SMART INDIA HACKATHON 2024

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Problem Statement ID: SIH1661
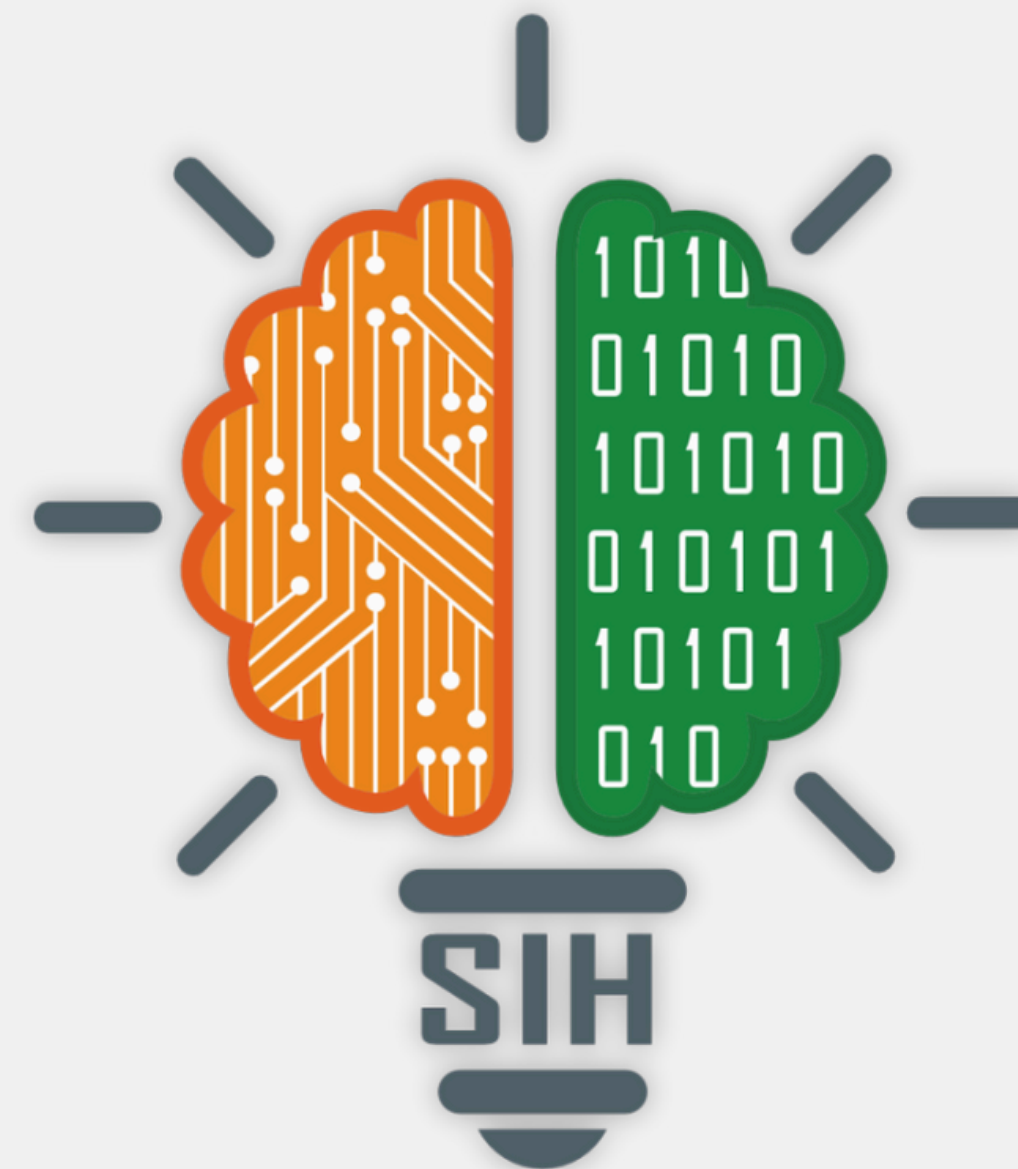
Problem Statement Title:

IMPLEMENT SOFTWARE SOLUTIONS TO REDUCE STUDENT DROPOUT RATES AT VARIOUS EDUCATIONAL STAGES

Theme: Smart Education

PS Category: Software

Team ID: 26824

Team Name : MentorMatrix

SUSTAINABLE DEVELOPMENT GOALS

4 QUALITY EDUCATION

10 REDUCED INEQUALITIES

DIGIBRIDGE: E-LEARNING
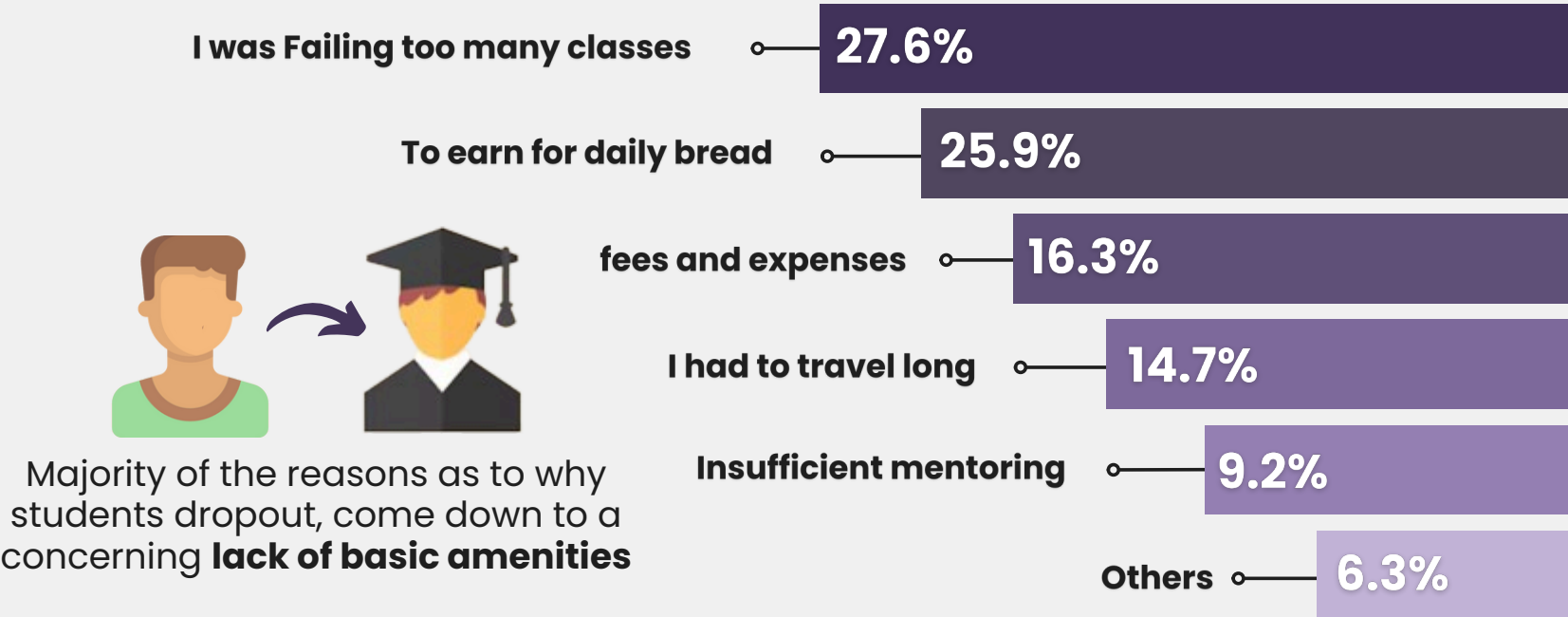
SMART INDIA HACKATHON 2024

Problem Statement focus :

The National Education Policy (NEP) 2020 stresses the urgent need to **reduce dropout rates** and ensure quality education for all, aiming for **100% GER** from preschool to secondary school by **2030**.

The focus is on leveraging **technology and data-driven** solutions to enhance student retention, ensuring alignment with **NEP 2020** goals.
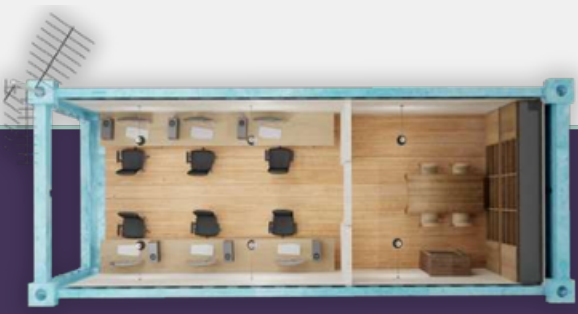
NEP 2020

REASONS FOR DROPOUT:

Reason	Percentage
I was Failing too many classes	27.6%
To earn for daily bread	25.9%
fees and expenses	16.3%
I had to travel long	14.7%
Insufficient mentoring	9.2%
Others	6.3%

Majority of the reasons as to why students dropout, come down to a concerning **lack of basic amenities**

Experience Learning with

DIGIBRIDGE

DigiBridge — CONNECTING YOUNG MINDS

Empowering Education: **Digibridge Desktop App** seamlessly integrates **three learning modes**, expert **mentorship,** and **scholarship** opportunities, creating a **supportive ecosystem** for students to learn.

Shipping container-based learning hubs provide **affordable, offline education** to students, helping those who drop out due to **long distances** from home to school

AI

The **I3 Dashboard** (Identify, Intervene, Impact) identifies issues at student, class, and school levels, implements interventions, measures impact, and provides **Education-as-a-Service** for flexible institutional use.

Parents can monitor their child's progress in **real-time** through Digibridge's secure parent portal, **tracking engagement**, **quiz scores**, and learning behavior to ensure timely interventions and optimized student success.

TECHNICAL APPROACH

Python
AI Models

React native
Mobile App Development

Blender-Unity
3D Visuals and Modelling

Electron js
Desktop App Development

How AI fits in the big picture?

Let the stakeholders and participants of the case know the problem and plan for an intervention strategy to reduce dropout rates

i3 Dashboard

Identify: Recognizes disengagement factors

Intervene: Develops tailored strategies to address factors.

Impact: Measures the effectiveness of interventions

Related Reasons

Identifying reasons for student disengagement—like financial issues, lack of interest, and distance—helps the AI model pinpoint potential dropout causes.

Sources

- Demographic data
- Achievement data
- Program data
- Perception data

PLAN FOR AI EARLY WARNING SYSTEMS

1. **DATA COLLECTION AND CLEANING**
2. **FEATURE ENGINEERING**
3. **MODEL SELECTION**
4. **MODEL DEPLOYMENT**
5. **CONTINUOUS MONITORING AND RE-TRAINING**

Collect data from schools – records and surveys related to the reasons. Clean dataset

Create new features – Performance index, Perception scores, Engagegment Score

Classification models – Random Forests, GBM,Logistic Regression, Neural Networks

Deployment of model in DigiBridge, use real-time dashboards

**Monitor** and **re-train** with new data

```
1/1                              0s 28m
Test Loss: nan
Test Accuracy: 0.6923077106475...
1/1                              0s 85m
Predicted categories for test d
Sample 1: Fast Learner
Sample 2: Fast Learner
Sample 3: Fast Learner
Sample 4: Fast Learner
Sample 5: Fast Learner
Sample 6: Fast Learner
Sample 7: Fast Learner
Sample 8: Fast Leaner
Sample 9: Fast Learner
Sample 10: Fast Learner
Sample 11: Fast Learner
Sample 12: Fast Learner
Sample 13: Fast Learner
```

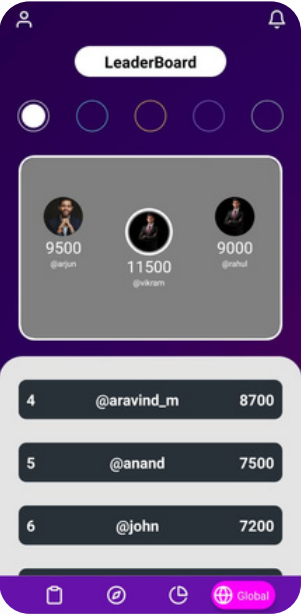AI model predicting fast, slow and average learners based o test performances
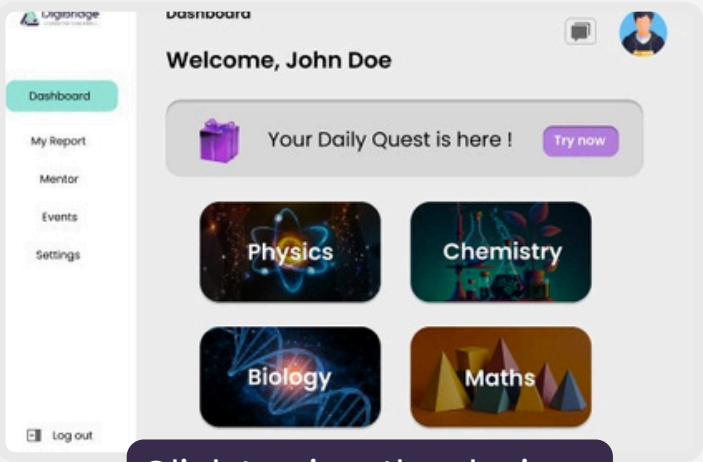
Click to view the designs
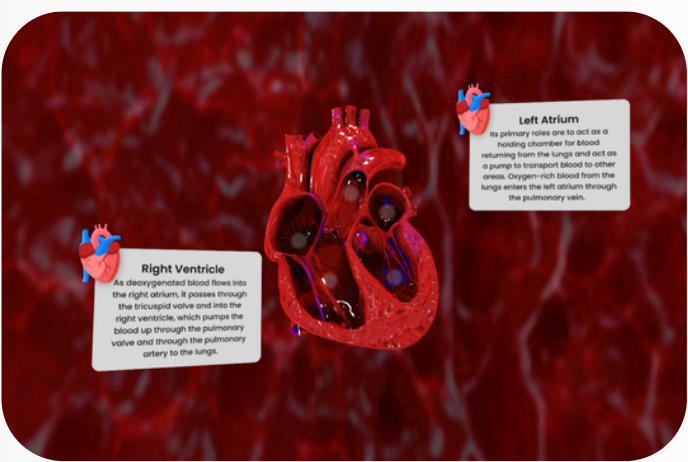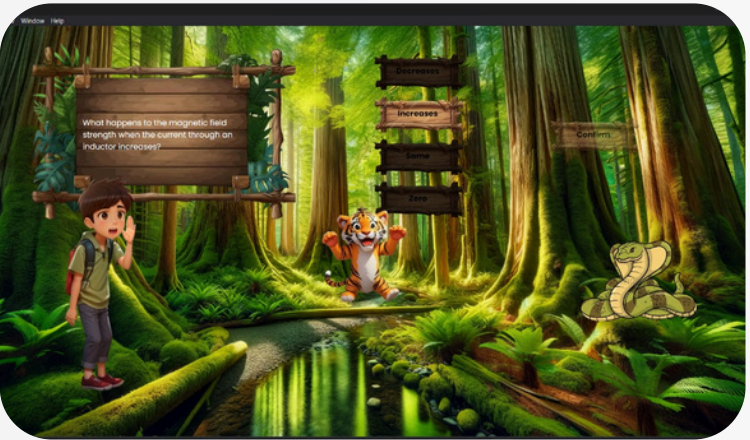
Desktop App Snapshots

Mobile App Snapshots

FEASIBILITY & VIABILITY

Our Idea is
Financially Feasibile

Refurbished shipping containers are **40% More Cost-Efficient** than traditional construction

Addressing a Social Cause holistically **Attracting CSR financial support** from companies focused on social responsibility.

Technically Feasibile

Desktop App designed for **Lag-less offline use,** reaching remote areas effectively

Course and **content updates** can occur with **limited internet**

Mobile App works offline using **SD cards** for storage & distribution

Operationally Feasibile

Quick to set-up, easier to manage and can be **relocated anywhere**

Connected with the **school syllabus,** while streamlining it to be **accessible** for **the unprivileged**

Flexible Learning that adapts to **individual student background** and their schedules.

3D Visualisation of our Learning Hub

Click to view **Video of Visualisation**

Connections like **Starlink** to provide **minimal internet** during updates

System Architecture

Central server that distributes update copy to the clients

About **8 Client systems** that function **offline,**
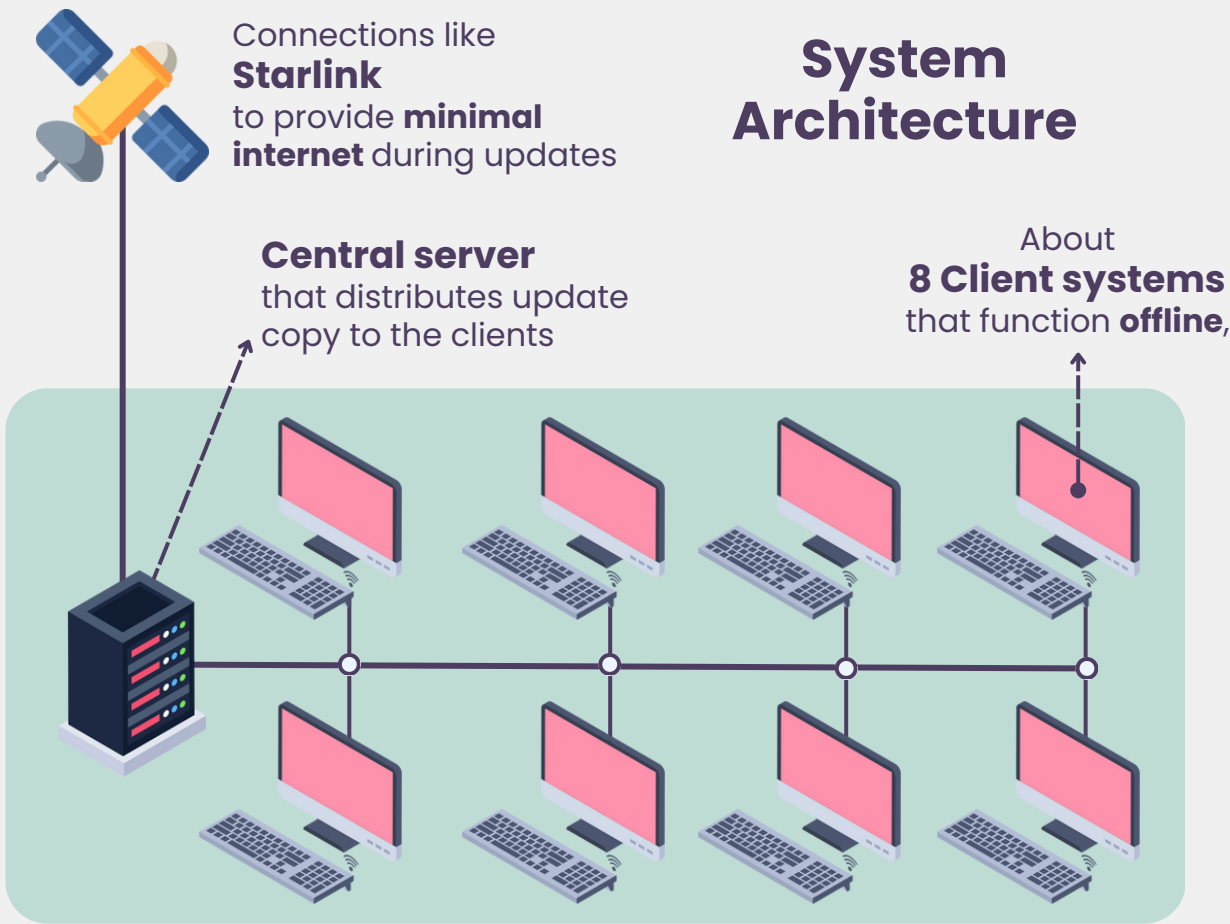
COMPARISION

CRITERIA	CONTAINERS	TRADITIONAL CONSTRUCTION
Area sq/ft	160	160
Construction cost per sq/ft	N/A	3000 INR
Total construction cost	30,000 to 40,000(aprx)	2,40,000- 400,000 INR
Furnishing	contractor (total 50k to 60k INR)	150,000 INR
Total	80,000-1,00,000 INR	5,50,000 INR
Total days of construction	10-15 days	6-8 months

CHALLENGES

Data Accuracy: Inconsistent or incomplete student data for AI models.
Funding: Securing ongoing financial support for scaling.
Integration: Compatibility with existing school systems.
Training: Ensuring educators are well-trained in using the tools.

IMPACT AND BENEFITS

SMART INDIA
HACKATHON
2024

Making Zero the Hero, Digibridge

With NEP's focus on **reducing dropout rates** and **improving rural literacy**, Digibridge can be instrumental in making this table with non-zero dropout rates zero, thereby **making Zero the Hero** !

The initiatives encourages **collaboration between local educators and community members**, fostering a supportive network that enhances the overall quality of education.

State	% of schools without a PC (data.gov.in)	Dropout Rate (data.gov.in)	Literacy Rate (data.gov.in)	% of Villages without a School (ASER Survey)
Bihar	98.4	21.4	61.8	15+
Assam	92.78	32.2	72.2	15+
Uttar Pradesh	95.72	14.4	67.7	15+
Madhya Pradesh	97.57	23.2	69.3	15+
Odisha	80.2	23.6	72.9	about 12
Andhra Pradesh	87.74	14.8	67	about 12
Haryana	72.5	13.3	75.6	about 12
Karnataka	79.42	16.8	75.4	about 10

We take the schooling system, for the students to **reach** it

We tailor education so it fits with their **time**

We try to understand their **background**.

And we make it engaging, so it prompts **interest**.

Thus covering the prominent factors that impact dropout rates

Empowering Rural Society:
The project enhances literacy and reduces dropouts, offering better future employment opportunities and local job creation.

Sustainability and Inclusivity:
By utilizing refurbished materials and ensuring access to quality education for all, promotes sustainability and inclusive society.

Cutting-Edge Technology Integration:
The use of AR and 3D visuals in an offline, gamified app makes learning exciting and accessible, even in remote areas.

Funding sources:
Aligning with national education goals and digital inclusion initiatives, making it eligible for CSR programs, government grants, and NGO support.

RESEARCH & REFERENCES

State/UT-wise Number of Dropout during 2019-20
National Data Sharing and Accessibility Policy, Rajya Sabha

Source: data.gov.in

State/UT-wise by Available Computer Facility
Unified District Information System for Education Plus (UDISE Plus)

Source: data.gov.in

Literacy Rate In India (NSSO And RGI)
Ministry of Statistics and Programme Implementation

Source: data.gov.in

Annual Status of Education Report (Rural) - 2023
Annual Status of Education Report (ASER), by PRATHAM

Source: ASER 2023

India Inequality Report 2022: Digital Divide
Mr. B. Singh
Oxfam India, NextIAS India.

Source: NextIAS India

CSR for Education, Differently Abled, livelihood
Ministry of Corporate Affairs, Central Govt of India Report

Source: csr.gov.in

Countries most unconnected - July 2024
Worldwide; DataReportal; GWI; July 2024, Ani Petrosyan

Source: Statista

Reasons Behind India's Rising Dropout Rates
Giving for Good Foundation, Bhairavi Hiremath

Source: GivingforGood

Computer Aid Container-Based Cyber Café
Tom Jowitt, Silicon - Technology Powering Business

Source: Silicon Tech