# AI System Design

**Category: Artificial Intelligence in Education**

AI system design is the iterative process of translating a human need into a responsible service that contains one or more AI components. It extends beyond choosing a model: designers must define the problem, prepare data, configure technical and human processes, shape interaction, evaluate outcomes and monitor the system after deployment.

A well-designed system is judged in its context of use. Accuracy alone cannot establish quality because educational value also depends on usability, safety, fairness, transparency, maintainability and the ability of people to understand, correct or override the system (NIST, 2023).

## Design Process

1. **Problem scoping:** Define affected people, intended benefit, constraints, harmful errors and non-AI alternatives.
2. **Data design:** Establish lawful, representative and documented processes for collection, labelling, access and quality.
3. **Architecture:** Connect data, models, interfaces and infrastructure in a secure, maintainable and proportionate system.
4. **Human interaction:** Design understandable controls, uncertainty cues, review points and routes for correction or appeal.
5. **Evaluation and iteration:** Test technical and social outcomes, monitor change and revise or withdraw the system when needed.

## Examples in Practice

When designing an AI-supported university advising service, a team should first define which questions are suitable for automation. It should protect student data, test performance across language backgrounds, refer uncertain or sensitive cases to qualified staff, explain the system's role and monitor whether students receive timely and equitable support.

## Why It Matters

Many AI failures arise from an ill-defined problem, unsuitable data or a weak human process rather than from the model alone. System design makes these dependencies visible and treats testing, feedback and accountability as continuing responsibilities rather than final checks (Miao et al., 2024).

## Further Reading

6. Miao, F., Shiohira, K., & Lao, N. (2024). AI competency framework for students. UNESCO.
7. National Institute of Standards and Technology. (2023). Artificial Intelligence Risk Management Framework (AI RMF 1.0). NIST AI 100-1.
8. Amershi, S., et al. (2019). Guidelines for human-AI interaction. CHI Conference on Human Factors in Computing Systems, 1-13.

**Related Terms:** Design Thinking | Human-Centred AI | Responsible AI | AI Risk Management