EduCare

A Smart Unified Educational Platform

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Agenda

What?

Why?

How?

Requirements

System Design

Project Full Documentation

Overview (What?)

Problem Statement (Why?)

Too many educational platform.

School and Higher Education are disconnected.

Technical Advancement is slow.

Knowledge finding and Accessibility issues.

Not making use of other public tooling.

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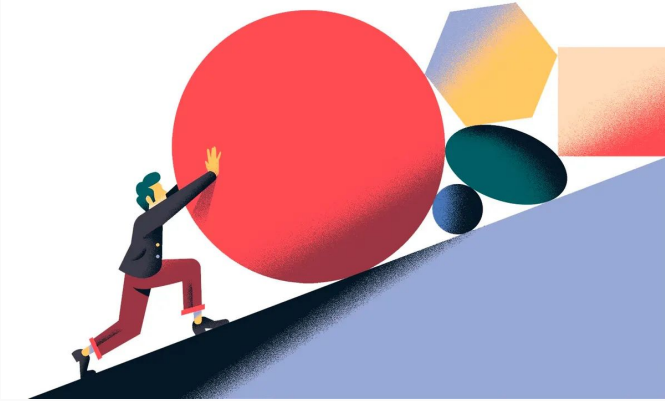


How ?

Unified Platform

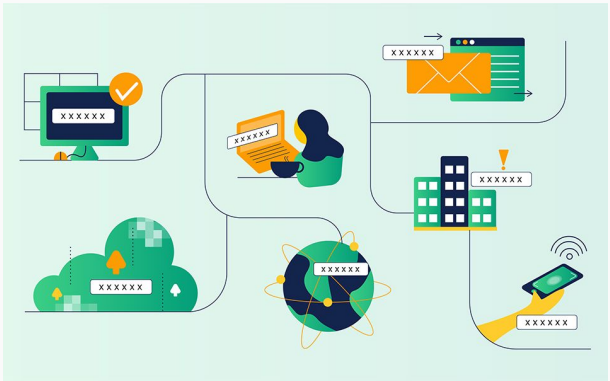
Integration with other technologies

Requirements

Non-Functional Requirements

Functional Requirements

Research and Development on current solutions



Non-Functional Requirements

Security

Reliability, Availability, and Fault-Tolerance

Scalability and Performance

Usability, Portability, Ease of use, and Accessibility

Code quality and Maintainability

Customization and Localization

Non-Functional Requirements

Security

- AAA framework authentication and authorization.
- Users choose the transparency of their data (private, public, group,.. etc)
- Zero-trust architecture.

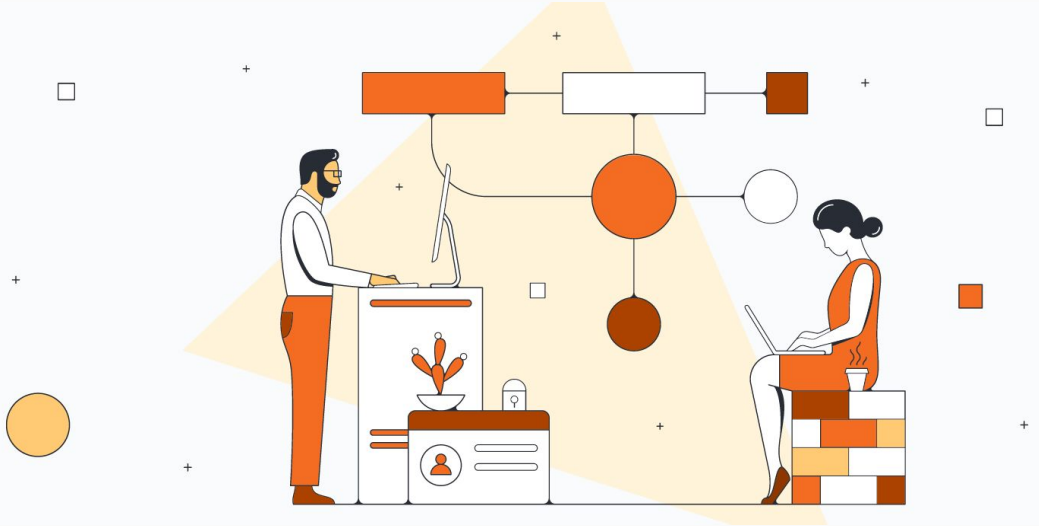
Non-Functional Requirements

Availability and Reliability

Serverless and Containers constantly fix availability issues, in addition to cloud providers have SLAs for their services.

Scalability and Performance

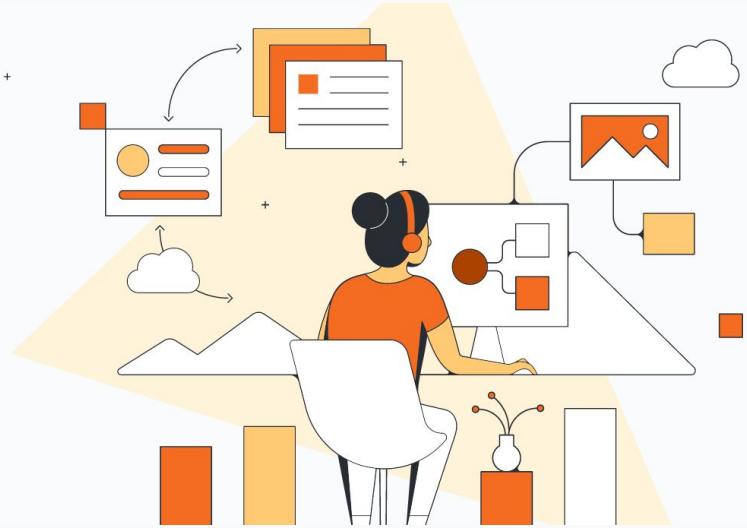
Concurrency and efficient algorithms are core part of the project, as well as the fact that serverless architecture provide high performance guarantees.



Non-Functional Requirements

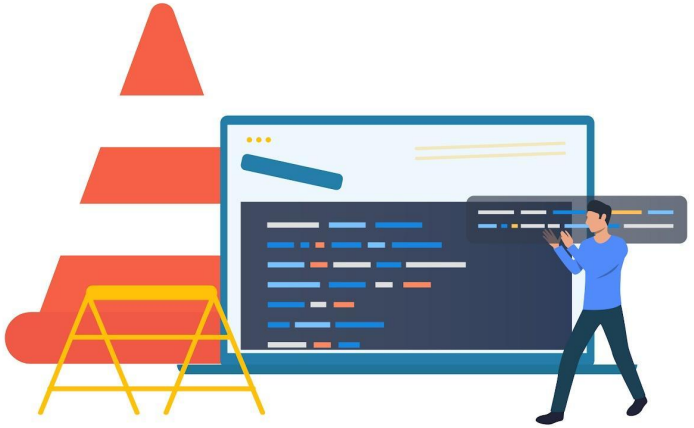
Usability, Portability, Ease of use, and Accessibility

The key to keeping users satisfied on a platform is providing a simple, unified, and convenient interface that works well on various devices and locations.



Code quality and Maintainability

- Provide high quality codebase for developers and other contributors to the project.
- Follow industry standards for clean code and deployment.
- Write for both long term use and short term use.
- State of the art algorithms and system design.



Customization and Localization

Users are able to customize many aspect of the platform with their own preference colors, images, and languages.

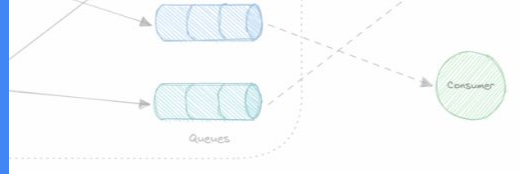
Also enabling seamless community integration and user-friendly adoption.

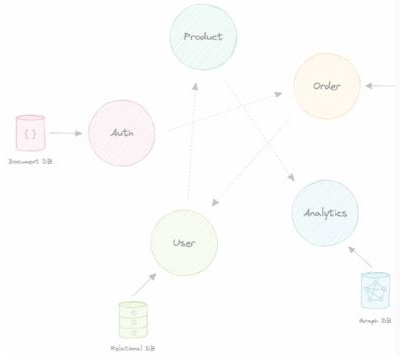
Functional Requirements

Entities CRUD Operations

Integration with public tooling

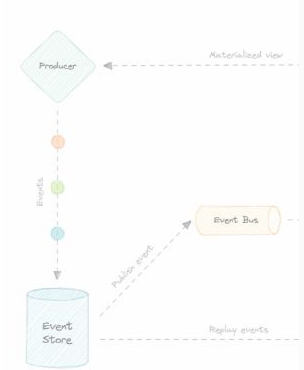
Engines: Policy, Query, and search

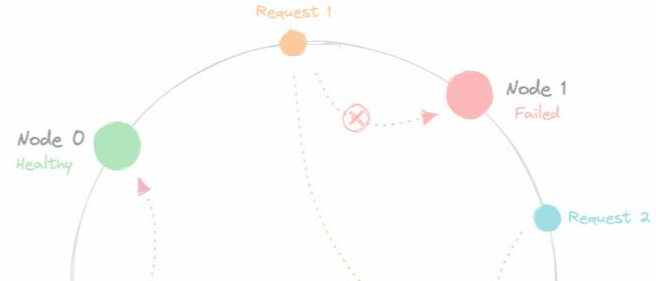




Current Entities in the platform:

- User
- Course
- Task
- Institution
- Resource
- Notification
- Policy Engine
- Association (Query Engine)
- Search
- Generator



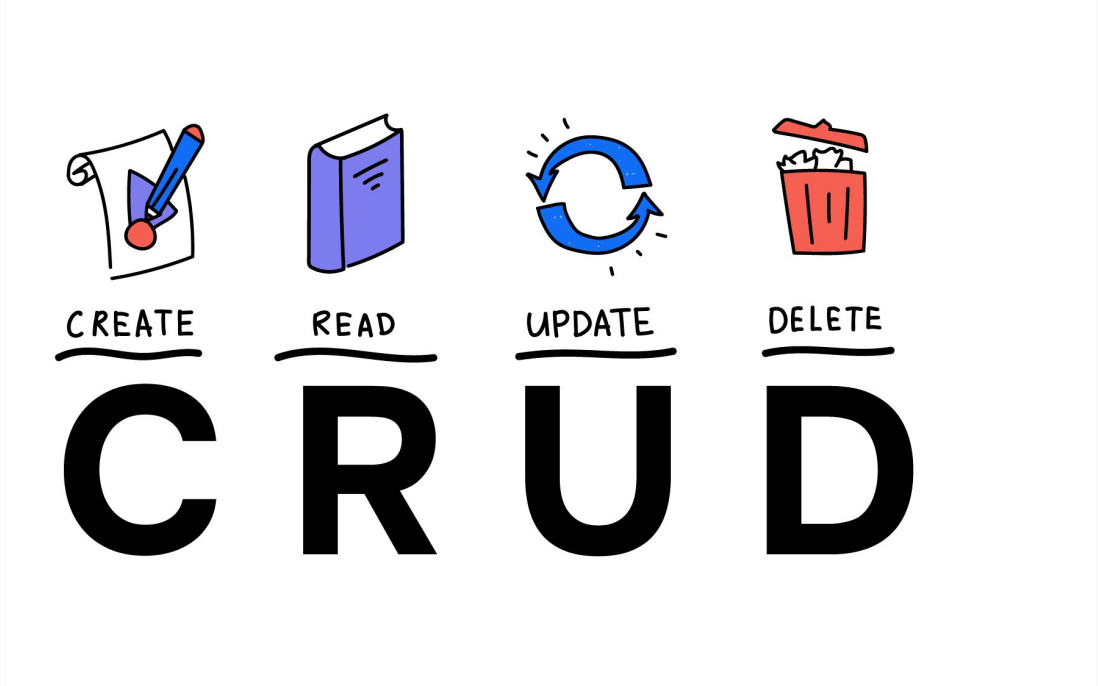


Entities CRUD Operations

Users can create *institutions*, *courses*, *resources, and tasks* as well as other entities.

Users can utilize the search engine to find entities with results limited to those they are authorized to view.

User Identity functional requirements are responsible for any user CRUD operations, the Identity requirement is mainly for authentication purposes .

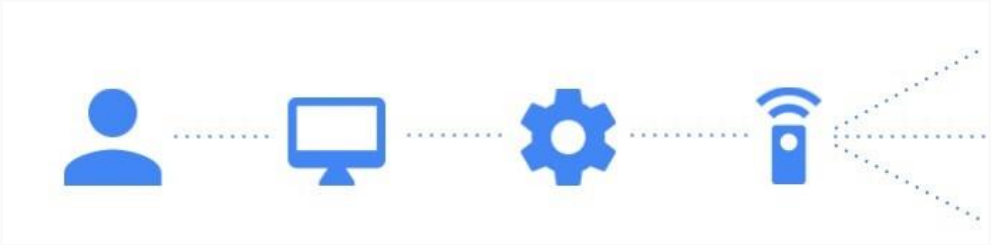


Integration with public tooling

- Join forces with other platforms and provide APIs for public use.
- Integrate with already established toolings such as AI tools.
- Follow educational system industry standards.

Engines: Policy, Query, and search

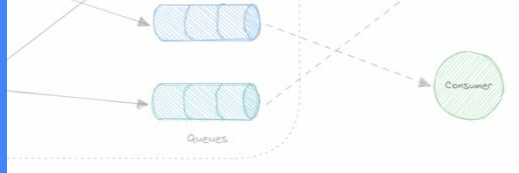
- Policy Engine: Manage the security and permissions in the platform using zero-trust architecture.
- Query Engine: To join data across different data stores in a fast efficient way.
- Search Engine: Finding resources and knowledge with ease.

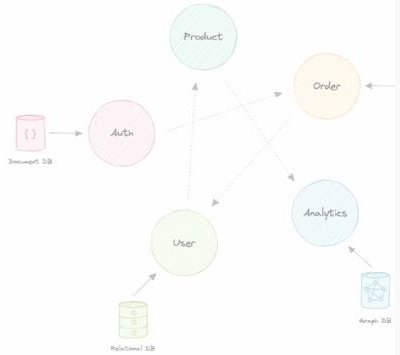


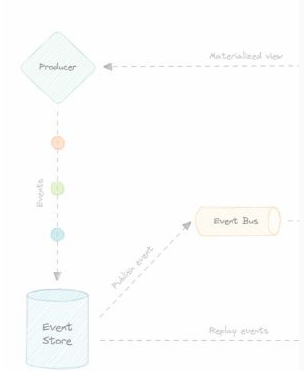
Research and Development

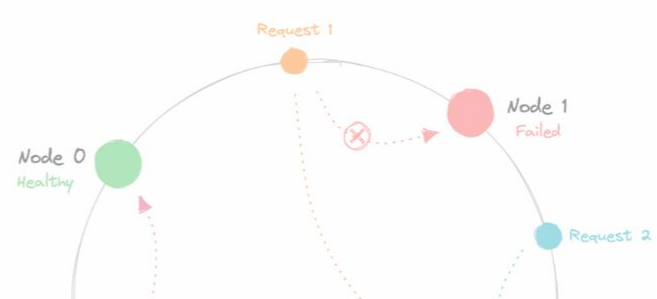
What questions did we have to ask and answer in order to have a better platform?

- How to distribute the platform services?
- How to secure the platform?
- How to perform fast data joins in a distributed environment?
- How to automate educational tasks?
- How to manage large users as an admin







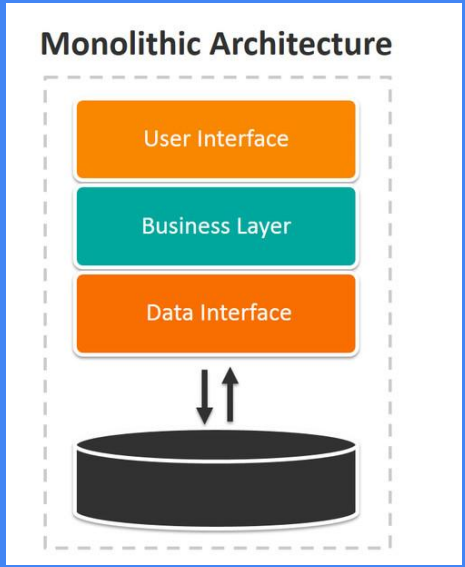


System Design

Why do enterprise educational platforms usually crash ?

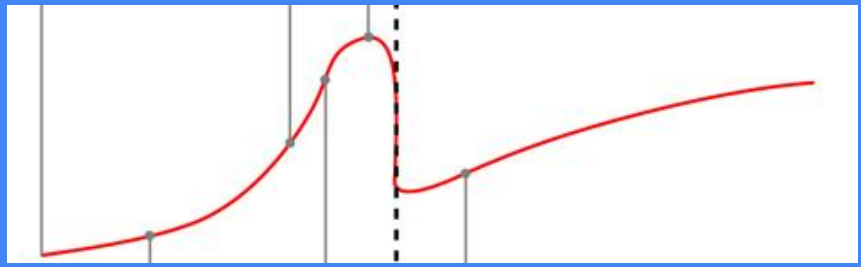
Monolithic Architecture

Peak times cause overload.
System is very tightly coupled.
One database system isn't enough to handle all the queries.
The business layer can cause bottleneck for the platform
Very expensive to deploy and maintain



Slow Development Cycle

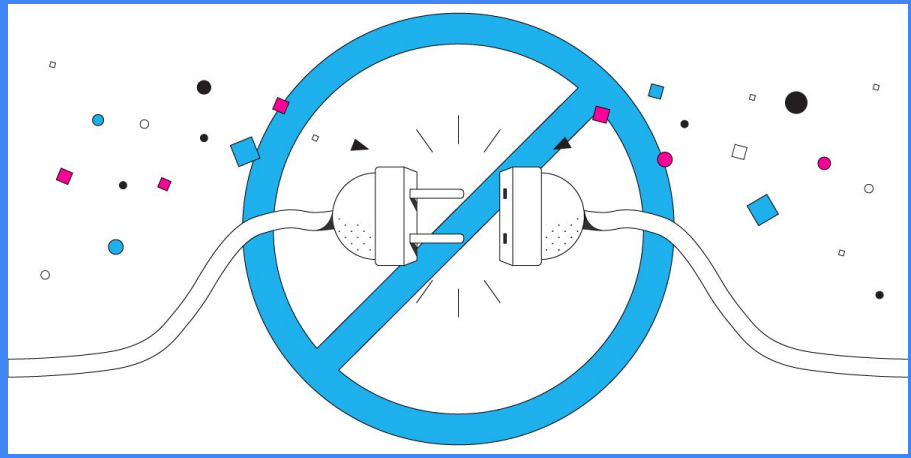
Peak times cause overload.
System is very tightly coupled.
One database system isn’t enough to handle all the queries.
The business layer can cause bottleneck for the platform



What is wrong with current educational platforms ?

Very disconnected

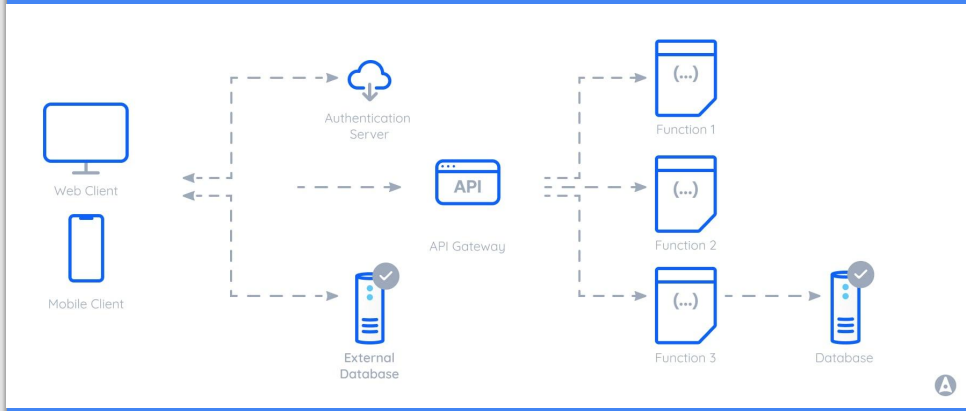
Each platform is very independent. Student have access to overwhelming resources.
Very low investment in other technology that could advance education such as AI



EduCare solution

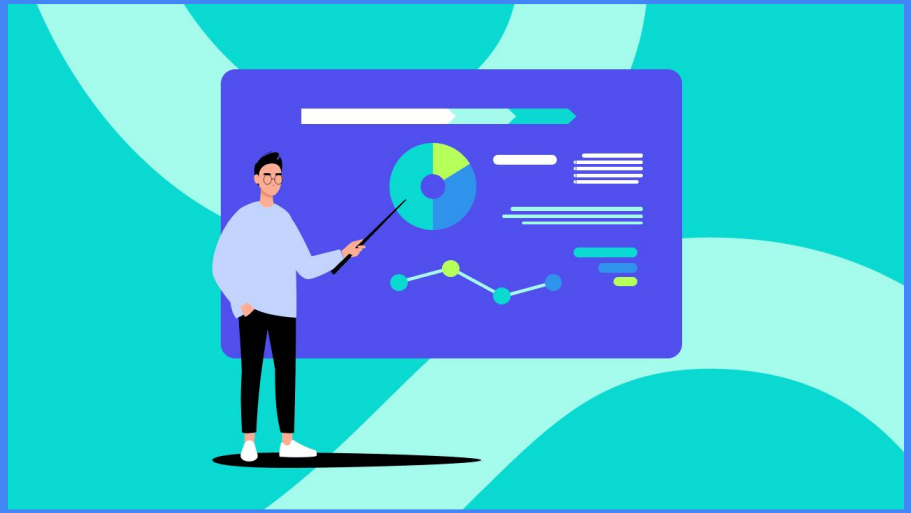
Distribute Serverless Resources

Make use of serverless functions and serverless distributed databases. Drop unnecessary operations.



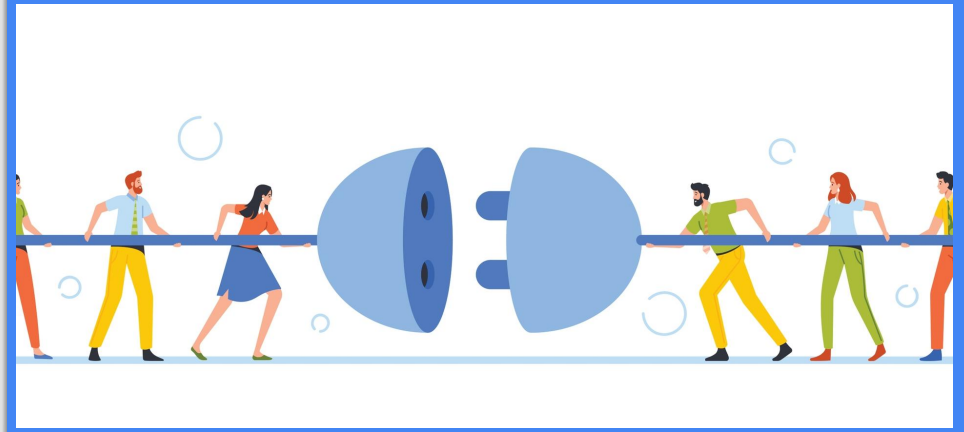
Enhance Operations

Enhance security through zero-trust architecture.
Make development flexibility a priority.



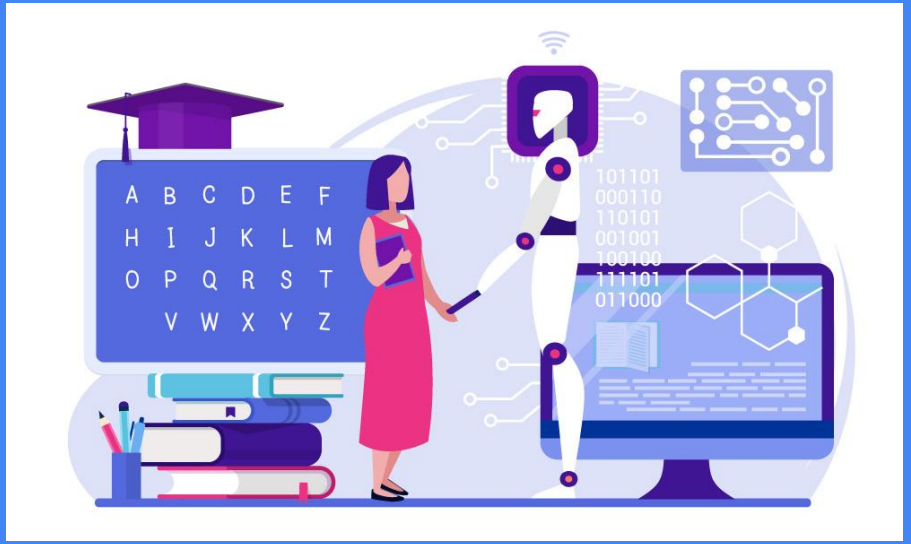
Join forces with current solutions

Off the shelf solutions, i.e. open source, pre-trained models.
Integrate with public standards.
Create API for public use.



AI in Education

Automate task using AI, such as self study plans, scheduling, and generating questions.
Exam Integrity and Plagiarism Detection.
Analyzing Student Success Metrics.



Thanks!

For more information, go to the full documentation