

Assignment: HelloPrints Quotation Process

Background

Approximately 20% of HelloPrint's revenue comes from customer inquiries requesting quotes for standard and non-standard products or services. To offer competitive pricing and ensure profitability, we communicate extensively with customers and pre-approved suppliers. Our current manual process for handling these inquiries is inefficient, resulting in longer lead times and negatively impacting our chances of securing the business.

Your task is to design a solution that automates this quotation process by leveraging data analytics and AI techniques. The goal is to create a system that:

- Efficiently gathers and aggregates quotes from multiple suppliers.
- Analyzes and scores incoming quotes based on factors such as cost, delivery time, and supplier reliability.
- Optimizes the final quotation to maximize the likelihood of customer acceptance while ensuring the company meets its margin requirements.
- Integrates with our existing CRM/ERP systems for seamless data exchange.

Objectives

1. Customer Inquiry and Data Capture

- **Design a process** that captures customer inquiries and relevant project details through our CRM system (HubSpot).

2. Supplier Communication

- **Develop a method** to automatically send Requests for Quotations (RFQs) to a list of pre-approved suppliers based on the customer's needs.
- Consider standardizing the RFQ process to ensure consistency across suppliers.

3. Data Aggregation and Analysis

- **Build a component** that aggregates incoming supplier responses into a centralized data store.
- **Implement an algorithm** (or propose one) that scores each quote based on multiple criteria (e.g., cost, delivery times, supplier performance).
- If possible, incorporate a machine learning approach to predict the likelihood of customer acceptance and assess margin viability.

4. Quote Optimization

- **Describe or prototype** how the system selects the best elements from the supplier quotes to generate an optimized final offer.
- Ensure that the final quote balances competitiveness (to secure customer acceptance) with profitability (to maintain desired margins).

5. Customer Presentation and Feedback Loop

- **Outline how the system** would automatically present the optimized quote to the customer (via email, portal, etc.).
- **Design a feedback loop** that logs the outcome (accepted or rejected) and feeds this data back into the system to improve future quote generation.

Deliverables

Technical Design Document

Provide a detailed document that includes:

- **High-Level Architecture Diagram:**
A diagram illustrating the overall architecture of your proposed solution.
- **Component Descriptions:**
A detailed description of each component (data capture, supplier communication, aggregation, scoring, optimization, and feedback loop).
- **Technology Stack:**
The technology stack you propose to use, along with any assumptions made regarding integration with existing systems.
- **Challenges and Solutions:**
A discussion of potential challenges (e.g., real-time data synchronization, handling supplier response delays) and your proposed solutions.

Prototype or Proof of Concept (Optional but Encouraged)

- Develop a simple prototype or provide code snippets/pseudocode demonstrating key parts of your solution (e.g., the scoring algorithm or automated supplier communication).
- Explain your approach and how it could be scaled to a production-level system.

Business Impact Discussion

- **Operational Efficiency:**
Explain how your solution improves the speed and efficiency of the quotation process.
- **Increased Win Rates:**
Discuss how your approach is designed to increase the likelihood of customer acceptance.
- **Profitability:**
Describe how the system ensures that every accepted quote maintains or improves the company's profit margins.
- **Alignment with Business Objectives:**
Summarize how your solution aligns with our overall business goals.

Evaluation Criteria

- **Technical Rigor:**
The quality and depth of your technical design, including the clarity of your architecture and algorithm choices.
- **Practicality and Scalability:**
How well your solution addresses real-world challenges and scales within a dynamic business environment.
- **Innovation and Use of AI/ML:**
The creativity and effectiveness of your approach in leveraging AI or machine learning for decision-making.
- **Communication:**
The clarity, organization, and thoroughness in your documentation and (if provided) code or prototype.

Submission Guidelines

- **Format:**
Please submit your design document in PDF format. If you include a prototype or code, you can share it via a public repository link (e.g., GitHub) along with instructions for running your solution.

We look forward to reviewing your innovative solutions that not only address the technical challenges but also align with our business objectives of efficiency, customer satisfaction, and profitability. Good luck!