LOVELY PROFESSIONAL UNIVERSITY
PUNJAB (INDIA)

INTRODUCTION TO DATA MANAGEMENT PROJECT REPORT

(Project Semester August-December 2018)

BANK MARKETING ANALYSIS
(USAGE OF EXCEL)

Submitted by:

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Programme: B.Tech

Section: KE1612

Course Code: INT217

Under the Guidance of

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Discipline of CSE/IT

Lovely School of Computer Science & Engineering

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DECLARATION

I, Shivam Patel, Student of Computer Science & Engineering with Data Science as Engineering Minor at, Lovely Professional University, Punjab, hereby declare that all the information furnished in this project report is based on my own intensive work and is genuine.

Date: ……………   **Signature:** ……………

Registration No.- 11611415   **Name:** Shivam Patel

CERTIFICATE

This is to certify that Shivam Patel bearing Registration no. 11611415 has completed Data Management (INT 217) project titled, "Bank Marketing Analysis" under my guidance and supervision. To the best of my knowledge, the present work is the result of his/her original development, effort and study.

Signature of the Supervisor: ……………..

Name of the Supervisor: Sameer Farooq

Assistant Professor,

School of Computer Science and Engineering

Lovely Professional University

Phagwara, Punjab.

Date:……………..

ACKNOWLEDGEMENT

The success and outcome of this project required a lot of guidance and assistance from many people and I am extremely privileged to have got this all along the completion of my project. All that I have done is only due to such supervision and assistance and I would not forget to thank them.

I respect and thank **Mr. Sameer Farooq**, for providing me an opportunity to do the project work and giving us all support and guidance, which made me complete the project duly. I am extremely thankful to him for providing such a nice support and guidance, although he had busy schedule managing the corporate affairs.

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INTRODUCTION

Dashboards are basically created to get a quick glance about how effectively a company is achieving its business objectives. It keeps a record about KPI, metrics and another data keywords in a visual and central place. It enhances the real time performance and tells about the current status and simplifies the data which is complex. Main feature provided by the dashboard is that collects the important data at a single place that increases the decision-making speed and keeps everyone up-to-date.

Dashboard could be made using tables, charts, gauge and numbers. They can be used almost everywhere where data play crucial role, including company, industry etc. We can make dashboard of following types:

Project dashboard, financial dashboard, marketing dashboard and many more.

Process for creating dashboard:

- **Before creating dashboard, we need to research, question and things to consider.**

1) First thing we need to do is to think the need for dashboard, what will be the served purpose of dashboard, from where we will gather the data, what all the capabilities we need and we don't need.

It will help to create the replica of the model in excel on a piece of paper. Draw different boxes for different data types to get a rough layout and sketch graphs you want to include in your dashboard. It will get all your things on the single page and you could get approval from stakeholders before investing money and time on a project.

2) Questions to ask yourself:

i) <u>Why are you creating the dashboard?</u> - This question will answer the prime reason to create a dashboard; like is it to show the status of the project, or to show the increasing performance or growth. Letting us know the reason of creating dashboard will guide us the design and data.

ii) <u>Who needs to see the dashboard?</u> - We need to have a clear knowledge about who are the observers, to whom we have showcase our dashboard is it: colleagues, stakeholder, manager or external vendor. We have to think about how much time they will take to digest the information, how they will prefer to digest the information. So, we have to keep in mind about the preferences of the one for whom we have to create the dashboard.

iii) <u>Where will the data come from?</u> - This includes the source from where you will get the data. We could enter the data manually or we can import it into our dashboard. It also includes what re the tools we are using to gather the data.

iv) <u>How up-to-date your dashboard is?</u> This will answer about the dashboard if it can be updated monthly or weekly or show the real time data.

 v) <u>What format does the dashboard need to be in?</u> Whether your dashboard is static or you are providing a dynamic link of your dashboard. Do you let the dashboard in read-only mode or provide editing capabilities to some of the users. This includes all these things.

3)Things to Consider: How to Design the Dashboard

- <u>Dashboard elements</u>: It refers to all the things included in a dashboard, we can choose from static tables, pivot tables, dynamic charts or from non-charting objects. We can include different small charts or one big chart. This will help you to gather all the similar data together and get a rough layout of the dashboard.
- <u> Dashboard background color</u>: In this you have to choose whether you want to add a color in background of dashboard or not. Whether we want to create charts of same color or of different color.
- <u>Dashboard user- interface</u>: It includes the ease of access. We could add hierarchy to the layout for easy navigation, drop- down menu or add labels to the charts.

I have created a dashboard on Bank Marketing:

Strategies and factors affect the Marketing: -

Marketing: Marketing is the study and management of exchange relationships. Marketing is used to create, keep and satisfy the customer. With the customer as the focus of its activities, it can be concluded that marketing is one of the premier components of business management - the other being innovation.

Today, there is hard competition in the market. So as to stay in the market some innovative marketing strategies needs to be implemented. One of them is proper analysis of customers their interests, target audience and feedbacks from the customer helps in collecting the data. Then it's analyst job to extract insights out of the data with proper analysis and visualization.

Marketing as a discipline has totally reinvented itself over the past several years, from primarily a communications function to one that creates both value and revenue. Unfortunately, most bank and credit union marketing departments have not kept up with the same pace of change that we've seen in other industries, costing their institutions hundreds of thousands or millions of dollars in hard costs and lost revenue opportunity.

The transformation of marketing has resulted from a confluence of three factors: consumer behaviour, technology, and data analytics:

- **The Consumer:** Consumers have changed the way they learn about and buy financial products. Increasingly, they distrust advertising and prioritize web content and customer reviews they perceive as being more objective.

- **Technology:** Digital advertising allows sales tracking and the calculation of marketing ROI. Marketing automation allows more varied and rapidly deployed campaigns, enabling testing, learning, and optimization of spend. Both have conspired to transform marketing from an "expense" to be minimized to an investment which needs to be optimized. There is a reason GEICO spends much more in advertising than many of its competitors. (Warren Buffett, whose Berkshire Hathaway owns GEICO, is not known for wasting money.)

- **Data Analytics:** It is one of the most important factors in Marketing. Analytics has transformed marketing from an art to a science. Data streams are now available that can identify prospects who are ready to buy whatever product you're trying to sell, and digital media can deliver targeted content to those prospects. Similarly, propensity and behavioural data on your existing clients allow marketers to serve up qualified sales opportunities to the front line.

While there are standouts in the banking industry who have transformed their marketing functions and capitalized on these three powerful trends, the vast majority of banks and credit unions have not. The implications of this are likely to be that an institution is spending too much on marketing activities with sub-optimal (or no) return, and spending too little (or nothing) on marketing activities with a high ROI.

SCOPE OF ANALYSIS

The process of marketing is that of bringing a product to market, which includes these steps: broad market research; market targeting and market segmentation; determining distribution, pricing and promotion strategies; developing a communications strategy; budgeting; and visioning long-term market development goals. Same is followed by Banks, Banks need money to give loans. So, they provide some interest to the depositor.

Scope of analysis for Bank Marketing include the following points:

- An aim of any bank is to increase the audience and target the customers.
- Banks make profit through loans whether it's car, home, property. By proper analysis bank will target to the customers who has no home for the home loan. In this marketing strategy, both customer and bank will be benefitted.
- With the proper analysis, if Bank is in big profit, may provide loans at low interest so that maximum audience will be benefitted.

The scope of marketing deals with the question, 'what is marketed?' According to Kotler, marketing people are involved with ten types of entities.

1. Goods:

Physical goods constitute the major part of a country's production and marketing effort. Companies market billions of food products, and millions of cars, refrigerators, television and machines.

2. Services:

ADVERTISEMENTS: As economies advance, a large proportion of their activities is focused on the production of services. Services include the work of airlines, hotels, car rental firms, beauticians, software programmers, management consultants, and so on. Many market offerings consist of a mix of goods and services. For example, a restaurant offers both goods and services.

3. Events:

Marketers promote events. Events can be trade shows, company anniversaries, entertainment award shows, local festivals, health camps, and so on. For example, global sporting events such as the Olympics or Common Wealth Games are promoted aggressively to both companies and fans.

4. Experiences:

Marketers create experiences by offering a mix of both goods and services. A product is promoted not only by communicating features but also by giving unique and interesting experiences to customers. For example, Maruti Sx4 comes with Bluetooth technology to ensure connectivity while driving, similarly residential townships offer landscaped gardens and gaming zones.

5. Persons:

Due to a rise in testimonial advertising, celebrity marketing has become a business. All popular personalities such as film stars, TV artists, and sportspersons have agents and personal managers. They also tie up with PR agencies for better marketing of oneself.

6. Places:

ADVERTISEMENTS: Cities, states, regions, and countries compete to attract tourists. Today, states and countries are also marketing places to factories, companies, new residents, real estate agents, banks and business associations. Place marketers are largely real estate agents and builders. They are using mega events and exhibitions to market places. The tourism ministry is also aggressively promoting tourist spots locally and globally.

7. Properties:

Properties can be categorized as real properties or financial properties. Real property is the ownership of real estates, whereas financial property relates to stocks and bonds. Properties are bought and sold through marketing.

Marketing enhances the need of ownership and creates possession utility. With improving income levels in the economy, people are seeking better ways of saving money. Financial and real property marketing need to build trust and confidence at higher levels.

8. Organizations:

Organizations actively work to build image in the minds of their target public. The PR department plays an active role in marketing an organization's image. Marketers of the services need to build the corporate image, as exchange of services does not result in the ownership of anything. The organization's goodwill promotes trust and reliability. The organization's image also helps the companies in the smooth introduction of new products.

9. Information:

Information can be produced and marketed as a product. Educational institutions, encyclopedias, non-fiction books, specialized magazines and newspapers market information. The production, packaging, and distribution of information is a major industry. Media revolution and increased literacy levels have widened the scope of information marketing.

10. Idea:

Every market offering includes a basic idea. Products and services are used as platforms for delivering some idea or benefit. Social marketers widely promote ideas. Maruti Udyog Limited promoted safe driving habits, need to wear seat belts, need to prohibit children from sitting near the driver's seat, and so on.
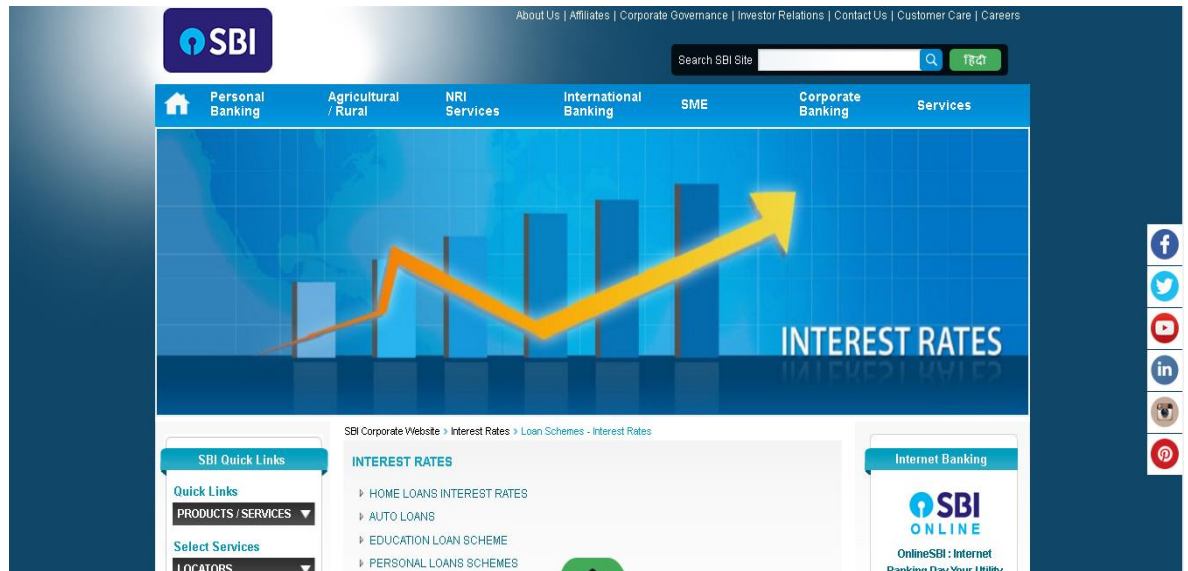
Existing System

As bank doesn't share its personal data. So, there is no real time system exists. The data used in the project is dummy data provided by UCI Machine Learning Repository.

Source: https://www.sbi.co.in/portal/web/interest-rates/loan-schemes

Limitation of Existing System:

➢ **Problems of security:** Security and privacy aspects are major in case of E-Banking transaction. Various sites are not properly locked at to ensure weather customers money is safe in cyber world or not.

➢ **High Cost:** The infrastructural cost of providing E-Banking facility is very high. The banks not only have to automate front-end services but also back office services, which involve high cost.

➢ **Lack of Awareness:** Another great hindrance is lack of awareness because effective and wide media efforts in publishing Internet banking need to be emphasized.

➢ **Lack of Computerisation:** Lack of computerization and low density of telephone lines is also a bottleneck for online banking. In India, out of 65000 bank branches, only 5000 branches are computerized.

➢ **Wrong assumption by People:** Many people are away from net banking on the assumption that it is more expensive than the traditional method of dealing with bank transactions. They still prefer going to bank to perform transactions.

DRAWBACKS OF EXISTING SYSTEM:

As the world is moving on high speed so our needs have also been changed. Earlier we are happy using large data sets but since they are large data files so we have required a large storage and a lot of time has also been consumed in analyzing the data sets.

1. **Missing Data**: The study investigated missing data in a bank marketing dataset. The task of finding missing values consumes a lot of effort and time. Some field values were to be filled with 'zero' by replacing the 'NULL' so as to make the calculations.

2. **Slow, tidies and time consuming**: It is virtually impossible for a person to find a particular set of record among the large data sets as the manager has to go through all the data sets individually, this will take a lot of time and get slow by the time.

3. **Lack of security**: Since all the data files are kept in a shelf, Almira, so anybody can get the access of the file and modify them according to the need.

4. **Tools not compatible** — the most widely used tool for big data analytics are not currently able to handle real-time large data. Therefore, we have many expectations with Hadoop and Excel that in future Hadoop will add functionality for a real-time approach.

5. New approach required — Some organizations are used to receiving insights once a week. However, with the constant inflow of big data, a completely different approach is required. This could be a challenge for some organizations and could lead to remodeling of some decisions and plans

6. **Large Data set- Loading is a problem:** If the data is too big you may use the lazy loading methods If you create new sub-sets of the structure you may have to map them to the original structure to update them.

7. **Data collection Methods:** Archival method which is generally used includes directly downloading the data which is already recorded by some organization are often out of date. Need to learn how records were compiled to assess validity. May not provide a complete picture of the situation. On the other hand if Surveys were used then relatively high cost, relatively slow to design, implement, and analyze. Accuracy limited to willing and reachable respondents May have low response rates.

SOURCE OF DATA SET

The Bank Marketing dataset for the market analysis is taken from UCI Machine Learning Repository. Below is the link of Bank Marketing Dataset.

https://archive.ics.uci.edu/ml/datasets/Bank+Marketing

ETL Process

What is ETL?

ETL is an abbreviation of Extract, Transform, and Load. In this process, an ETL tool extracts the data from different RDBMS source systems then transforms the data like applying calculations, concatenations, etc. and then load the data into the Data Warehouse system.

It's tempting to think a creating a Data Warehouse is simply extracting data from multiple sources and loading into database of a Data Warehouse. This is far from the truth and requires a complex ETL process. The ETL process requires active inputs from various stakeholders including developers, analysts, testers, top executives and is technically challenging.

In order to maintain its value as a tool for decision makers, Data Warehouse system needs to change with business changes. ETL is a recurring activity (daily, weekly, monthly) of a Data Warehouse system and needs to be agile, automated, and well documented.
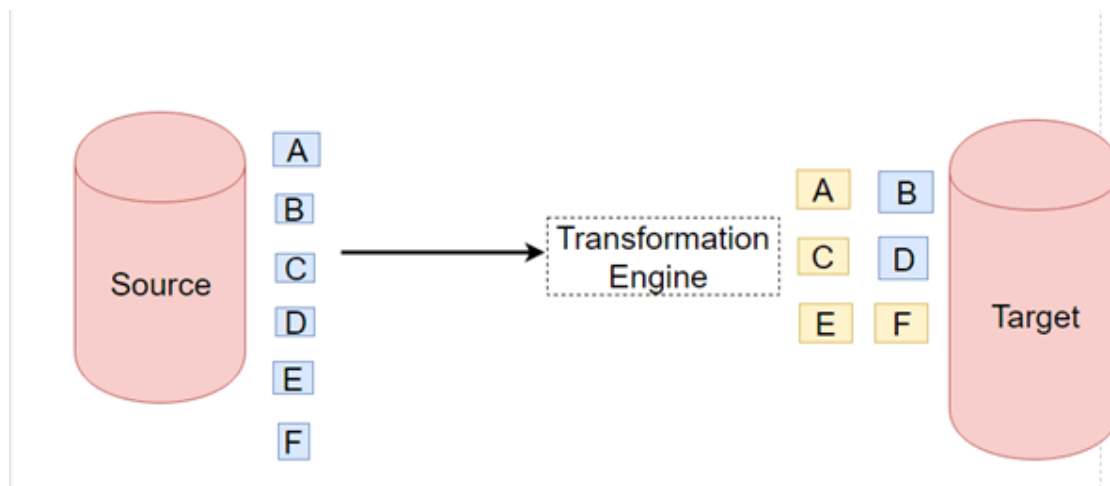

Figure 1

Why do we need ETL?

There are many reasons for adopting ETL in the organization:

➢ It helps companies to analyze their business data for taking critical business decisions.

➢ Transactional databases cannot answer complex business questions that can be answered by ETL.

➢ A Data warehouse provides a common data repository.

➢ ETL provides a method of moving the data from various sources into a data warehouse.

➢ As data sources change, the Data Warehouse will automatically update.

- Well-designed and documented ETL system is almost essential to the success of a Data Warehouse project.
- Allow verification of data transformation, aggregation and calculations rules.
- ETL process allows sample data comparison between the source and the target system.
- ETL process can perform complex transformations and requires the extra area to store the data.
- ETL helps to Migrate data into a Data Warehouse. Convert to the various formats and types to adhere to one consistent system.
- ETL is a predefined process for accessing and manipulating source data into the target database.
- ETL offers deep historical context for the business.
- It helps to improve productivity because it codifies and reuses without a need for technical skills.
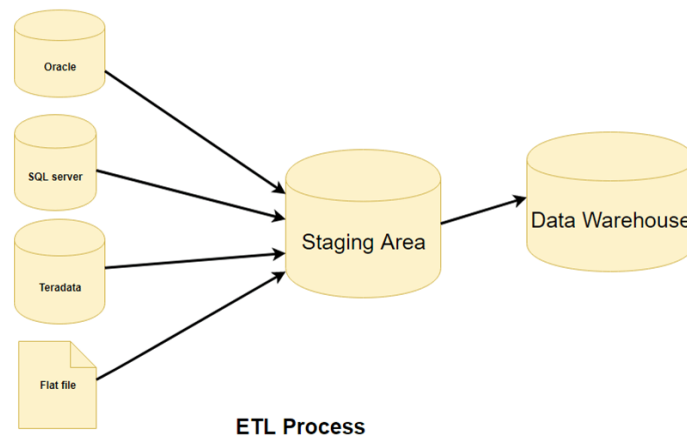

Figure 2

ETL Process in Data Warehouses:

ETL is a 3-step process:

Step – 1: Extraction

Step – 2: Transformation

Step – 3: Loading

Step – 1: Extraction

In this step, data is extracted from the source system into the staging area. Transformations if any are done in staging area so that performance of source system in not degraded. Also, if corrupted data is copied directly from the source into Data Warehouse database, rollback will be a challenge. Staging area gives an opportunity to validate extracted data before it moves into the Data Warehouse.

Data Warehouse needs to integrate systems that have different DBMS, Hardware, Operating Systems and Communication Protocols. Sources could include legacy applications like Mainframes, customized applications, Point of contact devices like ATM, Call switches, text files, spreadsheets, ERP, data from vendors, partners amongst others

Hence one needs a logical data map before data is extracted and loaded physically. This data map describes the relationship between sources and target data.

Three Data Extraction methods

1. Full Extraction
2. Partial Extraction – without update notification.
3. Partial Extraction – with update notification

Irrespective of the method used, extraction should not affect performance and response time of the source systems. These source systems are live production databases. Any slow down or locking could affect company's bottom line.

Some validations are done during Extraction

➢ Reconcile records with the source data
➢ Make sure that no spam/unwanted data loaded
➢ Data type check
➢ Remove all types of duplicate/fragmented data

➢ Check whether all the keys are in place or not

Step – 2: Transformation

Data extracted from source server is raw and not usable in its original form. Therefore, it needs to be cleansed, mapped and transformed. In fact, this is the key step where ETL process adds value and changes data such that insightful BI reports can be generated.

In this step, you apply a set of functions on extracted data. Data that does not require any transformation is called as Direct move or Pass through data.

In transformation step, you can perform customized operations on data. For instance, if the user wants sum-of-sales revenue which is not in the database. Or if the first name and the last name in a table is in different columns. It is possible to concatenate them before loading.
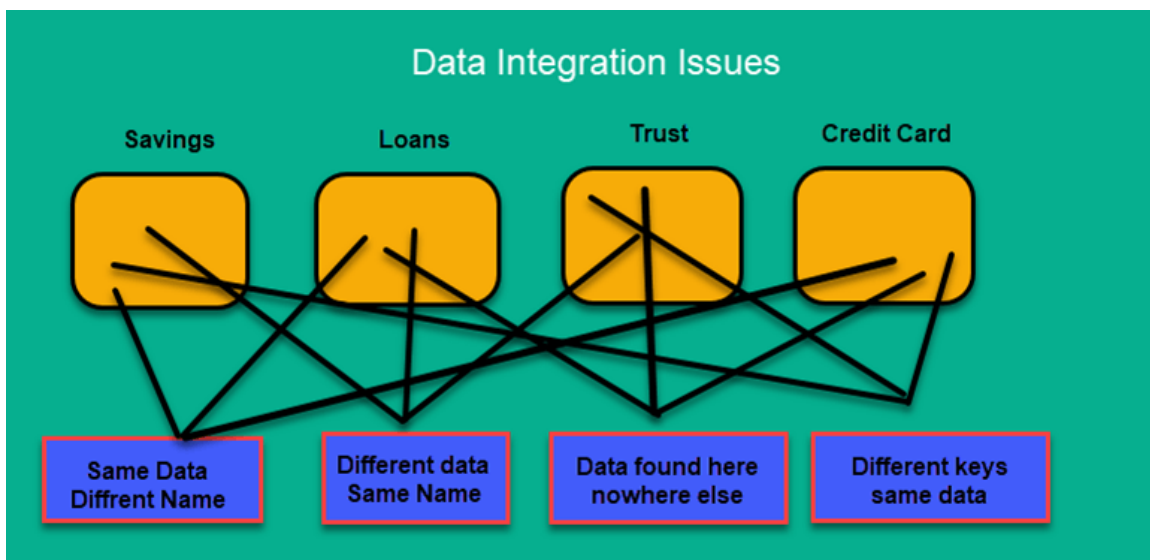

Figure 3

Validations are done during this stage

➢ Filtering – Select only certain columns to load
➢ Using rules and lookup tables for Data standardization

- ➢ Character set conversion and encoding handling
- ➢ Conversion of units of measurements like Date Time Conversion, Currency conversions, Numerical Conversions, etc.
- ➢ Data threshold validation check. For example, age cannot be more than two digits.
- ➢ Data flow validation from the staging area to the intermediate tables.
- ➢ Required fields should not be left blank.
- ➢ Cleaning (for example, mapping NULL to 0 or Gender Male to "M" and Female to "F" etc.)
- ➢ Split a column into multiples and merging multiple columns into a single column.
- ➢ Transposing rows and columns
- ➢ Use lookups to merge data
- ➢ Using any complex data validation (e.g., if the first two columns in a row are empty then it automatically rejects the row from processing)

Step – 3: Loading:

Loading data into the target data warehouse database is the last step of the ETL process. In a typical Data warehouse, huge volume of data needs to be loaded in a relatively short period. Hence, load process should be optimized for performance.

In case of load failure, recover mechanisms should be configured to restart from the point of failure without data integrity loss. Data Warehouse admins need to monitor, resume, cancel loads as per prevailing server performance.

Types of Loading

- ➢ **Initial Load** – Populating all the Data Warehouse tables
- ➢ **Incremental Load** – Applying ongoing changes as when needed periodically.
- ➢ **Full Refresh** – Erasing the contents of one or more tables and reloading with fresh data.

Load Verification:

- ➢ Ensure that the key field data is neither missing nor null.
- ➢ Test modelling views based on the target tables.

- ➢ Check that combined values and calculated measures.
- ➢ Data checks in dimension table as well as history table.
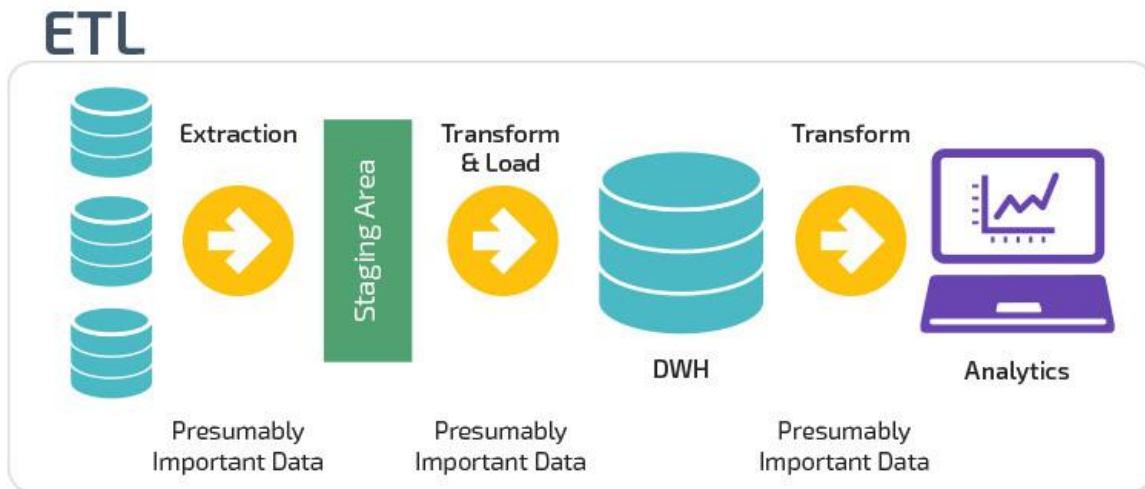- ➢ Check the BI reports on the loaded fact and dimension table.

Figure 4

Modern ETL Process:

Modern technology has changed most organizations approach to ETL, for several reasons. The biggest is the advent of powerful analytics warehouse like Amazon Redshift and Google Big Query. These newer cloud-based analytics databases have the horsepower to perform transformations in place rather than requiring a special staging area.

Also, data today is frequently analyzed in raw form rather than from preloaded OLAP summaries. This has led to the development of lightweight, flexible, and transparent ETL systems with processes that look something like this:
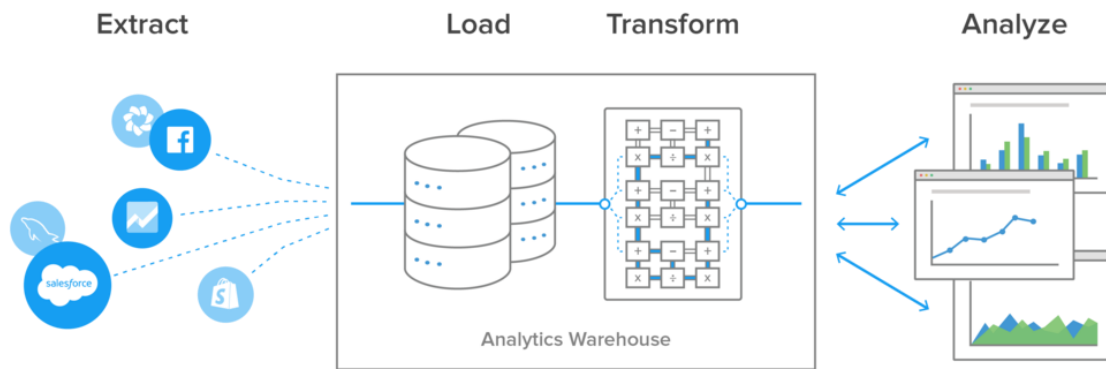
Figure 5

The biggest advantage to this setup is the transformations and data modelling happen in the analytics database. This gives the BI team, data scientist, and analysts greater control over how they work with it, in a common language they all understand.

ETL Vs ELT:

Difference between ETL Vs ELT		
ETL and ELT process are different in the following parameters		
Parameters	**ETL**	**ELT**
Process	Data is transformed at staging server and then transferred to Data Warehouse DB	Data remains in the DB of the Data Warehouse
Code Usage	Used for Compute intensive Transformation Small amount of data	Used for High amounts of data

	Transformations are done in ETL server/staging area.	Transformations are performed in the target system
Transformation		
Time-Load	Data first loaded into staging and later loaded into target system. Time intensive.	Data loaded into target system only once. Faster.
Time-Transformation	ETL process needs to wait for transformation to complete. As data size grows, transformation time increases.	In ELT process, speed is never dependant on the size of the data.
Time-Maintenance	It needs highs maintenance as you need to select data to load and transform.	Low maintenance as data is always available.
Implementation Complexity	At an early stage, easier to implement.	To implement ELT process organization should have deep knowledge of tools and expert skills.
Support for Data warehouse	ETL model used for on-premises, relational and structured data.	Used in scalable cloud infrastructure which supports structured, unstructured data sources.
Data Lake Support	Does not support.	Allows use of Data lake with unstructured data.
Complexity	The ETL process loads only the important data, as identified at design time.	This process involves development from the output-backward and loading only relevant data.

Cost	High costs for small and medium businesses.	Low entry costs using online Software as a Service Platforms.
Lookups	In the ETL process, both facts and dimensions need to be available in staging area.	All data will be available because Extract and load occur in one single action.
Aggregations	Complexity increase with the additional amount of data in the dataset.	Power of the target platform can process significant amount of data quickly.
Calculations	Overwrites existing column or Need to append the dataset and push to the target platform.	Easily add the calculated column to the existing table.
Maturity	The process is used for over two decades. It is well documented and best practices easily available.	Relatively new concept and complex to implement.
Hardware	Most tools have unique hardware requirements that are expensive.	Being Saas hardware cost is not an issue.
Support for Unstructured Data	Mostly supports relational data	Support for unstructured data readily available.

ANALYSIS OF DATA SET

- **Objective 1: -** <u>Marital Status Count:</u>

Introduction: Civil status, or marital status, are the distinct options that describe a person's relationship with a significant other. Married, single, divorced, and widowed are examples of civil status. Marital status count tells the count of each marital category.

General Description: From the Bank Marketing Dataset, we have column named as "Marital", this column will help us to check how many people are having their marital status as single, married or divorced. This also helps in finding that which type of people will take which type of loan.

Example: - Married people will prefer home loan than that of education loan.

Specific Requirements:

Requirements for this objective include the data of the columns name "marital". The whole knowledge of pivot table, slicers, timeline and charts for proper visualization of data.

Analysis Results:

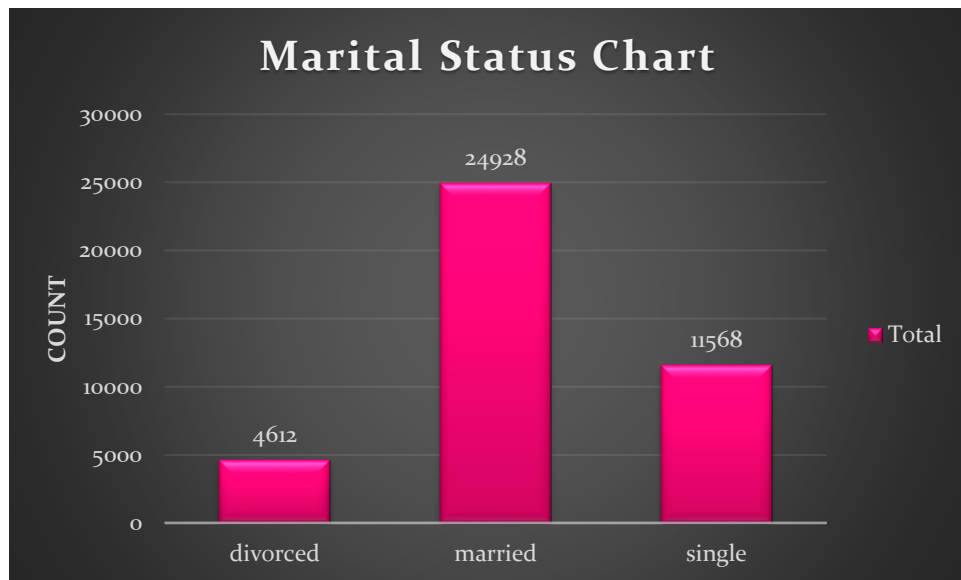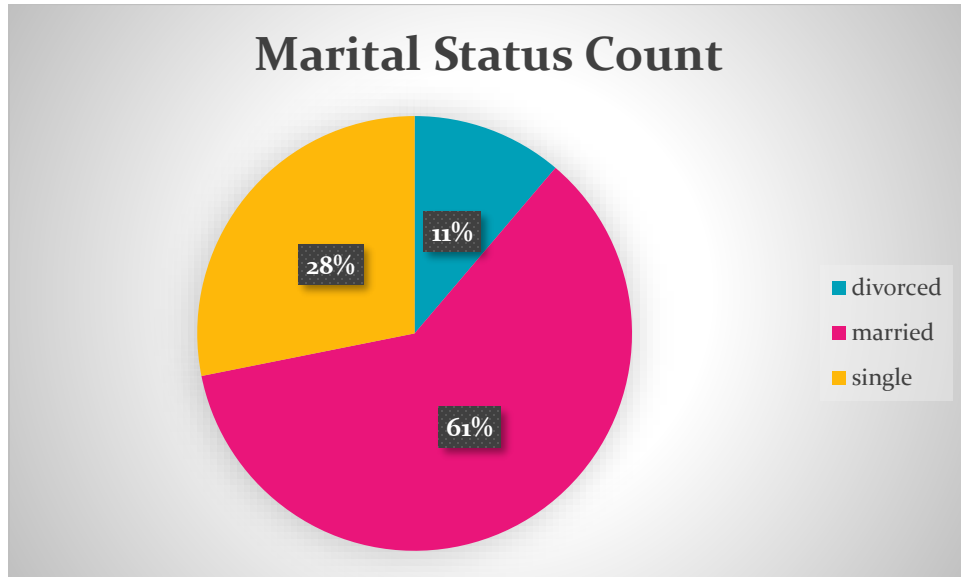The results include the following factors:

Row Labels	Count of Age
divorced	4612
married	24928
single	11568
Grand Total	41108

1. Total number of divorced people: 4612

2. Total number of married people: 24928

3. Total number of single people: 11568

VISUALISATION:

Marital Status Count

Marital Status Chart

- **Objective 2:-** Number of People of each Job at each Education Level:

Introduction: Education is the process of facilitating learning, or the acquisition of knowledge, skills, values, beliefs, and habits. Educational methods include storytelling,

discussion, teaching, training, and directed research. A job, or occupation, is a person's role in society. More specifically, a job is an activity, often regular and often performed in exchange for payment ("for a living"). Without education there is no job, as education is required to be eligible for a job. It maps your capabilities, according to which job will be assigned.

General Description: This objective mainly focuses on the job according to the education level of the person. The Data is first imported then create Pivot table, after creating pivot table, visualize using graph and charts. Slicers are inserted to quickly and easily filter the pivot tables.

Specific Requirements :

Requirements for this objective include the data for the State name and the no of roads. The whole knowledge for pivot table, slicers, timeline and charts.
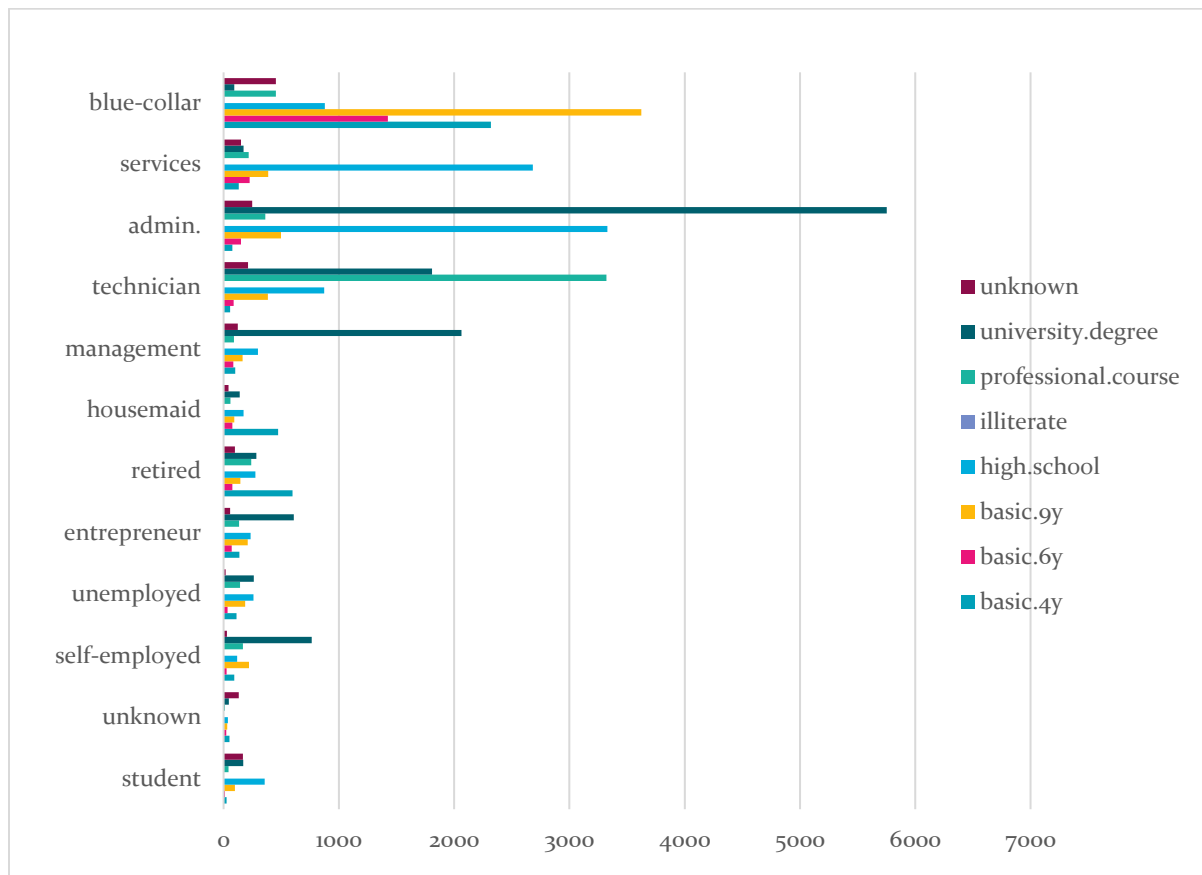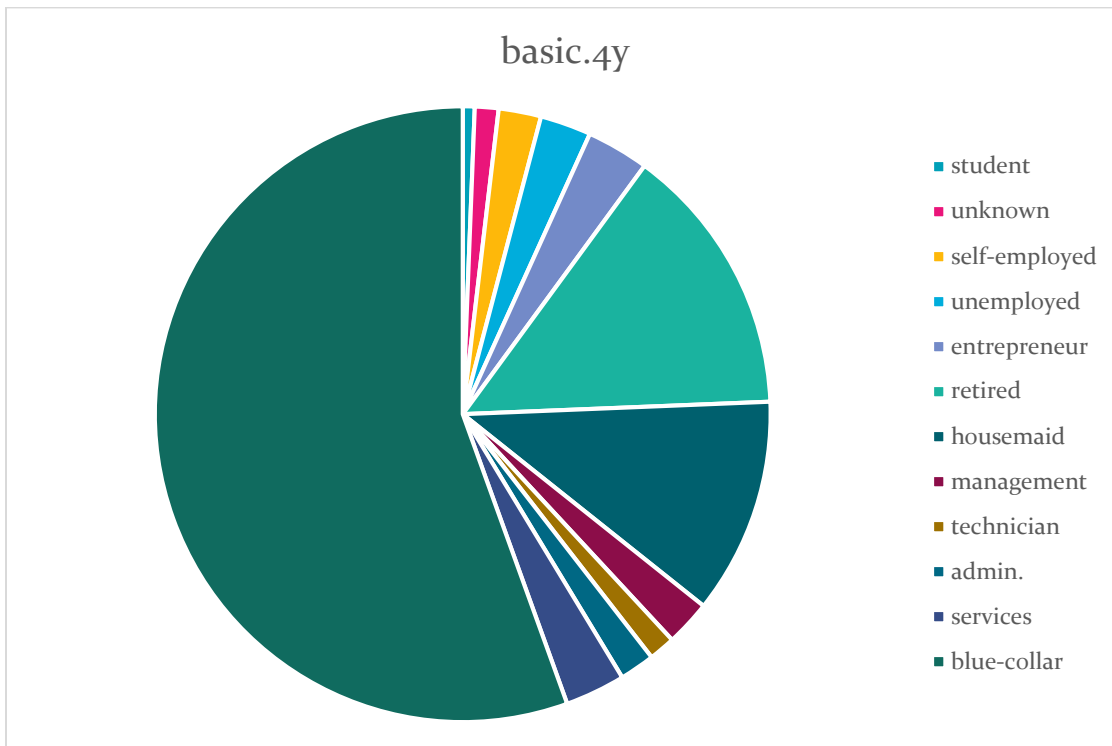
Analysis Results:

Count of Age Jobs	Education Level basic.4y	basic.9y	high.school	professional.course	university.degree
student	26	99	357	43	170
unknown	52	31	37	12	45
self-employed	93	220	118	168	765
unemployed	112	186	259	142	262
entrepreneur	137	210	234	135	610
retired	597	145	276	241	285
housemaid	474	94	174	59	139
management	100	166	298	89	2063
technician	58	384	873	3320	1809
admin.	77	499	3329	363	5753
services	132	388	2682	218	173
blue-collar	2318	3623	878	453	94
Grand Total	**4176**	**6045**	**9515**	**5243**	**12168**

The results include the following factors:

1. Total number of blue- collar who are educated at University Level: 94

2. Total number of services who are educated at Professional Course Level: 218

3. Total number of technicians who are educated at High School Level: 873

4. Total number of retired who are educated at Basic.4y Level: 597

5: Total number of entrepreneurs who are educated at High School Level: 234

Visualization:

basic.4y

- student
- unknown
- self-employed
- unemployed
- entrepreneur
- retired
- housemaid
- management
- technician
- admin.
- services
- blue-collar

- **Objective 3: -** Number of People who have house or not according to their Marital Status.

Introduction: A house is a building that functions as a home. They can range from simple dwellings such as rudimentary huts of nomadic tribes and the improvised shacks in shantytowns to complex, fixed structures of wood, brick, concrete or other materials containing plumbing, ventilation, and electrical systems. House is basic need in living of any being. Here we are talking about the availability of house according to their Marital Status.

General Description: It formulates a Pivot table by taking two columns from the whole data set namely Marital Status and Housing. We are going to analyze that how many persons have home or not if they are having marital status as single, divorced and married each. By the pivot table we can predict the possibility and find the count of people for each category.

Specific Requirements Functions and Formulas:

Requirements for this objective include the data columns named as "marital" and "Housing" from the Bank Marketing Dataset. The whole knowledge for pivot table, slicers, timeline and charts.

Analysis Results:

Count of Housing	Availability of Home		
			Grand
Marital Status	no	yes	Total
divorced	2092	2399	4491
married	11389	12951	24340
single	5097	6191	11288
Grand Total	18578	21541	40119

The results include the following factors:

1. Total number of divorced people who have house: 2399

2. Total number of divorced people who have no house: 2092

3. Total number of married people who have house: 12951

4. Total number of married people who have no house: 11389

5. Total number of single people who have house: 6191

6. Total number of married people who have house: 5097

Visualization:
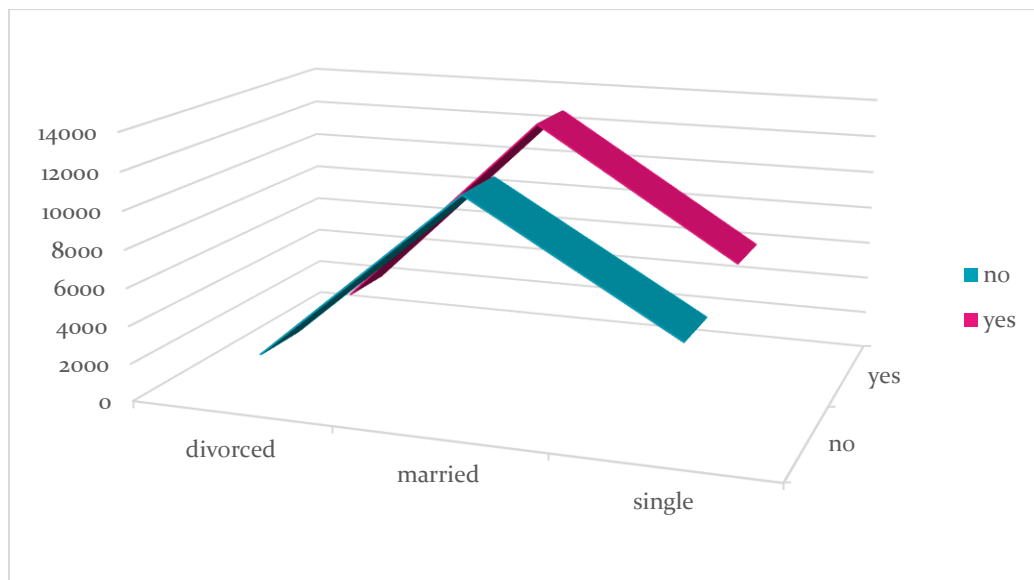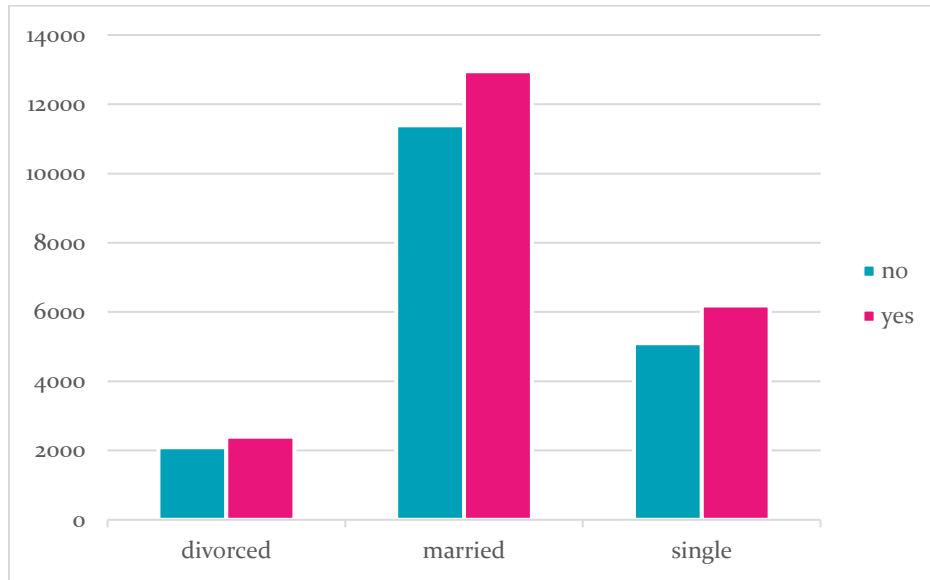
- **Objective 4: -** Number of People using the specific Contact Type

<u>Introduction:</u> Cellular refers to communications systems, especially the Advance Mobile Phone Service (AMPS), that divide a geographic region into sections, called cells. The purpose of this division is to make the most use out of a limited number of transmission frequencies.

A telephone, or phone, is a telecommunications device that permits two or more users to conduct a conversation when they are too far apart to be heard directly. As for bank to advertise it's useful to analyze which mode of contact customers are using and which is maximum.

<u>General Description:</u> For good marketing of any bank it's necessary to have contacts of customer to continuously ask customers for loans and offer them at good interest and earn profit. Bank marketing basically deals with making contacts and good and long-term relationship with customers. So, it's necessary to analyze how many customers are using cellular and telephone mode of contacts.

<u>Specific Requirements: -</u>

Requirements for this objective include the data columns named as "Cellular" from the Bank Marketing Dataset. The whole knowledge for pivot table, slicers, timeline and charts.
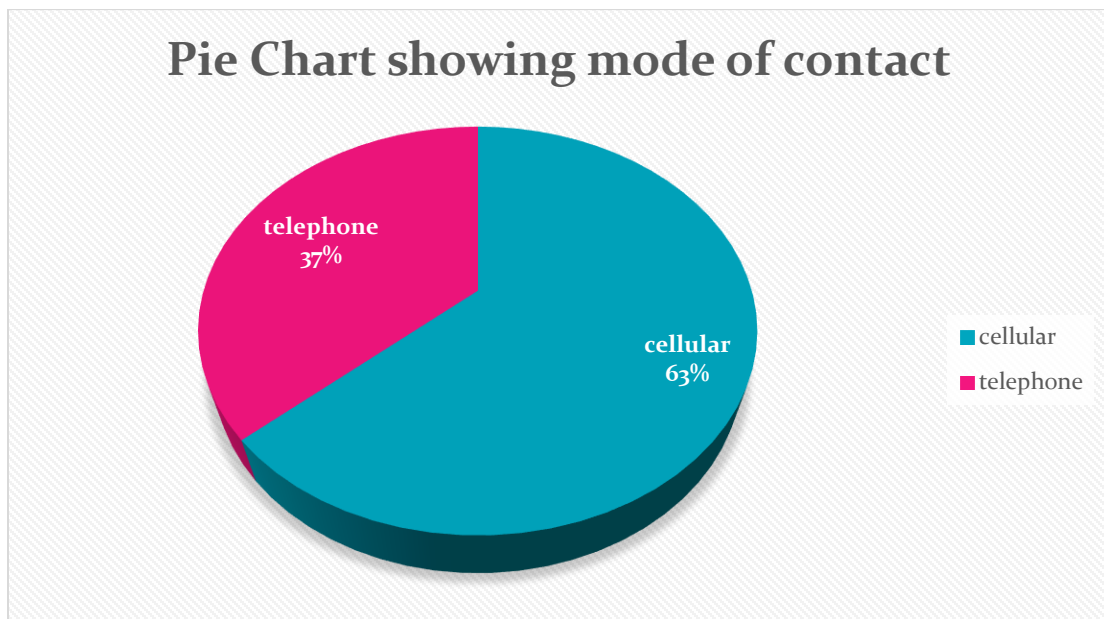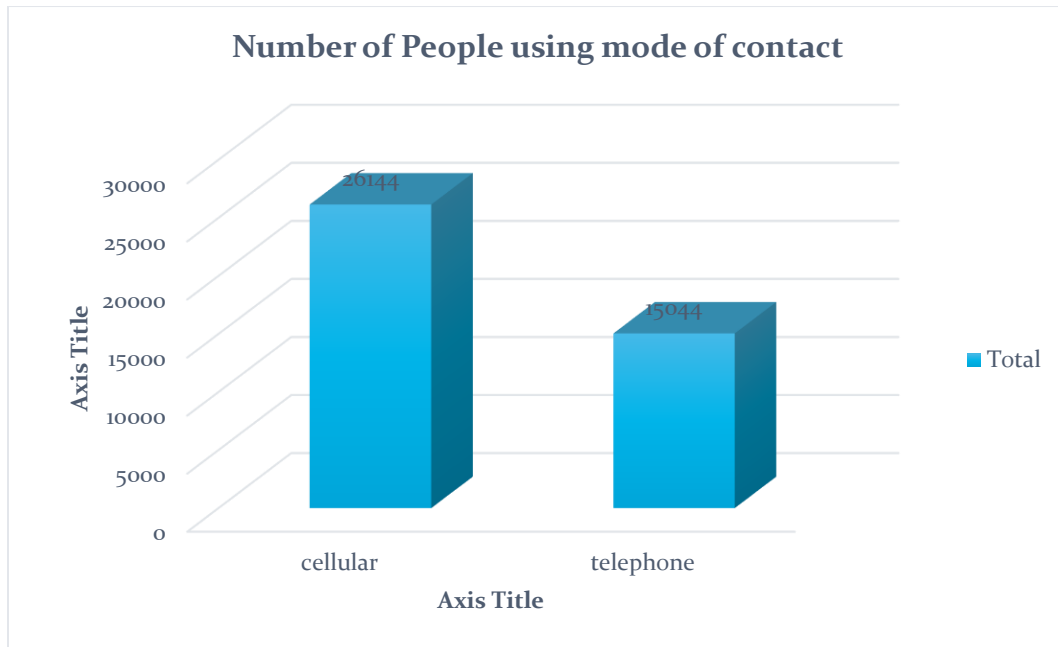
<u>Analysis Results:-</u>

Contact Type	Count of Contact
cellular	26144
telephone	15044
Grand Total	41188

The results include the following factors:

1. Total number of people who use cellular mode of contact: 26144

2. Total number of people who use telephone mode of contact: 15044

Visualization: -

- **Objective 5:** Total number of Successful deals after contacting through any mode

Introduction: Deal means an agreement or arrangement, especially in business. Talking about the bank it is very important to make profit. So, it's necessary to make customer convince and fulfil their requirements whether it's home loan, or education loan etc.

With the analysis of the Success conversion of phone call to both mode cellular and telephone. It will give us the number of people turns to be customer and other one number of people who are contacted and don't like the deal (Didn't take loan).

General Discription: It formulates a Pivot table by taking two columns from the whole data set namely "Contact" and "Success". The data first are inserted into Pivot Table, then the Pivot charts are drawn for visualizing the data insights. Slicers are inserted to quickly and easily filter the pivot tables.

Specific Requirements Functions and Formulas:

Requirements for this objective include the data for the State name and share released. The whole knowledge for pivot table, slicers, timeline and charts.
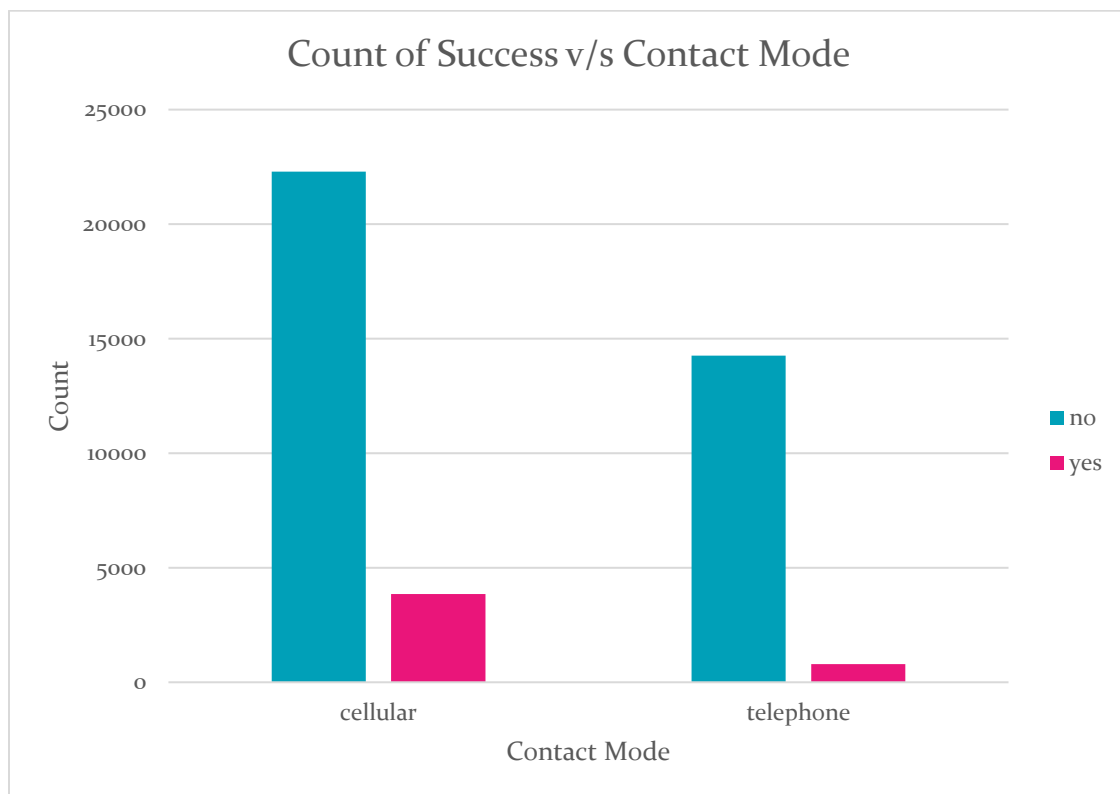
Analysis Results: -

| Count of Success	Success		
Contact mode	No	Yes	Grand Total
cellular	22291	3853	26144
telephone	14257	787	15044
Grand Total	36548	4640	41188

The results include the following factors:

1. Total number of people contacted by cellular and turns in to customer: 3853

2. Total number of people contacted by cellular and turns in to customer: 22291

3. Total number of people contacted by cellular and turns in to customer: 787

4. Total number of people contacted by cellular and turns in to customer: 14257

5. Total number of People who turns to be customer: 4640

6. Total number of People who turns to be customer: 36548

Visualization:
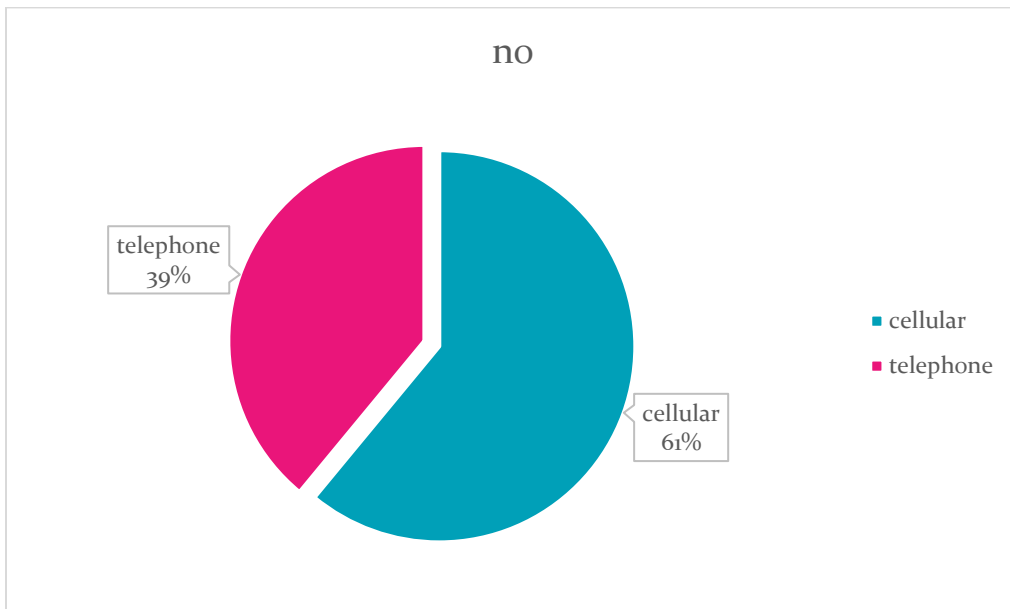
Screenshot of Dashboard:

LIST OF ANALYSIS WITH RESULT

1)<u>Marital Status Count:</u> From the Bank Marketing Dataset, we have column named as "Marital", this column will help us to check how many people are having their marital status as single, married or divorced. This also helps in finding that which type of people will take which type of loan.

Example: - Married people will prefer home loan than that of education loan.

<u>RESULT</u>:

1. Total number of divorced people: 4612

2. Total number of married people: 24928

3. Total number of single people: 11568

2) Number of People of each Job at each Education Level: This objective mainly focuses on the job according to the education level of the person. The Data is first imported then create Pivot table, after creating pivot table, visualize using graph and charts. Slicers are inserted to quickly and easily filter the pivot tables.

<u>RESULT:</u>

1. Total number of blue- collar who are educated at University Level: 94

2. Total number of services who are educated at Professional Course Level: 218

3. Total number of technicians who are educated at High School Level: 873

4. Total number of retired who are educated at Basic.4y Level: 597

5: Total number of entrepreneurs who are educated at High School Level: 234

3) Number of People who have house or not according to their Marital Status:

It formulates a Pivot table by taking two columns from the whole data set namely Marital Status and Housing. We are going to analyze that how many persons have home or not if

they are having marital status as single, divorced and married each. By the pivot table we can predict the possibility and find the count of people for each category.

RESULT:

1. Total number of divorced people who have house: 2399

2. Total number of divorced people who have no house: 2092

3. Total number of married people who have house: 12951

4. Total number of married people who have no house: 11389

5. Total number of single people who have house: 6191

6. Total number of married people who have house: 5097

4) **Number of People using the specific Contact Type**:

For good marketing of any bank it's necessary to have contacts of customer to continuously ask customers for loans and offer them at good interest and earn profit. Bank marketing basically deals with making contacts and good and long-term relationship with customers. So, it's necessary to analyze how many customers are using cellular and telephone mode of contacts.

RESULT:

1. Total number of people who use cellular mode of contact: 26144

2. Total number of people who use telephone mode of contact: 15044

5) **Total number of Successful deals after contacting through any mode:**

It formulates a Pivot table by taking two columns from the whole data set namely "Contact" and "Success". The data first are inserted into Pivot Table, then the Pivot charts are drawn for Visualizing the data insights. Slicers are inserted to quickly and easily filter the pivot tables.

RESULT:

1. Total number of people contacted by cellular and turns in to customer: 3853

2. Total number of people contacted by cellular and turns in to customer: 22291

3. Total number of people contacted by cellular and turns in to customer: 787

4. Total number of people contacted by cellular and turns in to customer: 14257

5. Total number of People who turns to be customer: 4640

6. Total number of People who turns to be customer: 36548

<u>FUTURE SCOPE</u>

In banking sector, basically banks deal with the profit by giving loans to its customers at some interest. The Job of analyst is to extract insights from data to increase the target audience. Greater the target audience greater will be the successful deals. To decide the target audience there are various factors. Some of them are Age, Job, Marital, Education, etc.

A bank can generate revenue in a variety of different ways including interest, transaction fees and financial advice. Traditionally, the most significant method is via charging interest on the capital it lends out to customer. The bank profits from the difference between the level of interest it pays for deposits and other sources of funds, and the level of interest it charges in its lending activities.

This difference is referred to as the spread between the cost of funds and the loan interest rate. Historically, profitability from lending activities has been cyclical and dependent on the needs and strengths of loan customers and the stage of the economic cycle. Fees and financial advice constitute a more stable revenue stream and banks have therefore placed more emphasis on these revenue lines to smooth their financial performance.

In the past 20 years, American banks have taken many measures to ensure that they remain profitable while responding to increasingly changing market conditions.

- First, this includes the Gramm–Leach–Bliley Act, which allows banks again to merge with investment and insurance houses. Merging banking, investment, and insurance functions allows traditional banks to respond to increasing consumer demands for "one-stop shopping" by enabling cross-selling of products (which, the banks hope, will also increase profitability).

- Second, they have expanded the use of risk-based pricing from business lending to consumer lending, which means charging higher interest rates to those customers that are considered to be a higher credit risk and thus increased chance of default on loans. This helps to offset the losses from bad loans, lowers the price of loans to those who have better credit histories, and offers credit products to high risk customers who would otherwise be denied credit.

- Third, they have sought to increase the methods of payment processing available to the general public and business clients. These products include debit cards, prepaid cards, smart cards, and credit cards. They make it easier for consumers to conveniently make transactions and smooth their consumption over time (in some countries with underdeveloped financial systems, it is still common to deal strictly in cash, including carrying suitcases filled with cash to purchase a home).

- However, with the convenience of easy credit, there is also increased risk that consumers will mismanage their financial resources and accumulate excessive debt. Banks make money from card products through interest charges and fees charged to cardholders, and transaction fees to retailers who accept the bank's credit and/or debit cards for payments.

By proper analysis of the dataset, it helps bank to target the particular type of customers. So future scope of the bank marketing is very high. Bank's whole marketing strategy reflects the successful deals of the customer.

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