**Assignments: ALY6080 90325 Integrated Experiential Learn SEC 03 Summer 2023 CPS [BOS-1-HY]**

**Module 1 Assignment — Individual Project Proposal Expectations**

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**Advanced Analytics Approach to Customer Lifetime Value Optimization for Locally Inspired**

1. **Statement of Purpose**

Locally Inspired is an innovative, community-focused retail store that thrives on providing high-quality, handcrafted products representing the talents of local Wisconsin artisans. While the retail store has been successful, there is a need to take a strategic step towards enhancing the customers' experience, improving customer retention, and increasing overall profitability.

The underlying business question is, "How can Locally Inspired predict and maximize Customer Lifetime Value (CLTV)?" Understanding and enhancing CLTV is a proven approach to boost a company's long-term financial performance. By proposing this project, we aim to develop a predictive model and an interactive dashboard to better understand the buying behavior of our customers and subsequently increase their CLTV. This proposal will help Locally Inspired not only to retain loyal customers but also to increase the monetary value each customer brings.

1. **Scope of the Project**

The proposed project focuses on the development and implementation of an analytical tool that can accurately predict the CLTV of Locally Inspired's customers. The deliverables for this project include:

1. An analytical model that accurately predicts the CLTV based on customer purchase history.
2. A dynamic, interactive dashboard that allows real-time visualization of critical customer metrics (Recency, Frequency, and Monetary Value).
3. A comprehensive report providing strategic recommendations to enhance customer engagement and increase CLTV based on the insights derived from the model and the dashboard.
4. **Background Research and Literature**

Extensive research has underscored the importance of CLTV in business strategy. A study by Gupta et al. (2006) strongly suggests that CLTV is a crucial driver of a firm's value, emphasizing the need for data-driven models to predict CLTV accurately. Additionally, Kumar and Reinartz (2012) stressed the significance of managing CLTV to improve a firm's profitability. These findings provide a strong rationale for implementing this project at Locally Inspired.

Successful implementation of similar projects in the retail sector has led to increased customer loyalty and improved revenues. For instance, a prominent online retail store implemented a CLTV predictive model, resulting in a significant increase in its customer retention rate and overall profitability. This past success offers promising prospects for Locally Inspired as well.

1. **Design and Data Collection Methods**

Our proposed CLTV project for Locally Inspired involves a comprehensive plan for identifying key customer metrics, calculating CLTV, and presenting this information in a format that is both accessible and easy to interpret. In order to ensure the accuracy and effectiveness of our project, we will follow a methodical approach based on the following steps:

1. **Identify necessary columns:** From the dataset provided, we'll isolate the columns that will be pivotal in our calculation of CLTV. The necessary columns from the Locally\_Inspired\_Order\_1\_1\_23\_5\_31\_23 dataset include 'Email', 'Total', and 'Created at'. The 'Email' field will serve to identify unique customers, 'Total' will inform us of the amount spent by the customer, and 'Created at' will allow us to determine the customer's tenure. Since there isn't a specific column indicating customer churn, we'll derive this by considering customers with no purchases within a recently defined period as churned.
2. **Calculate individual customer metrics:** Our focus will be to establish the Recency, Frequency, and Monetary Value for each customer. The recency metric will be determined by how recent the customer's last purchase was. The frequency will refer to the number of purchases made by the customer, thus indicating their purchase habits. Monetary Value will represent the average amount the customer spends. These three metrics will form the backbone of our CLTV calculations.
3. **Calculate CLTV:** The calculation of Customer Lifetime Value hinges on the metrics derived above. We'll calculate the CLTV using the following formula: CLTV = (Customer\_Value / Churn) \* Profit\_margin. Here, Customer Value is determined by the product of Average\_Order\_Value and Purchase\_Frequency. We'll assume a profit margin as part of our calculations since it's not provided in the dataset. It is important to note that while this approach provides a straightforward way to calculate CLTV, it is dependent on the specific nature of the business, the products it offers, and the purchase cycle of its customers. Therefore, we might need to refine our calculations to better suit Locally Inspired's unique business context.
4. **Visualization and Presentation:** To ensure that our findings are easily understandable, we'll resort to visual representation techniques. We'll use graphical methods like histograms, pie charts, and bar graphs, which are intuitive and simple to interpret. These visuals will be created using the 'ggplot2' and 'plotly' packages in RStudio. The goal is to create a visual narrative that highlights key takeaways about Locally Inspired's customer value.

Ultimately, the purpose of this analysis is to uncover who the most valuable customers are, how they can be retained, and what strategies can be employed to increase the value of less profitable customers. The data collection and design methods we plan to use are geared towards this goal, promising a fruitful result for Locally Inspired.

1. **Implementation Methodology and Strategies**

The implementation of this project will be informed by the methodologies discussed in two key research studies: "An Analysis of Mechanism for Customers' Purchase Amount and Number of Visits in Department Store" by Hiroki Yamada and Tadahiko Sato, and a chapter focusing on customer lifetime value (CLV), customer retention, and churn.

The first research piece suggests the use of a hierarchical Bayes regression model to analyze customers' purchasing amounts and a hierarchical Bayes Poisson regression model to estimate the number of visits. These models aim to reveal the hidden heterogeneity within customer behaviors and thus offer more precise predictions. In our case, we will apply these models to analyze and predict the Recency, Frequency, and Monetary Value of Locally Inspired's customers, which are key components for CLTV calculation.

The second study illuminates how to calculate CLV effectively in different market situations and emphasizes the critical role of customer retention and churn in the calculation of CLV. Based on the market nature of Locally Inspired, which is a non-contractual market, we will focus on churn probability, customer migration, and lifespan for CLTV calculation. Given the potential heterogeneity in our customer base, we will lean towards probabilistic models rather than deterministic ones. This decision aligns with the recommendation from the research, as deterministic models may overlook individual variations in customer behaviors.

Data analysis and model development will be performed in RStudio, leveraging its powerful and versatile libraries for statistical analysis and modeling. To address the issue of unobserved customer defection, survival analysis methods will be adopted, which are particularly effective in estimating customer churn rates and lifespan in non-contractual settings.

The interactive dashboard will be built using the 'Shiny' package in R. It will provide real-time visualization of key customer metrics and CLTV predictions. The dashboard will also allow for data manipulation and scenario analysis to facilitate more informed decision-making.

Upon completion of the model development and dashboard creation, we will conduct a validation phase where we test the model against unseen data to assess its prediction accuracy. Refinements will be made as necessary to improve the model's performance.

1. **Conclusion**

Predicting and optimizing CLTV is a strategic initiative that can significantly influence Locally Inspired's growth trajectory. Through the development and implementation of a predictive model and a real-time dashboard, the retail store can gain valuable insights into its customers' buying behavior. This knowledge can further drive effective strategies that enhance customer retention and boost the monetary value of each customer.

By focusing on Recency, Frequency, and Monetary Value of customer transactions, Locally Inspired can significantly improve its understanding of its customers, which is the cornerstone of any successful retail business. With the proposed tools in place, Locally Inspired can expect a stronger customer base, increased customer loyalty, and consequently, improved profitability.

**References:**

Castéran, H., Meyer-Waarden, L., Reinartz, W. (2022). Modeling Customer Lifetime Value, Retention, and Churn. In: Homburg, C., Klarmann, M., Vomberg, A. (eds) Handbook of Market Research. Springer, Cham. <https://doi.org/10.1007/978-3-319-57413-4_21>

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