
INTELLEXA
SMART AI STUDY ASSISTANT
Turn your study material into summaries, flashcards, and quizzes in seconds.

INTELLEXA

- Our application is called Intellexa
- The name stands for “Intelligent Learning Accelerator”
- It helps students learn smarter and faster using AI

GROUP DETAILS

Atharva Raibagi (A006)

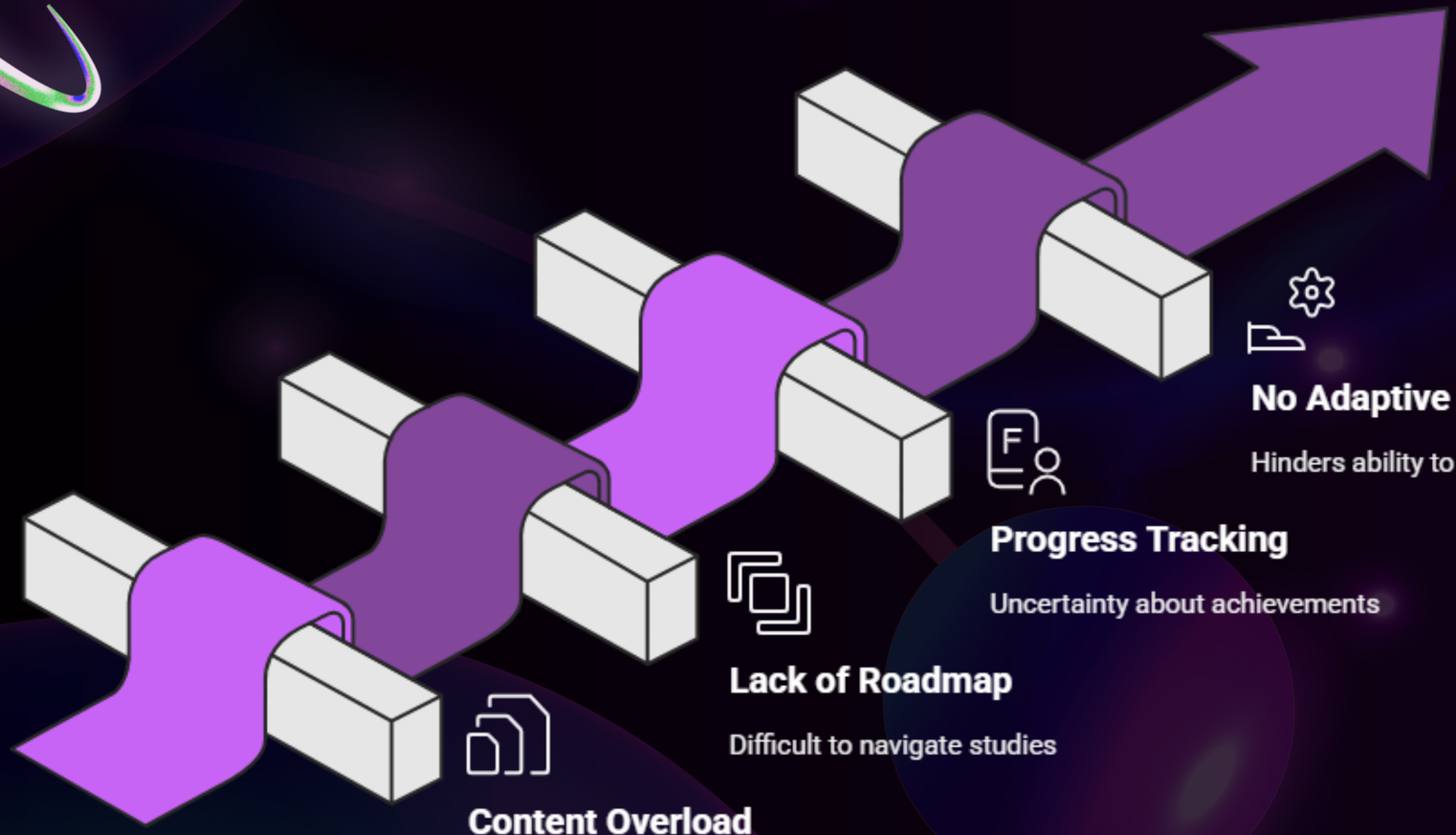
Manav Patel (A031)

Kshitij Panchal (A043)

Mahi Soni (A045)

Mentor - Yogesh Naik

NEED FOR APPLICATION



Content Overload

Overwhelming and confusing information

Lack of Roadmap

Difficult to navigate studies

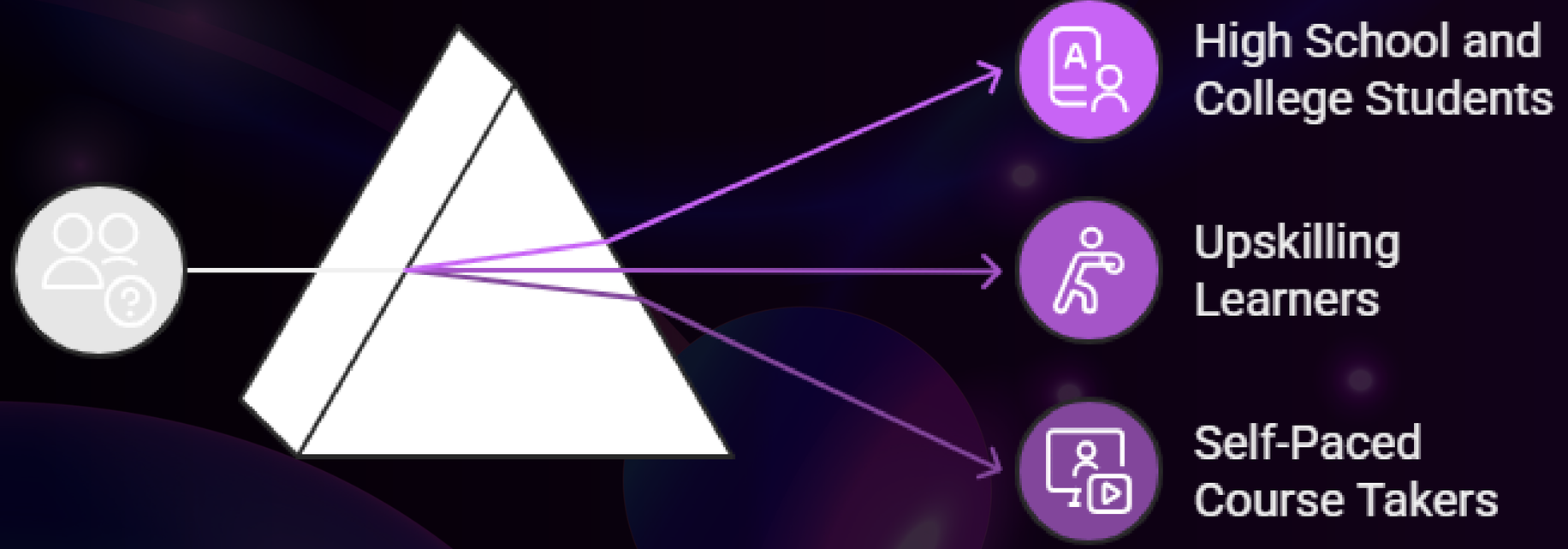
Progress Tracking

Uncertainty about achievements

No Adaptive Practice

Hinders ability to improve

TARGET AUDIENCE



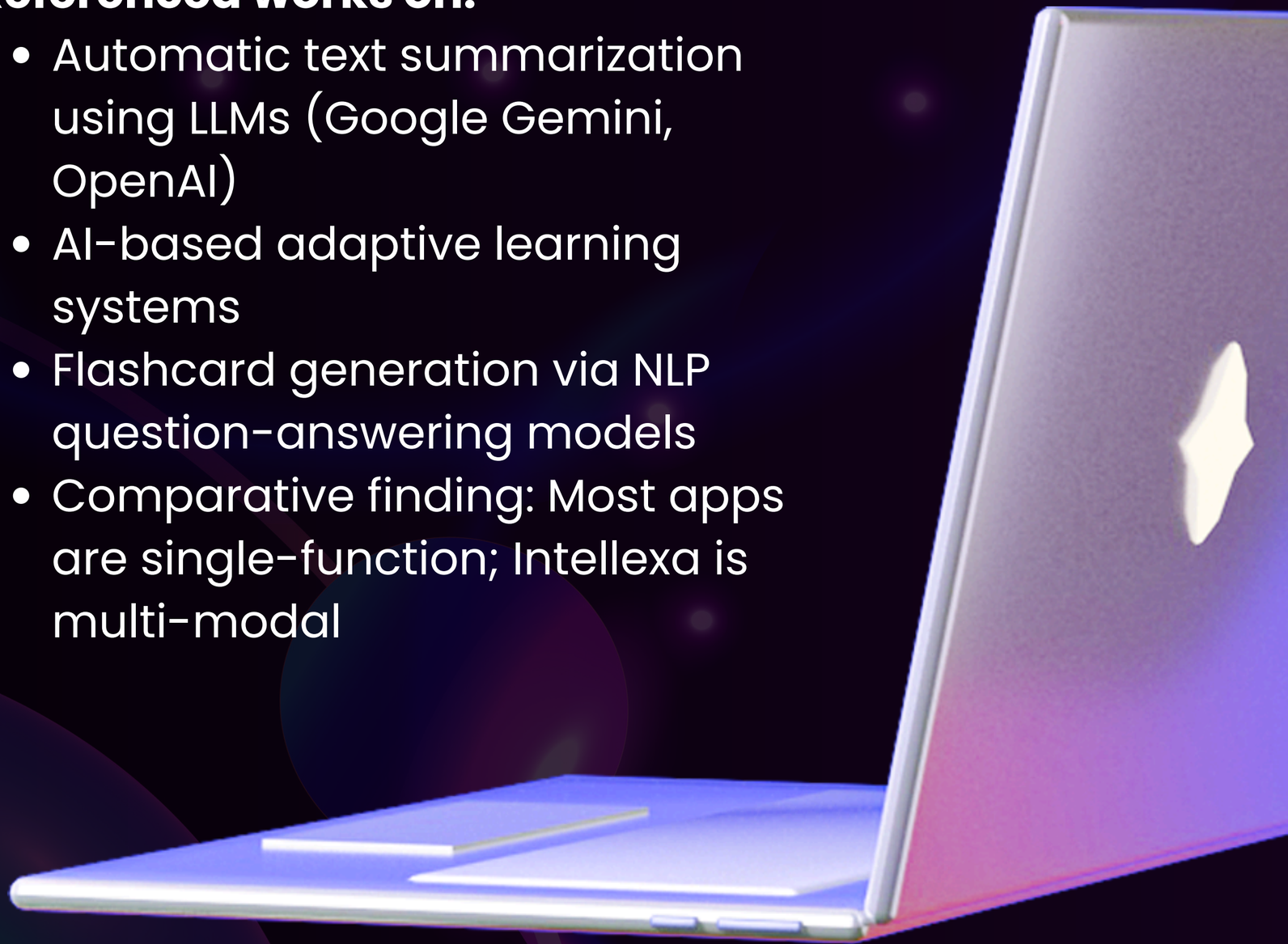
RESEARCH GAP

Problem	Gap in Current Solutions	Intellexa's Advantage
Most existing AI tools focus only on a single feature — either summarization or note generation. They fail to provide an integrated learning experience.	There is no single platform that combines summarization, flashcards, quizzes, and visuals from multiple sources like PDFs, notes, slides, and videos.	Intellexa bridges this gap by offering a complete AI-powered study assistant that unifies all learning tools in one platform for smarter, faster learning.

RESEARCH PAPERS REFERRED

Referenced works on:

- Automatic text summarization using LLMs (Google Gemini, OpenAI)
- AI-based adaptive learning systems
- Flashcard generation via NLP question-answering models
- Comparative finding: Most apps are single-function; Intellexa is multi-modal



EXISTING SOLUTIONS & GAP ANALYSIS

Feature	Coursera	Khan Academy	Duolingo	Intellexa
Structured courses	✅	✅	❌	✅
Gamification	❌	❌	✅	✅
Personalized path	✅	Limited	✅ (language only)	✅ (topics + quizzes)
Progress analytics	✅	✅	✅	✅
Quiz-based learning	✅	✅	✅	✅

TECHSTACK

Frontend
Tech Role Rationale

HTML5 Structure & content display Standard for web UI, accessible and lightweight

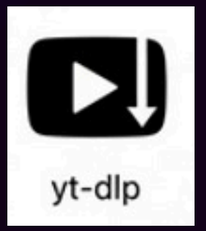
CSS3 Styling & layout Makes UI responsive and modern

JavaScript Client-side logic Enables interactivity and dynamic learning features

AI & Automation Tools
Tech Role Rationale

Google Gemini AI-driven personalized learning & explanation Highly capable LLM for generating study content & answers

Whisper Speech-to-text for videos/lectures Converts lectures to notes accurately, multilingual support



yt-dlp Downloading educational media Enables extraction of YouTube learning videos for study resources

TECHSTACK

Backend & Server Tech Role Rationale

Flask Backend framework Lightweight, fast, ideal for API-driven learning systems

Document Processing & Generation Tech Role Rationale

PyPDF PDF text extraction Used for reading study PDFs & generating notes

python-pptx Auto-generate learning slides Converts learning content into PPTs for revision

ReportLab Create structured PDF reports Generates study summaries & learning progress sheets

Database & Environment Tech Role Rationale

SQLite Local storage for users, notes & progress Lightweight DB, ideal for scalable prototypes

.ENV SECURING API KEYS & CONFIG PROTECTS SENSITIVE CREDENTIALS IN DEVELOPMENT

WIREFRAME


Intellexa
Features
How It Works
About Us
Contact
Login
Start Free
Learn Smarter,
Not Harder
Intellexa transforms your study materials into summaries, quizzes, and flashcards for faster learning.
Get Started Free
See How It Works
Powerful Study Features
Everything you need to accelerate your learning
Smart Summaries
Turn long text into concise notes instantly with AI-powered summarization technology.
Adaptive Quizzes
Test your knowledge with AI-generated quizzes that adapt to your learning progress.
Interactive Flashcards
Review concepts with personalized flashcards created from your study materials.
How It Works
Get started in three simple steps
1
Upload Document
Upload your study materials, notes, or textbooks
2
Choose Study Mode
Select summaries, quizzes, or flashcards
3
Learn & Track Progress
Study efficiently and monitor your improvement
Trusted by Students Worldwide
50,000+
Students
2M+
Study Materials Processed
95%
Improved Grades
4.9/5
User Rating
Start Learning Smarter Today
Join thousands of students who are already accelerating their learning
Join Intellexa Free
Intellexa
AI-powered study assistant for smarter learning
Quick Links
Product
Pricing
Resources
FAQ
Support
Help
Contact
Privacy
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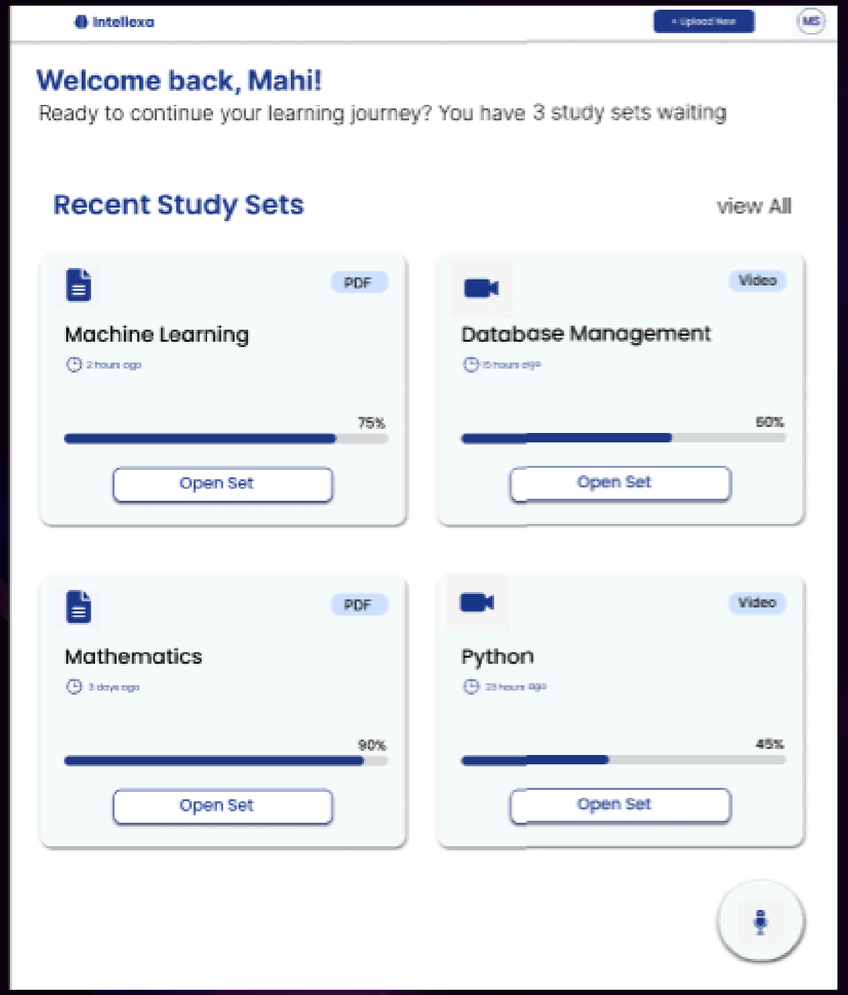
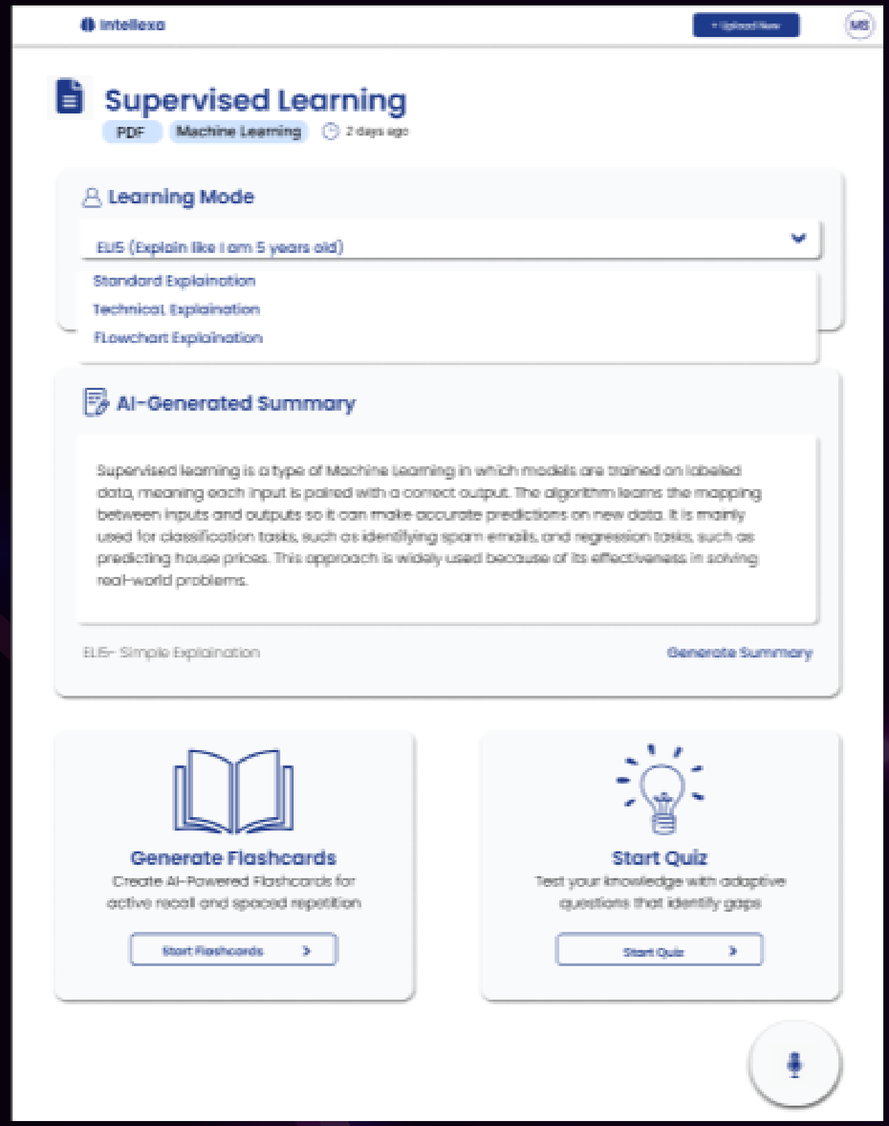
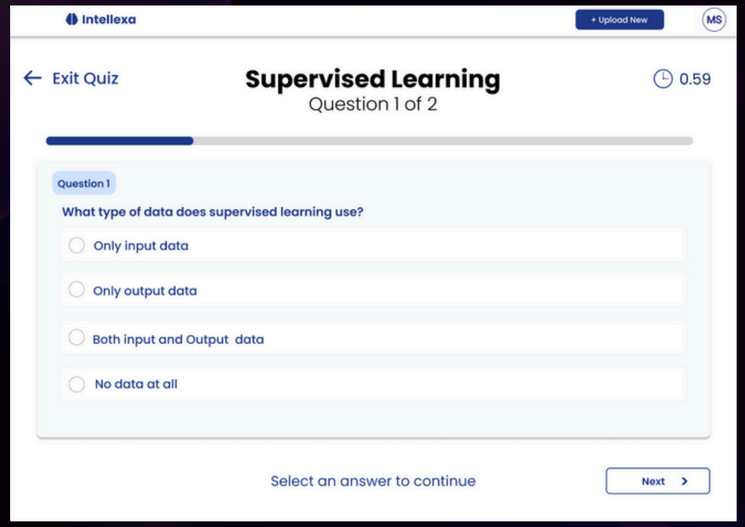

Intellexa
+ Upload New
MS
Welcome back, Mahi!
Ready to continue your learning journey? You have 3 study sets waiting
Recent Study Sets
view All
PDF
Machine Learning
2 hours ago
75%
Open Set
Video
Database Management
15 hours ago
60%
Open Set
PDF
Mathematics
3 days ago
90%
Open Set
Video
Python
23 hours ago
45%
Open Set

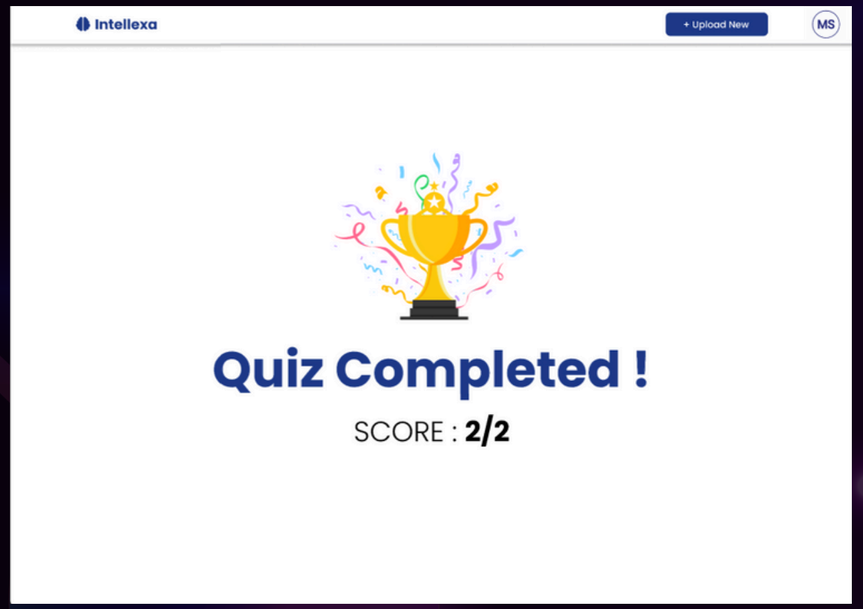
WIREFRAME

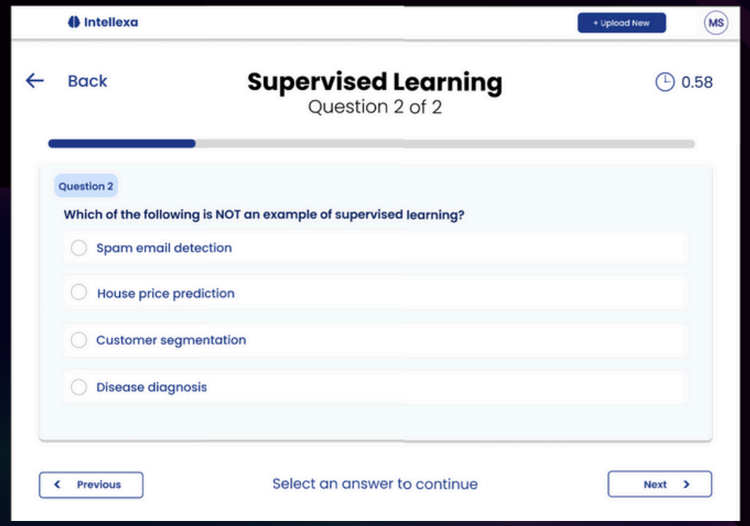

Intellexa
+ Upload New
MS
My Study Library
Add URL
Upload File
PDF
Supervised Learning
Machine Learning
Machine Learning (ML) is a field of Artificial Intelligence that focuses on developing algorithms and models that allow computers to learn from data and improve their performance without being explicitly programmed. Instead of.....
24 flashcards
15 questions
Open Material
Video
Unsupervised Learning
Machine Learning
Unsupervised learning is a type of Machine Learning where models are trained on unlabeled data, meaning the system is not given predefined outputs. Instead, it tries to find hidden patterns, structures, or groupings within.....
30 flashcards
18 questions
Open Material
PDF
Reinforcement Learning
Machine Learning
Reinforcement learning (RL) is a type of Machine Learning where an agent learns by interacting with an environment and making decisions to maximize rewards. Instead of using labeled data, the agent learns through trial and.....
21 flashcards
10 questions
Open Material


Intellexa
MS
Supervised Learning
PDF
Machine Learning
2 days ago
Learning Mode
ELI5 (Explain like I am 5 years old)
Standard Explaination
Technical Explaination
Flowchart Explaination
AI-Generated Summary
Supervised learning is a type of Machine Learning in which models are trained on labeled data, meaning each input is paired with a correct output. The algorithm learns the mapping between inputs and outputs so it can make accurate predictions on new data. It is mainly used for classification tasks, such as identifying spam emails, and regression tasks, such as predicting house prices. This approach is widely used because of its effectiveness in solving real-world problems.
ELI5- Simple Explaination
Generate Summary
Generate Flashcards
Create AI-Powered Flashcards for active recall and spaced repetition
Start Flashcards
Start Quiz
Test your knowledge with adaptive questions that identify gaps
Start Quiz

WIREFRAME


Intellexa
+ Upload New
MS
Exit Quiz
Supervised Learning
Question 1 of 2
0.59
Question 1
What type of data does supervised learning use?
Only input data
Only output data
Both input and Output data
No data at all
Select an answer to continue
Next


Intellexa
+ Upload New
MS
Quiz Completed !
SCORE : 2/2


Intellexa
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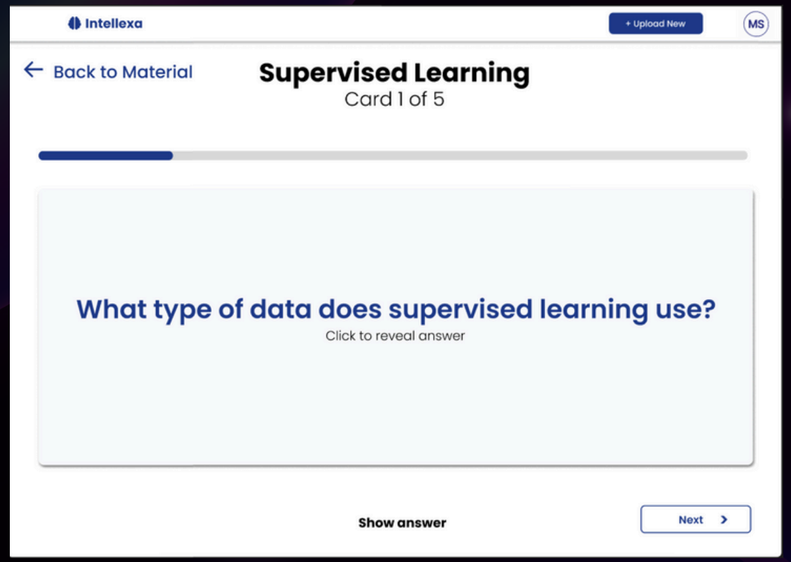
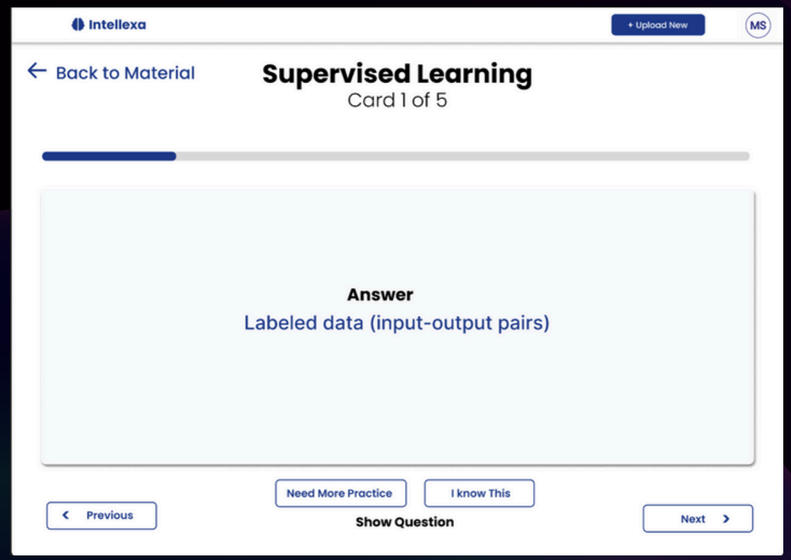
MS
Back
Supervised Learning
Question 2 of 2
0.58
Question 2
Which of the following is NOT an example of supervised learning?
Spam email detection
House price prediction
Customer segmentation
Disease diagnosis
Previous
Select an answer to continue
Next

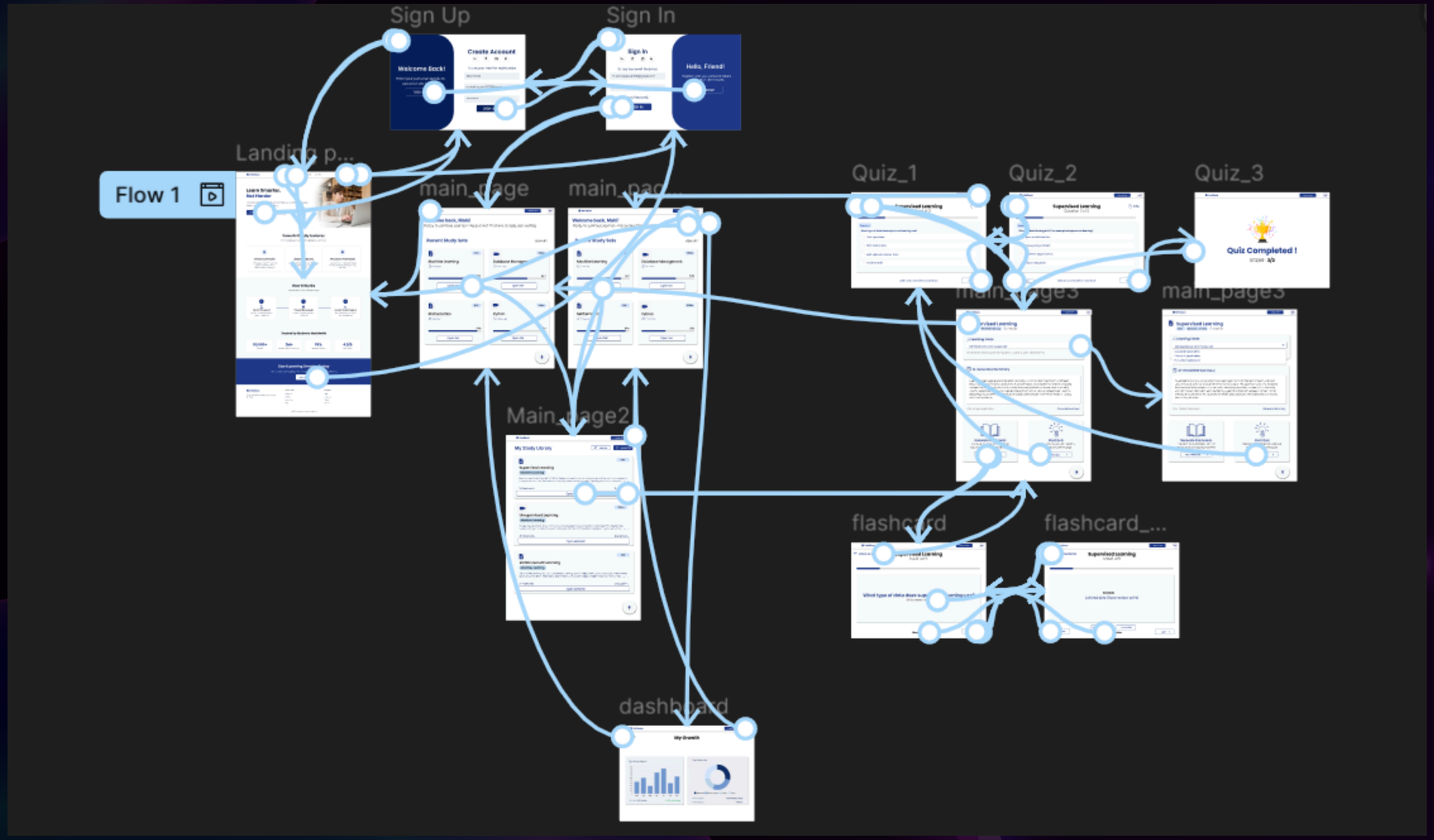
WIREFRAME


Intellexa
+ Upload New
MS
Back to Material
Supervised Learning
Card 1 of 5
What type of data does supervised learning use?
Click to reveal answer
Show answer
Next

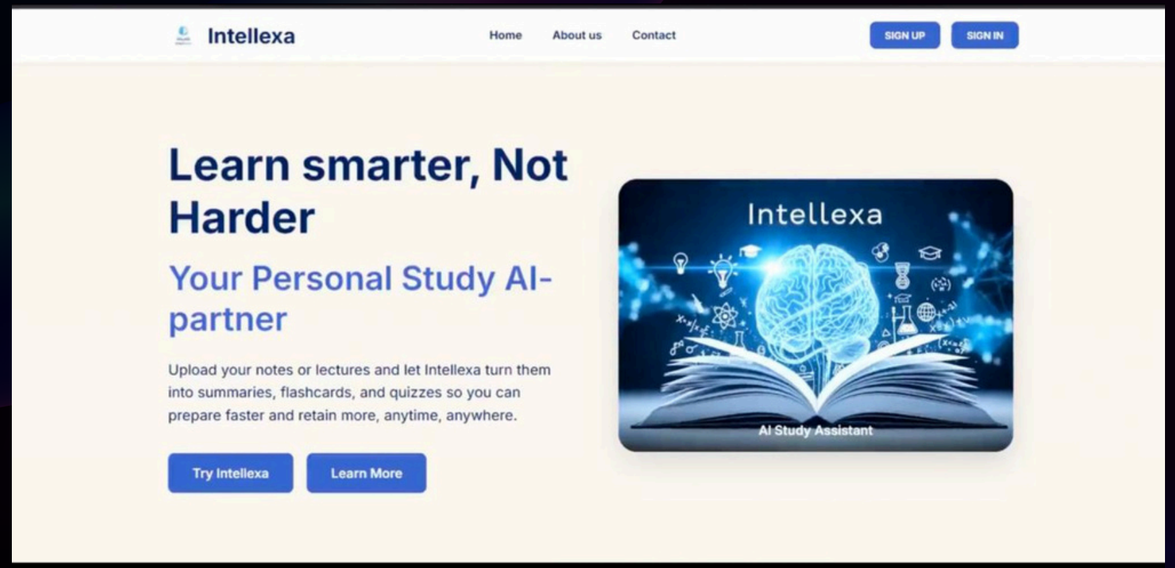

Intellexa
+ Upload New
MS
Back to Material
Supervised Learning
Card 1 of 5
Answer
Labeled data (input-output pairs)
Need More Practice
I know This
Previous
Show Question
Next

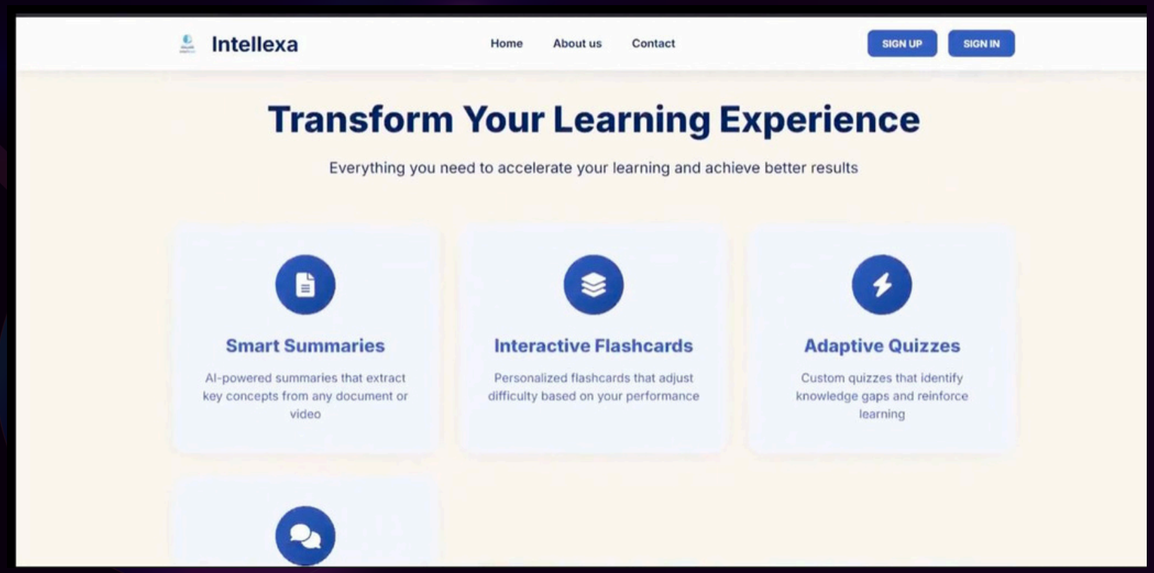

Intellexa
+ Upload New
MS
Back
My Growth
Weekly Progress
100
90
80
70
60
50
40
30
20
10
0
Mon
Tue
Wed
Thu
Fri
Sat
Sun
This Week: 415 minutes
+12% vs last week
Topic Distribution
Mathematics
Machine Learning
Physics
Python
Most Studied:
Mathematics (30%)
Total Subjects:
4 Active

WIREFRAME : CONNECTIONS

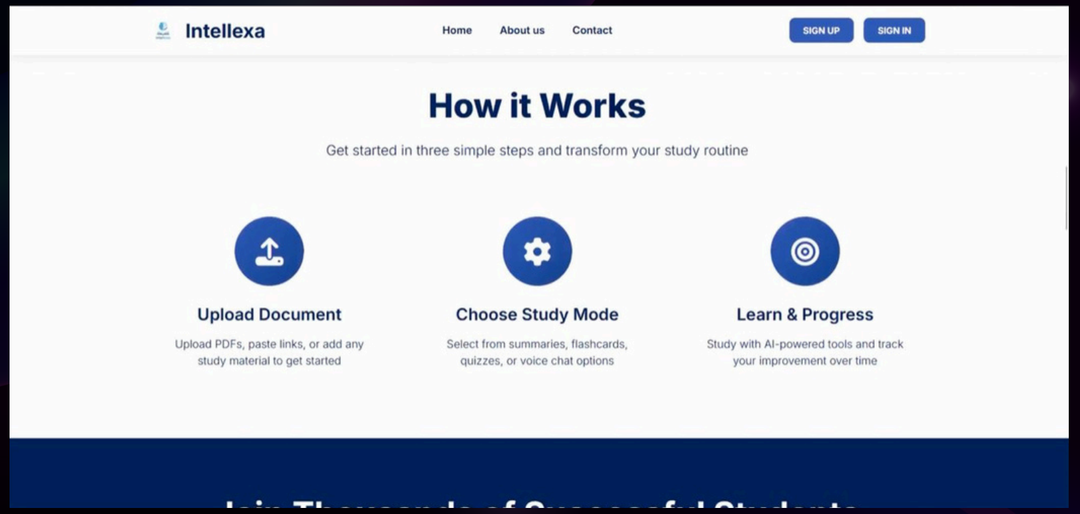


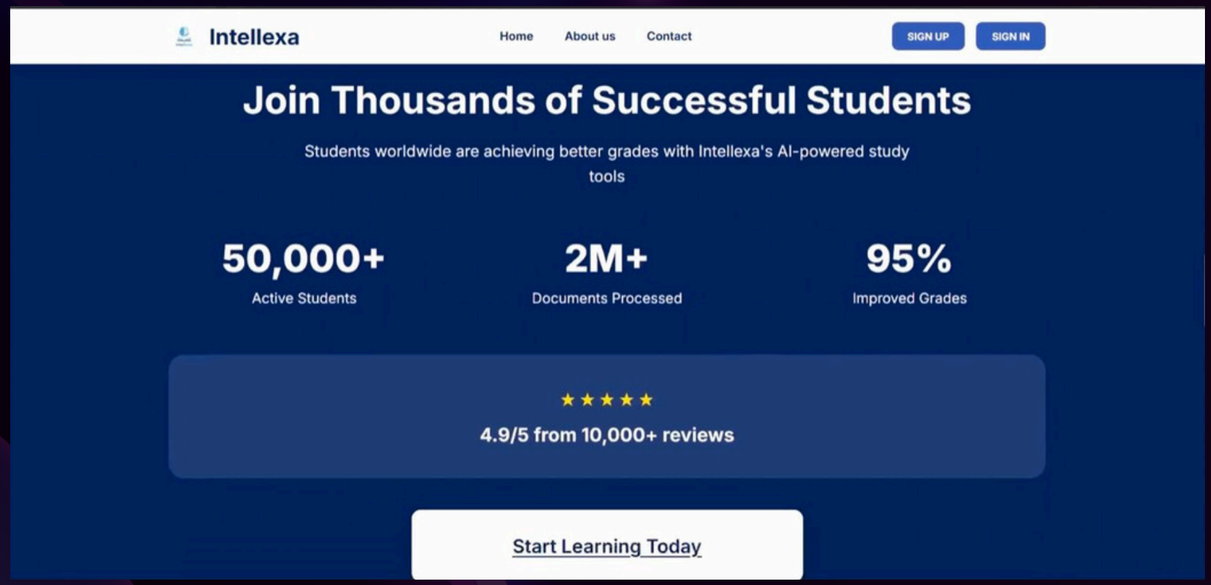
LANDING PAGE



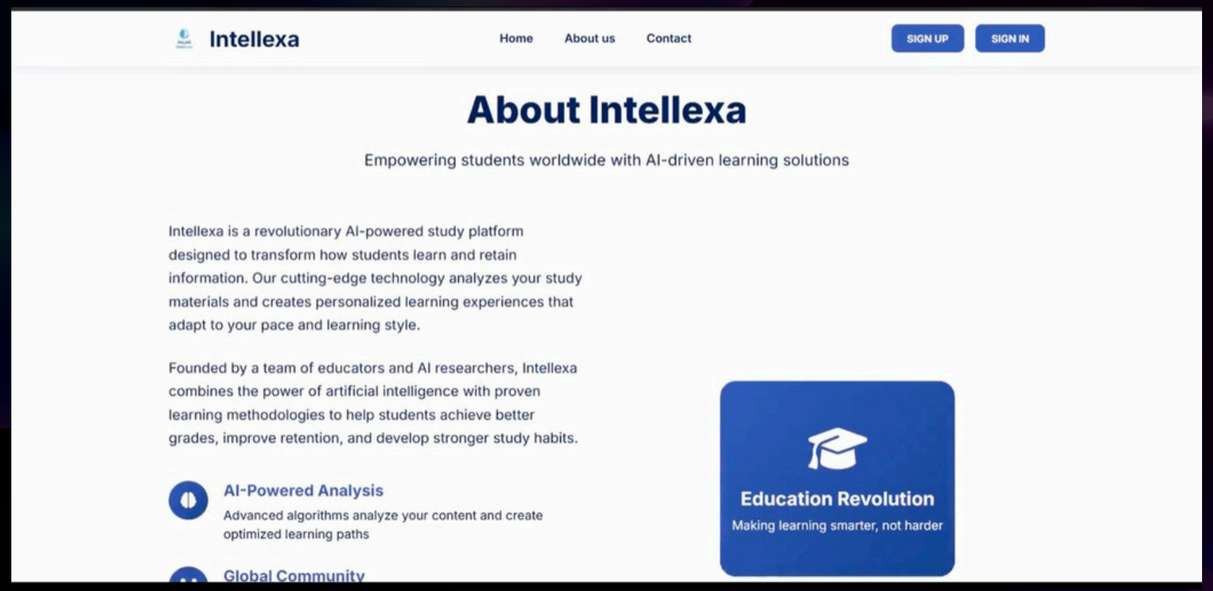


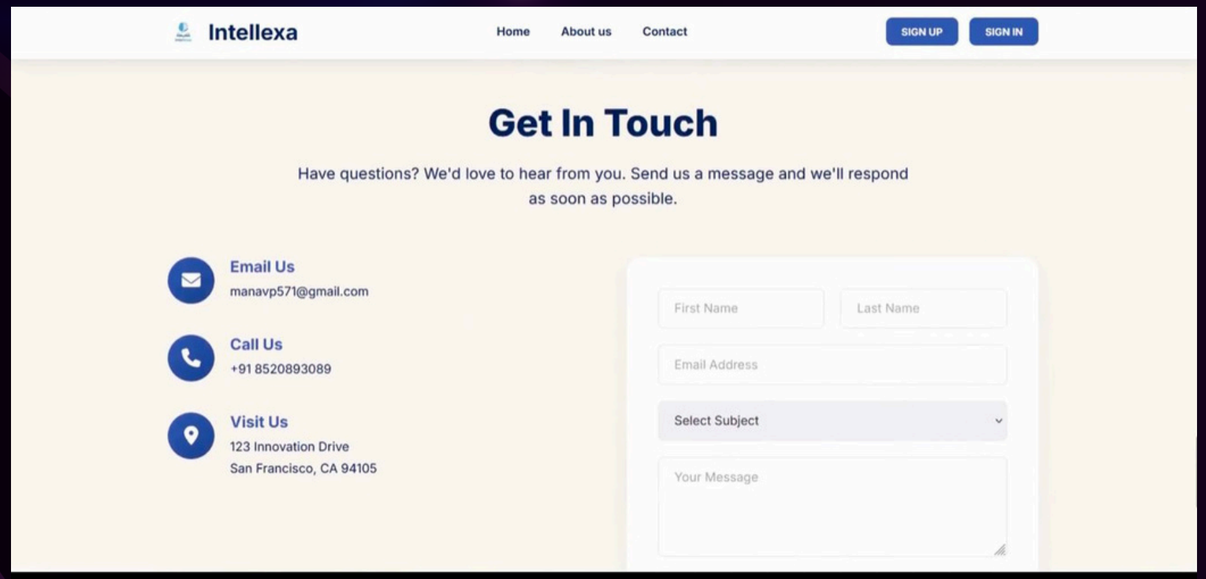
LANDING PAGE



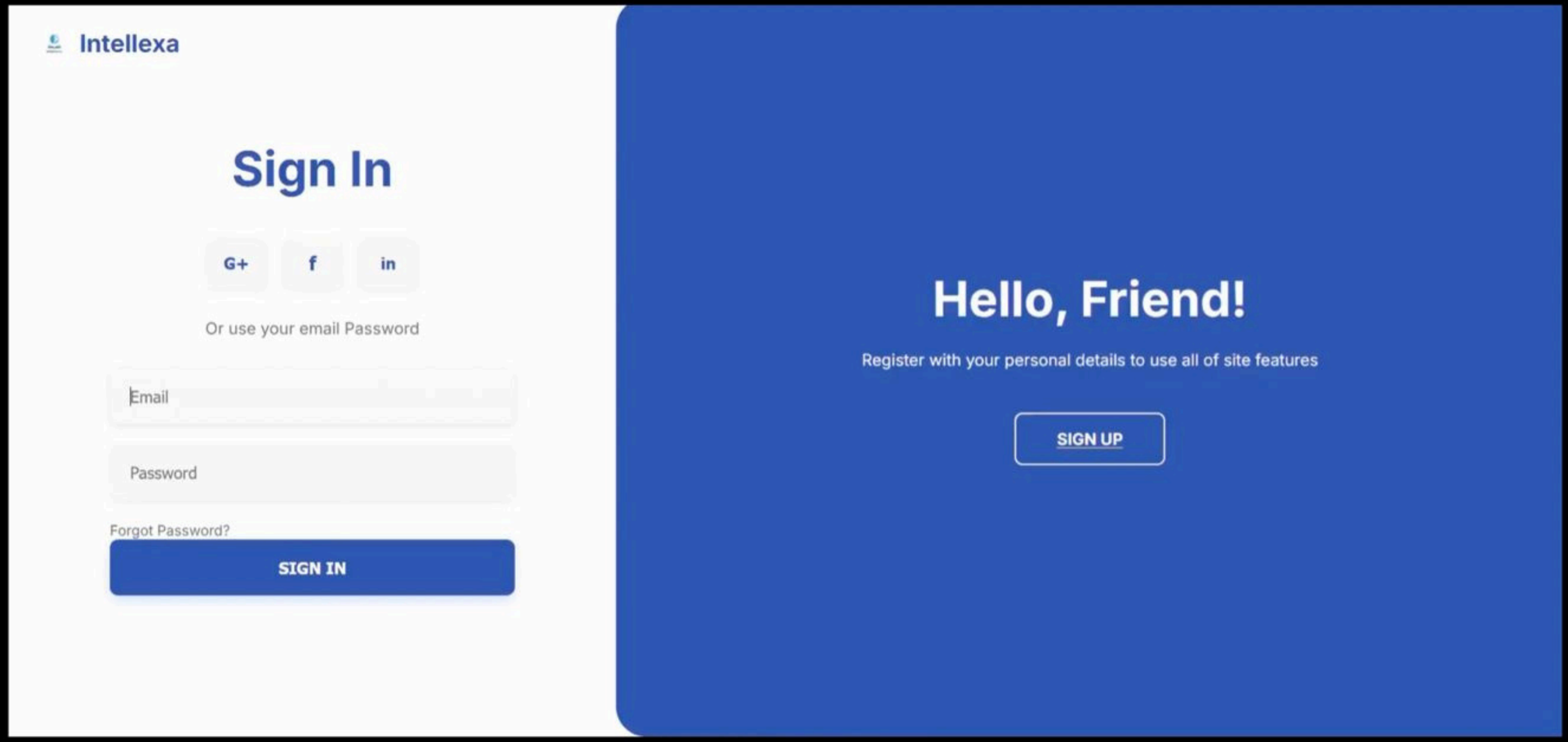


ABOUT US & CONTACT PAGE

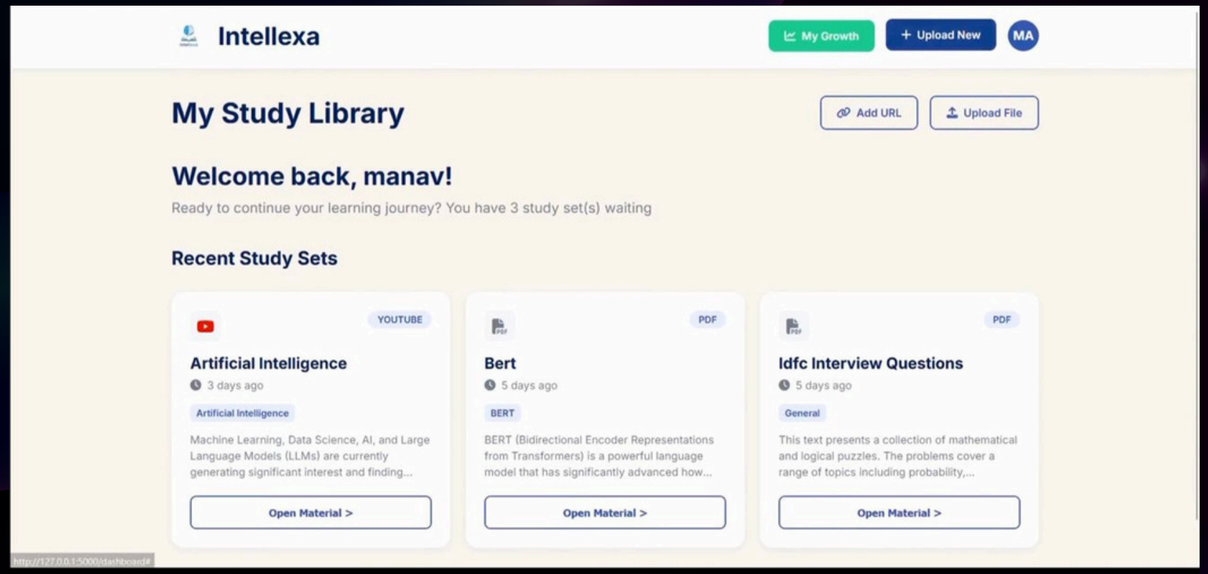


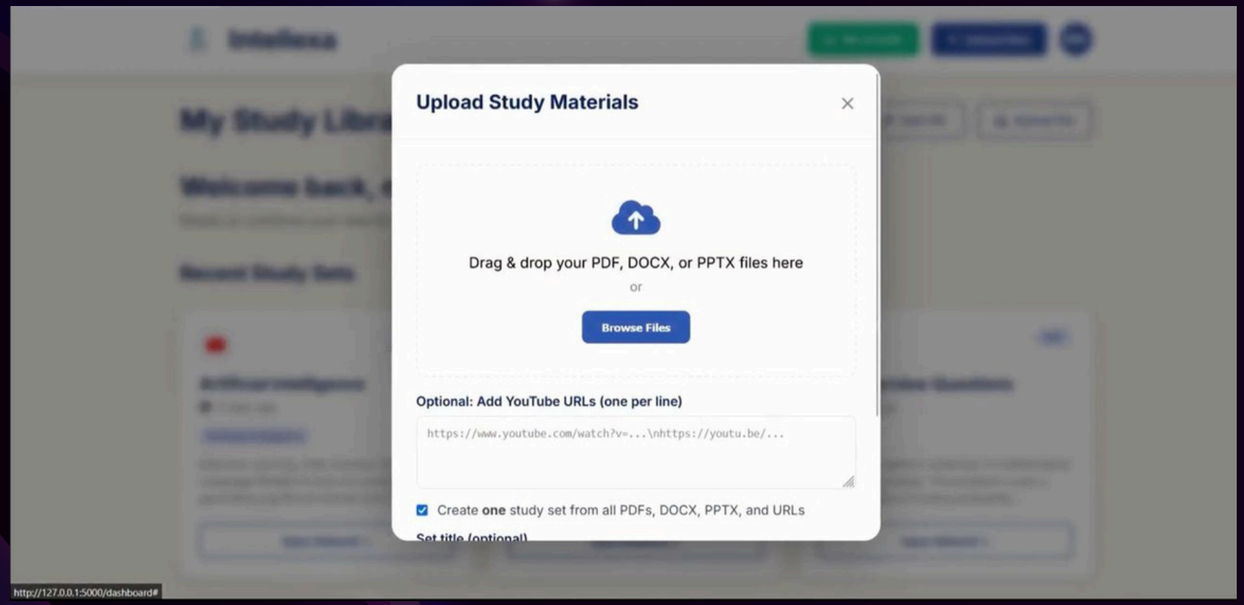


SIGN IN PAGE

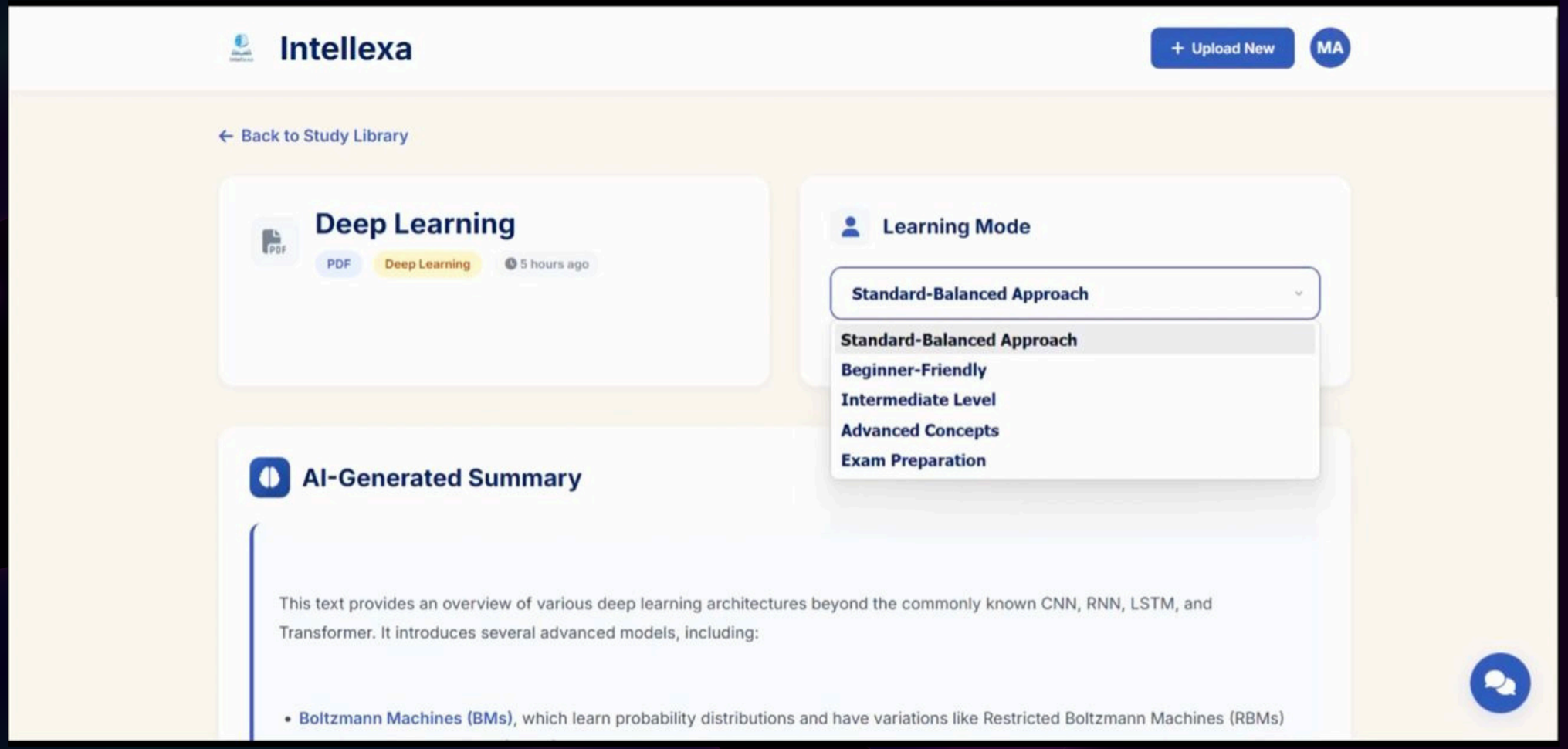

Intellexa
Sign In
G+
f
in
Or use your email Password
Email
Password
Forgot Password?
SIGN IN
Hello, Friend!
Register with your personal details to use all of site features
SIGN UP

MAIN PAGE

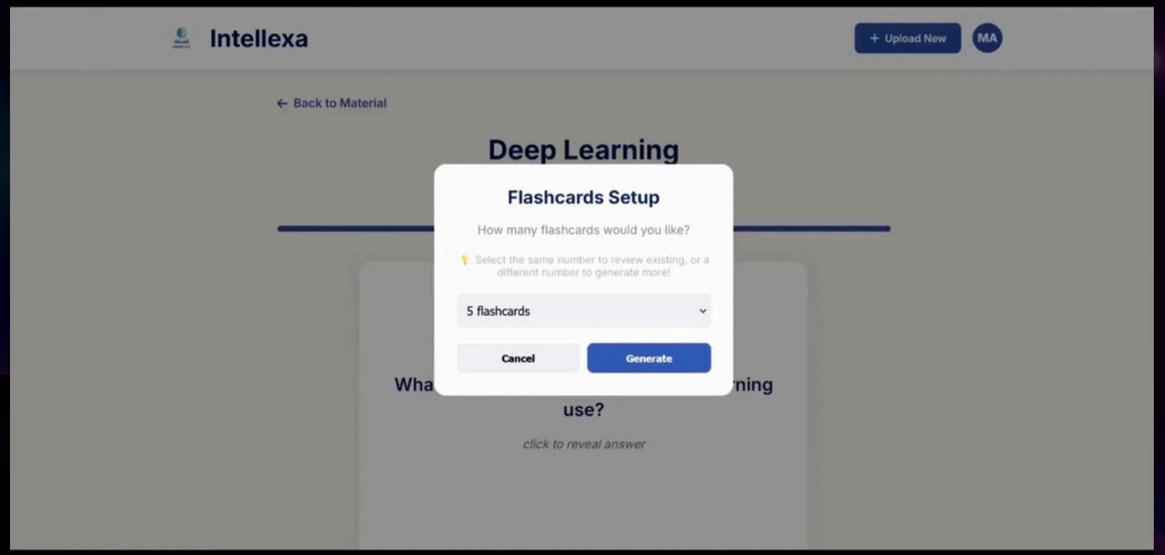

Intellexa
My Growth
+ Upload New
MA
My Study Library
Add URL
Upload File
Welcome back, manav!
Ready to continue your learning journey? You have 3 study set(s) waiting
Recent Study Sets
YOUTUBE
Artificial Intelligence
3 days ago
Artificial Intelligence
Machine Learning, Data Science, AI, and Large Language Models (LLMs) are currently generating significant interest and finding...
Open Material >
PDF
Bert
5 days ago
BERT
BERT (Bidirectional Encoder Representations from Transformers) is a powerful language model that has significantly advanced how...
Open Material >
PDF
Idfc Interview Questions
5 days ago
General
This text presents a collection of mathematical and logical puzzles. The problems cover a range of topics including probability,...
Open Material >
http://127.0.0.1:5000/dashboard#

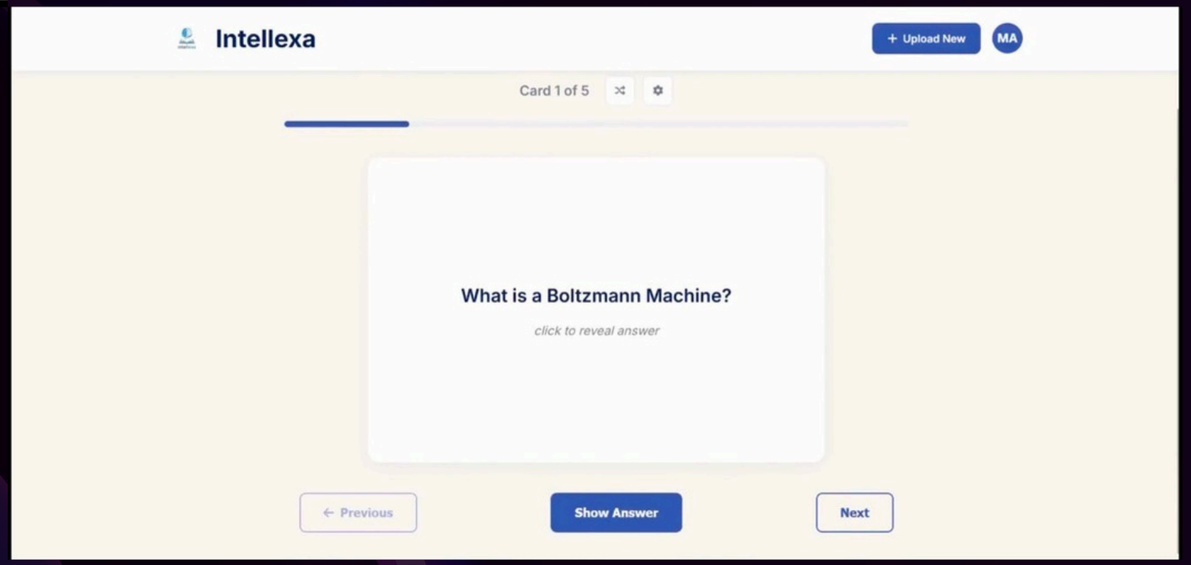

Upload Study Materials
Drag & drop your PDF, DOCX, or PPTX files here
or
Browse Files
Optional: Add YouTube URLs (one per line)
https://www.youtube.com/watch?v=...\nhttps://youtu.be/...
Create one study set from all PDFs, DOCX, PPTX, and URLs
Set title (optional)
http://127.0.0.1:5000/dashboard#

LEARNING MODE

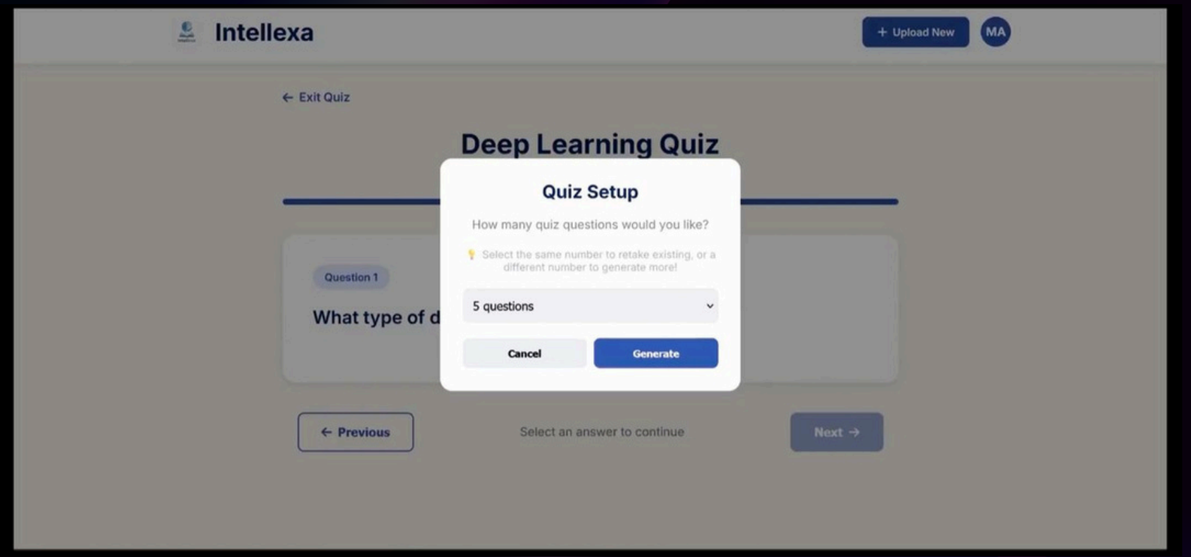


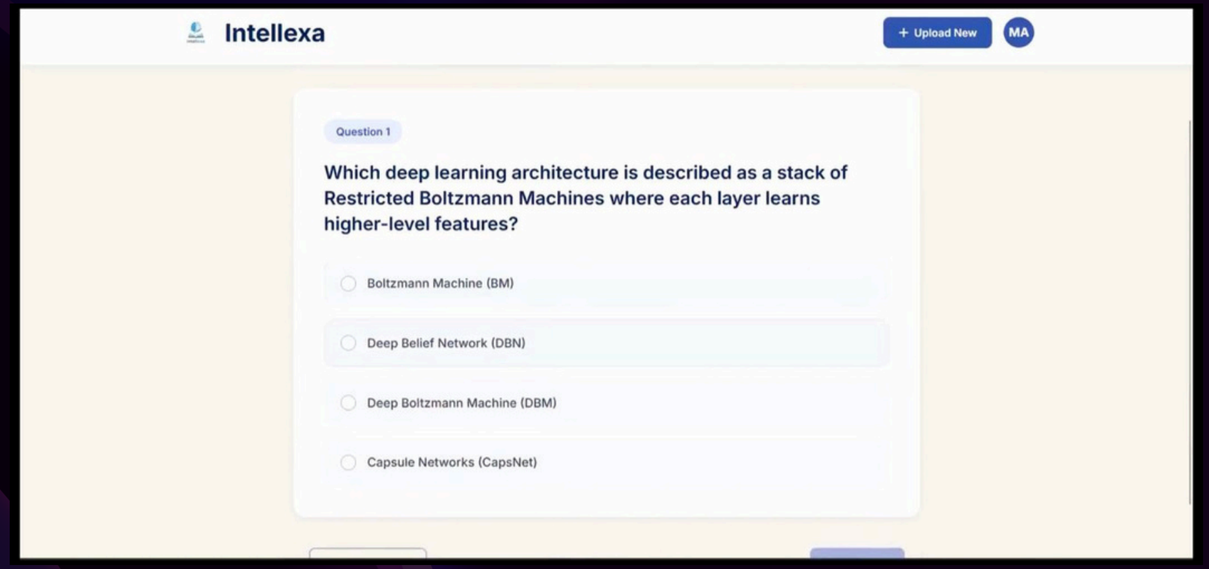
FLASHCARD


Intellexa
+ Upload New
MA
← Back to Material
Deep Learning
Flashcards Setup
How many flashcards would you like?
Select the same number to review existing, or a different number to generate more!
5 flashcards
Cancel
Generate
use?
click to reveal answer

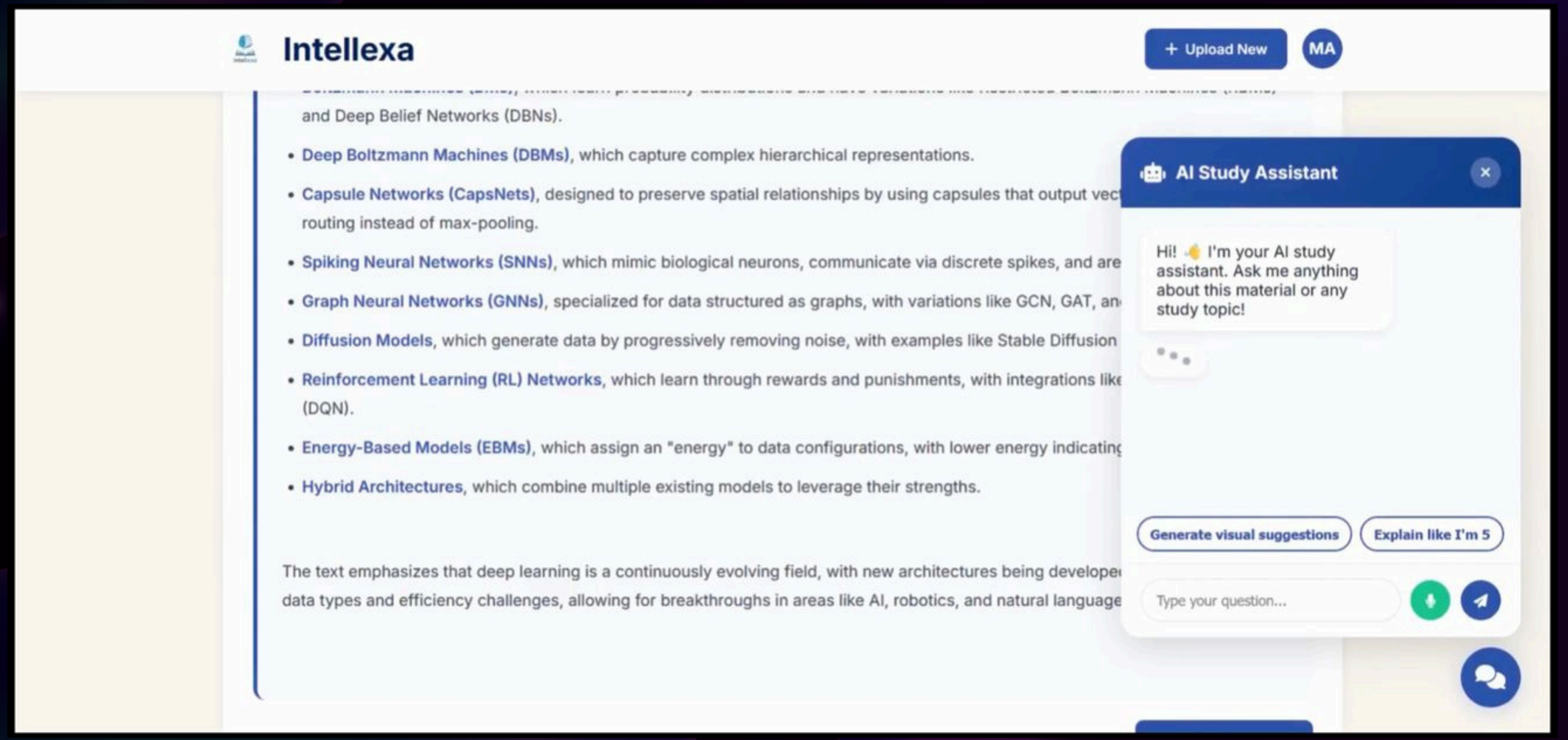

Intellexa
+ Upload New
MA
Card 1 of 5
What is a Boltzmann Machine?
click to reveal answer
← Previous
Show Answer
Next

QUIZ

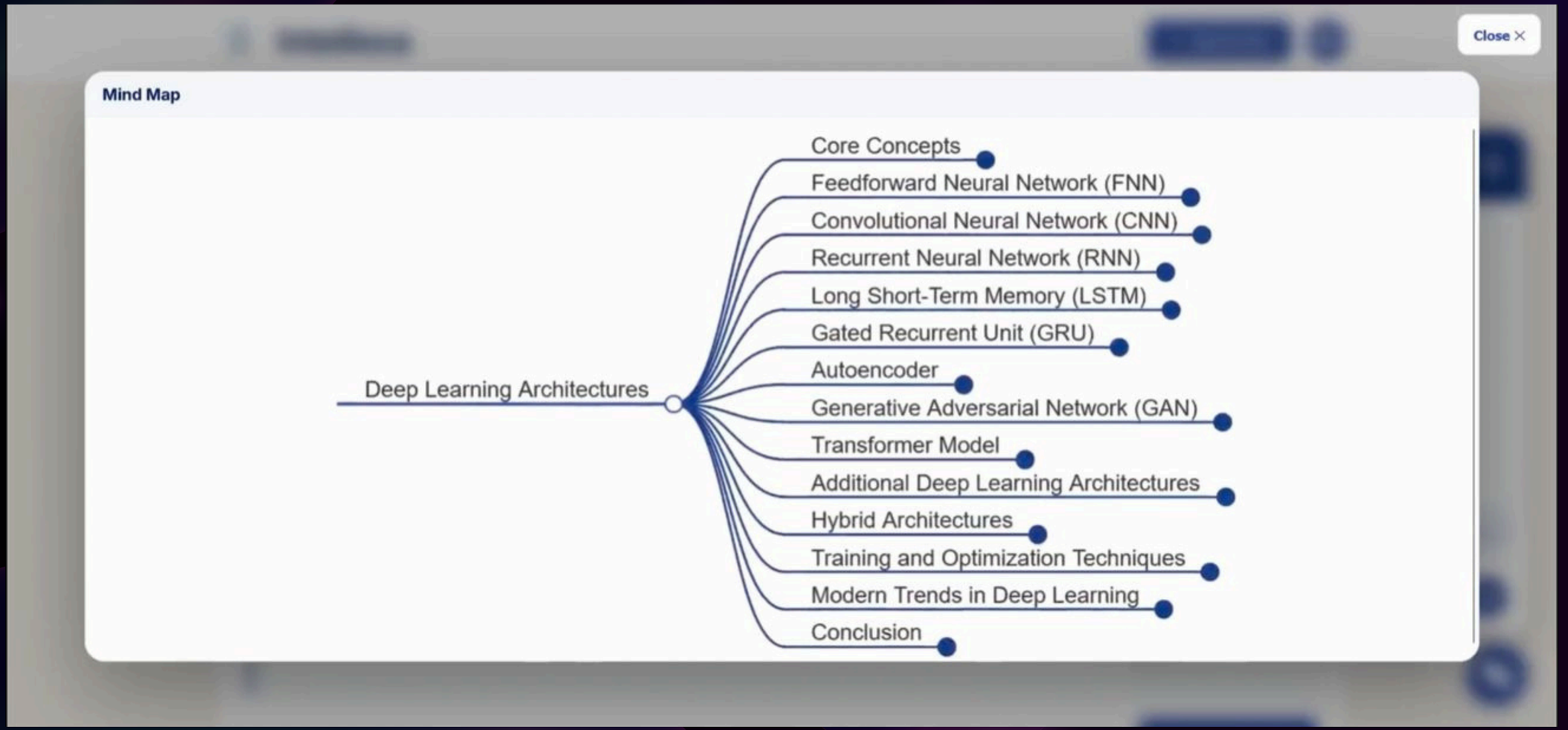

Intellexa
+ Upload New
MA
← Exit Quiz
Deep Learning Quiz
Quiz Setup
How many quiz questions would you like?
Select the same number to retake existing, or a different number to generate more!
5 questions
Cancel
Generate
Question 1
What type of d
← Previous
Select an answer to continue
Next →


Intellexa
+ Upload New
MA
Question 1
Which deep learning architecture is described as a stack of Restricted Boltzmann Machines where each layer learns higher-level features?
Boltzmann Machine (BM)
Deep Belief Network (DBN)
Deep Boltzmann Machine (DBM)
Capsule Networks (CapsNet)

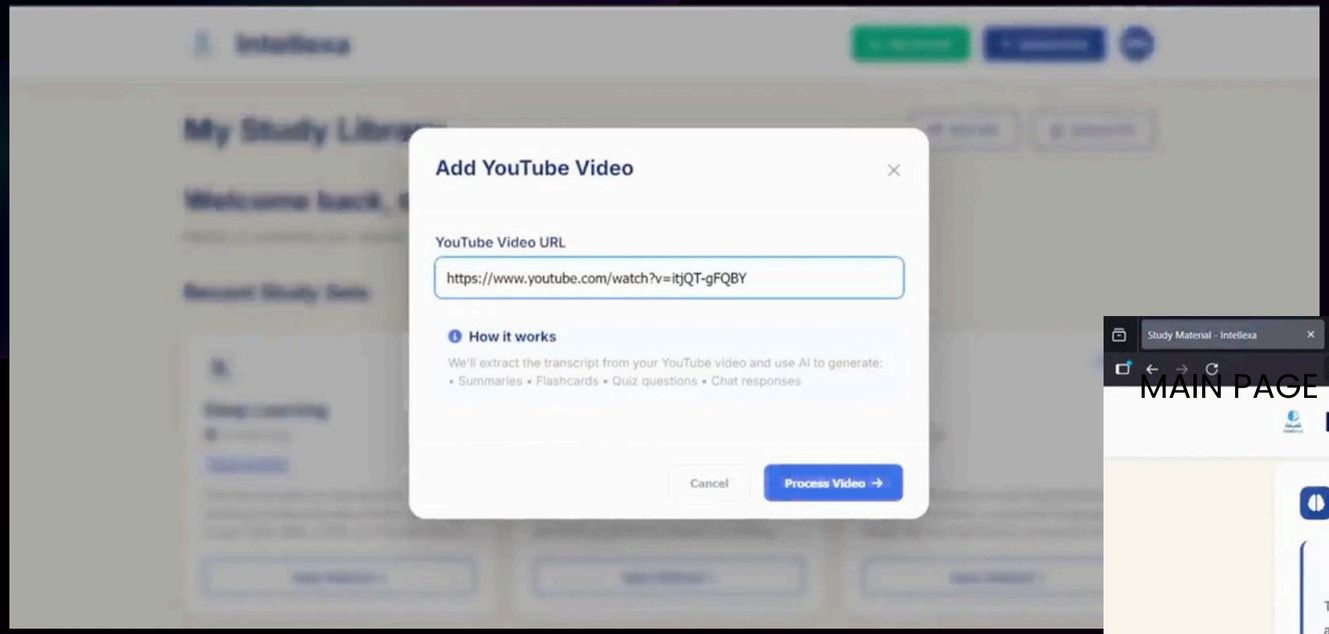
CHATBOT


Intellexa
+ Upload New
MA
and Deep Belief Networks (DBNs).
Deep Boltzmann Machines (DBMs), which capture complex hierarchical representations.
Capsule Networks (CapsNets), designed to preserve spatial relationships by using capsules that output vec
routing instead of max-pooling.
Spiking Neural Networks (SNNs), which mimic biological neurons, communicate via discrete spikes, and are
Graph Neural Networks (GNNs), specialized for data structured as graphs, with variations like GCN, GAT, an
Diffusion Models, which generate data by progressively removing noise, with examples like Stable Diffusion
Reinforcement Learning (RL) Networks, which learn through rewards and punishments, with integrations like
(DQN).
Energy-Based Models (EBMs), which assign an "energy" to data configurations, with lower energy indicating
Hybrid Architectures, which combine multiple existing models to leverage their strengths.
The text emphasizes that deep learning is a continuously evolving field, with new architectures being develope
data types and efficiency challenges, allowing for breakthroughs in areas like AI, robotics, and natural language
AI Study Assistant
Hi! I'm your AI study assistant. Ask me anything about this material or any study topic!
Generate visual suggestions
Explain like I'm 5
Type your question...

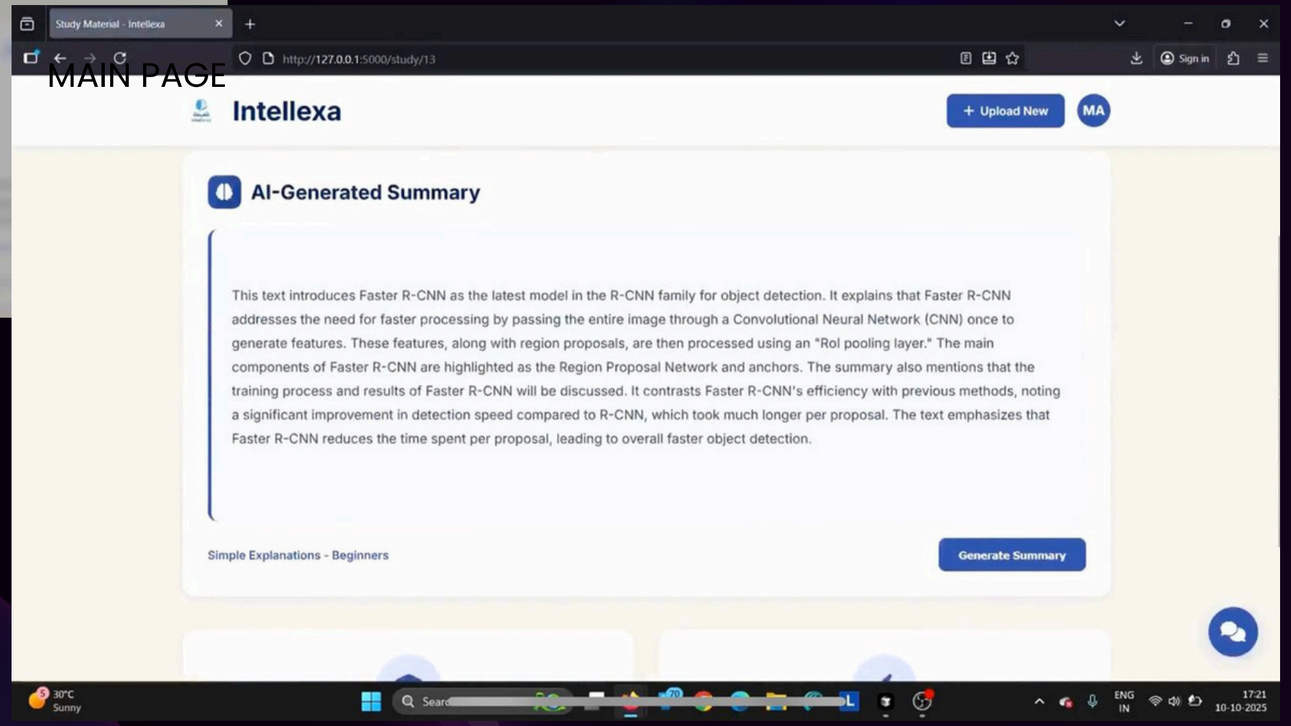
MINDMAP


Close ×
Mind Map
Deep Learning Architectures
Core Concepts
Feedforward Neural Network (FNN)
Convolutional Neural Network (CNN)
Recurrent Neural Network (RNN)
Long Short-Term Memory (LSTM)
Gated Recurrent Unit (GRU)
Autoencoder
Generative Adversarial Network (GAN)
Transformer Model
Additional Deep Learning Architectures
Hybrid Architectures
Training and Optimization Techniques
Modern Trends in Deep Learning
Conclusion

LINK PAGE

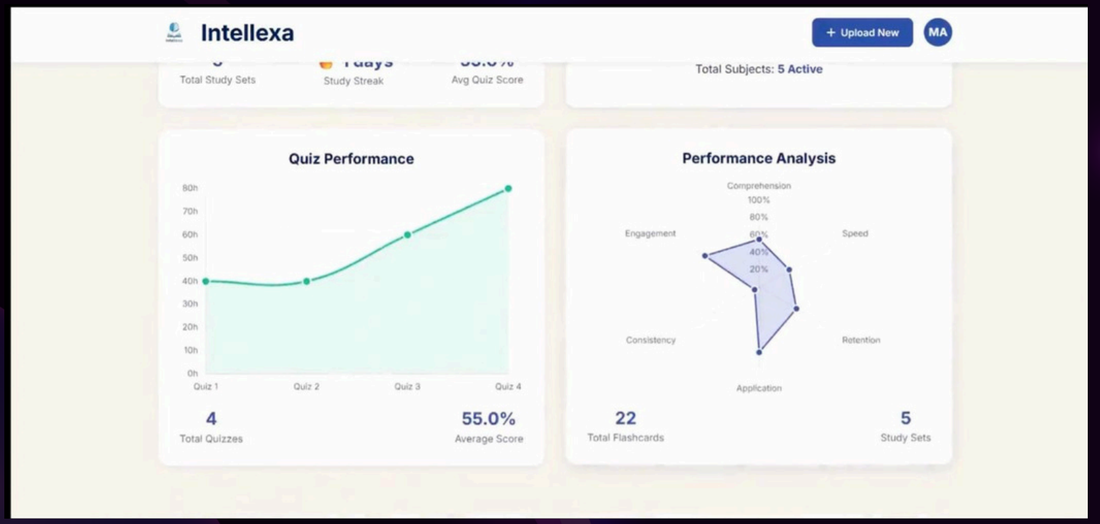


MAIN PAGE

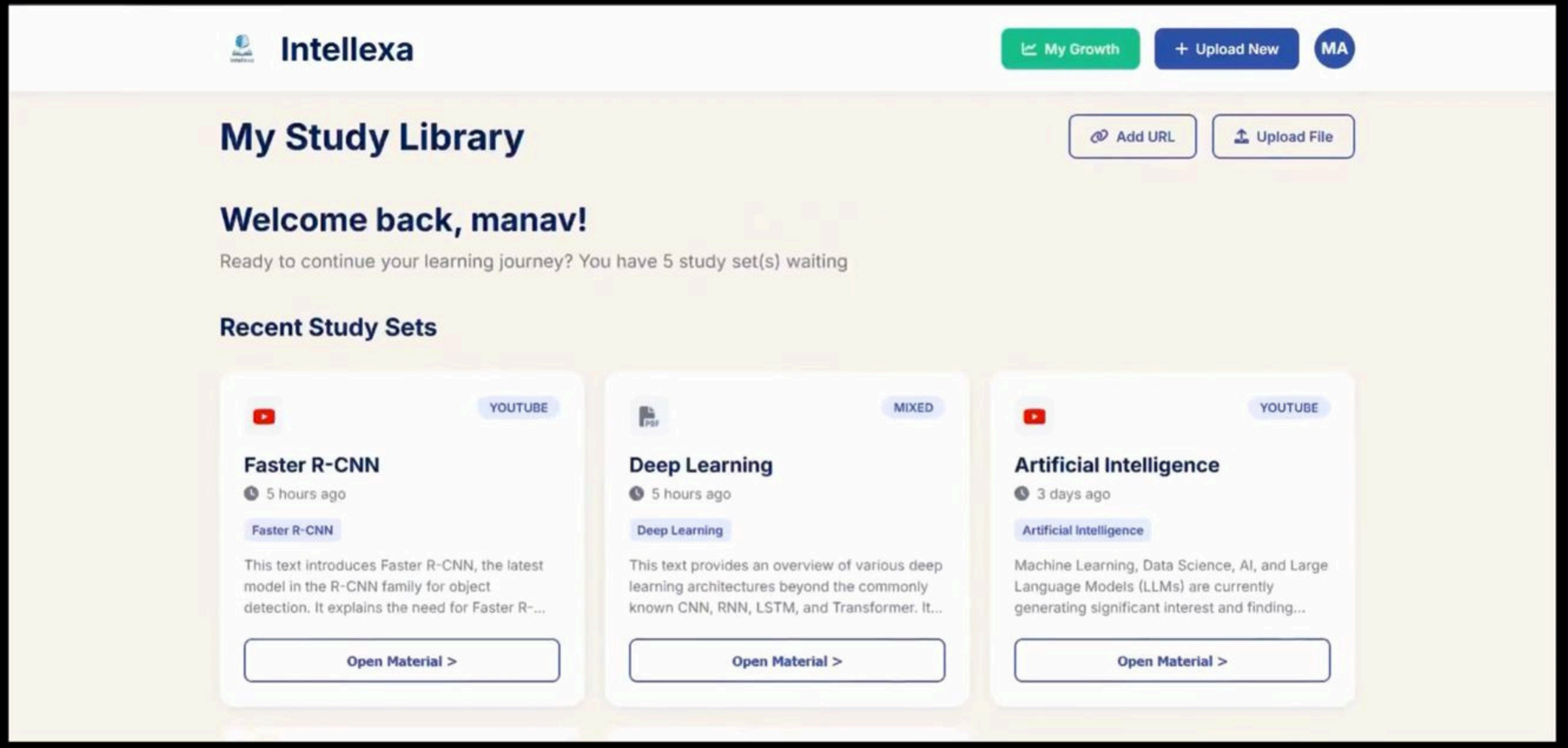


GROWTH PAGE


Intellexa
+ Upload New
MA
My Growth
Weekly Progress
100
80
60
40
20
0
Oct 5
Oct 7
Oct 10
5
Total Study Sets
1 days
Study Streak
55.0%
Avg Quiz Score
Topic Distribution
Most Studied: General (1 sets)
Total Subjects: 5 Active

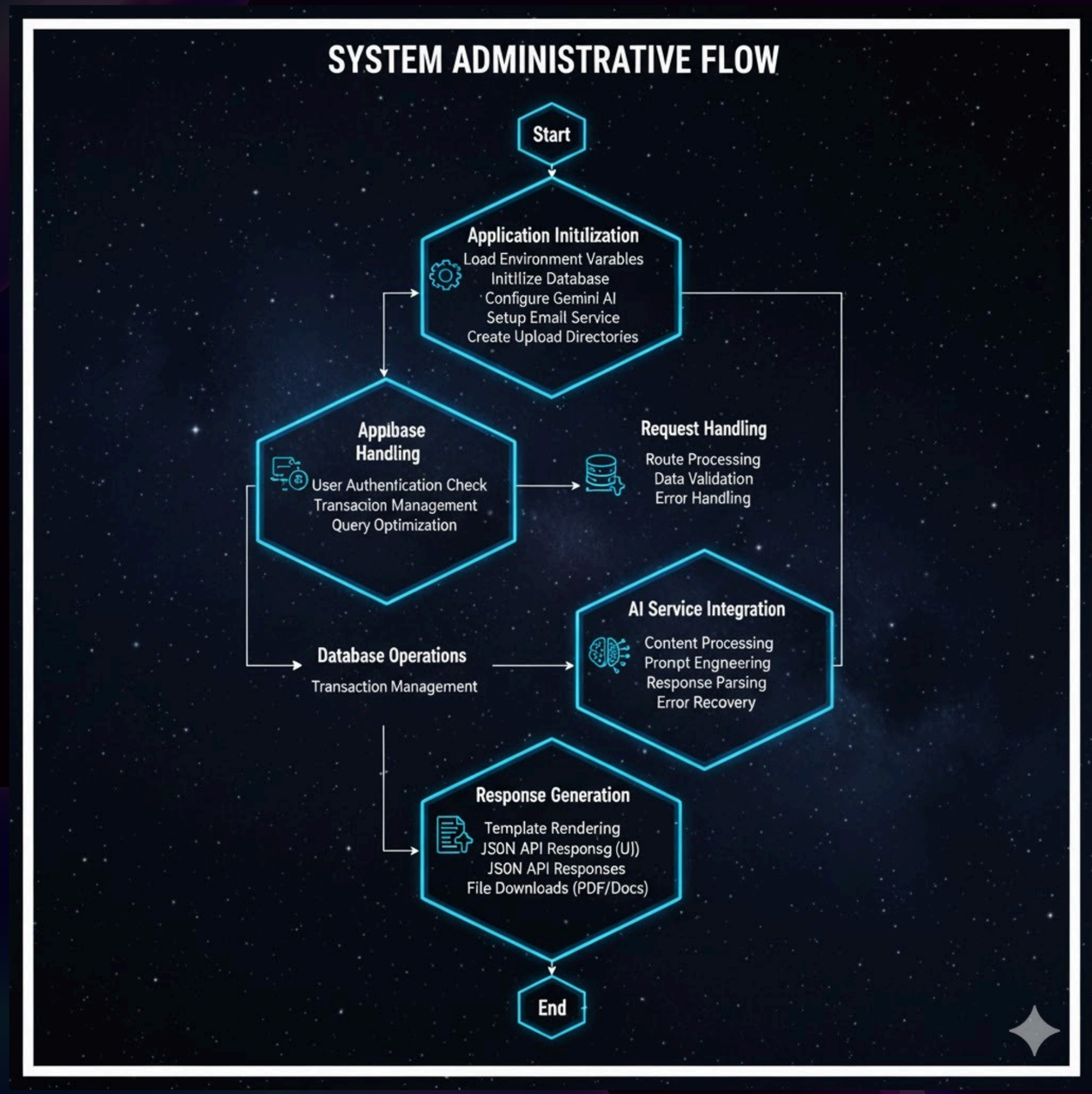

Intellexa
+ Upload New
MA
Total Study Sets
Study Streak
Avg Quiz Score
Total Subjects: 5 Active
Quiz Performance
80h
70h
60h
50h
40h
30h
20h
10h
0h
Quiz 1
Quiz 2
Quiz 3
Quiz 4
4
Total Quizzes
55.0%
Average Score
Performance Analysis
Comprehension
100%
80%
60%
40%
20%
Engagement
Speed
Consistency
Retention
Application
22
Total Flashcards
5
Study Sets

STUDY LIBRARY



USER ARCHITECTURE

SYSTEM ADMINISTRATION FLOW



LIST OF FEATURES IMPLEMENTED

CODE & CODE QUALITY TOOLS

intellexa/

Project root folder:	Initial commit	last month
instance/ static Contains temprary files	Initial commit	last month
templates	Initial commit	last month
uploads	first commit3	last month
Stores HTML web assets media	Commit	3 weeks seks
README.md Python media	Commit	3 wst month
app2.py	Commit	3 weeks agd
app3.py	Initial commit	last month
requirements.txt	Commit	last month

NON-FUNCTIONAL REQUIREMENTS (NFRS)

Performance Requirements

ID	Requirement Description	Metric / Target Value
NFR-P1	The system shall generate a summary for an input document (≤ 5 pages) within 5 seconds.	≤ 5 seconds
NFR-P2	Quiz or flashcard generation for the same input shall complete within 7 seconds.	≤ 7 seconds
NFR-P3	The application shall handle at least 3 simultaneous requests on localhost without failure.	≥ 3 concurrent requests
NFR-P4	Uploaded files shall not exceed 25 MB to maintain stable memory and API performance.	≤ 25 MB
NFR-P5	Average CPU utilization during Gemini API calls shall remain below 80%.	≤ 80 % CPU

Reliability & Availability Requirements

ID	Requirement Description	Metric / Target Value
NFR-R1	API call failures shall be handled using try-except without server crashes.	100 % handled
NFR-R2	User data and history shall persist in the SQLite database across sessions.	100 % persistence
NFR-R3	Dashboard progress data shall remain accurate for each user session.	100 % accuracy
NFR-R4	System uptime during local runs shall be at least 95 % (excluding manual stops).	≥ 95 % uptime

NON-FUNCTIONAL REQUIREMENTS (NFRS)

Security & Privacy Requirements

ID	Requirement Description	Metric / Target Value
NFR-S1	User passwords shall be stored as securely hashed values in SQLite.	100 % hashed
NFR-S2	Gemini API keys shall be stored in .env and config.py, never in code.	100 % externalized
NFR-S3	User sessions shall automatically expire after 30 minutes of inactivity.	30 min timeout
NFR-S4	Only .pdf, .docx, .pptx, and YouTube links are accepted as valid uploads.	4 file types allowed
NFR-S5	Each user shall only access their own dashboard data.	100 % access isolation

Usability & Accessibility Requirements

ID	Requirement Description	Metric / Target Value
NFR-U1	Dashboard and main pages shall load within 3 seconds on localhost.	≤ 3 seconds
NFR-U2	Loading indicators must display during all Gemini API operations.	Always visible
NFR-U3	UI shall be fully usable on standard desktop and laptop resolutions.	≥ 1024 × 768 px
NFR-U4	Core flow (upload → summarize → quiz) shall complete in ≤ 3 navigation steps.	≤ 3 steps

NON-FUNCTIONAL REQUIREMENTS (NFRS)

Maintainability & Configurability Requirements

ID	Requirement Description	Metric / Target Value
NFR-M1	All Gemini API configurations shall be stored externally (.env, config.py).	100 % externalized
NFR-M2	Core modules (upload, summarize, quiz, dashboard) shall be independently modifiable.	Low coupling
NFR-M3	Code shall include comments for at least 90 % of major functions.	≥ 90 % commented
NFR-M4	Minor API or configuration changes shall take ≤ 30 minutes to update.	≤ 30 minutes

Logging & Error Handling Requirements

ID	Requirement Description	Metric / Target Value
NFR-L1	All API calls and critical user actions shall be wrapped in try-except.	100 % handled
NFR-L2	Errors shall be shown as readable user messages, not raw traces.	100 % friendly errors
NFR-L3	Console logs shall record at least 80 % of key events for debugging.	≥ 80 % logged

NON-FUNCTIONAL REQUIREMENTS (NFRS)

Data Storage & Persistence Requirements

ID	Requirement Description	Metric / Target Value
NFR-D1	User progress, uploaded file metadata, and quiz data shall be saved in SQLite.	100 % stored
NFR-D2	Each database write operation shall maintain integrity and consistency.	100 % consistent
NFR-D3	Total SQLite DB size shall remain below 200 MB during local use.	≤ 200 MB

Deployment & Portability Requirements

ID	Requirement Description	Metric / Target Value
NFR-P1	Application shall run on systems with ≥ 4 GB RAM and Python 3.10+.	Min: 4 GB RAM, Python 3.10+
NFR-P2	Local setup and configuration shall complete within 10 minutes.	≤ 10 minutes
NFR-P3	System shall be operable on both Windows and Linux environments.	2 OS supported

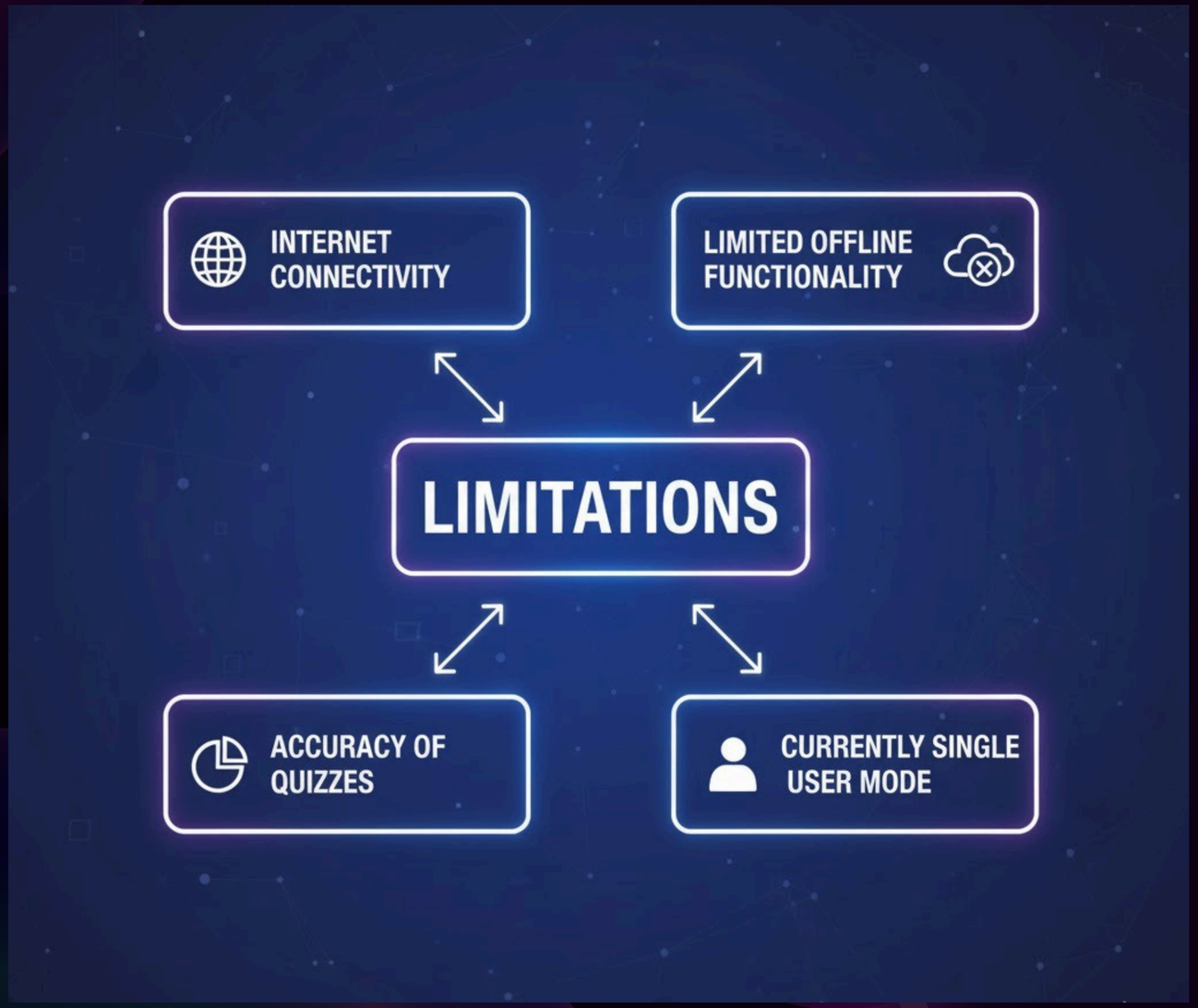
DEVELOPMENT APPROACH & FEATURES

Requirement Understanding & Planning	Identified student learning challenges and features needed.
Wireframing & UI Planning	Designed basic screens for learning modules, quizzes, and notes.
Backend Development (Flask APIs)	Created APIs for processing text, audio/video notes, and AI responses.
AI Integration	Integrated Gemini for content generation + Whisper for transcription.
Document Automation	Added automatic PDF/PPT generation and file handling.
Database Setup (SQLite)	Stored user learning progress, notes, and extracted content.
Frontend Integration	Connected UI with backend APIs for real-time user experience.
Testing & Refinement	Debugged features, improved UI flow, and optimized speed.

CHALLENGES

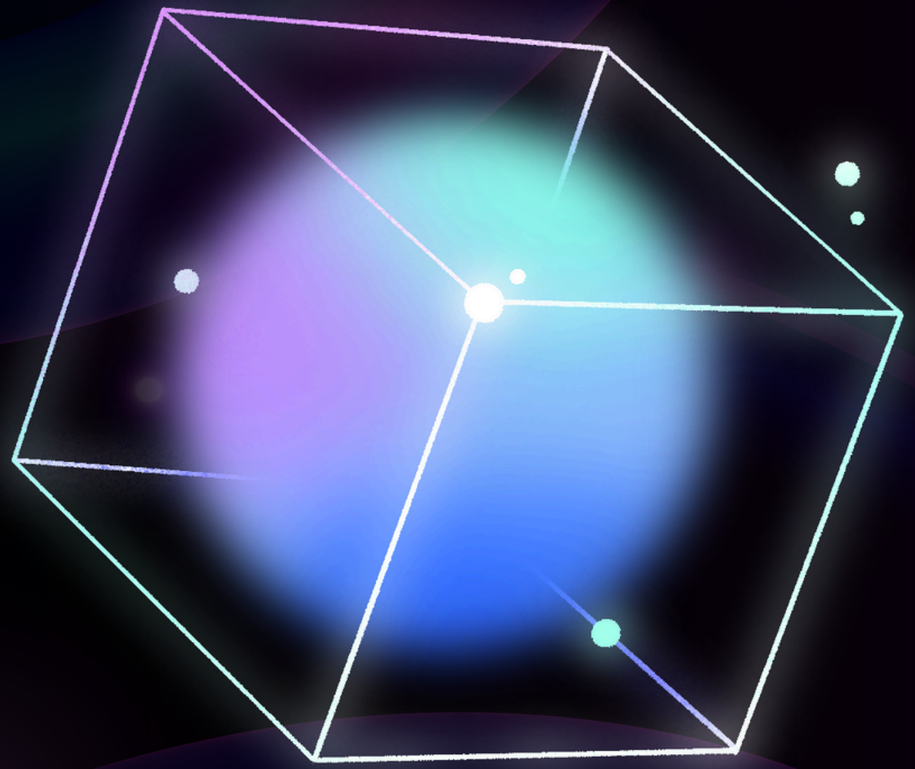

TECHNICAL CHALLENGES
Integrating Gemini API with Flask
Integrating Gemni with Flask
Extracting text cleanly from diverse PDS and videos
NON-TECHICAL CHALLENGES
Managing rate limits for AI API
Parsing AI-generated AI API
UI responviness across devices

LIMITATIONS



FUTURE DEVELOPMENT SCOPE

- **BATCH PROCESSING QUEUE** for large uploads
- **VIDEO SUMMARIZATION** from uploaded videos
- **REAL-TIME PROGRESS** updates during AI generation
- **SPEECH-TO-TEXT** for audio files
- **COLLABORATIVE STUDY** features
- **MULTI-LANGUAGE SUPPORT** beyond English/Hindi
- **MOBILE APP** integration
- **ADVANCED ANALYTICS** with ML insights
- **OFFLINE MODE** with sync
- **INTEGRATION** with learning management systems



Application Video Link

Click Here!

THANK YOU!