# Problem or Opportunity

Students in a classroom cannot concentrate on lecture due to jotting down the lecture. Many education institutions rely on traditional storage inefficient lecture recording system. Online lecturers and youtubers need a storage efficient video recording system. Students often can’t read the handwriting of instructor. They often need to perform a google search. They need to view the lecture live. Both instructor and students need to generate lecture notes automatically.

1. In a typical classroom, more than half of students **cannot concentrate on lecture** due to jotting down the lecture. They can’t grab the concepts fully. They can’t even listen to the instructor properly while jotting down speedily. The students, that don’t note down lecture at all, face trouble in quizzes and exams. They have to manage to get lecture notes and all that stuff that their leading fellows have.
2. Many students don’t have a healthy internet connection to **stream the video live**. Live streaming requires a healthy internet connection. There is need to reduce bandwidth requirements of live video view.
3. Many educational institutions that implement the lecture recording system **rely on traditional video recording system.** Thus, a typical video of a 1-hour lecture takes space up to 3 Gigabyte. A typical student has 80 Gigabyte of free space in average. He cannot manage to download even some of the lectures to watch later. Storage is the problem for traditional lecture recording systems.
4. **Online lecturers and youtubers** have to record lecture in minimum space in orders to save their storage assets such as bandwidth and also their uploading and downloading time. There is also need to provide a uniform recording platform to the online lectures that make the lecture recording easy. Not only lecturers, it is the need of designers, animators and artists as well.
5. Many students especially back benchers **cannot fully read the handwriting of instructor**. They often stop the instructor in between the lecture and the flow of the lecture is disturbed. Many of them don’t stop the instructor at all. They use to ask their fellows to tell what exactly is written on the board.
6. Students when not fully grab a concept in the classroom then they try a **google search** for the word written on the board. Many students cannot do it because use of mobile phone is prohibited in a typical classroom. So, there is need to have an integrated google search embedded in the board.
7. Using artificial intelligence and machine learning, **Lecture notes can be generated automatically.** Lecture animation with subtitle and their explanation according to google is to be generated.
8. **Instructor can annotate** the video lectures. He can add subtitles, video timeline tags so that he can partition the lecture animation. Student can easily jump to the required topic and start watching the video.

# Project Goal

Project goal consists of four major modules. Bandwidth Efficient Lecture Recording, HWR (Handwriting recognition, Lecture Annotations and Auto Generated Text Notes, Lecture Annotations and Auto Generated Text Notes.

Goal of the Digitized Lecture System consists on

* **Bandwidth Efficient Lecture Recording –** As compared to regular video recording, Digitized lecture system will have bandwidth efficiency of up to **100X**. Now lecture videos can be viewed can be viewed live on even extremely low-quality internet connection as well. All students far or close can attend lecture virtually. Also, it records the lecture as animation and provides the illusion of lecture video. The most valuable feature of this project is that no one have to change its routing work to engage with system.
* **HWR (Handwriting recognition) –** Handwritten lecture on the board can be recognized as sperate words. Lecture is readable to all students. Lecture keywords are now in regular text format and can be used for many purposes e.g. Google search.
* **Lecture Annotations and Auto Generated Text Notes–** Lecture notes can be generated automatically. Lecture is automatically divided in Topics and Subtopics. Lecture animations can be edited and annotated. Students can easily find the answer of their query in the lecture animation without scrolling and manual searching in the whole video.