Project Design Phase-I

Proposed Solution

Date	26 September 2023
Project Name	**PRODUCT SALES ANALYSIS**

Proposed Solution Template:

Project team shall fill the following information in proposed solution template.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	• To help businesses improve inventory management and marketing strategies by understanding sales trends and customer behavior.
2.	Idea / Solution description	• To Create an Interactive Dashboard, responsive design for identifying top-selling products, analyzing sales trends and understanding customer preferences.
3.	Novelty / Uniqueness	• Analysis of data from product sales data datasets and explore the transaction records, product information and customer demographics.

4.	Social Impact / Customer Satisfaction	• Data analytics helps the industryto understand customers' preferences and other maintenance issues. • For instance, analysis of product sales helps the business to target the customers with personalized offers while optimizing the price in real-time using predictive analysis techniques. As a result, by gathering meaningful data, products can fetch more sales in the given timeframe.
5.	Business Model (Revenue Model)	• Creating a website and affiliate marketing features for improving the sales.
6.	Scalability of the Solution	• Size and number of the data on the datasets can be large and sometimes very hard to visualize.

Project Design Phase-I

Solution Architecture

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Solution Architecture:

Solution architecture is a complex process – with many sub-processes – that bridges the gap between business problems and technology solutions.

Its goals are to:

- Find the best tech solution to solve existing business problems.

- Describe the structure, characteristics, behavior, and other aspects of the software to project stakeholders.

- Define features, development phases, and solution requirements.

- Provide specifications according to which the solution is defined, managed, and delivered.
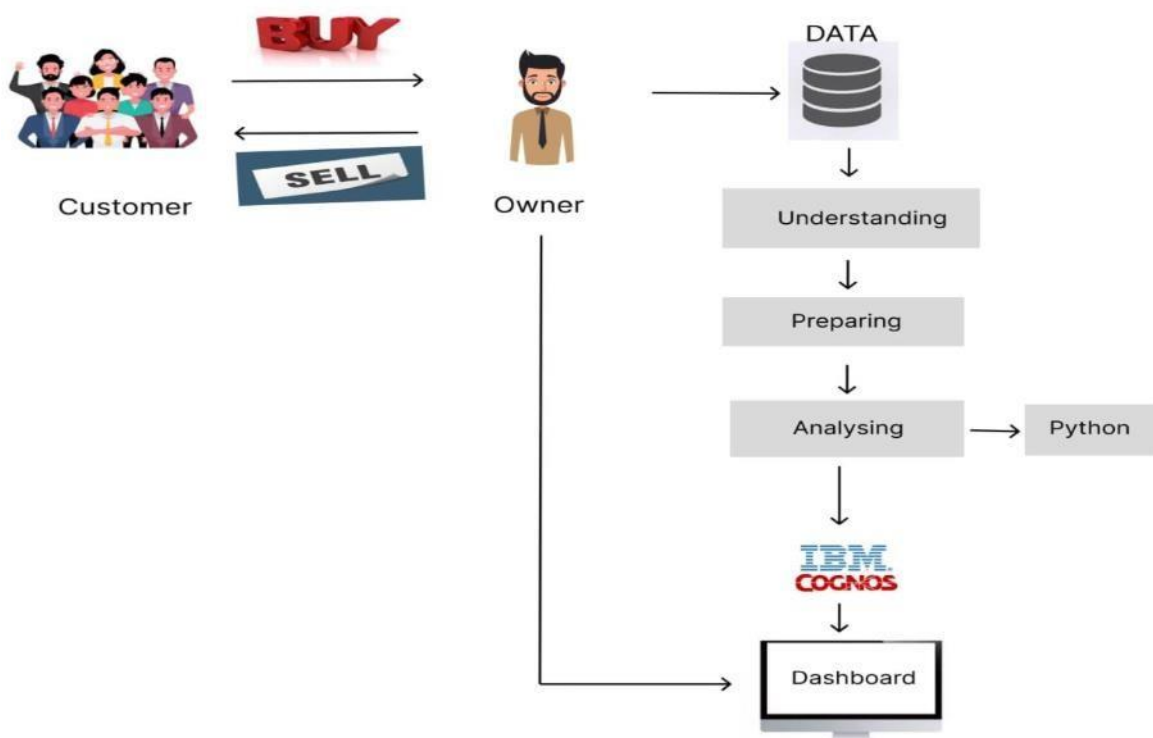
Solution Architecture Diagram:

Figure 1: Architecture and data flow of the product sales analytics

BRAINSTORM AND IDEATION

Jeeva

Perform joint data	Latitude deg	Waterfall chart
Understand-ing of dataset	Load the dataset	Data visulization
Pie Chart Visualisation	IBM Cloud	Multiple analytical grapic

Viswa

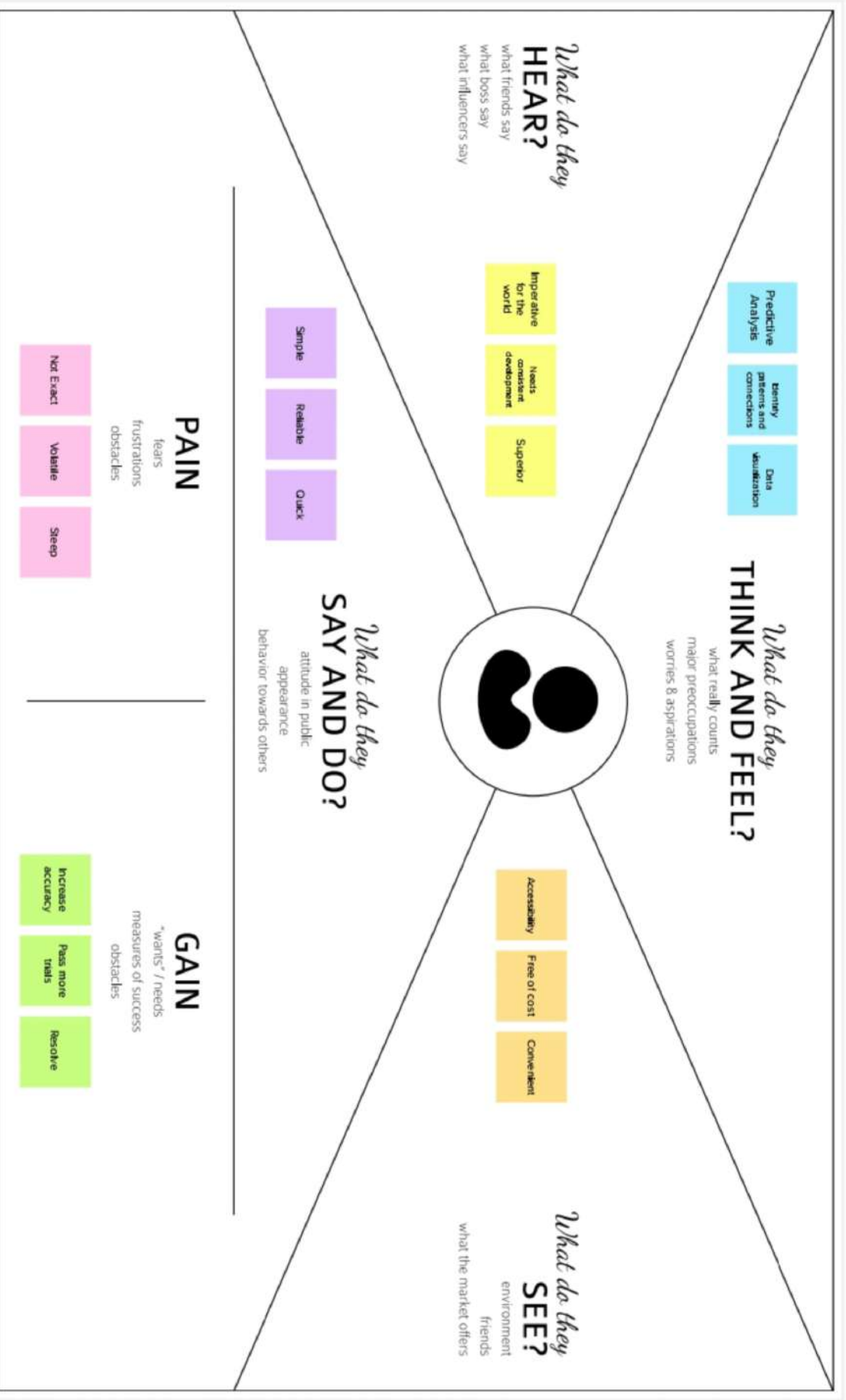|		
Product sales	coloum chart	Exploration of data
Understand Data	Data preparation	Calculated feld
Dataset	IBMcognos	Data stored in spreadsheet

Hariharan

Fundamental concepts of IBM cognos	Create meaningfull dashboard	Thirdparty view
Create meaningfull irtuialization	Planning phase	Promise the passanger from point to point on time
Development	Provide sales report	Costomer relationship manage

Empathy Map Canvas

Gain insight and understanding on solving customer problems.

Build empathy and keep your focus on the user by putting yourself in their shoes.

What do they
HEAR?

what friends say
what boss say
what influencers say

| Predictive Analysis | Identify patterns and connections | Data visualization |

What do they
THINK AND FEEL?

what really counts
major preoccupations
worries & aspirations

| Imperative for the world | Needs consistent development | Superior |

| Simple | Reliable | Quick |

What do they
SAY AND DO?

attitude in public
appearance
behavior towards others

PAIN

fears
frustrations
obstacles

| Not Exact | Volatile | Sleep |

GAIN

"wants" / needs
measures of success
obstacles

| Increase accuracy | Pass more trials | Resolve |

| Accessibility | Free of cost | Convenient |

What do they
SEE?

environment
friends
what the market offers

Share your feedback

Literature survey

Title & Author(s)	Year	Technique	Findings
Big Data Analytics and Deep Learning Based Sentiment Analysis System for Sales Prediction - Khatiwada, Aamod and Kadariya, Pradeep and Agrahari, Sandip and Dhakal, Rabin.	2019	Big data analytics (BDA) applications in e-commerce.	Structured data focuses on demographic data including name, age, gender, date of birth, address, and preferences, unstructured data includes clicks, likes, links, tweets, voices, etc. **Merits:** Used to understand complex datasets in a matter of time with beautiful visual representations **Demerits:** Lack of security since large data processed simultaneously.
COVID-19 pandemic in the new era of big data analytics: Methodological innovations and future research directions - Sheng, Jie and Amankwah-Amoah, Joseph and Khan, Zaheer and Wang, Xiaojun	2021	Descriptive and diagnostic analytics, Predictive analytics	The methodological innovations in studying big data analytics and. We provide insights on methods in descriptive/diagnostic, predictive and prescriptive analytics, and how they can be leveraged to study 'black swan' events such as the COVID-19-related global crisis. **Merits:** By comparing with machine learning models, we find that the proposed model is superiorto others. **Demerits:** The experiment only considers the features of the product and does not consider external influences, such as the impact of regulations on sales. It uses only small dataset.
Sales Forecasting Based on CatBoost - Jingyi Ding, Ziqing Chen.	2020	CatBoost algorithm.	It proposed a sales forecasting system based on CatBoosting. The

			algorithm is trained on the Walmart sales dataset, by far the largest dataset in this field. We performed effective feature engineering to boost prediction accuracy and speed. **Merits:** The search stops when no improvements over the current best solution have been found in 300 iterations. **Demerits:** Dataset is limited
2020 2nd International Conference on Broadband Communications, Wireless Sensors and Powering (BCWSP)-Wisesa, Oryza and Adriansyah, Andi and Khalaf, Osamah Ibrahim.	2020	Gradient Boost Algorithm	The results of this analysis are expected to generate reliable, accurate and effective forecasting data, a valuable resource for sales predictions. It shows good accuracy in forecasting. **Merits:** Better prediction.Profit function performance. **Demerits:** The revenue/loss factors of expected profit are is not used.
Developing and Implementing Big Data Analytics in Marketing - Dina Darwish	2020	Big data analytics, R tool.	Companies take informative business decisions in different fields, such as, healthcare, banking, manufacturing, media and entertainment, education and transportation and many others. **Merits:** The proposed method is based on similarity measurement without complextraining so that forecast can be completed in a short time, and performs well in small-scale data **Demerits:** The experiment only considers the features of the product and does not consider

			external influences, such as the impact of regulations on sales. It uses only small dataset.
Social media big data analytics for demand forecasting: development and case implementation of an innovative framework-Iftikhar, Rehan and Khan, Mohammad Saud	2020	Definitional aspects of big data analytics (BDA) in e-commerce	Social media big data offers insights that can be used to make predictions of products' future demand and add value to the supply chain performance. **Merits:** Captured linearity and nonlinearity better than ARIMA and ARNN gave the best result of 565 RMSE. **Demerits:** Hybrid Technique can fail if nonlinear model fails to capture residue patterns