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Project Submission Sheet – 2020/2021

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Continuous Assessment - II

BUSINESS INTELLIGENCE AND BUSINESS ANALYTICS

SPECIFICATION REPORT

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1 Abstract

The COVID 19 pandemic has changed the world in the ways we couldn't even begin to comprehend. It is believed to have impacted the economy of every major country in the world. The financial sector of every country has been affected the most. The people have found numerous ways to keep themselves engaged and sane during these hard times. One of the most emerging products in these recent times is the 'Do It Yourself' or DIY kits. These kits contain the detailed manual and the individual parts that can be assembled together to build a final item. These items include everything from cameras to model trains to crafty jewellery items. This project aims at contributing to the production industry, by enhancing overall production and distribution of this modern product that enables innovation and creativity within users. Due to the recent pandemic, many companies that produce customisable products have been affected. Our project will demonstrate how a company can improve sales and target market efficiently by making some changes in their Business Analytics and Business Intelligence systems.

A fictitious company *Arecibo Pvt. Ltd* is created which broadly represents almost all the aspects of the real companies in the industry. The sales, products and the customers data were mocked using random data generator and stored into the cloud based Customer Relationship Management(CRM) software(*Dynamics 365*). The database was created using a cloud based server(*Amazon Web Services*) and loaded into *Power BI* for visualising various trends with the help of interactive dashboards. With the use of various relevant tools, we have developed and implemented an improved model that aids in organising and analysing records of the company's development process, customer services and structure. This project will conclude the discussion of its merits and drawbacks by using visualisations.

2 Background

2.1 Organization Background and History

The Arecibo Pvt. Ltd. is a fictitious company created for the objective and scope of the project. Even though the company is fictitious, it emulates various aspects of the real companies in the DIY products industry. The concept and the idea of "Do it Yourself" i.e DIY has been around since the early 20th Century [1]. In simple terms, DIY is a procedure of building, altering or repairing things without the assistance of a professional. The idea of DIY has been associated with the customers since the early 1900s mainly in the domain of maintenance activities. When the globalisation started, the companies saw the opportunity and this concept was transformed into an enormous range of products in the DIY products industry that we see today. A DIY kit is basically a manual which contains detailed instructions on how to build different sorts of stuff like drones, cameras, model trains, jewellery, etc. and also the component parts needed to build it.

The Arecibo Pvt. Ltd. was established in the year 2004 in the county Dublin in Ireland under the name of "Dublin Toy stories" founded by Mr Ellen Cumberbatch, who was a simple carpenter. He created wood-based toys that could be assembled into creative shapes with unique patterns which aided in the growth of child development. These toys also encouraged families to spend time together while sharing the fun and creative aspects of the product. After nearly 10 prosperous years of the business, the company adopted the new strategies and started selling the DIY kits and products. Mr Ellen passed the company to his children, Mark and Ruben, who plan to evolve the organisation's structure and append new products toward their merchandise list. The new owners want to solely focus on creating a wide range of products that could be assembled in a fun way keeping up with the company's history. Hence they came up with 8 different types of products, each with 6 different categories(Tech, Science, Craft, etc.) that target different age demographics ranging from 10 - 50+. Therefore, they hired a technical data Analyst team, one of the best in the country, to analyse their Business Intelligence and Analytics system, revise, evaluate and provide a well-documented solution that can help understand the target market. They aim for a maximum amount of profit during the new launch of products just before the seasonal holidays.

2.2 Marketplace Participation

The founder, Mr Ellen Cumberbatch started the company with a local store in the heart of the Dublin city. He hand-created specific components that were assembled by the user to create unique models. At the time this concept was unique, novel and made an impact on the market. People bought these products in bulks for their loved ones for all occasions, and due to its uniqueness, it was ordered and delivered worldwide, which in turn generated a huge income for the company. Since the shift of the company's target market to the DIY kits, the company has been facing some challenges in maintaining their marketplace. Arecibo is still an emerging company and it would take some time to gain the trust of it's new customers. The company's owners have focused immensely on the quality of the products delivered. The trend in the sales and revenue over the past years assure the bright future for the company and it's employees as it aims to be the top company in the production and selling of the DIY products in the coming years.

The new owners aim to introduce a wide range of products to the market, which would target various market segments and demographics. They plan to use the company's rich history to capture and drive sales, and to make this venture successful they have hired a consultant analytics team to oversee their BI and BA system.

2.3 Vision

The Arecibo pvt. ltd. vision serves as a framework that guides every business decision with ethical implications, all the while providing our customers with quality products, games and gifts. The Arecibo aims to be the top DIY products manufacturing and selling company in the Europe spanning all the major cities and countries.

3 Objectives

- To provide our consumers with a unique experience.
- To invent an ethical culture that creates a bond between client and consumer.
- To smoothen the sales process in order to study the trends in the market efficiently.
- To promote a company where everyone plays a significant role in contributing to its growth, success and takes pride in the work.
- To boost sales and public outreach yet not to yield the quality of the products.

4 System Design

4.1 Process Flow

The following diagram depicts the different stages involved in the process of data collection. The process starts at the creation of *Leads* or prospective customer and ends at the *Invoice* generation stage where the order is considered to be complete. Figure 1 shows the process flow from the generation of Leads(i.e the potential customer) to the generation of invoice(i.e the completion of order).

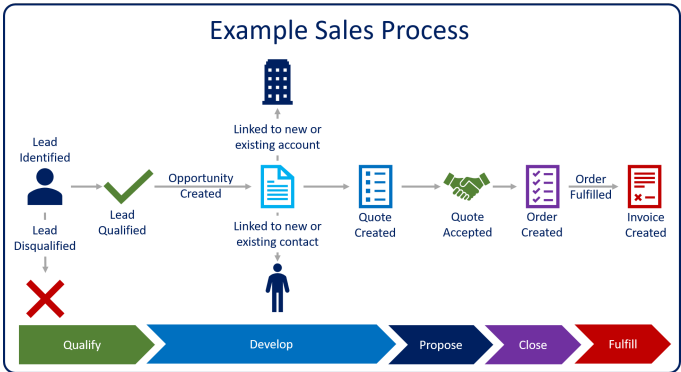


Figure 1: Process Flow Diagram

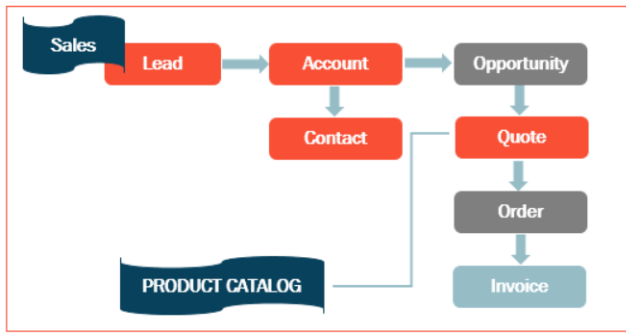


Figure 2: Sales to Product Catalog flow chain

4.2 Data Capture Points

The following table shows the data capture points in the database for Arecibo Pvt. Ltd.

Data Capture Points	
Capture Points	Data
Lead	Customers interested in buying the product(potential customers)
Opportunity	Details of engaged customers
Quote	Details of product preferences and price offered to the customers
Order	Details of product preferences and price agreed upon the customers
Invoice	Customer purchase details and order confirmation

Figure 3: Data capture points in the collected data

4.3 Analytical Requirements

When developing the analytical requirements for this company, we needed to identify and define any high-level business needs that the project might need to focus on by enhancing any existing or creating new requirements. We looked into details of their customer data, including Lead generating processes to end of the transaction completion. We created visuals from the database provided, studied them and revised a successful future strategy and investment for the company. To get a better picture of the analytical requirements of the solution, we focused on:

1. Identify the trends in the revenues that were generated by the products or services.
2. Analyze the clients' geographic location, types of services and products purchased by them in certain areas.
3. Focusing on the main trends created by the products and services provided over the previous years.
4. To study any unique patterns created over the years by comparing the Leads and Invoice ratio.

5 SWOT Analysis

SWOT Analysis is the careful and strategic planning approach that aids any business in identifying their *Strengths*, *Weaknesses*, *Opportunities* and *Threats* and plays a crucial role in the planning and management [2]. The internal factors consist of *Strengths* and *Weaknesses*, which are the resources and experience readily available to us, such as the company's financial and human resources. Whereas the external factors which can be categorised into *Opportunities* or *Threats*. To simplify, anything thing that our company cannot control, such as market trends, economic trends, fundings, political or environmental regulations.

SWOT diagrams can be particularly helpful when trying to determine whether or not to embark on a specific venture or plan by clearly analyzing and outlining the pros and cons of a business [3]. For businesses to remain successful in the long term, it is necessary to look at things from a wider perspective. The strategies need to be analyzed regularly to ensure the optimum performance and output of the company. SWOT analysis comes in handy for these kinds of analysis. Strengths refer to the robustness of the company. Weaknesses are the factors that make it difficult for the company to achieve its objectives. Opportunities refer to company's those external factors which can give it a competitive edge over

other companies in the market. Threats are anything that can cause harm or loss to the company or the product. Threats include anything from the rival companies in the market to the problems like supply shortages. The SWOT diagram for the Arecibo Pvt. Ltd. is shown in Figure 5



Figure 4: SWOT Analysis - Elements



Figure 5: SWOT Analysis for the Arecibo Pvt. Ltd

6 Database Design

6.1 Entity Relationship Diagram (ERD)

Entity Relationship Diagrams, also known as ERD is a visual depiction of the inter relationships or connections between the different *entities* in a database. An entity is a determinable thing or a concept within a database. In layman's terms, an entity is a table which has several properties known as the *attributes* or columns in it. A primary key is a unique attribute which defines an entry or record in a table. ER diagrams come in handy while creating database for an organisation since it allows to study the connections between different stages of the sales process and hence make wise decisions for the organization. Figure 6 explains the concept of entities and attributes. The ER diagram for the Arecibo pvt. ltd. is shown in the Figure 14.

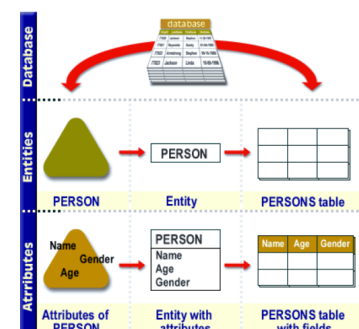


Figure 6: Entity and Attributes in a database

7 Data Dictionary

7.1 Leads

LEADS		
Attribute Name	DataType	Description
Lead_ID	String/Integer	Unique ID for potential customer
First_Name	String	First Name of potential customer
Last_Name	String	Last Name of potential customer
Full_Name	String	Full Name of potential customer
Email_address	String/Integer	Email address of the potential customer
Product_Name	String	Name of the product
Product_ID	String/Integer	Unique ID of the product
Date_Of_Birth	String	Date of Birth of potential Customer
Lead_Created_On	Date	Date on which the lead was generated
Product_Category	String	Category of the product

Figure 7: Leads(Potential Customers) data dictionary

7.2 Opportunities

OPPORTUNITIES		
Attribute Name	DataType	Description
Lead_ID	String/Integer	Unique ID for potential customer
Opp_ID	String/Integer	Unique ID for engaged customer
Product_ID	String/Integer	Unique ID for product being offered
Product_Name	String	Name of the product being offered
Email_address	String/Integer	Email address of engaged customer
Created_On	Date	Date on which opportunity was created
Closed_Date	Date	Date on which opportunity was closed
Estimated_Revenue	Integer	Estimation of the revenue that will be generated
Actual_revenue	Integer	Actual revenue that is generated by the engaged customer
Description	String	Status of the customer engagement (Won, Lost, Open)
Rating	String	Rating of the engaged customer (Hot, Warm, Cold)
Last_Modified_By	String	Name of the agent who last engaged with the customer
Probability	Integer	Estimated Probability of customer qualification

Figure 8: Opportunities(Engaged Customers) data dictionary

7.3 Accounts

ACCOUNTS		
Attribute Name	DataType	Description
Lead_ID	String/Integer	Unique ID for potential customer
Opportunity_ID	String/Integer	Unique ID for engaged customer
Account_ID	String/Integer	Unique ID for customer account
Full_Name	String	Full Name of potential customer
City	String	City of the customer
Email_address	String	Email address of customer
Phone_no	Integer	Phone number of the customer
Status	String	Status of customer account (Active/Inactive)

Figure 9: Accounts data dictionary

7.4 Quotes

QUOTES		
Attribute Name	DataType	Description
Lead_ID	String/Integer	Unique ID for potential customer
Opportunity_ID	String/Integer	Unique ID for engaged customer
Account_ID	String/Integer	Unique ID for customer account
Quote_ID	String/Integer	Unique ID for customer quote
Product_Name	String	Name of product which is of interest
Product_ID	String/Integer	Unique ID of product which is of interest
Product_Category	String	Category of product which is of interest
Actual_Revenue	String	Actual Revenue generated
Email_address	String	Email address of Customer
Status	String	Status of Customer Engagement (Won/Active/Closed)

Figure 10: Quotes data dictionary

7.5 Orders

ORDERS		
Attribute Name	DataType	Description
Lead_ID	String/Integer	Unique ID for potential customer
Opportunity_ID	String/Integer	Unique ID for engaged customer
Account_ID	String/Integer	Unique ID for customer account
Quote_ID	String/Integer	Unique ID for customer quote
Order_ID	String/Integer	Unique ID for customer order
Product_Name	String	Name of product being ordered
Product_ID	String/Integer	Unique ID of product being ordered
Product_category	String	Category of the product ordered
Actual_Revenue	String	Actual Revenue generated
Email_address	String	Email address of customer

Figure 11: Orders data dictionary

7.6 Invoice

INVOICES		
Attribute Name	DataType	Description
Lead_ID	String/Integer	Unique ID for potential customer
Opportunity_ID	String/Integer	Unique ID for engaged customer
Account_ID	String/Integer	Unique ID for customer account
Quote_ID	String/Integer	Unique ID for customer quote
Order_ID	String/Integer	Unique ID for customer order
Invoice_ID	String/Integer	Unique ID for customer invoice
Product_Name	String	Name of the product of interest
Product_ID	String/Integer	Unique ID of the product of interest
Actual_Revenue	Integer	Actual Revenue generated
Email_address	String/Integer	Email address of Customer
Phone_no	Integer	Phone number of the customer

Figure 12: Invoices data dictionary

7.7 Products

PRODUCTS		
Attribute Name	DataType	Description
Product_ID	String/Integer	Unique ID for product in inventory
Product_Name	String	Name of product in inventory
Product_Category	String	Category of product
Age_Group	Integer	Suitable age group of the customer for the product
Status_of_Product_availability	String	Status of product availability (Available/Unavailable)

Figure 13: Products data dictionary

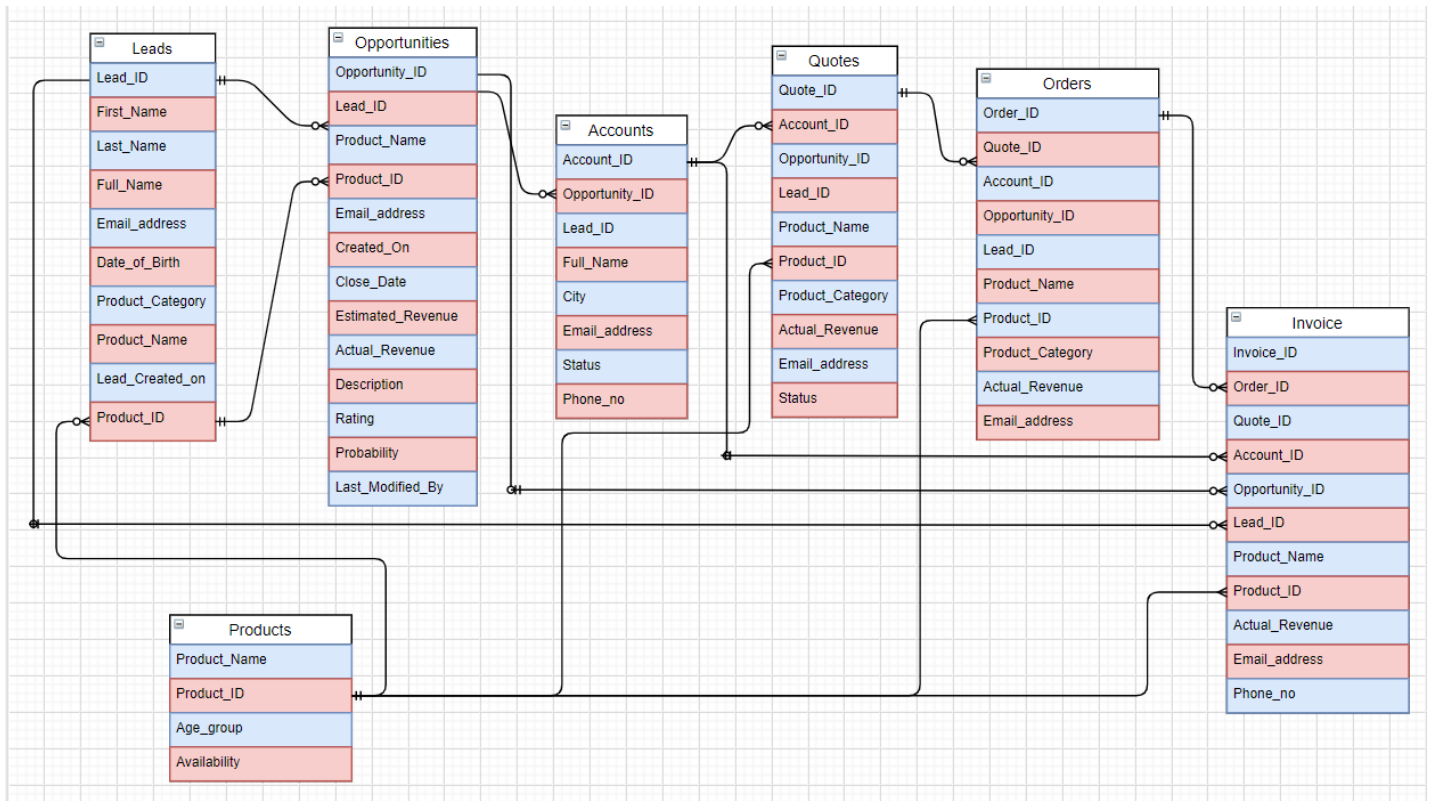


Figure 14: Entity Relationship Diagram for Arecibo Pvt. Ltd.

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