

# STUDY POINT: A Hybrid AI-Based Smart Tutor for MSBTE Curriculum

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**ABSTRACT**— Study Point is a hybrid AI-based smart tutor designed for students following the Maharashtra State Board of Technical Education (MSBTE). Many diploma students face difficulties in understanding technical subjects and often rely on online resources, which may not match the syllabus exactly and require internet access. Study Point provides both offline and online AI support. The offline module delivers syllabus-based answers without internet, while the online module provides more detailed explanations when connected. Basic Natural Language Processing (NLP) techniques are used to understand user queries, even if they contain spelling mistakes or abbreviations. Testing shows that the offline module provides faster responses, while the online module gives more accurate and detailed answers. This system improves accessibility, personalized learning, and academic support for MSBTE students. The system design is inspired by hybrid AI and adaptive learning research in Intelligent Tutoring Systems (ITS)."

**KEYWORDS**—Smart Tutor, Hybrid AI, Offline AI, Online AI, MSBTE, Personalized Learning, Artificial Intelligence in Education, E-Learning System, Natural Language Processing (NLP), Adaptive Learning, Educational Technology, Curriculum-Based Learning, Intelligent Tutoring System (ITS), Academic Assistance System

## I.INTRODUCTION

Education technology has rapidly evolved with the integration of artificial intelligence, enabling personalized and adaptive learning systems. However, most AI-powered tutoring platforms require continuous internet access and are not aligned with region-specific academic boards. MSBTE students often rely on generic resources that lack syllabus accuracy and offline accessibility.

Study Point is proposed as a smart tutoring system tailored for MSBTE students. It combines offline AI capabilities with online AI services to ensure reliable and intelligent academic support. The system is designed to understand user queries even with typing mistakes, missing spaces, or abbreviated subject names, making it student-friendly and accessible.

Existing Intelligent Tutoring Systems adapt content based on learner queries but they rarely provide offline support or board-specific content. Study Point addresses these gaps for MSBTE students.

## **II. LITERATURE REVIEW**

Intelligent Tutoring Systems (ITS) have been extensively explored in educational research for providing personalized learning [1]. ITS platforms adapt educational content according to student queries and performance, improving comprehension and engagement. However, most existing ITS solutions are cloud-dependent and lack offline support, making them unsuitable for students with limited internet access.

Adaptive learning strategies allow AI systems to tailor content based on learner needs [2]. Study Point implements this approach by offering query-specific guidance for MSBTE students, combining both theory and practical examples.

Hybrid AI architectures, which integrate offline and online modules, have been proposed to balance system reliability and advanced reasoning [3]. Inspired by these studies, Study Point introduces a hybrid model specifically for syllabus-aligned content delivery.

Natural Language Processing (NLP) is commonly used in educational AI to interpret student queries, including those with typographical errors or abbreviations [4]. Study Point leverages simple NLP techniques for accurate query understanding.

Evaluation of educational AI systems typically considers metrics such as accuracy, response time, and availability [5]. These metrics are applied in Study Point to assess offline and online module performance.

## **III SYSTEM OVERVIEW**

Study Point operates as a hybrid system consisting of two primary modules:

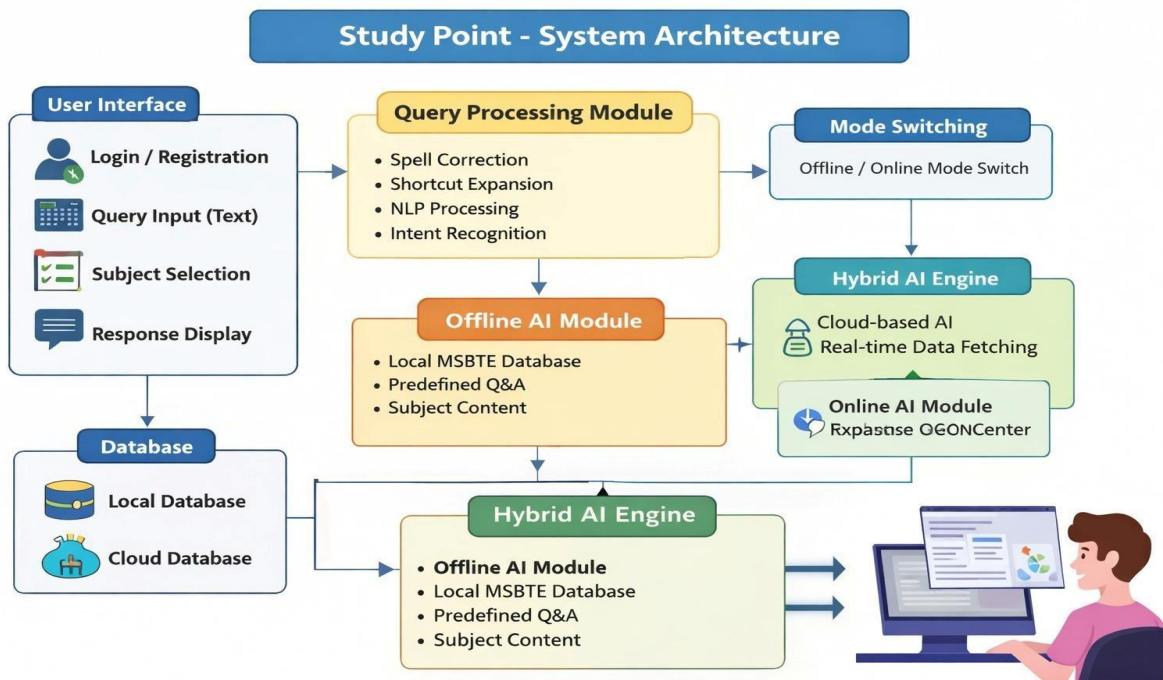
### **A. Offline AI Module**

The offline module provides predefined syllabus-based content, frequently asked questions, and subject explanations without requiring internet connectivity. This module ensures continuous learning support in low-connectivity environments.

### **B. Online AI Module**

The online module enhances the system by using cloud-based AI models to provide detailed explanations, real-time updates, and advanced reasoning when internet access is available. The system automatically switches between offline and online modes.

### C. Workflow



## IV. TECHNOLOGIES USED

The technologies used in Study Point are selected to ensure efficiency, scalability, and ease of integration.

### A. Programming Language

Python is used for backend development due to its strong AI and machine learning support.

### B. Artificial Intelligence

Natural Language Processing (NLP) is used to understand user queries, handle spelling mistakes, and interpret shortcut terms.

### C. Database

A local database is used for offline content storage, while cloud-based databases support online functionality.

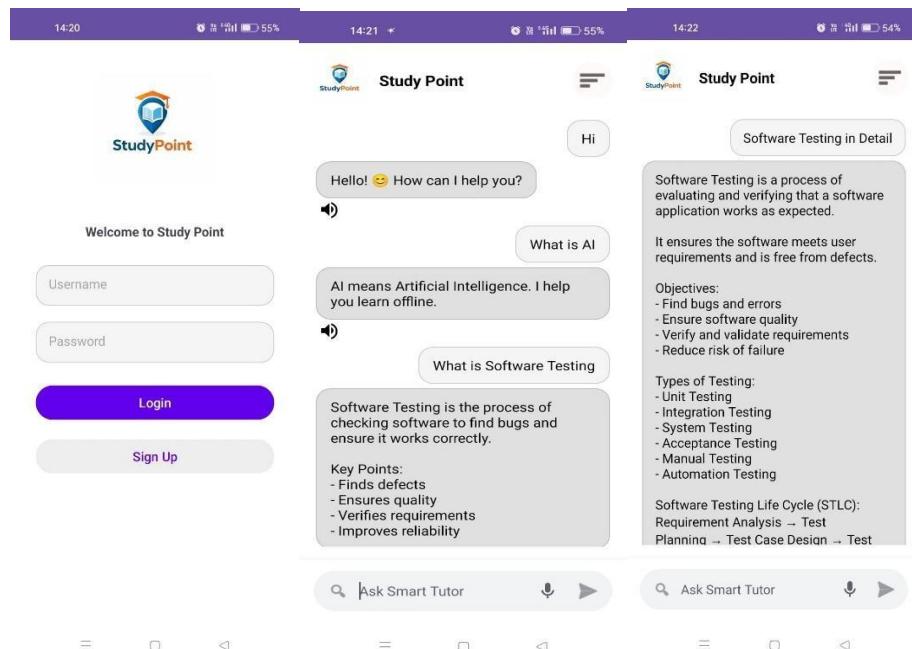
## V FEATURES OF STUDY POINT

The key features of the proposed system include:

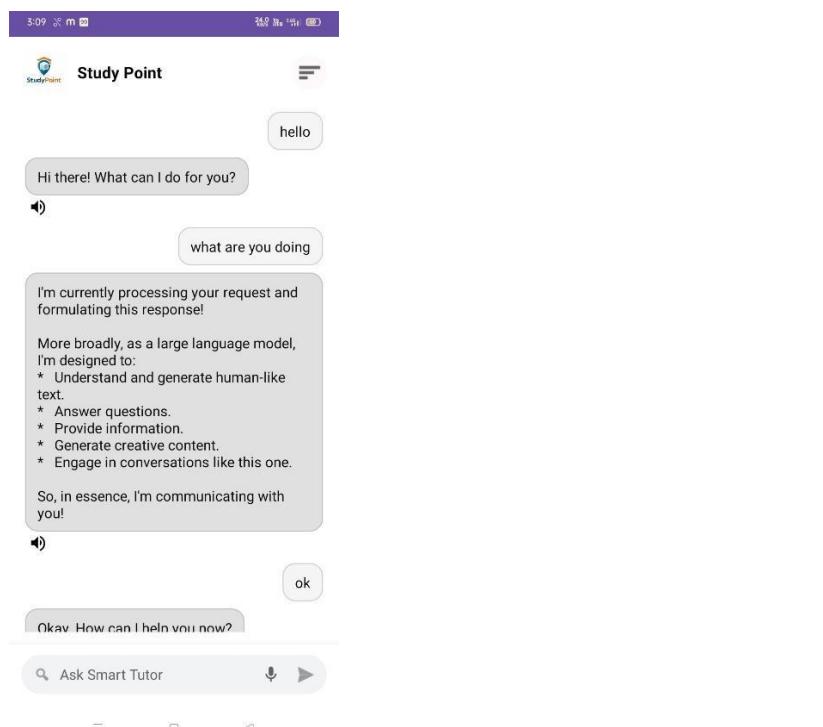
- MSBTE syllabus-specific content
- Hybrid offline and online AI support
- Typo correction and shortcut word handling
- Subject-wise learning assistance
- User-friendly and interactive interface
- Reduced dependency on internet connectivity

## VI IMPLEMENTATION AND RESULTS

### Offline AI-



### Online AI-



## **VII. ADVANTAGES**

Study Point provides several advantages over traditional learning platforms:

- Continuous access to learning resources
- Improved understanding through personalized responses
- Better accessibility for rural and low-network areas
- Curriculum-focused academic assistance

## **VIII. CONCLUSION**

Study Point presents an effective hybrid AI-based smart tutor system designed to meet the academic needs of MSBTE students. By combining offline and online AI capabilities, the system ensures reliability, accessibility, and intelligent assistance. The proposed solution enhances the learning experience and serves as a practical educational tool for diploma students. Future enhancements may include voice interaction, multilingual support, and performance analytics.

## **ACKNOWLEDGMENT**

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