**Ideation phase**

**Defining the problem statements**

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| **Date** | **30-09-2023** |
| **Team Id** |  |
| **Project name** | **Market basket insights** |

**Market Basket insights**

**Problem Definition and solution**

Introduction

Since the common corner stores from the 1900s, until the new e-commerce that has shaken the retail world to its core. This changing process has lead to new era possibilities for the commerce and the consumer. In the past, when the consumer had to buy something, they only could choose a product from the catalog of the store. However, with the new era of information and globalization, the list of options has increased exponentially. Now consumers can choose between a huge variety of products. All of this, caused that companies have a limitless possibilities nowadays. However, this limitless of possibilities caused a huge amount of new competitors as well. Companies have being forced to think new strategies in order to attract new customers or keep its customers.

**Definition**

**Market basket insights:**

**Market basket analysis** is a data mining technique used by retailers to increase sales by better understanding customer purchasing patterns. It involves analyzing large data sets, such as purchase history, to reveal product groupings, as well as products that are likely to be purchased together.

In market basket analysis use mostly in three domain:

**First domain:**

* The first domain is the creation of personalized recommendations which is a very well know methodology nowadays. During the explosion of the e-commerce, personalized recommendations have appeared as a part of the marketing process. Basically, the idea consists of suggesting items to customer based on his/her preferences. The first way to do it is, by suggesting items like the ones that the customer have purchased in the past which is also called collaborative filtering. The second way is, looking for similar customers and recommending items that had been purchased by others. It is called content-based filtering.

**second domain:**

* The second domain where market basket analysis is used in the analysis of spatial distribution in chain stores. Due the increasing number of products that nowadays exist, physical space in stores started to be a problem. More and more, stores invest money and time trying to find which distribution of items can lead them to obtain more sells. Due to that, knowing in advance which items are commonly purchased together, the distribution of the store can be changed in order to sell more products.

**Third domain:**

* The last domain is in the creation of marketing strategies which focus on discounts and promotions which is solely based on customer’s behavior through which special sales or targeted promotions can be performed. When sales campaigns are prepared, promoted items must be chosen very carefully. The main goal of a campaign is to entice customers to visit the store and buy more than they usually do. Profit margins on promoted items are usually cut; therefore, non-promoted items with the higher profit margin should be sold together with the promoted items. Therefore, the items chosen should make the promotion effective enough to generate higher sale.

**Types of market basket analysis:**

* **Predictive market basket analysis.** This type considers items purchased in sequence to determine cross-sell.
* **Differential market basket analysis.** This type considers data across different stores, as well as purchases from different customer groups during different times of the day, month or year. If a rule holds in one dimension, such as store, time period or customer group, but does not hold in the others, analysts can determine the factors responsible for the exception. These insights can lead to new product offers that drive higher sales

**Top of Form**

**WORKING METHOD**

Market Basket Analysis is generally powered by association rule mining, a data mining technique. The primary metrics include:

1. **Support**: Proportion of transactions in which the itemset appears.
2. **Confidence**: Proportion of transactions with item X, in which item Y also appears.
3. **Lift**: Increase in the probability of buying Y when X is purchased.

**Key insights:**

1. **Product Placement**: If two products are often bought together, they can be placed close to each other in the store.
2. **Cross-Selling**: In online retail, if a customer adds a product to their cart, other products that are frequently bought together with that product can be suggested.
3. **Promotions**: Bundled promotions can be designed for products that are frequently bought together.
4. **Inventory Management**: Knowing what products are frequently bought together can help in better inventory management.
5. **Personalized Marketing**: Send targeted offers based on a customer's purchase history.

**Challenges:**

1. **Data Size**: Transaction datasets can be huge, and analyzing them can be resource-intensive.
2. **Dynamic Patterns**: Buying patterns can change, so analysis should be done regularly.
3. **Spurious Associations**: Not all product associations make practical sense. Care should be taken to interpret results.

**Application:**

1. **Supermarkets**: Optimize shelf arrangement, offer bundled discounts.
2. **E-commerce platforms**: Recommend products, bundle offers, or design promotions.
3. **Content providers (like Netflix)**: If viewers often watch two shows or movies consecutively, suggest them together.

**Problems:**

1. **Data Overload**: With the proliferation of data sources, businesses often struggle to decipher which data points are relevant.
2. **Quality of Data:** Not all data is useful or accurate. There's a lot of noisy, irrelevant, or even misleading data that businesses must sift through.
3. **Dynamic Market Conditions:** Consumer preferences, technological advances, and competitive landscapes evolve, which can quickly render insights obsolete.
4. **Interpretation Bias:** There's a risk of interpreting the data in a way that aligns with preconceived beliefs, leading to flawed strategies.
5. **Costly Research:** Comprehensive market research can be expensive, especially for small businesses.
6. **Integration with Strategy:** Even after deriving insights, integrating them into an actionable strategy can be challenging.
7. **Short-term vs. Long-term:** Balancing short-term operational needs with long-term strategic insights can be difficult.
8. **Cultural and Regional Differences**: A strategy or insight that works in one region or cultural setting might not be effective elsewhere.

Design Thinking

1. **Use Advanced Analytics Tools:** Implement tools that can handle big data, like AI and machine learning algorithms, to sift through large datasets and pinpoint relevant insights.
2. **Data Validation:** Regularly update and validate the data sources. Cross-reference with multiple sources to ensure accuracy.
3. **Continuous Monitoring:** Instead of occasional market research, set up continuous monitoring mechanisms to keep abreast of market changes.
4. **Diverse Teams:** Ensure that the team analyzing the data is diverse to counteract individual biases. It's also helpful to bring in external perspectives occasionally.
5. **Cost-effective Research Methods:** Utilize online surveys, social media analytics, and other cost-effective tools for gathering insights.
6. **Iterative Strategy Development:** Build strategies in iterations. Start small, test, learn, and then scale or adjust.
7. **Balanced KPIs:** Establish KPIs (Key Performance Indicators) that consider both short-term results and long-term growth.
8. **Localized Strategies:** Instead of a one-size-fits-all strategy, develop localized strategies for different regions or cultural groups based on specific insights for each.

**Conclusion:**

Market-based insights are indispensable for businesses aiming to maintain a competitive edge. While the process of extracting these insights is riddled with challenges, ranging from data quality issues to the rapid evolution of market conditions, solutions are available. By leveraging advanced analytical tools, ensuring data accuracy, and embracing iterative and localized strategies, businesses can navigate these challenges effectively. Continuous monitoring and feedback mechanisms further ensure that strategies remain relevant and responsive in a dynamic marketplace. In essence, the right approach to market-based insights can significantly enhance business decision-making and drive growth.