



DUX

Experience the Pinnacle of Conversational AI with St. Clair Chatbot

TEAM MEMBERS

GROUP- 1

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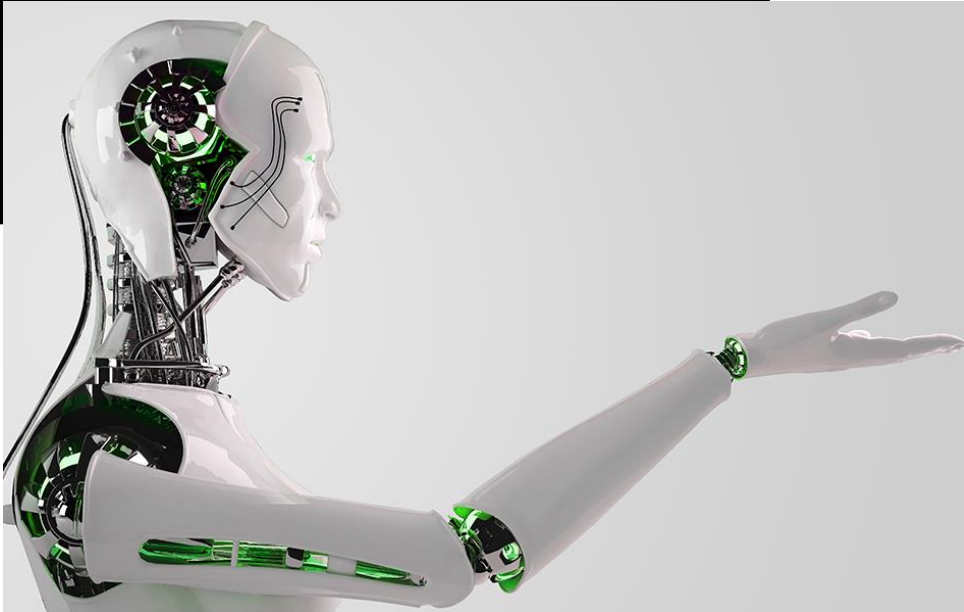
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PROJECT TYPE

- Implement an AI chatbot on the St. Clair College website to help students quickly find the information they need.
- Launch the chatbot on the website and make it easily accessible to users.
- Monitor and continuously improve the chatbot's performance based on user feedback and data analysis.



PROBLEM STATEMENT OF THE USECASE

- St. Clair College's website faces high traffic from students looking for information on courses and services.
- The website can be confusing for some students due to the vast amount of information listed.
- Students can sometimes find it difficult to navigate between pages while trying to decide between course options.
- The goal is to improve the user experience on the St. Clair College website.

IMPORTANCE OF AI SOLUTION FOR THE PROBLEM



- Since, this is a generic problem that can be implemented across various platforms/sites, finding a solution to this issue will help.
- Nowadays, many institutions already implemented chatbots on their websites as such, having a chatbot for St, Clair college will provide a much-needed technological boost.
- The objective of the project is to make the website user-friendly and help students find the information they need quickly and easily.

- Conversational AI can automate processes that are presently done by humans, which will save expenses and decrease human error.
- Since, using an AI chatbot can help users easily navigate between various courses and services and choose accordingly.
- To have a one-stop solution for all the information that the college wants to portray can be beneficial for St. Clair college.

IMPORTANCE OF AI SOLUTION FOR THE PROBLEM AT HAND

- The project will use Language Studio and Azure platform to create an AI Chatbot named 'Dux' as a guide for students.
- Dux will provide information about various courses and a brief description of what each program offers and a URL to navigate directly to the course content.

TASK & EXPECTED SOLUTION

- The chatbot will showcase different services provided by the college and offer a 360 Virtual Tour of the college infrastructure.
- The aim is to create a helpful chatbot that makes users feel important and well-informed about the college's offerings.
- The project will enhance the user experience on the St. Clair College website and make it easier for students to find the information they need.



- We planned to use LUIS for our chatbot, however, the deployment process is quite challenging and as such, we couldn't proceed as planned.

- While creating Dux, we faced a major difficulty while feeding data to Dux for training.
- The data was supposed to be in a hierarchical form with question-answer pairs being interlinked.

- As the data on the St. Clair website is quite vast and not properly structured, feeding data to the Knowledge Base in a structured format was challenging.



FAILURES & CHALLENGES

IMPROVEMENTS & LESSONS LEARNT

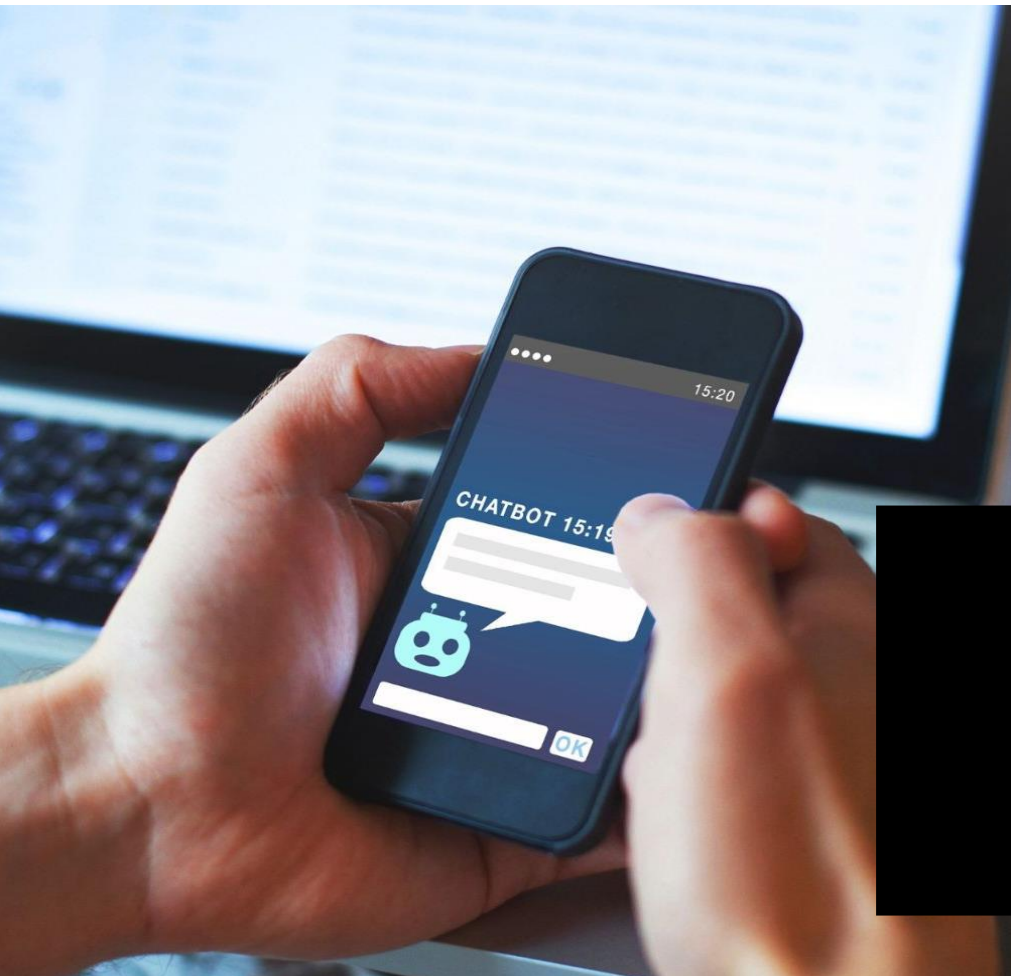
To solve the problem of creating a hierarchy of information for Dux, pairs were connected through follow-up prompts to create a context tree.

The context tree allows for a systematic splitting of information into smaller branches, making it easier for Dux to understand.

A sample data of courses and services provided by St. Clair College was used to train Dux due to the vast amount of available information.

Official help from the faculty would be beneficial in understanding the flow of information and distinguishing between important and unimportant features to fully overcome the large unstructured data challenge.

- Dux is now able to provide students with various information about St. Clair College and its courses.
- It can provide program descriptions, duration, fee structure, and website links for the program selected by the user.
- It can display a list of student services and their offerings
- It also offers a 360-degree virtual tour of the college.
- Dux is a suitable AI solution for St. Clair College's website and can serve as a perfect guide for students.



**PROJECT OUTCOME-
ACHIEVING THE OBJECTIVE**



STEP-WISE CREATION OF DUX (AI CHATBOT)

Language Service Resource Group

Home >

rg-chatbot-devproject-001 Resource group

Search

+ Create Manage view Delete resource group Refresh Export to CSV Open query Assign tags Move

Overview

Activity log

Access control (IAM)

Tags

Resource visualizer

Events

Settings

Deployments

Security

Policies

Properties

Locks

Essentials

JSON View

Resources Recommendations

Filter for any field... Type equals all Location equals all Add filter

Showing 1 to 2 of 2 records. Show hidden types

No grouping List view

Name	Type	Location
inst-chatbot-devproject-001	Language	East US
instchatbotdevproject001-asmdeyhjkz6fky4	Search service	East US

As part of this project, we have created this resource group to manage all the resources which are created for chatbot creation.

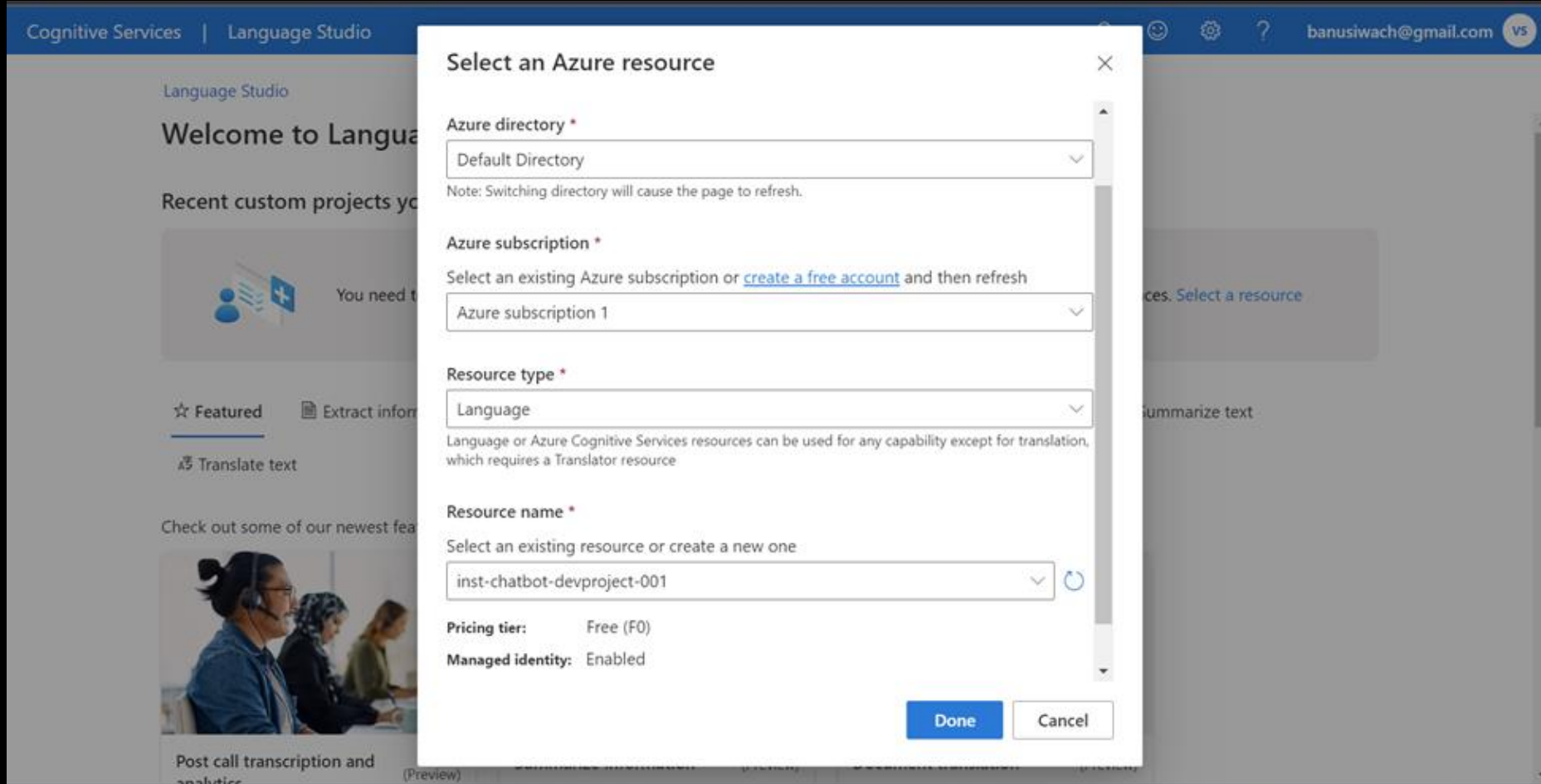
Instance details

The screenshot displays the Azure portal interface for an instance named 'inst-chatbot-devproject-001'. The breadcrumb navigation at the top shows the path: Home > TextAnalyticsCreate-20230415160255 | Overview > rg-chatbot-devproject-001 >. The instance name is followed by a star icon and a menu icon. Below the instance name, there is a search bar and a 'Delete' button. The left sidebar contains a navigation menu with options: Overview (selected), Activity log, Access control (IAM), Tags, Diagnose and solve problems, Resource Management, Features, Keys and Endpoint, Encryption, Pricing tier, Networking, and Identity. The main content area is titled 'Essentials' and shows various properties of the instance. A 'JSON View' link is located in the top right corner of the main content area. At the bottom of the main content area, there are tabs for 'Get Started', 'Discover', 'Develop', and 'Deploy'. A blue information banner at the bottom of the page states: 'Text Analytics has been rebranded and incorporated into Azure Cognitive Service for Language. [Learn More](#)'.

Property	Value
Resource group	(move) rg-chatbot-devproject-001
Status	Active
Location	East US
Subscription	(move) Azure subscription 1
Subscription ID	493ae50f-92bd-4b61-a1b0-9671f0b21b0c
Tags	(edit) Click here to add tags
API type	Language
Pricing tier	Free
Endpoint	https://inst-chatbot-devproject-001.cognitiveservices.azure.com/
Manage keys	Click here to manage keys

- In Azure, an instance refers to a single deployment of a resource, such as a virtual machine, a database, or a web app.
- As part of this project, we have created an instance that will act as an endpoint for our chatbot, allowing for seamless integration and efficient communication.

Language Studio Setup



- Language Studio provides you with a customizable interface that allows you to tailor the tools and features to your specific needs and preferences, making it a versatile and flexible platform.
- As part of this project, we have used Custom question answering option under "Understand questions and conversational language" option to design a chat bot.

Project Creation

Create a project

Choose language setting
Enter basic information
Review and finish

Review and finish
Review the configurations you set for your project in the previous steps.

Projects in multiple languages allowed?
No

Language resource
inst-chatbot-devproject-001

Azure Search resource
instchatbotdevproject001-asmdeyhjkz6fky4

Project name
StudentServices-Chatbot-Project

Description
Student Services Chatbot Project

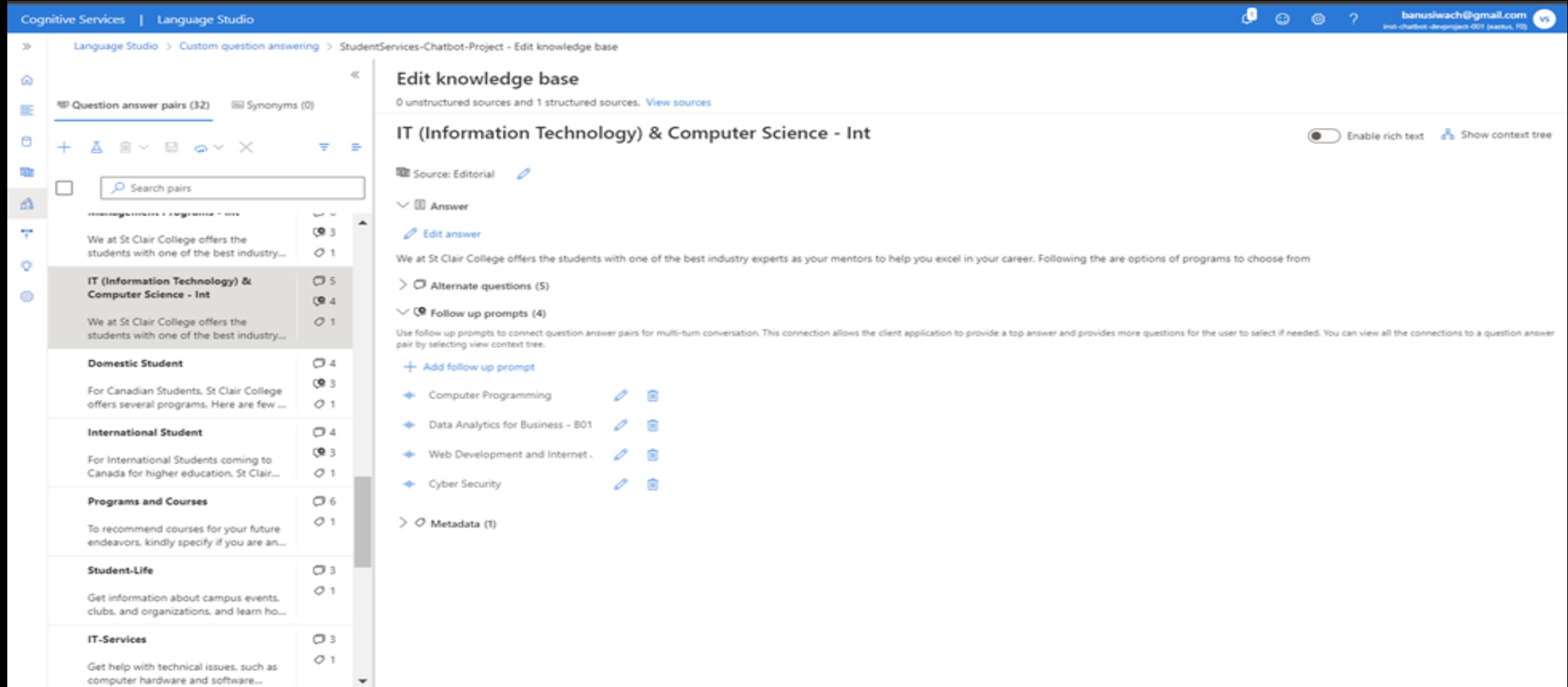
Source language
English

Default answer when no response is returned
For such queries, Contact Registrar's Office: 519-972-2759 - info@stclaircollege.ca

Back Next Create project Cancel

- When setting up a language-specific development environment, creating a project is the essential first step that sets the foundation for chatbot.
- With a properly set up project and data source, we can build and testing your chatbot, refining its responses and improving its functionality to deliver a seamless user experience.

Knowledge Base



- After creating a project in the language-specific development environment, we can add custom questions and answers to create a knowledge base for our chatbot.
- For this chat bot, we have created the knowledge base in an excel sheet by pulling the information from St Clair College website.

Testing Bot

The screenshot displays the Microsoft Cognitive Services Language Studio interface. The top navigation bar shows 'Cognitive Services | Language Studio' and the user 'banusiwach@gmail.com'. The main breadcrumb path is 'Language Studio > Custom question answering > StudentServices-Chatbot-Project - Edit knowledge base'.

Left Sidebar: Contains a navigation menu with icons for Home, Question answer pairs (32), Synonyms (0), and a search bar labeled 'Search pairs...'. Below the search bar is a list of knowledge base categories: 'continuing education and professional...', 'Academic-Integrity' (3 pairs, 1 synonym), 'Accommodations' (3 pairs, 1 synonym), 'Student Services' (4 pairs, 7 synonyms, 1 synonym), 'Virtual Tour' (3 pairs, 1 synonym), and 'Hello' (3 pairs, 3 synonyms, 1 synonym). The 'Student Services' category is currently selected.

Central Workspace: Titled 'Edit knowledge base', it shows '0 unstructured sources and 1 structured sources'. Below this is the 'Student Services' section, which includes a 'Source: Editorial' link, an 'Answer' section with an 'Edit answer' link, and a description: 'Discover a range of student services to enhance your college experience.' There are also sections for 'Alternate questions (4)' and 'Follow up prompts (7)', with an 'Add follow up prompt' button. At the bottom, a list of related topics is shown: Accommodations, Academic-Integrity, Career-Central, Health-Centre, Library, and IT-Services, each with edit and delete icons.

Right Sidebar: Titled 'Test', it contains 'Response options' with checkboxes for 'Include short answer response' and 'Use deployed knowledge base' (which is checked). Below this is a 'Show advanced options' link. The main test area shows a chat window with a 'Hi' button and an 'Inspect' button. The chat message reads: 'Welcome to St. Clair Portal. This is dux, an AI-powered bot, I am here to assist you with any information you need. Please feel free to choose from one of the options'. Below the message are three buttons: 'Programs and Courses', 'Student Services', and 'Virtual Tour'. At the bottom is a text input field with the placeholder 'Type your message and press enter' and a send button.

- The above screenshot shows the testing process after feeding data through the Knowledge Base.
- This process helps to refine the chat's responses and improve the overall user experience.
- Testing the Knowledge Base is a crucial step in building a successful chatbot.

Context Tree

The screenshot displays the 'Cognitive Services | Language Studio' interface. The main window is titled 'Edit knowledge base' for the 'International Student' entity. It shows 0 unstructured and 1 structured source. The 'Answer' section contains a text block about St Clair College programs for international students. Below the answer, there are sections for 'Alternate questions (4)' and 'Follow up prompts (3)'. The 'Follow up prompts' section includes three prompts: 'IT (Information Technology) & Computer Science - Int', 'Management Programs', and 'Business'. The 'Context tree' sidebar on the right shows a hierarchical structure of topics: 'International Student' (root), 'IT (Information Technology) & Computer Science - Int', 'Management Programs', and 'Business'. Each topic has a list of related questions and answers, with the number of connections indicated by a speech bubble icon.

Context tree

The context tree shows the connections between a question answer pair and any other question answer pair. Connections are made with follow up prompts.

Context tree

- International Student
 - IT (Information Technology) & Computer Science - Int
 - Computer Programming
 - Data Analytics for Business
 - Web Development and I...
 - Cyber Security
 - Management Programs
 - International Business M...
 - Event Management - B9...
 - Human Resources Mana...
 - Business
 - Business - B604
 - Business - Accounting - ...
 - Business - Marketing - B...
 - Data Analytics for Busin...
 - International Business M...

- The above screenshot illustrates the Context Tree generated from the Knowledge Base by adding follow-up prompts to the main header questions.
- The Context Tree displays the connections between question-answer pairs in a hierarchical format, making it easy for developers to identify all the possible answers to a given question.

Deploy Mode

Cognitive Services | Language Studio

Language Studio > Custom question answering > StudentServices-Chatbot-Project - Deploy knowledge base

Deploy knowledge base

Deploy knowledge base and create a bot in a few clicks.

Deploy Get prediction URL

✓ Your knowledge base is now deployed. You can get your prediction URL or create a bot.

Knowledge base status			
State:	Deployed	✓	Resource: inst-chatbot-devproject-001
Deployment Date:	4/16/2023	✓	Location: eastus
Deployment Time:	8:12:40 PM	✓	Tier: Free (F0)

Next steps: Create a bot

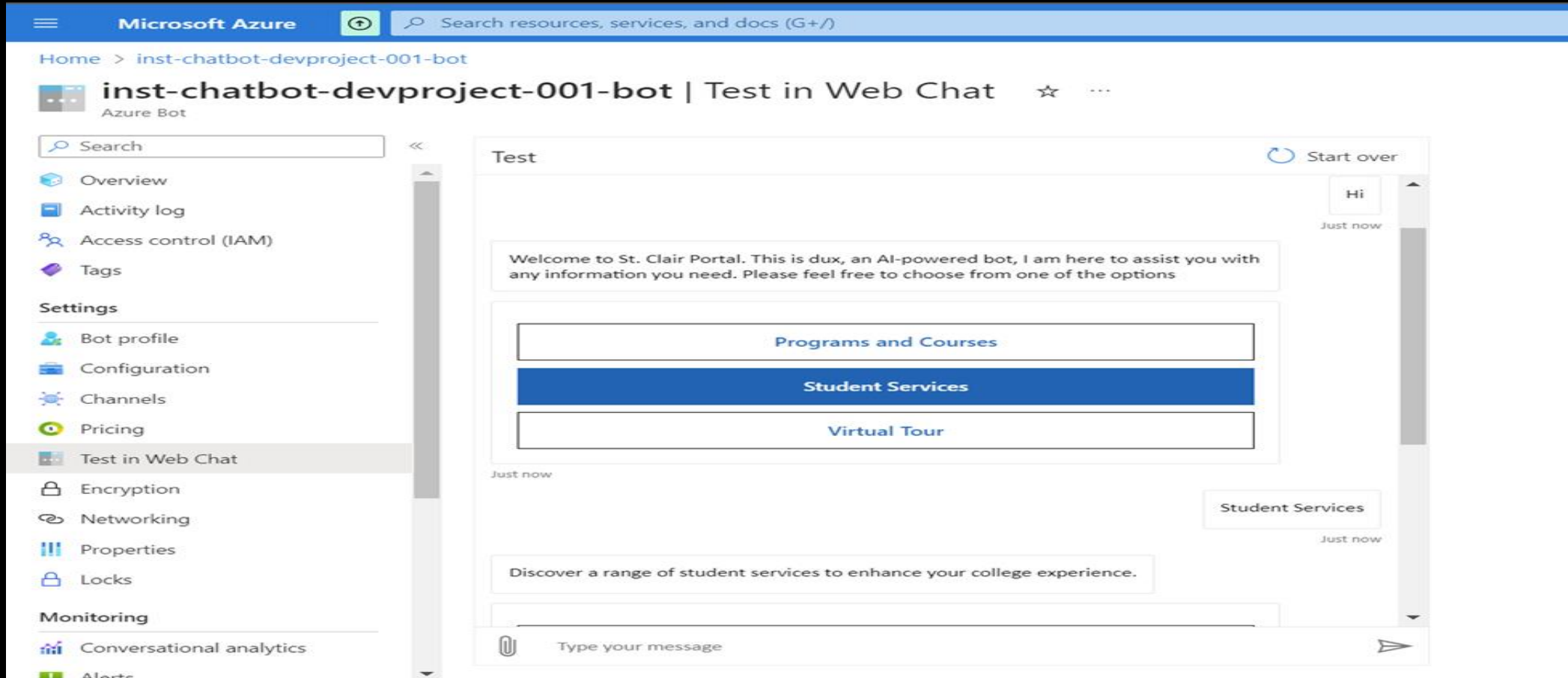
Step 1: [Read the documentation](#) to learn more about creating bots.

Step 2: Go to Azure to create a bot.

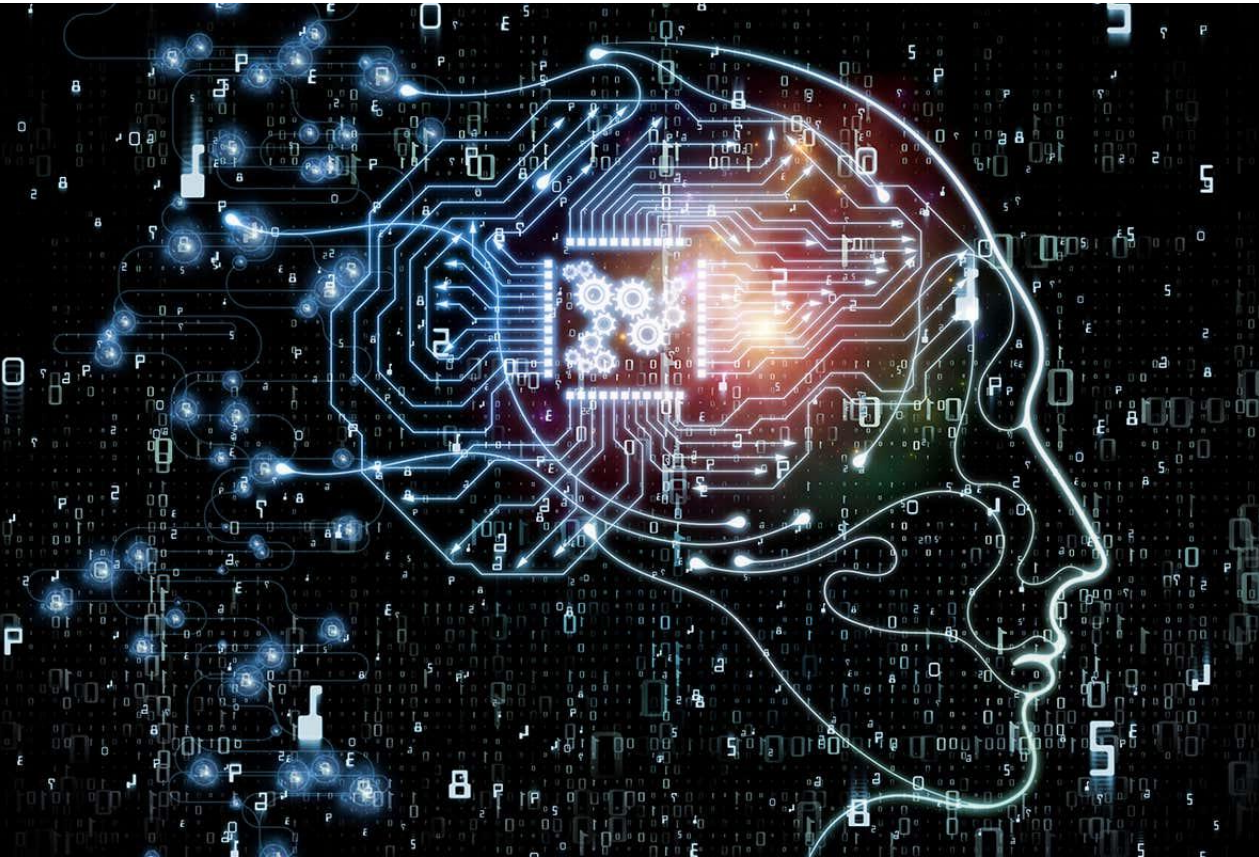
Create a bot

- Once the testing is successful, the Knowledge Base can be deployed.
- By deploying the Knowledge Base, developers can leverage the power of conversational AI to create a chatbot that provides intelligent and efficient communication with users.

Bot



- The above screenshot is an example of a deployed chatbot running in Web Chat mode.
- With its intuitive interface and conversational AI, the chatbot will provide students with instant access to important information and assistance.



Final Recommendations

Opportunities for Further Improvement

- Dux's knowledge can still be improved with more structured data and training.
- More training can help Dux understand various slangs and abbreviations as St Clair College accepts students from different cultures.

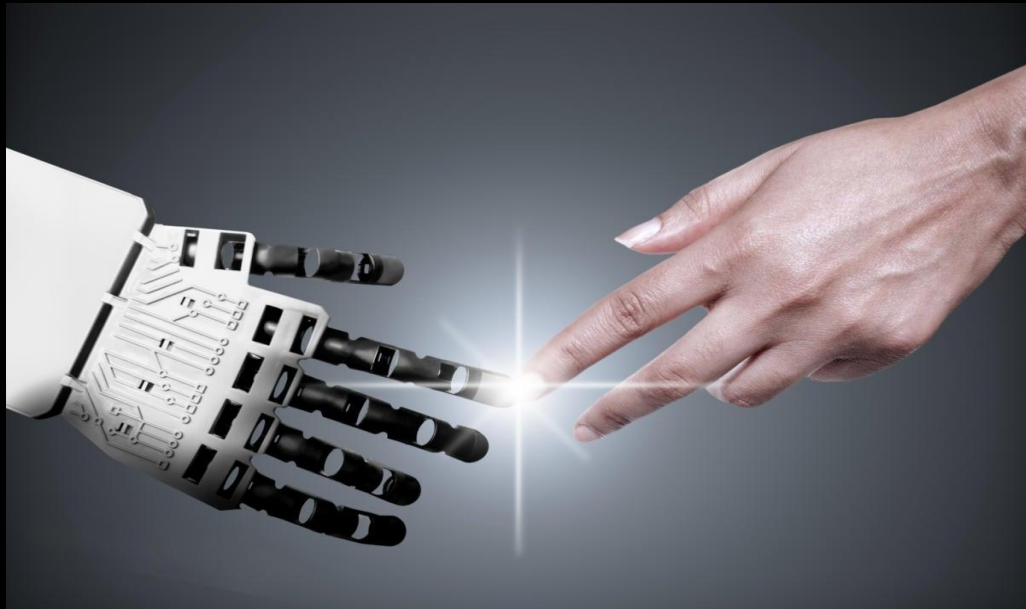
- Other information regarding St. Clair College like intake specifications and other programs offered outside of Full-time program can also be embedded in Dux.
- Dux can be embedded in student's official portal BLACKBOARD to guide current students in their study sessions and subject progress.
- Multilingual features can be added to Dux to make it more accessible for students from various backgrounds and ethnicities.



Final Recommendations & Opportunities for Further Improvement

ETHICAL CONCERNS RELATED TO AI

There are various major ethical concerns related to AI explained below like transparency, bias, accountability, and privacy explained in detail below:



Transparency

- The AI system uses Artificial Neural Network (ANN) which functions like a mysterious black box.
 - It becomes difficult or even impossible to fully comprehend the machine's decision-making process.
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Biases in AI

- AI cannot always be relied on to be impartial and fair.
- The quality of the dataset used to train the model is the primary cause of the system's biased judgments.

Accountability

- All organizations using AI technology need to establish strict policies to hold each other accountable for any wrongdoings.
 - One approach would be to assign separate users the tasks of designing, developing, and deploying AI systems so that each one could be identified and held accountable for their actions.
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Privacy & Security

- Data privacy and security play a major ethical issue in AI.
- Examine all potential sources of data carefully, and only utilize those that have explicit, informed user consent.



**ETHICAL
CONCERNS RELATED
TO AI**



THANK YOU!