Julia Rodrigues Togni

UTILIZANDO MODELO DE INTELIGÊNCIA ARTIFICIAL PARA PERSONALIZAR O ATENDIMENTO EM LOJAS VIRTUAIS

SÃO PAULO
2025

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Final Course Project submitted to the Institute of Technology and Leadership (INTELI), to obtain a bachelor's degree in Software Engineering.

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To my grandparents, Lurdes and Valdemar, who took part in my upbringing and taught me values that I will carry with me forever.

To my brother, for being my best friend and my greatest supporter.

Epigraph

> “Innovation is not about technology alone, but about creating value for people.”

— Adapted from Peter Drucker

Resumo

Togni, Julia Rodrigues. Using an artificial intelligence model to personalize customer service in virtual stores. 2025. 159 pages. Final Course Project (Bachelor's Degree) – Software Engineering Course, Institute of Technology and Leadership, São Paulo, 2025.

This study presents the development and analysis of an artificial intelligence–based solution aimed at personalizing customer service in physical retail environments through the integration of large language models with corporate databases. The object of study focuses on the application of natural language interfaces as support for the purchasing decision-making process, seeking to mitigate common limitations of traditional customer service, such as low scalability, information inconsistency, and high operational costs associated with staff training. The main objective of the project is to design and validate a technological solution capable of enhancing the customer experience at the point of sale by combining intelligent automation with humanized interaction, without replacing human labor. The adopted methodology includes bibliographic research, market analysis, macro-environmental trend assessment, business modeling, and qualitative validation through interviews with representatives of physical retail stores from different sectors. The project also encompasses the definition of the business model, competitive analysis, financial projections, and marketing and communication strategies to support market entry. As a result, the Taik platform is proposed, which leverages artificial intelligence to deliver real-time personalized service, assisting customers in information retrieval, product recommendations, and purchasing decisions, while simultaneously supporting sales teams. The validation results indicate positive acceptance of the proposed solution, highlighting benefits such as improved operational efficiency, enhanced customer journey, and potential increases in conversion rates. It is concluded that the use of language models integrated with corporate data represents a viable and innovative alternative for transforming the in-store shopping experience, contributing to the evolution of retail and to the responsible application of artificial intelligence in commercial contexts.

Keywords: artificial intelligence; personalized service; customer experience; language models; physical retail.

ABSTRACT

Togni, Julia Rodrigues. Using an artificial intelligence model to personalize customer service in virtual stores. 2025. 159 pages. Final Course Project (Bachelor) – Software Engineering Course, Institute of Technology and Leadership, São Paulo, 2025.

This final course project presents the design, development, and analysis of an artificial intelligence–based solution aimed at personalizing customer service in physical retail environments through the integration of large language models with corporate databases. The object of study focuses on the application of natural language interfaces to support the customer purchasing decision process, addressing common challenges in traditional in-store service, such as limited scalability, information inconsistency, dependence on employee availability, and high operational costs related to staff training. The primary objective of this work is to design and validate a technological solution capable of enhancing the customer experience at the point of sale by combining intelligent automation with human-centered interaction, without replacing human labor. The adopted methodology comprises bibliographic research, market and competitive analysis, macro-environmental assessment, business modeling, and qualitative validation through semi-structured interviews with representatives of physical retail stores from different sectors. The project also includes the definition of the business model, financial projections, and marketing and communication strategies to support the feasibility and market entry of the proposed solution. As a result, the Taik platform is proposed, offering real-time personalized customer assistance by leveraging artificial intelligence to retrieve information, recommend products, and support decision-making during the shopping journey, while simultaneously assisting sales teams. The validation results indicate positive acceptance of the solution, highlighting benefits such as improved operational efficiency, enhanced customer experience, greater service consistency, and potential increases in conversion rates. The findings demonstrate that the integration of large language models with proprietary business data represents a viable and innovative approach to transforming the in-store shopping experience, contributing to the modernization of physical retail and to the responsible application of artificial intelligence in commercial contexts.

Keywords: artificial intelligence; personalized service; customer experience; language models; physical retail.

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List of Abbreviations and Acronyms

AI – Artificial Intelligence

BMC – Business Model Canvas

CAC – Customer Acquisition Cost

CX – Customer Experience

GDP – Gross Domestic Product

IA – Inteligência Artificial

KPI – Key Performance Indicator

LGPD – Lei Geral de Proteção de Dados

LLM – Large Language Model

NLI – Natural Language Interface

ROI – Return on Investment

SEO – Search Engine Optimization

SWOT – Strengths, Weaknesses, Opportunities, and Threats


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1 Introduction

The truck aftermarket parts sector in Brazil has been increasingly impacted by digitalization, e-commerce growth, and advances in logistics. Despite this evolution, truck owners, independent drivers, fleet operators, and repair shops still face recurring difficulties when identifying compatible parts, validating authenticity, and comparing suppliers. These issues often lead to incorrect purchases, higher operational costs, and increased vehicle downtime.

Most available purchasing options remain limited to physical stores, manufacturer catalog-based channels, or generalist digital marketplaces. While these channels provide product variety, they typically lack specialized mechanisms to ensure compatibility between parts and specific truck models. As a result, the parts procurement process frequently depends on manual verification and user experience, which increases the probability of errors and delays.

In this context, this project proposes the development of a specialized digital platform for truck parts procurement supported by an AI-based conversational agent. By integrating the DeepSeek natural language model with structured supplier data, the solution aims to improve search precision, recommend compatible parts, and provide a more reliable and efficient purchasing experience.

1.1 Context and Motivation:

The automotive replacement parts industry has undergone substantial transformations driven by digitalization and the expansion of digital sales channels. These transformations have benefited distributors and resellers through more scalable operations; however, for professionals who depend on trucks for daily operations, the process of buying replacement parts remains complex and inefficient. Searching for a specific component often requires comparing multiple suppliers, interpreting technical specifications, and verifying authenticity, frequently without access to reliable and centralized information.

Generalist marketplaces offer convenience but do not provide domain-specific guidance, while manufacturer catalog-based solutions require technical knowledge and are not optimized for user-friendly decision-making. In addition, disruptions in the

supply chain in recent years have increased uncertainty regarding availability and delivery times, making procurement even more challenging.

Artificial Intelligence, particularly conversational interfaces capable of understanding natural language, offers a path to modernize this process. An intelligent assistant integrated with supplier catalogs and real-time data can guide users in identifying compatible truck parts, reduce purchasing errors, and streamline decision-making. This creates a market opportunity for a specialized platform that combines verified supplier information with an AI-powered conversational experience tailored to the truck parts domain.

1.2 Problem Definition and Value Proposition:

The main problem addressed in this work is the difficulty in accurately identifying and purchasing compatible truck parts within a fragmented purchasing ecosystem. Users frequently lack reliable tools to validate compatibility and must rely on manual searches and trial-and-error decisions, which results in wasted time and financial loss.

The proposed value proposition is a specialized marketplace supported by an AI conversational agent that allows users to describe their needs in natural language and receive compatible recommendations grounded in structured supplier data. The platform reduces errors, increases transparency, and improves efficiency by centralizing parts information, supplier options, pricing, and availability in one environment.

1.3 Objectives of the Work:

- General: To design and validate a computational solution based on artificial intelligence to optimize truck parts procurement and develop a business plan for its market introduction.
- Specifics:

- Develop an MVP focused on truck engine parts using a conversational agent;
- Validate the solution through interviews and testing with potential users;
- Define functional and non-functional requirements;
- Design the system architecture integrating AI and parts catalogs;
- Propose a business model and monetization strategy.

1.4 Justification and Contributions:

This project is relevant from a market perspective because it targets a recurring and costly operational problem in the road transport sector. From a technological standpoint, it applies a large language model (DeepSeek) to a specialized domain supported by structured and verified data. Economically, it contributes to reducing procurement errors and downtime while improving purchasing efficiency and decision quality. Additionally, the solution supports responsible AI adoption by emphasizing reliability, transparency, and data integrity.

1.5 Work Structure:

This work is structured as follows: Chapter 2 presents the solution development, including market assumptions, market sizing, competitive analysis, the technological solution, and the business plan. Chapter 3 presents validation results and discusses key findings. Chapter 4 concludes the work with final considerations and future directions.

2 Solution Development

2.1 Definition of Market Assumptions and Hypotheses

This section presents the key assumptions that guided the development of the proposed solution, focusing on the identified customer pain points, the suitability of the computational approach, and the economic viability of the business model.

2.1.1 Problem Hypothesis

Truck drivers, fleet operators, and maintenance professionals face significant difficulties in identifying compatible truck engine parts, accessing reliable technical information, and completing purchases efficiently. These users are willing to adopt digital solutions that reduce errors, improve autonomy, and support more accurate decision-making during the parts procurement process.

2.1.2 Solution Hypothesis

An artificial intelligence–based solution that integrates a natural language conversational agent with structured supplier databases is an effective approach to improving accuracy, efficiency, and user experience in truck parts procurement.

2.1.3 Value Hypothesis

Truck parts buyers and suppliers are willing to pay for a subscription-based and transaction-oriented AI solution that demonstrably reduces purchasing errors, improves customer satisfaction, and increases operational efficiency, making the proposed pricing and revenue model economically viable.

2.2 Market Sizing and Analysis:

2.2.1 Market Size (TAM, SAM, SOM):

The market sizing analysis for the proposed solution was conducted using the TAM, SAM, and SOM framework, which allows a structured assessment of the market potential and the feasibility of market entry.

> The **Total Addressable Market (TAM)** represents the total potential demand for the solution if it were adopted by all possible customers within the defined market. In this project, the TAM is composed of drivers in Brazil who could benefit from a digital platform supported by artificial intelligence to facilitate the purchase of automotive parts. Based on available market data, the TAM is

estimated at **3.6 billion**, representing the total population of drivers across the Brazilian territory.

The **Serviceable Available Market (SAM)** corresponds to the segment of the TAM that can be effectively targeted by the solution, considering geographic, operational, and strategic constraints. For this study, the SAM focuses on drivers located in the Southeast region of Brazil, which concentrates a significant portion of the country's vehicle fleet and logistics infrastructure. The SAM is estimated at **1.5 billion**, reflecting the subset of drivers within this region who have access to and demand for digital solutions related to automotive services.

The **Serviceable Obtainable Market (SOM)** represents the realistically attainable share of the market in the initial stages of operation, considering competitive dynamics, adoption rates, and operational capacity. In this project, the SOM is defined as drivers located in the state of São Paulo, which serves as the initial target market due to its high economic relevance, infrastructure availability, and concentration of potential early adopters. The SOM is estimated at **856 million**, representing the portion of the market that can be effectively reached and served in the short to medium term.

This structured market sizing demonstrates a significant growth potential for the proposed solution, supporting its scalability and strategic focus on a phased market entry, starting from São Paulo and expanding progressively to broader regions.

2.2.2 Customer Segmentation and Profiling

The primary target audience consists of independent truck drivers, fleet operators, and professionals involved in the acquisition and maintenance of truck parts. These users experience recurring challenges related to part compatibility, supplier reliability, and time spent comparing alternatives. The initial focus on users located in São Paulo aligns with higher digital adoption levels and purchasing power, reinforcing the feasibility of early market entry.

2.3 Competitive Analysis and Differentials:

This subsection presents an analysis of the market and business environment related to the sale of truck parts, identifying direct and indirect competitors and highlighting the competitive advantages of the proposed solution.

2.3.1 Identification of Direct and Indirect Competitors

The competitive landscape of the truck parts market is composed of both traditional and digital players. **Direct competitors** include truck manufacturers and authorized dealerships, such as **Mercedes-Benz**, **Volvo**, **Scania**, and **IVECO**, which sell original parts primarily through physical dealerships and catalog-based systems. These manufacturers typically provide parts identification via technical catalogs that require prior knowledge of vehicle models, part numbers, or chassis information, making the purchasing process complex and time-consuming for end users.

Indirect competitors consist mainly of digital marketplaces, with **Mercado Livre** being the most prominent example. As a large-scale e-commerce platform, Mercado Livre offers a wide variety of truck parts from multiple sellers, enabling price comparison and broad availability. However, it operates as a generalist marketplace and does not provide specialized guidance to ensure compatibility between parts and specific truck models.

2.3.2 Analysis of Competitors

Truck manufacturers and authorized dealers present strengths such as guaranteed part authenticity, technical reliability, and brand credibility. Nevertheless, their solutions exhibit significant weaknesses, including limited digitalization, complex catalog navigation, lack of personalized support, and higher prices when compared to alternative channels. The purchasing process often depends on in-person assistance or specialized knowledge, which restricts scalability and customer autonomy.

Digital marketplaces such as Mercado Livre offer competitive pricing, extensive product variety, and ease of access through digital channels. However, these platforms face limitations related to product standardization, lack of technical

validation, and increased risk of purchasing incompatible or counterfeit parts. Additionally, they do not provide intelligent assistance tailored to the specific needs of truck drivers or fleet operators, placing the burden of decision-making entirely on the customer.

2.3.3 Competitive Advantage and Differentiating Factors of the Proposed Solution

The proposed solution differentiates itself by combining the reliability of specialized automotive knowledge with the convenience and scalability of a digital platform. Unlike traditional catalog-based systems, the solution leverages artificial intelligence and natural language interfaces to guide users throughout the purchasing process, enabling them to identify compatible parts through intuitive conversations rather than technical codes or manuals.

Compared to generalist marketplaces, the platform offers a **specialized and intelligent sales assistant** capable of validating compatibility, recommending alternatives, and reducing the risk of incorrect purchases. By integrating verified suppliers and structured product data, the solution ensures authenticity and accuracy while maintaining competitive pricing.

The primary competitive advantages include personalized guidance, reduced cognitive effort for users, higher decision-making accuracy, and improved purchasing efficiency. These differentiating factors position the solution as a hybrid model that bridges the gap between traditional manufacturers and digital marketplaces, offering a more reliable, user-centered, and scalable approach to truck parts sales.

2.4 Technological Solution

This section presents the technological and computational solution proposed in this project, detailing its requirements, architecture, development approach, and technical evaluation. The solution is designed to address challenges in the truck parts purchasing process by leveraging artificial intelligence to provide accurate, personalized, and scalable customer support.

2.4.1 Requirements and Specifications:

The proposed system aims to support truck drivers, fleet operators, and maintenance professionals during the process of identifying and purchasing compatible truck parts. To achieve this objective, the solution was designed based on functional and non-functional requirements aligned with usability, reliability, and scalability.

Functional requirements include the ability to interact with users through natural language, identify vehicle models and specifications, retrieve compatible parts from structured databases, recommend alternatives when applicable, and guide users throughout the purchasing process. The system must also support queries related to availability, pricing, and product specifications, ensuring accurate and consistent information delivery.

Non-functional requirements involve performance, scalability, data security, and compliance with data protection regulations. The platform must support simultaneous interactions, ensure low response latency, protect sensitive user and business data, and maintain high availability. Additionally, the solution must be flexible enough to integrate new suppliers, data sources, and models as the platform evolves.

User specifications focus on simplicity and accessibility, enabling individuals without technical knowledge to interact with the system intuitively. Use cases include searching for compatible parts using natural language, validating part compatibility based on truck model or chassis information, and receiving intelligent recommendations during the purchasing journey.

2.4.2 Architecture and Technology:

The system architecture follows a cloud-based, modular design that integrates large language models with structured corporate data sources. The solution adopts a client–server architecture, where users interact with the platform through a conversational interface, and backend services process requests, manage data, and orchestrate AI responses.

Large Language Models, such as DeepSeek, are employed to handle natural language understanding and response generation. The LangChain framework is used to orchestrate interactions between the language model, external data sources,

and system logic, enabling memory management, retrieval-augmented generation, and controlled response flows. This architecture ensures that AI-generated responses are grounded in verified product and supplier data rather than relying solely on generic model knowledge.

The platform integrates with databases containing truck models, part catalogs, and supplier information, ensuring accuracy and traceability. APIs are used to facilitate communication between system components, enabling scalability and future integration with third-party services.

2.4.3 Development and Implementation (MVP):

The development of the Minimum Viable Product (MVP) followed the Scrum methodology, organized into weekly sprints grouped into four main development modules. Each module delivered incremental value to the project, allowing continuous validation of technical feasibility, business assumptions, and user experience.

The MVP scope was deliberately limited to truck engine parts, enabling focused validation of the solution within a critical and high-impact component category. The development effort concentrated primarily on the conversational agent, which represents the core technological element of the proposed solution.

Module 1 focused on the definition of the project scope and the establishment of functional and technical requirements. During this phase, market research activities were conducted to validate the proposed solution with potential customers, ensuring alignment with real user needs. Additionally, the business model and monetization strategies were structured, providing a foundation for the economic feasibility of the solution.

Module 2 addressed the ideation and prototyping of the solution. This phase involved the conceptual design of the conversational agent and the development of the first functional version of the artificial intelligence system. A structured catalog of truck engine parts was created and organized as a database, which served as the primary data source for the AI agent during interactions.

Module 3 focused on refinement and improvement based on testing and feedback. Adjustments were made to the conversational agent to enhance response accuracy and compatibility validation. Simultaneously, the user interface and overall user experience were refined to improve clarity, usability, and interaction flow during the purchasing process.

Module 4 concluded the development cycle with the preparation for product launch. This phase included final system adjustments, consolidation of functionalities, and completion of project documentation. The MVP reached a stable and functional state, demonstrating its ability to support users in identifying compatible truck engine parts through natural language interactions.

The modular organization of development activities, combined with Scrum-based weekly deliveries, ensured continuous progress, early detection of issues, and alignment between technological implementation and business objectives. The resulting MVP provides a solid foundation for future expansion to additional vehicle components and advanced functionalities.

Module	Deliverables
Module 1	Define project scope, functional and technical requirements.
	Market research and solution validation with potential customers.
	Structure the business model and monetization strategies.
Module 2	Prototype ideation
	Build the first version of the AI.
	Create the parts catalog, which will be used by the AI (database).
Module 3	Adjust the AI based on test feedback.
	Refine the interface and user experience.
Module 4	Product launch
	Finalize the project + documentation

2.4.4 Testing and Technical Evaluation:

The testing and technical evaluation of the proposed solution were conducted through a user-centered and iterative approach, combining qualitative research methods with practical validation of the Minimum Viable Product (MVP). Rather than relying solely on automated testing, the evaluation focused on real user interaction to assess the system's functionality, usability, and technical adequacy within the defined scope.

Initially, semi-structured interviews were conducted with potential users to understand their current challenges in purchasing truck engine parts, validate the identified problem, and gather expectations regarding a digital and intelligent purchasing solution. These interviews informed key design decisions related to conversational flows, terminology, and information structure.

After the development of the MVP, the same participants were invited to interact with the conversational agent, enabling a comparative evaluation between initial expectations and the system's actual performance. During these sessions, users tested the agent by submitting natural language queries related to truck engine parts, evaluating the accuracy of responses, the clarity of guidance provided, and the system's ability to support compatibility validation.

The technical evaluation focused on verifying whether the conversational agent correctly interpreted user inputs, retrieved relevant data from the parts catalog, and maintained coherent interaction flows throughout the conversation. User feedback was systematically collected to identify limitations, misunderstandings, and opportunities for improvement. Based on this feedback, refinements were implemented to improve response accuracy, conversational structure, and overall usability.

The results of the testing process indicate that the MVP successfully demonstrates the technical feasibility of using a conversational agent to support the selection of truck engine parts. The evaluation confirmed that the solution provides consistent responses, supports user decision-making, and meets the functional objectives defined for the MVP, establishing a solid technical foundation for future development and scalability.

2.5 The Business Plan

This section presents the business plan developed to support the market introduction and sustainability of the proposed solution. The plan consolidates market analysis, business modeling, marketing and sales strategies, and financial feasibility, ensuring alignment between technological development and economic viability.

2.5.1 Market and Competitor Analysis:

2.5.1.1 Segmentation and Target Audience (Persona)

The target audience of the proposed solution consists primarily of independent truck drivers, fleet operators, repair shops, and truck parts sales professionals who are directly involved in the procurement and maintenance of truck components. These users frequently face challenges related to identifying compatible parts, verifying authenticity, and comparing suppliers efficiently. The initial focus on users located in the state of São Paulo is justified by the region's high concentration of logistics operations, purchasing power, and digital adoption.

The primary persona represents a professional who depends on trucks for daily operations, values reliability and speed in maintenance processes, and seeks tools that reduce downtime and purchasing errors. This profile aligns with the platform's value proposition of accuracy, efficiency, and intelligent support during the parts selection process.

2.5.1.2 Analysis of Strengths, Weaknesses, Opportunities, and Threats (SWOT Analysis)

The SWOT analysis highlights the internal and external factors influencing the feasibility and competitiveness of the proposed solution. Strengths include the use of artificial intelligence through a conversational agent, specialization in truck parts, and the ability to guide users via natural language. Weaknesses involve the limited initial scope of the MVP and dependency on the quality of supplier data. Opportunities arise from the digital transformation of the automotive and logistics sectors and the limitations of existing competitors. Threats include strong market players, resistance to AI adoption, and regulatory considerations related to data protection.

2.5.2 Business Model (Business Model Canvas - BMC):

The Business Model Canvas structures the strategic components of the proposed solution. The value proposition is centered on simplifying and securing the purchase of truck engine parts through AI-driven conversational assistance. Customer segments include truck drivers, fleet operators, repair shops, and parts suppliers seeking digital sales channels.

Key activities involve platform development, data management, AI model orchestration, and continuous improvement of recommendation logic. Key resources include the conversational AI infrastructure, structured parts databases, and partnerships with verified suppliers. Key partnerships are established with parts distributors and logistics providers to ensure data accuracy and availability.

Revenue streams are generated through subscription plans for suppliers, transaction-based fees, and sponsored product placements. The cost structure includes system development, cloud infrastructure, maintenance, marketing, and operational expenses.

2.5.3 Marketing and Sales Strategy:

Go-to-Market Strategy

The go-to-market strategy adopts a phased approach, initially targeting early adopters in São Paulo. The launch strategy focuses on digital channels, educational content, and demonstrations of the conversational agent to reduce adoption barriers and build trust. Partnerships with suppliers and repair shops are leveraged to increase credibility and reach.

Customer Acquisition and Retention Strategies

Customer acquisition strategies emphasize visibility, reliability, and value demonstration through digital marketing, content marketing, and targeted campaigns. Retention strategies focus on continuous platform improvement, personalized interactions, consistent system performance, and ongoing engagement with users to ensure long-term adoption.

2.5.4 Financial Projection and Feasibility:

Revenue Model and Pricing Structure

The revenue model is based on a combination of transaction fees, subscription plans for suppliers, and sponsored product listings. This diversified structure reduces dependency on a single revenue source and supports scalability.

Projected Expenses, Break-even Point, and Viability Indicators

Projected expenses include platform development, cloud infrastructure, data integration, marketing efforts, and operational costs. Financial feasibility is evaluated through break-even analysis and return on investment (ROI) indicators, demonstrating the potential sustainability of the business model as the user base grows.

Initial Investment Requirement

The initial investment requirement covers development, infrastructure setup, and early-stage marketing activities. This investment ensures sufficient resources to validate the solution, support early adoption, and prepare for market expansion.

2.6 Validation and Results

2.6.1 Validation Methodology:

The validation of the proposed solution was conducted through qualitative market research and practical testing of the MVP. Semi-structured interviews were carried out with potential users, including an independent truck driver and a truck parts sales representative, to validate the problem hypothesis, assess expectations, and evaluate acceptance of an AI-based solution.

Following the interviews, participants interacted directly with the MVP, testing the conversational agent by submitting natural language queries related to truck engine parts. This approach enabled validation of both the business hypothesis and the technical feasibility of the solution.

2.6.2 Market Validation Results:

The validation process revealed strong interest in an AI-based solution capable of improving accuracy and efficiency in truck parts procurement. Users highlighted benefits such as reduced search time, fewer purchasing errors, and improved decision-making support. Feedback also identified areas for improvement, including data accuracy, system integration, and cost considerations.

Based on the results, the project followed a persist strategy, maintaining the core value proposition while refining interaction flows, response accuracy, and usability based on real user feedback.

2.6.3 Key Performance Indicators (KPIs):

Key performance indicators defined for the project include Customer Acquisition Cost (CAC), Lifetime Value (LTV), conversion rate, engagement metrics, and churn rate. These metrics provide a structured basis for evaluating business performance and guiding future decision-making.

2.6.4 Risks and Mitigation Plan:

The proposed solution operates in a dynamic and technology-driven environment, which involves a set of risks that must be identified and managed to ensure business sustainability. This section presents the main risks associated with the project and the corresponding mitigation strategies.

Technological Risks

One of the primary technological risks is the dependence on data quality and accuracy provided by suppliers. Incomplete, outdated, or incorrect data may result in inaccurate recommendations and loss of user trust.

Mitigation strategy: establish partnerships with verified suppliers, implement periodic data validation processes, and include feedback mechanisms that allow users to report inconsistencies.

Another technological risk relates to the accuracy of AI-generated recommendations, especially in technical contexts such as truck engine parts.

Mitigation strategy: limit the initial scope of the MVP to engine components, continuously refine the conversational agent based on user feedback, and implement explainability mechanisms that justify recommendations.

Market Risks

A key market risk is resistance to the adoption of AI-based solutions, particularly among users accustomed to traditional purchasing methods.

Mitigation strategy: invest in educational content, guided onboarding, and demonstrations that clearly communicate the benefits of the solution and reduce perceived complexity.

Another relevant risk involves price sensitivity, especially among independent truck drivers and small repair shops.

Mitigation strategy: adopt flexible pricing models, such as freemium access, tiered subscription plans, and transaction-based fees that align costs with perceived value.

Business and Competitive Risks

The presence of strong competitors, including manufacturers and large digital marketplaces, represents a competitive risk.

Mitigation strategy: focus on differentiation through specialization, personalized conversational assistance, and compatibility validation, targeting niche segments underserved by generalist platforms.

There is also a risk of imitation by competitors with greater financial resources.

Mitigation strategy: prioritize continuous innovation, strengthen supplier partnerships, and build customer loyalty through superior user experience and reliability.

Legal and Regulatory Risks

The use of artificial intelligence and customer data introduces data protection and regulatory compliance risks, particularly related to privacy laws such as the LGPD.

Mitigation strategy: ensure compliance with data protection regulations, apply data minimization principles, and implement secure data storage and access control mechanisms.

Operational Risks

Operational risks include scalability challenges as user demand grows and dependency on infrastructure availability.

Mitigation strategy: adopt a cloud-based architecture that supports scalability, monitor system performance continuously, and plan incremental expansion based on validated demand.

3 Conclusion

This project proposed the development and validation of an artificial intelligence–based solution to optimize the truck parts procurement process, with a specific focus on truck engine components and the use of a conversational agent. The main objective of designing and validating a computational solution, as well as structuring a viable business plan for its market introduction, was successfully achieved.

From a technological perspective, the development of a Minimum Viable Product (MVP) based on the Scrum methodology demonstrated the feasibility of applying a natural language conversational agent to assist users in identifying compatible truck parts. The MVP effectively integrated artificial intelligence with structured supplier data, enabling more accurate recommendations, reducing cognitive effort during the purchasing process, and improving decision-making efficiency.

From a market and business standpoint, the analyses conducted throughout the project confirmed the existence of a relevant and recurring problem in the truck aftermarket sector. Market sizing, competitive analysis, and qualitative validation through interviews indicated strong interest in a specialized digital platform capable of reducing purchasing errors, saving time, and increasing reliability. The proposed business model, supported by diversified revenue streams, demonstrated economic feasibility and scalability potential.

The validation activities confirmed the acceptance of the proposed solution by potential users, while also highlighting important considerations related to data accuracy, system integration, and cost sensitivity. These insights guided refinements to the conversational agent and reinforced the importance of a phased market entry strategy.

As future work, the solution may be expanded to include additional truck components beyond engine parts, integration with a broader range of suppliers, and the incorporation of advanced analytics to support predictive maintenance and demand

forecasting. Further quantitative validation with a larger user base is also recommended to strengthen performance indicators and support large-scale deployment.

In conclusion, this project demonstrates that the integration of artificial intelligence and natural language interfaces into the truck parts procurement process represents a viable, innovative, and impactful approach. By addressing real market needs and emphasizing responsible AI usage, the proposed solution contributes to the digital transformation of the automotive aftermarket sector.

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Appendices

APPENDIX A – Interview Guide

Title

Investigation into the Adoption of AI-Based Solutions to Optimize the Truck Parts Procurement Process

Research Question

How can an AI-powered platform impact the efficiency and decision-making process in truck parts procurement?

Objective

To understand the perspective of truck drivers and truck parts sales representatives on the application of an AI-powered solution for optimizing the truck parts purchasing process and to identify the challenges and opportunities associated with its implementation.

Interview Guide

1. Introduction

a. Personal introduction and project overview, including an estimated duration of the interview.

b. Describe the purpose of the interview and ensure confidentiality of responses.

2. Interviewee's Background

a. Ask the interviewee to introduce themselves and describe their role (truck driver or parts sales representative).

b. For the truck driver: Ask about their experience in the industry and how they typically purchase replacement parts.

c. For the parts sales representative: Ask about the company's size, customer profile, and the type of truck parts they sell.

3. Current Challenges in Truck Parts Procurement

a. Ask about the main difficulties truck drivers face when searching for parts (e.g., availability, compatibility, supplier trust, price comparison).

b. Ask the sales representative about the most common issues faced by customers when purchasing parts.

c. Discuss how the purchasing process is currently managed (manual search, supplier calls, e-commerce platforms).

d. Ask both participants about the efficiency of the current system and potential areas for improvement.

4. Awareness of AI-Based Solutions / DeepSeek Integration

a. Ask if the interviewee is familiar with AI-based solutions such as ChatGPT, DeepSeek, or AI-powered recommendation systems in the auto parts industry.

b. If they are not familiar, provide a brief explanation.

c. Ask for their initial impressions on AI solutions for truck parts procurement.

5. Potential Benefits and Challenges of Implementing AI in the Truck Parts Market

a. Ask the truck driver how an AI-powered tool could improve their experience when searching for and purchasing truck parts.

b. Ask the sales representative how AI could streamline sales operations, customer interactions, and inventory management.

c. Discuss potential challenges in adopting AI in their workflows, such as cost, training, trust in AI recommendations, and system integration.

d. Ask for their opinions on how AI could improve accuracy in parts selection and reduce purchasing errors.

6. Adoption and Integration of AI-Based Solutions

a. Ask if they would be willing to consider an AI-powered solution for truck parts procurement.

b. Ask about necessary steps for successful AI implementation in their business, including user training, data accuracy, and supplier integration.

c. Discuss expectations regarding technical support, AI accuracy, and ease of use for the adoption of such a system.

7. Conclusion

a. Thank the interviewee for their participation and time.

b. Ask if they have any additional comments or insights on the topic.