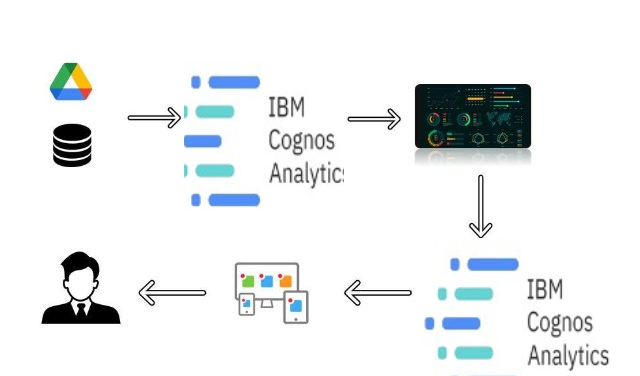
**Unveiling The Virtual Classroom: An In-Depth Analysis of The Online Education System**

Online classes and technology have emerged as a superhero during the lockdown days. We have all been under house arrest but are still connected with the world of education. Due to the lockdown, students have not been able to stay connected with the outer world and the lack of exposure is evident. The only reprieve for the students’ mental well-being has been the transition to online classes. Teachers made sure that the learning for students was not compromised, so they took a great leap forward to find solutions and create new learning environments for their students to ensure that learning never stops. With the rapid advancements in technology and the widespread availability of internet access, online education has gained significant popularity in recent years.  
  
This project aims to delve deep into the various aspects of online education, examining its strengths, weaknesses, opportunities, and challenges. The outcomes of this project will provide valuable insights for educational institutions, policymakers, and online learning platforms to enhance the effectiveness and accessibility of online education. This analysis of the online education system aims to contribute to the ongoing dialogue on the future of education and help shape a more inclusive, engaging, and effective learning environment in the digital age.

**Technical Architecture :**

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Project Flow :

To accomplish this, we have to complete all the activities listed below,

* Define Problem / Problem Understanding
  + Specify the business problem
  + Business requirements
  + Literature Survey
  + Social or Business Impact.
* Data Collection
  + Collect the dataset
  + Connect data with IBM cognos
* Data Preparation
* Prepare the Data for Visualization
* Data Visualizations
  + No of Unique Visualizations
* Dashboard
  + Responsive and Design of Dashboard
* Story
  + No of Scenes of Story
* Report
* Creating a report
* Performance Testing
  + Amount of Data Rendered to DB ‘
  + Utilization of Data Filters
  + No of Calculation Fields
  + No of Visualizations/ Graphs
* Web Integration
  + Dashboard and Story embed with UI With Flask
* Project Demonstration & Documentation
  + Record explanation Video for project end to end solution
  + Project Documentation-Step by step project development procedure

**Business Requirements**

Business requirements for a problem statement like this would include taking student and teacher surveys, understanding student needs , and having an efficient feedback system. There is a need to update the content that is being taught to students based on the feedback .These requirements are necessary to ensure that students are able to find it easy to adjust with online education / e-learning. Specific requirements may vary depending on the student demographic, their needs and their interests

**Literature Survey**

A literature survey for online education would involve reviewing existing research on topics related to ed tech and student behavior   . The survey would involve defining a research question, identifying relevant sources, reading and analyzing the literature, organizing and summarizing the literature, identifying gaps in the literature, and providing recommendations for e-learning/online education  based on the findings. The goal of the literature survey is to understand the current state of knowledge on a topic and to  
identify areas where further research is needed. It also helps to build upon the existing knowledge and avoid duplication of effort.

**Social Or Business Impact.**

**Social Impact:**Understanding the pros and cons of e-learning and making it better for future generations  
  
**Business Model/Impact:** Ed-tech companies and other organizations can capitalize on this

**Data Collection**

Data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes and generate insights from the data.

Data contains all the meta information regarding the columns described in the CSV files.   
Column Description for Online education system  review:

* Gender: Gender of the student
* Home Location : Rural or Urban.
* Level of Education : UG, PG or school
* Age : age of the student
* Number of subjects :
* Device Type Used : device used to attend the online classes
* Economic status :  economic status of the family
* Internet facility in your locality
* Are you involved on any sports
* Family Size
* Do elderly people monitor you ?.
* Study Time(hours)
* Sleep time (hours)
* Time spent on social media(hours)
* Interested in gaming ?
* Have a separate room for studying ?
* Engaged in group studies ?
* Average marks scored before pandemic in traditional classroom
* Your interaction in online mode
* Clearing doubts with faculties online ?
* Interested in ?
* Performance in online
* Your level of satisfaction in online education

**Prepare The Data For Visualization**

Preparing the data for visualization involves cleaning the data to remove irrelevant or missing data, transforming the data into a format that can be easily visualized, exploring the data to identify patterns and trends, filtering the data to focus on specific subsets of data, preparing the data for visualization software, and ensuring the data is accurate and complete. This process helps to make the data easily understandable and ready for creating visualizations to gain insights into the performance and efficiency. Data preprocessing can be performed in many ways using many different steps depending on your data here, we are going to do some part of data preparation on our data.

**Data Visualization**

Data visualization is the process of creating graphical representations of data in order to help people understand and explore the information. The goal of data visualization is to make complex data sets more accessible, intuitive, and easier to interpret. By using visual elements such as charts, graphs, and maps, data visualizations can help people quickly identify patterns, trends, and outliers in the data.

**No Of Unique Visualizations**

The number of unique visualizations that can be created with a given dataset. Some common types of visualizations that can be used to analyze the online education data include bar charts, line charts, heat maps, scatter plots, pie charts, Maps etc. These visualizations can be used to compare performance, track changes over time, show distribution, and relationships between variables, breakdown of revenue and customer demographics, workload, resource allocation and location of hotels.

**Dashboard**

A dashboard is a graphical user interface (GUI) that displays information and data in an organized, easy-to-read format. Dashboards are often used to provide real-time monitoring and analysis of data, and are typically designed for a specific purpose or use case. Dashboards can be used in a variety of settings, such as business, finance, manufacturing, healthcare, and many other industries. They can be used to track key performance indicators (KPIs), monitor performance metrics, and display data in the form of charts, graphs, and tables.

**Responsiveness And Design Of Dashboard**

The responsiveness and design of a dashboard for online education review data  is crucial to ensure that the information is easily understandable and actionable. Key considerations for designing a responsive and effective dashboard include  
user-centered design, clear and concise information, interactivity, data-driven approach, accessibility, customization, and security. The goal is to create a dashboard that is user-friendly, interactive, and data-driven

**Create a dashboard**: Once you have created the explorations, you can create a dashboard by clicking the "present data'' option & selecting the dashboard. you can drag the visualizations from the ‘pin’ option present at the left side of the screen

**Story**

A data story is a way of presenting data and analysis in a narrative format, with the goal of making the information more engaging and easier to understand. A data story typically includes a clear introduction that sets the stage and explains the context for the data, a body that presents the data and analysis in a logical and systematic way, and a conclusion that summarizes the key findings and highlights their implications. Data stories can be told using a variety of mediums, such as reports, presentations, interactive visualizations, and videos.

**Organize your story**: Once you have created the explorations/visualizations, you can create a story  by clicking the "present data'' option & selecting the story

**No Of Scenes Of Story**

The number of scenes in a storyboard for a data visualization analysis of the performance and efficiency of online education will depend on the complexity of the analysis and the specific insights that are trying to be conveyed. A storyboard is a visual representation of the data analysis process and it breaks down the analysis into a series of steps or scenes.

**Report**

A report is a document that presents information in a specific format and layout, usually based on data from a database or other data source. A report in IBM Cognos can contain various elements, such as tables, charts, graphs, and images, as well as text and data elements, and it is designed to be used by business users to help them better understand their data and make informed decisions. There are several different types of reports available in IBM Cognos, including list reports, crosstab reports, chart reports, and report studio reports, among others. The type of report that you choose will depend on the specific needs and requirements of your organization, as well as the data that you need to present.

**Organize your report:** You can create a story  by clicking the "present data'' option & selecting the report from that

**Performance Testing**

Performance testing is a non-functional software testing technique that determines how the stability, speed, scalability, and responsiveness of an application holds up under a given workload.

**Utilization Of Data Filters**

* Data filters are used to customize our visualization to achieve desired output
* We can apply filters while building visualizations . In explorations, filters  are present at bottom of the ‘Fields’ option

**No Of Visualizations/ Graphs**

* Column Chart: Age(Years) by Your level of satisfaction in Online Education
* Bar Chart: Internet facility in your locality by Your level of satisfaction in Online Education
* Bar chart: Performance in online by Level of Education
* Pie Chart: Time spent on social media (Hours) by Device type used to attend classes
* Packed bubbles : Engaged in group studies? colored by Engaged in group studies? sized by Performance in online
* Wordcloud: Average marks scored before pandemic in traditional classroom
* Table: Economic status, Home Location and Performance in online
* Radial Chart:
* Line Chart: Performance in online by study time(hours)
* Line Chart: Performance in online by sleep time(hours)

**Web Integration**

Publishing helps us to track and monitor key performance metrics, to communicate results and progress. help a publisher stay informed, make better decisions, and communicate their performance to others.