Cover page

Project title: "FlowX: Chatbot Builder" Academic Year: 2024/2025

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Project Type Software

Supervisor Name: Dr. Amjad Abu Hassan

Format:

- Single space, Times New Roman.
- 12 pt,
- Maximum 1 page.

Abstract Body:

Items must be provided in the Abstract:

- Why do you think this project is important? Please explain the significance of this Project in brief.
- In your point of view what are the important aspects that should be covered in the project?
- Objective(s): In your view, please explain the main objectives of the project.
- Methodology: Give a brief outline of the application development process.
- Had this project been done before? Are there any similar applications available today?
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- **Note:** Please deliver this abstract early to ensure that your Project has been approved by the department's projects committee. **Registration will not be done without this approval.**

Imagine being able to create a chatbot that can engage with users, automate tasks, and handle complex processes—all without writing a single line of code. FlowX, makes this possible by providing an innovative visual chatbot builder platform that allows users, regardless of technical background, to design and deploy custom chatbots for a wide range of applications, from simple customer service to advanced automation tasks and beyond. Featuring an integrated marketplace where users can share and discover chatbots. And allows developers to customize the visual look of the chatbots themselves that end-users interact with.

What sets FlowX apart is its sophisticated graph-based architecture that enables users to build complex conversational flows using specialized block types through a visual, drag-and-drop interface. Users can create workflows with text manipulation blocks, LLM integration blocks, conditional branching blocks, dynamic LLM-based routing blocks, API action blocks that allows for endless automation tasks. The result workflows will be advanced decision-trees that would have been very complicated to maintain program manually.

FlowX is built on a microservices architecture with an ASP.NET Core API service for workflow management, a Python-based LangChain executor for LLM operations, and a React Native frontend providing an intuitive development experience. We implemented a domain model that supports both user management and chatbot functionality, with a sophisticated graph implementation that distinguishes between flow links (controlling conversation sequence) and data links (transferring information between nodes). The system supports conversation state management and provides a unified development experience from workflow creation to visual customization to live testing. Performance optimizations ensure efficient rendering of complex workflows and responsive chatbot interactions. We leverage technologies under the hood like LangChain to execute and abstract actions without maintenance overhead which we take care of.

We have observed that existing solutions fall into two distinct categories: visual builders like Chatfuel and ManyChat that focus on structured workflows but lack sophisticated AI capabilities, and AI platforms like Dialogflow that require technical expertise. FlowX fills this gap by providing an accessible visual builder that seamlessly integrates both approaches. Unlike competitors, FlowX delivers hybrid chatbots that maintain predictability where needed while leveraging LLM capabilities for handling unexpected inputs, all within a unified development environment.

In conclusion, FlowX revolutionizes chatbot development through its innovative hybrid approach. By empowering users to visually design workflows that combine structured logic with dynamic AI responses, and interact with external services through API calls to automate tasks, and even customize the chatbot appearance, we enable the creation of next generation chatbots that are both powerful and user-friendly.