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# School of InfoComm Technology

**Intelligent Enterprise Systems**

Year 2 (2023/24), Semester 3

**ASSIGNMENT 2**

**(Individual Assignment)**

**Submission Deadline:**

**18th August 2023 2359hrs**

|  |  |  |
| --- | --- | --- |
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**Penalty for late submission:**

10% of the marks will be deducted every calendar day after the deadline.

**NO** submission will be accepted after 25th Aug 2023, 2359 hrs

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# E-learning

**A screenshot of a computer

Description automatically generated**

# SAP Cloud Analytics

## Dashboard 1

A close-up of a chart

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This dashboard shows an analysis of different visuals that provide overview of the company’s sales from different aspects. This sales dashboard serves as a central hub of information for a wide range of stakeholders, enabling them to make informed decisions, collaborate effectively, and contribute to the organization's sales-related activities and strategies. This dashboard are for stakeholders like Sales Managers and directors, marketing, business development, customer support and services teams to monitor sales metrics, track progress toward goals, and identify areas that require attention or improvement, analyze the effectiveness of marketing campaigns, identify lead sources, and understand which leads are converting into sales, identify potential new markets, analyze customer segments, and make decisions about expanding the business, gain insights into customers' purchasing behavior, which can help them provide better support and tailor their services to customer needs.

### Visual 1

A blue circle with numbers and text

Description automatically generated

This visual shows the sales per market. From this visual, it shows that the sales in EME(Europe and Middle East) have the most sales and Africa have the least sales. With this information, we can identify how well each market is doing and identify and review sales strategies that were successfully operated in the NAR (North America), LATAM (Latin America) and EME markets, and see how we can implement then in the markets with the other markets to increase sales.

### Visual 2

A graph of sales per category

Description automatically generated

This visual shows the sales for each product category. This visual shows that cameras have the highest sales followed by TV’s and Audio & HiFi which have the lowest sales. This shows that we should focus more on trying to increase the sales of Audio & HiFi products to increase overall company sales.

### Visual 3

A graph with numbers and a line

Description automatically generated

This visual shows the customer count and sales per order date, this visual shows a corresponding relationship between the customer count and sales. From this visual, Q1 has the lowest sales and customer count and Q4 have the highest sales and customer count, this visual also shows an upward trend in sales and customer count which shows that 2020’s marketing and sales strategies were effective.

### Visual 4

A screenshot of a report

Description automatically generated

This visuals shows the average quantity and sales amount of each the top and bottom 5 discount percentage’s by sales amount. With this information, we can see which percentage of discounts bring in the most sales and quantity. With this we can come up with sales campaigns with this percentages to increase sales and stop using the bottom 5 percentages.

### Visual 5

A blue circle with white text

Description automatically generated

This visual the sales be each segment, this visual shows that the majority of sales come from consumer sales which shows the business importance on focusing on the needs of our consumer’s to provide for them and thus increasing profit and sales.

### Visual 6

A graph with blue and black lines

Description automatically generated

This visual shows the profits and sales per market, from this visual we can see that the sales and profits per market showing a consistent relationship, when sales are high profits are high. With this visual we can compare each markets sales and profits with other markets allowing us to have a bigger picture of sales for the different markets.

### Visual 7

A map of the world with blue dots

Description automatically generated

This visual shows a map of location by sales, the colours in the map denote the market each location belongs to and the size of the bubble shows the amount of sales. With this visual we can have a visual representation of sales by market and location allowing us to have a geographical feel of the locations where sales are popular, with this information, we can identify where in the world our products are more popular and where our products are less popular, and come up with campaigns to target the markets with lower sales.

## Dashboard 2

A close-up of a graph

Description automatically generated

This dashboard shows an analysis on different visuals to give an overview of the companies’ profits. This profits dashboard serves as a vital tool for a wide spectrum of stakeholders, enabling them to make informed decisions, monitor financial performance, and contribute to the organization's profitability objectives. This dashboard is for these stakeholders, the Finance Team, sales managers, Executives and Leadership roles, and investors and shareholders to track overall profitability, monitor profit margins, analyse cost structures, and assess the impact of sales and expenses on the organization's bottom line, understand how sales performance translates into profits and to align their sales strategies with profitability goals, gain a high-level overview of the organization's financial health, identify trends in profitability, and make strategic decisions to optimize profits, and to assess the company's financial performance and evaluate the return on their investment.

### Visual 1

A graph of a graph with numbers and a bar

Description automatically generated with medium confidence

This visual shows the profit per market, the visual shows that EME has the highest profits and Africa has the lowest. This visual shows us how profitable a market is, with this information, when considering further expansion we can look towards expanding in the more profitable markets like EME, LATAM, and NAR.

### Visual 2

A graph with numbers and lines

Description automatically generated

This visual shows the profit per category and order date. With this trend line shown, we can see the quarterly profits of each product for 2019 and 2020. This trend line shows that audio & HiFi are the least profitable product category, and this visual shows increase in profits in the year 2020 compared to 2019.

### Visual 3

A graph of sales and sales

Description automatically generated

This visual shows the profit and sales by region. This visual shows that the Central region has the most sales and profits, this visual also shows that the sales expenses are very high from the wide gap between the sales amount and profits. This shows that we should find ways to reduce cost to increase profits and to capitalise on the sales in the regions with higher sales to learn more about the demographic to cater to their needs to enticing them to purchase our products.

### Visual 4

A graph of sales and sales

Description automatically generated

This visual shows the profit and sales by sub-category, this visual shows that speakers have the highest sales and TVs have the highest profits. With this visual, we can Identify our top selling products and which products are the most profitable with this information, we should seek to increase the sales of such products to drive sales.

### Visual 5

A screenshot of a computer screen

Description automatically generated

This visual shows the top 5 sales states and their respective profits. With this information, we can identify which states have the higher sales and do research on our customer demographic from this state, using this we can identify other states with similar demographics and target our sales ideas towards these states to increase sales.

### Visual 6

A graph of a company

Description automatically generated

This visual shows the top 10 customers by segment, this visual shows that the majority of these customers are consumers showed by the light blue bars. With this information, we must seek to meet the expectations and needs of these customers to retain these valuable customers and their sales.

### Visual 7

A screenshot of a data

Description automatically generated

The visual shows the top 5 customers by profit for the 2 segments. From this visual, we can identify the top 5 customers from both segments and using this information we should seek to strengthen our relationship with them to ensure the continuity of our relationship with them.

### Visual 8

A graph of a company

Description automatically generated with medium confidence

This visual shows the top 10 products by product name, this visual shows that are most profitable product is a product that is used for coparate needs and the rest come from consumers, with this information, we should seek to ensuring the quality and availability of our top selling products to maintain sales as well as come up with promotions to encourage bulk purchases of these products to reduce cost and increase profits.

### Visual 9

A screenshot of a website

Description automatically generated

This visual shows the top 10 products by sales, quantity and profits, with these visuals side by side we can compare the products and have a deeper understanding of our top products in each products to find connections and insights to increase sales, like out top selling product by profits are not in the top 10 products by sales amount and quantity, hence to increase its profitable we should seek ways to increase this product’s sales amount and quantity by analysing our current top 10 products for these categories to identify possible reasons for their popularity and come up with ways to replicate it on our top profiting products.

## Dashboard 3

A graph of a graph

Description automatically generated with medium confidence

This dashboard shows an analysis of different visuals that highlight trends over the quarters for the last years 2019 and 2020. A trend dashboard is a valuable tool for a wide range of stakeholders who seek insights into historical patterns and changes. By tracking trends over time, stakeholders can make informed decisions, optimize strategies, and contribute to the organization's overall success. For stakeholders like the marketing team, sales representatives, business analysts, executive and leadership roles to analyse the effectiveness of marketing campaigns over time, track customer engagement, and identify emerging market trends, monitor the historical performance of leads and deals, helping them predict future sales trends and adjust their strategies accordingly, perform in-depth trend analysis, identify anomalies, and provide insights into potential areas of growth or concern, and identify long-term patterns in various aspects of the business, such as sales, expenses, and customer behaviours, to guide strategic planning.

### Visual 1

A graph with numbers and a green arrow

Description automatically generated

This visual shows the sales trend over the past 2 years. This visual shows an upward sales trend, with the first quarters having the lowest sales and the last quarters having the highest. With this information, we can see that sales are increasing which shows that 2020 sales strategies were effective and we should continue implementing them to increase our sales.

### Visual 2

A graph with numbers and a line

Description automatically generated

This visual shows the customer count per order date, from this visual it shows the quarterly customer count follows a similar trend to our sales trend creating a relationship between the number of customer and sales, hence we should seek to increase our customer base through targeted campaigns and sales strategies to increase sales.

### Visual 3

A graph with numbers and a line

Description automatically generated

This visual shows the profit per order date. This visual shows that compared to 2019 the profits in 202 have made a big increase and show a upward trend as seen from the visible increase in area size compared to 2019 where the area size is much flatter. With this information we should find out what was done differently in 2019 compared to 2020 to try and see how we can continue seeing such increase in profits for the future.

### Visual 4

A graph of sales and numbers

Description automatically generated with medium confidence

This visual shows the profit, sales and quantity by date. This visual shows a consistent trend for both years where quarter 1 is low and the profits, sales and quantity continue to increase each quarter until quarter 4 which is the peak. With this information, we can predict next year’s sales trend and make preparation for the coming quarters.

## Dashboard 4

A screenshot of a computer

Description automatically generated

This dashboard shows an analysis of different visuals on costs. With this information, we can do a cost analysis to find ways to decrease our costs to increase profits. a cost dashboard caters to a wide range of stakeholders who are invested in monitoring, analysing, and optimizing costs across various aspects of the organization's operations. This dashboard is for the finance , operations and supply chain teams and executives and leadership roles to monitor and analyze various cost components such as operating expenses, production costs, and overhead expenses, optimize procurement, inventory management, and production processes to control and reduce costs make decisions related to cost reduction strategies, resource allocation, and budget planning.

### Visual 1

A graph of blue bars

Description automatically generated with medium confidence

This visual shows the costs of each cost type. Using this visual we can identify which cost type is the costliest. this visual shows that selling costs is the costliest and shipping costs are the least costliest. With this information, we should drill into ways to decrease selling costs to increase profits.

### Visual 2

A screenshot of a graph

Description automatically generated

This visual shows the percentage breakdown of each cost from the total cost per category. From this

It shows that the cost breakdown for each category are similar to one another with selling cost having the highest percentage. With this information, we can find ways to decrease selling and storage costs through sales campaigns that encourage bulk purchases and consistent orders for corporation which will help decrease selling and storage costs.

### Visual 3

A graph with numbers and lines

Description automatically generated

This visual shows a line graph 1 of the total cost and profit for each quarter over the years. With this visual, it shows that quarter have the lowest sales and Q4 have the highest profits this visual also shows the that the Q4 sales for 2020 is exponentially higher than 2019.

### Visual 4

A white background with black and blue text

Description automatically generated

This visual total cost per order date this visual shows that cost trends and the average line, from this visual, we can see an overall. Irregular day to day trend of costs???

## Smart Insights

A close-up of a graph

Description automatically generated

I have performed the smart insights features on these visuals about sales quantities. To make use of SAP analytic cloud and its features to gain insights and analysis. a quantity dashboard serves the needs of a wide range of stakeholders involved in inventory management, production, distribution, and customer service, ensuring that the right quantities of products or materials are available at the right times to support the organization's operations and goals. This dashboard is for inventory managers, supply chain and procurement team and sales representatives to monitor stock levels, track inventory turnover, and ensure that sufficient quantities of products are available to meet customer demand, forecast demand, plan procurement activities, and maintain optimal stock levels and ensure that products are available for sale and to manage customer expectations regarding product availability.

### Visual 1

A graph of a number of people

Description automatically generated with medium confidenceA graph of a number of countries/regions

Description automatically generatedA screenshot of a graph

Description automatically generatedA graph of a number of cities

Description automatically generatedA blue circle with text

Description automatically generated

A screenshot of a graph

Description automatically generatedA graph of a bar

Description automatically generated with medium confidenceThis visual, shows a pie chart denoting the breakdown of sales quantity by each category, with the use of smart insights, it tells me that the camera has the highest quantity. The total so far for Q4 2020 is 6,938, The total for Q3 2020 was 5,386, an increase of 24% (1,054) compared to Q2 2020 (4,332). Using smart insights, it shows me visuals on quantity per ship date showing an increase in 2020 quantity compared to 2019. It also shows visuals highlighting the top camera contributors, by city, location, state, country, and ISO3. With this information, I can create a targeted sales campaign for the top contributors to further increase the sales of cameras.

### Visual 2

A graph with numbers and a blue bar

Description automatically generatedA graph of a number of countries/regions

Description automatically generated with medium confidenceA graph of a number of countries/regions

Description automatically generatedA graph of the number of countries/regions

Description automatically generatedA screenshot of a graph

Description automatically generatedA blue circle with text

Description automatically generatedA graph of a number of cities

Description automatically generated

This visual, shows a pie chart of sales quantity per segment. Using smart insights, it tells me that consumer has the highest quantity. The total so far for Dec 2020 is 3,800. The total for Nov 2020 was 3525, an increase of 20% (584) compared to oct 2020 (2,941). It shows me visual of the quantity per ship date to back up its analysis. It also shows visuals that highlighting the top contributors by city, location, state, country and ISO3. With this information, I can create targeted sales campaigns for my top contributors and launch them during low quarters like quarter one to increase sales and profits.

### Visual 3

A graph of numbers and a number of objects

Description automatically generatedA graph of blue bars

Description automatically generated with medium confidenceA screenshot of a calculator

Description automatically generated

This visual, shows a bar chart of average quantity per segment. Using smart insights, Q4 2020 has the highest Average Quantity. Average Quantity is a calculation. It also shows me an overview of quantity per Primary ID and its distribution. With this information, I can create predict the average sales quantity for the future to help manage costs to increase sales and profits.

### A graph with numbers and lines Description automatically generatedA screenshot of a phone Description automatically generatedVisual 4

This visual, shows a line chart or average quantity per discount. Using smart insights, it tells me that the discounted percentage of 0.55 has the highest Average Quantity, showing a 29% deviation from the average. The total so far for Mon, Aug 17 is 5.00. The total for Sun, Apr 19 was 3.00, a decrease of 50% (3.00) compared to Thu, Jan 10 (6.00). It shows me visual of the quantity per ship date to back up its analysis. It also shows an overview of quantity per primary ID and the distribution of quantity per primary ID. With this information, I can create discounts with the more popular discount percentage by average quantity to entice customers to increase sales and profits.

### Visual 5

A graph with blue and purple bars

Description automatically generatedA screenshot of a computer screen

Description automatically generatedA screenshot of a graph

Description automatically generatedA screenshot of a graph

Description automatically generatedA graph of a number of states

Description automatically generated

A graph of a number of people

Description automatically generatedA graph of a bar

Description automatically generatedThis visual, shows a bar chart or average quantity per discount. Using smart insights, it tells me that TV+TVs have the highest Sales. The total so far for Q4 2020 is 978,896.00. The total for Q3 2020 was 630,272.00, an increase of 20% (105,552.00) compared to Q2 2020 (524,720.00). It also shows me visuals that highlighting the top contributors by city, location, state, country and ISO3. With this information, I can identify which areas to promotions towards to increase profits and sales.

## Smart Discovery

Using the smart discovery function with target variable being selling cost and my entity as product name. to investigate selling costs and its influence of products to identify ways to increase profits since selling cost is my highest cost factor. This discovery are for stakeholders such as product managers, operations and production, supply chain and procurement, marketing and sales forecasting teams to analyse the selling costs of different products, assess profitability, and make informed decisions about pricing, features, and product lifecycles, understand how product selling costs impact pricing strategies, promotional efforts, and sales projections. They also assess the cost-effectiveness of marketing campaigns.

A screenshot of a computer

Description automatically generated

A screenshot of a computer

Description automatically generated

This dashboard shows gives a overview on selling costs and products. Showing visuals like numeric points to highlight values, a histogram to show the product names by selling cost, a line chart showing the selling cost over time and providing predictions as well as a bar chart showing selling costs by product name and the key influencers of selling costs for product name. with this information I can have a general overview of selling costs and its relationship with products, shipping cost and profits.

A graph of a bar graph

Description automatically generated with medium confidence

These next visuals, shows the average selling costs for product name by shipping costs bin and the distribution of product name by shipping costs bin.

A graph on a white background

Description automatically generated

These next visuals, shows the average selling costs for product name by profit bin and the distribution of product name by profit bin

A graph of a bar graph

Description automatically generated with medium confidence

These next visuals, shows the average selling costs for product name by quantity bin and the distribution of product name by quantity bin

A screenshot of a computer

Description automatically generated

These next visuals, shows a heat map showing how the average selling costs for product name is affected by shipping cost bin and quantity bin and the distribution of product name by shipping costs bin and quantity bin.

A blue and white image of a screen

Description automatically generated with medium confidence

These next visuals, shows a heat map showing how the average selling costs for product name is affected by profit bin and quantity bin and the distribution of product name by profit bin and quantity bin.

A group of black and white text

Description automatically generated

This visual shows a table highlighting unexpected values in selling costs for product name, this visual shows outliers.

A graph of a person

Description automatically generated with medium confidence

These visuals show the association between the actual and expected selling costs for product name. these visual shows that the expected selling cost lower than the actual selling costs for all products.

A white background with black text

Description automatically generated

This visual shows a numeric point of the expected selling cost for product name.

## Reflection

From this assignment 2, I have learnt how to use SAP Analytics Cloud to make useful visuals for business stakeholders to identify pattern and trends to make informed decisions and propositions to improve business.

During this assignment, one initial hurdle I faced was a lack of effective space planning when embarking on the creation of my visuals. In my eagerness to explore and learn the capabilities of SAP Analytics Cloud, I generated a surplus of visuals, resulting in a cluttered and disorganized narrative. Consequently, I had to meticulously assess each visual, categorizing them according to their relevance and the specific dashboard they should belong to. This experience taught me the importance of structured planning and organization to maintain clarity and coherence in presenting data-driven insights.

Another notable challenge I encountered was achieving functionality with smart insights and discoveries. After persistent experimentation and trial and error, I managed to resolve the problem. I identified the factor contributing to this issue: my initial choice of the optimized view for creating visuals did not support the advanced features, such as smart insights and discoveries, which are available in the classic view. Unfortunately, transitioning between these two modes within a single story was not an option, so I had to rework all my visuals and dashboards into a new story.

Throughout this process, I cultivated a newfound proficiency in leveraging SAP Analytics Cloud to craft impactful dashboards and visuals. Additionally, the assignment compelled me to critically assess a plethora of visualizations and discern their relevance to distinct business stakeholders allowing me to have an understanding of the whole business flow and how each component fits with one another. This analytical skill will undoubtedly prove invaluable in my future role as a data scientist, enabling me to comprehend the holistic business ecosystem and the interconnectedness of its components.

The analytical skill gained through this assignment will play a pivotal role in my future endeavors as a data scientist and especially so for my upcoming internship. It equips me to not only analyze individual data points but also to discern broader patterns, trends, and relationships within the business ecosystem. This holistic understanding will empower me to provide data-driven recommendations that align with the organization's overarching goals, fostering effective strategic decision-making.

the analytical skill I have developed through this assignment serves as a foundational tool that empowers me to excel as a data scientist. It equips you with the ability to unravel the complexities of the business world, make informed predictions, collaborate effectively, and provide value-driven insights that guide strategic decision-making.

In conclusion, Assignment 2 has equipped me with practical knowledge and skills in employing SAP Analytics Cloud for the creation of insightful visualizations, fostering within me a deeper understanding of how data-driven insights can drive informed decision-making and propel business growth. The challenges I encountered further underscored the importance of strategic planning, adaptability, and thoughtful consideration of stakeholders' needs when designing data visualizations. This experience will undoubtedly contribute to my growth as a data professional, enhancing my ability to contribute meaningfully to organizations and their strategic endeavours.

Through this assignment I had to pick up a new data analytics tool SAP Analytics Cloud which I will now compare to the other data analytics tools I have learned.

|  |  |  |
| --- | --- | --- |
| Analytic tool | Pros | Cons |
| SAP Analytics Cloud | * Smart insights * Smart discoveries * Location analysis for maps * Dashboard themes provided. * Easier to learn. * Many options to add trend lines and tooltips | * Laggy and takes a long time to load * Have to exit story to edit the dataset * No option to have average or count. |
| Power BI | * Easy to learn * Able to edit the dataset and visuals on the same display * Many available themes and colours * Can easily sum, average and get the count of measures. | * Hard to add trend lines |
| Tableau | * Easy to learn * Easy dashboard creation * Provides a description on the visuals | * Cost money |
| Excel | * Can make pivot tables * Easy to make new measures | * Editing of visuals can be hard at first |
| Jupyter Notebook | * Easy to transform data | * Requires knowledge of Python * Takes a lot of effort to make visuals aesthetic * All visuals are created on one page |

Throughout this module, I have learned how to use SAP S/4 HANA, Lucidchart, and SAP Analytics Cloud to which has enabled me to learn about the use of intelligent enterprise systems which has become a necessity in multi-national companies as well as small and medium enterprises. and appreciate the complexity of business processes, how IT can help organizations to be more competitive, and gain basic management skills that are required to manage business processes in an organization. For example, learning about the material management and procurement process on SAP S/4 HANA, documenting business flow with Lucidchart and performing business analysis with SAP Analytics Cloud. In this module, I was given the opportunity to visit the SAP cloud office and attend a special talk by SAP Guest Speaker – Dr. Michael Nuernberg, Vice President of Global Director, SAP University Alliances. From these experiences I was able to learn more about SAP beyond SAP S/4 HANA and SAP Analytics Cloud, at the office I was able to see the real-life application of their services, one particular product that wowed me was the stadium analysis, I thought it was so interesting how all the real-time statistics were being collected to present an accurate dashboard on things like parking spaces, how full the stadium was and so on. And the talk about SAP allowed me to learn more about the company and where it originated.

Throughout this module, I've ventured into the realm of transformative technologies, gaining proficiency in SAP S/4 HANA, Lucidchart, and SAP Analytics Cloud. These tools have illuminated the landscape of intelligent enterprise systems, which hold sway not only in multinational corporations but also in the operations of smaller businesses.

In summation, this module has not only equipped me with technical proficiencies but has also deepened my comprehension of the intricate fusion between technology and effective management. Armed with these insights, I'm poised to make meaningful contributions to the dynamic realm of technology-driven business transformation in my future endavours.