Sprint 3-4

Presentation Deck

FYPJ-2023

Updated as of 23/5/2023 by Nasrullah

SPRINT 3
(17-5 May 2023)

Solution

- Business intelligence (BI) tools, such as Power BI, can be used to help track and measure student engagement in online learning. BI tools can be used to collect data from a variety of sources, such as Mentimeter & learning objects (Videos), and then analyze this data to identify trends and patterns. This information can then be used to improve the online learning experience for students.

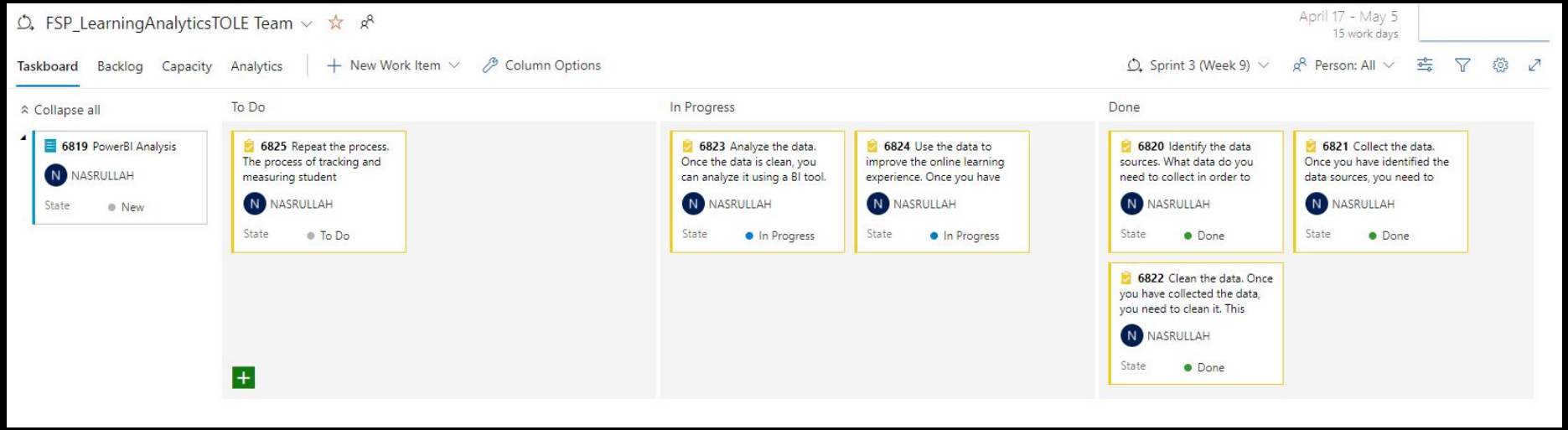
Benefits

- **Improved student outcomes:** By identifying trends and patterns in student engagement, BI tools can help educators identify areas where students are struggling and provide them with the support they need.

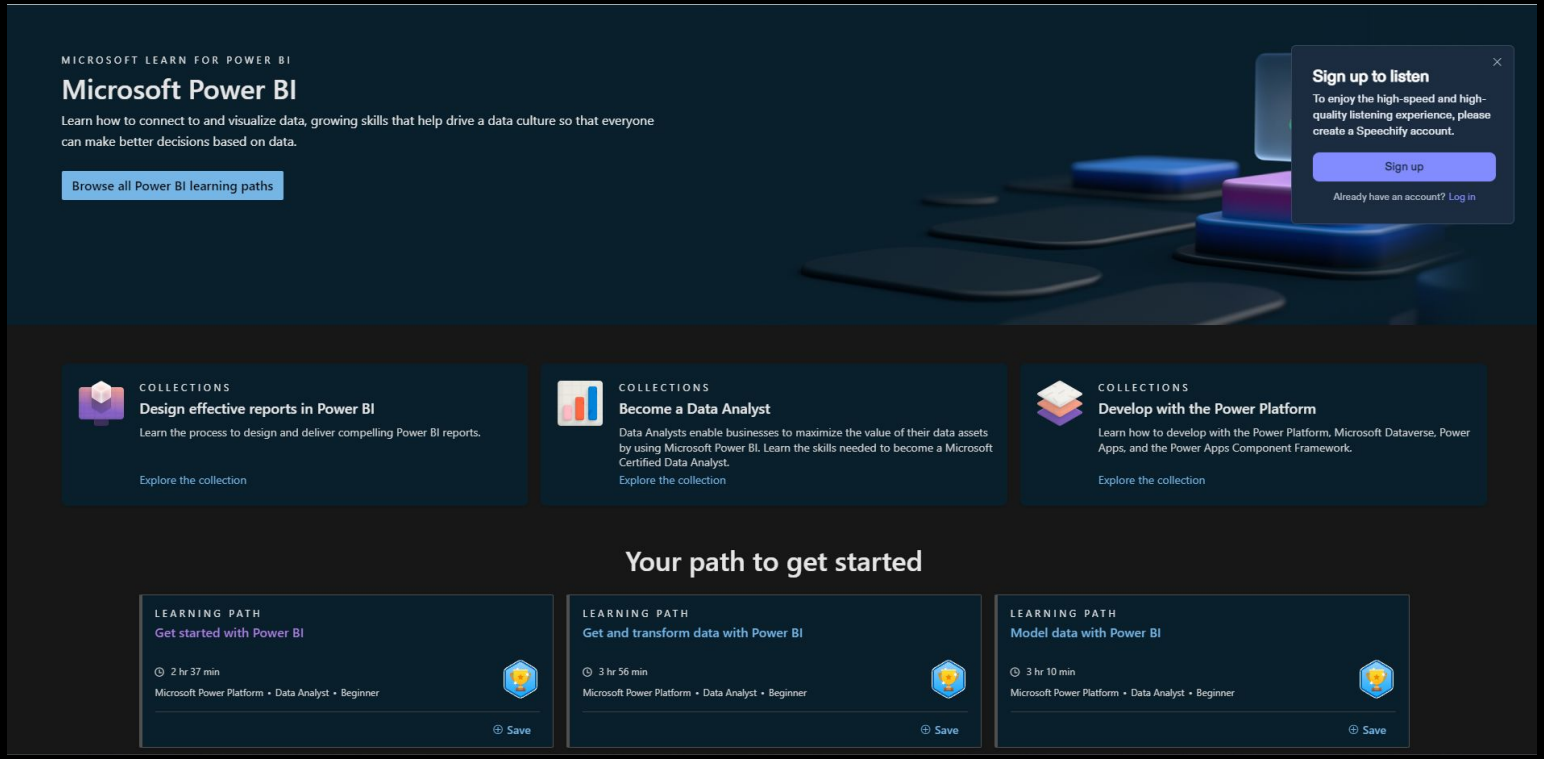
- **Increased efficiency:** BI tools can help educators save time and resources by automating the process of collecting and analyzing data.

- **Enhanced decision-making:** BI tools can help educators make better decisions about how to improve the online learning experience for students.

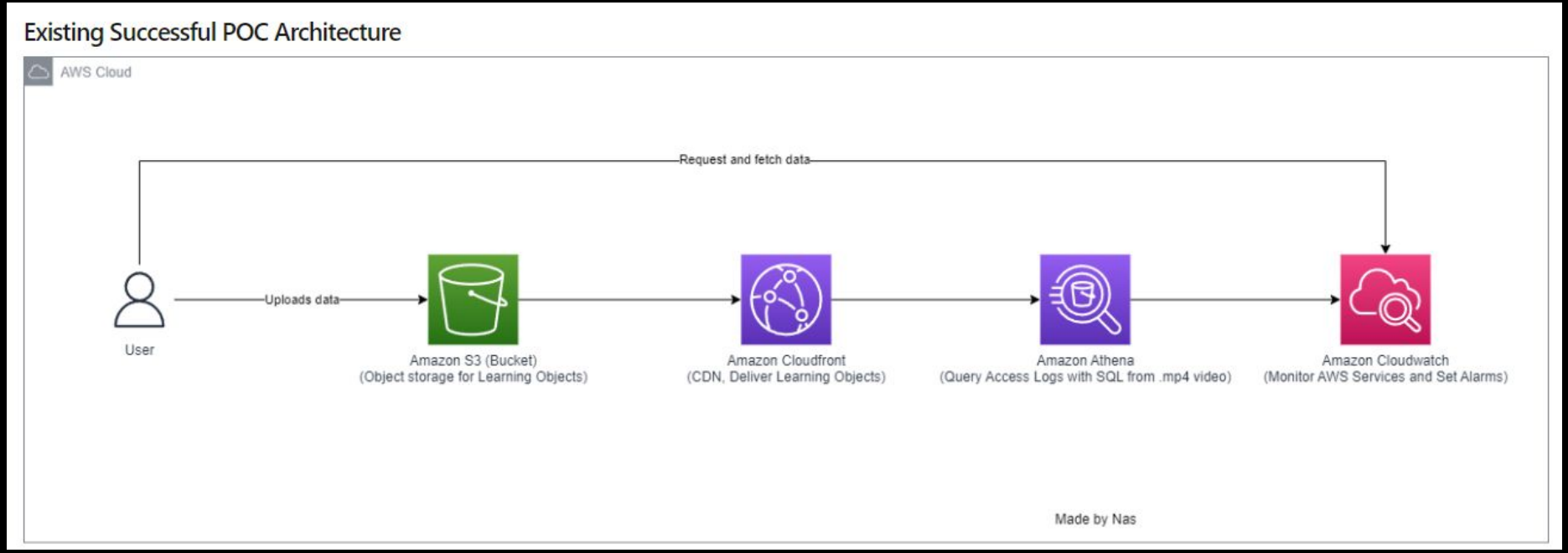
Sprint 3 Schedule



Initial Research & Challenges

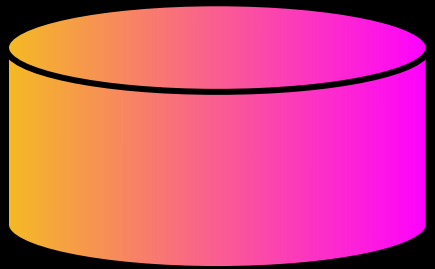


Successful POC



Extract, Transform, Load

Get Data

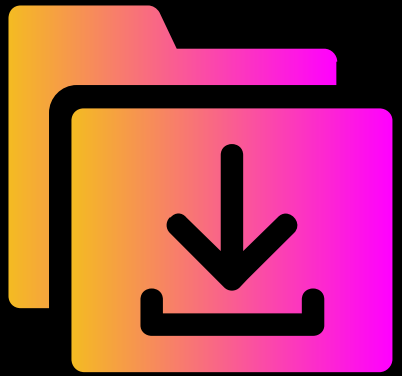


Data Source (CSV)
(AWS & Mentimeter)

Transform Data

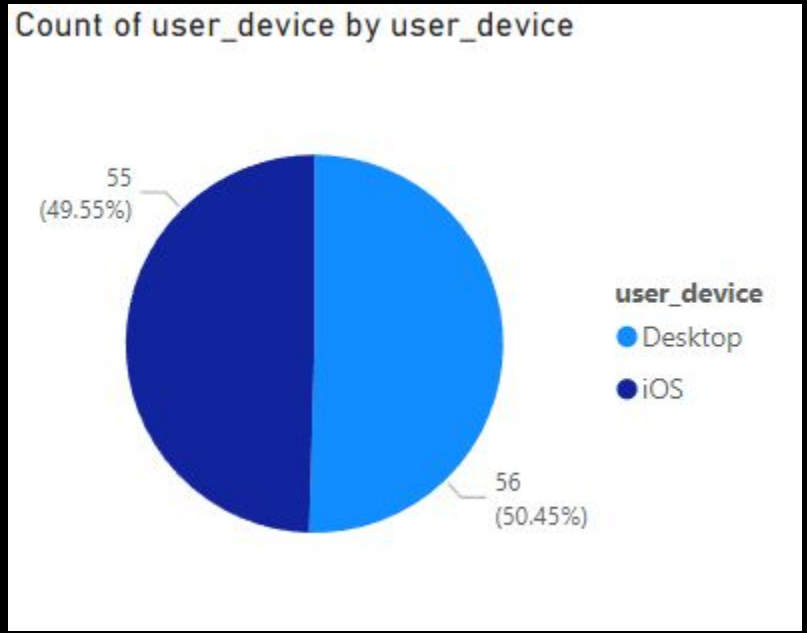
PowerBI PowerQuery
Removed unnecessary columns like (location, query_string, cookie, xforwarded_for, file_status, etc)

Build & Format Visuals



Target
Dashboard & Pages

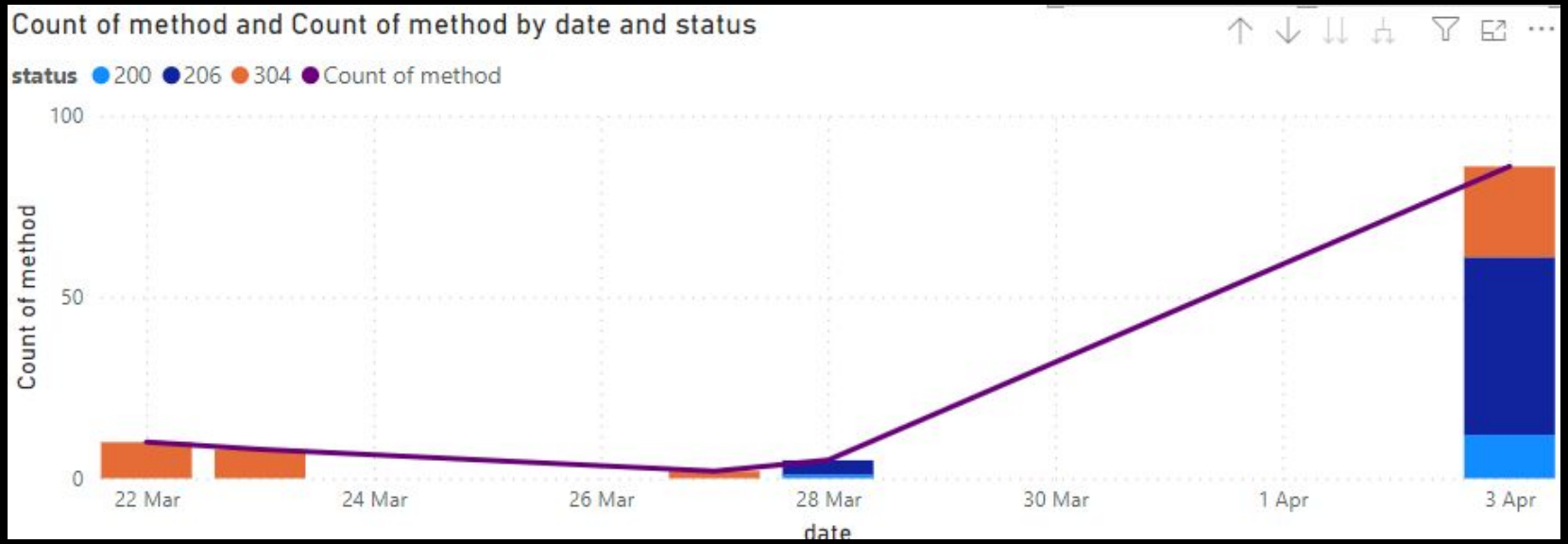
Charts Used



Pie Chart

Pie chart is a simple and effective way to visualize categorical data in Power BI and AWS.

Charts Used



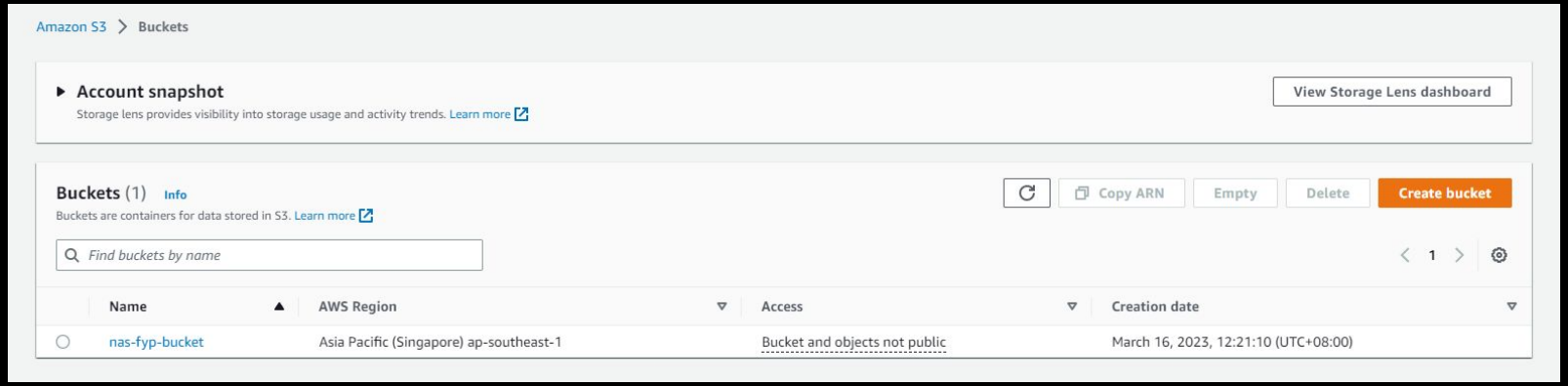
Line Chart

Line chart is a simple and effective way to visualize the relationship between two variables in Power BI and AWS.

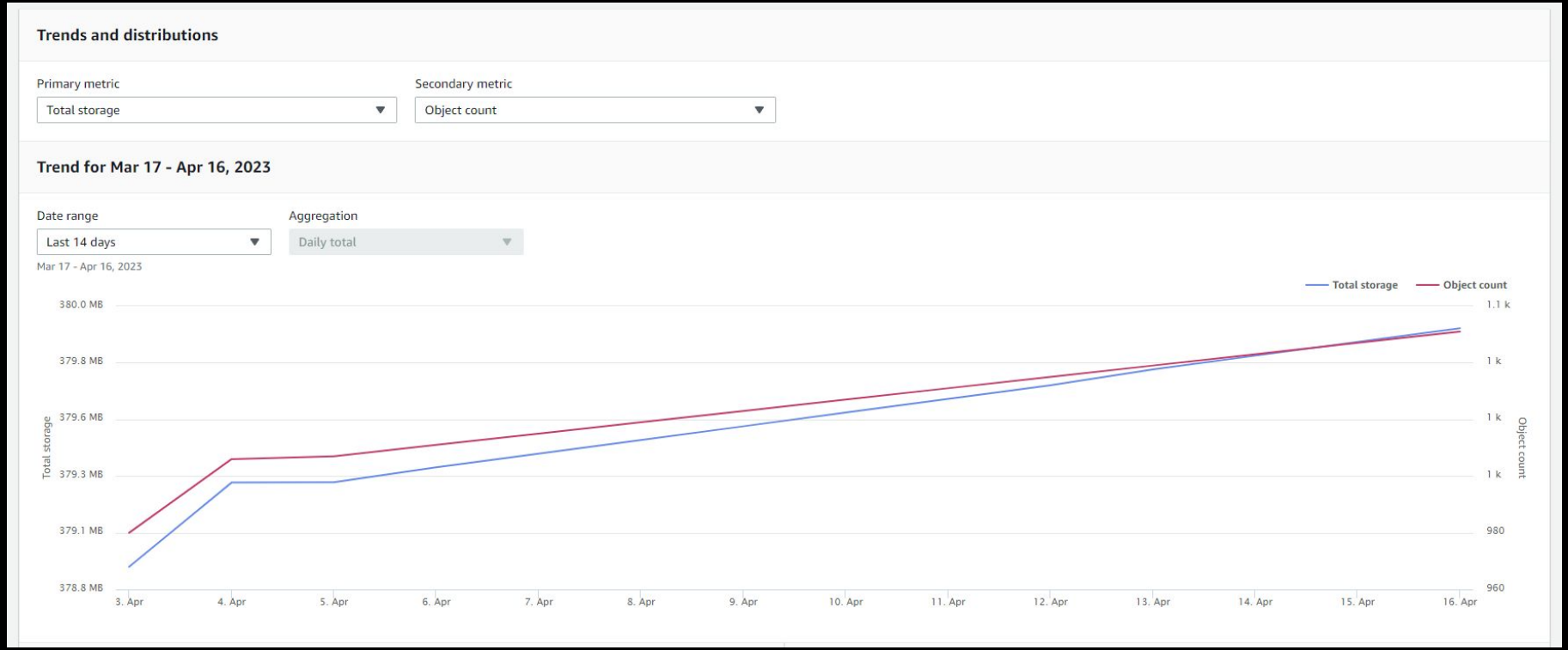
Full Chart (In Progress)

Objective

- Proof of concept for deploying **learning objects** (existing videos or storyline content) to the Web using Amazon Web Services (AWS).



Amazon S3


Trends and distributions
Primary metric
Total storage
Secondary metric
Object count
Trend for Mar 17 - Apr 16, 2023
Date range
Last 14 days
Aggregation
Daily total
Mar 17 - Apr 16, 2023
Total storage
Object count
380.0 MB
379.8 MB
379.6 MB
379.3 MB
379.1 MB
378.8 MB
1.1 k
1 k
1 k
1 k
980
960
Total storage
Object count
3. Apr
4. Apr
5. Apr
6. Apr
7. Apr
8. Apr
9. Apr
10. Apr
11. Apr
12. Apr
13. Apr
14. Apr
15. Apr
16. Apr

Amazon Athena for Querying

- Creating a database and table to collect metrics and access real-time logs

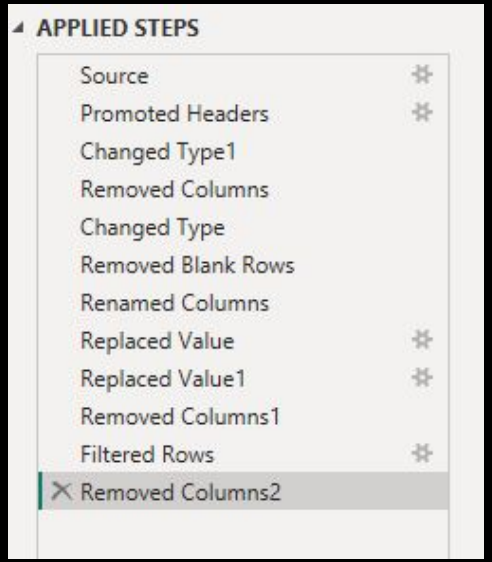
Cloudfront real-time access logs

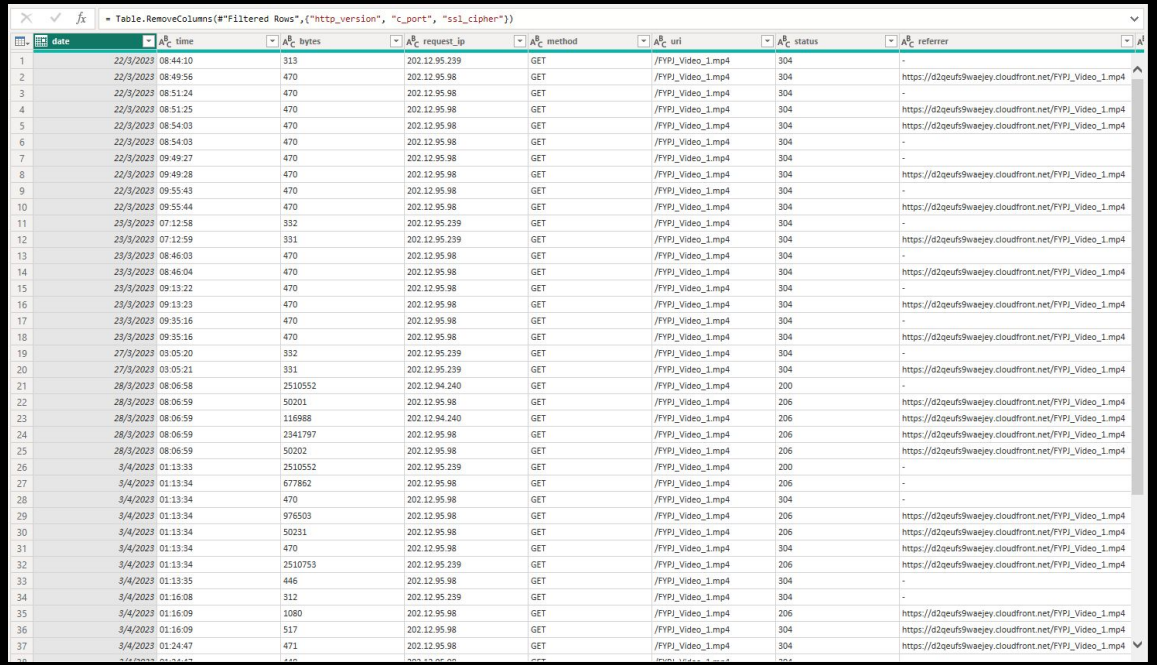
1. time: The timestamp of the request.
2. x-edge-location: The edge location that served the request.
3. sc-bytes: The number of bytes served by CloudFront to the viewer.
4. c-ip: The IP address of the viewer.
5. cs-method: The HTTP method used for the request.
6. cs(Host): The domain name of the CloudFront distribution.
7. cs-uri-stem: The URI of the requested object.
8. sc-status: The HTTP status code returned to the viewer.
9. cs(Referer): The URL of the page that referred the viewer to the requested object.
10. cs(User-Agent): The user agent string of the viewer's browser.
11. cs-uri-query: The query string of the request.
12. x-edge-result-type: The result type of the request (e.g. Hit, Miss, Error).
13. x-edge-request-id: The unique ID of the request.
14. x-host-header: The value of the Host header in the viewer's request.
15. cs-protocol: The protocol used for the request (e.g. HTTP/1.1).
16. cs-bytes: The number of bytes in the request.
17. time-taken: The time taken for CloudFront to process the request and serve the response.

```
CREATE EXTERNAL TABLE IF NOT EXISTS default.cloudfront_logs (
  `date` DATE,
  time STRING,
  location STRING,
  bytes BIGINT,
  request_ip STRING,
  method STRING,
  host STRING,
  uri STRING,
  status INT,
  referrer STRING,
  user_agent STRING,
  query_string STRING,
  cookie STRING,
  result_type STRING,
  request_id STRING,
  host_header STRING,
  request_protocol STRING,
  request_bytes BIGINT,
  time_taken FLOAT,
  xforwarded_for STRING,
  ssl_protocol STRING,
  ssl_cipher STRING,
  response_result_type STRING,
  http_version STRING,
  fle_status STRING,
  fle_encrypted_fields INT,
  c_port INT,
  time_to_first_byte FLOAT,
  x_edge_detailed_result_type STRING,
  sc_content_type STRING,
  sc_content_len BIGINT,
  sc_range_start BIGINT,
  sc_range_end BIGINT
)
ROW FORMAT DELIMITED
FIELDS TERMINATED BY '\t'
LOCATION 's3://nas-fyp-bucket/CloudFrontLogs'
TBLPROPERTIES ( 'skip.header.line.count'='2' )
```

Cleaning & Transforming

- **Removing unnecessary and reiterating columns**
- Filtered rows and removed empty rows





	date	time	bytes	request_ip	method	uri	status	referrer
1	22/3/2023	08:44:10	313	202.12.95.239	GET	/FYPJ_Video_1.mp4	304	-
2	22/3/2023	08:49:56	470	202.12.95.98	GET	/FYPJ_Video_1.mp4	304	https://d2qeufs9waejey.cloudfront.net/FYPJ_Video_1.mp4
3	22/3/2023	08:51:24	470	202.12.95.98	GET	/FYPJ_Video_1.mp4	304	-
4	22/3/2023	08:51:25	470	202.12.95.98	GET	/FYPJ_Video_1.mp4	304	https://d2qeufs9waejey.cloudfront.net/FYPJ_Video_1.mp4
5	22/3/2023	08:54:03	470	202.12.95.98	GET	/FYPJ_Video_1.mp4	304	https://d2qeufs9waejey.cloudfront.net/FYPJ_Video_1.mp4
6	22/3/2023	08:54:03	470	202.12.95.98	GET	/FYPJ_Video_1.mp4	304	-
7	22/3/2023	09:49:27	470	202.12.95.98	GET	/FYPJ_Video_1.mp4	304	-
8	22/3/2023	09:49:28	470	202.12.95.98	GET	/FYPJ_Video_1.mp4	304	https://d2qeufs9waejey.cloudfront.net/FYPJ_Video_1.mp4
9	22/3/2023	09:55:43	470	202.12.95.98	GET	/FYPJ_Video_1.mp4	304	-
10	22/3/2023	09:55:44	470	202.12.95.98	GET	/FYPJ_Video_1.mp4	304	https://d2qeufs9waejey.cloudfront.net/FYPJ_Video_1.mp4
11	23/3/2023	07:12:58	332	202.12.95.239	GET	/FYPJ_Video_1.mp4	304	-
12	23/3/2023	07:12:59	331	202.12.95.239	GET	/FYPJ_Video_1.mp4	304	https://d2qeufs9waejey.cloudfront.net/FYPJ_Video_1.mp4
13	23/3/2023	08:46:03	470	202.12.95.98	GET	/FYPJ_Video_1.mp4	304	-
14	23/3/2023	08:46:04	470	202.12.95.98	GET	/FYPJ_Video_1.mp4	304	https://d2qeufs9waejey.cloudfront.net/FYPJ_Video_1.mp4
15	23/3/2023	09:13:22	470	202.12.95.98	GET	/FYPJ_Video_1.mp4	304	-
16	23/3/2023	09:13:23	470	202.12.95.98	GET	/FYPJ_Video_1.mp4	304	https://d2qeufs9waejey.cloudfront.net/FYPJ_Video_1.mp4
17	23/3/2023	09:35:16	470	202.12.95.98	GET	/FYPJ_Video_1.mp4	304	-
18	23/3/2023	09:35:16	470	202.12.95.98	GET	/FYPJ_Video_1.mp4	304	https://d2qeufs9waejey.cloudfront.net/FYPJ_Video_1.mp4
19	27/3/2023	03:05:20	332	202.12.95.239	GET	/FYPJ_Video_1.mp4	304	-
20	27/3/2023	03:05:21	331	202.12.95.239	GET	/FYPJ_Video_1.mp4	304	https://d2qeufs9waejey.cloudfront.net/FYPJ_Video_1.mp4
21	28/3/2023	08:06:58	2510552	202.12.94.240	GET	/FYPJ_Video_1.mp4	200	-
22	28/3/2023	08:06:59	50201	202.12.95.98	GET	/FYPJ_Video_1.mp4	206	https://d2qeufs9waejey.cloudfront.net/FYPJ_Video_1.mp4
23	28/3/2023	08:06:59	116988	202.12.94.240	GET	/FYPJ_Video_1.mp4	206	https://d2qeufs9waejey.cloudfront.net/FYPJ_Video_1.mp4
24	28/3/2023	08:06:59	2341797	202.12.95.98	GET	/FYPJ_Video_1.mp4	206	https://d2qeufs9waejey.cloudfront.net/FYPJ_Video_1.mp4
25	28/3/2023	08:06:59	50202	202.12.95.98	GET	/FYPJ_Video_1.mp4	206	https://d2qeufs9waejey.cloudfront.net/FYPJ_Video_1.mp4
26	3/4/2023	01:13:33	2510552	202.12.95.239	GET	/FYPJ_Video_1.mp4	200	-
27	3/4/2023	01:13:34	677862	202.12.95.98	GET	/FYPJ_Video_1.mp4	206	-
28	3/4/2023	01:13:34	470	202.12.95.98	GET	/FYPJ_Video_1.mp4	304	-
29	3/4/2023	01:13:34	976503	202.12.95.98	GET	/FYPJ_Video_1.mp4	206	https://d2qeufs9waejey.cloudfront.net/FYPJ_Video_1.mp4
30	3/4/2023	01:13:34	50231	202.12.95.98	GET	/FYPJ_Video_1.mp4	206	https://d2qeufs9waejey.cloudfront.net/FYPJ_Video_1.mp4
31	3/4/2023	01:13:34	470	202.12.95.98	GET	/FYPJ_Video_1.mp4	304	https://d2qeufs9waejey.cloudfront.net/FYPJ_Video_1.mp4
32	3/4/2023	01:13:34	2510753	202.12.95.239	GET	/FYPJ_Video_1.mp4	206	https://d2qeufs9waejey.cloudfront.net/FYPJ_Video_1.mp4
33	3/4/2023	01:13:35	446	202.12.95.98	GET	/FYPJ_Video_1.mp4	304	-
34	3/4/2023	01:16:08	312	202.12.95.239	GET	/FYPJ_Video_1.mp4	304	-
35	3/4/2023	01:16:09	1080	202.12.95.98	GET	/FYPJ_Video_1.mp4	206	https://d2qeufs9waejey.cloudfront.net/FYPJ_Video_1.mp4
36	3/4/2023	01:16:09	517	202.12.95.98	GET	/FYPJ_Video_1.mp4	304	https://d2qeufs9waejey.cloudfront.net/FYPJ_Video_1.mp4
37	3/4/2023	01:24:47	471	202.12.95.98	GET	/FYPJ_Video_1.mp4	304	https://d2qeufs9waejey.cloudfront.net/FYPJ_Video_1.mp4

Conclusion for Sprint 3

Difficulty in querying and cleaning data
(Can just use Athena or S3 Dashboard)

Not enough data
(Not enough requests in data to perform analysis)

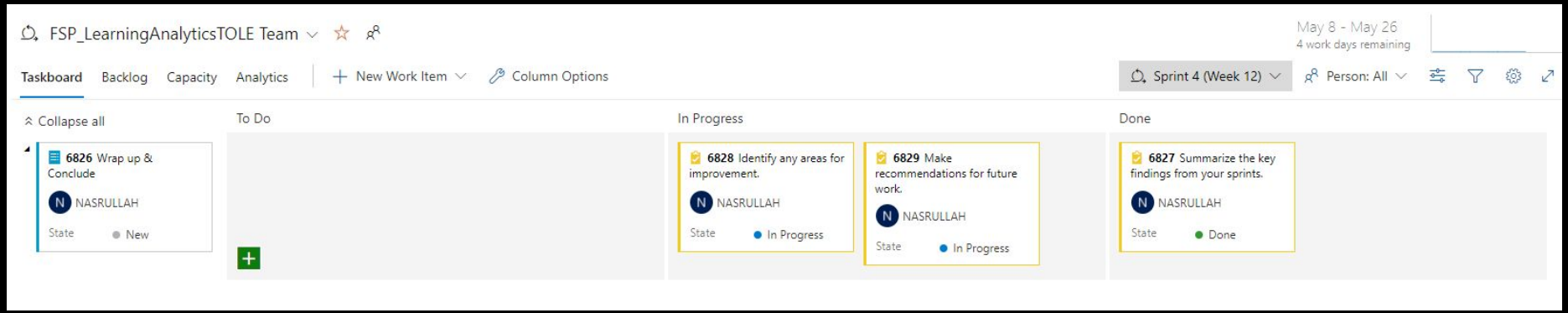
Inability to collect key metrics
(Cannot use SQL queries like athena to query and create tables)

SPRINT 4
(8 May - 26 May)
WRAP UP & CONCLUDE

Objectives

- Summarize the key findings from your sprints and identify any areas for improvement.
- Make recommendations for future work based on your findings and areas for improvement.

Sprint 4 Schedule



Mentimeter Downsides

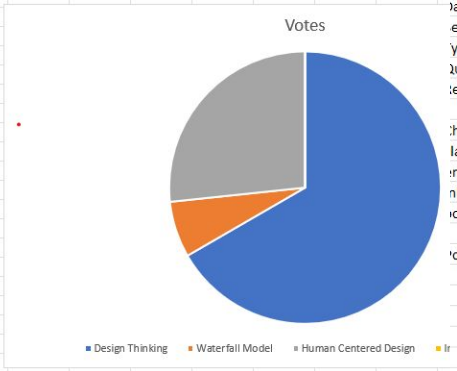
- Data exported from sessions are structured **poorly**, layout and design is **messy** at best.
- Student engagement during sessions are **lacking**.
- With a lack of engagement, commitment to any Mentimeter sessions **decreases** to almost a negligent rate.
- There is no guarantee of students **cheating** through copying of answers.
- Sessions are well designed to look **attractive** but no original use cases.
- **Complicated** to use, there are better alternatives (Slido/Kahoot)

Unstructured Data

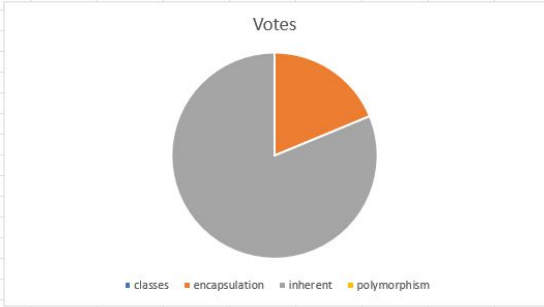
Question 1			
Date	2023-01-17		
Session	4		
Type	quiz		
Question	What methodology should you use to create innovative and human-centric applications to solve real life problems?		
Respondents	15		
Choices	**Votes**	**Correct answer**	
Design Thinking	10	True	
Waterfall Model	1	False	
Human Centered Design	4	False	
Interaction Design	0	False	
Position	**Name**	**Emoji**	**Score**
1	ana's mother	:fire:	957
2	Magical Rhino	:unicorn_face:	942
3	早上好中国 现在我有冰淇淋	:volcano:	937
4	mr kck	:watermelon:	929
5	jun hao	:the_horns:	928
6	bbbbbbbbbbbbbbbbbbbbnbbbb	:crocodile:	919
7	Rohanaldo SIUUUUUU	:crown:	916
8	asyks father	:crab:	913
9	Black bick	:flag-se:	887
10	I'm not here	:angel:	559
11	ben dover	:four_leaf_clover:	0
12	chooongster	:ghost:	0
13	Tigerbaby	:tiger2:	0
14	Tigermommy	:snowflake:	0
15	D	:articulated_lorry:	0

Attempt for Structure

Question 1			
Date	########		
Session	4		
Type	quiz		
Question	What methodology should you use to create innovative and human-centric applications to solve real life problems?		
Responde	15		
Choices	Votes	Correct answer	
Design Th	10	TRUE	
Waterfall	1	FALSE	
Human Ce	4	FALSE	
Interactio	0	FALSE	
Position	Name	Emoji	Score
1	ana's motl	:fire:	957
2	Magical Rl	:unicorn_f	942
3	????? ???	:volcano:	937
4	mr kck	:waterme	929
5	jun hao	:the_horn	928
6	bbbbbbbb	:crocodile	919
7	Rohanald	:crown:	916
8	asyks fath	:crab:	913
9	Black bick	:flag-se:	887
10	I'm not he	:angel:	559
11	ben dover	:four_leaf	0
12	chooongs	:ghost:	0
13	Tigerbaby	:tiger2:	0
14	Tigermom	:snowflak	0
15	D	:articulate	0

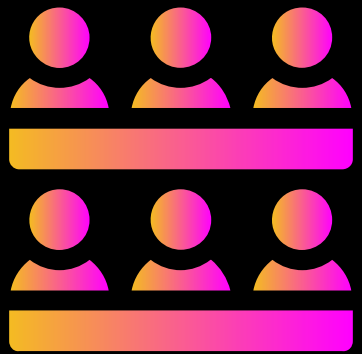


Question 11			
Date	########		
Session	4		
Type	quiz		
Question	The following is not related to object-oriented programming in software development		
Responde	16		
Choices	Votes	Correct answer	
lasses	0	FALSE	
ncapsula	3	FALSE	
nherent	13	TRUE	
olymorp	0	FALSE	
osition	Name	Emoji	Score
1	ana's motl	:fire:	5559
2	bbbbbbbb	:crocodile	5401
3	mr kck	:waterme	5235
4	????? ???	:volcano:	4682
5	Rohanald	:crown:	4672
6	jun hao	:the_horn	4617
7	Magical Rl	:unicorn_f	4609
8	issac	:penguin:	4600
9	asyks fath	:crab:	4502
10	Black bick	:flag-se:	4445
11	I'm not he	:angel:	4219
12	Tigerbaby	:tiger2:	3638
13	ben dover	:four_leaf	3518
14	Tigermom	:snowflak	3517
15	D	:articulate	2733
16	chooongs	:ghost:	1818



Conclusion for Sprint 4

Business intelligence (BI) tools can be used to help track and measure student engagement in online learning.



BI tools can be used to collect data from a variety of sources, such as Mentimeter & learning objects (Videos), and then analyze this data to identify trends and patterns.

This information can then be used to improve the online learning experience for students.

The Importance for this FYPJ

Potential Deployment

- **Real-life scenarios,** good case studies for data analysis, learning analytics and visualisation-related teaching modules
- **Developing online quizzes** and can be adapted and reused as formative assessment of future teaching modules
- **Empirical research** can also be conducted by combining both data analytics approach and the quantitative/qualitative survey approaches to measure online learning engagement

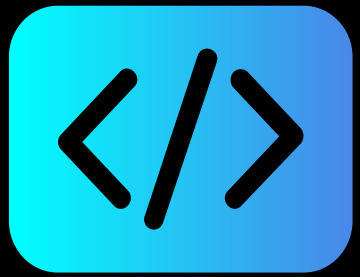
What I learnt

- **Hands-on experience** deploying learning objects (videos, storyline content) to the web using AWS
- **Practical experience** acquiring requirements, user testing, and implementing e-quizzes via Mentimeter cloud-based gamification tools for formative assessment
- **Develop competencies** in designing and creating interesting visualisation by using many different colours, and adding learning objects in the quizzes
- **Understanding** and **extracting** learning analytics (collection, cleaning, transformation, and modelling) from various online environments

Challenges for Sprint 3-4

Data Issues

Very hard to find resources to structure data accordingly



Technical challenges

Searching everywhere for resources and tutorials for PowerBI & AWS and for Mentimeter

Mentimeter

Mentimeter is a bad source of data as it is unstructured. It is better to view it on the web

Thank You
Any Questions?