



Advanced Collaborative BI Chatbot for Enhanced Enterprise Decision-Making

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I certify that I have read this thesis and that in my opinion it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Science.



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DECLARATION

This is to certify that the work is entirely my own and not of any other person, unless explicitly acknowledged (including citation of published and unpublished sources). The work has not previously been submitted in any form to the Sri Lanka Institute of Information Technology or to any other institution for assessment for any other purpose.

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ABSTRACT

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This research outlines the creation of an innovative collaborative Business Intelligence (BI) chatbot aimed at improving enterprise decision-making by utilizing context awareness, multimodal data integration, predictive analytics, and real-time collaboration. The system merges structured data from SQL databases and CSV files with unstructured resources like text files, PDFs, and images. A multimodal data integration component utilizes FAISS-based vector embeddings to enable semantic retrieval from unstructured materials while guaranteeing smooth access to structured data repositories. The predictive analytics feature goes beyond simple regression by integrating statistical model selection to determine the most appropriate forecasting technique. It also produces interactive dashboards using Dash and generates static PDF reports to cater to various decision-making scenarios. The context-awareness module incorporates tokenization, categorization, and embedding-based retrieval, as well as the capability to create user-specific reports, providing responses that are tailored to both inquiries and analytical requirements. Real-time collaboration among teams is facilitated through connections with Slack and Telegram, in conjunction with a custom chatbot interface, allowing several users to question, share, and annotate insights together. To enable enterprise deployment, the system encompasses API generation with secure management of API keys, credit allocation, and token-based pricing, ensuring controlled access and scalability. Together, these advancements transform the chatbot into a flexible decision-support platform that consolidates various data sources, generates predictive insights, produces contextual reports, and promotes collaborative analytics in real time.

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