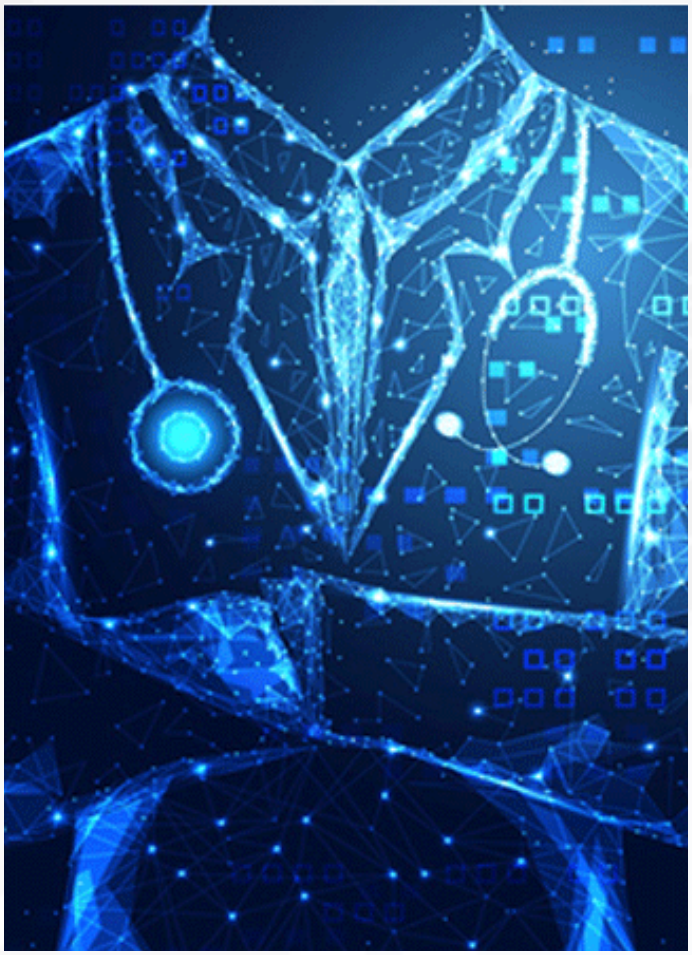
KPIs of Healthcare Industry and Its Measures

The healthcare industry has seen rapid growth in terms of advancements and technological influence in its different operations. From diagnosing the disease to performing complex surgeries, technological development has brought a remarkable change in this industry. The major problems faced by the Healthcare industry are the timeliness in patient care and patient satisfaction. To overcome this issue, the relevant Key Performance Indicators which can help to improve patient care has to be identified. Better service quality and comfort of patients are the key goals and the KPIs found are as follows:



Average waiting time: It is the measure of average patient waiting time in the general ward and emergency ward to visit the physician. Smart patient cards can be used to track the patient entry time and doctor consulting time. Measuring the waiting time can help in identifying the processes that cause long waiting time and redesigning them using digitization.

Bed to patient ratio: It includes calculating the total number of beds available in different departments at a specific time with the number of patients waiting for accommodation. Maintaining an application or software for getting real time bed status, where the information can be obtained from the central database.

The KPI helps in bed capacity planning and avoiding serious threats such as admission and surgery cancellations.

Lab test turnaround time: It is the average response time for various tests conducted such as blood test, x-ray, scanning etc. This KPI is important because the more timely and rapidly testing, the more efficient and effective the treatment will be. The time of sample arrival and time of analysis completed can be recorded in MS Excel and the differences can be calculated.

Physician to patient ratio: This ratio indicates whether the organization has a sufficient supply of physicians at a specific time. It can be measured by dividing the total number of available physicians by the average number of patient visits per day.

Physician's smart card in and out time details and the patient's smart card entries can be correlated and the availability can be identified. Computing this ratio helps in identifying the need of physicians supply and systematic planning of the workforce.

Inpatient admission time: This KPI gives the average time that the patient needs to wait for admission to inpatient care. Given the patients are provided with the smart cards, the time of doctor's order for admission entry and the time when beds/rooms allotted can be collected using a central database. The lower the delay in the admission process, the more efficacious the treatment will be.

Patient satisfaction index: Patients can rate the service quality and their experience with the services and hospitality. Push button feedback devices can be set up at the discharge ward and the Net Promoter score can be used to calculate patient satisfactory measure. Measuring satisfaction helps in identifying the shortfalls and improving the service quality.

Healthcare industry has evolved over centuries with new innovations along with the aim of providing better care to patients. The KPIs discussed above can be used by the industry to measure and improve the overall quality of service.

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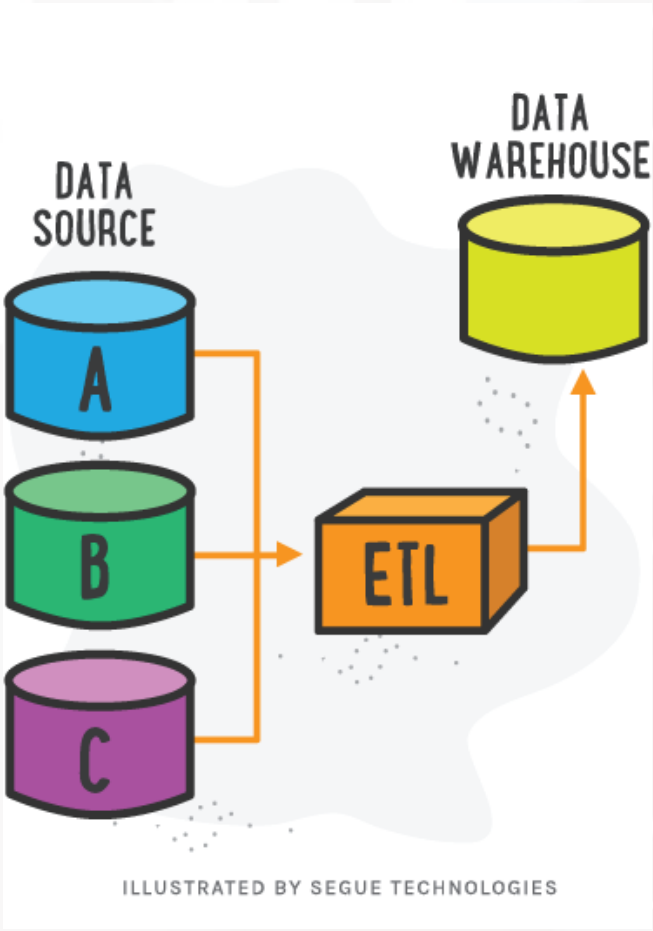
EXTRACT LOAD AND TRANSFORM USING SSIS

Introduction

Data plays an essential role in almost all business operations. This points to the direction of ETL operation. Raw data is "Extracted" from an array of unstructured sources in email or text files without formatting; this is now placed into destinations like a data lake or a data warehouse. In doing so, the extraction stage is complete. Next is the "Transformation" stage, where various business rules and regulations are applied to achieve standardization, verification and sorting and any other custom task that is to be incorporated. After transformation comes the "Loading" charge. If standard hand-coding is a better option than yet another tool like ETL, it always comes to question. But hand-coding comes with numerous challenges. Managing to support and reusing a code is complex. Multiple such complexities can result in higher maintenance costs. But most importantly, developers experienced in custom coding are scarce in number.

Extract: The initial step is to extract data from the various data sources. This entails choosing and preparing the data for the transformation step in the multiple source systems. In most situations, only partial regions are extracted from each source database. Extractions are carried out regularly to deliver updated data continually to the data warehouse. Extractions prompted by events or requests are feasible as well.



Transform: The data provided are adjusted to the target database format and scheme. The process of transformation again takes numerous phases. For example, defining fundamental formatting features, cleaning inaccurate data, or checking for similar information might be included in these phases and duplicating data with later deletion and exclusion.

Load: The last stage in the ETL process is the load to the destination database or data storage of converted data. This phase will allow for real integration with the database or data warehouse. The data will be shifted to the destination physically without protracted loading stalling of the database. Detailed logging documents all modifications to the target system.

Usage of ETL:

- Appropriate cloud compatibility
- Portable pipe lines that form clear communication lines between various cloud platforms.

There are many such tools used to perform the ETL operation as such. One of which, SSIS stands for SQL Server Integration Services. SSIS is part of the data program for various data migration operations used in Microsoft SQL Server. It is essentially an ETL tool in the Business Intelligence Suite of Microsoft, which is generally used to perform data integration. The major objective is to offer the mechanism for extracting, transforming, and loading data into data stores in SQL Server Integration Services (SSIS) packets.The SSIS services take and then load data from different sources such as flat files, XML files, CSV files and related references to their appropriate destinations.

Benefits of SSIS compared to other ETL tools:

SSIS is known as SQL Server Integration Services. A component of the Microsoft SQL Server database program that can work with a wide range of data migration functions is SQL Server Integration Services. SSIS is an integration of data and workflow platform. It includes a data storage tool used to extract, transform and load data. Basic description SSIS is the .dtsx extension storage file which includes your flow of control, the flow of information, connections, variables, parameters, event management, etc., in SSIS projects. SSIS is a part of data software from Microsoft SQL Server which is used for several activities of data migration. Basically, it is an ETL tool in the Business Intelligence Suite of Microsoft, which is mostly used for data integration

- Compared to other ETL tools like Informatica, they are easier to maintain.
- SQL Server and Visual Studio highly integrated
- Package Settings have proved much superior in dynamical settings or in the retrieval of the package configuration settings as per other ETL tools

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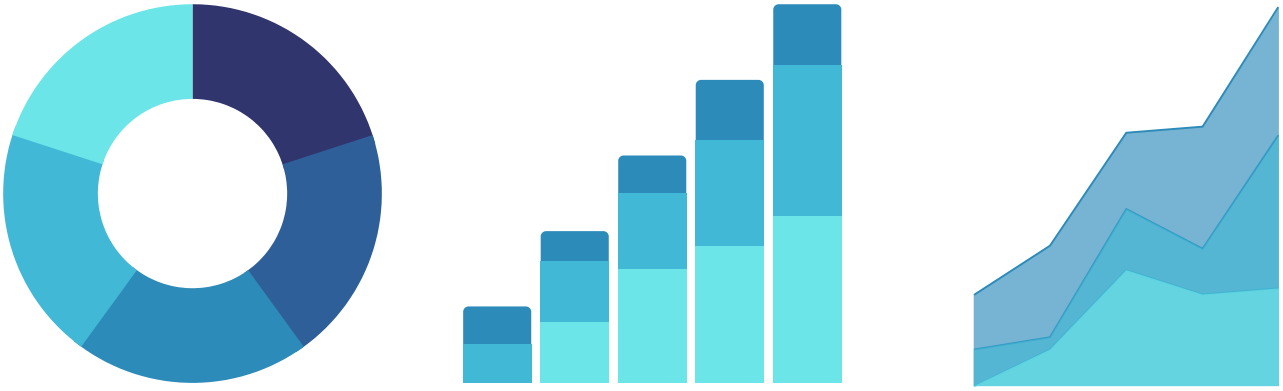
INFOGRAPHICS



BUSINESS INTELLIGENCE

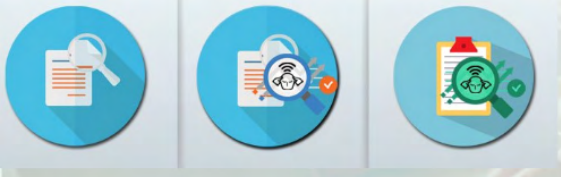
A set of processes and technologies that convert data into meaningful and useful information for business purposes.

BUSINESS INTELLIGENCE

What is happening now?
What have we done in the past to deal with it?

Descriptive

Descriptive | Predictive | Prescriptive



BUSINESS ANALYTICS

What is happening now?
What will be happening?
What is the best strategy to deal with it?

EXTRACT -----▸ TRANSFORM -----▸ LOAD

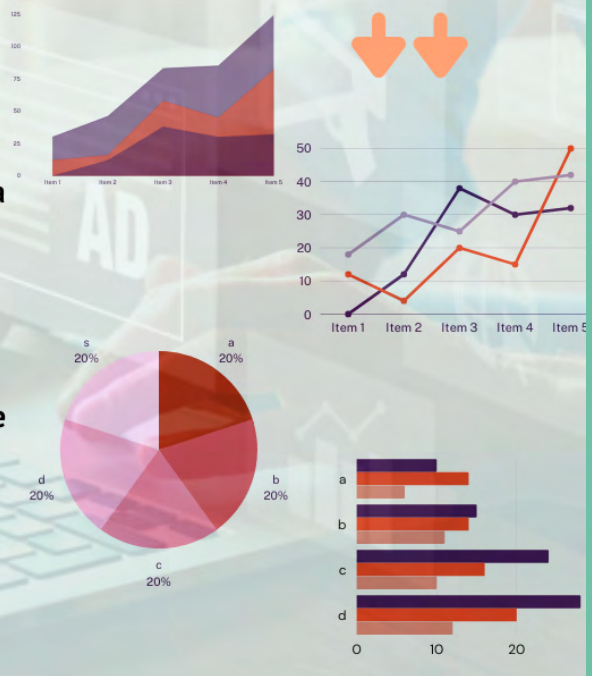
Data is automatically pulled using APIs, an interface used to access data from it's sources .[Google Analytics, CRM]

Removing errors, changing formats & classification. Accuracy of data is verified and passed onto next stage.

Transformed data is loaded into a data warehouse: a repository that consolidates data from all sources into a single database.

BI Tools

- **Companies use BI interfaces to analyze data from warehouses.**
- **It comprises dashboards, created for data visualization.**
- **They depict data in graphical forms which are used to derive business insights.**
- **BI Tools come integrated with popular databases.**



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BUSINESS INTELLIGENCE

COMMONLY USED TOOLS

HOW BUSINESS INTELLIGENCE WORKS?

In the Business intelligence process, organizations collect and store a huge volume of present and historical data. They use this data and turn it into meaningful information to get actionable and accurate business decisions. Business intelligence helps organizations to take better decisions for business growth.

WHAT IS A BUSINESS INTELLIGENCE TOOL?

Business Intelligence (BI) Tool is a software application that collects, transforms, and presents data to help decision-makers drive business growth. BI tool ingests large amounts of structured and unstructured data from varied sources, transforms it and helps deduce actionable business insights from the data. BI tool also offers data visualization, data integration and reporting.

Power BI

tableau

SAP BI

Qlik

HubSpot

IBM COGNOS

CLOUD COMPUTING IN BI

The best way to keep decision makers in touch with customers in real time.

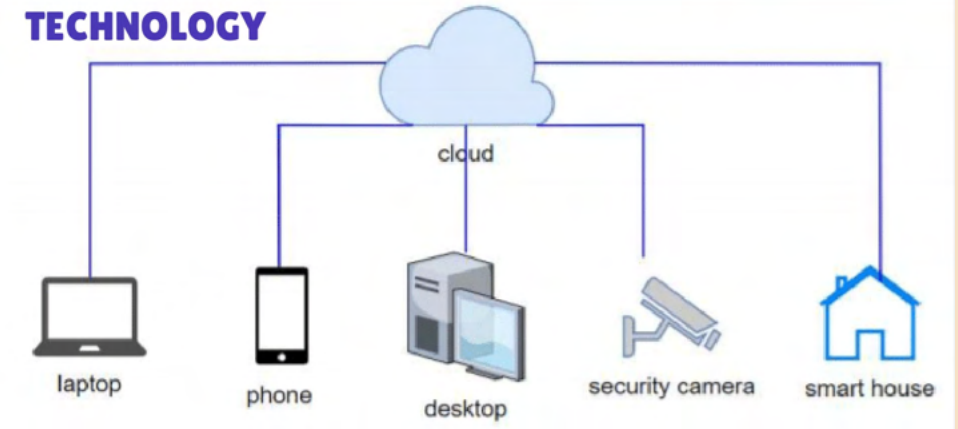
ENABLES

- Effective Collaboration
- Decision Making
- Real-time Communication

KEY CHALLENGES

- BI is compliant with the architectural requirements for web services
- Data warehousing system deployment
- Query load should be dispersed uniformly among the servers in an array

TECHNOLOGY



TOP CLOUD PROVIDERS – 2021

aws
Azure
IBM
Alibaba Cloud
Google Cloud

TOP 3RD PARTY CONNECTORS FOR CLOUD BI – 2020

Google Analytics
salesforce

MAJOR ADVANTAGES

Cost Effectiveness
Flexibility and Scalability
Resiliency
Better Data Transfer
No Capital Outlay

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SRILEKHA K 2027357

AVS PAVAN KUMAR 2027331

INDUSTRY EXPERT INTERVIEW

DR. S SURESH

Chief Technology Officer

BrainTower

BrainTower is a major player in the world of sales and marketing. They expertise in Consulting, Project Management , Interim Management. BrainTower brings the necessary experience and a natural passion for new technologies

INTERVIEW

1.Could you please tell us about your role in your company and something about the company?

I am the CTO and head the data analytics division.

2.How is BI and Business Analytics interconnected ?What is the importance of storytelling in today's world in your perspective?

Both BI and BA fundamentals remain the same. The underlying difference being that in BA , you do predictive analytics of your business whereas BI is all about adding intelligence to your business.

3.Does your company use Business Intelligence to build any product or services that it offers? If yes, please elaborate on it.

We work on both BI and BA tools. None of our solutions are without the essence of BI or BA.

4.What are the common challenges industry faces in the process of BI and how to overcome them ?

The challenges generally faced by any industry are:

1. Lack of BI strategy
2. BI when you don't know how to code
3. Lack of training and execution
4. BI with unstructured data
5. Installation and deployment

5.What are the important BI tools which are used in industry?

- TABLEAU
- SAS BI
- Qliksense
- PowerBI

6.What do you think is the future of Business Intelligence across various domains?

The future of BI lies in accuracy spanning either 100% or very close to 100% accuracy. This shall help businesses to accelerate.

7. What job roles are coming up in the Business Intelligence domain?

As on today countries such as USA face a shortage of about 250% of professionals in BI domain. BI is the talk of the day and are the highest paid professionals.

8.What would be your advice to aspiring Business Intelligence Professionals?

My advice to aspiring Business Intelligence Professionals is to learn the right BI tool and more so use the tool to solve any business problem. I feel that the aspiring Business Intelligence Professionals are to be involved with industry hands on for the last one year of their education in using BI tools.

SUMMER INTERNSHIP PROJECTS

ANALYSIS OF CUSTOMER EXPERIENCE AT BENZY INFOTECH

SUMMARY

This article is regarding the summer internship in Benzy Infotech Private Ltd, which is based in Cochin, Kerala. The topic was to analyze the customer experience and create the model for the same, depicting the proper distention. Customer experience analytics enables data-driven decisions on how to improve the business from initial contact through customer service and identify barriers that consumers may be unaware of.

UNDERSTANDING THE BUSINESS

The company's vision is to provide end-to-end business solutions that utilize quality in a dynamic environment where their clients' business strategies and technological strategies intersect to enhance solutions and service quality to provide a higher level of customer value. With the aid of cutting-edge technology and efficient resources, to conceive and implement intelligent and quality-driven business transformation initiatives.

As mentioned in the business objective, the company is working for a travel agency. Hence many customers travel daily and give their experience feedback. Analyzing the data collected as the customer experience would determine what changes are required and how to grow the business in future. The data collection is to see for the competitors how the company strategies and methods can be enhanced yearly,i.e. changes noticed before the pandemic and after. Hence was collected from the data world website.

- Customer acquisition: By identifying the potential customers and understanding the customer interests and preferences.
- Customer experience: By collecting data where they have given feedback of travel experience over the years
- Customer loyalty: NPS scores derived from sentiment analysis. Agile customer support

DATA UNDERSTANDING

The data has been retrieved from various sources, which is similar to the customer experiences of travelling. The data feedback is how well the customer experienced their journey while travelling. The feedback includes the cleanliness rating, ease of online booking, food and drink, service etc. The data were explored to find more ways to analyze topics and didn't show sufficient satisfaction alterations. Certain areas of data are yet to be cleansed as the relevancy of the data seems to be absurd. Hence, with R programming, all the minor errors that raw data has been rectified.

DATA PREPARATION

The data was reviewed in Microsoft Excel. The information was segregated with relevant column names and distinguished with sheets. The data was cleaned using the R programming codes. Firstly, the data was put into classes and data frames. Later it was summarized.

While analyzing the data in the dashboard created in Power Bi, the analytical dashboard has created new data that compares the data over different years. It also shows how the data has improvised over the years and what fundamental changes have to be made. The string values in necessary conditions have been converted to numerical form for mathematical operations.

MODELLING

The model that has been selected is for regression in the R programming language, the dashboard has been created in Power Bi. It consists of three segments: overview, feedback and travel.

The dashboard shows the various travel parameters that were rated by the travellers and how well was it convenient while travelling.

A detection model using NLP in Python Jupyter Notebook was created. Data pre-processing has been done, splitting the data into tests and trains using NLP. The model has been built in R programming language and NLP, and an analytical dashboard has been created. The model depicts the changes compared to the other data that has priorly changed the aspects of the data.

EVALUATION

The model shows various possibilities of how it is helpful in decision-making and shows what necessary changes can be made to improve in the future. It shows during the covid 19 pandemics, many people were not willing to travel. It shows due to the pandemic; people were particular about cleanliness, food and safety. Most of them have prefered online booking, which makes it easy.

ANAGHA C

2027954

DEPLOYMENT

As the model is created for the competitor's, the changes for the company to take up in future can be decided.

MARKET RESEARCH TO DISCOVER THE POTENTIAL CUSTOMERS FOR STAFFING AND RECRUITMENT INDUSTRY

BUSINESS PROBLEM

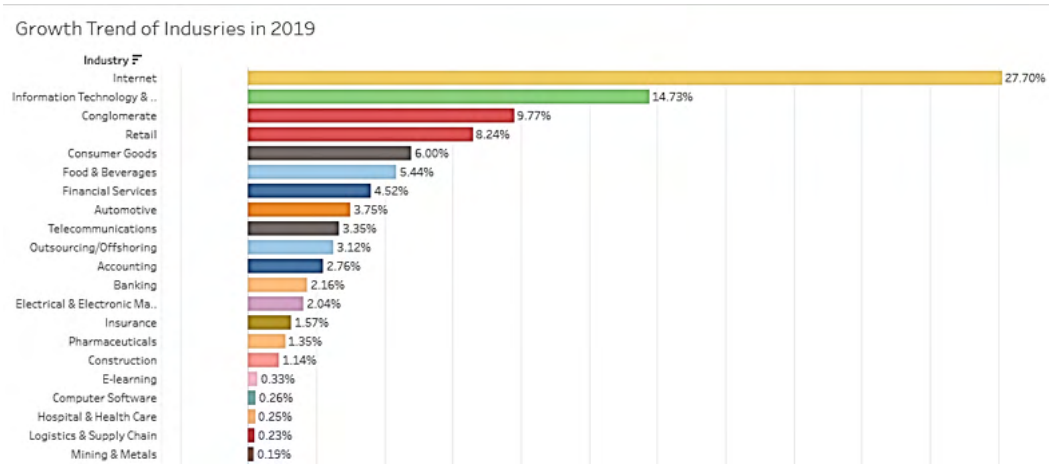
The start-up ventures generally face difficulties in understanding the market dynamics due to which they lags behind in building effective marketing and business strategies to collaborate with customers' needs. With reference to the case of a start-up company belongs to recruitment consultancy industry acted as a talent acquisition partner to the companies across different sectors to help them to succeed in a fast-changing and uncertain world of work. Company is incognizant about its potential customer base and its competitors strategies, due to which company confronted with the challenges in building appropriate business development strategies for establishing relationship and collaborating across different industries clients.

SOLUTION APPROACH

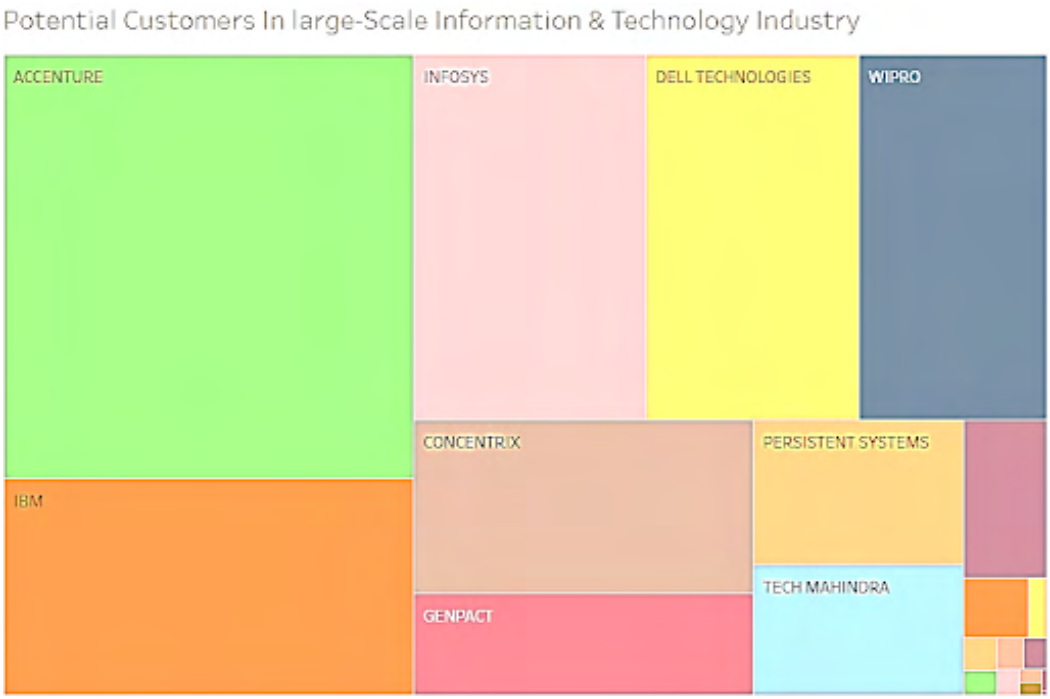
For conceptualizing the solution to the above business problem company needs to discover answers to the following questions:

- What is the hiring trends of different industries and which industries has the highest hiring growth under different scales of industries?
- Who are the Prospective customers under different industries across all scales of industries?
- In the basket of prospective customers, what is the hiring trend of different functional areas and which functional area has the highest hiring growth?

So, the project aims to respond all these listed queries by gathering the data related to all the customers and most of the top competitors in the market from various web sources and analyzing the gathered data using any BI visualization tool for delivering actionable insights that helps business stakeholders to make the informed business decisions related to the formulating effective marketing and business strategies to establish and build relationship with the potential customer base. For example, on visualizing the data we came across the industries having with high no. of job openings and who are the perspective customers under that industry.



The bar chart (Fig) depicts the Growth of different industries with respect to recruitments/hiring. The top- three industries for job openings in different job-roles are: Internet (27.70%), Information & Technology (14.73%), and Conglomerate (9.77%).



The tree-map demonstrates potential customers in the large-scale Information and Technology industry, which is the second top-most industry. The top customers to be targeted in the market under this industry are: Accenture, IBM, Infosys, Concentrix, Dell and Wipro.

Based the above visualization, company can devise a strategy to establish a relationship with the customers under large-scale Information and Technology industry by knowing for which functional area they hire more, for which job-categories they have more no. of openings, what kind of candidates they are looking for, in which salary bracket they hire the candidates, what is their hiring cycle throughout the year etc. This is how BI helps to draw intelligence from the data based on which company can take strategic decisions for its growth and development in the market.

ANCHAL

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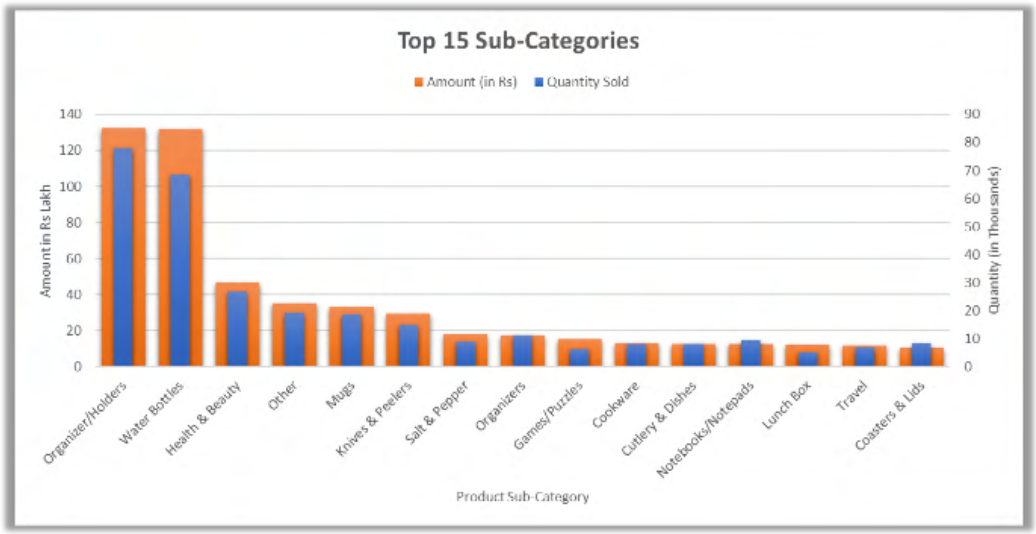
DATA VISUALIZATION: AN ENTRY-WAY INTO BUSINESS INTELLIGENCE

Data, raw information, is all around us. Created and collected in every aspect of our daily lives, the world is abundant in this resource which, unlike gold, oil or currency, only grows in volume as more people gain interest in it. Any large company you take is investing heavily into this next source of competitive advantage. Machine Learning, Artificial Intelligence, the Internet of Things, all the buzzwords surrounding this field are sure to reshape the way businesses will operate going into the next decade. However, the first step to all the complex algorithms and specialised tools is the simple, boundless and powerful process of data visualisation.

Data visualisation is the representation of data in a graphical, pictorial or visual format. Used for identifying and exploring relationships between variables and tracking trends over time, this front-end depiction of data provides a more straightforward way to communicate the complexities studied by the back-end algorithms. But what does this mean for businesses? Take your traditional Indian MSMEs, many family businesses or traders who have learned from the previous set of business owners and taken on the trade into the next generation; very few of such companies have any level of awareness towards data analytics. With the changing competitive environment, this ignorance will only result in one possible ending. Therefore, the question arises, how does one introduce data and business analytics into such companies?

The simplest and quickest way to leverage their semi-structured data into valuable insights is almost always through data visualisation.

With the ever-evolving legal requirements and compliance policies laid out by the government's various institutions, companies have already begun collecting some essential data in a relatively structured format. Most of them would be depending on an accounting system and multiple spreadsheets to run their business. Few improvements in their processes can help streamline their data collection and processing systems. The most significant hurdle, however, is the company's management. Data-driven decision-making can only succeed in an organisation if it is supported and driven by the highest level of management. Therefore, forget everything about creating data warehouses, implementing BI tools or developing various algorithms. Data visualisation is the first step to prove that there is a benefit to analytics. Once an organisation is convinced by the results, then the opportunities for analytics become endless.



Take an example of this B2B corporate gifting company. A simple depiction of their product sales suggests that they should immediately shift their resources and efforts towards the top 2 performing categories of products that account for most of their business. A market development strategy with these two product categories can lead to a significant uptick in the business's performance without requiring any major development of new talent, product expertise or investment. The idea here is that a simple chart can lead to an overnight shift in the business's strategies without needing a skilled professional in machine learning algorithms or coding. All companies need is someone who understands the importance of data analytics and has access to the vast knowledge provided through the internet.

Now all of this may seem like an evident activity to those who are studying or practising in this field every day of the week. Still, the reality is that there is a significant gap between the larger corporates and the traditional MSMEs. However, this gap is only an opportunity. Take it up as a consulting role and transform these companies one by one, or become a corporate mentor and spread the knowledge to hundreds of business leaders at once; the possibilities are truly endless. So, all that is left is to step into these businesses and show them how data visualisation can reshape the way they make their decision and slowly introduce them into this vast field of business analytics.

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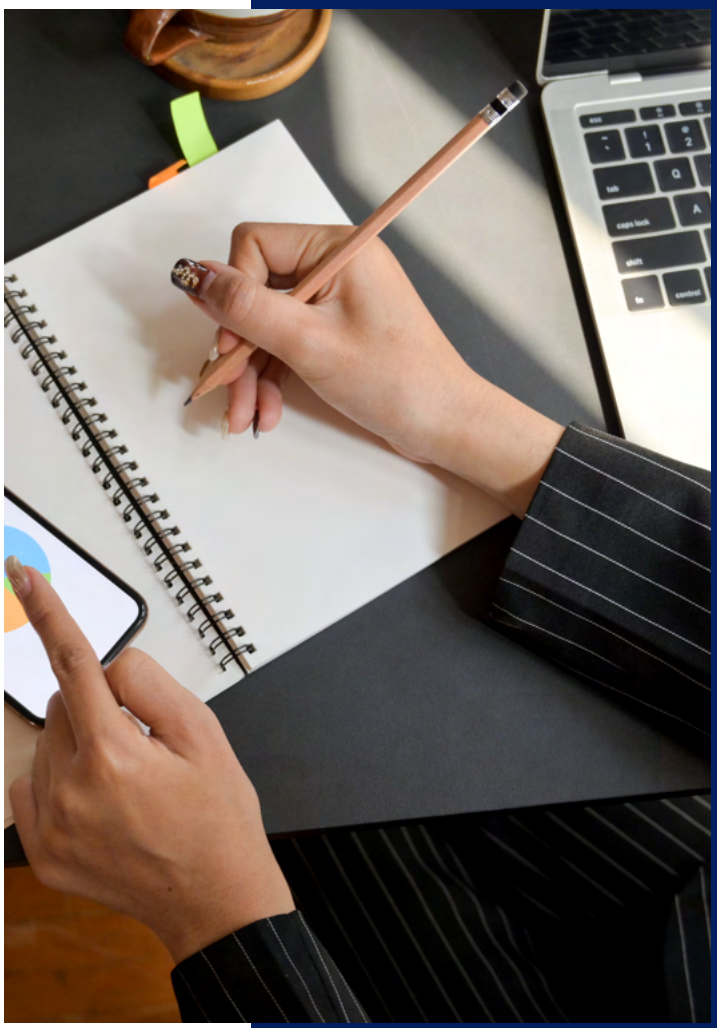
2027025

FACTORS AFFECTING CUSTOMER PREFERENCE TOWARDS DIGITAL MAGAZINES: A STUDY WITH REFERENCE TO TENHARD INDIA PVT. LTD



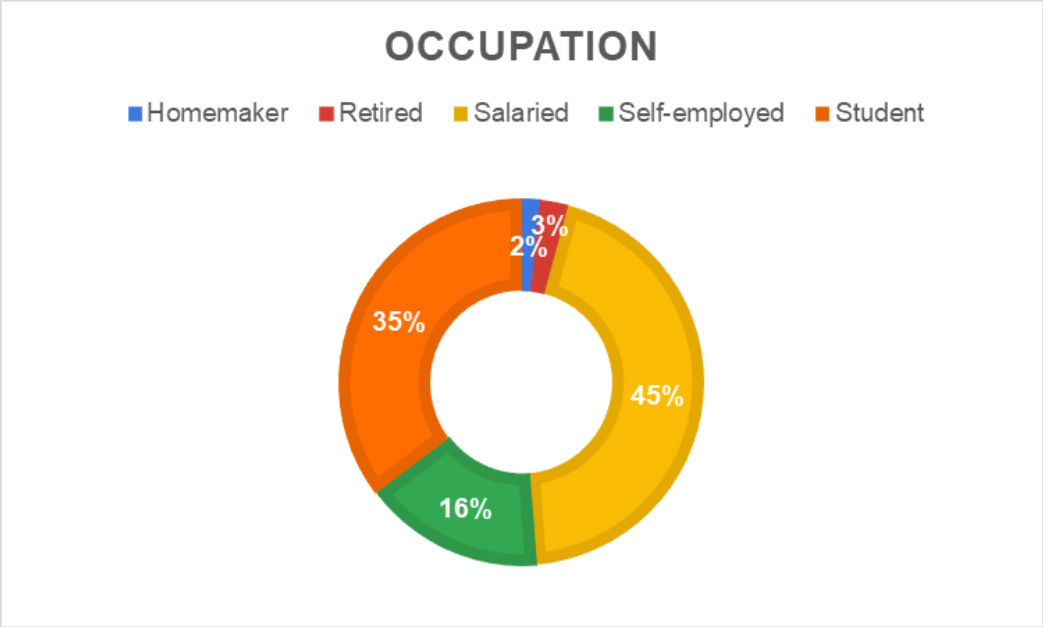
To understand and answer this question first, we must understand what graphs are. Graphs are used to analyze the cause-and-effect relationship between two variables. Now, it's important because a graph's aim is to quickly visualize a data collection. Understanding and recognizing patterns and trends in the flow of data requires a graphic visual representation of information.

For the Summer Internship Project, the topic that was chosen was 'Factors affecting customer preference towards digital magazines: a study with reference to Tenhard India Pvt. Ltd'. The problem statement was to measure the satisfaction levels of customers towards digital magazines through graphical representation. Primary research was conducted. The research that was conducted is exploratory in nature. Target population used samples from various regions and the total collection (Sample size) was 119.

The research instrument is a questionnaire for digital magazine readers having both open and closed-ended questions. The research instrument is structured. The data type has Likert scale, which is used to measure the preference of digital magazine readers. All the visualizations were done through MS-Excel.

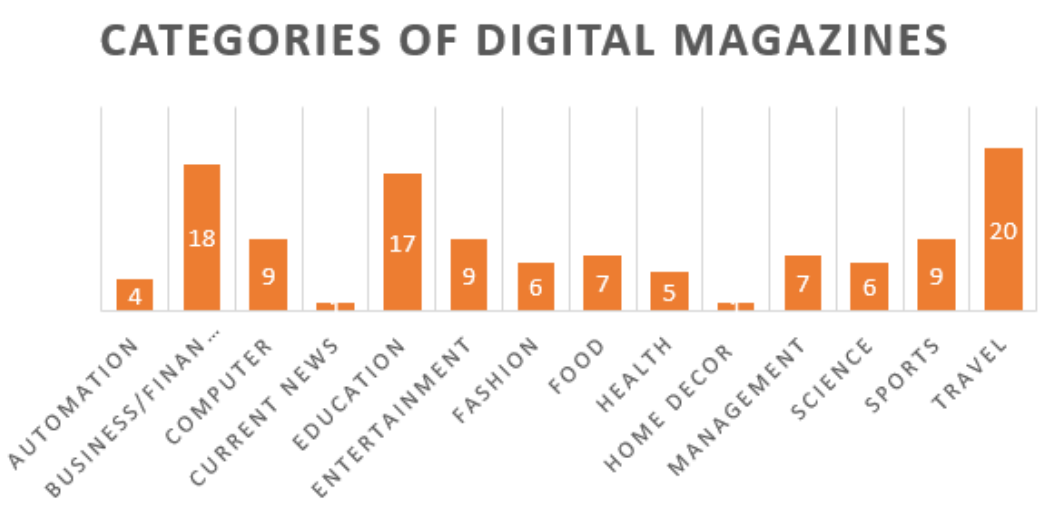
Demographic Representation:

The graphical representation shows the demographic analysis of the consumers. For example, a doughnut chart was used for occupation distribution, where we saw that majority of the subscribers are salaried, i.e., 45% of the total.



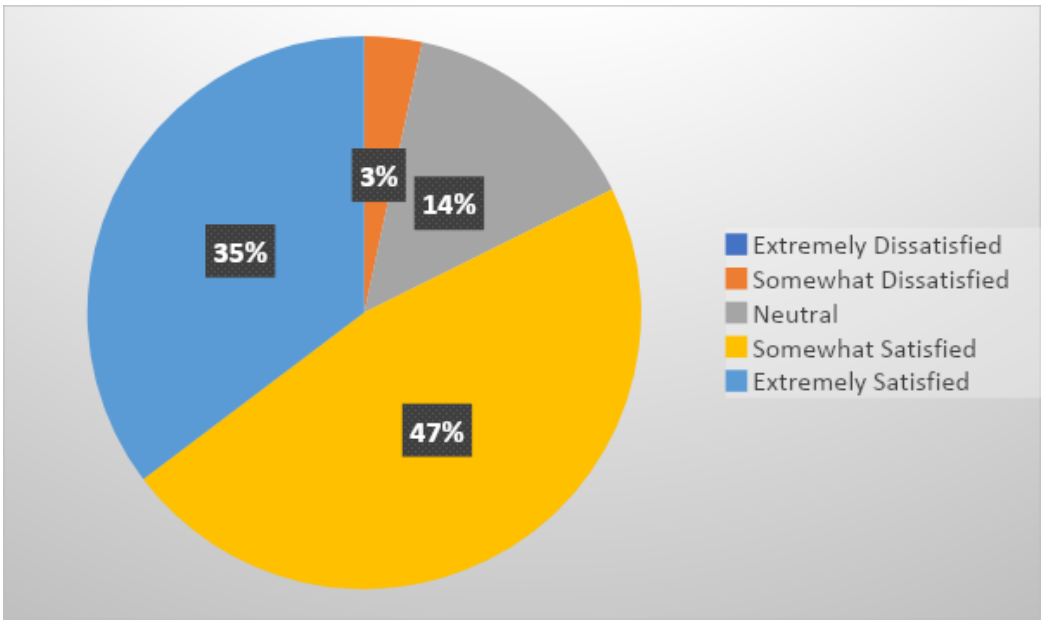
Preferences Representation:

For preference representation, all the charts that were used for visualization were bar graphs. The graphical representation showed the preferences of the consumers in various categories. We could see that the most preferred category among the readers of digital magazines is Travel, i.e., 20.

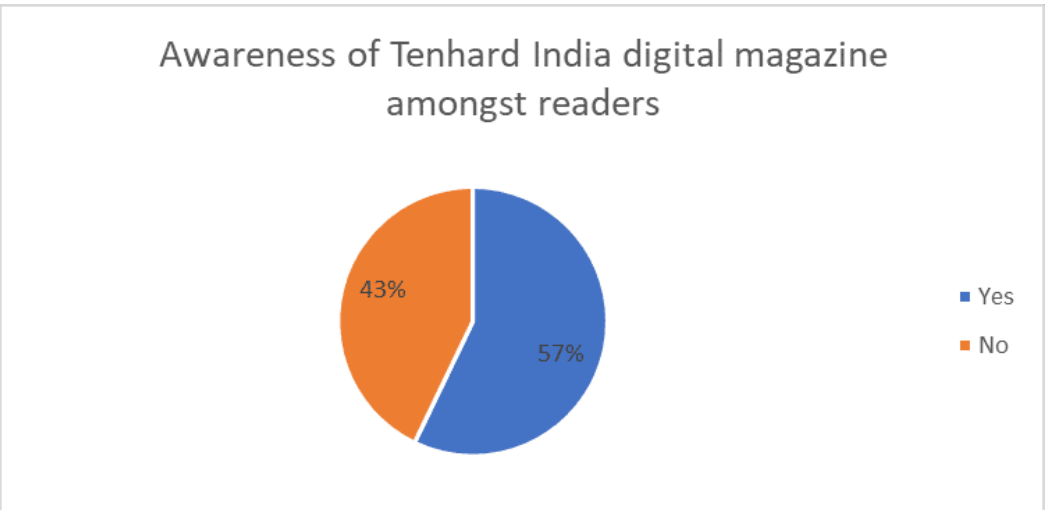


Satisfaction Level Representation:

A pie chart was used for the representation of the satisfaction levels of all the subscribers of digital magazines. A total of 18% was representing a negative satisfaction level where the neutral factor was dominating. Again 82% was representing a positive satisfaction level where the respondents are mainly somewhat satisfied with the magazines they were currently subscribed to.



And lastly, we made a visual representation in the form of pie charts of the awareness of Tenhard India among the sample. From the representation, we could see that we understand that among all the 119 respondents, 57 % of them are aware of Tenhard India digital magazines.



Conclusion:

From the above representations, we can understand that Business Intelligence can be used by Tenhard and other similar companies. Providing data for analysis in a user-friendly, accessible format becomes a must. As a result of business intelligence for data visualization technology helps in understanding the data faster and simple perception as a big data collection with a complicated structure becomes analyzed. The audience is encouraged to focus on the core of the data rather than the technique and it assists in avoiding the distortion of what the data should indicate.

SHRADDHA DAS

2027037

DASHBOARD CREATION FOR UNDERSTANDING AND FORMATION OF SALES AND RETURNS STRATEGIES

Visualization and analytics industry has undergone significant disruptions over the last five years. The purpose of the internship was to understand the sales and returns strategies of a company with the help of the given data. Insights were generated from the data by creating a dashboard, and new strategies were formulated, which resulted in more sales. Power BI is one of the fast-growing software. It helps in the visualization of a large volume of data. Today, businesses have a competitive advantage if they use data and can generate insights from it. These insights help in the growth of the company. Visualization of graphical information can significantly help interpret complex data imported from excel tables, having a substantial effect on individuals, helping in the decision-making process.

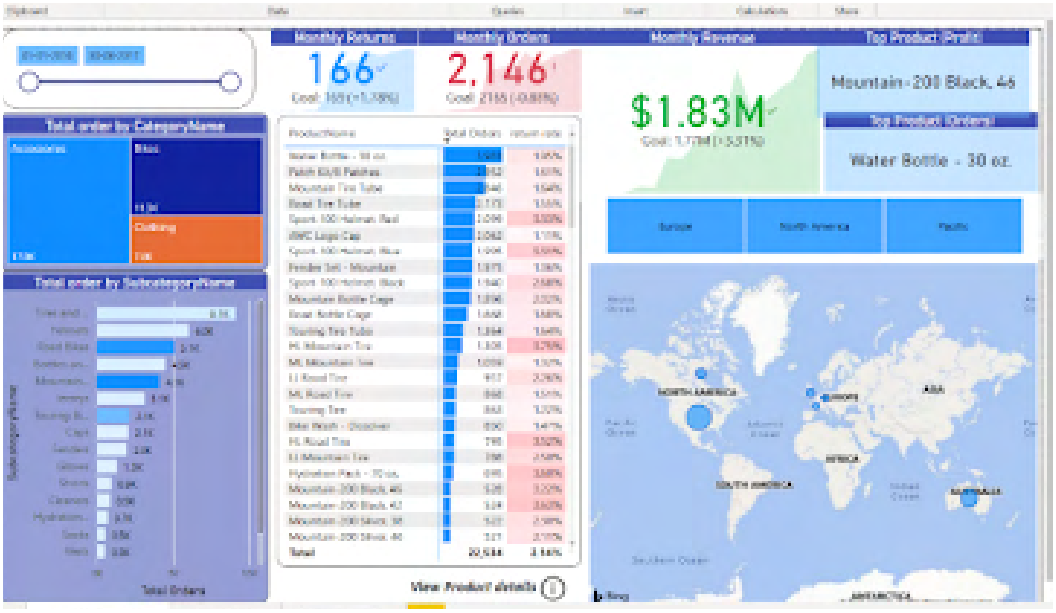
The dataset used in the internship was of a sports company from which valuable insights were made, and strategies suggested. These new strategies increased the revenue of the company gradually. The project had the following objectives :

1. To design a dashboard that shows all the valuable points of the company.
2. To forecast the weekly profit of the company.
3. To anticipate the profit margin if the present profit rate is increased.
4. To estimate the most valuable customer and the revenue generated from them.
5. To categorize different income level customers.

The Cross-industry process for data mining (CRISP-DM) methodology approach was adopted in carrying forward the project.

Initially, an industry study was performed and analyzed what the scopes of the market are and learned the key aspects of the market. Next, visualization was made based on the given data with the help of Power BI. The data about the sales of the products, the products that were returned, and the number of orders that took place were mainly used to understand the company's performance and details.

In Power BI, the dataset was first imported and cleaned to ensure that all the datatypes indicate the particular data entry. The next step was to formulate the DAX measures that will help get the appropriate data values and thereby help in the dashboard creation. For the DAX measures, the following distinct functions were used; CONCATENATE(), RELATED(), CALCULATE(), COUNTA(), ALL(), DATEADD(), DATESINPERIOD() and DATEDIFF(). All these functions have specific uses depending on the dataset. After this, a dashboard was created on the platform. With the help of various tools in Power BI, the following dashboards were created.



The above figure shows the executive summary of the overall product details . This dashboard contains the treemap, which shows the Category with respect to the orders. A bar chart and matrix shows details of the products. The treemap shows the distribution of orders, The KPI cards showing the progress of the sales of the products. In the treemap, we can see the accessories that have the highest demands. The treemap helps in showing us a variety of categories and the distribution in the form of rectangular boxes. Next, we have used the bar chart, which depicts the products most ordered by the customers and their revenues. KPI cards help indicate the key performing products. Furthermore, the total global distribution of the sales of the products is also shown.

The second dashboard presents a detailed review of the products and the monthly orders, returns, and revenue details. The forecasting tool helps in forecasting the future process. It shows the average growth and also shows the maximum loss that we might be incurred.

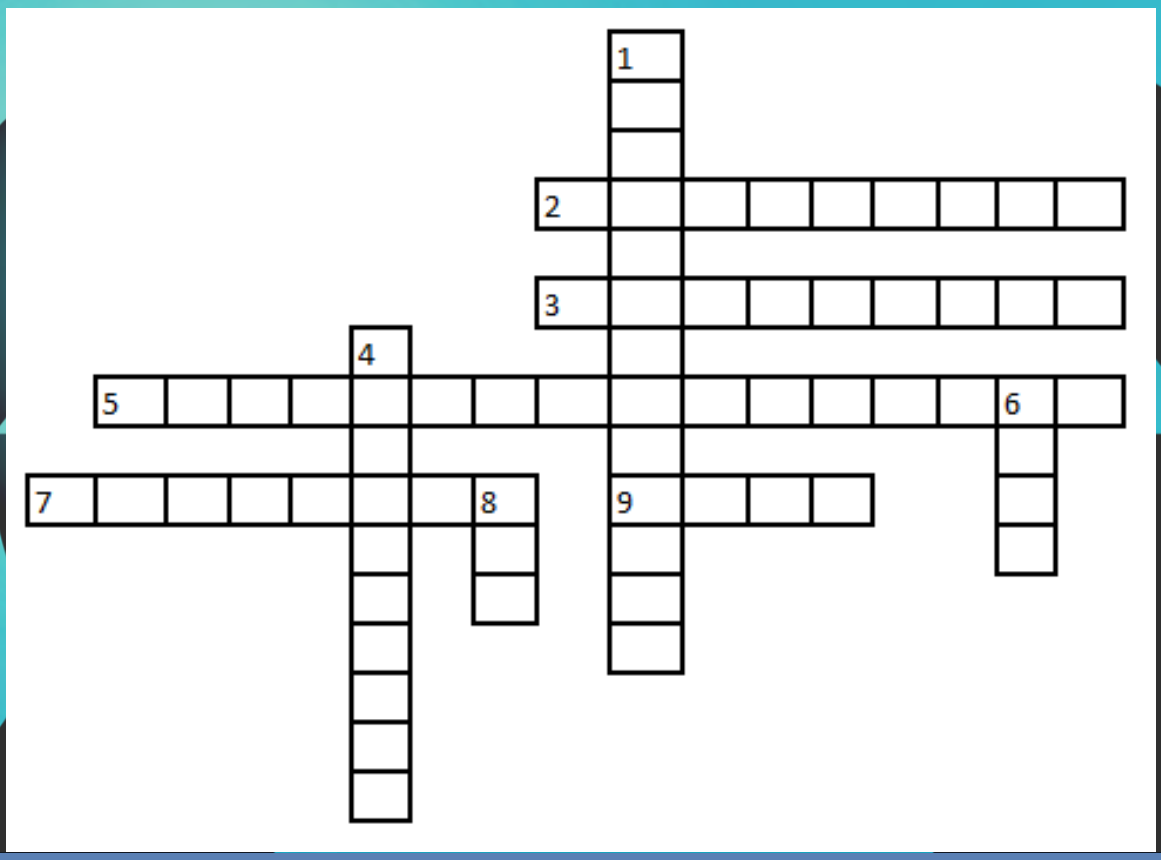
The final dashboard shows the summary details of the customers. The matrix shows orders and revenue generated by each customer. Customer name is displayed, and the revenue generated from that customer is also displayed. The donut chart shows the orders by gender, income level, and occupation. This helps in understanding the different distribution of income levels. We can know in which particular group there is the sales and which specific group needs more attention. The TreeMap shows the age which has the highest orders.

From these dashboards, appropriate strategies were formulated and presented to the company. The project's findings were that the company should consider the customers who belong to the average income level and make sure that they price accordingly. The marketing strategy was to target people between the age of 40-65 since those are the ones who customers who have the highest orders.

It can be concluded that a dashboard can display the ongoing status of the business and understand where the company stands. Furthermore, a viable dashboard can work with a dynamic cycle to rapidly trigger activities by conveying information to users. In this project, the importance of the various orders generated in the company is gauged, valuable insights from the sales data are drawn, and strategies to improve the company's sales were devised. The new strategy, if not entirely, was in contrast to the present ones and was able to increase the sales.

BELWIN BENNY
2027818

CHECK YOUR KNOWLEDGE



ACROSS:

2. A table which is located at the center of star or snowflake schema which contains measurements, metrics or facts about a business process is called as.
3. In business intelligence, the tool helps users to read large amounts of data and reports through a single graphical interface.
5. A process of finding unusual patterns in dataset is called as.
7. A data storage repository that stores a large volume of raw data in its natural format until it is processed is called as.
9. Data processing that consists of executing a number of transactions occurring concurrently, for example, online banking shopping, order entry, or sending text messages.

DOWN:

1. Data management system created to facilitate and support business intelligence (BI) tasks is called as.
4. The process of predicting outcomes by looking for anomalies, patterns, and correlations in huge data sets.
6. Computing method that allows users to extract and query data quickly and selectively in order to examine it from many perspectives.
8. A process for combining data from several sources, present it in a unified form and loading into a data warehouse is called as.

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Answers:
1. Data warehouse 2. Fact Table 3. Dashboard 4. Data mining 5. Anomaly Detection
6. OLAP 7. Data Lake 8. ETL 9. OLTP

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