Implementation approach and platform selection justification

I chose Botpress.com from the recommended platform under technical requirements in the project information document as the platform to implement my AI chatbot as it required little to no coding knowledge in order to use the platform.

As part of the implementation process included no code, working graphically in Botpress was the main working process, including text, images, partial code, etc. The bot was built around the required information which consisted of 15 questions and answers that covered information given to us in the Coursera bootcamp AI for Everyone course. This information was stored as PDFs in the knowledge base section of Botpress in order for FirstLife to pull information from there and not search the internet or generate new content for questions concerning the bootcamp information in the Q/A pairs. This information is also cited; this feature however works at a base level. Cross-linking of AI concepts is also a feature that is done at base level, as it does work but not in varying answers for the different questions. FirstLife is able to handle follow-up questions on the same topic. A further learning feature is included which recommends Coursera courses that are related to what skills the user has said that they want to learn; the courses are linked in the chat as well. The final feature is perhaps the most practical, and it is the error handling feature which is tied to features that require user input. 3 diagrams and an interactive carousal element in seen throughout the different conversation flows.

List of all implemented Q&A pairs

1. What is data science?
   Data science is the science of extracting knowledge and insights from data.
2. What is natural language processing?
   Natural Language Processing (NLP) involves tasks such as text classification, sentiment recognition, information retrieval (e.g., web search), name entity recognition, and machine translation. It is used in applications like email spam filtering and product description categorization. NLP enables machines to understand and generate human language, facilitating applications like chatbots and language translation.
3. What are large language models?
   Large Language Models (LLMs) are a type of machine learning model often used in text recognition and generation tasks. They are built by using supervised learning to repeatedly predict the next word in a sequence. When trained on a very large amount of data (hundreds of billions of words), these models can generate

coherent and contextually relevant text outputs. An example of an LLM is ChatGPT. LLMs work by taking an input sequence of words and predicting the next word, which enables applications such as chatbots, machine translation, speech recognition, and more.

4. What are neural networks?

Inspired by the brain, but the details of how they work are almost completely unrelated to how biological brains work. They are a key tool in AI, especially in deep learning, and involve large mathematical equations and neurons to process data.

5. What is computer vision?

Computer Vision is a major AI application area that involves tasks such as image classification, object recognition (including face recognition), object detection, and image segmentation.

6. What is AI?

Artificial Intelligence (AI) is the ability of a machine to perform cognitive functions associated with human minds, such as perceiving, reasoning, learning, and problem solving. There are two main types of AI systems: rule-based AI (also called expert AI), which behaves according to a set of fully defined rules created by human experts, and learning-based AI, which solves problems and adapts its functionality on its own based on its initial human-designed configuration and training dataset. Examples of learning-based AI include generative AI tools. AI systems are complex structures of algorithms and models designed to mimic human reasoning and perform tasks autonomously.

Additionally, AI can be categorized as Artificial Narrow Intelligence (ANI), which performs specific tasks like smart speakers or self-driving cars, and Artificial General Intelligence (AGI), which can do anything a human can do.

7. What is machine learning?

Machine learning is a field of study that gives computers the ability to learn without being explicitly programmed. It is a subset of artificial intelligence that enables systems to automatically learn, improve from experience, and adapt to new data without explicit programming.

8. What is deep learning?

Deep learning is a subset of machine learning that involves neural networks and is one of the many tools used in AI. It is often explained in a non-technical way to help understand its concepts and applications.

9. What industries use AI today?

Industries that use AI today include farming and factories, as well as sectors involving smart speakers, self-driving cars, and web search technologies.

10. What are real-world applications that currently use AI?
    Real-world applications that currently use AI include:
    Smart speakers
    Self-driving cars
    Web search
    AI in farming and factories
    Spam filtering
    Speech recognition
    Machine translation
    Online advertising
    Visual inspection
    Chatbots
    These examples cover various AI types such as artificial narrow intelligence (ANI) and generative artificial intelligence (e.g., ChatGPT, Bard).

11. What are the ethical principles of fairness in AI?
    The ethical principles of fairness in AI include prioritizing impartial and just treatment or behavior without unjust favoritism or discrimination. Design processes should focus on fairness, equality, and representation to mitigate bias and discrimination in AI systems. This involves using diverse data sets and statistical methods to detect and correct biases, as well as conducting regular audits to monitor bias. Fairness is a key component of ethical AI principles that aim to ensure AI systems do not disproportionately target or harm certain demographic groups.

12. What are the ethical principles of accountability in AI?
    The ethical principles of accountability in AI include:
    Human oversight: Ensuring that AI systems have human monitoring at every stage of development and use, so that ultimate ethical responsibility rests with a human being.
    Responsibility and accountability: Organizations and individuals involved in AI development and deployment must take responsibility for the ethical implications and outcomes of AI systems.
    Transparency and explainability: AI models should be transparent and explainable in clear language to allow understanding of how decisions are made.
    Establishing governance structures: Forming AI ethics steering committees and compliance review processes to provide top-level accountability and oversight.
    Documentation and transparency: Keeping detailed records of compliance activities to ensure clarity and accessibility for audits.

Feedback and escalation mechanisms: Implementing procedures for reporting and addressing ethical concerns and compliance issues.

These principles help ensure that AI is developed and used in ways that are beneficial to society and that ethical considerations are integrated into all technical and operational AI processes.

13. What are the ethical principles of transparency in AI?

The ethical principles of transparency in AI involve making clear how AI models make specific decisions and produce results. Transparency means justifying how and why an AI system is developed, implemented, and used, and making that information visible and understandable to people. This includes explainability, which is the ability to answer the question, "What did the machine do to reach its output?" Transparency and explainability should be provided in clear language so users can understand the AI system's mechanics, rules, algorithms, and training data.

14. What are the ethical principles of security in AI?

The ethical principles of security in AI include upholding data privacy and protection by ensuring AI systems meet stringent data privacy standards and use robust cybersecurity methods to avoid data breaches and unauthorized access. Additionally, AI systems must be designed to be safe and secure, incorporating robust and reliable design to handle various conditions effectively. Continuous monitoring and updating of AI systems are also essential to maintain ethical compliance and security over time.

15. What are the ethical principles of privacy in AI?

The ethical principles of privacy in AI include upholding data privacy and protection by ensuring AI systems meet the most stringent data privacy and protection standards. This involves using robust cybersecurity methods to avoid data breaches and unauthorized access. AI systems must securely manage data, comply with privacy laws, and use encryption, anonymization, and secure protocols to safeguard data integrity.

16. What are the ethical principles of the potential societal impact in AI?

The ethical principles related to the plausible societal impact in AI include:

Human wellbeing and dignity: AI systems should prioritize and ensure the wellbeing, safety, and dignity of individuals without replacing humans or compromising human welfare.

Addressing bias and discrimination: Design processes should prioritize fairness, equality, and representation to mitigate bias and discrimination.

Transparency and explainability: AI models should be transparent and explainable in clear language regarding how decisions and results are produced.

Upholding data privacy and protection: AI systems must meet stringent data privacy and protection standards using robust cybersecurity methods.

Promoting inclusivity and diversity: AI technologies need to reflect and respect the vast range of human identities and experiences.

Society and economies: AI should help drive societal advancement and economic prosperity for all people, without fostering inequality or unfair practices.

Enhancing digital skills and literacy: AI technologies should be accessible and understandable to everyone, regardless of digital skills.

The health of businesses: AI should accelerate processes, maximize efficiency, and promote growth.

These principles ensure that AI development and use contribute positively to society and mitigate potential harms.

17. AI VS ML VS Deep Learning Advantages and Differences.

Artificial Intelligence (AI) is a broad field that includes various techniques such as machine learning, deep learning, and other methods like unsupervised learning, reinforcement learning, graphical models, planning, and knowledge graphs.

Machine Learning (ML) is a subset of AI focused on learning from data to perform tasks. ML works well when learning simple functions and when there is a lot of data available. However, it tends to perform poorly when learning complex functions from small amounts of data or when asked to perform on new types of data it has not seen before.

Deep Learning is a specialized subset of machine learning that uses large neural networks. It is often used for more complex tasks and can handle large amounts of data better than traditional machine learning methods.

Advantages:

AI encompasses a wide range of tools and techniques, allowing for diverse applications.

Machine Learning automates tasks that typically require human thought, especially when there is sufficient data.

Deep Learning can model complex patterns and functions, especially with large datasets and neural networks.

Related topics include "What machine learning can and cannot do" and "Building AI in your company".

Description of conversation flows

I have 3 conversation flows in total

1. What would you like to know? > FAQs > ethical considerations > do you have any more questions > do you have different follow up questions
2. What would you like to know? > How can I use AI? > types of personal AI usage > relation to other AI concepts
3. What would you like to know? > related skill courses for AI > what skills are you looking to learn? > Coursera recommended courses > any other questions > follow up questions

Screenshot examples of the chatbot in action

Emulator

Hi!

🏳 Conversation Started

Hello, What can I do for you today?

Pick any one from the list below

How do I use AI?

📖 Answer found in Knowledge Base   **Inspect**

✓ Captured variable **user1stchoice**

▷▷ Transitioned - Main:Personal_AI_Usage

Here are some types of personal AI usage.

✦ AI Task Completed – 1299ms

Personal AI uses: virtual assistants, health tracking, learning aids, content creation, smart home control.

Here are some more depicted types of personal AI uses

recent

Type a message...

Emulator

Here are some more depicted types of personal AI uses

Productivity and Organization

▷▷ Transitioned - Main:relation_to_other_AI_concepts

📍 Capturing Variable – prompt – active

Would you like to know how these applications relate to other AI concepts?

Yes   No

recent

Type a message...