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

16. Project Documentation

16.1 Introduction

During the lockdown days, technology and online classes have become super heroes. Despite being under house arrest, we are all still involved in the educational community. The lack of exposure is obvious because pupils have been unable to maintain contact with the outside world due to the lockdown. The change to online classes has been the only relief for the pupils' mental health. Teachers took a big step forward to identify answers and design new learning environments for their students to ensure that learning never ceases to ensure that kids' learning was not compromised. Online learning has been increasingly popular in recent years thanks to the quick improvements in technology and the accessibility of the internet.

This study attempts to examine the many facets of online education in-depth, highlighting its advantages, disadvantages, opportunities, and difficulties. The results of this study will give educational institutions, decision-makers, and online learning platforms useful information to improve the efficacy and accessibility of online education. In order to contribute to the continuing discussion about education's future and to help create a more inclusive, interesting, and productive learning environment in the digital age, this analysis of the online education system is being published.

16.2 Literature Survey

Mishra et al, have investigated the online teaching-learning in higher education during lockdown period of COVID-19 pandemic. In this study, the online teaching-learning strategies used by the Mizoram University for the teaching-learning process and ensuing semester exams are described. In addition to highlighting the deployment of online teaching-learning modes, the paper uses both quantitative and qualitative methods to investigate how teachers’ and students’ perspectives of these modes compare.

Gupta et al. have suggested a deep learning-based method for identifying online learners' real-time involvement using facial expressions. Throughout the online learning session, they have evaluated the students' facial expressions to categorize their emotions. The engagement index (EI), which predicts two engagement states: "Engaged" and "Disengaged" is calculated using the face emotion recognition data. The best predictive classification model for real-time engagement detection was determined by evaluating and comparing various deep

learning models, including Inception-V3, VGG19, and ResNet-50. Different benchmarked datasets, including FER-2013, CK+, and RAF-DB, were utilized to evaluate the system's overall performance and accuracy.

Safarov et al, have proposed a Deep Neural Network (DNN) approach that combines synchronous sequences and heterogeneous features to produce candidates in e-learning platforms that are faced with an exponential rise in the number of accessible online educational courses and students more accurately. Additionally, during the modeling, the cold-start issue of the learners was mitigated. They have started with grouping of learners in the first phase, and then combine the heterogeneous data and sequence as embeddings into recommendations using deep neural networks.

Selvaraj et al, have presented the effect of pandemic based online education on teaching and learning system. The purpose of this study was to evaluate how well Indian teachers and students responded to online instruction. Additionally, it made an effort to comprehend the obstacles that this style of education presents as well as the experience of the users. The study discussed the advantages and disadvantages of online education versus traditional classes from the participant's perspective. It includes further information on how to enhance technology so that they can be used more effectively. Additionally, this study provided a suitable foundation for modifying or developing educational policies, legislation, and programs to ensure that everyone has equitable access to resources.

Zhang et al, have presented the key factors affecting college students' adoption of the e-learning system in mandatory blended learning environments. They have proposed the Unified Technology Acceptance and System Success (UTASS) model, a method integrating self-reported and system log data was implemented. Self-reported questionnaires were distributed in the e-learning system and a total of 287 valid questionnaires were collected, meanwhile system log was collected to record students' actual behaviour online. Their results suggested that male college students are more susceptible to the impact of system quality and social influence.

16.3 Problem Definition

16.3.1 Problem Specification

The goal of this analysis is to pinpoint obstacles, chances, and prospective areas for improvement in the online education landscape.

16.3.2 Business Requirements

- **Research Scope and Objectives:** Defining the areas of emphasis within the online education system, specify the analysis's precise objectives and scope. Define the research's aims clearly, e.g., by assessing the viability of online learning environments, pointing out problems, and making recommendations for improvement.
- **Timeline and Milestones:** Create a thorough project schedule with distinct milestones to monitor progress and guarantee the timely completion of the various analysis processes.
- **Budget and Resources:** Calculate the necessary financial resources for data collection, analytic tools, participant incentives, and eventual publication or presentation fees. Set aside enough human resources, such as researchers, analysts, and technological assistance, to complete the analysis successfully.
- **Data Collection and Analysis:** Define the methods for gathering data, which may include questionnaires, interviews, observational research, and examination of current educational platforms. Choose the analytical methods that will be applied, such as qualitative and quantitative study of user experiences and student outcomes.
- **Technology Infrastructure:** Determine the platforms and technology tools that will be required to undertake the study, such as learning management systems (LMS), data analytics software, and survey tools. A diverse student population's data should be collected, therefore make sure it is compatible with and accessible across a range of platforms and devices.
- **Ethical Considerations:** In order to protect student privacy and handle data securely, establish ethical norms for data collecting and analysis. Before gathering any data, get the required consents and authorizations from the pertinent organizations, institutions, and participants.
- **Survey and Questionnaire Design:** Make well-organized surveys and questionnaires to collect quantitative and qualitative participant inputs. Create test questions that evaluate students' involvement, learning experiences, difficulties, and recommendations for development.
- **Educator Collaboration:** To learn about efficient pedagogical practices, evaluation methodologies, and teaching strategies in online classrooms, work with academic specialists and educators.

- **Analysis and Reporting:** To analyze the gathered data and find trends, patterns, and correlations, develop a systematic analysis process. Compelling summaries of the findings should be written, and they should include graphics, statistical analysis, and suggestions for further research.
- **Presentation and Dissemination:** Create interesting presentations to convey the investigation' findings and suggestions to the public, legislators, and educational institutions. To add to the larger discussion surrounding online education, take into consideration publishing study findings in scholarly journals, conferences, or online forums.

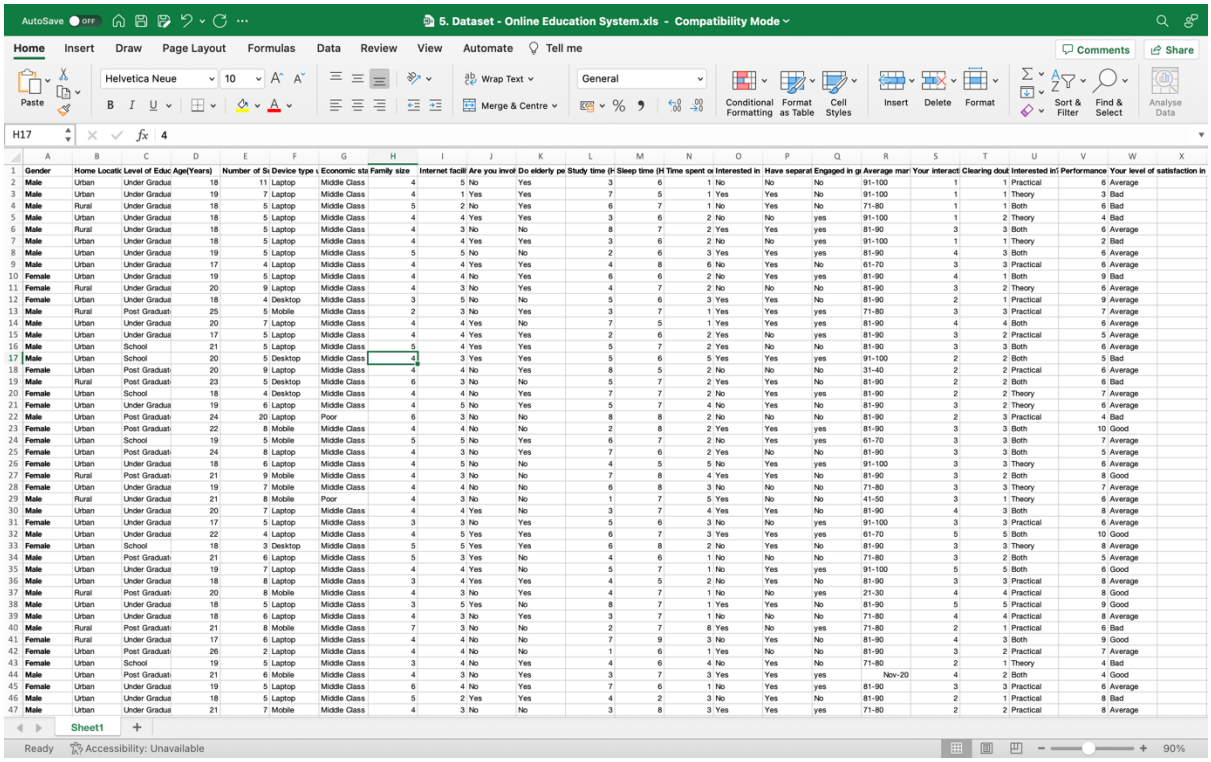
16.3.3 Social or Business Impact

- **Increased Access to Education:** By increasing inclusivity and enabling a wider demographic to pursue learning, the analysis might increase access to education for people who encounter financial or geographic hurdles.
- **Equity in Education:** The analysis may help to lessen educational disparities and ensure that all people, regardless of background, have access to high-quality education by addressing problems and offering solutions.
- **Skill Enrichment:** The conclusions of the study may promote the use of online learning for lifelong learning and upskilling, enabling people to continuously pick up new abilities and knowledge throughout their lifetimes.
- **Educational Innovation:** The analysis might stimulate the development of new instructional strategies, cooperative learning frameworks, and interactive techniques that improve student engagement and overall learning outcomes.
- **Digital Literacy Promotion:** The analysis may highlight the value of digital literacy and encourage people to acquire the skills they need to succeed in the digital age.
- **Educational Institutions:** Educational institutions offering online courses could benefit by optimizing their virtual classroom environments, which would improve retention, engagement, and satisfaction among students.
- **Technology Companies:** Companies that offer online education platforms and tools may utilize the analysis to improve their products and services, better meeting the demands and preferences of their customers.

- **Professional Development:** Online education system demands for educator training and development programs focused on effective online teaching methodologies, creating opportunities for professional development providers.
- **Policy and Investment:** The analysis might be used by investors and policymakers to help them make decisions about funding and policy for educational technology, which would encourage expansion of the online education market.
- **Research and Development:** The analysis might inspire more investigation and advancement in the area of online education, resulting in the development of new tools, technologies, and methodologies.

16.2 Data Collection

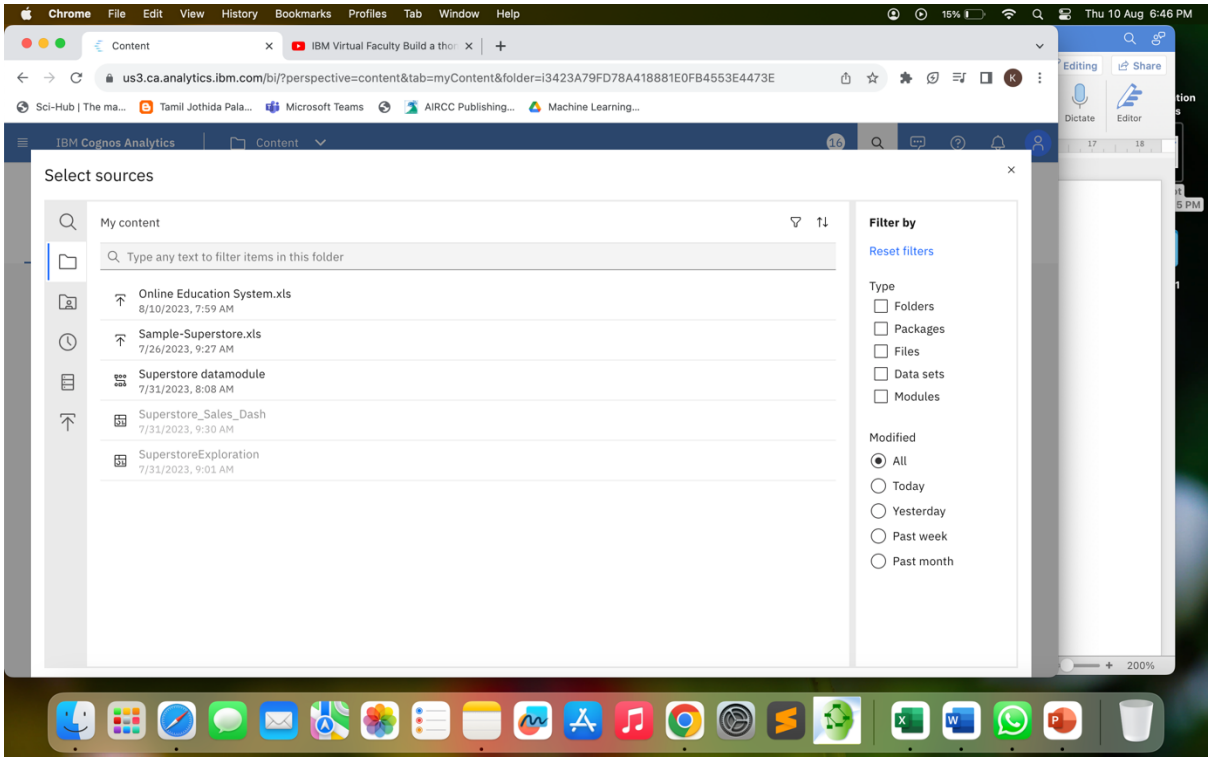
An online education system analysis dataset is collected from Kaggle.

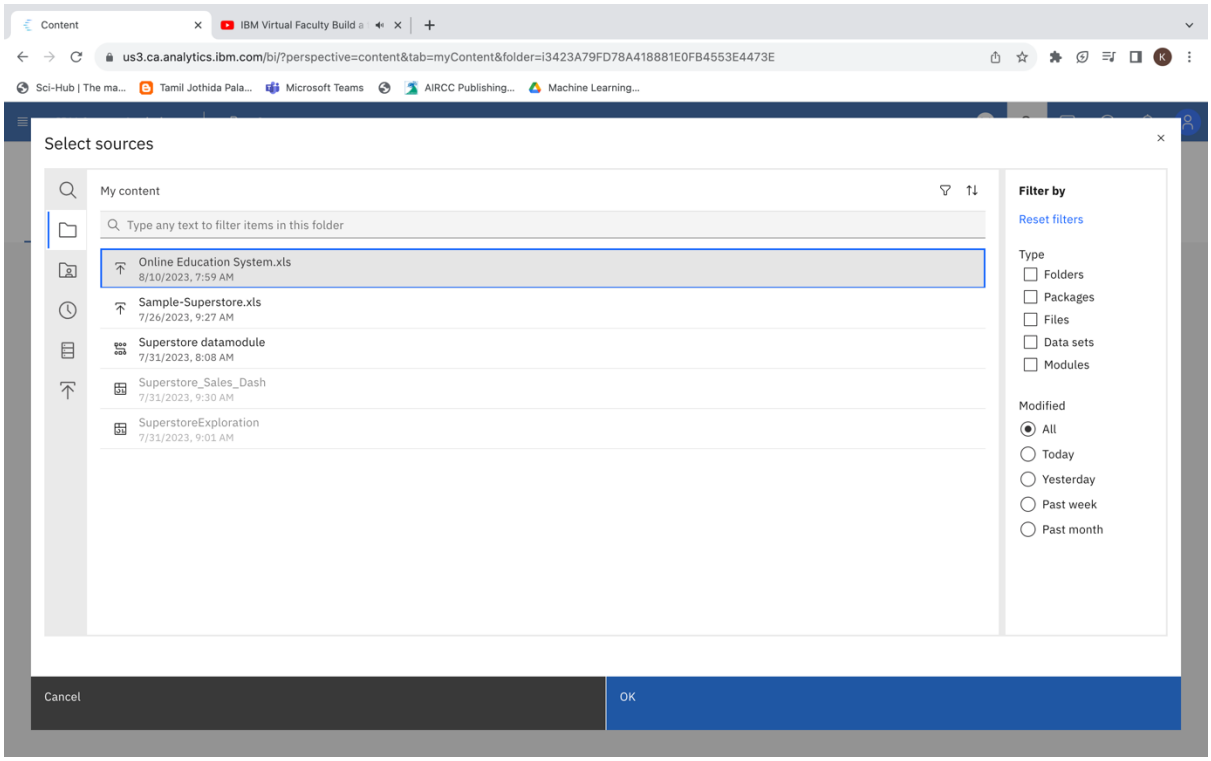


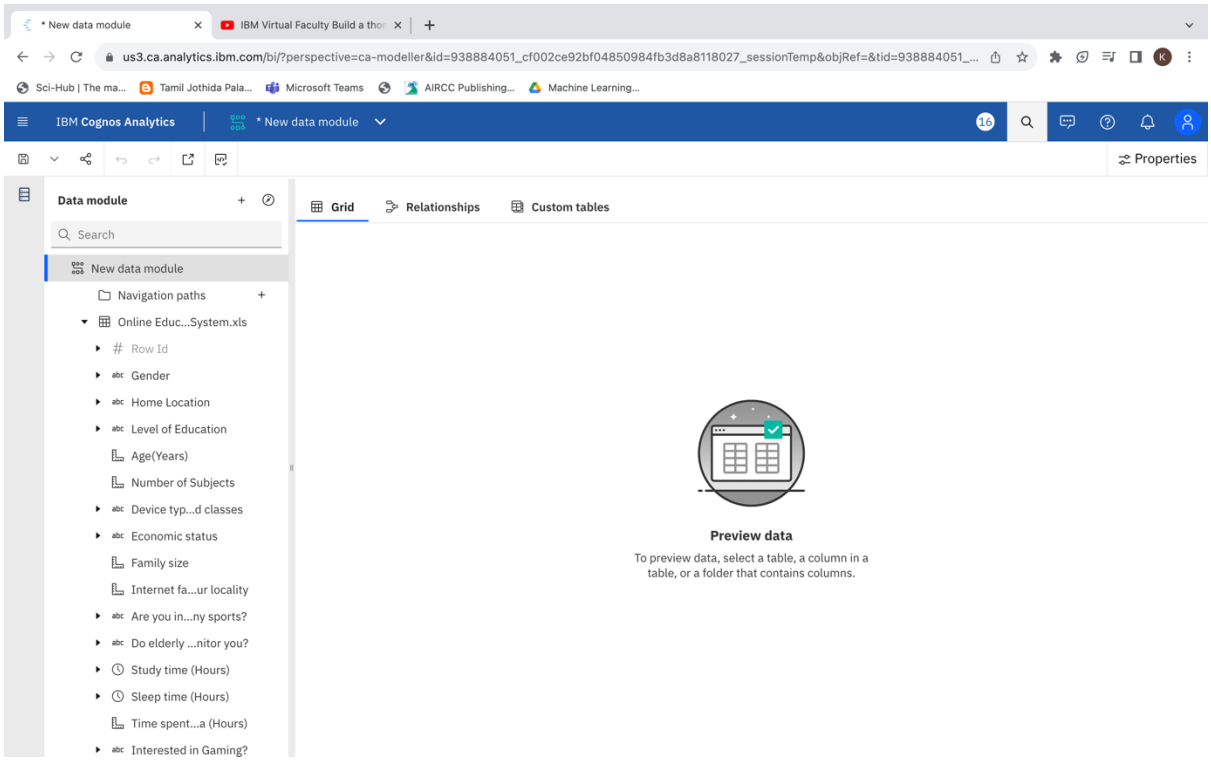
16.3 Data Preparation

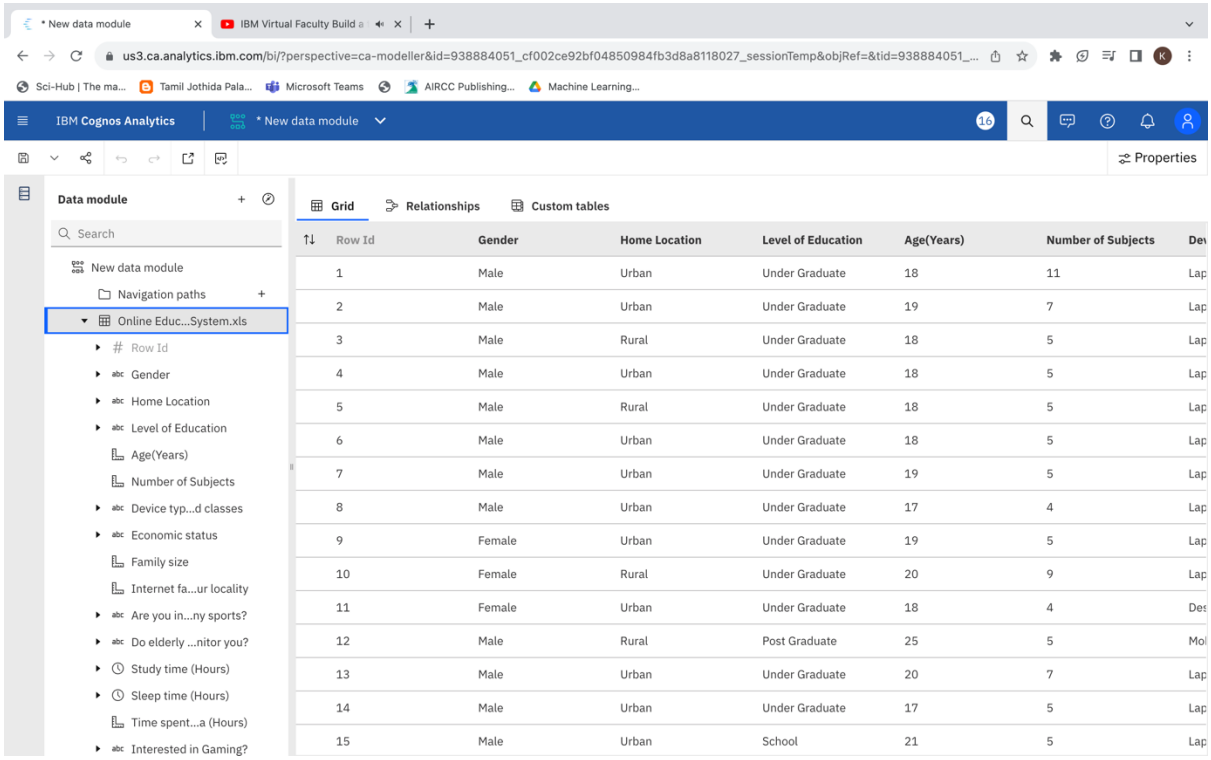
Data collection is an error-prone process. In this phase you enhance the quality of the data and prepare it for use in subsequent steps. *Data cleansing* removes false values from a data source and inconsistencies across data sources. *Data integration* enriches data sources by combining information from multiple data sources. *Data transformation* ensures that the data is in a suitable format for use in your models.

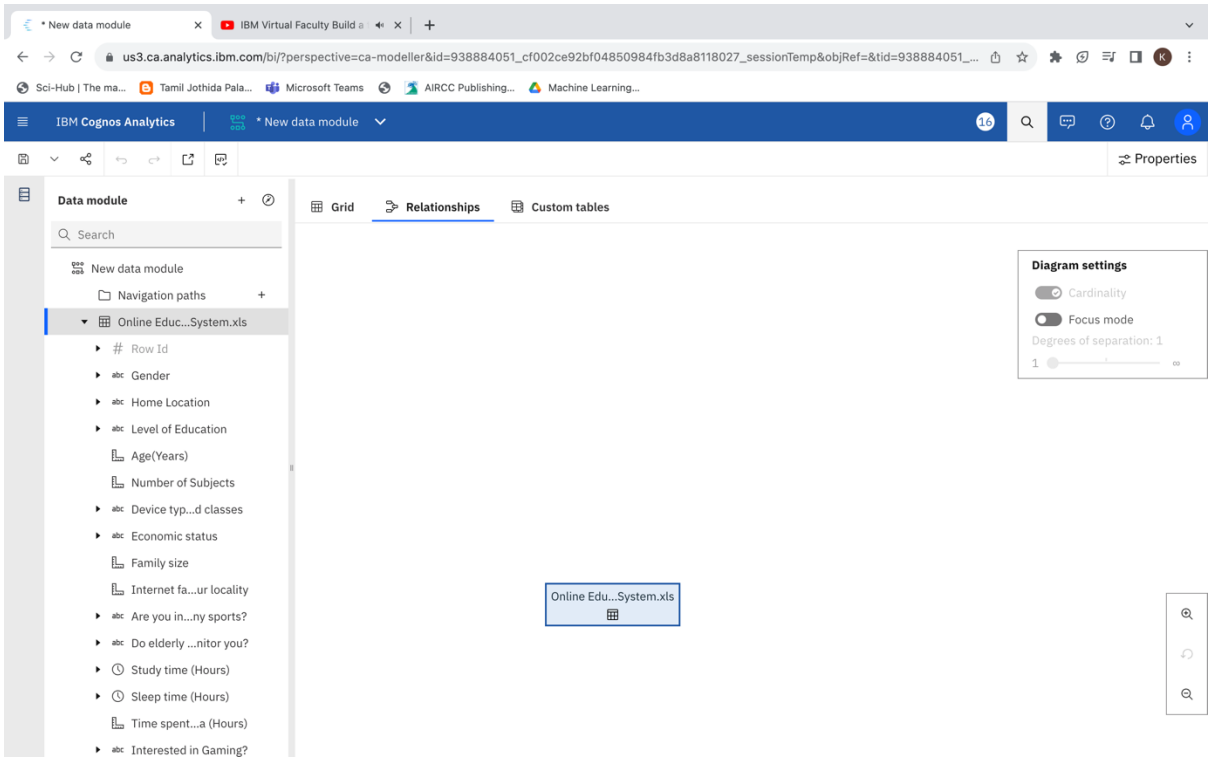
Here the collected dataset is upload in the IBM cognos analytics for the data preparation.

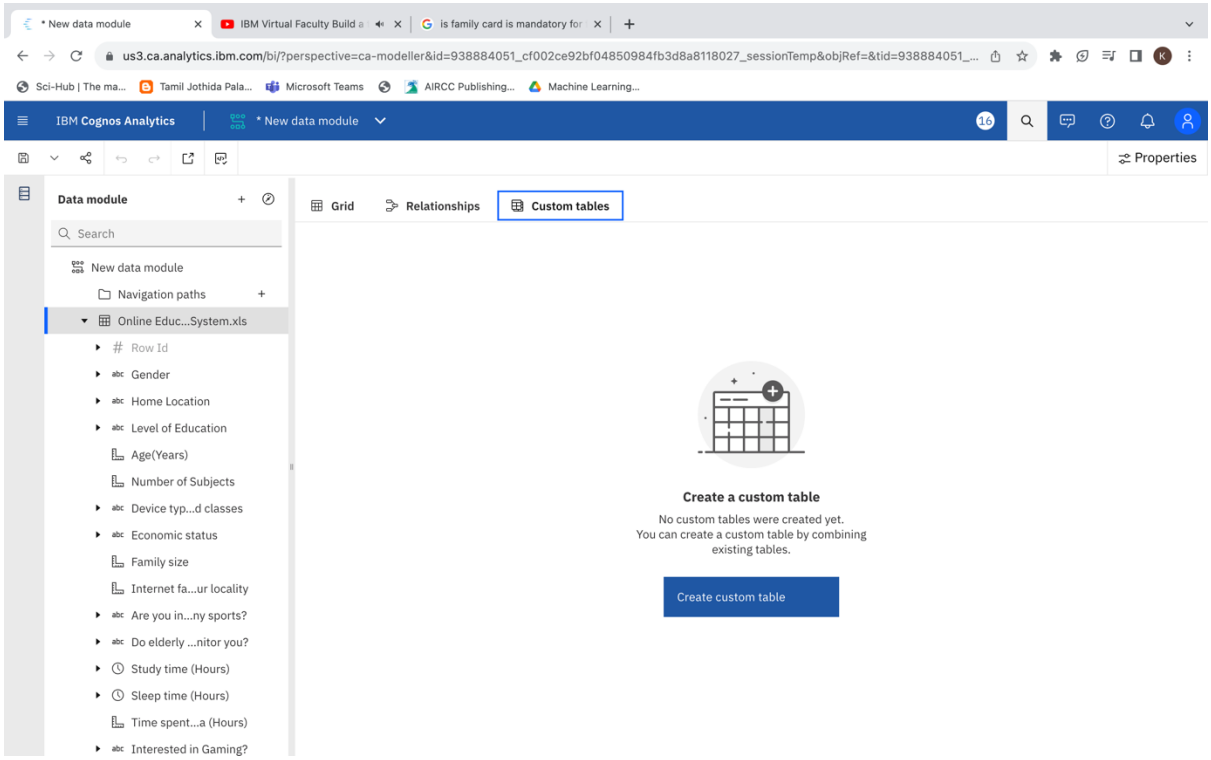


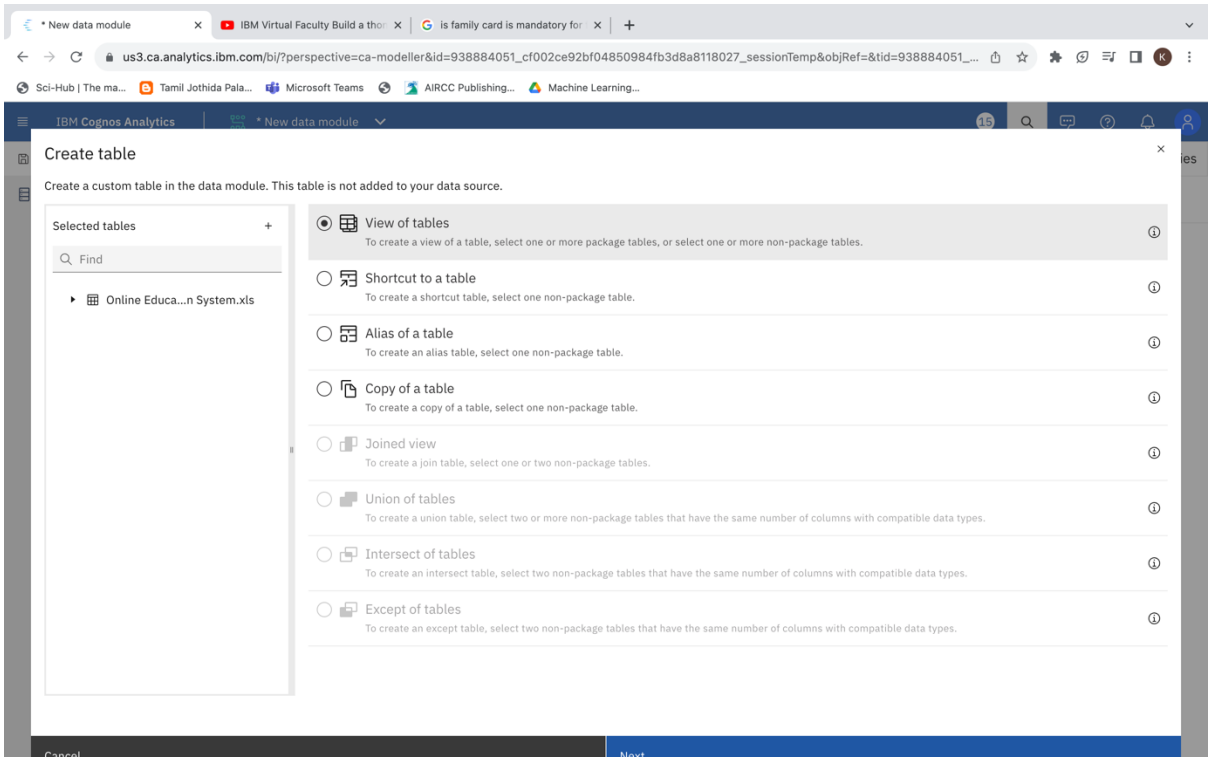


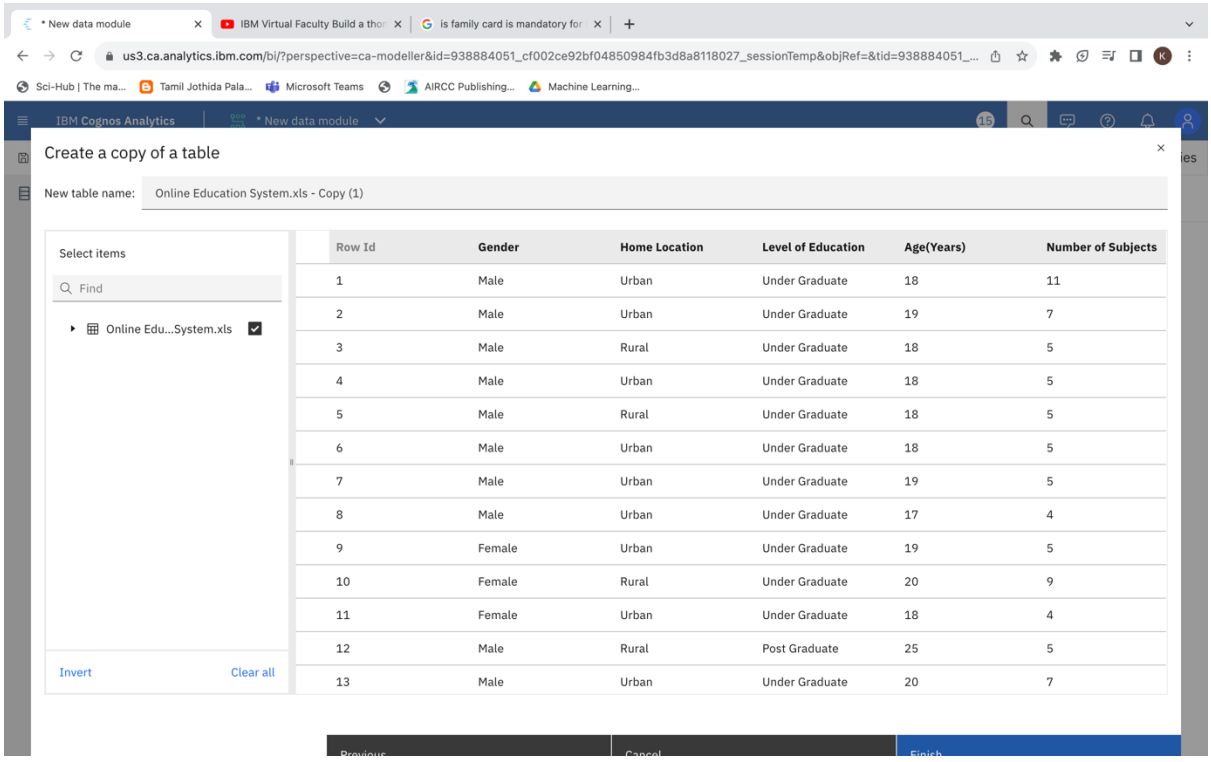

* New data module
IBM Virtual Faculty Build a thon
us3.ca.analytics.ibm.com/bi/?perspective=ca-modeller&id=938884051_cf002ce92bf04850984fb3d8a8118027_sessionTemp&objRef=&tid=938884051_...
Sci-Hub | The ma...
Tamil Jothida Pala...
Microsoft Teams
AIRCC Publishing...
Machine Learning...
IBM Cognos Analytics
* New data module
Properties
Data module
Search
New data module
Navigation paths
Online Educ...System.xls
Row Id
Gender
Home Location
Level of Education
Age(Years)
Number of Subjects
Device typ...d classes
Economic status
Family size
Internet fa...ur locality
Are you in...ny sports?
Do elderly ...nitor you?
Study time (Hours)
Sleep time (Hours)
Time spent...a (Hours)
Interested in Gaming?
Grid
Relationships
Custom tables
Preview data
To preview data, select a table, a column in a table, or a folder that contains columns.

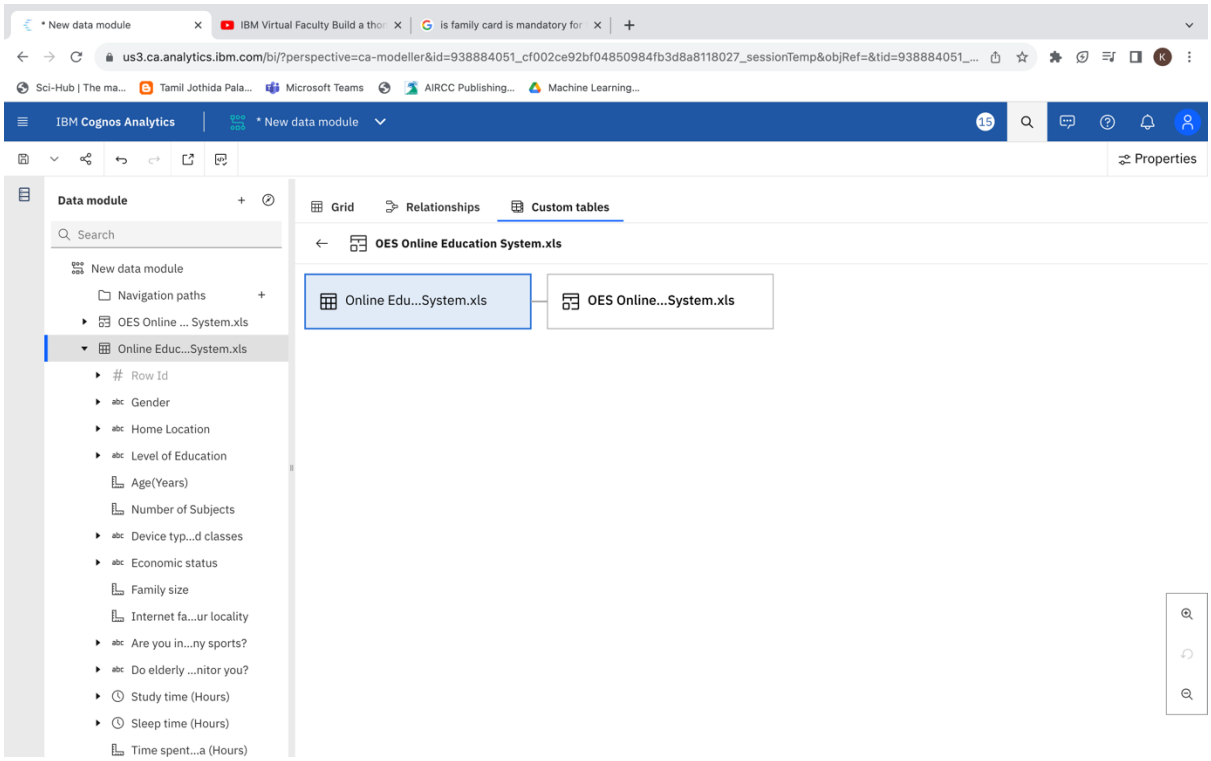

* New data module
IBM Virtual Faculty Build a
us3.ca.analytics.ibm.com/bi/?perspective=ca-modeller&id=938884051_cf002ce92bf04850984fb3d8a8118027_sessionTemp&objRef=&tid=938884051_...
Sci-Hub | The ma...
Tamil Jothida Pala...
Microsoft Teams
AIRCC Publishing...
Machine Learning...
IBM Cognos Analytics
* New data module
Properties
Data module
Search
New data module
Navigation paths
Online Educ...System.xls
Row Id
Gender
Home Location
Level of Education
Age(Years)
Number of Subjects
Device typ...d classes
Economic status
Family size
Internet fa...ur locality
Are you in...ny sports?
Do elderly ...nitor you?
Study time (Hours)
Sleep time (Hours)
Time spent...a (Hours)
Interested in Gaming?
Grid
Relationships
Custom tables
Row Id
Gender
Home Location
Level of Education
Age(Years)
Number of Subjects
1 Male Urban Under Graduate 18 11
2 Male Urban Under Graduate 19 7
3 Male Rural Under Graduate 18 5
4 Male Urban Under Graduate 18 5
5 Male Rural Under Graduate 18 5
6 Male Urban Under Graduate 18 5
7 Male Urban Under Graduate 19 5
8 Male Urban Under Graduate 17 4
9 Female Urban Under Graduate 19 5
10 Female Rural Under Graduate 20 9
11 Female Urban Under Graduate 18 4
12 Male Rural Post Graduate 25 5
13 Male Urban Under Graduate 20 7
14 Male Urban Under Graduate 17 5
15 Male Urban School 21 5

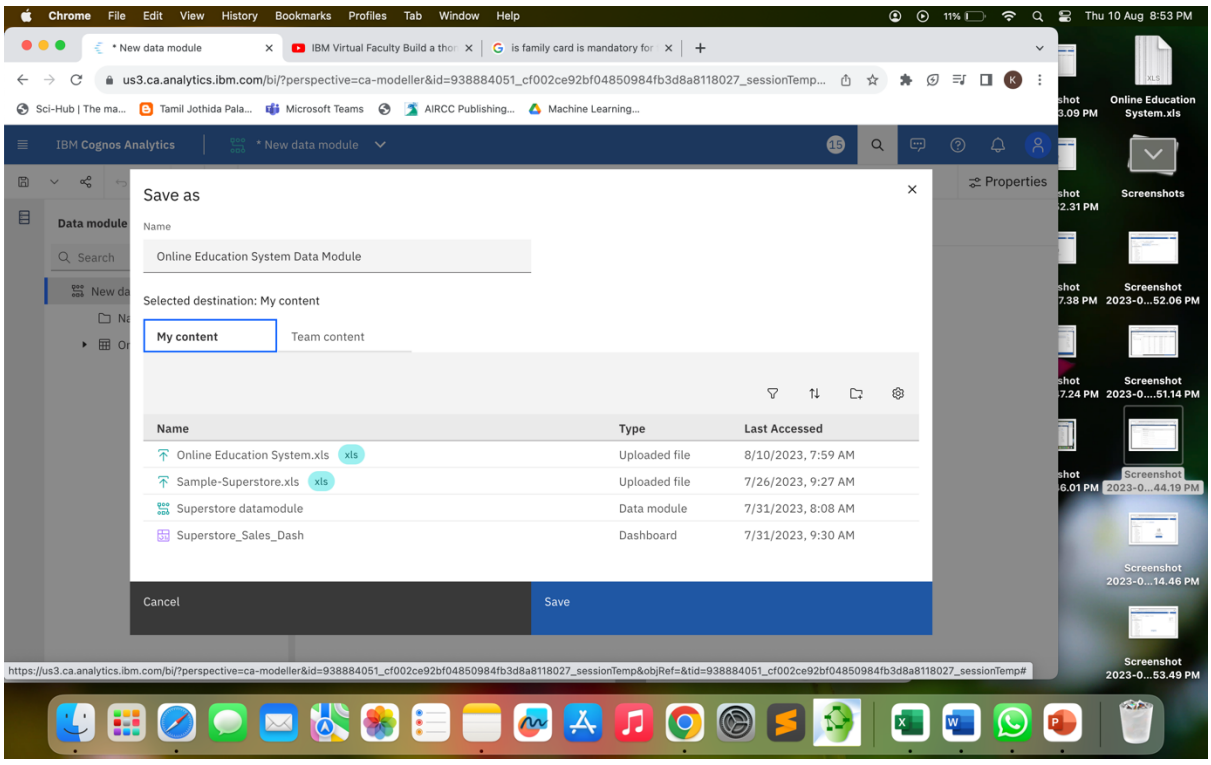

* New data module
IBM Virtual Faculty Build a
us3.ca.analytics.ibm.com/bi/?perspective=ca-modeller&id=938884051_cf002ce92bf04850984fb3d8a8118027_sessionTemp&objRef=&tid=938884051_...
Sci-Hub | The ma...
Tamil Jothida Pala...
Microsoft Teams
AIRCC Publishing...
Machine Learning...
IBM Cognos Analytics
* New data module
Properties
Data module
Search
New data module
Navigation paths
Online Educ...System.xls
Row Id
Gender
Home Location
Level of Education
Age(Years)
Number of Subjects
Device typ...d classes
Economic status
Family size
Internet fa...ur locality
Are you in...ny sports?
Do elderly ...nitor you?
Study time (Hours)
Sleep time (Hours)
Time spent...a (Hours)
Interested in Gaming?
Grid
Relationships
Custom tables
Diagram settings
Cardinality
Focus mode
Degrees of separation: 1
1
∞
Online Edu...System.xls


* New data module
IBM Virtual Faculty Build a
is family card is mandatory for
us3.ca.analytics.ibm.com/bi/?perspective=ca-modeller&id=938884051_cf002ce92bf04850984fb3d8a8118027_sessionTemp&objRef=&tid=938884051_...
Sci-Hub | The ma...
Tamil Jothida Pala...
Microsoft Teams
AIRCC Publishing...
Machine Learning...
IBM Cognos Analytics
* New data module
Properties
Data module
Search
New data module
Navigation paths
Online Educ...System.xls
Row Id
Gender
Home Location
Level of Education
Age(Years)
Number of Subjects
Device typ...d classes
Economic status
Family size
Internet fa...ur locality
Are you in...ny sports?
Do elderly ...nitor you?
Study time (Hours)
Sleep time (Hours)
Time spent...a (Hours)
Interested in Gaming?
Grid
Relationships
Custom tables
Create a custom table
No custom tables were created yet.
You can create a custom table by combining existing tables.
Create custom table


* New data module
IBM Virtual Faculty Build a thon
is family card is mandatory for
us3.ca.analytics.ibm.com/bi/?perspective=ca-modeller&id=938884051_cf002ce92bf04850984fb3d8a8118027_sessionTemp&objRef=&tid=938884051_...
Sci-Hub | The ma...
Tamil Jothida Pala...
Microsoft Teams
AIRCC Publishing...
Machine Learning...
IBM Cognos Analytics
* New data module
Create table
Create a custom table in the data module. This table is not added to your data source.
Selected tables
Find
Online Educa...n System.xls
View of tables
To create a view of a table, select one or more package tables, or select one or more non-package tables.
Shortcut to a table
To create a shortcut table, select one non-package table.
Alias of a table
To create an alias table, select one non-package table.
Copy of a table
To create a copy of a table, select one non-package table.
Joined view
To create a join table, select one or two non-package tables.
Union of tables
To create a union table, select two or more non-package tables that have the same number of columns with compatible data types.
Intersect of tables
To create an intersect table, select two non-package tables that have the same number of columns with compatible data types.
Except of tables
To create an except table, select two non-package tables that have the same number of columns with compatible data types.
Cancel
Next


* New data module
IBM Virtual Faculty Build a thon
is family card is mandatory for
us3.ca.analytics.ibm.com/bi/?perspective=ca-modeller&id=938884051_cf002ce92bf04850984fb3d8a8118027_sessionTemp&objRef=&tid=938884051_...
Sci-Hub | The ma...
Tamil Jothida Pala...
Microsoft Teams
AIRCC Publishing...
Machine Learning...
IBM Cognos Analytics
* New data module
Create a copy of a table
New table name:
Online Education System.xls - Copy (1)
Select items
Find
Online Edu...System.xls
Invert
Clear all
Row Id
Gender
Home Location
Level of Education
Age(Years)
Number of Subjects
1 Male Urban Under Graduate 18 11
2 Male Urban Under Graduate 19 7
3 Male Rural Under Graduate 18 5
4 Male Urban Under Graduate 18 5
5 Male Rural Under Graduate 18 5
6 Male Urban Under Graduate 18 5
7 Male Urban Under Graduate 19 5
8 Male Urban Under Graduate 17 4
9 Female Urban Under Graduate 19 5
10 Female Rural Under Graduate 20 9
11 Female Urban Under Graduate 18 4
12 Male Rural Post Graduate 25 5
13 Male Urban Under Graduate 20 7
Previous
Cancel
Finish

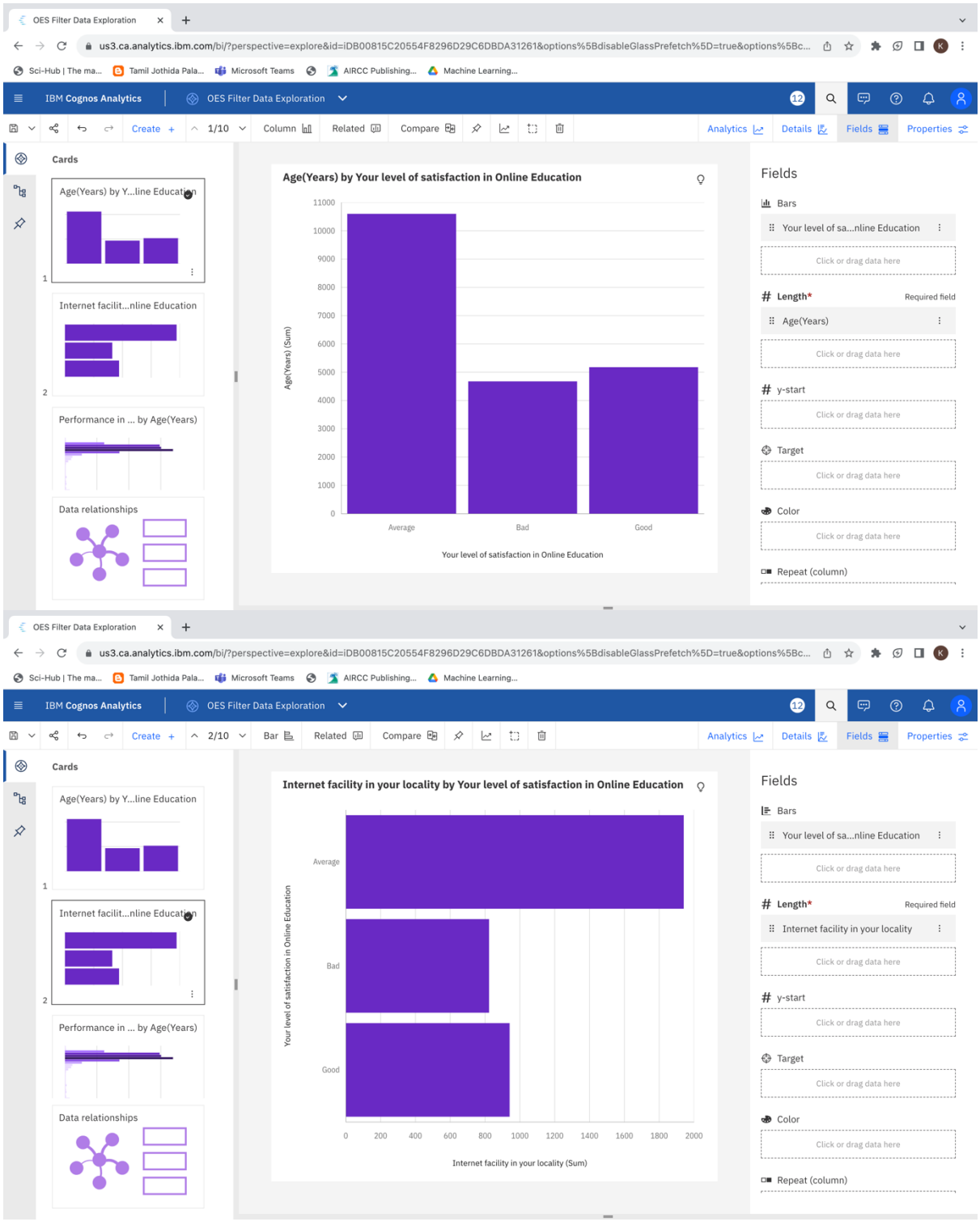


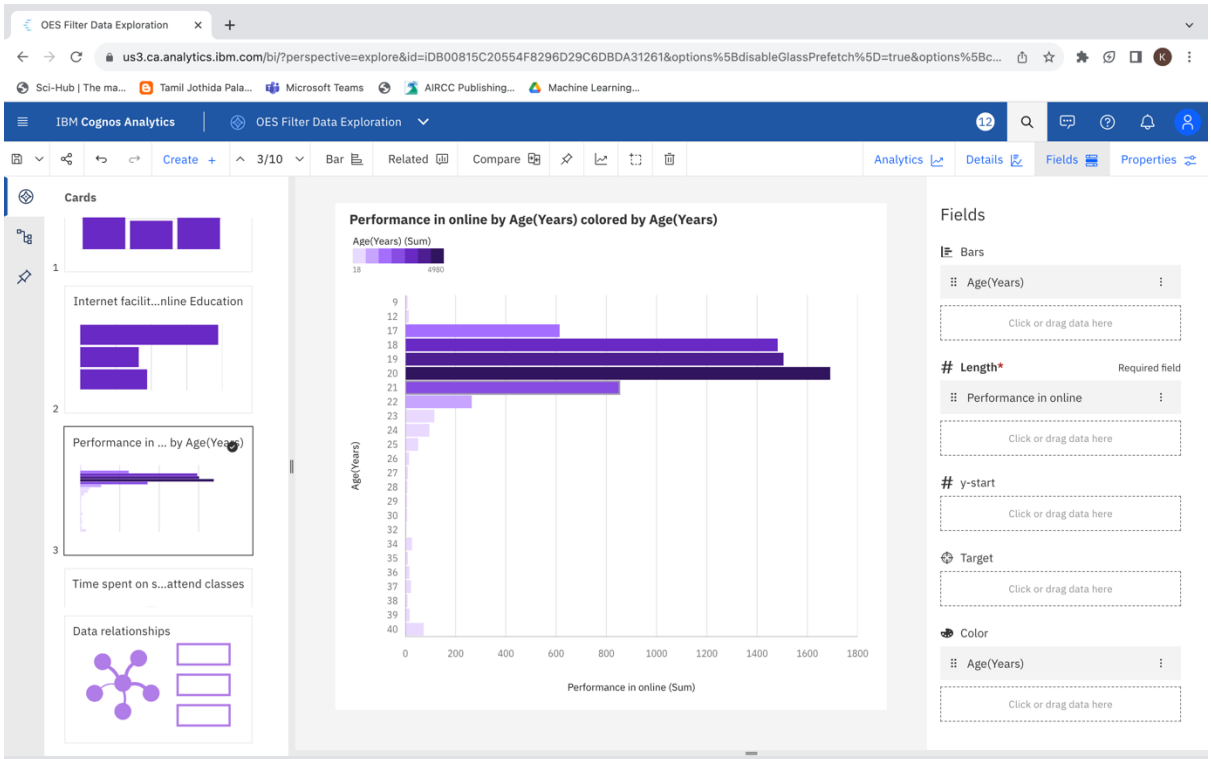


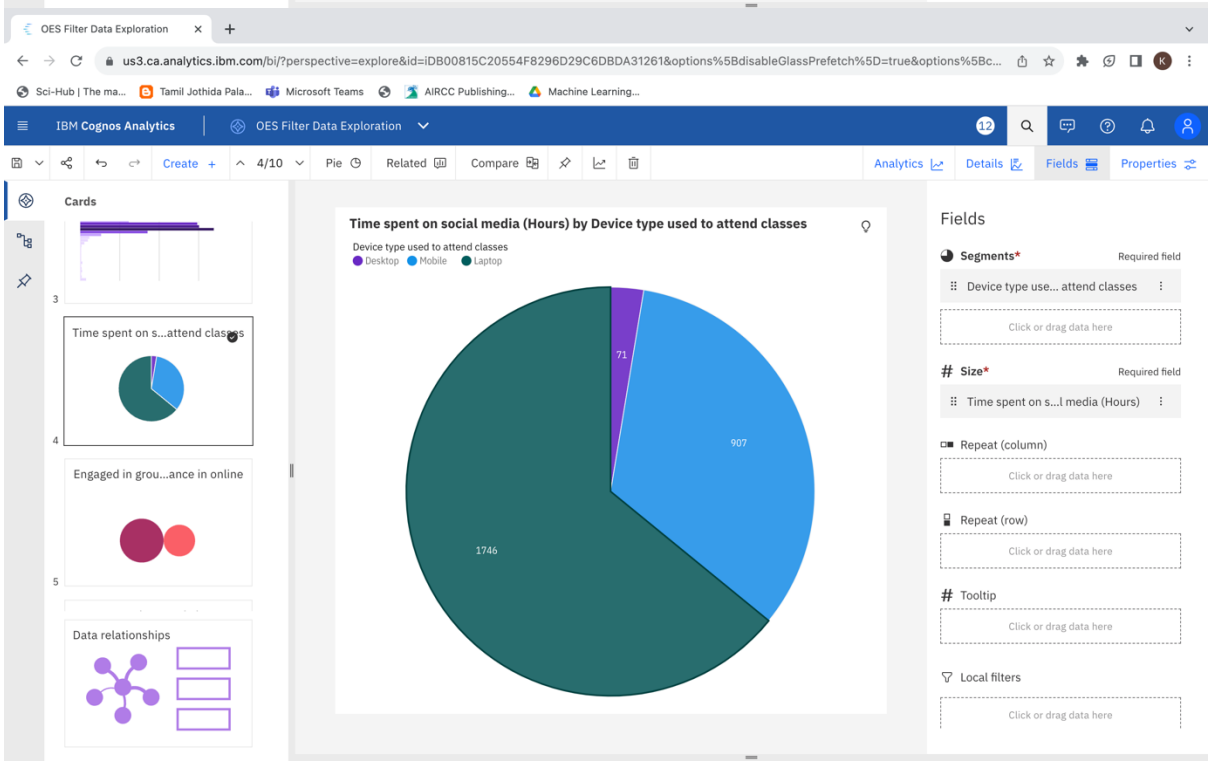
16.4 Data Exploration

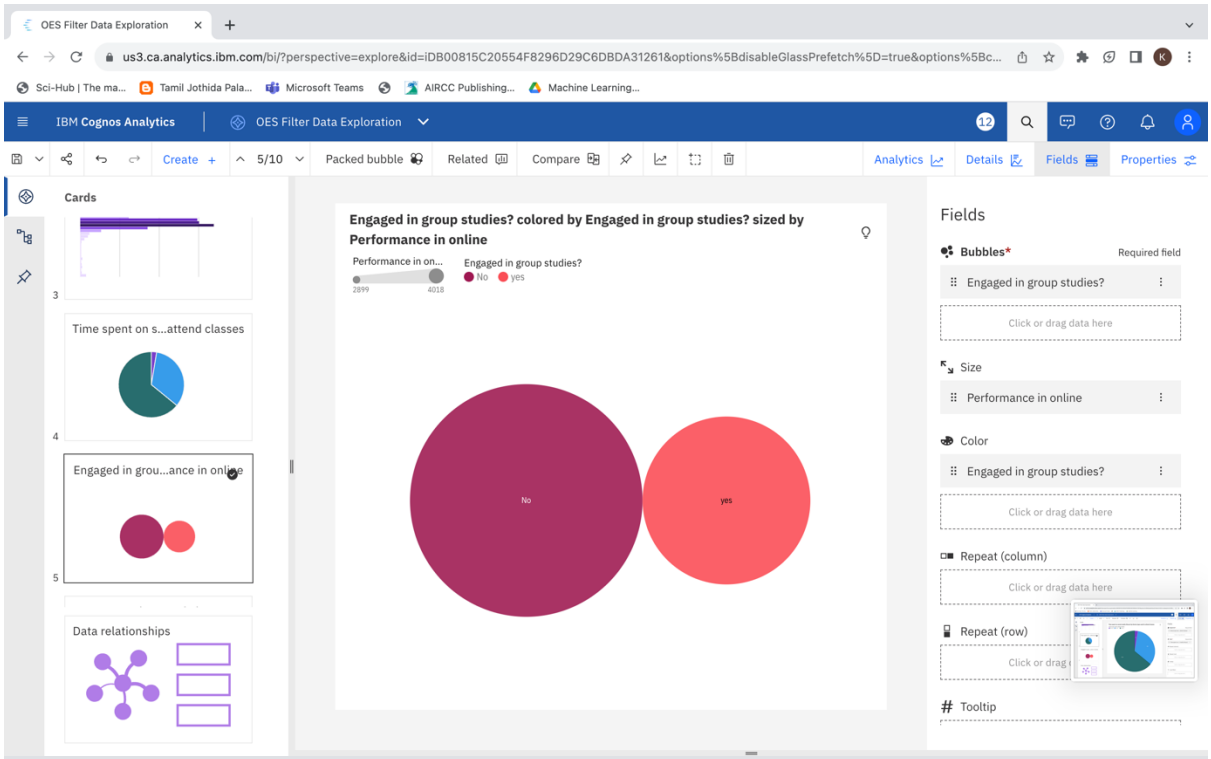
It is concerned with building a deeper understanding of your data. To understand how variables interact with each other, the distribution of the data, and whether there are outliers.

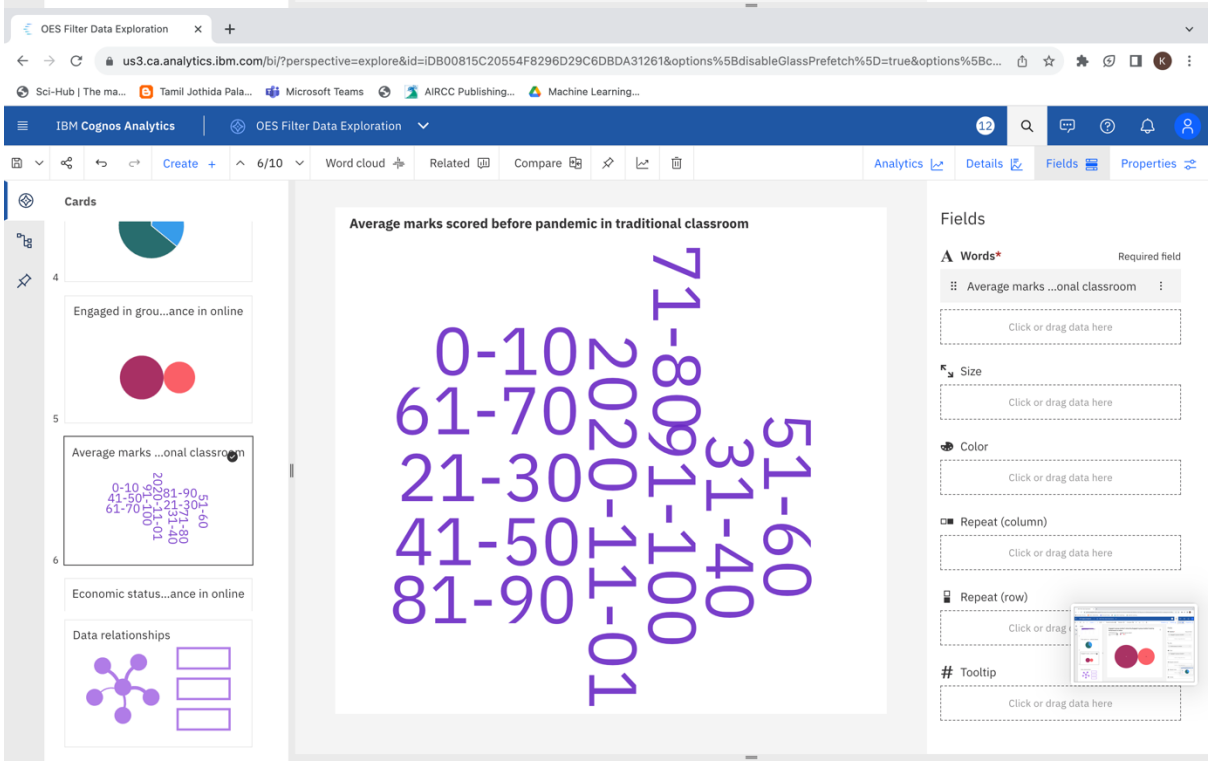
To achieve this you mainly use descriptive statistics, visual techniques, and simple modeling. This step often goes by Exploratory Data Analysis (EDA).

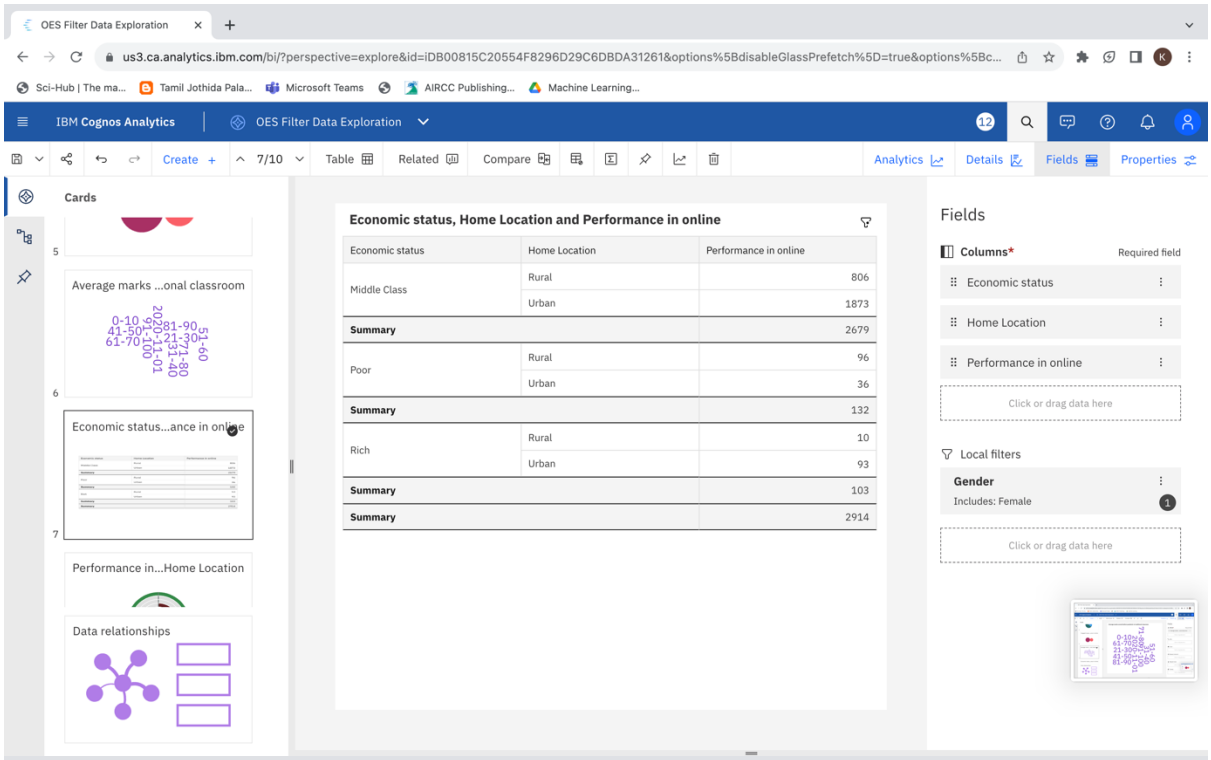


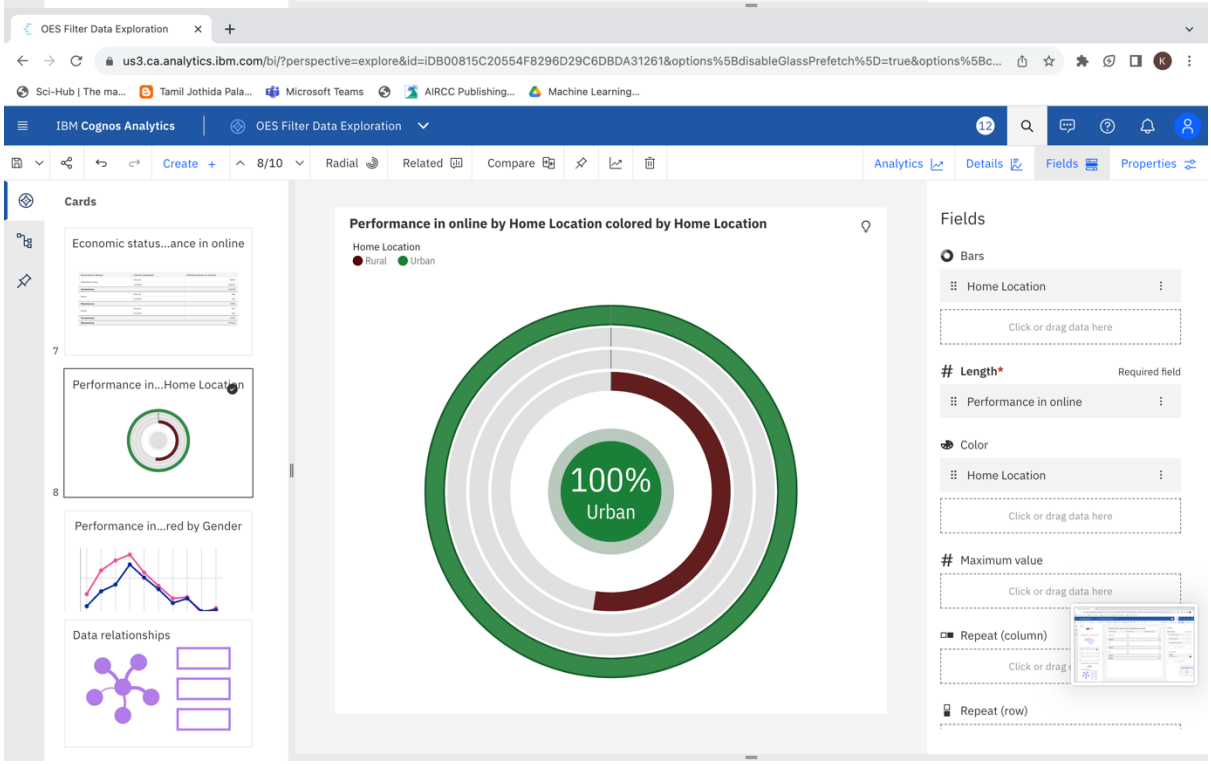

OES Filter Data Exploration
us3.ca.analytics.ibm.com/bi/?perspective=explore&id=iDB00815C20554F8296D29C6DBDA31261&options%5BdisableGlassPrefetch%5D=true&options%5Bc...
Sci-Hub | The ma...
Tamil Jothida Pala...
Microsoft Teams
AIRCC Publishing...
Machine Learning...
IBM Cognos Analytics
OES Filter Data Exploration
Create
3/10
Bar
Related
Compare
Analytics
Details
Fields
Properties
Cards
Internet facilit...nline Education
Performance in ... by Age(Years)
Time spent on s...attend classes
Data relationships
Performance in online by Age(Years) colored by Age(Years)
Age(Years) (Sum)
18
4980
Age(Years)
Performance in online (Sum)
Fields
Bars
Age(Years)
Click or drag data here
Length*
Required field
Performance in online
y-start
Target
Color

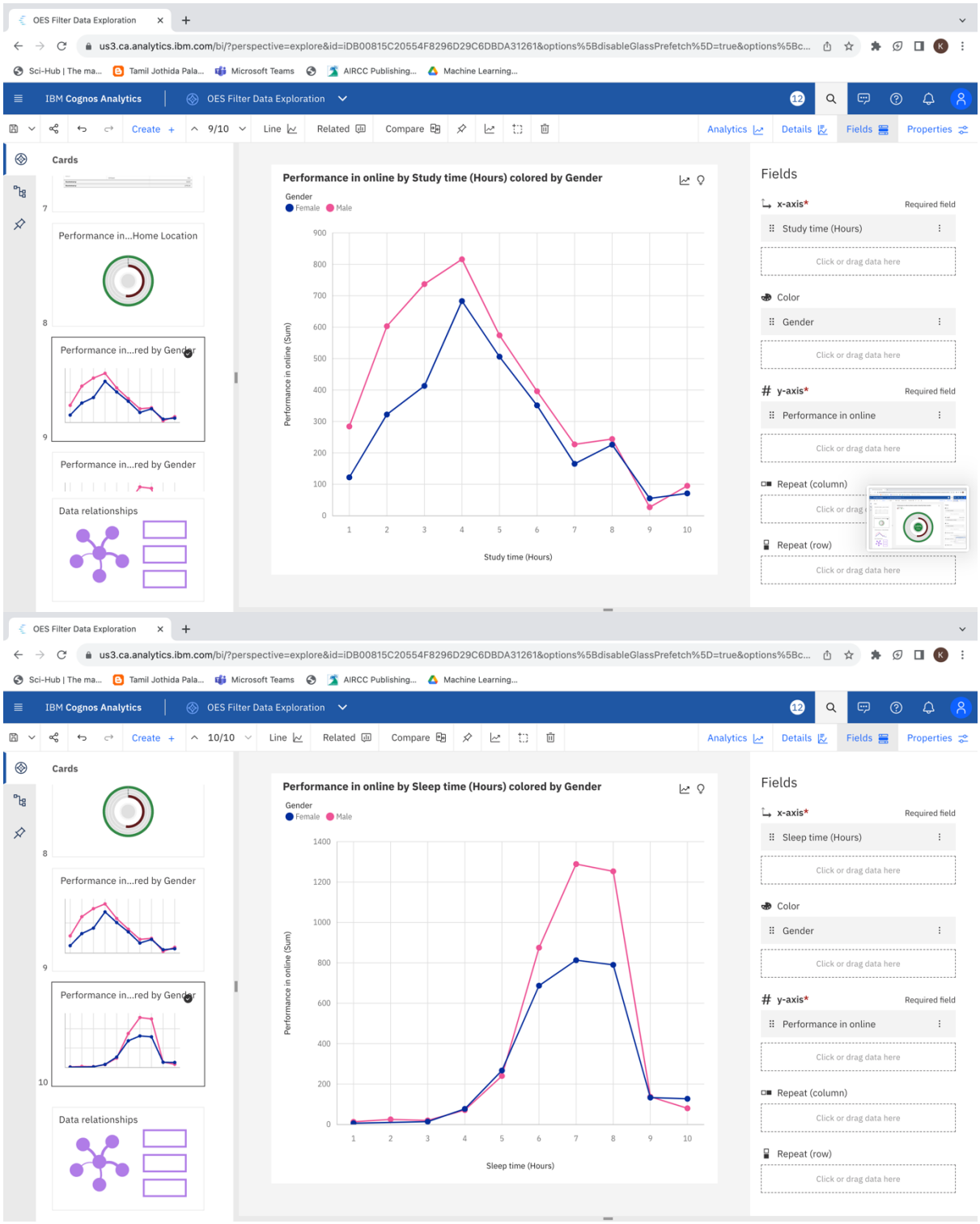

OES Filter Data Exploration
us3.ca.analytics.ibm.com/bi/?perspective=explore&id=iDB00815C20554F8296D29C6DBDA31261&options%5BdisableGlassPrefetch%5D=true&options%5Bc...
Sci-Hub | The ma...
Tamil Jothida Pala...
Microsoft Teams
AIRCC Publishing...
Machine Learning...
IBM Cognos Analytics
OES Filter Data Exploration
Create
4/10
Pie
Related
Compare
Analytics
Details
Fields
Properties
Cards
Time spent on s...attend classes
Engaged in grou...ance in online
Data relationships
Time spent on social media (Hours) by Device type used to attend classes
Device type used to attend classes
Desktop
Mobile
Laptop
71
907
1746
Fields
Segments*
Required field
Device type use... attend classes
Size*
Time spent on s...l media (Hours)
Repeat (column)
Repeat (row)
Tooltip
Local filters


OES Filter Data Exploration
us3.ca.analytics.ibm.com/bi/?perspective=explore&id=iDB00815C20554F8296D29C6DBDA31261&options%5BdisableGlassPrefetch%5D=true&options%5Bc...
IBM Cognos Analytics
OES Filter Data Exploration
Create
5/10
Packed bubble
Related
Compare
Analytics
Details
Fields
Properties
Cards
Time spent on s...attend classes
Engaged in grou...ance in online
Data relationships
Engaged in group studies? colored by Engaged in group studies? sized by Performance in online
Performance in on...
2899
4018
Engaged in group studies?
No
yes
Fields
Bubbles*
Required field
Engaged in group studies?
Click or drag data here
Size
Performance in online
Color
Engaged in group studies?
Repeat (column)
Repeat (row)
Tooltip


OES Filter Data Exploration
us3.ca.analytics.ibm.com/bi/?perspective=explore&id=iDB00815C20554F8296D29C6DBDA31261&options%5BdisableGlassPrefetch%5D=true&options%5Bc...
IBM Cognos Analytics
OES Filter Data Exploration
Create
6/10
Word cloud
Related
Compare
Analytics
Details
Fields
Properties
Cards
Engaged in grou...ance in online
Average marks ...onal classroom
Economic status...ance in online
Data relationships
Average marks scored before pandemic in traditional classroom
0-10
61-70
21-30
41-50
81-90
2020-11-01
71-80
91-100
31-40
51-60
Fields
Words*
Required field
Average marks ...onal classroom
Click or drag data here
Size
Color
Repeat (column)
Repeat (row)
Tooltip


OES Filter Data Exploration
us3.ca.analytics.ibm.com/bi/?perspective=explore&id=iDB00815C20554F8296D29C6DBDA31261&options%5BdisableGlassPrefetch%5D=true&options%5Bc...
IBM Cognos Analytics
OES Filter Data Exploration
Create
7/10
Table
Related
Compare
Analytics
Details
Fields
Properties
Cards
Average marks ...onal classroom
Economic status...ance in online
Performance in...Home Location
Data relationships
Economic status, Home Location and Performance in online
Economic status
Home Location
Performance in online
Middle Class
Rural
806
Urban
1873
Summary
2679
Poor
Rural
96
Urban
36
Summary
132
Rich
Rural
10
Urban
93
Summary
103
Summary
2914
Fields
Columns*
Required field
Economic status
Home Location
Performance in online
Click or drag data here
Local filters
Gender
Includes: Female
Click or drag data here

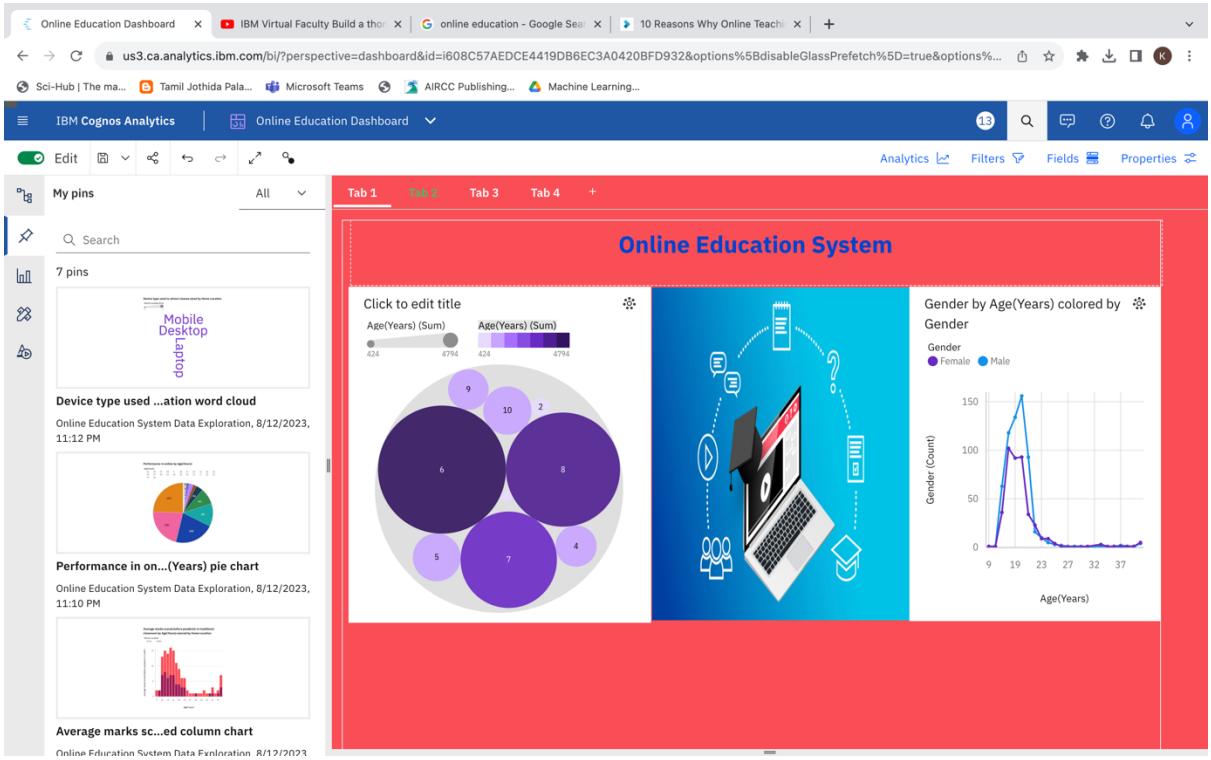

OES Filter Data Exploration
us3.ca.analytics.ibm.com/bi/?perspective=explore&id=iDB00815C20554F8296D29C6DBDA31261&options%5BdisableGlassPrefetch%5D=true&options%5Bc...
IBM Cognos Analytics
OES Filter Data Exploration
Create
8/10
Radial
Related
Compare
Analytics
Details
Fields
Properties
Cards
Economic status...ance in online
Performance in...Home Location
Performance in...red by Gender
Data relationships
Performance in online by Home Location colored by Home Location
Home Location
Rural
Urban
100%
Urban
Fields
Bars
Home Location
Click or drag data here
Length*
Required field
Performance in online
Color
Home Location
Click or drag data here
Maximum value
Click or drag data here
Repeat (column)
Repeat (row)

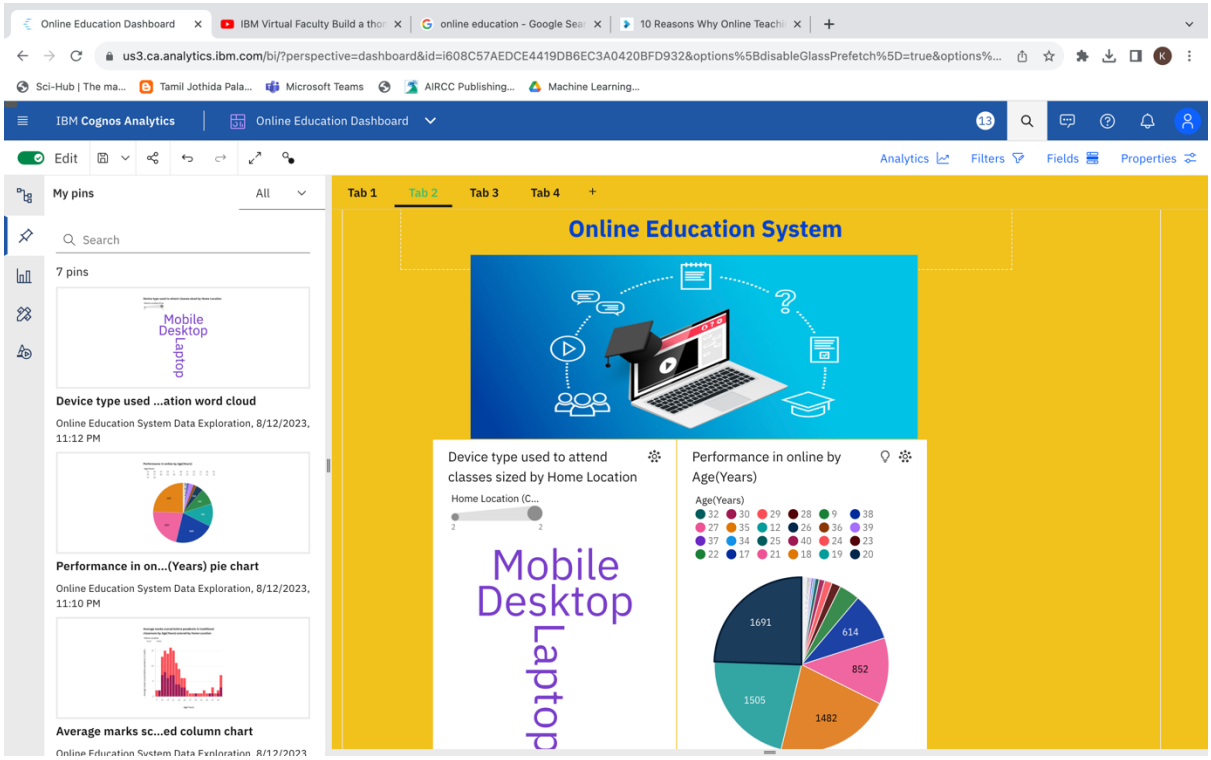


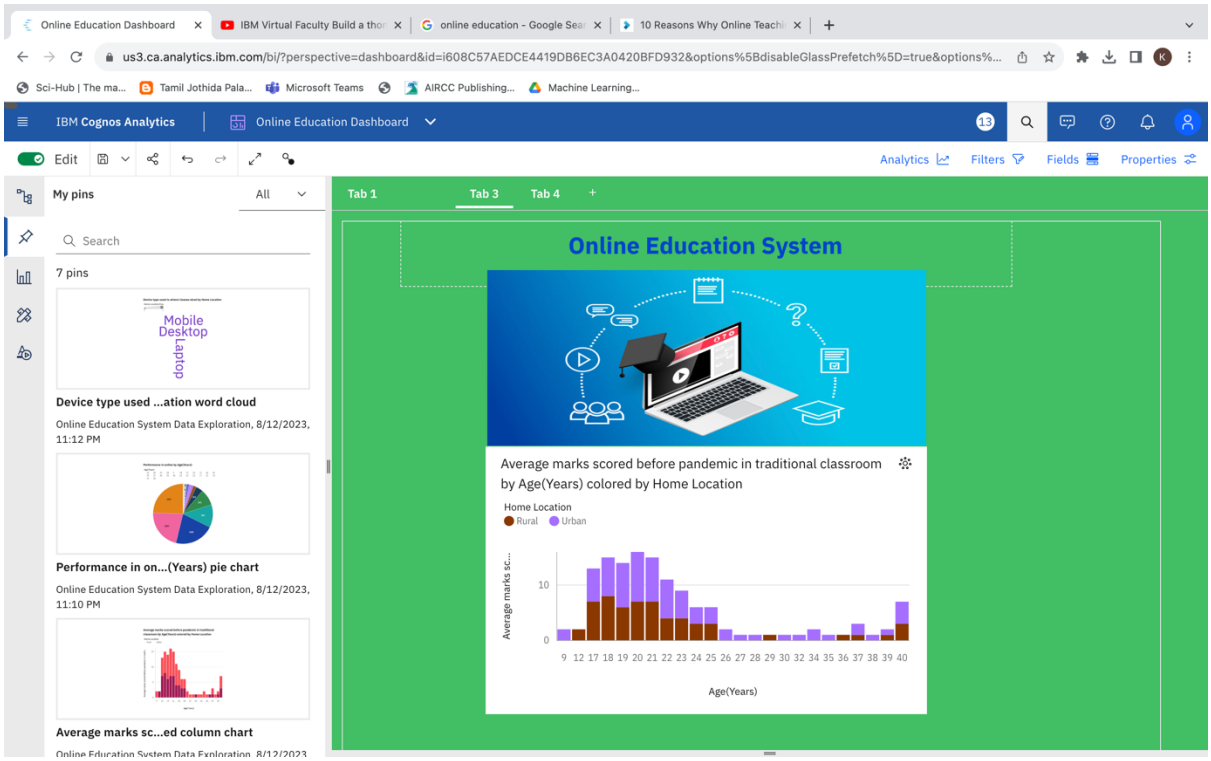
16.5 Data Presentation

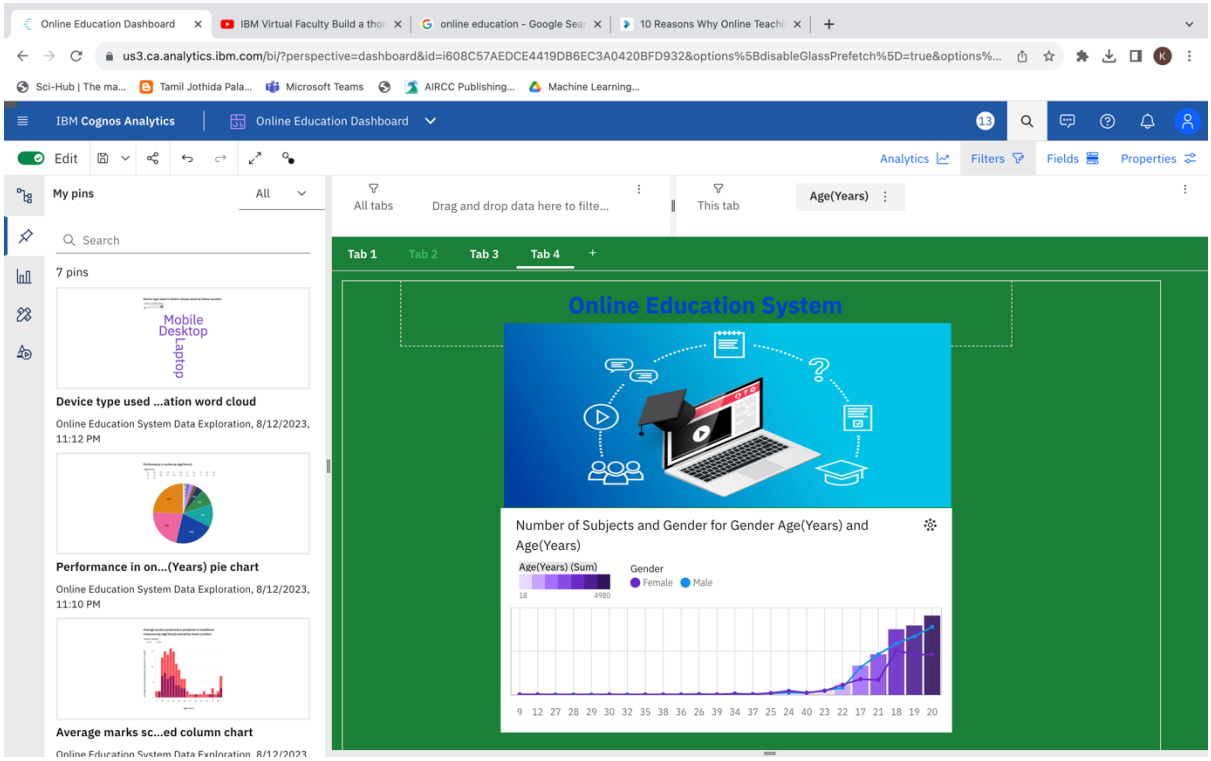
Finally, you present the results to your business. These results can take many forms, ranging from presentations to research reports. Sometimes you'll need to automate the execution of the process because the business will want to use the insights you gained in another project or enable an operational process to use the outcome from your model.

16.5.1 Dashboard

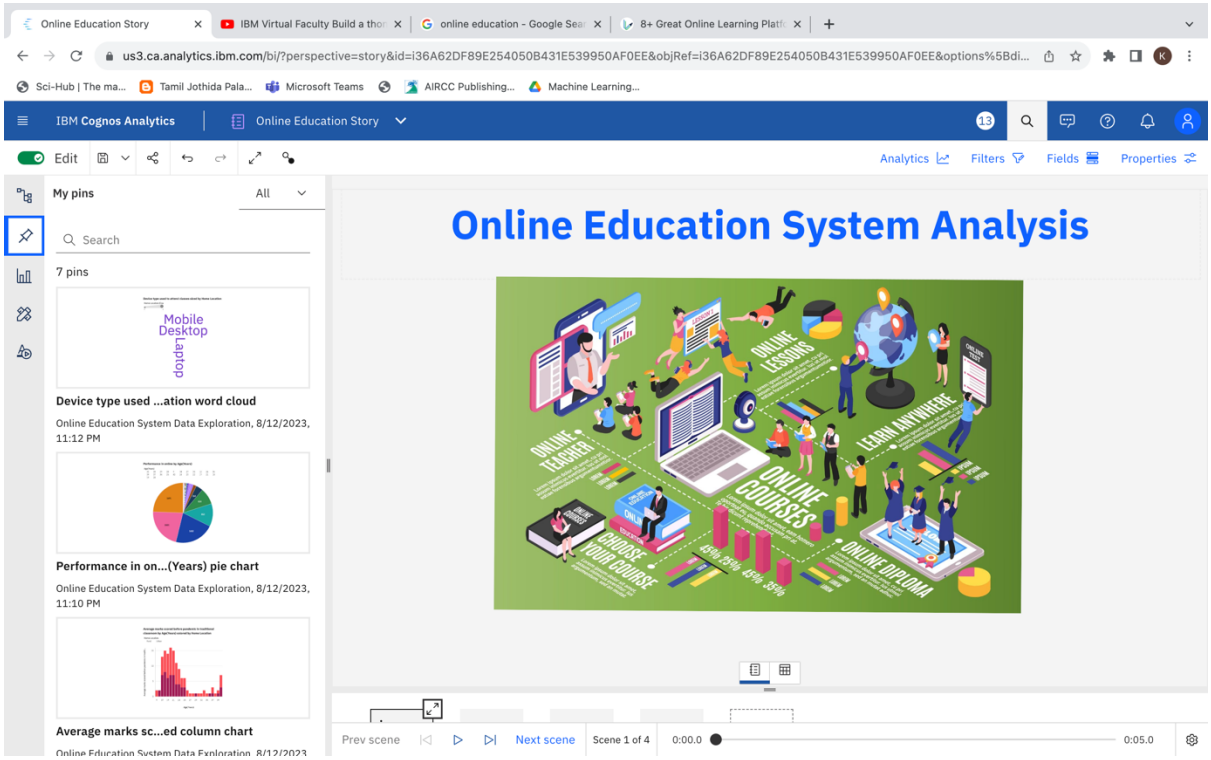


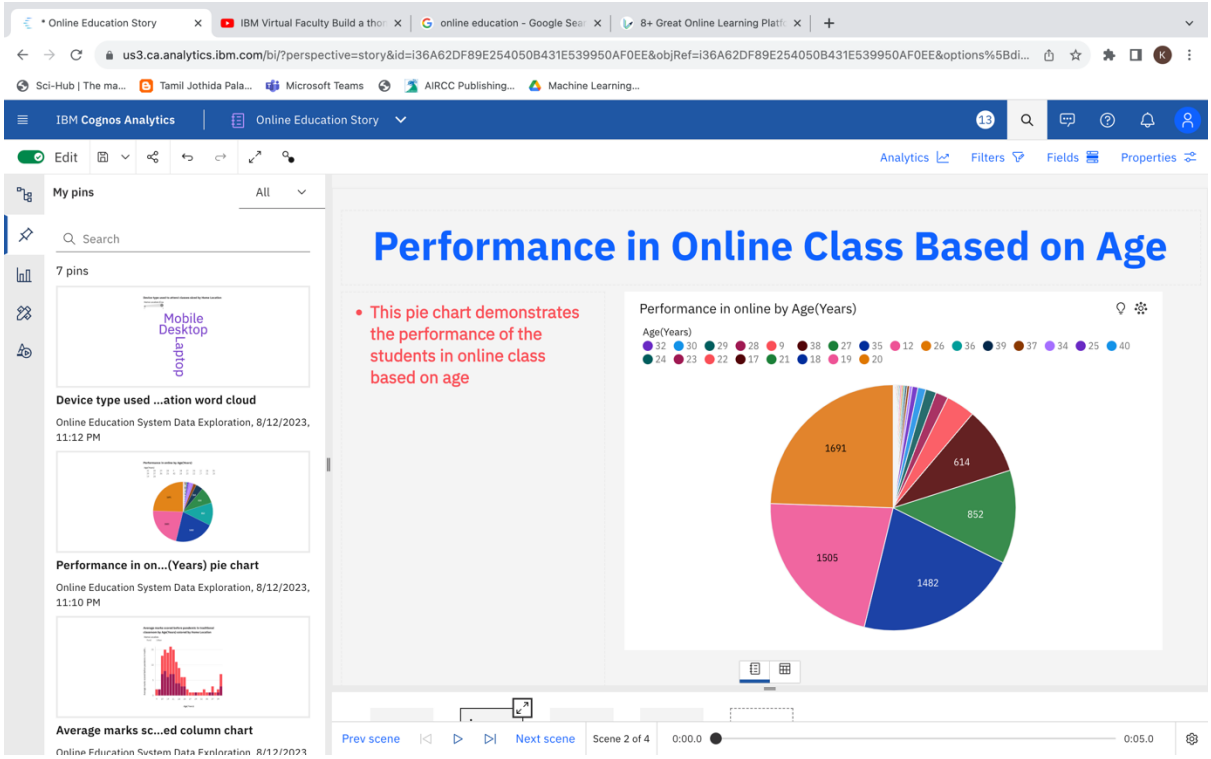


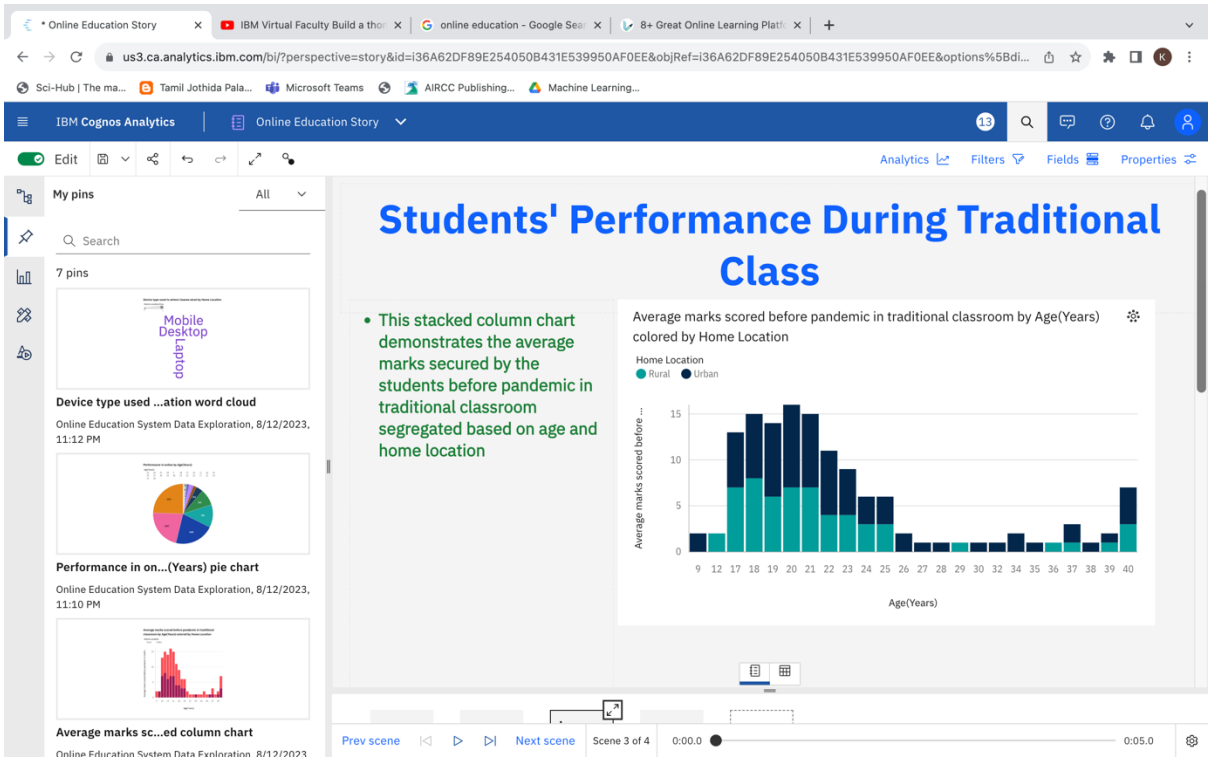

Online Education Dashboard
us3.ca.analytics.ibm.com/bi/?perspective=dashboard&id=i608C57AEDCE4419DB6EC3A0420BFD932&options%5BdisableGlassPrefetch%5D=true&options%...
IBM Cognos Analytics
Online Education Dashboard
Edit
Analytics
Filters
Fields
Properties
My pins
All
Search
7 pins
Device type used ...ation word cloud
Online Education System Data Exploration, 8/12/2023, 11:12 PM
Performance in on...(Years) pie chart
Online Education System Data Exploration, 8/12/2023, 11:10 PM
Average marks sc...ed column chart
Tab 1
Tab 3
Tab 4
Online Education System
Average marks scored before pandemic in traditional classroom by Age(Years) colored by Home Location
Home Location
Rural
Urban
Average marks sc...
Age(Years)

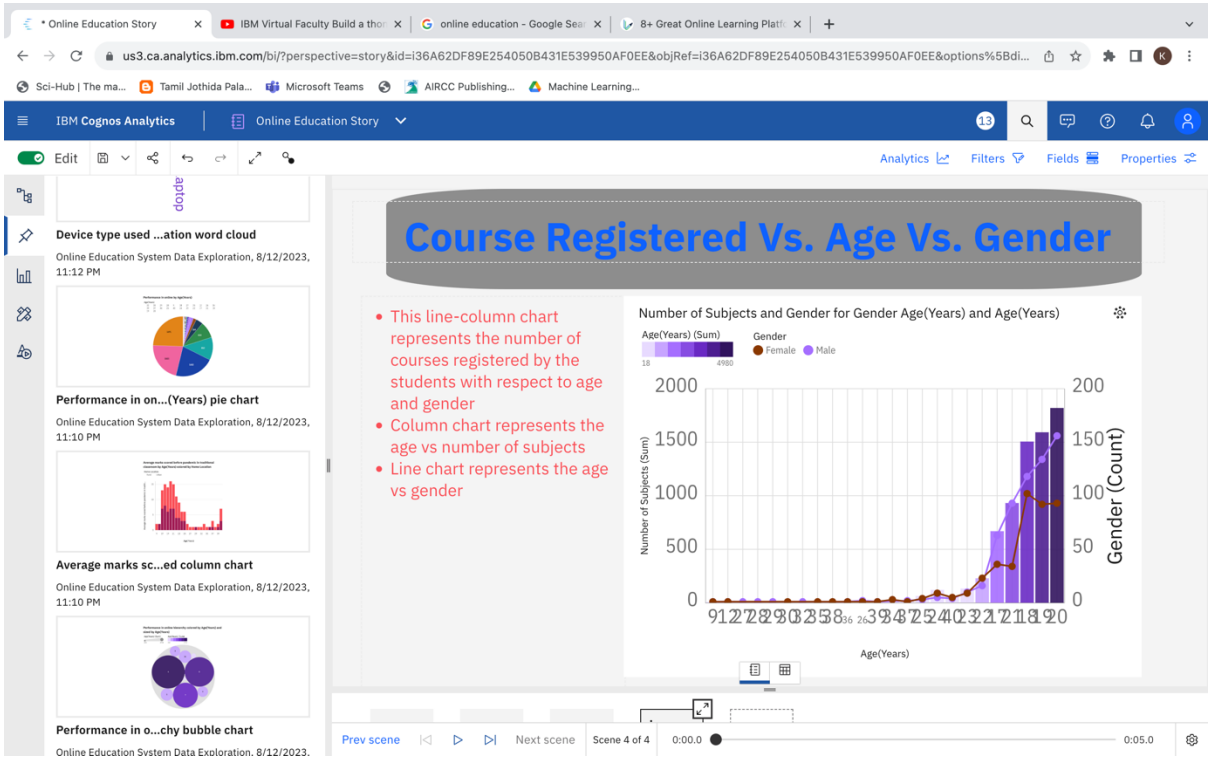

Online Education Dashboard
us3.ca.analytics.ibm.com/bi/?perspective=dashboard&id=i608C57AEDCE4419DB6EC3A0420BFD932&options%5BdisableGlassPrefetch%5D=true&options%...
IBM Cognos Analytics
Online Education Dashboard
Edit
Analytics
Filters
Fields
Properties
My pins
All
All tabs
Drag and drop data here to filte...
This tab
Age(Years)
Search
7 pins
Device type used ...ation word cloud
Online Education System Data Exploration, 8/12/2023, 11:12 PM
Performance in on...(Years) pie chart
Online Education System Data Exploration, 8/12/2023, 11:10 PM
Average marks sc...ed column chart
Tab 1
Tab 2
Tab 3
Tab 4
Online Education System
Number of Subjects and Gender for Gender Age(Years) and Age(Years)
Age(Years) (Sum)
Gender
Female
Male

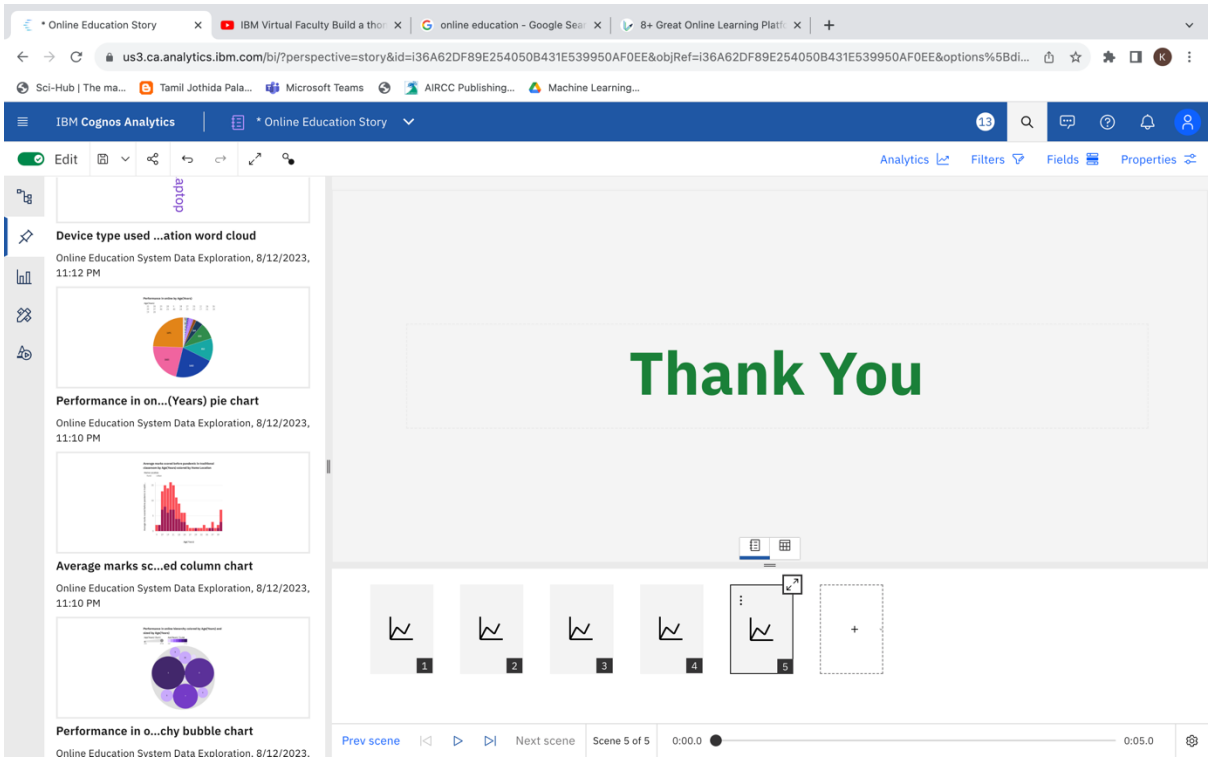
16.5.2 Story


Online Education Story
IBM Virtual Faculty Build a thon
online education - Google Sear
8+ Great Online Learning Platfo
us3.ca.analytics.ibm.com/bi/?perspective=story&id=i36A62DF89E254050B431E539950AF0EE&objRef=i36A62DF89E254050B431E539950AF0EE&options%5Bdi...
Sci-Hub | The ma...
Tamil Jothida Pala...
Microsoft Teams
AIRCC Publishing...
Machine Learning...
IBM Cognos Analytics
Online Education Story
Edit
Analytics
Filters
Fields
Properties
My pins
All
Search
7 pins
Device type used ...ation word cloud
Online Education System Data Exploration, 8/12/2023, 11:12 PM
Performance in on...(Years) pie chart
Online Education System Data Exploration, 8/12/2023, 11:10 PM
Average marks sc...ed column chart
Online Education System Data Exploration, 8/12/2023
Online Education System Analysis
ONLINE LESSONS
LEARN ANYWHERE
ONLINE TEACHER
ONLINE COURSES
CHOOSE YOUR COURSE
ONLINE DIPLOMA
Prev scene
Next scene
Scene 1 of 4
0:00.0
0:05.0

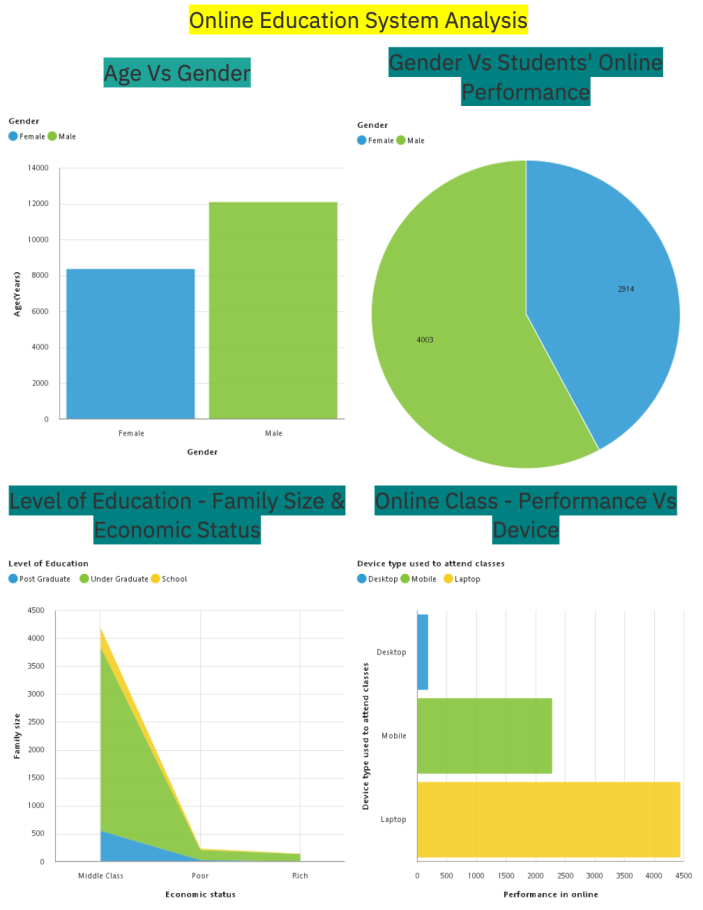

* Online Education Story
IBM Virtual Faculty Build a thon
online education - Google Sear
8+ Great Online Learning Platfo
us3.ca.analytics.ibm.com/bi/?perspective=story&id=i36A62DF89E254050B431E539950AF0EE&objRef=i36A62DF89E254050B431E539950AF0EE&options%5Bdi...
Sci-Hub | The ma...
Tamil Jothida Pala...
Microsoft Teams
AIRCC Publishing...
Machine Learning...
IBM Cognos Analytics
Online Education Story
Edit
Analytics
Filters
Fields
Properties
My pins
All
Search
7 pins
Device type used ...ation word cloud
Online Education System Data Exploration, 8/12/2023, 11:12 PM
Performance in on...(Years) pie chart
Online Education System Data Exploration, 8/12/2023, 11:10 PM
Average marks sc...ed column chart
Online Education System Data Exploration, 8/12/2023
Performance in Online Class Based on Age
This pie chart demonstrates the performance of the students in online class based on age
Performance in online by Age(Years)
Age(Years)
1691
614
852
1505
1482
Prev scene
Next scene
Scene 2 of 4
0:00.0
0:05.0


* Online Education Story
IBM Virtual Faculty Build a thon
online education - Google Sear
8+ Great Online Learning Platfo
us3.ca.analytics.ibm.com/bi/?perspective=story&id=i36A62DF89E254050B431E539950AF0EE&objRef=i36A62DF89E254050B431E539950AF0EE&options%5Bdi...
Sci-Hub | The ma...
Tamil Jothida Pala...
Microsoft Teams
AIRCC Publishing...
Machine Learning...
IBM Cognos Analytics
Online Education Story
Edit
Analytics
Filters
Fields
Properties
My pins
All
Search
7 pins
Mobile
Desktop
Laptop
Device type used ...ation word cloud
Online Education System Data Exploration, 8/12/2023, 11:12 PM
Performance in on...(Years) pie chart
Online Education System Data Exploration, 8/12/2023, 11:10 PM
Average marks sc...ed column chart
Online Education System Data Exploration, 8/12/2023
Students' Performance During Traditional Class
This stacked column chart demonstrates the average marks secured by the students before pandemic in traditional classroom segregated based on age and home location
Average marks scored before pandemic in traditional classroom by Age(Years) colored by Home Location
Home Location
Rural
Urban
Average marks scored before ...
0
5
10
15
9 12 17 18 19 20 21 22 23 24 25 26 27 28 29 30 32 34 35 36 37 38 39 40
Age(Years)
Prev scene
Next scene
Scene 3 of 4
0:00.0
0:05.0


* Online Education Story
IBM Virtual Faculty Build a thon
online education - Google Sear
8+ Great Online Learning Platfo
us3.ca.analytics.ibm.com/bi/?perspective=story&id=i36A62DF89E254050B431E539950AF0EE&objRef=i36A62DF89E254050B431E539950AF0EE&options%5Bdi...
Sci-Hub | The ma...
Tamil Jothida Pala...
Microsoft Teams
AIRCC Publishing...
Machine Learning...
IBM Cognos Analytics
Online Education Story
Edit
Analytics
Filters
Fields
Properties
Device type used ...ation word cloud
Online Education System Data Exploration, 8/12/2023, 11:12 PM
Performance in on...(Years) pie chart
Online Education System Data Exploration, 8/12/2023, 11:10 PM
Average marks sc...ed column chart
Online Education System Data Exploration, 8/12/2023, 11:10 PM
Performance in o...chy bubble chart
Online Education System Data Exploration, 8/12/2023.
Course Registered Vs. Age Vs. Gender
This line-column chart represents the number of courses registered by the students with respect to age and gender
Column chart represents the age vs number of subjects
Line chart represents the age vs gender
Number of Subjects and Gender for Gender Age(Years) and Age(Years)
Age(Years) (Sum)
18
4980
Gender
Female
Male
Number of Subjects (Sum)
0
500
1000
1500
2000
Gender (Count)
0
50
100
150
200
Age(Years)
Prev scene
Next scene
Scene 4 of 4
0:00.0
0:05.0


* Online Education Story
IBM Virtual Faculty Build a thon
online education - Google Sear
8+ Great Online Learning Platfo
us3.ca.analytics.ibm.com/bi/?perspective=story&id=i36A62DF89E254050B431E539950AF0EE&objRef=i36A62DF89E254050B431E539950AF0EE&options%5Bdi...
Sci-Hub | The ma...
Tamil Jothida Pala...
Microsoft Teams
AIRCC Publishing...
Machine Learning...
IBM Cognos Analytics
* Online Education Story
Edit
Analytics
Filters
Fields
Properties
Device type used ...ation word cloud
Online Education System Data Exploration, 8/12/2023, 11:12 PM
Performance in on...(Years) pie chart
Online Education System Data Exploration, 8/12/2023, 11:10 PM
Average marks sc...ed column chart
Online Education System Data Exploration, 8/12/2023, 11:10 PM
Performance in o...chy bubble chart
Online Education System Data Exploration, 8/12/2023,
Thank You
Prev scene
Next scene
Scene 5 of 5
0:00.0
0:05.0

16.5.3 Report


Online Education System Analysis
Age Vs Gender
Gender Vs Students' Online Performance
Gender
Female
Male
Age(Years)
Gender
2914
4003
Level of Education - Family Size & Economic Status
Online Class - Performance Vs Device
Level of Education
Post Graduate
Under Graduate
School
Family size
Middle Class
Poor
Rich
Economic status
Device type used to attend classes
Desktop
Mobile
Laptop
Performance in online
Aug 13, 2023
1
1:34:28 AM

16.6 Tool Used

IBM Cognos Analytics

BM Cognos Business Intelligence is a **web based reporting and analytic tool**. It is used to perform data aggregation and create user friendly detailed reports. Reports can contain Graphs, Multiple Pages, Different Tabs and Interactive Prompts. These reports can be viewed on web browsers, or on hand held devices like tablets and smartphones.

Cognos also provides you an option to export the report in XML or PDF format or you can view the reports in XML format. You can also schedule the report to run in the background at specific time period so it saves the time to view the daily report as you don't need to run the report every time.

IBM Cognos provides a wide range of features and can be considered as an enterprise software to provide flexible reporting environment and **can be used for large and medium enterprises**. It meets the need of Power Users, Analysts, Business Managers and Company Executives. Power users and analysts want to create adhoc reports and can create multiple views of the same data. Business Executives want to see summarize data in dashboard styles, cross tabs and visualizations. Cognos allows both the options for all set of users.

Key Features of IBM Cognos

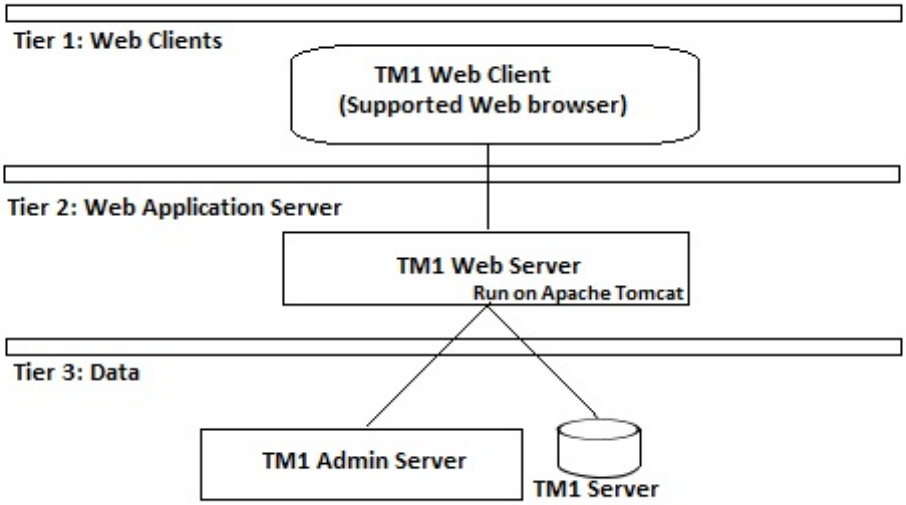
Cognos BI reporting allows you to bring the data from multiple databases into a single set of reports. IBM Cognos provides wide range of features as compared to other BI tools in the market. You can create and schedule the reports and complex report can be designed easily in the Cognos BI Reporting Tool.

The Cognos BI Reporting Tool allows to create a report for a set of users like – Power users, Analysts, and Business Executives, etc. IBM Cognos can handle a large volume of data and is suitable for medium and large enterprises to fulfil BI needs.

3-Tier Architecture Cognos

Cognos BI is considered to be a 3-tier architecture layout. At the top, there is a Web Client or a Web Server. The 2nd tier consists of a Web Application Server. While the bottom tier consists of a Data layer.

These tiers are separated by firewalls and communication between these tiers happens using SOAP and HTTP protocols.



Tier-1 Web Clients

The web client allows BI users to access TM1 data and interact with data in any of the supported browsers. Tier 1 is responsible to manage the gateway and is used for encryption and decryption of passwords, extract information needed to submit a request to the BI server, authentication of server and to pass the request to Cognos BI dispatcher for processing.

Tier-2 Web Application Server

This tier hosts the Cognos BI server and its associated services. Application server contains Application Tier Components, Content Manager and Bootstrap service.

Cognos TM1 Web Application Server runs on Java based Apache Tomcat server. Using this tier, Microsoft Excel worksheets can be converted to TM1 Web sheets and also allows to export web sheets back to Excel and PDF format.

Tier-3 Data

This tier contains content and data sources. It contains TM1 Admin server and at least one TM1 server. TM1 Admin server can be installed on any computer on your LAN and it must reside on same network as TM1 server. The version of TM1 server should be equal or most recent then the version of Cognos TM1 web.

References

1. Mishra, L., Gupta, T., & Shree, A. (2020). Online teaching-learning in higher education during lockdown period of COVID-19 pandemic. In International Journal of Educational Research Open (Vol. 1, p. 100012). Elsevier BV. https://doi.org/10.1016/j.ijedro.2020.100012

2. Gupta, S., Kumar, P., & Tekchandani, R. K. (2022). Facial emotion recognition based real-time learner engagement detection system in online learning context using deep learning models. In Multimedia Tools and Applications (Vol. 82, Issue 8, pp. 11365–11394). Springer Science and Business Media LLC. https://doi.org/10.1007/s11042-022-13558-9
3. Safarov, F., Kutlimuratov, A., Abdusalomov, A. B., Nasimov, R., & Cho, Y.-I. (2023). Deep Learning Recommendations of E-Education Based on Clustering and Sequence. In Electronics (Vol. 12, Issue 4, p. 809). MDPI AG. https://doi.org/10.3390/electronics12040809
4. Selvaraj, A., Radhin, V., KA, N., Benson, N., & Mathew, A. J. (2021). Effect of pandemic based online education on teaching and learning system. In International Journal of Educational Development (Vol. 85, p. 102444). Elsevier BV. https://doi.org/10.1016/j.ijedudev.2021.102444
5. Zhang, Z., Cao, T., Shu, J., & Liu, H. (2020). Identifying key factors affecting college students' adoption of the e-learning system in mandatory blended learning environments. In Interactive Learning Environments (Vol. 30, Issue 8, pp. 1388–1401). Informa UK Limited. https://doi.org/10.1080/10494820.2020.1723113