

# **Velagapudi Ramakrishna Siddhartha Engineering College**

**Kanuru, 520001**



## **BUSINESS INTELLIGENCE HOME ASSIGNMENT - 1**

**Code : 20IT7403 A**

**Batch Members :**

**208W1A1297**

**208W1A1299**

**Submitted To :**

**Dr . G . Jaya Lakshmi**

**Department Of IT**

**Problem Statement:**

18. Examine the use of Insurance to measure the benefits of predictive analytics. Analysts found benefits including the detection of a fraud ring in the first 30 days of use, the ability to accelerate 50 percent of processing claims, and savings equivalent to the cost of 30 external assessors.

<https://nucleusresearch.com/research/single/ibm-roi-case-study-santam-insurance/>

**Solution:**

One main way insurance companies use predictive analytics is to improve their claims processing. By analyzing historical data and using machine learning algorithms, insurers can quickly and accurately assess the validity of claims, reducing the time it takes to process them and improving customer satisfaction. Predictive analytics can also help insurers identify claims that are likely to be fraudulent, helping them to save money and improve their risk management.

Another area where predictive analytics is used in the insurance industry is pricing and underwriting. By analyzing data on customer behavior, demographics, and other factors, insurers can better understand their customers and tailor their products and pricing accordingly. This can help insurers attract new customers, improve customer retention, and ultimately increase their revenue.

Predictive analytics is also being used to improve risk management in the insurance industry. By analyzing data on past events and using machine learning algorithms to predict future events, insurers can better assess the risks associated with certain policies or customers. This can help insurers avoid losses and make better decisions about which policies to offer.

Finally, predictive analytics is being used to improve customer service in the insurance industry. By analyzing customer data and using machine learning algorithms to predict customer behavior, insurers can provide personalized recommendations and improve the customer experience. This can help insurers build stronger relationships with their customers and improve customer loyalty.

Overall, the use of predictive analytics in the insurance industry is transforming the way insurers operate. By leveraging data and machine learning algorithms, insurers can improve their claims processing, pricing and underwriting, risk management, and customer service, ultimately leading to better business outcomes.

The use of predictive analytics in the insurance industry has proven to be highly beneficial in detecting fraudulent activities and accelerating the processing of claims.

The benefits of predictive analytics in the insurance industry were examined in a case study conducted by Nucleus Research on Santam Insurance, which used IBM's predictive analytics software to improve their claims processing and fraud detection capabilities.

The study found that Santam Insurance was able to detect a fraud ring within the first 30 days of using the software, resulting in the recovery of fraudulent claims and prevention of future fraudulent activity. Additionally, the use of predictive analytics allowed Santam Insurance to accelerate the processing of 50% of claims, resulting in faster and more efficient processing times for customers.

Furthermore, the study found that the savings generated by the use of predictive analytics were equivalent to the cost of hiring 30 external assessors. This demonstrates the significant cost-saving potential of predictive analytics in the insurance industry.

Overall, the use of predictive analytics has proven to be highly beneficial for Santam Insurance, resulting in improved fraud detection, faster claims processing, and significant cost savings. As such, it is likely that more insurance companies will continue to adopt predictive analytics in the future to improve their business processes and enhance their customer service offerings.

Sure! Predictive analytics is a branch of data analytics that involves using statistical algorithms and machine learning techniques to analyze data and make predictions about future events. In the insurance industry, predictive analytics can be used to identify patterns and trends in data related to customer behavior, claims history, and other relevant factors.

By analyzing this data, insurance companies can make more accurate predictions about future claims, identify potential fraud or risk factors, and optimize their business processes to improve efficiency and customer service. Predictive analytics can also help insurance companies personalize their offerings to individual customers, creating a more personalized experience and improving customer satisfaction.

Some of the specific applications of predictive analytics in the insurance industry include:

- Fraud detection: Predictive analytics can help insurance companies identify patterns of fraudulent activity, such as unusual claims behavior or suspicious network connections, and flag potentially fraudulent claims for further investigation.
- Claims processing: By analyzing claims data, predictive analytics can help insurance companies identify claims that are likely to be legitimate and accelerate the processing of those claims. This can lead to faster payments for customers and reduced administrative costs for insurance companies.
- Risk management: Predictive analytics can help insurance companies identify high-risk customers or policies, allowing them to take proactive measures to reduce risk and minimize losses.
- Customer retention: By analyzing customer data, predictive analytics can help insurance companies identify customers who are at risk of leaving and take steps to retain them, such as offering personalized incentives or discounts.

Overall, the use of predictive analytics in the insurance industry has the potential to improve efficiency, reduce costs, and enhance customer satisfaction. As such, it is likely that more insurance companies will continue to adopt predictive analytics in the coming years.

# **Velagapudi Ramakrishna Siddhartha Engineering College**

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## **BUSINESS INTELLIGENCE HOME ASSIGNMENT - 2**

**Code : 20IT7403 A**

**Batch Members :**

**208W1A1297**

**208W1A1299**

**Submitted To :**

**Dr . G . Jaya Lakshmi**

**Department Of IT**

**Problem Statement:**

18. TCV reports off a number of datasets, including financial performance, funding and liquidity, profit, market risks, and risk metrics of how the business runs, with one large treasury system that is the main feed and several others running into it. With many data sources and reports to accommodate, its team needed a BI solution that could offer a level of automation, consolidation, and streamlining to bring together key datasets and improve the efficiency of self-service BI fast.

**Solution:**

**Ans:** The use of a Business Intelligence (BI) solution is becoming increasingly important in the management of financial data in large organizations such as TCV. TCV reports on a number of datasets, including financial performance, funding and liquidity, profit, market risks, and risk metrics. The team at TCV needed a BI solution that could offer a level of automation, consolidation, and streamlining to bring together these key datasets and improve the efficiency of self-service BI.

One of the key benefits of a BI solution is the ability to automate data collection and consolidation. With many data sources and reports to accommodate, a BI solution can help to streamline the process of bringing together key datasets from various sources. This can save time and improve the accuracy of financial reporting.

Another benefit of a BI solution is the ability to offer self-service BI. This allows users to quickly and easily access the data they need, without having to rely on IT or data analysts. This can improve the efficiency of the organization as a whole and help to drive better decision-making.

Finally, a BI solution can provide valuable insights into financial performance, market risks, and other key metrics. By analyzing this data, organizations such as TCV can identify areas of strength and weakness, and make data-driven decisions to improve their performance and manage risks effectively.

In summary, the use of a BI solution can help organizations such as TCV to automate data collection and consolidation, improve the efficiency of self-service BI, and gain valuable insights into financial performance and risk management.

The use of a Business Intelligence (BI) solution can be highly beneficial for organizations like TCV, which have to deal with multiple datasets from different sources. By automating the process of consolidating and streamlining these datasets, a BI solution can improve the efficiency of self-service BI and enable faster and more accurate decision-making.

In the case of TCV, the datasets that need to be accommodated include financial performance, funding and liquidity, profit, market risks, and risk metrics related to how the business runs. The main treasury system serves as the primary data feed, while several other systems provide additional data that needs to be integrated and analyzed.

To address these challenges, TCV needed a BI solution that could offer automation, consolidation, and streamlining of key datasets. This would enable the organization to quickly and easily access the data it needs to make informed decisions, without having to spend a lot of time and resources manually collecting and analyzing the data.

A BI solution can offer several benefits for organizations like TCV, including:

- Automation: A BI solution can automate the process of collecting and consolidating data from multiple sources, saving time and reducing errors.
- Consolidation: A BI solution can bring together key datasets from different sources, allowing for a more comprehensive and accurate analysis of business performance.
- Streamlining: A BI solution can streamline the process of self-service BI, making it easier for users to access the data they need to make informed decisions.

Overall, the adoption of a BI solution can help organizations like TCV improve their business performance by providing faster, more accurate, and more comprehensive access to key datasets. As such, it is likely that more organizations will continue to

adopt BI solutions in the future to improve their decision-making capabilities and gain a competitive edge in the marketplace.

some additional information on Business Intelligence (BI) solutions and their benefits:

A BI solution is a software platform that enables organizations to analyze and visualize data, providing insights into business performance and enabling informed decision-making. BI solutions can be used to consolidate data from multiple sources, including databases, spreadsheets, and other applications, into a single dashboard or report.

The benefits of a BI solution for organizations include:

1. Improved data accuracy and consistency: By consolidating data from multiple sources, a BI solution can help ensure that data is accurate and consistent across the organization.
2. Faster access to information: BI solutions enable users to quickly access and analyze data, providing faster insights and enabling faster decision-making.
3. Greater insights into business performance: BI solutions can provide visualizations and reports that enable users to better understand business performance and identify areas for improvement.
4. Improved collaboration and communication: BI solutions can be used to share data and insights across departments and teams, improving collaboration and communication across the organization.
5. Reduced costs and increased efficiency: BI solutions can help automate data analysis and reporting, reducing the need for manual processes and saving time and resources.

Overall, the adoption of a BI solution can help organizations gain a competitive edge by enabling faster, more informed decision-making and improving overall business performance. As such, it is likely that more organizations will continue to adopt BI solutions in the future to leverage the power of data and analytics in their operations.



# **Velagapudi Ramakrishna Siddhartha Engineering College**

**Kanuru, 520001**



## **BUSINESS INTELLIGENCE HOME ASSIGNMENT - 3**

**Code : 20IT7403 A**

**Batch Members :**

**208W1A1296**

**208W1A1297**

**208W1A1299**

**Submitted To :**

**Dr . G . Jaya Lakshmi**

**Department Of IT**

## **Problem Statement:**

12. Optimize sales team's efficiencies at a pharma manufacturing giant

<https://www.kaggle.com/datasets/milanzdravkovic/pharma-sales-data>

## **Solution:**

### **Ans:**

The dataset is built from the initial dataset consisted of 600000 transactional data collected in 6 years (period 2014-2019), indicating date and time of sale, pharmaceutical drug brand name and sold quantity, exported from Point-of-Sale system in the individual pharmacy. Selected group of drugs from the dataset (57 drugs) is classified to the following Anatomical Therapeutic Chemical (ATC) Classification System categories:

M01AB - Anti-inflammatory and antirheumatic products, non-steroids, Acetic acid derivatives and related substances

M01AE - Anti-inflammatory and antirheumatic products, non-steroids, Propionic acid derivatives

N02BA - Other analgesics and antipyretics, Salicylic acid and derivatives

N02BE/B - Other analgesics and antipyretics, Pyrazolones and Anilides

N05B - Psycholeptics drugs, Anxiolytic drugs

N05C - Psycholeptics drugs, Hypnotics and sedatives drugs

R03 - Drugs for obstructive airway diseases

R06 - Antihistamines for systemic use

Sales data are resampled to the hourly, daily, weekly and monthly periods. Data is already pre-processed, where processing included outlier detection and treatment and missing data imputation.

Optimizing the efficiency of a sales team is a key priority for many organizations, including pharma manufacturing giants. By improving the efficiency of the sales team, these organizations can increase revenue, improve customer satisfaction, and gain a

competitive advantage. One approach to achieving this goal is through the use of data analytics and machine learning.

The Pharma Sales Data available on Kaggle provides a valuable resource for analyzing the performance of a pharma manufacturing giant's sales team. By analyzing this data, organizations can gain insights into which products are selling well, which sales representatives are performing best, and which regions are generating the most revenue. This information can be used to optimize sales strategies and improve the efficiency of the sales team.

One approach to analyzing this data is through the use of machine learning algorithms. By training these algorithms on historical sales data, organizations can develop predictive models that can be used to identify which products are likely to sell well in the future, which sales representatives are likely to perform best, and which regions are likely to generate the most revenue. This can help organizations to focus their resources on the areas that are most likely to generate revenue and improve the efficiency of their sales team.

Another approach to optimizing the efficiency of a sales team is through the use of data visualization tools. By creating interactive dashboards and visualizations, organizations can provide sales teams with real-time insights into their performance and help them identify areas for improvement. This can help sales teams to make data-driven decisions and improve their efficiency.

At last To optimize the sales team's efficiencies at a pharma manufacturing giant, several strategies can be implemented using the available pharmaceutical sales data. Here are a few suggestions:

1. Sales Performance Analysis: By analyzing sales data, sales managers can identify top-performing sales representatives and territories, as well as those that are

underperforming. This information can be used to reward top-performing sales representatives and optimize territories for underperforming sales representatives.

2. Customer Segmentation: Using sales data, the company can segment customers based on their prescription history, demographic data, and other factors. This can help sales representatives focus on the highest-value customers and provide them with personalized offers and services.

3. Sales Forecasting: By analyzing historical sales data, the company can develop accurate sales forecasts for different regions and product lines. This information can be used to optimize inventory management and production planning.

4. Sales Territory Optimization: Using sales data, the company can optimize sales territories based on the size of the customer base, the potential for growth, and the number of sales representatives available. This can help maximize sales while minimizing travel time and expenses.

5. Performance Monitoring: Sales data can be used to monitor the performance of individual sales representatives and the team as a whole. This can help managers identify areas where additional training or support is needed and adjust strategies accordingly.

6. Customer Relationship Management: Sales data can be used to track customer interactions and preferences, allowing sales representatives to provide better service and support. This can improve customer satisfaction and loyalty.

Overall, by utilizing the available sales data, the pharma manufacturing giant can optimize sales team efficiencies and drive growth in their business. The Kaggle dataset provided can be used to perform the analysis needed to implement the above strategies, as well as other insights into the pharmaceutical sales landscape.

In summary, the use of data analytics and machine learning can help pharma manufacturing giants to optimize the efficiency of their sales teams. By analyzing historical sales data and developing predictive models, organizations can identify areas for improvement and focus their resources on the areas that are most likely to generate revenue. By providing sales teams with real-time insights through data visualization tools, organizations can help them make data-driven decisions and improve their efficiency.

# **Velagapudi Ramakrishna Siddhartha Engineering College**

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## **BUSINESS INTELLIGENCE HOME ASSIGNMENT - 4**

**Code : 20IT7403 A**

**Batch Members :**

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**Submitted To :**

**Dr . G . Jaya Lakshmi**

**Department Of IT**

## **Problem Statement:**

9. Create a dashboard to strategic dashboard that collects and monitors the overall financial health of an organization.

## **Solution:**

**Ans:** The financial KPI dashboard collects the key performance indicators which are significant for business analysis and decision-making, including working capital, current ratio, quick ratio, cash flow ratio, current assets and liabilities, profit margin, liquidity ratio, budgets and payment errors and so on. Working capital is a measure of a company's liquidity, operational efficiency, and its short-term financial health. The current ratio measures a company's ability to pay short-term obligations or those due within one year. And the quick ratio measures a company's ability to meet its short-term obligations with its most liquid assets. The cash flow ratio shows how readily current liabilities are covered by the cash flows generated from a company's operations. It can help gauge a company's liquidity in the short term. Next, current assets and current liabilities are calculated with corresponding numbers. If a company's current assets are hard to exceed its current liabilities, then it may have trouble growing or paying back creditors. Liquidity ratio analysis, presented with a line chart, is a financial ratio that indicates whether a company's current assets will be sufficient to meet the company's obligations when they become due. Comparing current ratio, quick ratio, and cash flow ratio, companies could judge the current operation situation and whether to take actions to adapt to business strategies. Budget variance is a periodic measure to quantify the difference between budgeted and actual figures. It occurs to help forecasters predict future costs and revenue with complete accuracy. Profit margin is one of the most important indicators of a company's financial health. By tracking increases and decreases in its profit margin, a company can assess whether current practices are working and forecast profits based on revenues. Last, Vendor payment error rate measures the diligence of the accounts payable department in issuing and paying vendor invoices.

To create a strategic dashboard that collects and monitors the overall financial health of an organization, here are the steps you can follow:

1. Determine the key financial metrics: Identify the key financial metrics that are relevant to your organization, such as revenue, profit margin, expenses, cash flow, and return on investment (ROI).

2. Choose a data visualization tool: Select a data visualization tool that can help you create an interactive dashboard that displays the metrics you have identified. Examples of popular data visualization tools include Tableau, Power BI, and Google Data Studio.

3. Collect and organize data: Collect and organize data from your organization's financial systems, such as accounting software, ERP systems, and financial statements. Make sure to organize the data in a way that is easy to analyze and interpret.

4. Create visualizations: Use the data visualization tool to create visualizations that display the key financial metrics in an easy-to-understand format. You can create bar charts, line charts, pie charts, and other visualizations that display the data in a way that is visually appealing and informative.

5. Add interactivity: Make the dashboard interactive by adding filters, drop-down menus, and other features that allow users to explore the data in different ways. This will allow users to drill down into the data and identify trends and patterns that can inform decision-making.

6. Share the dashboard: Share the dashboard with key stakeholders in the organization, such as senior management, investors, and board members. Make sure to provide context for the data and highlight key insights that can inform decision-making.

7. Monitor and update the dashboard: Regularly monitor and update the dashboard to ensure that the data is accurate and up-to-date. This will ensure that the organization is able to make informed decisions based on the latest financial information.

By following these steps, you can create a strategic dashboard that collects and monitors the overall financial health of an organization, providing key insights that can inform decision-making and drive growth.



## Financial KPI Dashboard

### Working Capital



### Current Ratio



### Quick Ratio



### Cash Flow Ratio



Cash	102,000
Accounts Receivable	74,000
Inventory	21,000
Pre-paid Expenses	19,000
<b>Current Assets</b>	<b>216,000</b>
Accounts Payable	82,000
Credit Card Debit	11,000
Bank Operating Credit	37,000
Accrued Expenses	6,000
Taxes Payable	2,000
<b>Current Liabilities</b>	<b>138,000</b>

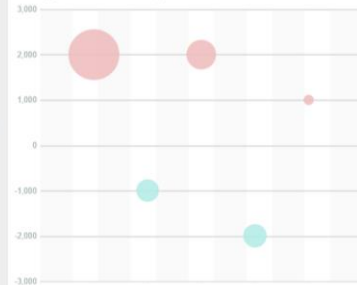
### Liquidity Ratio Analysis



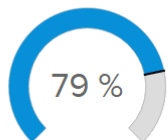
### Profit Margin Analysis



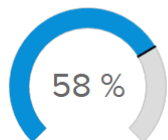
### Budget Variance Analysis



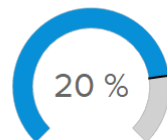
### Vendor Payment Error Rate



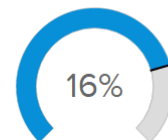
GROSS PROFIT MARGIN



OPEX RATIO



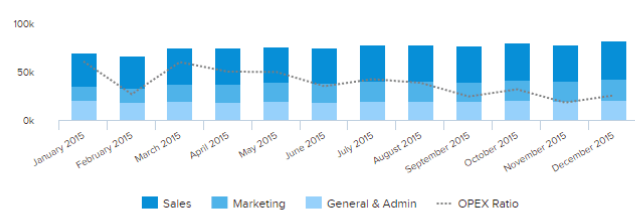
OPERATING PROFIT MARGIN



NET PROFIT MARGIN

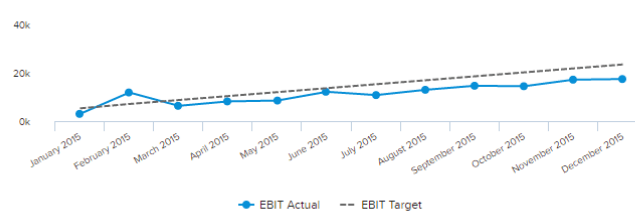
### OPEX

Month-to-Month | YTD



### Earning before Interest and Taxes

Month-to-Month | YTD



### INCOME STATEMENT

Revenue	567,304	\$
COGS	119,129	\$
<b>GROSS PROFIT</b>	<b>448,170</b>	<b>\$</b>
<b>OPEX</b>	<b>326,519</b>	<b>\$</b>
Sales	193,760	\$
Marketing	66,382	\$
General & Admin	66,358	\$
Other Income	1,448	\$
Other Expenses	6,823	\$
<b>OPERATING PROFIT (EBIT)</b>	<b>116,257</b>	<b>\$</b>
Interest and Tax	25,015	\$
<b>NET PROFIT</b>	<b>91,264</b>	<b>\$</b>

## CFO COCKPIT | YTD (March 2020)

### Key Metrics

#### REVENUE

\$10,078,844 (+2%)

Target: \$9,900,000



#### GROSS PROFIT

\$6,518,508 (+2%)

Target: \$6,400,000



#### EBIT

\$3,585,266 (+4%)

Target: \$3,450,000



#### EBIT %

35.6% (+0.7)

Target: 35%



#### OPERATING EXPENSES

\$2,933,242 (+3%)

Target: \$2,850,000



#### NET INCOME

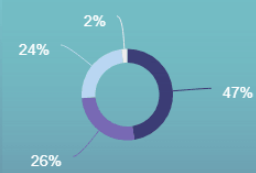
\$2,688,950 (+5%)

Target: \$2,553,684



### Breakdowns

#### Costs



#### Revenue



Your added metrics

+ ADD A CHART

#### EVA

Economic Value Add

\$3,105,266

#### BERRY RATIO

2.2

#### PAYROLL HEADCOUNT RATIO

0.02

### EMPLOYEE SATISFACTION (NPS)

3-MONTHS TREND



NEGATIVE



### CUSTOMER SATISFACTION (NPS)

3-MONTHS TREND



POSITIVE

