

COMPONENTS OF AI PROJECT FRAMEWORK

Overview, Components

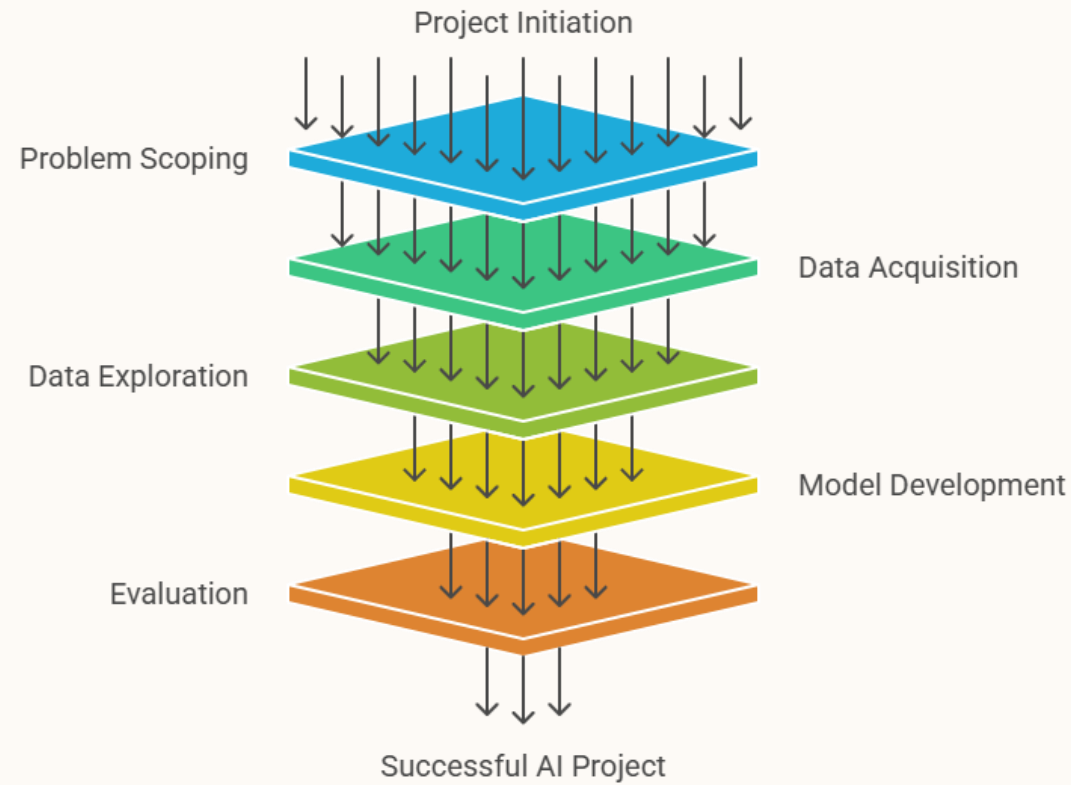
Robotics and AI Faculty



INTRODUCTION

- ❑ AI projects follow a structured workflow that helps define, develop, and deploy intelligent systems.
- ❑ This process ensures that the system can learn from data, solve specific problems, and improve over time.

AI PROJECT FRAMEWORK: FIVE ESSENTIAL STAGES



PROBLEM SCOPING

Problem scoping is the first step in an AI project where the goal is to clearly understand the problem that needs to be solved.

- **Objective:** Identify what the AI system should achieve.
- **Problem Stakeholders:** Define who is affected by or involved in the project.
- **Success Criteria:** Outline how success will be measured.
- **Constraints:** Understand limitations like budget, time, and data availability.

Example: In a school attendance automation project, the problem scoping would include defining the goal (automatic attendance), identifying stakeholders (students, teachers, administration), and specifying success (accurate and timely tracking).

PROBLEM SCOPING (CONT.)

Another approach in problem scoping is also very popular, known as 4Ws. It focuses on answering four key questions: **Who, What, Where, Why**.

- **Who:** Who are the stakeholders?
 - Who will be affected by or benefit from the AI solution?
- **What:** What is the problem?
 - What specific issue or challenge are we trying to solve using AI?
- **Where:** Where is the problem located?
 - Where does the problem occur and in what context or environment?
- **Why:** Why does the problem need to be solved?
 - Why is solving this problem important, and what value will it bring?

DATA ACQUISITION

Once the problem is defined, the next step is to collect relevant data that the AI system can learn from.

- **Sources:** Data may come from sensors, databases, websites, forms, etc.
- **Formats:** Can include text, images, audio, video, and structured tables.
- **Tools:** Google Forms, APIs, Web Scraping, Excel, etc.

** Good data is the foundation of a successful AI system.*



DATA EXPLORATION

Data exploration involves analyzing the collected data to understand its structure, patterns, and issues.

- **Cleaning:** Handling missing, duplicate, or incorrect values.
- **Visualization:** Using graphs and charts to find trends.
- **EDA (Exploratory Data Analysis):** A method to summarize the main characteristics of the data.

** This step ensures the data is suitable for modeling and helps in deciding the right AI techniques.*

MODEL DEVELOPMENT

Modeling is the core of AI development where algorithms are used to train a model using the prepared data.

- **Algorithms:** Depending on the task, different algorithms (e.g., decision trees, neural networks) are selected.
- **Training:** Feeding data into the algorithm so it can learn patterns.
- **Testing:** Verifying the model's performance on unseen data.

** A well-trained model can make predictions or decisions based on new data.*

EVALUATION

Evaluation determines how well the AI model performs in solving the original problem.

- **Metrics:** Accuracy, precision, recall, etc.
- **Validation:** Checking if the model works consistently across different data sets.
- **Iteration:** If the performance is unsatisfactory, the process may go back to data preparation or modeling.

** The goal is to ensure that the model is reliable, unbiased, and effective in real-world conditions.*

QUESTIONS

- ☐ What are the different types of data sources?
- ☐ Name two approaches of AI modelling.
- ☐ How do the 4Ws help in effective problem scoping?
- ☐ What are the different stages in AI project cycle?
- ☐ Explain with an example how problem scoping influences the success of an AI project cycle.



THANK YOU

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