

PROFESSIONAL TRAINING REPORT

AT

**SATHYABAMA INSTITUTE OF
SCIENCE AND TECHNOLOGY**

(DEEMED TO BE UNIVERSITY)

Submitted in partial fulfillment of the requirements for
the award of
Bachelor of Engineering degree Information Technology

by

DHANALAKSHMI.S
(40120026)



**DEPARTMENT OF INFORMATION TECHNOLOGY
SCHOOL OF COMPUTING**

SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY

(DEEMED TO BE UNIVERSITY)

Accredited with Grade “A” by NAAC

**JEPPIAAR NAGAR, RAJIV GANDHI SALAI,
CHENNAI - 600 119**

APRIL – 2023



SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY

(DEEMED TO BE UNIVERSITY)

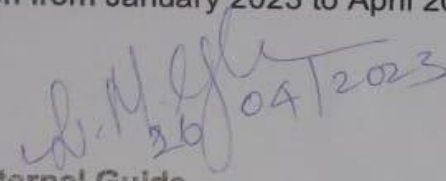
Accredited "A" Grade by NAAC | 12B Status by UGC | Approved by AICTE

www.sathyabama.ac.in

DEPARTMENT OF INFORMATION TECHNOLOGY

BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of **Dhanalakshmi.S** (Reg. No. 40120026) who carried out the project entitled "**PRODUCT SALES PREDICTION**" under my supervision from January 2023 to April 2023 .

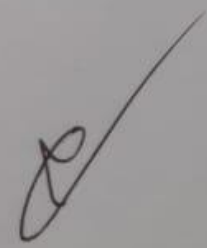

Internal Guide

Dr. Mary Gladence L. M.E., Ph.D.,


HEAD OF THE DEPARTMENT

Dr. R. Subhashini M.E., Ph.D.,

Submitted for Viva voce Examination held on 28.04.23


Internal Examiner


External Examiner

DECLARATION

I Dhanalakshmi.S hereby declare that the Project Report entitled "PRODUCT SALES PREDICTION" done by me under the guidance of Dr.Mary Gladence.L M.E.,Ph.D., at Sathyabama Institute of Science and Technology (Deemed to be University), Jeppiaar Nagar, Rajiv Gandhi Salai, Chennai - 600119 is submitted in partial fulfillment of the requirements for the award of Bachelor of Technology degree in Information Technology.

DATE: 28.4.23

PLACE: CHENNAI

SIGNATURE OF CANDIDATE:

S. 

ACKNOWLEDGEMENT

I am pleased to acknowledge our sincere thanks to Board of management of **SATHYABAMA** for their kind encouragement in doing this project and for completing it successfully. I am grateful to them.

I convey our thanks to **Dr. T. SASIKALA M.E., Ph.D., Dean, School of Computing** and **Dr. R. SUBHASHINI M.E., Ph.D., Head of the Department, Department of Information Technology** for providing us the necessary support and details at the right time during the progressive reviews.

I would like to express our sincere and deep sense of gratitude to our Project Dr.Mary Gladence.L M.E.,Ph.D., for her valuable guidance, suggestions and constant encouragement paved way for the successful completion of my project work.

CERTIFICATE:

No. : 34336



एन एस आई सी
N S I C

राष्ट्रीय लघु उद्योग निगम लिमिटेड
NATIONAL SMALL INDUSTRIES CORPORATION LIMITED
(A Govt. of India Enterprise)

NSIC - TECHNICAL SERVICES CENTRE
Sector B-24, Guindy Industrial Estate, Ekkaduthangal, Chennai - 600 032.

CERTIFICATE

This is to certify that Ms. **DHANALAKSHMI S.** D/o.
Shri. **SENTHIL**, student of III year B.Tech. (IT),
Sathyabama Institute of Science and Technology has
undergone "**SKILL DEVELOPMENT PROGRAM ON**
DATA ANALYTICS" conducted by us for a period of
one week(30 Hours) from 09.03.2023 to 14.03.2023.



[Signature]
HEAD OF TRAINING

[Signature]
HEAD OF CENTRE

ABSTRACT

In our country there are lots of electronic stores the managing sales of the shopping is very exigent works. The customer requirements will be changed every month, the manager or store owners are facing the problem for keeping stock for upcoming months. In this work we proposed data analytics-based approach for predicting the sales details based on the last 12 months data and it will generate report, in which moth maximum products are sales profit of the each and every month. This system performs various task like, finding best months for sales, calculate monthly earned money from different products, which area sold the maximum products, when will be the best time for advertisement to maximum customer to buy the products also generates report, which are items are frequently bought by the customer to keep stock for upcoming months and, increase the profit of the shopping mall business. These issues could be overcome by using various data mining techniques. In this paper, we briefly analyzed the concept of sales data and sales forecast. The various techniques and measures for sales predictions are described in the later part of the research work. On the basis of a performance evaluation, a best suited predictive model is suggested for the sales trend forecast. The results are summarized in terms of reliability and accuracy of efficient techniques taken for prediction and forecasting. We will also explore how such data can be used to obtain insights into consumer behavior, and the impact of such data on organizational forecasting. As needs are, a growing number of researchers revolve around how to use data mining to process recorded data and handle inclines in bargains desire.

TABLE OF CONTENTS

CHAPTER NO.	TITLE	PAGE NO.
	ABSTRACT	vi
	LIST OF FIGURES	viii
1.	INTRODUCTION	1
	1.1 FORECASTING	1
	1.2 SALES FORECASTING	2
	1.3 SALES PREDICTION	3
	1.4 DATA PROCESSING	4
	1.5 SPECIFICATION	5
2.	LITERATURE SURVEY	6
3.	METHODS AND ALGORITHM USED	10
	3.1 PROJECT DEVELOPMENT	10
	3.2 DATA ANALYTICS	11
	3.3 DESCRIPTION ANALYSIS	12
	3.4 SYSTEM REQUIREMENTS	15
	3.5 POWER BI	16
	3.6 METHODOLOGY	17

4.	RESULT AND DISCUSSION	26
5.	CONCLUSION AND FUTURE WORK	29
	REFERENCES	30
	APPENDICES	31

LIST OF FIGURES

FIGURE NO.	FIGURE NAME	PAGE NO.
3.1	PROJECT DEVELOPMENT	10
3.2	EXCEL DATA	19
3.3	EXCEL DATA	20
3.4	SALES BY MONTH	21
3.5	SALES BY STABILIZER AND MODEL	22
3.6	DAYWISE SALES BY STABILIZER	23
3.7	MODEL WISE VARIETY OF LITRE	24
3.8	LOCATION WISE SALES	25
3.9	PRODUCT SALES PREDICTION	26
3.10	PRODUCT SALES PREDICTION	27
3.11	PRODUCT SALES PREDICTION	28

CHAPTER – 1

INTRODUCTION

Sales forecasting is a crucial business exercise. Accurate sales forecasts allow business leaders to make smarter decisions about things like goal-setting, budgeting, hiring, and other things that affect cash flow. A sales forecast is a prediction of future sales revenue. Sales forecasts are usually based on historical data, industry trends, and the status of the current sales pipeline. Businesses use the sales forecast to estimate weekly, monthly, quarterly, and annual sales totals. Sales forecasting is also different from sales goal-setting. While a sales goal describes what you want to happen, a sales forecast estimates what will happen, regardless of your goal. Sales prediction is playing creating and noteworthy employment in various fields, for instance, money related envisioning, electric power deciding, resource conjecture, etc. Arrangements conjecture is a noteworthy basic for enormous business orchestrating and right powerful, allowing associations to all the more promptly structure their business works out. Sales prediction is critical for separated associations, especially vehicle arrangements, land, and other customary undertakings. The desires are generally done by applying verifiable systems, for instance, backslide or the autoregressive–moving-typical (ARMA) taking into account recorded arrangements data. Regardless, these procedures simply work for explicit data. Such enormous quantities of components with complex interrelationships sway bargains and in all likelihood consolidate ones with a sensible degree of defencelessness. Using data mining, we can perceive potential models and headway consistency from most of the data. As needs are, a growing number of researchers revolve around how to use data mining to process recorded data and handle inclines in bargains desire.

1.1 FORECASTING

Forecasting is the process of projecting past sales demand into the future. Implementing a forecasting system enables you to assess current market trends and sales quickly so that you can make informed decisions about the operations. It is a planning tool that enables businesses to chart their next moves and create budgets that will hopefully cover whatever uncertainties may occur.

1.1.1 Types of Forecasting

- Quantitative
- Qualitative

1.2 SALES FORECASTING

Sales forecasting is a prediction of future sales revenue and Sales forecasts are usually based on historical data, industry trends, and the status of the current sales pipeline. Businesses use the sales forecast to estimate weekly, monthly, quarterly, and annual sales totals. Just like a weather forecast, your team should view your sales forecast as a plan to work from, not a firm prediction. Sales forecasting is also different from sales goal-setting. While a sales goal describes what you want to happen, a sales forecast estimates what will happen, regardless of your goal. They can also help enterprises to plan their marketing and advertising efforts. Sales forecasting can help businesses make informed decisions about allocating resources. Sales forecasting is not an exact science, and uncertainty is always involved. However, sales forecasts can give businesses a good idea of what to expect in the future and help them plan accordingly.

1.2.1 Pros and Cons

Pros:

- i) Provides insights into upcoming sales and revenue.
- ii) Appeals to stakeholders.
- iii) Aligns business strategies and result.
- iv) Provides opportunities to make adjustments.
- v) Reveals patterns in data.
- vi) Helps integrate lead sources.
- vii) Begins gathering data on new products or services.
- viii) Establishes a sales process.

Cons:

- i) Is hard to predict.
- ii) Creates biased opinions.
- iii) Requires clean data.
- iv) Requires time.
- v) Lacks essential details with numerical data.
- vi) Affected by employee turnover.
- vii) Promotes false optimism.

1.3 SALES PREDICTION

Sales prediction also commonly called sales forecasting is the process of estimating future sales by predicting the amount of product or services an individual salesperson, a sales team, or a company is likely to sell in a fixed time period i.e., next week, month, quarter, or year.

There are a lot of different methods for predicting sales, but the important thing is that they're all backed by some kind of data. Sales prediction allows you to replace gut feelings with evidence-based decision-making.

1.3.1 BENEFITS OF SALES PREDICTION:

- Set better goals
- Evaluate sales performance
- Plans effectively
- Makes decision with confidence

1.4 DATA PROCESSING:

The influencing factors of sales from five aspects: product attributes, merchant attributes, buyer attributes.

1.4.1 PRODUCT ATTRIBUTES:

The characteristics of the product itself are the main factors affecting the sales volume. The product attribute indexes finally determined in this paper are as follows: price quality grade, collection volume.

1.4.2 MERCHANT ATTRIBUTES:

The characteristics of businesses through the attributes of business time store level, sales volume and score. The “scoring” index includes the scoring results of “product description consistency score,” “logistics service level score,” and “comprehensive service score”.

1.4.2 BUYER ATTRIBUTES:

The basic information of customers, such as gender, age, education, information of products purchased, and online transaction amount, involves personal privacy issues, there is no channel for obtaining it on major e-commerce platforms. Therefore, this paper selects buyer loyalty to reflect customers’ satisfaction with products and their personal consumption preferences.

1.5 SPECIFICATIONS

1.5.1 HARDWARE CONFIGURATION

- Processor - I5
- Speed - 3 GHz
- RAM - 8GB (min)
- Hard Disk - 500 GB
- Key Board - Standard Windows Keyboard
- Mouse - Two or Three Button Mouse
- Monitor - LCD
- Ethernet connection :(LAN)

1.5.2 SOFTWARE CONFIGURATION

- Microsoft Excel sheet
- Power BI Application
- Web Browser

CHAPTER - 2

LITERATURE SURVEY

2.1 AN APPROACH OF SALES PREDICTION SYSTEM OF CUSTOMERS USING DATA ANALYTICS TECHNIQUES

In country there are lots of supermarkets, shopping malls the managing sales of the shopping malls is very exigent works. The customer requirements will be changed every month, the manager or store owners are facing the problem for keeping stock for upcoming months. In this work we proposed data analytics-based approach for predicting the sales details based on the last 12 months data and it will generate report, in which moth maximum products are sales profit of the each and every month. This system performs various task like, finding best months for sales, calculate monthly earned money from different products, which city sold the maximum products, when will be the best time for advertisement to maximum customer to buy the products also generates report, which are items are frequently bought by the customer to keep stock for upcoming months and, increase the profit of the shopping mall business. A Sales analysis is very important constraint to run any business Successful. The prediction of customers purchased item is playing important role in Sales Analysis, In this proposed work subsequent task are implemented using python coding like data analysis such as best month for sales, best month for earned more, city sold more product, best time for advertisement to maximize the likelihood of customer buying product, products are purchased by together finally what product are sold more reason behind of selling more based on the Sales Dataset.

2.2 A survey on retail sales forecasting and prediction in fashion market

This paper conducted an overview of recent progress in the field of sales forecasting with the focus on fashion and new product sales forecasting. Conventional forecasting methods face challenges in producing accurate sales

data for new products and consumer-oriented goods. In particular, uncertain demand, seasonality, product variability as well as a lack of historical can hardly be handled. Within the recently introduced approaches, hybrid forecasting models perform more precisely. Moreover, this study gave an overview of the literature focusing on the predictive value of user-generated content and search queries. For future work, different aspects of fashion forecasting can be followed: Most reviewed works propose complex models in order to produce precise forecasts, and validate them in most cases with real sales data. However, still fashion companies face challenges in adapting these complex models. Therefore, one interesting aspect is to explore models which are accurate and at the same time applicable for the daily work of fashion companies. Furthermore, it is worth to focus more on the diverse impacting factors which have been described. Different aspects such as the general handling and the reduction possibilities on the forecast results can be examined. Finally, the measurement of the predictive value of user-generated content in real life is a valuable aspect, which is currently followed and explored by the authors of this review.

2.3 Forecasting Sales Profiles of Products in an Exceptional Context: COVID-19 Pandemic

The fashion industry is one of the economic sectors that were seriously impacted by the COVID-19 pandemic. Existing sales forecasting systems have become inapplicable due to the remarkable change in consumer purchasing behaviors, which has left retailers in a situation where they have to rapidly act to deal with the new environment's constraints. Motivated by a real business project, this study proposed a new sales forecasting methodology that can be applied in such an exceptional context—the COVID-19 pandemic, where train and test datasets present different constraints. Our proposed methodology suggests starting with a normal, yet advanced, sales forecasting system as if there is no additional constraint for the test set—2020's sales. For this purpose, we used a clustering procedure, applied to cumulative sales profiles, that aims

to identify k different sales prototypes, followed by a RF classifier that assigns the corresponding sales prototype for each new item based on its characteristics. Thereafter, once normal predictions are obtained, a regression approach is proposed to model the crisis' impact on sales and correct the predictions accordingly. The proposed correction model is optimized within the time window made up of the few weeks following the start of the crisis, where real sales (affected by the pandemic) and previously predicted sales are available. By analyzing sales behaviors in this window, and optimizing the regression models' parameters, the proposed model is able to predict an optimal correcting coefficient capable of correcting the predicted sales for the next weeks (short-term prediction). We tested the proposed methodology on four different datasets of online sales corresponding to four different families of products. The results showed that we were able to correct sales predictions on the desired period (four weeks) in an efficient way for all of the datasets. Hence, our proposed framework has offered an effective tool to our fashion retailer partner to better manage his supply chain, by knowing which items from the previous collection must be kept in stores, and which new items must be supplied to stores after the end of the lockdown period.

2.4 Predicting Online Product Sales using Machine Learning

Product sales prediction is a major aspect of a purchasing management. One of the key challenges faced nowadays by organizations of the dynamic international and unpredictable business environment in which they operate. With growing customer expectations for price and the quality manufacturers today can no longer rely only on cost advantage that they have over their rivals. Forecasting the sales are crucial in determining inventory stock levels and accurately estimating the future demand for goods has been an ongoing challenge in industries. If goods are not readily available or if goods availability is more than demand overall profit can be compromised. As a result, sales prediction for goods can be significant to ensure that loss is minimized. Depending on this study, our project is creating a prediction model using

machine learning algorithms for accurately predicting online product sales. Our project aims to use update data which includes online reviews ,online ratings ,online promotional strategies and sentiments and various other parameters for predicting product sales.

2.5 Prediction of Merchandise Sales on E-Commerce Platforms Based on Data Mining and Deep Learning

Online business has grown exponentially during the last decade, and the industries are focusing on online business more than before. However, just setting up an online store and starting selling might not work. Different machine learning and data mining techniques are needed to know the users' preferences and know what would be best for business. According to the decision-making needs of online product sales, combined with the influencing factors of online product sales in various industries and the advantages of deep learning algorithm, this paper constructs a sales prediction model suitable for online products and focuses on evaluating the adaptability of the model in different types of online products. In the research process, the full connection model is compared with the training results of CNN, which proves the accuracy and generalization ability of CNN model. By selecting the non-deep learning model as the comparison baseline, the performance advantages of CNN model under different categories of products are proved. In addition, the experiment concludes that the unsupervised pretrained CNN model is more effective and adaptable in sales forecasting. The analysis results show that CNN model has good prediction accuracy and generalization ability and is suitable for sales prediction of online products in different industries. For the problem that the samples show a long tail distribution, although it does not significantly affect the training results of the model. Forecasting the sales are crucial in determining inventory stock levels and accurately estimating the future demand for goods growing customer expectations for price and the quality manufacturers today cost advantage that they have over their rival

CHAPTER – 3

METHODS &ALGORITHM USED

3.1 PROJECT DEVELOPMENT:

In this section, there is an overview of the process of data mining and data modelling, from collecting the data, through the data preparation and finally the data modeling. Data cleaning and formatting can be considered as the most critical part of the whole project according to several data scientists. Figure 3.1 shows how the process of data mining works to extract knowledge using algorithms.

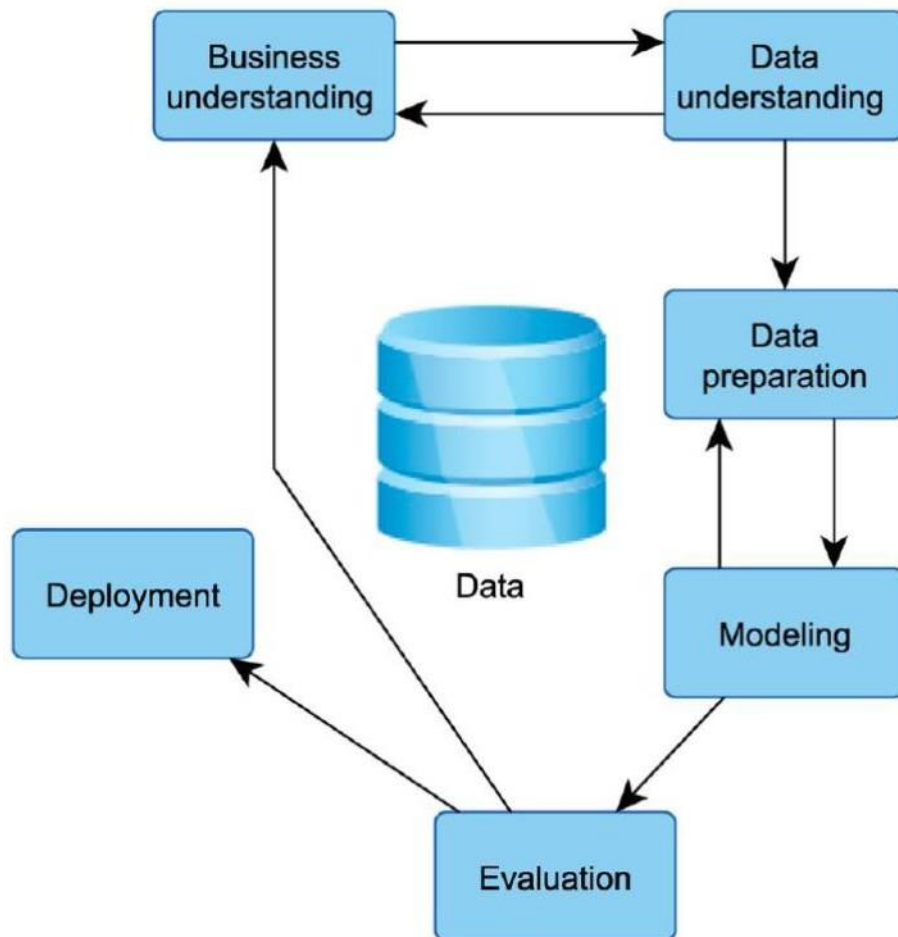


Fig:3.1 Project Development

3.2 DATA ANALYTICS:

The process of data analysis, or alternately, data analysis steps, involves gathering all the information, processing it, exploring the data, and using it to find patterns and other insights. The process of data analysis consists of: Data Requirement Gathering: Ask yourself why you're doing this analysis, what type of data you want to use, and what data you plan to analyses.

3.2.1 Data Collection:

Guided by your identified requirements, it's time to collect the data from your sources. Sources include case studies, surveys, interviews, questionnaires, direct observation, and focus groups. Make sure to organize the collected data for analysis.

3.2.2 Data Cleaning:

Not all the data you collect will be useful, so it's time to clean it up. This process is where you remove white spaces, duplicate records, and basic errors. Data cleaning is mandatory before sending the information on for analysis.

3.2.3. Data Analysis:

Here is where you use data analysis software and other tools to help you interpret and understand the data and arrive at conclusions. Data analysis tools include Excel, Python, R, Looker, Rapid Miner, Charito, Meta base, Rehash, and Microsoft Power BI.

3.2.4. Data Interpretation:

Now that you have your results, you need to interpret them and come up with the best courses of action based on your findings.

3.2.5. Data Visualization:

Data visualization is a fancy way of saying, "graphically show your information in a way that people can read and understand it." You can use charts, graphs, maps, bullet points, or a host of other methods. Visualization helps you derive valuable insights by helping you compare datasets and observe relationships.\

3.2.6 Types of Data Analysis:

The four types of data analysis are:

1. Descriptive Analysis
2. Diagnostic Analysis
3. Predictive Analysis
4. Prescriptive Analysis

3.3 DESCRIPTIVE ANALYSIS:

Descriptive analytics answer the question, “What happened?”. This type of analytics is by far the most commonly used by customers, providing reporting and analysis centered on past events. It helps companies understand things such as:

- How much did we sell as a company?
- What was our overall productivity?
- How many customers churned in the last quarter?

Descriptive analytics is used to understand the overall performance at an aggregate level and is by far the easiest place for a company to start as data tends to be readily available to build reports and applications. It’s extremely important to build core competencies first in descriptive analytics before attempting to advance upward in the data analytics maturity model. 23 Core competencies include things such as data modeling fundamentals, communicating data with right visualization and basic dashboard skills. It’s likely you’ve adopted some form of descriptive analytics internally, whether that be static P&L statements, PDF reports, or reporting within an analytics tool. For a true descriptive analytics program to be implemented, the concepts of repeatability and automation of tasks must be top of mind. Repeatability in that a data process is standardized and can be regularly applied with minimal effort (think a weekly sales report), and automation in that complex task (VLOOKUPS, merging of excel spreadsheets, etc.) are automated—requiring little to no manual intervention.

3.3.1. DIAGNOSTIC ANALYSIS:

Diagnostic analytics, just like descriptive analytics, uses historical data to answer a question. But instead of focusing on “what”, diagnostic analytics addresses the critical question of why an occurrence or anomaly occurred within your data. Diagnostic analytics also happens to be the most overlooked and skipped step within the analytics maturity model. Anecdotally, I see most customers attempting to go from “what happened” to “what will happen” without ever taking the time to address the “why did it happen” step. This type of analytics helps companies answer questions such as:

- Why did our company sales decrease in the previous quarter?
- Why are we seeing an increase in customer churn?
- Why is a specific basket of products vastly outperforming their prior year sales figures? Diagnostic analytics tends to be more accessible and fit a wider range of use cases than machine learning/predictive analytics. You might even find that it solves some business problems you earmarked for predictive analytics use cases. Being at the diagnostic analytics phase likely means you’ve adopted a modern analytics tool. Most modern analytics tools contain a variety of search-based, or lightweight artificial intelligence capabilities. ²⁴ These features allow for detailed insights a layer deeper (for example: the Key Drivers visualization in Power BI, or Qlik’s search-based insight functionality). To be clear, these are an effective lightweight means to address diagnostic analytics use cases but are not a means to a full-scale implementation. Software vendors like Sisu have built their core business around addressing diagnostic analytics use cases (what they call “augmented analytics”) and are a great bet. Diagnostic analytics is an important step in the maturity model that unfortunately tends to get skipped or obscured. If you cannot infer why your sales decreased 20% in 2020, then jumping to predictive analytics and trying to answer “what will happen to sales in 2021” is a stretch in advancing upward in the analytics maturity model.

3.3.2. PREDICTIVE ANALYSIS:

Predictive analytics is a form of advanced analytics that determines what is likely to happen based on historical data using machine learning. Historical data that

comprises the bulk of descriptive and diagnostic analytics is used as the basis of building predictive analytics models. Predictive analytics helps companies address use cases such as:

- Predicting maintenance issues and part breakdown in machines.
- Determining credit risk and identifying potential fraud.
- Predict and avoid customer churn by identifying signs of customer dissatisfaction.

At the outset of any predictive analytics build, three core elements need to be established:

- Identify a problem to solve,
- Define what is you want to predict, and
- State what you will achieve by doing so. To start you should collect existing data, organize data in a useful way to allow for data modeling, cleanse your data and review overall quality, and finally determine your modeling objective. 25 While modeling takes up the spotlight in predictive analytics, data prep is a crucial step that needs to happen first. This is why organizations with a rock-solid foundation in descriptive and diagnostic analytics are better equipped to handle predictive analytics. Simply put, the time and effort to prep, transform, and ensure data quality for retrospective reporting has already taken place. The groundwork should be relatively well laid to quickly identify and leverage data for the modeling phase. I always encourage customers with well-defined KPIs and business logic in a specific business reporting area (think sales reporting for example) to use that as the first predictive analytics use case. The goal is to derive value quickly, and there is no better place to start than an area where you know data is well defined and of high quality.

3.3.3. PRESCRIPTIVE ANALYSIS:

Prescriptive analytics is the fourth and final pillar of modern analytics. Prescriptive analytics pertains to true guided analytics where your analytics is prescribing or guiding you toward a specific action to take. It is effectively the merging of descriptive,

diagnostic, and predictive analytics to drive decision making. Existing scenarios or conditions (think your current fleet of freight trains) and the ramifications of a decision or occurrence (parts breakdown on the freight trains) are applied to create a guided decision or action for the user to take (proactively buy more parts for preventative maintenance). Prescriptive analytics requires strong competencies in descriptive, diagnostic, and predictive analytics which is why it tends to be found in highly specialized industries (oil and gas, clinical healthcare, finance, and insurance to name a few) where use cases are well defined. Prescriptive analytics help to address use cases such as:

- Automatic adjustment of product pricing based on anticipated customer demand and external factors.

- Flagging selects employees for additional training based on incident reports in the field.

26 Prescriptive analytics' primary aim is to take the educated guess or assessment out of data analytics and streamline the decision-making process. Prescriptive analytics is commonly considered the merging of descriptive, diagnostic, and predictive analytics. Getting started isn't so much a step-by-step list but rather the time and effort up front to build your competencies within the analytics maturity curve. Simply put, there is no starting point in prescriptive analytics without the requisite first three pillars of modern analytics being established first. If you're ready for prescriptive analytics, then quantifying your call to action and the underlying criteria will be the first requirement. For example: if the use case is to call corrective action for an employee (i.e. – additional training based on poor performance) then the factors that necessitate this action must be firmly established and the action itself must be clearly defined. Knowing how each kind of analytics helps you better understand your data and how to use it.

.

3.4 SYSTEM REQUIREMENTS:

3.4.1 Windows:

- Microsoft® Windows® 7/8/10 64-bit

- 4 GB RAM minimum, 8 GB RAM recommended
- 2 GB of available disk space minimum,
- 4 GB Recommended 500 MB for IDE + 1.5 GB for Android SDK and emulator system image
- 1280 x 800 minimum screen resolution

3.4.2 Mac:

- Mac® OS X® 10.10 Yosemite or higher, up to 10.14 macOS Mojave
- 4 GB RAM minimum, 8 GB RAM recommended
- 2 GB of available disk space minimum,
- 4 GB Recommended 500 MB for IDE + 1.5 GB for Android SDK and emulator system image

3.4.3 Linux:

- GNOME or KDE desktop - Tested on gLinux based on Debian.
- 64-bit distribution capable of running 32-bit applications
- GNU C Library glibc 2.19 or later 17
- 4 GB RAM minimum, 8 GB RAM recommended
- 2 GB of available disk space minimum.

3.5 POWER BI:

Power BI is an interactive data visualization software product developed by Microsoft with a primary focus on business intelligence. It is part of the Microsoft Power

Platform. Power BI is a collection of software services, apps, and connectors that work together to turn unrelated sources of data into coherent, visually immersive, and interactive insights. Data may be input by reading directly from a database, webpage, or structured files such as spreadsheets, CSV, XML, and JSON. Microsoft Power BI is a business intelligence (BI) platform that provides nontechnical business users with tools for aggregating, analyzing, visualizing and sharing data. 27 Power BI's user interface is fairly intuitive for users familiar with Excel, and its deep integration with other Microsoft products makes it a versatile self-service tool that requires little upfront training. Users can download an application for Windows 10, called Power BI Desktop, and native mobile apps for Windows, Android and iOS devices. There is also Power BI Report Server for companies that must maintain their data and reports on premises. That version of Power BI requires a special version of the desktop app -- aptly called Power BI Desktop for Power BI Report Server.

3.5.1 USES OF POWER BI:

Microsoft Power BI is used to find insights within an organization's data. Power BI can help connect disparate data sets, transform and clean the data into a data model and create charts or graphs to provide visuals of the data. All of this can be shared with other Power BI users within the organization. The data models created from Power BI can be used in several ways for organizations, including the following:

- Telling stories through charts and data visualizations;
- Examining "what if" scenarios within the data;
- Creating reports that can answer questions in real time and help with forecasting to make sure departments meet business metrics. Power BI can also provide executive dashboards for administrators or managers, giving management more insight into how departments are doing

3.6 METHODOLOGY:

The project is implemented in Microsoft excel and Microsoft power Bi.

- We need to collect the data set for our product, over a year or 365 days.

- So, we are creating a data set for our product
- That includes:
 1. Product model
 2. Product price
 3. Product colour
 4. Product litre
 5. Product brand
 6. Product defect
 7. Product stabilizer
 8. Type of payment
 9. Location
 10. Type of delivery

Now enter the dataset in Microsoft excel sheet as per the date and month as show in the fig 3.2

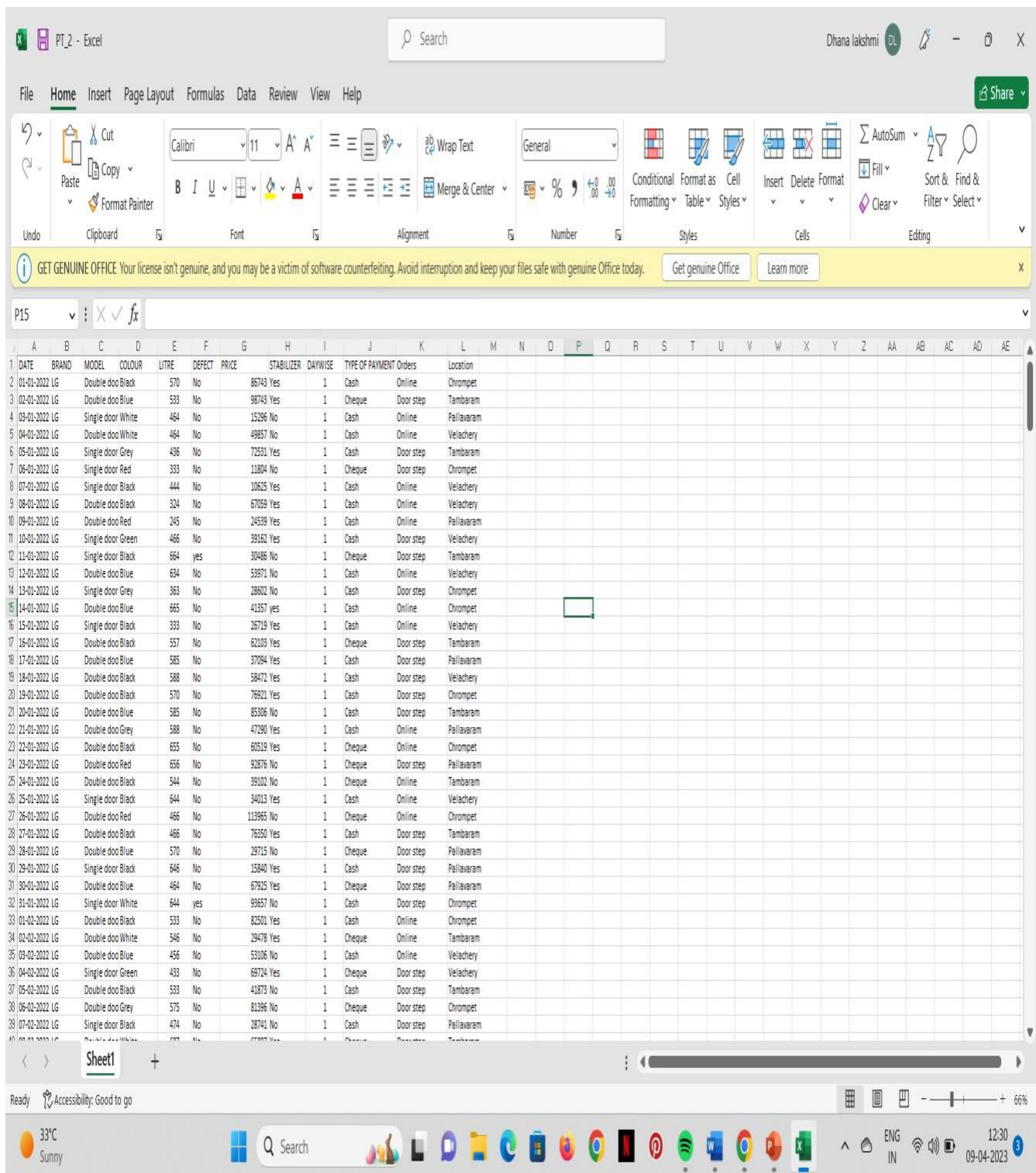


FIG: 3.2 EXCEL DATA

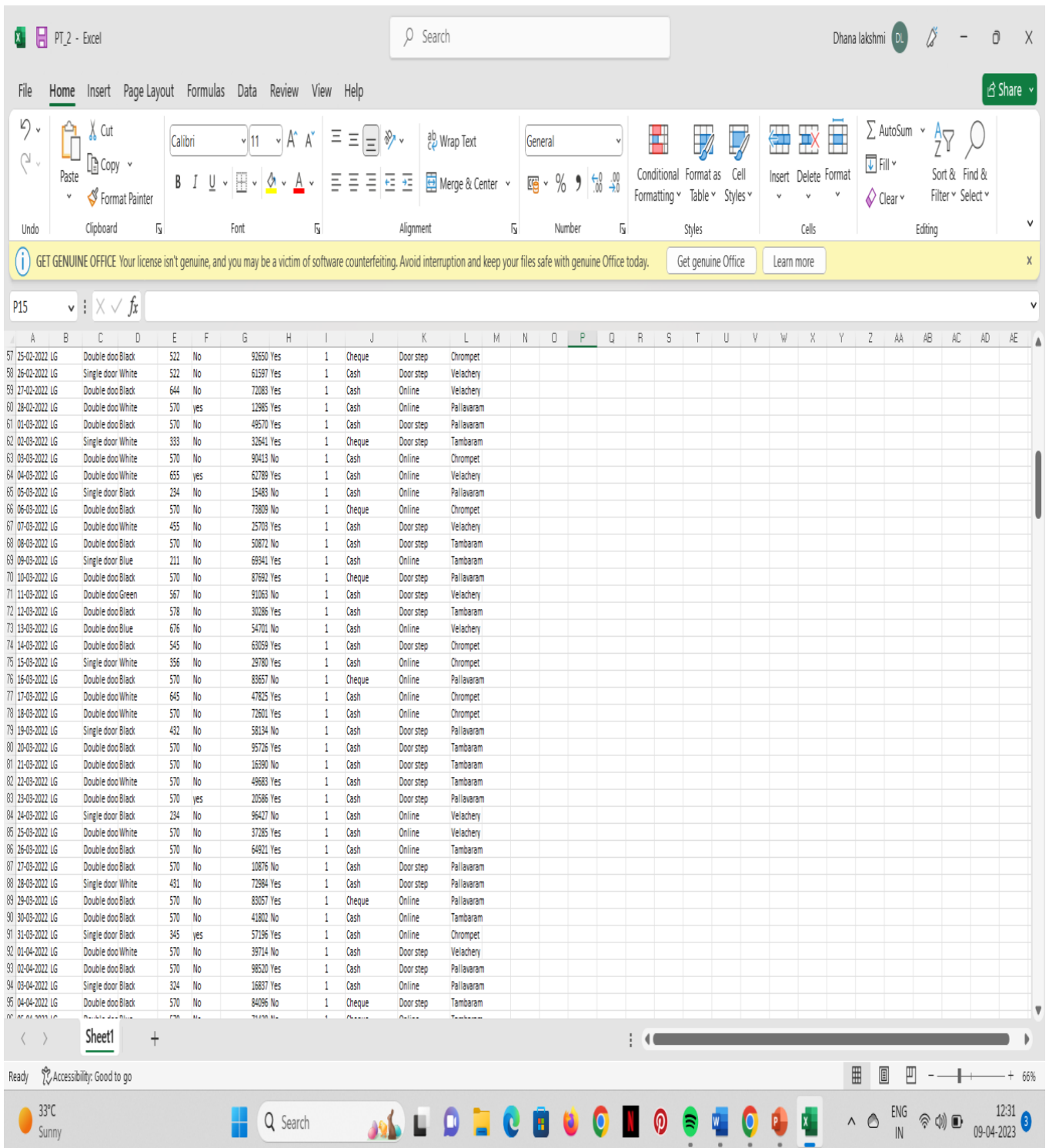


FIG: 3.3 EXCEL DATA

- Here our product is FIRDGE
- So, we are entering all the data of our product like, colour, model, defect, type of delivery etc.
- Import the excel data in the Power Bi
- Create the required KPI'S
- Here in our project, we created pie chart, bar chart, forecasting etc.
- We also created Q&A Kpi also
- Now we can easily predict the number of defects and sales by using the kpi's
- We can also identify our product sales using price ranges also
- If we click on the bar chart it shows the percentage sales of our product

Power bi makes our work easier so we can recognize the defect and needs of our customer and we can see more profits.

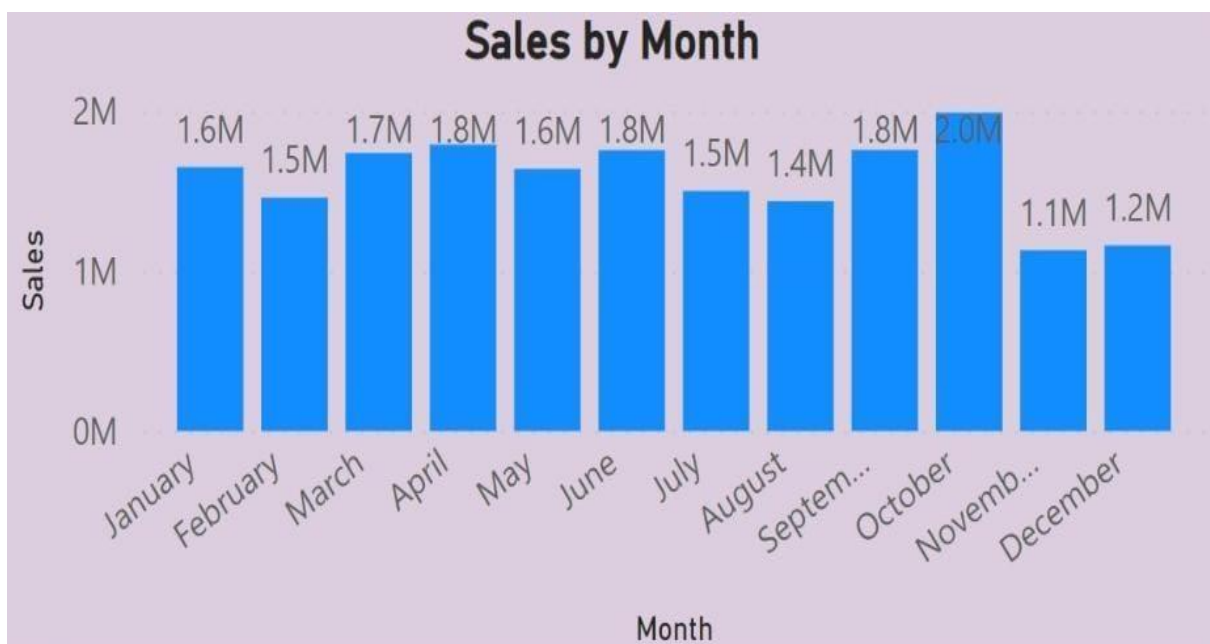


FIG: 3.4 SALES BY MONTH

- This bar graph (fig:3.4) shows month wise sales of our product.
- Here we can see that in the month of October the sales are higher since it's a festive session we will have more offers which will attract customers to buy the product.
- Same way we can see November month is the least number of sales.

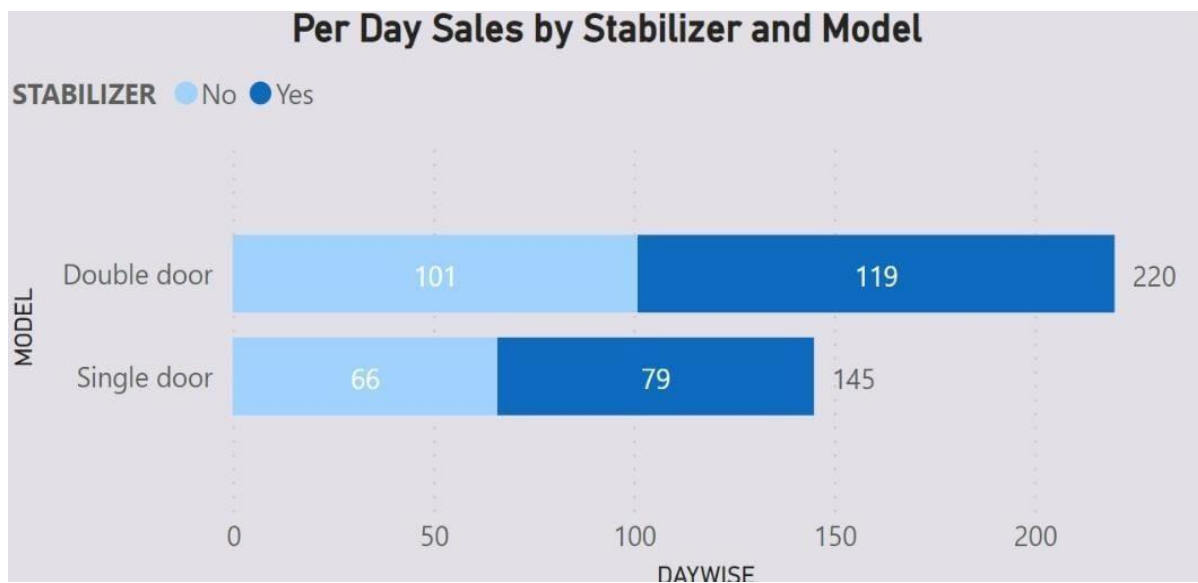


Fig:3.5 SALESBY STABILIZER AND MODEL

- This chart (fig:3.5) is based on model and stabilizer-based sales.
- Double door fridge with stabilizer is purchased more than a double door without stabilizer.
- Same way single door with stabilizer is getting more sales than single door without stabilizer.

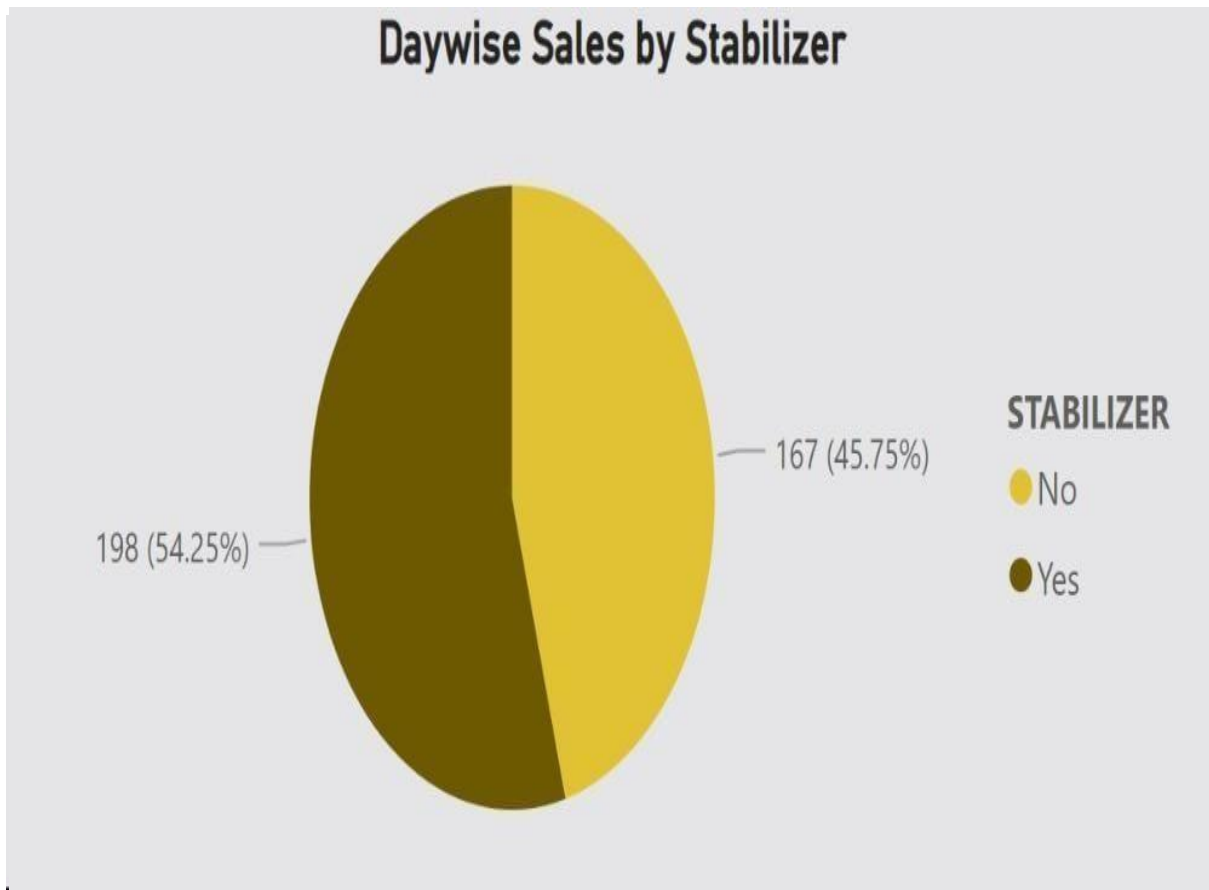


FIG:3.6 DAYWISE SALES BY STABILIZER

- This pie chart (fig:3.6) represents the sales based on stabilizer
- Because each and every customer prefers a stabilizer-based product since it consumes less electricity comparatively a model without stabilizer
- Here we can see with stabilizer its 198(54.25%) of sales .167 (45.57%) without stabilizer



FIG :3.7 MODEL WISE VARIETY OF LITRE

- Here it's a simple bar graph (fig:3.7).
- where x axis represents MODEL and y axis represent LITRE.
- Here double door with above 40L is getting more sales since a fridge can occupy more stuff since its double door
- Single door is getting less sales compared to double door.

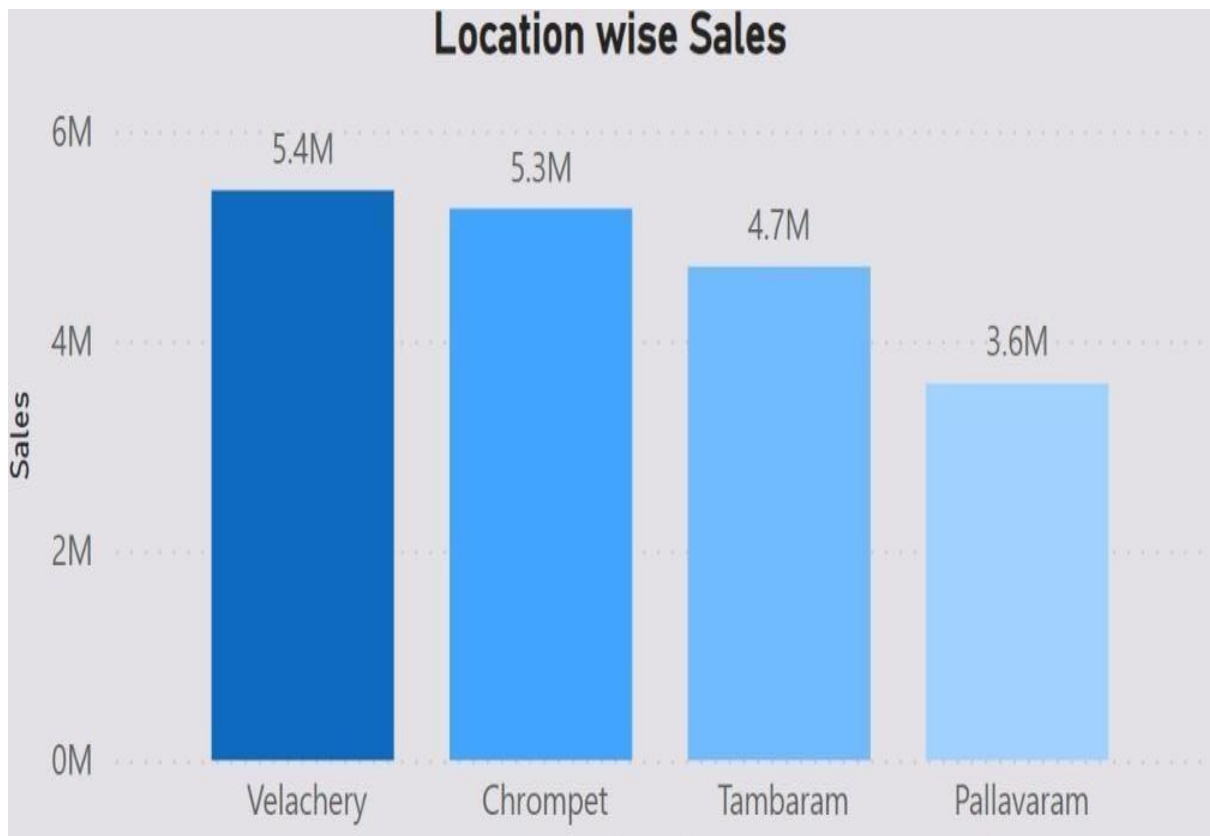


FIG:3.8 LOCATION WISE SALES

- This graph (fig:3.8) shows the sales based on location wise.
- Here x axis is location and y axis are sales
- Here we can see that Velachery locality is highest no. of sales 5.4M
- Pallavaram is the least number of sales
- Chrompet is second highest 5.3M.

CHAPTER – 4

RESULT & DISCUSSION

The performance of the Prediction is mostly focused on Prediction accuracy, Accuracy in each table and confusion matrix which shows the number of predictions of each table which can be compared to the instances of each table. From the data visualization it was observed that the October month has the highest sales since it's a festive session we will have more offers which will attract customers to buy the product and also Velachery has highest sales among all other areas.

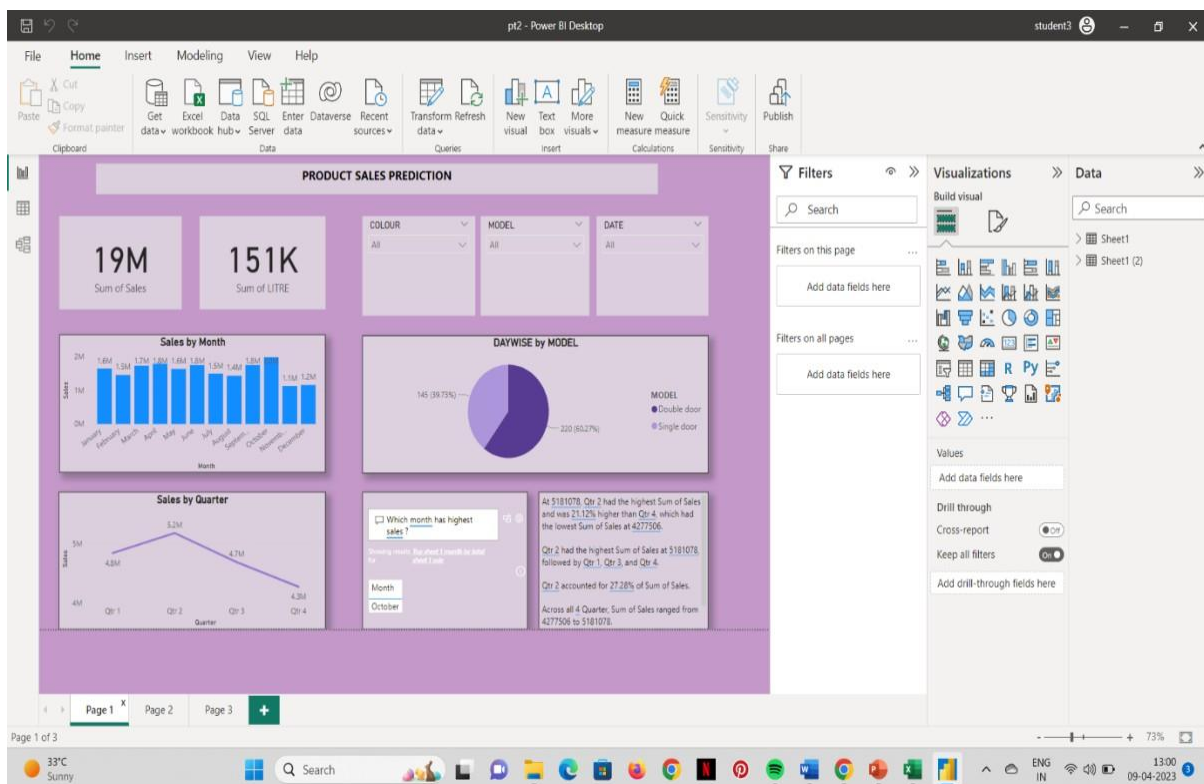


FIG:3.9 PRODUCT SALES PREDICTION

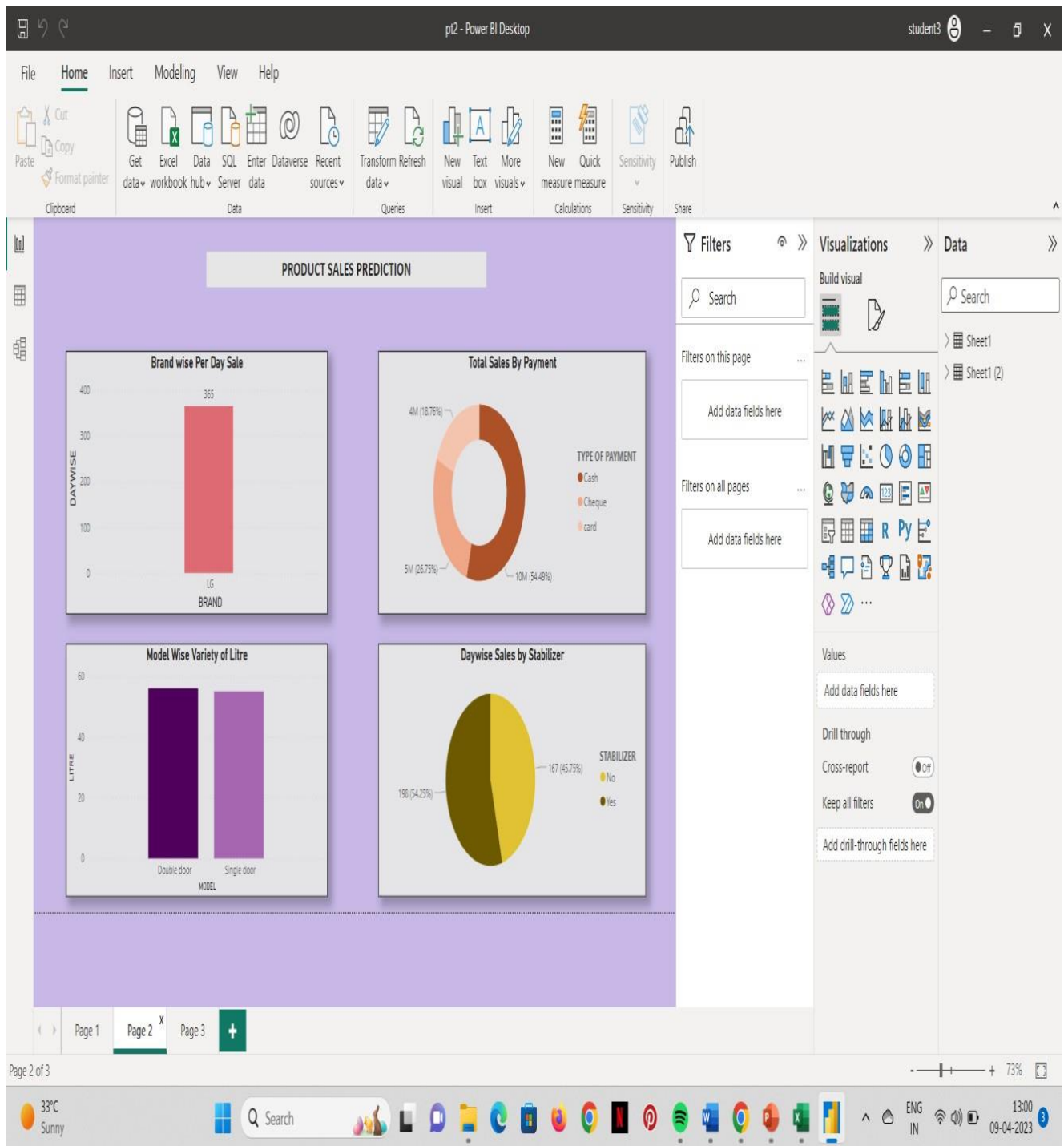


FIG:3.10 PRODUCT SALES PREDICTION

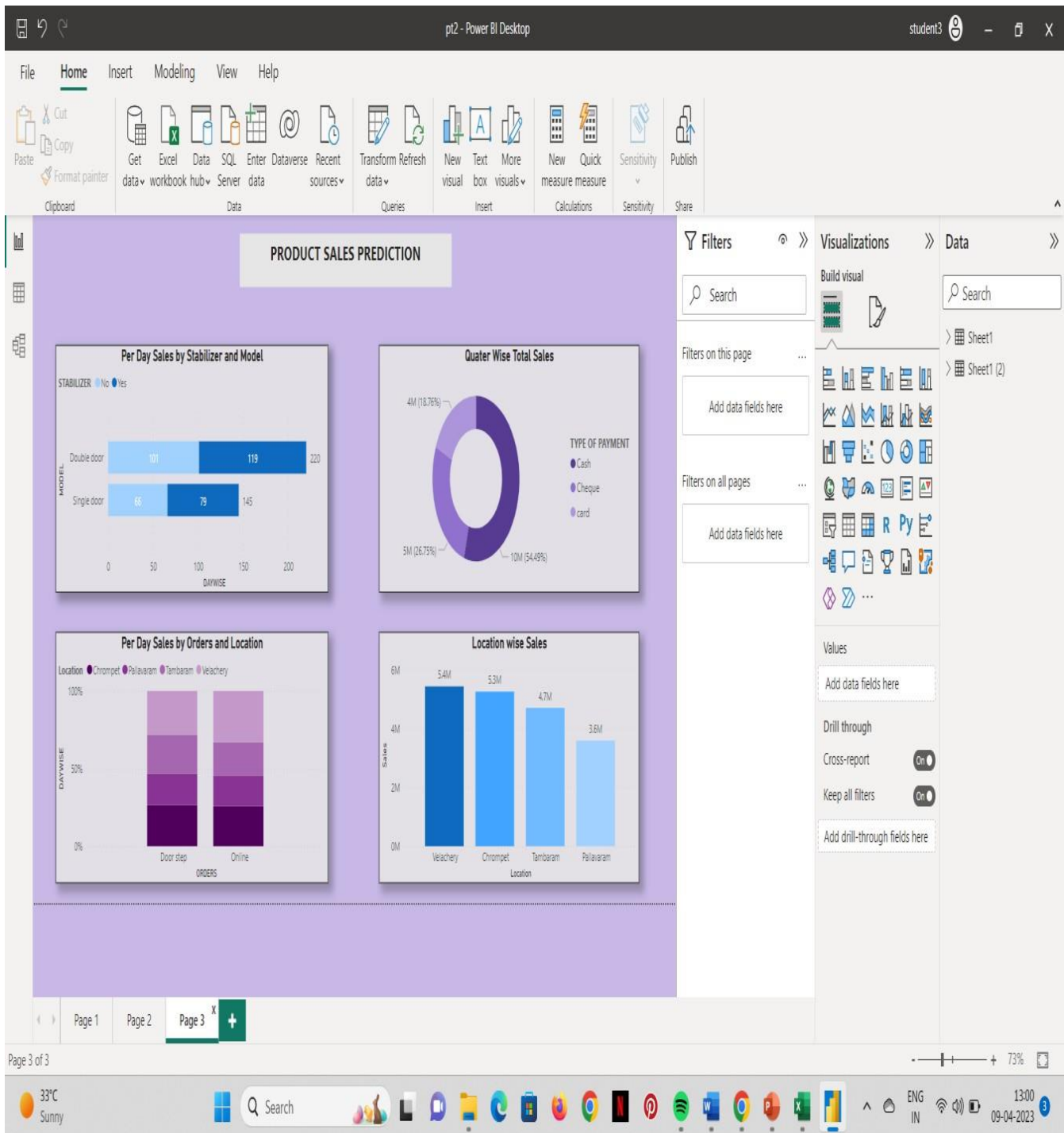


FIG: 3.11 PRODUCT SALES PREDICTION

CHAPTER – 5

CONCULSION & FUTURE WORK

5.1 CONCULSION

Most Stores plan to attract the customers to the store and make profit to the maximum extent by them. Once the customers enter the stores, they are attracted then definitely they shop more by the special offers and obtain the desired items which are available in the favorable cost and satisfy them. The advantage of forecasting is to know the number of employees should be appointed to meet the production level. Sales drop is bad thing forecasting sales helps to analyze it and it can overcome through the sales drop to remain in the competition forecast plays a vital role.

5.2 FUTURE WORK

For future scope and improvement of this model All the predicted statistical analysis will be help for proper planning and keep storing of all stocks in upcoming years, easily to identify the customer expectation and increase the sales of the products. Data analytics can be used to provide more accurate sales predictions by analyzing historical data and identifying patterns that can be used to forecast future sales. This can help companies to make more informed decisions about inventory management, production planning, and sales forecasting.

REFERENCES

- [1] Simulation Based Sales Forecasting on Retail Small Stores. Hai Rong Lv Xin Xin Bai Wen Jun Yin Jin Dong.
- [2] Boulaksil Y. Safety stock placement in supply chains with demand forecast updates. *Oper Res Perspect.* 2016; 3:2731.
- [3] P. HANSEN, H. HEINSBROEK: Product selection and space allocation in supermarkets, *European Journal of Operational Research* - 3(6) (1979), 474-484.
- [4] Tang CS. Perspectives in supply chain risk management. *Int J Prod Econ.* 2006;103(2):451–88.
- [5] Wang G, Gunasekaran A, Ngai EWT, Papadopoulos T. Big data analytics in logistics and supply chain management: certain investigations for research and applications. *Int J Prod Econ.* 2016; 176:98–110
- [6] K. BURLAKANTI, R. VIJAYA: The Most Influential Factors of Consumers' Buying Pattern at Organized and Unorganized Retail Stores with Special Reference to Kakinada City, Andhra Pradesh, *Indian Journal of Marketing*, 43(1) (2013).

APPENDICES

PT_2 - Excel

Search

Dhana lakshmi

File Home Insert Page Layout Formulas Data Review View Help

Clipboard Font Alignment Number Styles Cells Editing

GET GENUINE OFFICE Your license isn't genuine, and you may be a victim of software counterfeiting. Avoid interruption and keep your files safe with genuine Office today.

S20

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
	DATE	BRAND	MODEL	COLOUR	LITRE	DEFECT	PRICE	STABILIZER	DAYWISE	TYPE OF PAYMENT	Orders	Location							
1	01-01-2022	LG	Double door	Black	570	No		86743	Yes	1	Cash	Online	Chrompet						
2	02-01-2022	LG	Double door	Blue	533	No		98743	Yes	1	Cheque	Door step	Tambaram						
3	03-01-2022	LG	Single door	White	464	No		15296	No	1	Cash	Online	Pallavaram						
4	04-01-2022	LG	Double door	White	464	No		49857	No	1	Cash	Online	Velachery						
5	05-01-2022	LG	Single door	Grey	436	No		72531	Yes	1	Cash	Door step	Tambaram						
6	06-01-2022	LG	Single door	Red	333	No		11804	No	1	Cheque	Door step	Chrompet						
7	07-01-2022	LG	Single door	Black	444	No		10625	Yes	1	Cash	Online	Velachery						
8	08-01-2022	LG	Double door	Black	324	No		67059	Yes	1	Cash	Online	Velachery						
9	09-01-2022	LG	Double door	Red	245	No		24539	Yes	1	Cash	Online	Pallavaram						
10	10-01-2022	LG	Single door	Green	466	No		39162	Yes	1	Cash	Door step	Velachery						
11	11-01-2022	LG	Single door	Black	664	yes		30486	No	1	Cheque	Door step	Tambaram						
12	12-01-2022	LG	Double door	Blue	634	No		53971	No	1	Cash	Online	Velachery						
13	13-01-2022	LG	Single door	Grey	363	No		28602	No	1	Cash	Door step	Chrompet						
14	14-01-2022	LG	Double door	Blue	665	No		41357	yes	1	Cash	Online	Chrompet						
15	15-01-2022	LG	Single door	Black	333	No		26719	Yes	1	Cash	Online	Velachery						
16	16-01-2022	LG	Double door	Black	557	No		62103	Yes	1	Cheque	Door step	Tambaram						
17	17-01-2022	LG	Double door	Blue	585	No		37094	Yes	1	Cash	Door step	Pallavaram						
18	18-01-2022	LG	Double door	Black	588	No		58472	Yes	1	Cash	Door step	Velachery						
19	19-01-2022	LG	Double door	Black	570	No		76521	Yes	1	Cash	Door step	Chrompet						
20	20-01-2022	LG	Double door	Blue	585	No		85306	No	1	Cash	Door step	Tambaram						
21	21-01-2022	LG	Double door	Grey	588	No		47290	Yes	1	Cash	Online	Pallavaram						
22	22-01-2022	LG	Double door	Black	655	No		60519	Yes	1	Cheque	Online	Chrompet						
23	23-01-2022	LG	Double door	Red	656	No		92876	No	1	Cheque	Door step	Pallavaram						
24	24-01-2022	LG	Double door	Black	544	No		39102	No	1	Cheque	Online	Tambaram						
25	25-01-2022	LG	Single door	Black	644	No		34013	Yes	1	Cash	Online	Velachery						

Sheet1

Ready Accessibility: Good to go

37°C Sunny

Search

ENG IN

18.02 17-04-2023

PT_2 - Excel

Search

Dhana lakshmi

File Home Insert Page Layout Formulas Data Review View Help

Clipboard Font Alignment Number Styles Cells Editing

GET GENUINE OFFICE Your license isn't genuine, and you may be a victim of software counterfeiting. Avoid interruption and keep your files safe with genuine Office today.

S20

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
	DATE	BRAND	MODEL	COLOUR	LITRE	DEFECT	PRICE	STABILIZER	DAYWISE	TYPE OF PAYMENT	Orders	Location							
76	16-03-2022	LG	Double door	Black	570	No		83657	No	1	Cheque	Online	Pallavaram						
77	17-03-2022	LG	Double door	White	645	No		47825	Yes	1	Cash	Online	Chrompet						
78	18-03-2022	LG	Double door	White	570	No		72601	Yes	1	Cash	Online	Chrompet						
79	19-03-2022	LG	Single door	Black	432	No		58134	No	1	Cash	Door step	Pallavaram						
80	20-03-2022	LG	Double door	Black	570	No		95726	Yes	1	Cash	Door step	Tambaram						
81	21-03-2022	LG	Double door	Black	570	No		16390	No	1	Cash	Door step	Tambaram						
82	22-03-2022	LG	Double door	White	570	No		49683	Yes	1	Cash	Door step	Tambaram						
83	23-03-2022	LG	Double door	Black	570	yes		20586	Yes	1	Cash	Door step	Pallavaram						
84	24-03-2022	LG	Single door	Black	234	No		96427	No	1	Cash	Online	Velachery						
85	25-03-2022	LG	Double door	White	570	No		37285	Yes	1	Cash	Online	Velachery						
86	26-03-2022	LG	Double door	Black	570	No		64921	Yes	1	Cash	Online	Tambaram						
87	27-03-2022	LG	Double door	Black	570	No		10876	No	1	Cash	Door step	Pallavaram						
88	28-03-2022	LG	Single door	White	431	No		72984	Yes	1	Cash	Door step	Pallavaram						
89	29-03-2022	LG	Double door	Black	570	No		83057	Yes	1	Cheque	Online	Pallavaram						
90	30-03-2022	LG	Double door	Black	570	No		41802	No	1	Cash	Online	Tambaram						
91	31-03-2022	LG	Single door	Black	345	yes		57196	Yes	1	Cash	Online	Chrompet						
92	01-04-2022	LG	Double door	White	570	No		39714	No	1	Cash	Door step	Velachery						
93	02-04-2022	LG	Double door	Black	570	No		98520	Yes	1	Cash	Door step	Pallavaram						
94	03-04-2022	LG	Single door	Black	324	No		16837	Yes	1	Cash	Online	Pallavaram						
95	04-04-2022	LG	Double door	Black	570	No		84096	No	1	Cheque	Door step	Tambaram						
96	05-04-2022	LG	Double door	Blue	570	No		71439	No	1	Cheque	Online	Tambaram						
97	06-04-2022	LG	Double door	Black	570	No		52690	Yes	1	Cheque	Door step	Chrompet						
98	07-04-2022	LG	Single door	Black	234	No		60924	Yes	1	Cash	Online	Velachery						
99	08-04-2022	LG	Single door	Green	432	No		35290	Yes	1	Cash	Door step	Chrompet						
100	09-04-2022	LG	Double door	Black	570	No		91246	No	1	Cash	Online	Velachery						
101	10-04-2022	LG	Double door	Black	433	No		78450	Yes	1	Cash	Door step	Pallavaram						

Sheet1

Ready Accessibility: Good to go

37°C Sunny

Search

ENG IN

18.02 17-04-2023

PT_2 - Excel

Search

Dhana lakshmi

File Home Insert Page Layout Formulas Data Review View Help

Undo Paste Copy Format Painter Clipboard Font Alignment Merge & Center Number Conditional Formatting Styles Cells Editing

GET GENUINE OFFICE Your license isn't genuine, and you may be a victim of software counterfeiting. Avoid interruption and keep your files safe with genuine Office today. Get genuine Office Learn more

S20

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
108	17-04-2022	LG	Double door	Black	570	No	69402	Yes	1	Cheque	Online	Velachery							
109	18-04-2022	LG	Single door	Black	353	No	15829	Yes	1	Cash	Online	Pallavaram							
110	19-04-2022	LG	Double door	Black	433	No	24570	Yes	1	Cash	Online	Tambaram							
111	20-04-2022	LG	Double door	White	570	No	70163	Yes	1	Cash	Door step	Tambaram							
112	21-04-2022	LG	Single door	Black	353	No	63459	No	1	Cash	Door step	Velachery							
113	22-04-2022	LG	Double door	Black	570	No	89524	Yes	1	Cash	Door step	Velachery							
114	23-04-2022	LG	Double door	Blue	570	No	18427	Yes	1	Cash	Door step	Chrompet							
115	24-04-2022	LG	Single door	Green	367	No	75396	No	1	Cash	Online	Tambaram							
116	25-04-2022	LG	Double door	Grey	570	No	47908	Yes	1	Cash	Online	Pallavaram							
117	26-04-2022	LG	Double door	Black	570	No	38260	Yes	1	Cheque	Online	Velachery							
118	27-04-2022	LG	Double door	Black	570	No	59013	Yes	1	Cheque	Online	Velachery							
119	28-04-2022	LG	Single door	White	421	No	92647	No	1	Cash	Online	Velachery							
120	29-04-2022	LG	Double door	White	570	No	63528	No	1	Cheque	Online	Chrompet							
121	30-04-2022	LG	Double door	Black	570	No	94087	Yes	1	Cheque	Door step	Chrompet							
122	01-05-2022	LG	Single door	Black	234	No	82906	Yes	1	Cash	Door step	Pallavaram							
123	02-05-2022	LG	Single door	White	234	No	40629	Yes	1	Cash	Door step	Tambaram							
124	03-05-2022	LG	Double door	Black	570	No	76210	Yes	1	Cash	Door step	Chrompet							
125	04-05-2022	LG	Double door	Black	570	No	15792	No	1	Cash	Door step	Velachery							
126	05-05-2022	LG	Single door	White	221	No	38704	No	1	Cash	Door step	Tambaram							
127	06-05-2022	LG	Double door	Black	570	No	54068	No	1	Cash	Door step	Pallavaram							
128	07-05-2022	LG	Double door	Black	570	No	20143	Yes	1	Cash	Door step	Velachery							
129	08-05-2022	LG	Double door	White	570	No	65891	Yes	1	Cash	Online	Chrompet							
130	09-05-2022	LG	Double door	Black	570	No	43058	No	1	Cash	Online	Tambaram							
131	10-05-2022	LG	Double door	Black	570	No	80271	Yes	1	Cash	Online	Pallavaram							
132	11-05-2022	LG	Single door	Black	323	No	67135	Yes	1	Cash	Online	Tambaram							
133	12-05-2022	LG	Double door	White	570	No	38452	No	1	Cash	Online	Chrompet							

Sheet1

Ready Accessibility: Good to go

37°C Sunny

Search

ENG IN 18:02 17-04-2023

PT_2 - Excel

Search

Dhana lakshmi

File Home Insert Page Layout Formulas Data Review View Help WPS PDF

Undo Paste Copy Format Painter Clipboard Font Alignment Merge & Center Number Conditional Formatting Styles Cells Editing

PRODUCT NOTICE Excel hasn't been activated. To keep using Excel without interruption, activate before 24 April 2023. Activate

P15

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
211	29-07-2022	LG	Double door	baby pink	345	No	56643	Yes	1	card	Online	Pallavaram							
212	30-07-2022	LG	Single door	baby pink	345	yes	4567	Yes	1	card	Online	Tambaram							
213	31-07-2022	LG	Double door	wine red	456	No	7896	Yes	1	card	Online	Velachery							
214	01-08-2022	LG	Double door	blue	467	yes	4567	No	1	Cheque	Door step	Chrompet							
215	02-08-2022	LG	Double door	blue	457	No	74000	No	1	Cheque	Door step	Chrompet							
216	03-08-2022	LG	Single door	blue	457	No	50700	No	1	Cheque	Online	Velachery							
217	04-08-2022	LG	Double door	brown	457	yes	75444	No	1	Cash	Door step	Pallavaram							
218	05-08-2022	LG	Single door	brown	500	No	7000	No	1	Cash	Online	Chrompet							
219	06-08-2022	LG	Single door	brown	500	No	46444	Yes	1	card	Door step	Tambaram							
220	07-08-2022	LG	Single door	grey	500	yes	42122	Yes	1	card	Door step	Tambaram							
221	08-08-2022	LG	Single door	grey	875	No	53223	Yes	1	card	Door step	Velachery							
222	09-08-2022	LG	Double door	black	300	No	32255	No	1	cash	Door step	Tambaram							
223	10-08-2022	LG	Double door	black	300	yes	10000	No	1	Cheque	Door step	Chrompet							
224	11-08-2022	LG	Single door	Black	308	No	25213	No	1	Cheque	Online	Tambaram							
225	12-08-2022	LG	Double door	Black	308	No	35322	No	1	Cheque	Door step	Chrompet							
226	13-08-2022	LG	Single door	Black	309	No	63633	No	1	Cash	Online	Tambaram							
227	14-08-2022	LG	Single door	Black	308	yes	53222	No	1	Cash	Door step	Tambaram							
228	15-08-2022	LG	Single door	matte black	300	No	64633	No	1	card	Door step	Velachery							
229	16-08-2022	LG	Double door	purple	100	No	35333	No	1	card	Online	Pallavaram							
230	17-08-2022	LG	Double door	purple	81	No	33336	Yes	1	Cheque	Online	Chrompet							
231	18-08-2022	LG	Double door	purple	81	No	75755	Yes	1	Cheque	Online	Velachery							
232	19-08-2022	LG	Single door	brown	500	yes	33336	Yes	1	Cheque	Door step	Pallavaram							
233	20-08-2022	LG	Double door	brown	500	No	75577	Yes	1	Cash	Door step	Tambaram							
234	21-08-2022	LG	Single door	black	500	No	47444	Yes	1	Cash	Online	Pallavaram							
235	22-08-2022	LG	Double door	black	500	No	97777	Yes	1	Cash	Door step	Velachery							
236	23-08-2022	LG	Double door	purple	300	No	47777	Yes	1	card	Door step	Velachery							

Sheet1

Ready Accessibility: Good to go

32°C Rain showers

Search

ENG IN 18:43 24-04-2023

