The Global Problem Statement

Introduction

E-commerce websites are an important avenue for businesses to reach customers and generate sales. With increasing competition and evolving customer needs, it has become challenging for businesses to attract and retain customers. In this context, it is essential for e-commerce portals to constantly evaluate their performance and identify ways to increase sales.

The Problem

Synergix Solutions is a multinational consumer goods e-commerce company that sells a wide range of consumer products. With a strong presence in the market, the company continually strives to enhance its market share, drive revenue growth, and strengthen its brand equity. The Company's e-commerce portal was launched two years ago, and it has been successful in attracting customers from various parts of the world. However, in the recent past, the sales have not been increasing as predicted, and the management is concerned about the future of the business. They have tried various strategies such as discounts, promotions, and ads but these have not yielded desired results. The management believes that there may be underlying issues that need to be addressed to improve sales performance.

The Task

Throughout this professional certificate program, you will be solving a business problem holistically leveraging data science. Learners focus on breaking down a complex real business problem into smaller manageable parts using a structured approach and then solving each part using tools like Python, SQL, Power BI and machine learning. In the end, learners will craft compelling data stories enabling informed decision-making. Throughout, the tools and techniques play the role of enablers – they are always the means to an end, and not themselves the goal.

Deep Dive into the Problem

In the course, **Python for Data Science**, we will explore how to:

1. Collect, clean, and combine data from the Point-of-Sale dataset and Online Promotions Dataset. Imagine putting together pieces of a puzzle. You'll also learn how to organize time-related information, so that we can understand patterns like how things change over the different months of the year. This is called **Data Wrangling.**
2. After this, you'll delve into understanding your data better. You'll learn how to describe your data in simple ways and visually display what it looks like. You'll also

see how different parts of your data relate to each other and you'll use some tools to figure out if differences you see are real or just by chance. This is called **Exploratory Data Analysis.**

3. After Exploratory Data Analysis, you will perform **Data Pre-processing.** This is like preparing ingredients for cooking. You'll learn how to deal with missing data, so your analysis doesn't get messed up. You'll also learn how to change the way your data looks so it's easier to understand, like bringing the various features to the same scale. And you'll learn how to spot unusual bits of data that might not fit in.
4. Finally comes **Feature Engineering**. Imagine you have a bunch of colors, and you want to mix them to create new shades. That's what this is about, but with data. You'll learn how to use your data to create new things that can help you better address business problems. And this will become invaluable for machine learning modelling which we might want to do next.

Two of the datasets that are provided to us by Synergix Solutions are:

- **Point of Sales (POS) Data**, which captures transactional information like SKU ID, date, manufacturer, sector and so on, and sales metrics like revenue and units sold. It also has engagement data in the form of page traffic.
- **Online Promotions Data**, which includes SKU_ID, date, Online Clicks, Online Cost, and Online Impressions. This lets us look at the effectiveness of digital campaigns and can help us optimize promotional strategies.

Course Focus

In this course **<Python for Data Science>**, you will look into the issue <Increasing Marketing Effectiveness, for example - “how can the company increase return on investment on marketing initiatives>. Using the various techniques of <Data Wrangling, Exploratory Data Analysis, Data Pre-Processing and Feature Engineering > you would solve the issue and similar issues highlighted below. Happy problem learning.