



BBA

Semester V

Calicut University

Communicating with AI

Course Code: BBA5FS114 • Module 4 Notes

1. Understanding AI Communication & NLP

Fundamentals

Communicating effectively with AI systems requires understanding the underlying natural language processing (NLP) architectures that allow computers to parse, interpret, generate, and respond to human language.

Natural Language Processing (NLP) Architecture

NLP bridges the gap between human communication and computational logic through a multi-stage pipeline:

NLP Pipeline Stage	Technical Process	Business Communication Purpose
Tokenization	Breaking raw text input into individual words, sub-words, or structural units (tokens).	Prepares unstructured user text for numerical processing.
Text Normalization	Converting text to lowercase, removing punctuation, stop-words, and performing stemming/lemmatization.	Standardizes input variations for consistent analysis.
Vector Embedding	Mapping words/sentences into high-dimensional mathematical vector spaces capturing semantic meaning.	Enables machines to measure context and semantic similarity.
Intent & Entity Extraction	Identifying the user's primary goal (Intent) and key data variables (Entities) in a message.	Powers chatbot routing and automated workflow execution.

2. Exploring Chatbots, Virtual Assistants, and AI Interfaces

AI-driven communication tools have evolved from rigid rule-based decision trees to conversational Large Language Model agents capable of complex contextual dialogue.

Types of Conversational AI Tools

1. Rule-Based Chatbots

Operate on strict IF-THEN decision trees. Limited to predefined options; fail when users input natural language variations outside programmed paths.

2. Conversational AI Assistants

Utilize NLP and machine learning to understand intent, track conversation state across multiple turns, and provide natural responses (e.g., Customer Service Bots).

3. Generative AI Agents (LLM-Powered)

Leverage advanced transformer models to generate dynamic, context-aware responses, summarize documents, write code, and execute complex agentic workflows.

4. Voice AI Assistants

Combine Automatic Speech Recognition (ASR), NLP, and Text-to-Speech (TTS) synthesis to enable hands-free voice interactions (e.g., Alexa, Siri, Voice Bots).

3. Tailoring Messages: Prompt Engineering & Dialogue Design

Prompt engineering is the art and science of structuring text inputs to effectively communicate with Large Language Models, ensuring accurate, relevant, and high-quality AI outputs.

Core Frameworks for High-Impact Prompt Engineering

Effective business prompts follow structured multi-element frameworks:

- **Role Definition:** Assign a clear persona or expert identity to the AI (e.g., *"Act as a senior financial analyst..."*).
- **Context Provision:** Supply relevant background data, constraints, and target audience details (e.g., *"We are evaluating a Q3 budget proposal for an e-commerce startup..."*).
- **Explicit Instruction / Task:** Clearly define the specific output requested (e.g., *"Identify 3 major cost risks and summarize in a comparison table..."*).
- **Output Formatting & Style Guidelines:** Specify structure, tone, length, and format (e.g., *"Use bullet points, maintain a professional tone, limit response to 300 words"*).
- **Few-Shot Prompting Technique:** Providing 2 to 3 concrete examples of desired input-output pairs within the prompt to guide complex formatting requirements.
- **Chain-of-Thought (CoT) Prompting:** Instructing the AI to "think step-by-step" before delivering final answers, dramatically improving logical and mathematical accuracy.

4. Enhancing User Experience (UX) and Feedback Loops

Designing effective AI communication interfaces requires optimizing human-AI interaction dynamics, ensuring seamless fallback options, and incorporating feedback mechanisms for continuous system learning.

Best Practices for AI Communication Interface Design

UX Design Principle	Implementation Guidelines	User Impact
Immediate Expectation Setting	Clearly state what the AI bot can and cannot do at the start of the interaction.	Prevents user frustration from unfulfilled complex requests.
Graceful Degradation & Hand-off	Provide a seamless transfer to a human customer support agent when the AI fails to resolve an issue after 2 attempts.	Maintains customer satisfaction and operational trust.
Explicit Feedback Controls	Include simple "Thumbs Up / Thumbs Down" or star rating options on AI responses.	Generates reinforcement data to fine-tune AI model accuracy.
Conversational Context Memory	Retain session state so users do not need to repeat past information during multi-turn dialogues.	Delivers natural, fluid, and efficient communication experience.

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