SOLUTION PROPOSAL

B2B Sales Generative AI Assistant Prototype

EE656 Embedded AI Project Group 1

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Abstract

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Declaration

Use of Generative AI

This document was written with assistance from Claude Opus 3.5 and Mistral Le Chat for: (1) LaTeX formatting and diagram creation, and (2) generating abstract content and certain BibTeX citations.

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Contents

I. Glossary of Terms and Acronyms

AI	Artificial Intelligence - Technology capable of performing tasks that typically require human intelligence, being utilized to transform B2B sales processes.
B2B	Business-to-Business - Commercial transactions between businesses, characterized by complex sales processes, slower decision-making cycles, and relationship-focused interactions.
B2C	Business-to-Consumer - Commercial transactions between businesses and end consumers, generally simpler than B2B processes.
FAB	Feature-Advantage-Benefit - A sales methodology that communicates a product's technical characteristics, the improvements these features bring, and the personal or emotional gains from using the product.
LLM	Large Language Model - A sophisticated class of AI designed to understand, generate, and manipulate human language, serving as a core component in the proposed system.
RAG	Retrieval-Augmented Generation - A framework that enhances LLMs by integrating external knowledge sources during the generation process, used in the proposed system to index conversations by customer, topic, and outcome.
GPT-4	Generative Pre-trained Transformer 4 - An advanced large language model developed by OpenAI, mentioned as one of the flexible LLM options in the proposed system architecture.
Claude	An advanced large language model developed by Anthropic, mentioned as one of the flexible LLM options in the proposed system architecture.
Llama	A family of large language models developed by Meta, mentioned as one of the flexible LLM options in the proposed system architecture.
API	Application Programming Interface - A set of protocols that allows different software applications to communicate with each other, referenced in the context of AssemblyAI's Transcript API for audio transcription.

II. Technical Background

A. B2B Sales

Business-to-business (B2B) sales processes are significantly more complex compared to business-to-consumer (B2C) contexts, characterized by slower decision-making cycles and intricate information exchanges [1]. The information requirements in B2B sales are resource-intensive, with substantial reliance on the capabilities and expertise of the sales force [2]. Unlike B2C transactions, B2B sales primarily revolve around establishing robust, long-term relationships optimally achieved through trust development [1].

In B2B contexts, buying firms require comprehensive engagement from selling entities, necessitating thorough information exchange that goes beyond mere product specifications [3]. Traditional face-to-face meetings between sellers and buyers involve both objective information and nonverbal cues, which play a critical role in establishing mutual understanding, agreement levels, and trust in the salesperson [1], [4]. These interactions facilitate the sharing of both rational and emotional information, establishing a common ground that infuses the exchanged information with value and significance for both parties [1].

The sales argument is a meticulously crafted document highlighting product-specific selling points to better address customer needs and concerns [5]. It serves as a guide to structuring communication that influences the customer's decision-making process, containing various arguments designed to provide the sales force with precise knowledge of the product's features and qualities [6]. Effective sales argumentation cannot be improvised; it requires thorough preparation and adaptation to meet the needs and expectations of each customer rather than using standardized pitches [7].

Among various sales techniques, the Feature-Advantage-Benefit (FAB) method is one of the most effective and practical approaches for sales argument creation and preparation [6]. This method clearly communicates a product's features (technical characteristics), advantages (improvements the feature brings), and benefits (personal or emotional gains from using the product) to potential buyers, linking them to consumer needs [7]. For instance, in presenting a smartphone, a salesperson would describe the high-resolution screen as a feature, improved visual clarity as its advantage, and ease of use with eye protection as the resulting benefit. This structured approach enhances the persuasiveness of the sales argument by focusing on how the product satisfies specific customer needs rather than merely describing its technical specifications [6].

The integration of advanced technologies like artificial intelligence (AI) has begun transforming traditional B2B sales processes. AI technologies have been redefining sales practices, changing all sales funnel steps from making initial contact with prospects to managing negotiations [8]. Generative AI, in particular, promises to disrupt B2B customer experience, productivity, and growth by enabling hyper-personalized content and offerings based on individual profiles, customer behavior, and purchase history [9]. However, there remain challenges in aligning AI solutions with corporate strategies, with ongoing debates about their actual value in business applications [3]. Research indicates strategic challenges associated with AI, such as its limitation in recognizing business interdependencies and resistance to managerial control [10]. Despite these challenges, the potential of AI to enhance B2B sales processes through automation, personalization, and data-driven insights presents significant opportunities for competitive advantage in increasingly complex sales environments.

B. Software Design

Software design is a fundamental aspect of application development, encompassing the systematic planning and structuring of software systems to achieve specific functional and performance goals [11]. Effective software design prioritizes modularity, maintainability, scalability, and adaptability. These attributes facilitate the management of complexity inherent in software projects, supporting the incremental and iterative nature of software development, and enabling flexibility in response to evolving requirements [12]. This is especially important in B2B sales where application requirements can grow or change rapidly [1].

One widely recognized approach in software design is the concept of separation of concerns, a principle that advocates dividing software into distinct, clearly defined components or modules [13]. Each component is responsible for specific functionalities and can be developed and tested independently [11]. This modularity simplifies the integration and testing processes, reducing complexity and improving maintainability [14]. Clearly defined interfaces and responsibilities among software components significantly enhance both collaborative development efforts and long-term software quality [11].

Requirement analysis is another critical step in software design, serving as the foundation for setting clear design goals [15]. Thorough analysis involves systematically identifying, documenting, and validating user and system requirements, ensuring alignment between stakeholder expectations and software capabilities [11]. Effective requirement analysis not only captures explicitly stated customer needs but also includes inferring implicit requirements, uncovering user expectations that may not be directly communicated [12]. Such proactive inference ensures comprehensive design coverage, contributing significantly to system usability and customer satisfaction.

A crucial element highlighted frequently in software design literature is robust error handling. Robust error handling involves proactive strategies to anticipate, de-

tect, manage, and recover from errors to ensure system reliability and user confidence [11]. It is recommended to incorporate explicit error checking, recovery procedures, and user communication strategies to mitigate adverse effects and enhance user experience. Additionally, effective software design for AI-based programs must include robust monitoring and logging mechanisms to ensure reliability and predictability in operation [16]. These measures support system stability and facilitate quick troubleshooting, which are critical for maintaining software [11].

Recent literature provides valuable insights into software design patterns specifically for AI-based systems. A multi-vocal literature review has identified various established and emerging patterns applicable to AI systems, such as the Multi-Layer Pattern (also known as Separation of Concerns or Multi-Tiered Architecture) [17]. This pattern divides applications into clearly defined layers, each consisting of submodules that process input and provide output to subsequent layers. Such an approach allows for independent layer design and enhances the adaptability of AI systems. The modular structure facilitates the inference of results at each layer, enabling easier adjustments and scalability, particularly beneficial in complex applications such as those involving AI components.

III. Methodology

A. User Interface Design for AI-Enhanced B2B Sales Applications

Effective user interface (UI) design is essential for realizing the full potential of generative AI in B2B sales applications [18]. The UI serves as the primary interaction point between users and AI-driven functionalities, significantly influencing the usability, adoption, and overall effectiveness of the system [19]. Designing a user interface for AI-enhanced sales tools must focus on clarity, ease of use, transparency, and trust-building, given the complexity and high stakes in B2B sales contexts [1].

The proposed UI leverages advanced generative AI to significantly enhance user interactions in B2B sales discovery. Recognizing the complexity and information-intensive nature of B2B sales processes, the UI is designed to facilitate efficient data visualization, intuitive information access, and clear communication of AI-generated insights to support informed decision-making by sales professionals [20].

The UI incorporates detailed dashboards and descriptions to effectively display key insights generated by remote AI components, such as opportunity assessments, customer relationship analyses, and sales process optimization recommendations [7]. These dashboards enable quick comprehension and efficient management of complex data, providing users with clear visualizations of AI-derived conversational summaries, predictive insights, and personalized recommendations. Such visual presentations ensure transparency, interpretability, and rapid assimilation of AI-driven insights, crucial for informed decision-making [18].

Specific UI elements tailored for B2B sales include dynamic meeting preparation tools, detailed conversational analysis reports, and intuitive visual indicators of deal progress and status. Such tools empower sales representatives by providing immediate access to critical performance metrics, customer sentiments, and competitive insights.

User interactions are further optimized through responsive design elements that enable deep exploration of AI-generated insights [21]. The UI includes interactive components allowing users to refine results based on their immediate context, providing flexibility and enhancing the relevance of information presented [22].

To ensure transparency and foster user trust, comprehensive monitoring and logging functionalities are integrated into the UI [16]. These features provide traceability and visibility into AI-driven decision-making processes, promoting accountability and aiding rapid problem resolution.

The implementation of the UI will adopt an iterative, user-informed design approach, leveraging user research, heuristic evaluations, and remote usability testing methods to continually refine the system [20]. This approach ensures alignment with user expectations and practical workflows, ensuring high usability and effectiveness in real B2B sales scenarios.

B. Generative AI-Enhanced Conversational Intelligence for B2B Sales

Modern B2B sales processes face significant challenges due to their complexity and information-intensive nature [1], [2]. Sales representatives must engage in extensive information exchange to build trust and establish relationships with clients, while attempting to identify key signals and patterns across numerous conversations [4]. This subsection proposes a technical solution leveraging generative artificial intelligence to enhance B2B sales effectiveness through conversational intelligence.

Our proposed system architecture implements a three-layer approach to sales conversation analysis and enhancement. The foundation consists of an audio transcription pipeline utilizing AssemblyAI's Transcript API to convert recorded sales conversations into high-quality text with speaker diarization. This addresses the fundamental challenge identified by [6], who note that sales argument creation is "a challenging task that requires considerable effort, time, and skills" by automating the capture and processing of sales conversations.

The second layer implements a Retrieval-Augmented Generation (RAG) system that indexes conversations by customer, topic, and outcome. As explained by [23], RAG frameworks "enhance the capabilities of Large Language Models by integrating external knowledge sources during the generation process," which in our case allows for

contextual analysis of conversations enhanced by historical interaction data. The RAG system is designed to mitigate what [10] identifies as AI's "myopic nature," which limits contextual awareness beyond assigned tasks, by providing comprehensive conversation history and relationship context.

The third layer consists of a flexible Large Language Model (LLM) architecture allowing seamless interchange between models (e.g., GPT-4, Claude, Llama) based on specific analysis requirements and client preferences. This design follows [24]'s framework for aligning generative AI applications with specific tasks based on accuracy requirements and complexity levels.

The system offers three primary analytical functions designed specifically for B2B sales contexts. First, the opportunity assessment capability identifies buying signals, objection patterns, and decision criteria mentioned across conversations. This addresses [9]'s finding that commercial leaders see significant potential in AI for lead identification and personalized outreach. Second, the relationship intelligence function analyzes conversational patterns to map stakeholder relationships, sentiment changes, and trust indicators. This capability is particularly valuable in B2B contexts where, as [3] explains, "trust in the salesperson" is critical for establishing mutual understanding and agreement. Third, the process optimization component evaluates adherence to established sales methodologies, extracts competitive intelligence, and analyzes time allocation across topics. This function responds to [25]'s observation that B2B sales leaders see the greatest potential in AI for improving efficiency and boosting top-line growth.

The delivery of insights is designed to integrate seamlessly with existing sales workflows, providing pre-meeting briefings, post-call analysis, visual deal health dashboards, and personalized coaching recommendations. This approach addresses what [26] identifies as a key obstacle to AI adoption: the lack of organizational readiness and cultural resistance to AI-influenced decision-making.

For implementation, we recommend following [27]'s hybrid approach that combines top-down strategic guidance with bottom-up experimentation. This allows sales teams to independently explore and develop AI applications that address their specific needs while maintaining alignment with organizational objectives.

Expected outcomes include reduced sales cycle length, increased deal size, improved win rates, and faster onboarding of new sales representatives. These benefits address the challenges identified by [28], who notes that in B2B environments, customer inquiries often involve "highly technical, domain-specific issues" that require extensive knowledge resources.

Our proposed solution transforms traditional B2B sales conversations from ephemeral interactions into strategic, analyzable assets that continuously enhance sales performance. By integrating generative AI with RAG capabilities, the system mitigates the inaccuracy concerns highlighted by [29] as one of the most prominent risks associated with generative AI implementations.

IV. Project Management

A. User Stories

User stories represent concise, user-centric descriptions of software functionality valuable to users or customers of a system [30] [31]. Commonly employed in Agile development methodologies such as Scrum and Extreme Programming (XP), user stories serve as a means to clearly articulate user needs and facilitate project planning [30] [31] [32]. In this project, each user story comprises three essential elements: a written description, stakeholder conversations to detail the requirements, and acceptance tests to verify completion [30] [32] [33].

User stories are widely adopted due to their simplicity, flexibility, and effectiveness in promoting clear communication among stakeholders [34] [31]. Unlike more extensive documentation methods, user stories are concise and written in accessible language, promoting broader participation from the entire Agile team, including end-users [34]. This participatory approach ensures the product backlog accurately reflects user needs, goals, and evolving requirements throughout the project lifecycle [34] [32].

However, the simplicity of user stories can lead to ambiguity, resulting in vague, unclear, or imprecise interpretations [35]. Such ambiguity may create challenges in clearly articulating choices and expectations, thereby impacting development clarity and precision [35]. Addressing this ambiguity is essential for effective requirement communication and alignment among stakeholders.

To enhance clarity and quality, frameworks such as the Quality User Story (QUS) have been proposed, outlining criteria like unambiguity, atomicity, minimalism, and completeness [33]. Following these quality criteria ensures user stories are well-defined within this project, estimable, independent, and problem-oriented, significantly enhancing their usefulness in Agile planning and execution [33].

Usability is another critical factor addressed by user stories, emphasizing the need for the system to provide intuitive and satisfactory feedback to users [36]. Usability-specific user stories, termed usability stories, explicitly document the features required to improve user trust, ease of use, and overall user experience [36]. Incorporating usability considerations into user stories helps ensure the developed system aligns closely with end-user expectations and requirements [36].

Incorporating user stories into Scrum practices provides agility, allowing teams to respond effectively to rapidly changing requirements typical in software development [32]. Through iterative planning and continuous stakeholder feedback, user stories remain relevant and accurately represent current user needs, helping to manage evolving requirements proactively [32]. This project synthesizes user stories as an integral part of the Scrum

methodology, leveraging their strengths to facilitate continuous communication, prioritization, and refinement of requirements, ultimately delivering valuable and user-driven outcomes.

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