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TITLE: Unified AI-Powered Knowledge Search for Smart Campuses

Team Name: Coding JAMS

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Problem Statement

Engineering colleges generate vast academic content — research papers, lecture videos, notes, presentations, and project reports.

However:

- 📁 Data is scattered across multiple platforms
- 🔍 Discovery is slow and inefficient
- ❌ Traditional search lacks contextual understanding
- 🎥 Multi-modal content (video, audio, images) is not properly indexed
- 👤 No personalized recommendations for students or faculty

As a result, students and faculty struggle to quickly find relevant, high-quality resources aligned with their curriculum and research needs.

There is a need for an AI-powered unified knowledge search system that enables semantic search, multi-modal indexing, and personalized academic discovery.

Proposed Solution

1. Smart Semantic Search

- Understands meaning, not just keywords
- Shows relevant notes, videos, research papers
- Example: “Binary trees” → exact lecture timestamp

3. Personalized Recommendations

- Based on branch & semester
- Based on previous searches
- Suggests relevant academic content

2. Multi-Modal Content Processing

- Supports PDFs, Videos, Audio, PPTs
- OCR for scanned docs
- Speech-to-text for lectures

4. Unified Dashboard

- Single platform for students & faculty
- Smart filters
- Simple & fast interface

Transforming scattered academic data into an intelligent, searchable campus ecosystem.

Key Features

1) AI Context-Aware Semantic Search

- Understands meaning, not just keywords
- Finds exact topic inside long content

2) Multi-Modal Content Processing

- Supports PDFs, PPTs, Videos & Audio
- OCR & Speech-to-text enabled

3) Personalized Recommendation System

- Based on branch & subjects
- Learns from previous searches

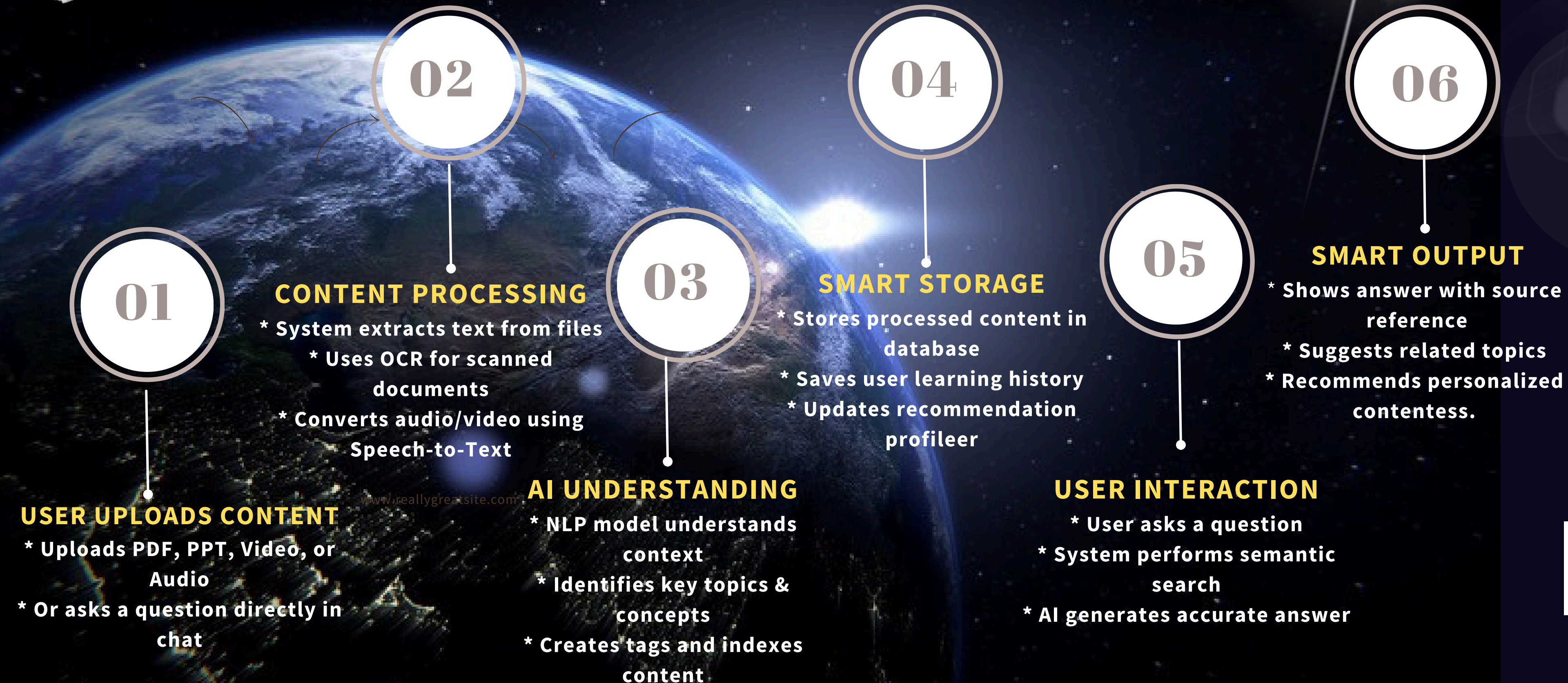
4) AI Academic Chat Assistant

- Ask doubts in natural language
- Answers with source reference

5) Intelligent Auto-Tagging & Indexing

Automatically categorizes content
Shows trending & difficult topics

System Architecture



How It Works (Workflow)

INNOVGENIUS

USER

[React.js (Web Application), Tailwind CSS (Styling)]



UPLOAD / ASK QUESTION

[Backend (Server Side) Node.js, Express.js]



TEXT EXTRACTION (OCR + SPEECH-TO-TEXT)

[Tesseract OCR (for scanned PDFs/images) Speech-to-Text API (for lecture videos/audio)]



AI PROCESSING (NLP + TOPIC EXTRACTION)

[OpenAI API (for NLP & Chat Assistant) Sentence Transformers (for semantic search)]



DATABASE STORAGE

[MongoDB]



Semantic Search

[MongoDB]



Answer + Recommendations

Impact & Benefits

For Students

- Faster and smarter learning
- Personalized study support

For Institution

- Centralized knowledge system
- Improved academic performance

For Faculty

- Organized academic content
- Reduced manual effort

Overall Impact

- Saves time
- Reduces information overload
- Enhances learning efficiency

Conclusion & Future Scope

CONCLUSION

- Our AI-Powered Academic Assistant transforms scattered study material into a smart, searchable knowledge system.
- Context-aware search
- Personalized recommendations
- Accurate answers with references
- Faster and smarter learning

FUTURE SCOPE

- Mobile app development
- LMS integration
- Real-time lecture summarization
- Multi-language support
- AI-based exam preparation