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

**Module 6 Assignment — XN Project: Project Roadmap**

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**NORTHEASTERN UNIVERSITY**

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**Submitted by**

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**Instructor**

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**Date**

07/30/2023

**Locally Inspired** **XN Project: Project Roadmap**

**Analytic Approach**

Our project will leverage a two-pronged analytical approach: a prediction model for forecasting future sales and a visualization tool to communicate results in a user-friendly way.

* *Prediction Model:* (Aug 1-10)  
  We plan to use supervised Machine Learning algorithms for sales prediction. Based on initial data exploration, we anticipate that a Time Series model may be effective, although we will also consider alternative models such as Random Forest and XGBoost. We will use cross-validation for model selection and parameter tuning to optimize prediction accuracy. Python libraries like pandas and scikit-learn will be used for data manipulation and model implementation.  
  + Hanchen Xu and Haoran Wang will conduct preliminary data exploration and cleaning.
  + Puchang Yin and Zihan Ma will start model selection and initial testing.
* *Data Visualization:* (Aug 11-15)  
  To ensure our outputs are comprehensible to stakeholders, we will use Rstudio to create intuitive and interactive visualizations. We aim to make complex data and analytics results accessible and meaningful to our sponsor, who does not have a background in analytics. We will leverage R packages such as ggplot2 for static plots and plotly or Shiny for creating interactive visualizations.  
  + Zihan Ma and Puchang Yin will identify key metrics to visualize and create initial drafts using Rstudio.
  + Hanchen Xu and Haoran Wang will provide feedback and suggest enhancements.

**Milestones**

* *Module 7 - Mid-Term Presentation & Project Scope Document:* (Due Aug 6 at 11:59 pm)
  + Aug 1-3: Prepare Mid-Term Presentation (All)
  + Aug 4-5: Prepare Project Scope Document (All)
  + Aug 6: Review and Finalize Documents (All)
* *Module 10 - Project Draft:* (Due Aug 20 at 11:59 pm)
  + Aug 7-12: Finalize Prediction Model (Puchang Yin & Zihan Ma)
  + Aug 13-17: Develop Initial Visualizations (Zihan Ma & Hanchen Xu)
  + Aug 18-19: Compile Draft and Review (All)
* *Module 11 - Final Draft:* (Due Aug 27 at 11:59 pm)
  + Aug 21-23: Incorporate Feedback into Model and Visualizations (All)
  + Aug 24-26: Compile Final Draft and Review (All)
* *Module 12 - Project Deliverable, Presentation, and Slide Deck:* (Due Aug 28-29 at 11:59 pm)
  + Aug 28: Finalize Project Deliverable (All)
  + Aug 29: Finalize Presentation Slide Deck (All)
* *Module 12 - Individual Contribution:* (Due Aug 30 at 11:59 pm)
  + Aug 30: Document Individual Contributions (All)

**Job Assignments**

Hanchen Xu: Preliminary Data Cleaning, Feedback on Visualizations, Mid-Term Presentation, Project Scope Document, Final Draft Review, Finalize Project Deliverable, Document Contributions.

Haoran Wang: Preliminary Data Cleaning, Feedback on Visualizations, Mid-Term Presentation, Project Scope Document, Final Draft Review, Finalize Project Deliverable, Document Contributions.

Puchang Yin: Model Selection & Testing, Initial Visualization Drafts, Mid-Term Presentation, Project Scope Document, Incorporate Feedback into Model, Final Draft Review, Finalize Project Deliverable, Document Contributions.

Zihan Ma: Model Selection & Testing, Initial Visualization Drafts, Mid-Term Presentation, Project Scope Document, Incorporate Feedback into Model, Final Draft Review, Finalize Project Deliverable, Document Contributions.

**Key Risks and Mitigation Strategies**

* *Sponsor Satisfaction:*   
  Sponsor Satisfaction: We understand the importance of meeting the sponsor's needs, who is a non-technical stakeholder. To mitigate this risk, we will engage in frequent and clear communication with the sponsor, validating our understanding of the business objective and adjusting our approach based on feedback. (All)
* *Effectiveness of the Predictive Model:*   
  Predictive modeling is a complex process and it's possible our initial models may not perform as expected. We will mitigate this risk by iterating our approach, considering a range of models and tuning parameters to find the most effective solution. (Puchang Yin & Zihan Ma)
* *Data Cleaning/Imputation:*   
  As the datasets contain missing values and potential outliers, the quality of the data poses a significant risk. We will mitigate this risk by implementing robust data cleaning processes and using appropriate techniques for handling missing data. (Hanchen Xu & Haoran Wang)

**Measure of Success**

Technical indicators: The technical quality of our predictive model will be evaluated through measures such as RMSE, MAE, and R-Squared. The model's predictive accuracy will need to be superior to simple baseline models (e.g., historical average sales).

Non-technical indicators: A successful project will also meet the sponsor's expectations and contribute to their business objectives. This includes the quality of visualizations and the usability of our deliverables. Sponsor feedback will be a crucial measure of success here.

**Presentation Method**

We will aim to provide an exemplary proof of concept presentation by adhering to the following criteria:

* *Content Organization:* We will structure our presentation logically, introducing our business understanding, analytical approach, key findings, and business recommendations in a coherent flow.
* *Visual Appeal:* We will use visually appealing and clear graphics to illustrate our insights. We will ensure that our visualizations are easy to understand for a non-technical audience.
* *Delivery:* We will aim for a clear and concise narration, emphasizing key points with variations in volume and inflection to hold the audience's attention.
* *Writing:* Our presentation will use clear language to explain abstract concepts. We will ensure no errors related to organization, grammar, style, and citations are present in our work.

**References:**

Locally inspired. Locally Inspired WI. (n.d.). <https://locallyinspiredwi.com/>