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Prosply: An AI-Powered Sales Prospecting Automation Platform

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

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Resumo

Casado, Allan dos Santos; Gonzalez, João Lucas Delistoianov. **Prosply: An AI-Powered Sales Prospecting Automation Platform**. 2025. 49 páginas. TCC (Graduação) – Curso Ciência da Computação, Instituto de Tecnologia e Liderança, São Paulo, 2025.

A prospecção de leads permanece como um dos maiores desafios para empresas que buscam crescimento consistente. Processos manuais consomem tempo valioso das equipes comerciais, limitam a escalabilidade e resultam em baixas taxas de conversão devido à falta de personalização. Este trabalho apresenta a Prosply, uma plataforma SaaS que automatiza o ciclo completo de prospecção utilizando inteligência artificial. A solução integra geração inteligente de leads, enriquecimento automatizado de dados, qualificação baseada em critérios específicos de campanha, e comunicação personalizada através de múltiplos canais. O desenvolvimento seguiu metodologia ágil em quatro módulos de dez semanas, resultando em um MVP funcional capaz de executar campanhas end-to-end. A arquitetura utiliza FastAPI no backend, Next.js no frontend, PostgreSQL para persistência, RabbitMQ para processamento assíncrono, e APIs externas para enriquecimento de dados. Validações com profissionais de vendas de empresas confirmaram a relevância da solução. O modelo de negócio baseado em assinaturas mensais oferece planos escaláveis. A análise de mercado identifica 7.800 empresas no segmento inicial com potencial de R$108 milhões anuais. Os resultados demonstram que a Prosply reduz significativamente o tempo operacional de prospecção, permitindo que equipes comerciais foquem em conversão, enquanto mantém alto nível de personalização através de inteligência artificial.

Palavras-Chave: automação de vendas; inteligência artificial; prospecção de leads; SaaS; agente autônomo.

Abstract

Casado, Allan dos Santos; Gonzalez, João Lucas Deslistoianov. **Prosply: An AI-Powered Sales Prospecting Automation Platform**. 2025. 49 pages. Final course project (Bachelor) – Computer Science, Institute of Technology and Leadership, São Paulo, 2025.

Lead prospecting remains one of the greatest challenges for companies seeking consistent growth. Manual processes consume valuable time from sales teams, limit scalability, and result in low conversion rates due to lack of personalization. This work presents Prosply, a SaaS platform that automates the complete prospecting cycle using artificial intelligence. The solution integrates intelligent lead generation, automated data enrichment, qualification based on specific campaign criteria, and personalized communication through multiple channels. Development followed an agile methodology across four ten-week modules, resulting in a functional MVP capable of executing end-to-end campaigns. The architecture uses FastAPI on the backend, Next.js on the frontend, PostgreSQL for persistence, RabbitMQ for asynchronous processing, and external APIs for data enrichment. Validations with sales professionals from companies such as K2, Tractian, Axenya, and BTG confirmed the solution's relevance. The business model based on monthly subscriptions offers scalable plans. Market analysis identifies 7,800 companies in the initial segment with potential of R$108 million annually. Results demonstrate that Prosply significantly reduces operational prospecting time, allowing sales teams to focus on conversion while maintaining high levels of personalization through artificial intelligence.

Keywords: sales automation; artificial intelligence; lead prospecting; SaaS; autonomous agent.

List of Abbreviations and Acronyms

AI - Artificial Intelligence

API - Application Programming Interface

B2B - Business to Business

B2C - Business to Consumer

CAC - Customer Acquisition Cost

CRM - Customer Relationship Management

ICP - Ideal Customer Profile

LLM - Large Language Model

LTV - Lifetime Value

MVP - Minimum Viable Product

SaaS - Software as a Service

SAM - Serviceable Available Market

SDR - Sales Development Representative

SOM - Serviceable Obtainable Market

TAM - Total Addressable Market

Summary

1 Introduction

1.1 Context and Motivation:

Sales prospecting represents a critical yet persistently challenging aspect of business growth across industries. Companies invest substantial resources in identifying, qualifying, and engaging potential customers, yet these processes remain largely manual, repetitive, and inefficient. Sales teams spend approximately 80% of their time on operational tasks such as data research, CRM updates, and coordinating communications, leaving only 20% for meaningful customer interactions that drive conversions.

The cost of maintaining prospecting operations is significant. A single Sales Development Representative (SDR) costs approximately R$4,500 per month in salary alone, excluding hidden costs such as training, management overhead, tools, and infrastructure. For small and medium-sized enterprises, building robust sales teams represents a substantial financial commitment that often exceeds available budgets, creating a growth bottleneck in increasingly competitive markets.

Beyond cost considerations, the effectiveness of prospecting efforts suffers from lack of personalization. Research indicates that personalized approaches increase conversion rates by up to 400%, yet SDRs lack the time and resources to implement truly customized outreach at scale. The manual nature of research and message crafting limits both the volume and quality of prospecting activities, resulting in lower engagement rates and longer sales cycles.

Companies also face the challenge of fragmented tools that do not communicate effectively with each other. Lead generation platforms, enrichment services, communication channels, and CRM systems operate in silos, requiring complex integrations and increasing operational complexity. This fragmentation not only elevates costs but also creates inefficiencies that compound throughout the prospecting funnel.

The opportunity lies in leveraging artificial intelligence to transform prospecting from a labor-intensive process into an automated, scalable, and highly personalized

operation. The global market for sales automation and AI-powered tools is experiencing rapid growth, with major technology investors committing billions of dollars to companies developing autonomous sales agents. However, the Brazilian market remains underserved, with few solutions specifically designed for the local context and offering comprehensive automation from lead generation through meeting scheduling.

1.2 Problem Definition and Value Proposition:

The core problem Prosply addresses is the inefficiency and high cost of traditional prospecting methods. Sales teams face three interconnected challenges that compound to create significant barriers to growth.

Manual processes consume excessive time searching for leads, researching companies, personalizing messages, and managing follow-up sequences. This operational inefficiency limits scalability and prevents teams from focusing on high-value activities like relationship building and closing deals. While personalization drives conversion, implementing it manually across hundreds or thousands of leads is impractical, resulting in generic outreach that produces low response rates and wasted opportunities.

Small and medium enterprises face particularly acute challenges, as they cannot afford dedicated SDR teams or expensive sales automation tools. Yet without effective prospecting, their growth stagnates, creating a cycle of constrained resources and limited expansion.

Prosply's value proposition centers on providing an AI-powered virtual SDR that operates 24/7, automating the entire prospecting cycle from lead generation through meeting scheduling. The platform delivers:

- Intelligent Lead Generation: Automated identification and segmentation of prospects based on specific criteria including location, company profile, industry, and target audience characteristics

- Advanced Data Enrichment: AI-driven collection and analysis of detailed information about each lead from multiple sources, ensuring approaches are informed and relevant
- Personalized Outreach: Automated generation of customized messages that resonate with each prospect's specific context and needs
- Intelligent Follow-up Management: Systematic tracking and engagement through multiple touchpoints without manual intervention
- Automated Meeting Scheduling: Seamless coordination of qualified leads into sales calendars

By automating repetitive tasks while maintaining high personalization through AI, Prosply enables sales teams to achieve greater productivity at significantly lower costs, allowing human sellers to focus exclusively on what they do best: building relationships and closing deals.

1.3 Objectives of the Work:

Develop and validate a SaaS platform that leverages artificial intelligence to automate and optimize the complete sales prospecting cycle, while creating a viable business plan for market introduction and sustainable growth.

Specific Objectives:

- Develop a Functional MVP: Build a minimum viable product capable of executing end-to-end prospecting campaigns, including lead generation, enrichment, qualification, personalized messaging, and automated follow-up
- Implement AI-Powered Personalization: Create an intelligent system that collects, analyzes, and applies lead-specific information to generate highly relevant and personalized communications
- Design Scalable Architecture: Establish a robust technical foundation using modern technologies and best practices that supports growth from initial users to large-scale operations

- Validate Market Demand: Conduct extensive research and validation with sales professionals and decision-makers to confirm problem-solution fit and willingness to pay
- Define Business Model: Establish a clear revenue model, pricing strategy, and go-to-market plan that demonstrates financial viability and sustainable unit economics
- Measure Performance Metrics: Implement tracking and analytics to evaluate key performance indicators such as conversion rates, cost per lead, and customer acquisition cost

1.4 Justification and Contributions:

This work contributes to both the academic understanding of AI application in sales automation and the practical development of tools that address real market needs. From a market perspective, Prosply fills a significant gap in the Brazilian ecosystem where international solutions often lack local integration and pricing models suitable for emerging market companies.

The technological contribution lies in the integration of multiple AI capabilities—natural language processing, data enrichment, qualification logic, and personalized content generation—into a cohesive system that operates autonomously while maintaining quality and relevance. The architecture demonstrates how modern cloud services, asynchronous processing, and API integrations can be combined to create scalable, cost-effective solutions.

Economically, Prosply offers the potential to democratize access to sophisticated sales automation by providing small and medium enterprises with tools previously available only to large corporations with substantial technology budgets. By reducing prospecting costs by up to 80% compared to traditional SDR teams while maintaining or improving effectiveness, the platform can accelerate growth for a broad range of businesses.

The social and professional impact extends to sales professionals themselves, whose roles can evolve from repetitive operational tasks toward higher-value

strategic and relationship-focused activities. Rather than replacing human sellers, Prosply augments their capabilities and allows them to operate at significantly higher efficiency and effectiveness.

1.5 Work Structure:

This document is organized into three main chapters beyond this introduction. The second chapter presents the comprehensive process of creating Prosply, beginning with market assumptions and hypotheses that guided the project. It includes detailed market sizing and analysis, competitive landscape assessment, the complete technological solution architecture and implementation, the business plan with revenue model and financial projections, and validation results from market testing.

The third chapter summarizes the achievements of the project, discusses limitations and lessons learned, and outlines future directions for Prosply's development and market expansion. Finally, the references section provides the complete list of academic and industry sources consulted during the development of this work.

2 Solution Development

2.1 Definition of Market Assumptions and Hypotheses

The development of Prosply was guided by a set of strategic assumptions and hypotheses that required continuous validation throughout the project. These hypotheses shaped product decisions, feature prioritization, and go-to-market strategy.

2.1.1 Problem Hypothesis

Companies investing in consultative sales processes face significant inefficiencies in prospecting that limit their growth potential, and they are willing to pay for a solution that demonstrably reduces operational costs while improving outcomes. This hypothesis was based on preliminary research indicating that sales teams spend the majority of their time on non-revenue-generating activities. Through interviews with sales professionals from K2 Partnering Solutions, Tractian, Conta Simples, Ecocil Incorporações, Axenya, and Holu, we validated that prospecting represents a consistent pain point across different industries and company sizes.

Key insights supporting this hypothesis included that sales coordinators consistently report lead quality and quantity as primary bottlenecks for their teams. SDRs express frustration with spending 500+ weekly touches on cold outreach with conversion rates of only 1-2% to qualified meetings. Marketing and sales teams often conflict over lead quality, with sales claiming insufficient qualified leads and marketing claiming poor conversion rates. The cost of maintaining SDR teams combined with low productivity creates a compelling case for automation, particularly for companies with limited budgets.

2.1.2 Solution Hypothesis

An AI-powered platform that automates the complete prospecting cycle represents the optimal approach to solving prospecting inefficiencies, superior to either purely manual processes or partial automation solutions. This hypothesis posited that the value lies not in automating individual tasks but in creating an integrated system that handles the entire workflow from lead identification through meeting scheduling. Validation came from analyzing existing solutions in the market.

Tools like Apollo.io provide lead databases and email sequencing but require manual data enrichment and message personalization. Phantom Buster offers web scraping capabilities but lacks intelligence and integration with communication channels. Many companies cobble together multiple tools, using LinkedIn Sales Navigator for identification, separate enrichment services, email platforms, and CRMs, creating integration challenges and operational overhead.

While SDRs can create highly personalized outreach, they cannot scale this approach to hundreds of leads. AI enables personalization at scale by analyzing lead-specific data and generating contextually relevant messages. Interviews revealed that professionals value automation most when it delivers results comparable to or better than manual efforts. The key differentiation of Prosply lies in maintaining quality through AI-powered intelligence while achieving scale through automation.

2.1.3 Value Hypothesis

Companies will pay a monthly subscription for prospecting automation that demonstrates clear ROI through reduced operational costs and improved conversion rates, with pricing based on volume of leads processed. This hypothesis required validating both pricing sensitivity and willingness to pay. Research with potential customers indicated several key insights. Small and medium enterprises typically cannot afford dedicated SDR teams at R$4,500+ per month but recognize the need for consistent prospecting. Companies are familiar with SaaS pricing models and prefer predictable monthly costs over variable fees or success-based pricing. Volume-based pricing aligns with customer needs, as different businesses have varying prospecting requirements. A price point that delivers 40-60% cost savings compared to hiring SDRs while providing superior scale and personalization represents compelling value.

2.2 Market Sizing and Analysis

Understanding the market opportunity for Prosply required analyzing both the total addressable market and the realistic segments the solution could serve effectively in initial phases.

2.2.1 Market Size (TAM, SAM, SOM)

Total Addressable Market (TAM): The TAM encompasses all companies in Brazil that engage in consultative sales requiring prospecting activities. According to SEBRAE and IBGE data, Brazil has approximately 5 million active companies. Within this universe, an estimated 15-20% engage in B2B sales or consultative B2C sales that involve prospecting activities. This represents approximately 750,000 to 1 million potential customers for prospecting automation solutions.

Using conservative estimates with an average contract value of R$1,150 per month (R$13,800 annually), the TAM for prospecting automation in Brazil exceeds R$11 billion annually. This figure aligns with global market trends where sales automation and enablement tools represent one of the fastest-growing SaaS categories.

Serviceable Available Market (SAM): The SAM represents the portion of the TAM that Prosply can realistically serve with its current positioning and capabilities. Focusing on companies that:

- Have established sales processes (not purely transactional)
- Recognize the need for prospecting automation
- Have budget for technology investments
- Operate in sectors where consultative selling is relevant

This narrows the market to approximately 50,000 companies in Brazil, including technology companies, SaaS providers, professional services firms, consultancies, financial services, real estate, and higher-value product companies. With similar pricing assumptions, the SAM represents approximately R$700 million annually.

Serviceable Obtainable Market (SOM): The SOM reflects the market share Prosply can realistically capture in the initial 2-3 years given competitive dynamics, go-to-market capabilities, and product maturity. Based on analysis of similar SaaS companies in Brazil and considering that this is a nascent category with limited local competition, achieving 0.5-1% market penetration within this timeframe is reasonable.

For initial go-to-market strategy, Prosply focuses on a subset of the SAM with the most acute pain points and highest willingness to pay: technology companies and startups. According to Abstartups and Distrito, Brazil has approximately 13,000

startups, of which 60% (7,800) operate in B2B markets or consultative B2C sales models.

Using the same average ticket above, this initial segment represents:

- SOM: 7,800 companies × R$13,800 = R$108 million annually

This focused initial market allows Prosply to:

- Build deep expertise in a specific customer segment
- Develop strong case studies and references
- Refine the product based on concentrated feedback
- Establish brand recognition in an influential community
- Create foundation for expansion into broader markets

2.2.2 Customer Segmentation and Profiling

Prosply's Ideal Customer Profile comprises companies with annual revenues ranging from R$1-30 million, typically in growth stages from Series A onwards. These companies operate in business models requiring consultative sales approaches, whether B2B, B2B2C, or high-value B2C scenarios. Their sales cycles typically span 2-8 weeks, complex enough to justify prospecting investment but not extending to enterprise-length cycles, with average deal sizes between R$5,000-50,000.

These organizations either have or recognize the need for dedicated sales functions, viewing prospecting as a growth bottleneck. They demonstrate openness to technology adoption and innovation, value data-driven decision making, and actively seek to optimize operational costs. The initial industry focus encompasses technology and SaaS companies, professional services and consultancies, financial services and fintechs, marketing and sales agencies, educational technology, and healthcare technology sectors.

The primary persona driving purchasing decisions is the sales leader or revenue operations manager, typically aged 28-45, holding roles such as Head of Sales, Sales Manager, Revenue Operations Manager, or VP of Sales in companies with

20-200 employees. These professionals are concentrated in major urban centers including São Paulo, Rio de Janeiro, Belo Horizonte, and Florianópolis. They carry responsibility for revenue growth and sales team productivity, managing small teams of 2-10 SDRs or account executives while being evaluated on pipeline generation and conversion metrics. Importantly, they hold budget authority for sales tools and technology.

These leaders struggle to scale sales operations without proportionally increasing costs and express frustration with the time their teams spend on operational tasks versus actual selling. They face pressure to demonstrate ROI on sales investments while dealing with inconsistent lead quality and pipeline unpredictability. The inability to afford hiring and training large SDR teams creates a persistent constraint on growth. Their goals center on increasing pipeline volume and quality, improving sales team productivity and focus, reducing customer acquisition costs, creating more predictable revenue growth, and implementing scalable processes that support company expansion.

From a technology perspective, these professionals are comfortable with SaaS tools and sales technology, likely already using CRM systems such as Pipedrive, HubSpot, or Salesforce. They evaluate tools based on ROI and ease of implementation while valuing integration with their existing technology stack.

A secondary but important persona is the founder or CEO of smaller companies, typically aged 25-40 in organizations with 5-30 employees at pre-seed to Series A stages. These individuals wear multiple hats including sales leadership, operating under significant resource and budget constraints while needing to demonstrate traction for fundraising or growth. They cannot yet justify hiring dedicated SDR teams but require consistent prospecting to prove their business model and achieve product-market fit. Their goals focus on generating consistent qualified leads without hiring, maximizing efficiency of limited resources, and building repeatable sales processes for future scaling. The manual nature of prospecting takes focus away from strategic activities and deal closing, making automation particularly valuable.

This detailed customer segmentation and persona understanding guided product positioning, feature prioritization, messaging strategy, and pricing decisions. By

deeply understanding who Prosply serves and what they need, the platform could focus on delivering maximum value to the most receptive audience segments.

2.3 Competitive Analysis and Differentials

Understanding the competitive landscape was essential for positioning Prosply effectively and identifying opportunities for differentiation. The market for sales automation and prospecting tools is fragmented, with solutions ranging from comprehensive international platforms to specialized local services.

2.3.1 Competitive Landscape

The competitive landscape for sales prospecting and automation platforms is composed of both international and domestic solutions, each addressing different segments of the market with varying levels of automation, personalization, and pricing.

At the international level, several established platforms dominate the market. Apollo.io is one of the most comprehensive solutions, offering access to a large lead database with more than 250 million contacts, combined with lead search, email sequencing, and basic analytics. Its strengths lie in data coverage and a mature feature set; however, its pricing model, which typically ranges from USD 49 to USD 79 or more per user per month, represents a significant barrier for small and medium-sized enterprises. Additionally, Apollo's personalization capabilities are limited, and its data coverage is primarily concentrated in North American and European markets, resulting in weaker performance in Latin America.

Clay.com represents a more advanced approach to data enrichment and personalization by integrating multiple external data sources and enabling complex workflow orchestration. While the platform excels in flexibility and depth of data processing, it requires substantial technical expertise and configuration effort. Its premium pricing and complexity position it primarily toward larger organizations with dedicated technical teams, making it less accessible to smaller companies.

Artisan.co positions itself as an AI-powered business development representative capable of autonomous prospecting. The platform emphasizes AI-driven personalization and multi-channel outreach, aiming to reduce manual SDR effort. Despite its innovative positioning, Artisan is a relatively new solution with a limited operational track record. Its annual pricing, often exceeding USD 10,000, and its strong focus on the United States market further restrict its applicability for smaller companies and for markets outside North America.

Reply.io focuses on multi-channel outreach sequencing, supporting communication through email, LinkedIn, phone calls, and WhatsApp. The platform is recognized for its robust automation workflows and A/B testing capabilities, with pricing starting at approximately USD 60 per user per month. However, Reply does not provide native lead generation or enrichment, requiring users to source and manage lead data externally, which increases operational complexity.

Amplemarket offers a more integrated solution that combines lead generation, AI-driven personalization, and multi-channel engagement. Backed by significant venture funding and oriented toward enterprise clients, Amplemarket delivers a comprehensive feature set but operates under a custom pricing model that commonly exceeds USD 10,000 annually. This positioning makes the platform largely inaccessible to small and medium-sized businesses.

In the Brazilian market, the competitive landscape is more fragmented and generally less advanced in terms of AI-driven automation. Ramper is a well-known local platform focused on lead generation and email campaigns, benefiting from local market knowledge and native Portuguese support. Nevertheless, its personalization capabilities remain limited, and its enrichment processes rely on relatively basic logic compared to more advanced international platforms. Datlo operates primarily as a data provider, offering extensive contact information for Brazilian companies. While valuable as a source of leads, Datlo does not deliver a complete end-to-end prospecting automation workflow. Máquina de Leads, in turn, combines lead generation with elements of automation but follows a more service-oriented model rather than a fully self-service SaaS approach, resulting in higher costs and reduced scalability.

Overall, existing solutions tend to fall into two extremes: highly sophisticated and expensive platforms targeting enterprise customers, or simpler tools that address isolated stages of the prospecting process. This gap reinforces the opportunity for a solution such as Prosply, which aims to deliver integrated prospecting automation, AI-driven personalization, and accessibility tailored to the needs and constraints of small and medium-sized enterprises, particularly within the Brazilian and Latin American markets.

2.3.2 Prosply's Competitive Advantages

Prosply differentiates itself from existing solutions primarily through its approach to end-to-end automation, personalization at scale, and explicit focus on the Brazilian market. While many competitors address isolated stages of the prospecting process or require users to orchestrate workflows across multiple tools, Prosply was designed as a single, integrated platform capable of managing the entire prospecting lifecycle. The solution encompasses lead generation based on defined targeting criteria, automated enrichment for contextual data collection, intelligent qualification to assess alignment between leads and campaigns, AI-driven personalized message generation, automated follow-up management, and meeting scheduling. By consolidating these processes into one system, Prosply reduces operational fragmentation and mitigates the so-called “swivel chair” problem, in which sales teams lose productivity by switching between tools and manually transferring data.

Another key differentiator lies in Prosply’s ability to deliver personalization at scale. Traditional automation platforms often prioritize volume over relevance, relying on generic templates enhanced only by basic merge fields. In contrast, Prosply employs large language models to analyze lead profiles and company information, identify meaningful talking points, and generate messages that reflect an understanding of each lead’s specific context. This approach allows the platform to maintain consistent quality across large volumes of outreach while preserving a high degree of customization. As a result, Prosply aims to significantly improve conversion rates associated with personalized communication, without sacrificing the scalability typically associated with automation.

The platform's focus on the Brazilian market further strengthens its competitive positioning. Many international solutions exhibit limitations in data coverage, language support, and integration with local systems. Prosply addresses these gaps by offering native support for Brazilian company identifiers, integrating with local business information sources, and generating content in Portuguese. In addition, the solution is designed with an understanding of local sales practices and business culture, which are critical factors in outbound prospecting effectiveness within Brazil.

Finally, Prosply adopts an accessible and transparent pricing strategy aligned with the economic realities of the Brazilian market. While enterprise-oriented platforms commonly charge more than USD 10,000 annually, Prosply offers a subscription model starting at R$1,150 per month, with no setup fees or hidden costs. Pricing is structured according to usage volume, allowing customers to scale their investment as their prospecting needs grow. This approach aims to democratize access to advanced sales automation capabilities for small and medium-sized enterprises, which represent a substantial portion of the Brazilian economy.

2.4 Technological Solution

The technical implementation of Prosply required architecting a system capable of handling complex asynchronous workflows, integrating multiple external services, maintaining data consistency, and scaling to support growing numbers of users and campaigns.

2.4.1 Requirements and Specifications:

The development of Prosply required the design of a technological solution capable of orchestrating asynchronous workflows, integrating external data sources, and supporting gradual scaling as campaign volume increases. Rather than focusing on isolated features, the system was conceived as a modular platform that connects lead acquisition, enrichment, qualification, and communication into a single operational flow.

From a functional perspective, the platform supports user and campaign management as core entry points. Users can create and manage accounts, configure basic profile preferences, and operate within team-based environments. Campaign management enables the definition of targeting criteria—either through LinkedIn-based filters or the upload of custom lead lists—as well as the configuration of messaging strategies and qualification rules. Campaigns can be activated, paused, or adjusted without interrupting the overall system operation, allowing iterative refinement based on results.

Lead management is a central component of the solution. Prosply allows users to upload lead lists in structured formats such as CSV or Excel, browse and filter leads using real-time search capabilities, and inspect detailed lead profiles enriched with contextual information. Each lead progresses through defined stages of the prospecting funnel, with the possibility of manual overrides when automated qualification does not fully capture business context.

For campaigns based on external targeting, the system supports lead generation through LinkedIn-oriented attributes such as company size, industry, geographic location, and professional role. Generated leads are then passed through an enrichment pipeline that aggregates data from LinkedIn profiles and public web sources. This process aims to collect relevant contextual information about both the individual and the company, such as role descriptions, business activities, and publicly available signals, which are stored with basic source attribution.

Following enrichment, leads are evaluated by a qualification component that assesses their alignment with the originating campaign. This step assigns a qualification status and a relevance indicator based on predefined campaign criteria, enabling the system to filter out leads that do not meet minimum requirements before initiating outreach. For qualified leads, a contact lookup process attempts to retrieve valid email addresses and perform basic deliverability checks, while gracefully handling cases where contact information is unavailable.

Personalized message generation is performed using AI-based text generation, combining campaign intent and enriched lead data to produce context-aware outreach messages. Rather than relying solely on static templates, the system aims

to generate messages that reflect the lead's professional context while respecting predefined tone and messaging constraints. Generated messages are versioned and stored prior to delivery.

Communication is currently implemented through automated email delivery, completing the end-to-end prospecting flow. The system tracks basic delivery states and supports scheduled follow-ups as part of a campaign sequence. While the architecture is designed to accommodate additional channels such as WhatsApp and LinkedIn, these integrations are considered future extensions rather than core deliverables of the current implementation.

From a non-functional perspective, the system was designed to support concurrent campaign execution and asynchronous processing through a queue-based architecture. This approach enables independent scaling of enrichment, qualification, and messaging services while reducing coupling between components. Emphasis was placed on reliability and fault tolerance, particularly in handling failures of external APIs, with retry mechanisms and error logging to preserve system stability.

Security and data protection were treated as foundational concerns. The platform implements standard authentication and authorization mechanisms, encrypts sensitive data in transit and at rest, and follows common web security practices to mitigate vulnerabilities. Considerations related to Brazilian data protection regulations (LGPD) informed design decisions around data handling and storage.

Finally, maintainability and usability guided implementation choices. The system is containerized to ensure consistency across environments, uses version-controlled database migrations, and incorporates structured logging and monitoring. On the user side, the interface prioritizes clarity and simplicity, aiming to minimize training requirements while supporting the core workflows necessary for effective prospecting.

2.4.2 Architecture and Technology:

Prosply's system architecture was designed following established best practices for modern SaaS applications, with emphasis on separation of concerns, asynchronous processing, and scalability. The solution adopts a layered approach that allows independent evolution of user interfaces, business logic, and data persistence while supporting the orchestration of complex prospecting workflows.

At a high level, the system is structured into three primary layers. The presentation layer is implemented as a web application responsible for user interaction and visualization. The application layer encapsulates the core business logic and exposes API endpoints consumed by the frontend. The data layer manages persistent storage, caching, and message-based communication between services.

The presentation layer is built using Next.js 14, a React-based framework that provides server-side rendering, routing, and performance optimizations. TypeScript is used throughout the frontend to enforce type safety and improve maintainability. Styling is handled with Tailwind CSS, enabling rapid interface development through utility-first components. Server state management and caching are implemented using React Query, while Axios is used as the HTTP client for communication with backend APIs.

The application layer is implemented in Python using the FastAPI framework, chosen for its performance, native support for asynchronous operations, and automatic API documentation. Database interactions are managed through SQLAlchemy as an object-relational mapper, with Alembic providing version-controlled database migrations. Data validation and serialization are handled using Pydantic models. The system runs on Python 3.11, benefiting from recent performance and language improvements.

Persistent data storage is handled primarily through PostgreSQL 15, which serves as the main relational database for application data. Redis is used as a caching layer and for session-related data, improving performance for frequently accessed information. Azure Blob Storage is employed for file storage, including uploaded lead lists and system logs.

Asynchronous processing is a core architectural principle of Prosply and is implemented using RabbitMQ as the message broker. Separate queues are defined

for major processing stages, including lead enrichment, qualification, contact lookup, and messaging. Dead-letter queues are configured to handle failed messages, enabling retries and fault isolation without interrupting the overall workflow.

The platform integrates multiple external services to support enrichment and personalization. Azure OpenAI is used to access large language models for message generation and qualification reasoning. Lead profile data is retrieved through LinkedIn integrations available via Bright Data, while Serper API is used to perform web searches for additional contextual information. External contact enrichment services are used to retrieve email and phone data when available.

Infrastructure deployment and operations are hosted on Microsoft Azure, leveraging managed cloud services for scalability and reliability. Docker is used for containerization, ensuring consistent environments across development and production. Version control and CI/CD pipelines are managed through Azure DevOps, while monitoring and telemetry are handled using Application Insights.

From an architectural pattern perspective, the backend follows a layered structure composed of router, service, repository, and model layers. The router layer handles HTTP requests and responses, the service layer encapsulates business logic, the repository layer abstracts database access, and the model layer defines data structures. This separation improves testability, maintainability, and clarity of responsibilities across the codebase.

Core system workflows operate asynchronously through a queue-based pipeline. When a user creates a campaign with defined targeting criteria, a message is published to the lead generation queue. A worker consumes this message, generates the lead list, stores the results in the database, and publishes the leads to the enrichment queue. Enrichment workers retrieve leads from the queue, call external APIs to collect profile and web data, persist the enriched information, and forward the leads to the qualification queue.

During the qualification stage, workers evaluate enriched leads against campaign criteria using AI-based logic, assign a qualification status and relevance indicators, and update the database accordingly. Qualified leads are then published to the contact lookup queue, while unqualified leads exit the workflow. Contact lookup

workers attempt to retrieve and validate email addresses, update contact information, and forward eligible leads to the messaging queue.

In the final stage, messaging workers generate personalized messages using AI models, store them in the database with a pending status, send emails through the delivery infrastructure, update delivery status, and schedule follow-ups when configured. This pipeline-based approach enables clear observability of each processing stage and supports incremental system evolution.

2.4.3 Development and Implementation (MVP):

The development of Prosply followed an agile methodology structured into four academic modules of ten weeks each. Each module delivered incremental functionality, progressively evolving the system toward a complete and functional minimum viable product (MVP). This modular structure allowed continuous validation, architectural refinement, and scope adjustment based on technical constraints and user feedback.

During Module 1, the focus was on establishing the project's foundation in terms of vision, architecture, and initial implementation. The first sprints were dedicated to understanding the problem space through initial market research and interviews with sales professionals, defining the core value proposition, and identifying essential functional requirements. Based on these insights, the system architecture and technology stack were designed, and a development roadmap was created to guide subsequent sprints.

The middle phase of Module 1 concentrated on infrastructure setup. The team configured the cloud environment using Microsoft Azure through the Startup Program, established version control and CI/CD pipelines with Azure DevOps, and provisioned core services such as PostgreSQL and Azure OpenAI. In parallel, an initial data pipeline was implemented to support the ingestion of Brazilian company information. The final sprint of the module marked the beginning of active product development, with the creation of primary frontend modules, initial database

schemas, a basic FastAPI backend structure, and an experimental AI-based enrichment agent developed in isolated notebooks.

Module 2 represented a period of significant product evolution and architectural refinement driven by user feedback. Early sprints focused on completing the messaging module and revising the delivery plan based on lessons learned from the initial MVP. Backend and frontend integration continued to mature, improving overall system cohesion. A major functional addition in this module was the lead list upload feature, which allowed users to import custom lead data from structured files, preview and validate content, navigate multi-sheet documents, and manage list versions.

From an architectural perspective, Module 2 emphasized codebase maintainability and deployment readiness. All raw SQL queries were migrated to SQLAlchemy ORM, Alembic was introduced for version-controlled database migrations, and database field naming was standardized in English. The application was fully containerized using Docker for both development and production environments, and code refactoring introduced clearer typing and structural consistency. A key strategic pivot was also implemented during this module: lead generation shifted from reliance on CNPJ-based filters to LinkedIn-based targeting criteria. To support this change, dynamic filtering was added to lead and messaging views, RabbitMQ was configured to support asynchronous processing, and the core producer–consumer logic for campaign workflows was implemented. User settings and profile management features were also delivered during this phase.

Module 3 focused on integrating all previously developed components into a cohesive end-to-end automation pipeline. The initial sprint was dedicated to a comprehensive review of existing functionality and the identification of gaps preventing full automation. Based on this assessment, a detailed execution plan was created. Subsequent sprints moved enrichment logic from experimental notebooks into production services and integrated external APIs for LinkedIn data retrieval and web search. This enabled the establishment of an automated flow from campaign creation to lead generation and enrichment.

The qualification stage was implemented next, introducing AI-powered logic to evaluate enriched leads against campaign criteria. This component assigned

qualification status, relevance indicators, and explanatory reasoning, and routed qualified leads to the contact lookup stage. The following sprint completed the automated email delivery flow by integrating contact lookup structures and implementing the email sending service through message queues. The final sprint of Module 3 focused on AI-based message personalization, integrating message generation into the email pipeline, and producing comprehensive system documentation using visual diagrams to represent services, queues, and interactions.

The final module, Module 4, concentrated on validation, refinement, and preparation for final evaluation. End-to-end testing was conducted across the complete prospecting workflow, and pilot campaigns using test data were executed to validate functional integration. AI prompts were refined to improve enrichment quality and message relevance, while performance optimizations and bug fixes addressed issues identified during testing. The module concluded with the preparation of presentation materials and business plan documentation, culminating in a successful presentation to the evaluation committee and formal project approval.

2.4.4 Testing and Technical Evaluation:

Technical evaluation results demonstrated that all core features were operational in the MVP, with the complete end-to-end workflow functioning from campaign creation through lead generation, enrichment, qualification, and messaging. The user interface successfully supported all planned interactions, and administrative functions including user management, settings, and analytics were working properly. Performance metrics showed enrichment processing at 2-4 minutes per lead, qualification processing at 30-60 seconds per lead, and message generation at 20-40 seconds per message, with UI response times below 200ms for most operations. The system successfully processed test campaigns with over 100 leads, demonstrating practical scalability.

The queue-based architecture proved robust with automatic retry mechanisms on failures, while external API failures were handled gracefully with comprehensive error logging. Database operations remained stable with no data loss, and the system

recovered successfully from simulated failures. AI quality assessment showed that enrichment gathered relevant data in over 85% of cases where sufficient public information was available, qualification reasoning provided clear and logical explanations, and generated messages maintained appropriate tone and relevance, though some variance in quality was observed based on available lead data.

Areas identified for improvement included enrichment speed optimization through caching and parallel processing, ongoing prompt refinement for message quality, full implementation of the contact lookup service with reliable data sources, multi-channel communication expansion, and more sophisticated analytics dashboard visualizations. These findings provided clear direction for post-MVP development priorities.

2.5 The Business Plan

2.5.1 Market and Competitor Analysis:

As discussed in Section 2.2, Prosply's initial target market consists of Brazilian technology companies and startups that operate under a consultative B2B sales model. This segment includes approximately 7,800 companies and represents an estimated annual market potential of R$108 million. These organizations typically rely on outbound and hybrid sales strategies, where consistent lead generation and qualification are critical to revenue performance, yet operational constraints often limit scalability.

The primary persona addressed by the solution is composed of sales leaders and revenue operations managers responsible for pipeline generation, team productivity, and forecasting accuracy. These professionals are evaluated based on predictable performance and efficient resource allocation, making them particularly sensitive to inefficiencies in prospecting workflows. A secondary persona includes founders and CEOs of small companies who personally manage sales activities but lack the

resources to build or sustain dedicated SDR teams. For this group, automation represents not only a productivity gain but a structural necessity to support growth.

SWOT Analysis:

Strengths:

- **Technical Differentiation:** True end-to-end automation with AI-powered personalization sets Prosply apart from partial solutions
- **Market Focus:** Dedicated attention to Brazilian market with local data integration and pricing
- **Team Expertise:** Strong technical capabilities in AI, software development, and system architecture
- **Cost Efficiency:** Demonstrated ability to deliver sophisticated solution at accessible price point
- **First-Mover Advantage:** Limited direct competition in Brazilian market for comprehensive AI prospecting automation

Weaknesses:

- **Early Stage:** Unproven track record and limited customer base
- **Brand Awareness:** Unknown brand requiring investment in marketing and positioning
- **Resource Constraints:** Limited team and budget compared to international competitors
- **Feature Completeness:** Some planned features (multi-channel, advanced analytics) not yet implemented
- **Data Dependency:** Reliance on third-party APIs for enrichment and contact lookup

Opportunities:

- **Growing Market:** Increasing adoption of sales automation and AI tools
- **Digital Transformation:** Companies accelerating technology adoption post-pandemic
- **Funding Environment:** Venture capital interest in AI-powered B2B tools
- **Market Education:** Rising awareness of AI capabilities creating demand

- **Partnership Potential:** Integration opportunities with CRMs, marketing platforms, and data providers
- **Geographic Expansion:** Opportunity to expand to other Latin American markets
- **Vertical Specialization:** Potential to create industry-specific versions

Threats:

- **International Competition:** Well-funded global players may enter Brazilian market
- **Technology Commoditization:** AI capabilities becoming more accessible
- **Regulatory Changes:** Potential restrictions on automated outreach or data usage (LGPD compliance)
- **Market Saturation:** Sales professionals developing "automation fatigue"
- **Economic Uncertainty:** Budget cuts affecting technology spending
- **Data Access:** Changes to LinkedIn or other data source policies

Prosply positions itself as an AI-powered virtual SDR focused on maximizing productivity while minimizing operational cost. This positioning is grounded in three core attributes: automation of repetitive prospecting tasks, intelligence through AI-driven personalization and qualification, and accessibility via transparent and affordable pricing.

When compared to international competitors, Prosply differentiates itself through significantly lower pricing—estimated to be between 40% and 60% less expensive—stronger integration with Brazilian market data, and AI capabilities that are comparable or superior for the intended use case. Additionally, the platform emphasizes a more focused feature set, avoiding the complexity often associated with enterprise-oriented solutions.

Relative to local competitors, Prosply offers a more advanced technological approach, incorporating AI-driven enrichment, qualification, and message generation into a single automated workflow. While many domestic solutions address lead generation or outreach in isolation, Prosply aims to deliver a complete prospecting pipeline supported by a modern technology stack and a clearly defined product roadmap.

2.5.2 Business Model (Business Model Canvas - BMC):

The business model of Prosply can be described using the Business Model Canvas framework, which structures the organization's value creation and capture logic through nine interconnected elements. This framework provides a comprehensive view of how the platform delivers value to customers while maintaining operational and financial sustainability.

Prosply's value proposition is centered on enabling automated and scalable prospecting for B2B companies. The platform aims to reduce the operational burden associated with manual lead research, qualification, and outreach by integrating these activities into a single AI-supported workflow. Rather than focusing on isolated automation features, Prosply seeks to deliver an end-to-end prospecting process that preserves contextual personalization while supporting volume-based execution.

Customer segments are primarily composed of small and medium-sized technology companies operating in B2B markets, particularly those with consultative sales models. These organizations typically depend on outbound or hybrid prospecting strategies but face limitations in scaling sales development activities. Secondary segments include professional services firms and other B2B companies with similar prospecting dynamics. While enterprise customers are not the initial focus, the model allows for future expansion through customized plans.

Customer relationships are managed predominantly through a self-service model. Onboarding is supported by guided setup flows, documentation, and educational materials designed to minimize adoption friction. Ongoing support is provided through email and chat channels during business hours, with the possibility of introducing more structured customer success initiatives for higher-tier plans as the platform matures.

Prosply reaches its customers primarily through digital channels. Direct acquisition occurs via the company's website, supported by content marketing initiatives such as articles, guides, and case studies. Paid digital advertising and referral mechanisms complement organic acquisition. Partnerships and integrations, particularly with CRM

and marketing automation platforms, represent additional channels for distribution and future growth.

Revenue streams are based on recurring monthly subscriptions, structured according to the volume of leads processed by the platform. This pricing logic aligns revenue generation with customer usage and operational cost drivers. Tiered plans enable customers to scale their usage over time while providing predictable revenue for the platform. Additional revenue opportunities may emerge through enterprise plans, add-on features, and professional services related to campaign configuration and integration.

Key resources underpinning the business model include the technical team responsible for software development and AI logic, the proprietary automation workflows and qualification mechanisms embedded in the platform, and the underlying cloud infrastructure supporting scalability and reliability. Intellectual property in the form of source code, system architecture, and accumulated operational knowledge also represents a critical asset.

Key activities focus on continuous product development, infrastructure operation, AI prompt engineering, and system monitoring. These activities are complemented by customer acquisition efforts, support operations, and the management of integrations with external data providers and services.

Key partnerships play an enabling role in the business model. These include cloud infrastructure providers, AI platform providers, external data and enrichment services, email delivery services, and payment processors. Such partnerships allow Prosply to leverage specialized capabilities without internalizing excessive operational complexity, while maintaining flexibility to adapt providers over time.

Finally, the cost structure of Prosply reflects a combination of fixed and variable costs. Fixed costs include personnel, baseline infrastructure, and operational expenses, while variable costs are driven primarily by API usage, AI processing, data enrichment, and communication services. This structure supports a usage-aligned pricing model and provides transparency in unit economics, which is essential for long-term sustainability.

2.5.3 Marketing and Sales Strategy

Prosply's marketing and sales strategy is structured around a phased go-to-market approach that reflects the maturity of the product and the gradual expansion of its target audience. The strategy emphasizes early validation, progressive scaling of acquisition channels, and long-term positioning within the sales automation market.

In the initial phase, corresponding to the first six months of operation, the primary objective is to establish product–market fit and acquire an initial customer base. During this period, the focus is on launching the product with the Start and Growth plans, implementing a structured onboarding experience, and closely monitoring early usage patterns. Early adopters are leveraged to generate qualitative feedback and initial case studies, which support credibility and messaging refinement. Customer acquisition efforts in this phase rely heavily on founders' networks, direct outreach at startup and sales-related events, and the gradual construction of a content base composed of educational materials such as blog posts, guides, and tutorials. Referral mechanisms are also introduced to encourage organic growth. The goal of this phase is to validate demand and reach an initial group of customers while maintaining close interaction with users.

The second phase, spanning months seven to twelve, shifts the focus toward scaling and optimization. At this stage, acquisition channels that demonstrated traction during the initial phase are expanded. Paid advertising campaigns are introduced on platforms such as Google and LinkedIn, and partnerships with complementary tools are explored. Content marketing efforts are strengthened through search engine optimization, and educational initiatives such as webinars and workshops are used to reinforce thought leadership. As the product matures, outbound sales activities may be selectively introduced for higher-tier prospects, particularly those evaluating larger usage volumes. This phase aims to improve conversion efficiency and build a more predictable acquisition pipeline.

In the longer term, the strategy envisions a phase focused on consolidation and expansion. Marketing investments are scaled based on validated channels, and a more structured sales function may be introduced to support larger or more complex

accounts. Product evolution, including multi-channel capabilities and deeper integrations, enables expansion into additional verticals and potentially other Latin American markets. At this stage, partnerships and integrations play a more prominent role in distribution, and the platform may evolve toward a broader ecosystem approach.

Customer acquisition is supported by a combination of inbound, outbound, and product-led growth mechanisms. Inbound efforts emphasize educational content, case studies, and thought leadership focused on sales automation and AI-driven prospecting. Outbound activities prioritize warm leads generated through engagement signals, targeted account-based outreach, and event-driven opportunities. Product-led growth initiatives, such as free trials or limited-access tiers, aim to reduce adoption friction and allow users to experience value before committing to a subscription.

Customer retention is treated as a strategic priority throughout all phases. Onboarding processes are designed to ensure that customers successfully launch their first campaigns, while continuous feedback loops inform product improvements. Usage monitoring supports the identification of at-risk accounts, enabling timely intervention. Over time, community-building initiatives and transparent communication of the product roadmap contribute to long-term engagement and retention.

Performance is monitored through a set of key indicators covering acquisition, engagement, and revenue. These include metrics related to traffic and conversion, platform usage intensity, customer retention, and recurring revenue. Together, these indicators support data-driven decision-making and continuous refinement of the go-to-market strategy.

2.5.4 Financial Projection and Feasibility:

Prosply’s financial feasibility is evaluated based on projected subscription revenue, operating costs, and expected scaling dynamics over a three-year horizon. The

revenue model follows a recurring subscription structure with tiered plans, as described in Section 2.5.2, with monthly pricing aligned to lead processing volume. This structure enables predictable revenue growth while maintaining alignment between customer usage and operational costs.

In the first year of operation, financial projections assume gradual customer acquisition, starting from zero and reaching approximately 100 customers by the end of the period. Average monthly recurring revenue is estimated at around R$75,000, resulting in an annual recurring revenue of approximately R$900,000. Gross margins in this initial stage are projected between 40% and 45%, reflecting higher relative costs associated with lower scale and early infrastructure usage.

During the second year, growth is expected to accelerate as acquisition channels mature and operational efficiencies improve. The customer base is projected to expand from 100 to approximately 350 customers, with average monthly recurring revenue increasing accordingly. Economies of scale and infrastructure optimization are expected to improve gross margins to a range between 50% and 55%. By the third year, projections assume continued growth toward approximately 800 customers, with further improvements in margin as fixed costs are diluted across a larger revenue base.

Operating expenses are primarily driven by personnel, infrastructure, and sales and marketing investments. Personnel costs represent the largest expense category, reflecting the need for engineering, product, commercial, and customer success roles as the company scales. Infrastructure costs grow with usage volume but benefit from cloud-based scalability. Sales and marketing expenditures increase progressively as acquisition efforts expand, while general operating expenses remain proportionally smaller.

Break-even analysis indicates that operational profitability becomes achievable once monthly recurring revenue reaches approximately R$180,000 to R$200,000, depending on cost structure and plan mix. Under the projected growth trajectory, this threshold would be reached during the second year of operation, following initial investment in product development and customer acquisition.

To execute the proposed plan, an initial investment is required to support early-stage operations. This funding would be allocated primarily toward product refinement, team compensation, infrastructure setup, and marketing launch activities. The objective of this initial capital allocation is to reach product–market fit and establish a stable customer base capable of sustaining further growth through recurring revenue.

From a feasibility perspective, the projected financial trajectory suggests that the model is viable under reasonable growth assumptions. Revenue scalability, improving margins, and controlled cost expansion support the long-term sustainability of the platform. While external factors such as market conditions and competitive dynamics may influence outcomes, the proposed model demonstrates internal consistency between pricing, cost structure, and growth strategy.

2.6 Validation and Results

2.6.1 Validation Methodology:

The validation of Prosply combined qualitative research with technical and operational testing of the MVP. This approach aimed to ensure that both the problem definition and the proposed solution were grounded in real-world sales practices while remaining technically feasible.

Qualitative validation was conducted through structured interviews with sales professionals and leaders from different B2B organizations and roles. These interviews focused on current prospecting workflows, commonly used tools, channel effectiveness, and operational bottlenecks. Insights from these conversations confirmed that lead generation and qualification represent primary pain points in sales operations, while personalization is recognized as a key driver of conversion but remains difficult to execute at scale. Interviewees consistently indicated that cold outbound conversion rates are relatively low, reinforcing the importance of volume combined with relevance. These findings directly influenced product decisions, including the shift from company registry–based targeting to LinkedIn-based filters and the prioritization of email as the initial outreach channel, with cautious expansion to other channels.

Technical validation focused on assessing the functionality, reliability, and performance of the MVP. End-to-end testing verified the complete workflow from campaign creation through lead enrichment, qualification, message generation, and email delivery. Additional tests covered error handling, data consistency across pipeline stages, and usability of the interface by non-technical users. Performance evaluations examined processing time per lead, concurrent campaign execution, and infrastructure behavior under load, alongside monitoring of operational costs.

The quality of AI-driven components was evaluated through manual review of enrichment outputs, qualification logic, and generated messages. These outputs were compared against typical SDR-produced content to assess relevance, tone, and contextual accuracy. While full-scale outbound execution was intentionally limited during testing to avoid compliance and spam risks, pilot campaigns processed over one hundred leads through the complete pipeline, providing quantitative signals on enrichment success rates and qualification distribution.

Overall, the validation process supported the feasibility of the proposed solution and confirmed alignment between identified market needs, technical implementation, and the platform's intended use cases.

2.6.2 Market Validation Results:

Market validation results were primarily derived from qualitative feedback and observational signals collected during interviews, demonstrations, and academic evaluations. Overall, feedback indicated strong alignment between the identified problem and the proposed solution.

Participants consistently recognized prospecting inefficiency as a significant operational challenge, confirming the relevance of the problem addressed by Prosply. The concept of AI-supported automation combined with contextual personalization was perceived as relevant, particularly as a way to reduce manual effort without fully standardizing outreach. Pricing assumptions were generally viewed as reasonable

when compared to the cost of maintaining internal sales development resources, reinforcing the economic rationale of the model.

Feedback also highlighted areas requiring careful consideration and refinement. Data quality emerged as a critical factor, with emphasis on the need for accurate and up-to-date lead information to support trust in automation. Channel strategy, especially regarding messaging platforms such as WhatsApp, was identified as a potential risk area due to concerns about intrusiveness and compliance. Additionally, integration with existing CRM systems was frequently mentioned as an important requirement for practical adoption, along with interest in configurable templates and industry-specific campaign logic.

Beyond interview feedback, validation signals were observed through the project's evaluation and demonstration activities. The solution was formally approved by the academic evaluation committee and received positive reception during public demonstrations. These interactions generated preliminary interest from external organizations for potential early usage, suggesting initial market curiosity, although no commercial commitments were established at this stage.

Overall, the validation results support the relevance of the problem and the feasibility of the proposed solution, while also highlighting key constraints and priorities for future development.

2.6.3 Key Performance Indicators (KPIs):

The definition of key performance indicators focused on establishing reference metrics to guide future validation and operational monitoring, rather than reporting finalized production results. These indicators reflect performance levels considered desirable and realistic for an early-stage AI-driven prospecting platform operating under MVP conditions.

From a technical standpoint, enrichment effectiveness is a central indicator. The platform aims to retrieve contextual information for the majority of leads with publicly available data, with a target enrichment success rate above 80%. For enriched leads, the intended outcome is the extraction of multiple relevant data points per profile,

such as company information, role context, and public activity signals. Variability in enrichment coverage is expected due to differences in external data availability, particularly for profiles with limited visibility.

Qualification quality is evaluated through alignment between automated decisions and campaign-defined criteria. The desired benchmark is that the majority of qualification outcomes—targeting levels above 85%—are consistent with expected human judgment when manually reviewed. Score distributions are expected to demonstrate differentiation across leads, avoiding uniform classification patterns, and each qualification decision should be accompanied by explanatory reasoning to support transparency.

Message generation quality is assessed qualitatively and structurally. Generated messages are expected to maintain a professional tone, respect predefined brand guidelines, and reference lead-specific context when available. Target message length follows common outbound best practices, typically ranging between 120 and 150 words. While some variability in creativity is acceptable, the platform aims for consistent clarity and relevance across automated messages.

Processing performance indicators focus on throughput rather than real-time responsiveness. Given the batch-oriented nature of prospecting workflows, acceptable end-to-end processing time per lead is defined within a target range of approximately 5 to 10 minutes, including enrichment, qualification, and message generation. Individual pipeline stages are expected to operate asynchronously and independently, allowing the system to scale through horizontal worker expansion.

System reliability is monitored through indicators related to data integrity and workflow continuity. The intended benchmarks include zero data loss during processing, graceful handling of external API failures through retry mechanisms, and stable queue operation under concurrent campaign execution. High availability is expected during active operation periods, recognizing that MVP environments may experience controlled downtime during development iterations.

Business-related indicators are defined to evaluate the plausibility of the proposed economic model. Market sizing estimates provide reference values rather than guaranteed outcomes, establishing a context in which early adoption can be

evaluated. Unit economics targets are guided by maintaining per-lead processing costs within a range compatible with subscription pricing, supporting gross margins above 40% at moderate scale. These targets are intended to validate the sustainability of the pricing model rather than predict exact financial outcomes.

Willingness to pay is assessed qualitatively, with the target condition being that subscription pricing remains meaningfully lower than the cost of maintaining internal sales development resources or adopting international enterprise platforms. Competitive positioning indicators focus on differentiation rather than dominance, with success defined as delivering an integrated, AI-driven prospecting workflow tailored to the Brazilian market.

Overall, these KPIs serve as directional benchmarks to guide further experimentation, optimization, and validation as the platform evolves beyond the MVP stage.

2.6.4 Risks and Mitigation Plan:

The development and potential deployment of Prosply involve a set of business, technical, regulatory, and financial risks that are typical for early-stage SaaS platforms operating in data-intensive and AI-driven domains. Identifying these risks and outlining mitigation strategies is essential to assess the feasibility and robustness of the proposed solution.

From a business perspective, one of the primary risks relates to outbound channel effectiveness, particularly email engagement. Low open or response rates could reduce the perceived value of automated prospecting. To mitigate this risk, the platform emphasizes continuous experimentation with messaging formats, subject lines, and prompts, alongside best practices in email deliverability. Additionally, prioritizing lead quality over volume and gradually expanding to alternative channels, such as professional networks, reduces reliance on a single communication medium.

Another significant business risk is dependency on external data providers. The platform relies on third-party APIs for enrichment and contact data, which exposes it to potential pricing changes, access restrictions, or service instability. Mitigation

strategies include diversifying data sources, caching enrichment results to reduce repeated calls, and designing the architecture to allow provider substitution with limited disruption.

Regulatory and privacy considerations also represent a critical risk, particularly in the context of automated prospecting and data usage. To address this, Prosply is designed to prioritize publicly available business information, incorporate opt-out mechanisms in communications, and support data deletion requests. Compliance considerations, including alignment with Brazilian data protection regulations (LGPD), are treated as foundational design constraints rather than post hoc adjustments.

Market adoption risk is associated with limited trust or understanding of AI-driven automation among potential users. This risk is mitigated through transparency in how automation is applied, positioning AI as an augmentation rather than a replacement of human sales efforts, and enabling hands-on experimentation through trials and educational content.

From a technical standpoint, variability in AI output quality poses a risk to user trust. Mitigation involves iterative prompt refinement, structured feedback loops, and the ability to review or override automated decisions during early usage stages. Scalability risks are addressed through a queue-based, horizontally scalable architecture that supports incremental load growth and isolates failures within individual processing stages. External API instability is mitigated through retry mechanisms, monitoring, and asynchronous processing that allows workflows to resume after temporary disruptions.

Competitive risks stem primarily from the potential entry of well-funded international players and the commoditization of AI technologies. Prosply mitigates these risks by focusing on local market integration, pricing aligned with Brazilian economic conditions, and differentiation at the workflow and user experience level rather than reliance on AI capabilities alone.

Finally, financial risks include funding availability and burn rate management. These are mitigated through a staged growth approach, lean team structure, careful monitoring of expenses, and prioritization of activities with clear impact on validation

and revenue generation. Maintaining operational flexibility and sufficient runway is treated as a core financial discipline.

Overall, the identified risks and mitigation strategies reflect a realistic understanding of the challenges associated with building and scaling an AI-driven SaaS platform. Continuous monitoring and iterative adjustment of these strategies are essential as the project evolves beyond the MVP stage.

3 Conclusion

This project successfully achieved the objectives established at its outset. A functional minimum viable product was developed, capable of automating the complete prospecting cycle, from lead generation to personalized email delivery. The results demonstrate that artificial intelligence can be applied to maintain contextual personalization while operating at the scale and efficiency required for automated workflows.

From a technical perspective, the platform delivers an end-to-end solution that supports campaign creation, lead generation through LinkedIn-based filters or custom uploads, automated enrichment using multiple data sources, AI-driven qualification with explanatory reasoning, and personalized message generation integrated with email delivery. All core components operate cohesively within a production-ready environment, incorporating appropriate error handling and monitoring mechanisms. The system successfully collects relevant contextual information for each lead, analyzes this information within the scope of a specific campaign, and generates customized messages that reference meaningful talking points. Testing indicated that the quality of AI-generated content is comparable to that produced manually by sales development representatives, while achieving substantially higher processing throughput.

The architectural foundation of the platform, built using FastAPI, PostgreSQL, RabbitMQ, and cloud services, proved to be robust and scalable. The use of queue-based asynchronous processing enables horizontal scaling through the

addition of workers, allowing the system to grow from pilot usage to significantly higher volumes without fundamental redesign. These architectural choices were critical in supporting the integration of all system components into a coherent pipeline.

Market validation activities confirmed alignment between the proposed solution and real operational needs. Research conducted through interviews and exploratory validation consistently indicated that prospecting inefficiency represents a significant pain point across different sales contexts. Feedback supported the relevance of Prosply's approach, particularly its focus on automating lead generation and qualification while preserving personalization. Pricing assumptions were also validated qualitatively, with indications that the proposed subscription levels are perceived as reasonable when compared to internal sales development costs and existing market alternatives.

The project also resulted in the definition of a clear business model based on recurring monthly subscriptions structured into tiered plans. This model aligns pricing with customer usage and provides predictable revenue while maintaining viable unit economics. Financial projections indicate a plausible path to sustainability, supported by gross margins above 40% and a defined break-even threshold. Market sizing analysis identified a meaningful initial opportunity with potential for expansion beyond the initial segment.

Throughout development, the system was instrumented to track key indicators across the prospecting funnel, including enrichment coverage, qualification outcomes, message generation quality, and delivery status. This analytics foundation supports future expansion toward deeper performance measurement, conversion tracking, and return-on-investment analysis.

The development process yielded several important insights. Continuous market research proved essential, as early assumptions regarding targeting and segmentation required adjustment based on practitioner feedback. In particular, the shift from company registry–based filtering to LinkedIn-oriented targeting reflected how sales professionals conceptualize prospecting in practice. Maintaining focus on completing a functional end-to-end workflow before expanding feature scope was

also critical, helping avoid fragmented implementation. The iterative nature of AI development became evident, as prompt design and output quality required continuous refinement rather than one-time implementation. Architectural decisions made early in the project had lasting impact on development velocity and system integration, reinforcing the importance of investing in sound technical foundations. Additionally, reliance on third-party data providers introduced operational and cost considerations that required careful abstraction, monitoring, and contingency planning. Pricing strategy similarly demanded balance between customer willingness to pay, cost structure, competitive context, and perceived value, with transparency emerging as a positive differentiator.

Despite achieving its core objectives, the project also identified limitations that represent opportunities for future improvement. The current implementation focuses primarily on email as the outbound channel, while multi-channel approaches such as LinkedIn and WhatsApp remain planned extensions. Contact discovery capabilities are structurally present but require further integration with reliable data sources. Certain workflows still benefit from human oversight, particularly during early adoption stages, and analytics capabilities remain basic relative to long-term optimization needs. Broader ecosystem integration with CRM and marketing platforms also represents a key area for evolution.

Future development priorities span short-, medium-, and long-term horizons. In the near term, completing contact lookup integration, expanding outbound channels, strengthening CRM connectivity, enhancing analytics, and adding experimentation capabilities are natural next steps. Medium-term efforts may include mobile access, collaboration features, campaign templates, and expanded AI learning from campaign performance. Over the longer term, opportunities exist to develop industry-specific solutions, predictive models, autonomous optimization mechanisms, geographic expansion, and enterprise-grade capabilities. Several research avenues also remain open, including AI model optimization for sales communication, systematic conversion experimentation, data quality improvement, and the ethical application of AI in prospecting contexts.

Overall, Prosply illustrates the convergence of advances in artificial intelligence with persistent challenges in sales operations. Prospecting has long remained inefficient

despite technological progress, consuming time and resources while delivering inconsistent outcomes. This project demonstrates that AI can automate complex workflows that require judgment, contextual understanding, and personalization, enabling scale without sacrificing quality. By augmenting rather than replacing human sales professionals, the platform supports a shift toward higher-value activities centered on relationship building and strategic engagement.

The Brazilian market presents a particularly favorable context for this approach, characterized by strong demand, limited local competition, and growing acceptance of AI-driven tools. The project's progression from concept to functional MVP over four academic modules reflects the iterative nature of entrepreneurial development, marked by hypothesis testing, pivots, and continuous learning. Approval by the evaluation committee and positive external reception validate the project's direction while underscoring the importance of disciplined execution moving forward.

Looking ahead, the success of Prosply will depend on sustained product development, effective go-to-market execution, strong customer relationships, and prudent financial management. The foundation established through this project provides a solid basis for continued exploration, whether as an academic outcome or as the early stage of a broader entrepreneurial endeavor.

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