Public Report on AI-Powered Management Tool for Small Restaurants

Introduction

This report summarizes a project focused on developing an AI-powered management tool for small restaurants in Brazil. Observations showed that these businesses often struggle with operational and financial management due to limited resources and expertise. The project aimed to address this by creating a system designed to simplify key processes, allowing owners to focus on strategy rather than getting bogged down in day-to-day tasks. To achieve this, a case study of a specific restaurant was conducted, used to identify challenges and inform the design of an AI solution.

Planning

The primary objective for this project was to conduct a detailed analysis of a small restaurant's financial and operational structure. This analysis aimed to pinpoint inefficiencies and define the requirements for an AI-driven management tool. A core issue was identified: while existing ERP systems offer advanced features, they are often too complex for small business owners, leading to low adoption and underutilization.

To bridge this gap, the project focused on integrating AI-driven financial diagnostics into the daily workflow of restaurant owners. The project plan emphasized understanding the obstacles that prevent small business owners from making data-driven decisions. The methodology involved partnering with a restaurant owner who granted access to the business's systems and processes. Process mapping (VSM, BPMN), manual data collection, ERP system data extraction, and analysis with Jupyter Notebook were utilized. Semi-structured interviews conducted with the owner and chef, combined with direct observation, were crucial for the diagnostic phase.

Execution

The execution of the project involved several key steps:

1. **Process Mapping and Understanding:** The restaurant's value streams and administrative workflows were mapped to understand the financial ecosystem and identify inefficiencies. Value Stream Mapping (VSM) was used to visualize operational processes and identify areas for improvement in data collection. Bottlenecks were found in manual workflows, particularly in inventory management and supplier invoice processing. The current manual approach

increased procurement time and underutilized the existing ERP system. For example, supplier invoices were manually digitized, consuming 40% of the finance department's daily work time. Business Process Model and Notation (BPMN) was used to map the supplier invoice process in detail.

2. **Preliminary Data Exploration:** Primary data collection involved extracting profit margins and mapping each product's expenses. Physical data sheets were used to record ingredient usage, which were later digitized for Cost of Goods Sold (COGS) calculations within the ERP system. Data was also extracted from the restaurant's ERP system, including daily sales, payment methods, and revenue trends. A key finding was that the owner struggled to extract reports from the ERP, highlighting the system's complexity.
3. **Interview with SME Owner:** A semi-structured interview was conducted with the restaurant owner, providing valuable qualitative data. The owner described the challenges of managing daily operations, including dealing with paperwork and feeling overwhelmed by administrative tasks.

Decisions and Insights

Several key decisions and insights shaped the project. A primary focus was placed on usability, as it was recognized that existing ERP systems were too complex for many small business owners. This led to the decision to develop an AI-powered tool intended to simplify these systems.

The importance of process mapping was also highlighted. The use of VSM and BPMN diagrams provided a visual representation of the restaurant's operations, revealing inefficiencies that might have been missed otherwise.

A data-driven approach was emphasized throughout the project, stressing the importance of collecting and analyzing data to inform decision-making. This included both quantitative data from the ERP system and qualitative data gathered from interviews.

Addressing cash flow challenges became a priority. Cash flow was identified as a major challenge for small restaurants in Brazil, largely due to delays in credit card payments. The proposed AI solution aims to address this by providing better cash flow management, as it takes a lot of planning and data collection to manage cash flow, using ERP systems, even more if you consider most business owners don't have the knowledge to handle those systems.

Furthermore, the project highlighted the need for better system integration and the automation of manual processes, such as invoice processing, to reduce administrative

workload and improve accuracy.

Finally, it was realized that training is key. The existing ERP system was not being used to its full potential simply because the owner lacked the knowledge to use it effectively, underscoring the need for accessible training or more intuitive tools.

The insights gained from this project have significant implications for developing AI-powered management tools for small businesses. The project demonstrates the potential of AI to simplify complex processes, improve decision-making, and free up business owners to focus on strategic growth. The emphasis on user-friendly design and practical application is crucial for ensuring that these tools are adopted and effectively used by small businesses.