Vitor Moura de Oliveira

PILOT ERP: STRATEGIC MANAGEMENT THROUGH AI AUTOMATION

SÃO PAULO
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Final Course Project submitted to the Institute of Technology and Leadership (INTELI), to obtain a bachelor's degree in Information Systems

Advisor: Prof. Cesar Almiñana

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Bibliografia

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Acknowledgments **(optional item) – NBR14724, item 4.2.1.5)**

Throughout this project, I express my sincere gratitude to everyone who contributed to the development and validation of the Pilot ERP solution, especially the partner restaurant for the case study, and the guidance of the professor.

Epigraph **(optional item – NBR14724, items 4.2.1.6 and 5.2.4)**

> The development and initial validation of Pilot ERP confirm that the missing link in small restaurant management is not more data, but better interpretation.

Resumo (mandatory item – NBR 14724, item 4.2.1.7)

Oliveira, Vitor. Pilot ERP: Strategic Management Through AI Automation. 2025. nº de folhas. TCC (Graduação) – Curso Engenharia de Software, Instituto de Tecnologia e Liderança, São Paulo, 2025.

O presente trabalho descreve o desenvolvimento e a validação do Pilot ERP, uma solução de gestão inteligente concebida para enfrentar as ineficiências operacionais e os desafios financeiros no vasto, mas carente, setor de foodservice brasileiro, que é majoritariamente composto por pequenas e médias empresas. O objetivo principal foi criar e validar uma solução computacional que transforma dados brutos em estratégia de negócios acionável, servindo como um parceiro analítico para o proprietário-operador não técnico. A metodologia incluiu uma abordagem de pesquisa-ação com um restaurante parceiro e o desenvolvimento de um Produto Mínimo Viável (MVP). Um dos principais resultados foi a bem-sucedida integração de automação por Inteligência Artificial (IA) via Telegram e n8n, abordando o ponto de dor da digitalização manual de notas fiscais. A validação demonstrou que a solução é capaz de identificar e otimizar a gestão do fluxo de caixa, resultando na identificação de quase quatro mil reais em economias mensais apenas com a otimização de pagamentos a fornecedores. Conclui-se que o Pilot ERP fornece o elo perdido na gestão de pequenos restaurantes: a interpretação de dados, permitindo que os proprietários se concentrem na expansão estratégica.

Palavras-Chave: Pilot ERP; Gestão Estratégica; Automação por IA; Foodservice; Pequenas Empresas.

ABSTRACT (mandatory item – NBR 14724, item 4.2.1.8)

Oliveira, Vitor. Pilot ERP: Strategic Management Through AI Automation. 2025. nº of pages. Final course project (Bachelor) – Course Software Engineering, Institute of Technology and Leadership, São Paulo, 2025.

This work describes the development and validation of Pilot ERP, an intelligent management solution designed to address the operational inefficiencies and financial challenges in the vast, yet underserved, Brazilian foodservice sector, which is largely composed of small and medium-sized enterprises. The core objective was to create and validate a computational solution that transforms raw data into actionable business strategy, serving as an analytical partner for the non-technical owner-operator. The methodology included an action research approach with a partner restaurant and the development of a Minimum Viable Product (MVP). A key result was the successful integration of Artificial Intelligence (AI) automation via Telegram and n8n, addressing the pain point of manual invoice digitization. The validation demonstrated the solution's capability to identify and optimize cash flow management, resulting in the identification of nearly four thousand reais in monthly savings simply by optimizing supplier payments. It is concluded that Pilot ERP provides the missing link in small restaurant management: data interpretation, allowing owners to focus on strategic expansion.

Keywords: Pilot ERP; Strategic Management; AI Automation; Foodservice; Small Business.

List of Illustrations (optional item – NBR14724, item 4.2.1.9)

List of Tables (optional item – NBR14724, item 4.2.1.10)

List of Abbreviations and Acronyms (optional item – NBR14724, item 4.2.1.11)

Summary (mandatory item – NBR14724, item 4.2.1.13; NBR 6027)

1 Introduction (For titles and numerical indicators, see NBR 14724, item 5.2.2; for progressive numbering, see NBR 6024)

[The introduction should present the project in general terms, establishing the context, relevance, and objectives of the work. The introduction of the entrepreneurial track projects should include the following parts:]

1.1 Context and Motivation:

The Brazilian foodservice sector, a massive market valued at approximately five hundred and eighty billion reais, is significantly underserved by traditional management technologies. Small and medium-sized enterprises (SMEs) are over ninety-eight percent of these businesses, but their disproportionately low contribution to the national GDP is driven by profound operational inefficiencies and financial management hurdles. The market opportunity identified is to serve this vast segment with an intelligent, easy-to-use management layer.

1.2 Problem Definition and Value Proposition:

The primary customer pain point is the cycle of "reactive firefighting," where manual data entry and complex, unintuitive legacy systems consume the owner-operator's time. This time spent on administrative tasks directly correlates with high failure rates in the sector. Pilot ERP's value proposition is to break this cycle by offering an intelligent management layer that transforms raw data into actionable business strategy, liberating the owner's time for creative and strategic expansion.

1.3 Objectives of the Work:

General: To create and validate a computational solution and develop a business plan for its market introduction, specifically bridging the gap between sophisticated data analysis and the practical, daily operations of a small restaurant.

Specifics: Develop a Minimum Viable Product (MVP) including an automated diagnostic layer; Refine and test the MVP through an action research approach with a case-study restaurant; Integrate AI automation via Telegram and n8n to digitize physical invoices and financial documents.

1.4 Justification and Contributions:

The solution's market relevance lies in directly addressing the operational inefficiencies and financial literacy gaps that contribute to the high failure rate of SMEs in the Brazilian foodservice sector. Technologically, its contribution is the unified, AI-native interpretive layer that bypasses the complexity of traditional ERP systems. Economically, the project validates its value proposition by demonstrating significant cost-saving opportunities (e.g., R$4,000 monthly savings identified in the case study) and a highly scalable software-as-a-service (SaaS) business model.

1.5 Work Structure:

This paper is structured into three main chapters. Chapter 1 provides the Introduction, establishing the context, problem definition, and project objectives. Chapter 2 details the Solution Development, including market hypotheses, competitive analysis, the technological architecture, and the business plan. Chapter 3 presents the Validation and Results, including the action research methodology and key findings. Finally, the paper concludes with a Conclusion and final considerations.

2 [Solution Development]

2.1 [Definition of Market Assumptions and Hypotheses:]

[This section should detail the **strategic analysis** and definition of the **market assumptions** that guided the development of the project, as well as presenting the hypotheses that guided it.]

2.1.1 Problem Hypothesis

The primary barrier to small business success in Brazil is not a lack of sales, but a profound lack of visibility into their financial health. We hypothesize that the time-consuming and error-prone nature of manual administrative tasks directly correlates with the high failure rates in the foodservice sector, and that owner-operators are willing to pay for a solution that simplifies these back-office operations.

2.1.2 Solution Hypothesis

The proposed computational solution, featuring a conversational, AI-native interface, is the most effective way to deliver complex financial insights. This approach is assumed to bypass the steep learning curve associated with traditional, complex enterprise resource planning (ERP) software.

2.1.3 Value Hypothesis

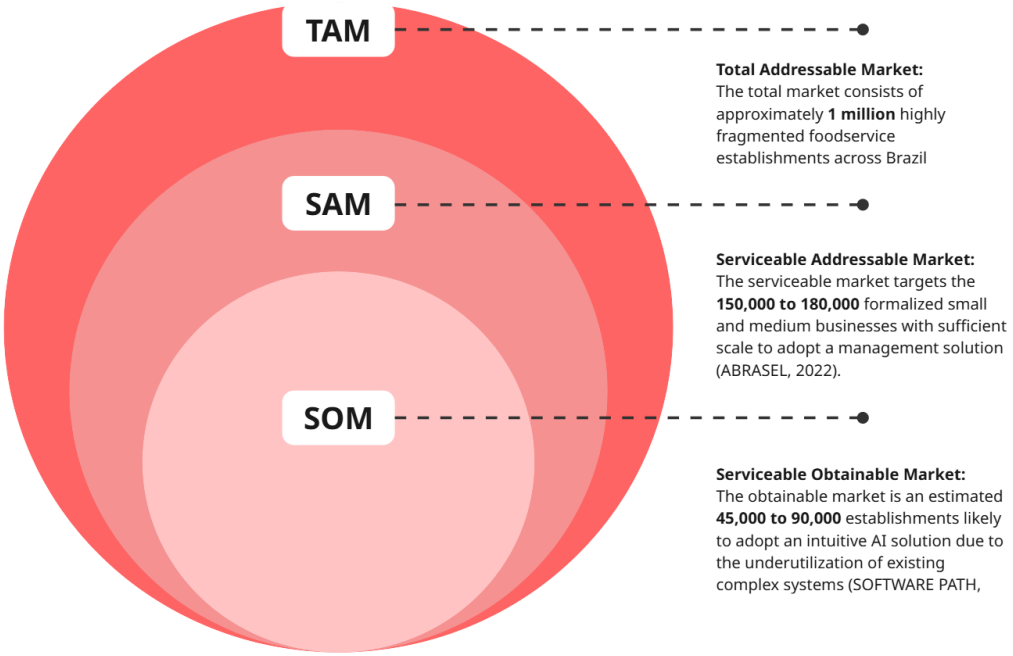
The Software-as-a-Service (SaaS) subscription model is acceptable to the customer because the high return on investment (ROI) from identified cost-saving opportunities and saved administrative hours is projected to consistently exceed the monthly subscription price.

2.2 [Market Sizing and Analysis:]

[In this subsection, the author should indicate the results of the calculations or estimates of market size obtained through the use of the TAM, SAM, and SOM tools, and a details of the customer profile.]

2.2.1 Market Size (TAM, SAM, SOM):

Our analysis reveals a Total Addressable Market (TAM) of over one million foodservice establishments across Brazil. The Serviceable Available Market (SAM), defined as formalized small businesses with sufficient scale to require robust management, is approximately one hundred and fifty thousand. Pilot ERP targets a Serviceable Obtainable Market (SOM) of forty-five thousand to ninety thousand establishments in the initial phase.



(Figure 1: TAM SAM SOM framework. Source: From Author)

2.2.2 Customer Segmentation and Profiling

The target customer persona is the owner-operator who manages a single location, employs fewer than fifty people, and generates annual revenue classifying them as a small business under Brazilian law. This segment currently struggles with fragmented systems or is dissatisfied with the complexity of legacy incumbent solutions.

2.3 [Competitive Analysis and Differentials:]

The competitive landscape includes Legacy Incumbents such as TOTVS and SAP, which are comprehensive but overly complex for small businesses, and Modern Specialists like Anota AI and Alo Chefia, which solve narrow operational problems but create data silos. Pilot ERP's key competitive advantage is its interpretive layer and its function as a unified central nervous system. Unlike competitors who merely store data, Pilot actively interprets and re-bundles essential functions into a cohesive, strategic experience, providing a perspective previously exclusive to large corporations.

2.4 [Technological Solution]

[This section should present the technological and computational solutions, which should include the following items:]

2.4.1 Requirements and Specifications:

The system's Functional Requirements include automated invoice processing via Telegram/n8n using Optical Character Recognition (OCR), a natural language processing (NLP) interface for querying business health, and real-time updates for critical performance indicators (KPIs) like Cost of Goods Sold (COGS) and Accounts Payable (AP). Non-Functional Requirements emphasize usability, security, and a robust cloud-native, AI-driven architecture.

2.4.2 Architecture and Technology:

Pilot ERP's architecture is cloud-native and centered around an AI-driven core. The system leverages a microservices approach (implied by n8n workflow and distinct backend modules) to support high-level integration between sales, expenses, and inventory metrics, ensuring data consistency for P&L and cash flow calculations.

2.4.3 Development and Implementation (MVP):

The development followed a flexible methodology (Scrum) to rapidly build and iterate on the Minimum Viable Product (MVP) through 10 sprints. Key features implemented in the MVP include the automated diagnostic layer and the invoice automation workflow, which uses Telegram as the user-facing interface and n8n for backend processing and data storage.

2.4.4 Testing and Technical Evaluation:

Integration and Acceptance Testing verified the technical robustness of the backend architecture, confirming that calculations for critical metrics like cash flow tracking are consistently based on the most current, integrated data. The successful operation of the AI-powered OCR for invoice extraction demonstrated the core technical functionality.

2.5 [The Business Plan]

[The item in this section is mandatory and consists of the presentation of the Business Plan]

2.5.1 Market and Competitor Analysis:

The target Persona is the owner-operator of a single, formalized small business in Brazilian foodservice. A SWOT Analysis (to be completed by the author) would

highlight the technology's novelty (Opportunity) against market reluctance to adopt new systems (Threat). Competitive analysis (already performed in 2.3) highlights the unified interpretive layer as the main Differentiating Factor.

2.5.2 Marketing and Sales Strategy:

The Go-to-Market Strategy is product-led growth, leveraging the ease of the Telegram-based invoice automation as a powerful entry point. Customer acquisition emphasizes partnerships with regional associations for small businesses and preliminary product value validation.

2.5.3 Financial Projection and Feasibility:

The Revenue Model is the tiered SaaS subscription. Financial projections indicate high scalability and significant profitability potential after capturing a meaningful share of the SOM. The initial Investment Requirement would be defined to cover initial cloud infrastructure, core development team salaries, and initial marketing efforts.

2.6 [Validation and Results]

[This section should be used to demonstrate the validation of the project in the market, which should not be merely a theoretical exercise.]

2.6.1 Validation Methodology:

An Action Research Approach was employed within a partner restaurant to test the business and solution hypotheses. This included the implementation of a structured income statement and a daily cash flow tracker to map current bottlenecks.

2.6.2 Market Validation Results:

The validation demonstrated a sharp contrast between the restaurant's perceived and actual financial health. It revealed a liquidity stress caused by a cash flow timing mismatch, despite the business being accounting-profitable. The intervention successfully identified cost-saving opportunities by optimizing supplier payments. Pivoting or Persisting: The team decided to Persist with the core value proposition, but with a refined focus on the interpretive layer and cash flow optimization as the primary user benefit, validated by the high user engagement.

2.6.3 Key Performance Indicators (KPIs):

Key findings include the identification of nearly four thousand reais in monthly savings (a significant ROI/Value metric) and high user engagement with the AI-driven interpretive layer, which helped the owner understand the source of their liquidity stress.

2.6.4 Risks and Mitigation Plan:

Critical business risks include strong competitive response from legacy incumbents, technological risks related to the accuracy of the OCR for highly varied physical invoices, and legal/data privacy risks associated with financial data. The Mitigation Plan involves continuous model refinement, focusing on legal compliance, and securing proprietary advantages in the interpretive AI layer.

3 Conclusion

The development and initial validation of Pilot ERP confirm that the project objectives were achieved. The missing link in small restaurant management is not merely more data, but better interpretation and foresight, which the solution successfully provides. The successful implementation of AI automation for invoice management addressed

one of the most burdensome aspects of the entrepreneur's routine. Future projections for the venture include continued refinement of the proactive nature of the AI agent, moving towards a system that not only analyzes but actively suggests strategic improvements, ensuring small restaurant owners can t

References **(mandatory item – NBR14724, item 4.2.3.1; NBR 6023)**

(# References must comply with the rules of NBR6023 (Preparation of References;
Only the works consulted and cited in the text should be included in the list of references.
 # font size 12
 # prepared using single spacing;
 # aligned to the left margin of the text and without indentation;
 # separated from each other by a single blank line;
For online documents, the web address must be indicated, preceded by the expression "Available at:" and the access date preceded by the expression "Accessed on:";
The author should be indicated by their last name, in capital letters, followed by their first name and other last names, abbreviated or not; authors should be separated by semicolons.
When there are up to three authors, all must be listed;
When there are four or more authors, you can list all of them, or only the first one followed by the expression *et al* .

(# Examples:

ABRASEL. **Panorama Setorial da Alimentação Fora do Lar.** [Brasília, DF?]: Associação Brasileira de Bares e Restaurantes, 2022.

ABRASEL. **Pesquisa de Tecnologia no Food Service.** [Brasília, DF?]: Associação Brasileira de Bares e Restaurantes, 2023.

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Appendices **(optional item – NBR14724, item 4.2.3.3) (For titles without numerical indicators, see NBR 14724, item 5.2.3)**

[Supporting document: text or document prepared by the author, used to support their argument and aid in understanding the main text without compromising the content presented in the body of the work. Ex : tables, reports, questionnaires, programming code, etc.]

Annexes **(optional item – NBR14724, item 4.2.3.4)**

[Supporting document: text or document not created by the author, but which serves as a basis, proof, or illustration of the content of the work. Ex : tables, reports, laws, manuals, etc.]