AQUATIC INSIGHTS: COGNOS-POWERED WATER PORTABILITY ANALYSIS

NAAN MUDHALVAN

PROJECT REPORT

Submitted By

MUGIL VENDHAN G	**(611220104090)**
POMMI SUJITHA E	**(611220104104)**
PREETHI M	**(611220104109)**
PRINCY M	**(611220104110)**

in partial fulfilment for the award of the

degree of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

KNOWLEDGE INSTITUTE OF TECHNOLOGY,

SALEM-637504

ANNA UNIVERSITY::CHENNAI 600 025

OCTOBER 2023

AQUATIC INSIGHTS: COGNOS-POWERED WATER PORTABILITY ANALYSIS

NAAN MUDHALVAN

PROJECT REPORT

Submitted By

MUGIL VENDHAN G	**(611220104090)**
POMMI SUJITHA E	**(611220104104)**
PREETHI M	**(611220104109)**
PRINCY M	**(611220104110)**

in partial fulfilment for the award of the

degree of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

KNOWLEDGE INSTITUTE OF TECHNOLOGY,

SALEM-637504

ANNA UNIVERSITY::CHENNAI 600 025

OCTOBER 2023

BONAFIDE CERTIFICATE

Certified that this project report titled **"AQUATIC INSIGHTS: COGNOS POWERED WATER PORTABILITY ANALYSIS"** is the bonafide work of **"MUGIL VENDHAN G (611220104090), POMMI SUJITHA E (611220104104), PREETHI M (611220104109), PRINCY M (611220104114)"** who carried out the project work under my supervision.

SIGNATURE	**SIGNATURE**
Dr. V. KUMAR M.E., Ph.D.,	Mr.J.MURUGESAN ,B.E.,M.E.
HEAD OF THE DEPARTMENT	**FACULTY MENTOR**
PROFESSOR	**ASSISTANT PROFESSOR**
Department of Computer Science	Department of Information Technology
and Engineering,	and Engineering,
Knowledge Institute of Technology,	Knowledge Institute of Technology,
Kakapalayam,	Kakapalayam,
Salem- 637 504.	Salem- 637 504.

---------- ----------

SPOC **HEAD OF THE DEPARTMENT**

ACKNOWLEDGEMENT

At the outset, we express our heartfelt gratitude to **GOD,** who has been our strength to bring this project to light.

At this pleasing moment of having successfully completed our project, we wish to convey our sincere thanks and gratitude to our beloved president **Mr.C.Balakrishnan,** who has provided all the facilities to us.

We would like to convey our sincere thanks to our beloved Principal **Dr.PSS.Srinivasan,** for forwarding us to do our project and offering adequateduration in completing our project.

We express our sincere thanks to our Head of the Department **Dr.V.Kumar,** Department of Computer Science and Engineering for fostering the excellent academic climate in the Department.

We express our pronounced sense of thanks with deepest respect and gratitude to our Faculty Mentor **Mr.J.Murugesan** ,Department of Information Technology for their valuable and precious guidance and for having amicable relation.

With deep sense of gratitude, we extend our earnest and sincere thanks to our SPOC **Mr.T. Karthikeyan,** Assistant Professor, Department of Computer Science and Engineering for his guidance and encouragement during this project.

We would also like express our thanks to all the faculty members of our Department, friends and students who helped us directly and indirectly in all aspects of the project work to get completed successfully.

TABLE OF CONTENTS

ABSTRACT

ABSTRACT

The "AQUATIC INSIGHTS" project aims to revolutionize water portability analysis through the integration of IBM Cognos, a powerful business intelligence and data analytics platform. Access to clean and safe drinking water is a fundamental human right, and ensuring water quality is essential to public health and environmental sustainability. Traditional methods for monitoring water quality are often time-consuming and require extensive manual labor. To address these challenges, our project leverages the advanced capabilities of IBM Cognos to create a data-driven solution for efficient and accurate water portability analysis. The project encompasses the development of a comprehensive data management system that collects real-time water quality data from various sources, including sensors, laboratories, and remote monitoring stations. This data is stored, processed, and visualized using IBM Cognos, enabling stakeholders to gain deep insights into water quality, identify trends, and make decisions

LIST OF FIGURES

LIST OF ABBREVIATIONS

ABBREVIATION	EXPANSION
CSV	Comma-Separated Values
OTP	One-Time Password
CGPA	Cumulative Grade Point Average
ERP	Enterprise Resource Planning
SAT	Scholastic Assessment Test

INTRODUCTION

CHAPTER – 1

INTRODUCTION

1.1 PROJECT OVERVIEW

"Aquatic Insights: Cognos-Powered Water Portability Analysis" is a cutting-edge project aiming to enhance the assessment and management of water quality and portability. Leveraging IBM Cognos analytics, it will collect and analyse real-time data from aquatic sources, providing valuable insights to improve water quality, availability, and safety. This project addresses critical environmental and public health issues, making informed decisions for sustainable water resource management.

1.2 PURPOSE

The purpose of this project is to utilize data analysis and predictive modelling techniques to gain a deeper understanding of the factors that influence water portability analysis. The purpose of Aquatic Insights: Cognos-Powered Water Portability Analysis is to leverage advanced data analytics and IBM Cognos software to assess and optimize the quality, safety, and availability of water resources. This solution aids in informed decision-making for managing water systems, ensuring potable water access, and mitigating environmental impacts. By harnessing data-driven insights, it empowers stakeholders to enhance water portability, reduce waste, and safeguard water resources, benefiting both communities and ecosystems.

LITERATURE SURVEY

CHAPTER – 2

LITERATURE SURVEY

1) WATER ANALYTICS EMERGING CONTAMINANTS AND CURRENT ISSUES LITERATURE SURVEY (2011 BY SUSAN D. RICHARDSON AND THOMAS A. TERNES)

Placement of students in appropriate jobs is very important to college recruitment or placement committee of a university. It is crucial to identify parameters and discover trends that improve a student's chances of getting a suitable job. The placement team selects students based on company criteria like education history and CGPA. After that the students have to clear the company's evaluation levels, namely aptitude, technical and personal interview to get the job. To identify key roles and factors that enable a student to successfully navigate this process. This would provide insight into improving the overall placement process and highlight areas that need attention. In this study, we have analyzed historical placement data from 2014 to 2016 to infer relevance of placement techniques and trends in recruitment over the years. We have also employed an alumni survey to gauge the relevance of college curriculum to the current job of the alumnus.

2.2 STATE-OF-THE-ART LAB CHIP SENSORS FOR ENVIRONMENTAL WATER MONITORING (2011 BY AM JANG, ZHIWEI ZOU, KANG KUG LEE)

A literature survey on state-of-the-art lab chip sensors for environmental water monitoring provides a comprehensive overview of cutting-edge technologies and research in the field of water quality analysis. Lab chip sensors, miniature analytical devices, have emerged as powerful tools in the monitoring and assessment of environmental water quality. These sensors, built on various analytical techniques, including spectroscopy, electrochemistry, and microfluidics, offer numerous advantages such as portability, rapid analysis, and precise detection capabilities.

2.3. WATER QUALITY ASSESSMENT OF PONDS AROUND TWO CEMENT FACTORIES IN ASSAM, INDIA (2016)

Water is one of the most indispensable resources and is the elixir of life. Water constitutes about 70% of the body weight of almost all living organism1.Fresh water has a great role in sustenance of life of human beings, other organisms of the environment and maintaining the balance of nature. Water resources are being used by human being for various purposes like agriculture, industries, hydropower, fisheries and recreational uses2. Freshwater is a very limited resource and makes up less than 2.8% of the water supply and

water is a wonderful chemical medium which has unique properties of dissolving and carrying in suspension, huge varieties of chemicals. Thus it gets contaminated easily and if water is focally polluted it spreads diseases in consumers to a great number of people.

2.4 VISUALIZATION AND VISUAL ANALYTICS APPLICATIONS IN WATER INSIGHTS (2015 BY CHONG H. AHN AND PAUL L. BISHOP)

Recent advances in information, communication, and environmental monitoring technologies have increased the availability, spatiotemporal resolution, and quality of water-related data, thereby leading to the emergence of many innovative big data applications. Among these applications, visualization and visual analytics, also known as the visual computing techniques, empower the synergy of computational methods (e.g., machine learning and statistical models) with human reasoning to improve the understanding and solution toward complex science and engineering problems. These approaches are frequently integrated with geographic information systems and cyber infrastructure to provide new opportunities and methods for enhancing water resources management.

IDEATION & PROPOSED SOLUTION

CHAPTER - 3

IDEATION & PROPOSED SOLUTION

3.1 PROBLEM STATEMENT DEFINITION

Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which Makes me feel
PS-1	I am a customer	drinking water crisis that appears	It takes long time to solve	It took too much time to solve.	Frustrated
PS-2	I am a Customer	drinking water crisis that appears	It takes long time to solve	It hard to buying drinking water	Annoying

3.2 EMPATHY MAP CANVAS

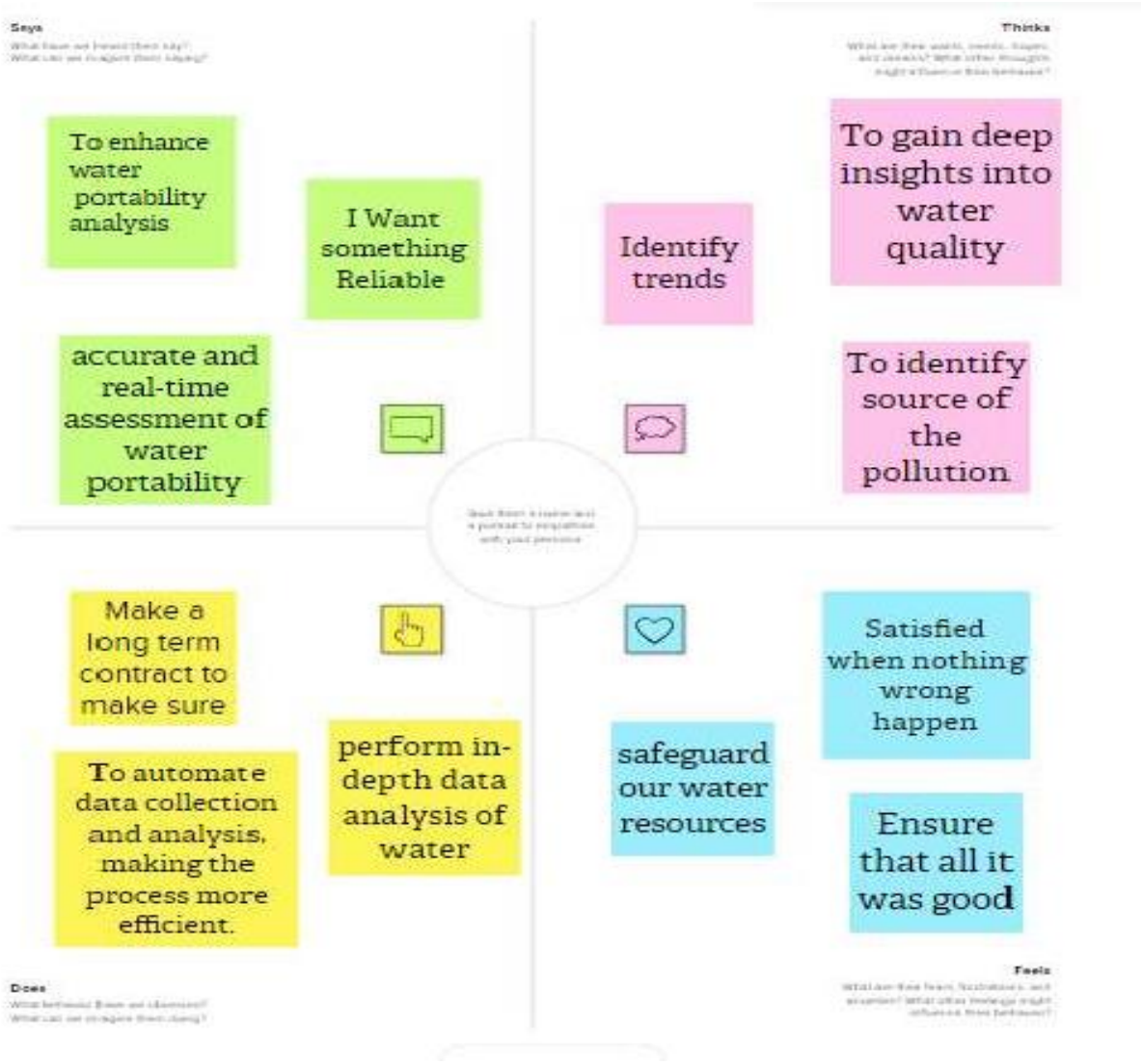


Fig.No. 3.2 EMPATHY MAP

3.3 IDEATION & BRAINSTORMING

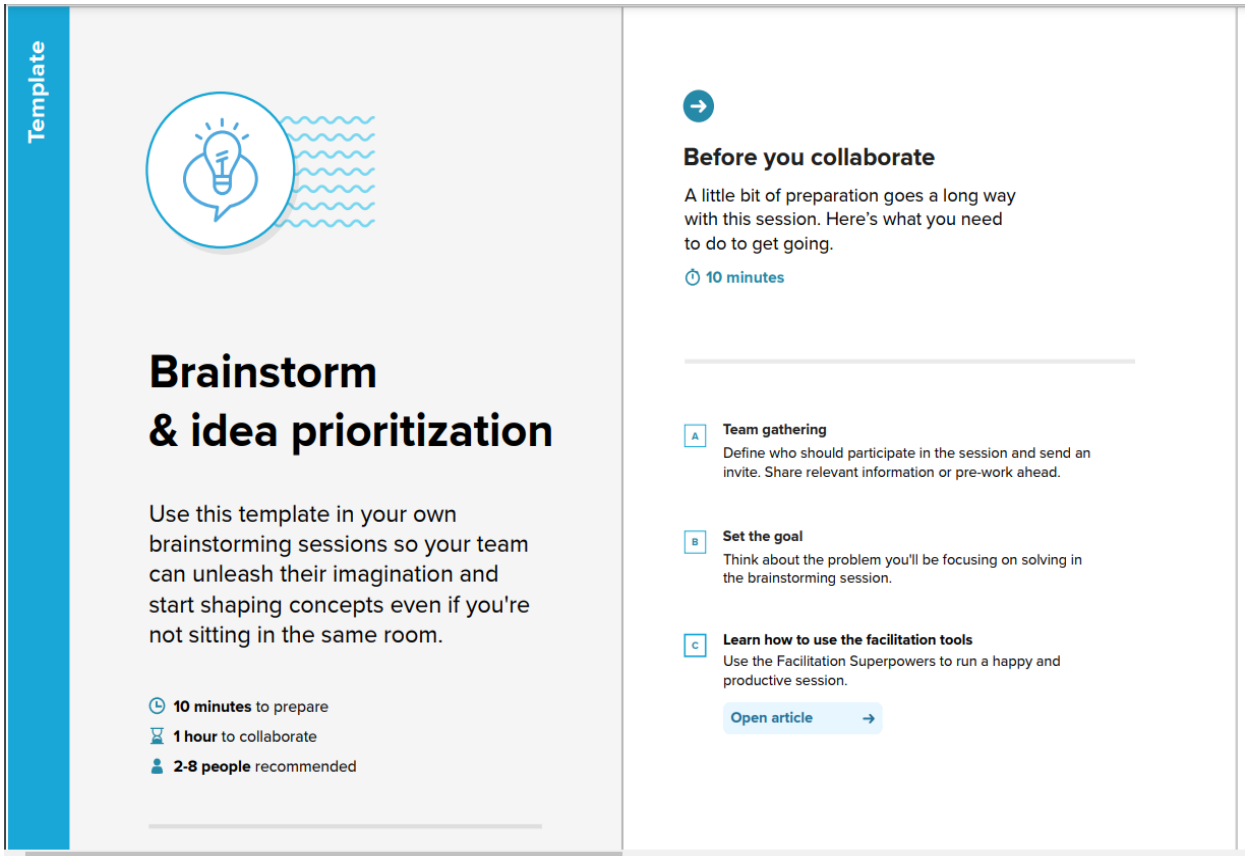


Fig. No. 3.3.1 BRAINSTROMING & IDEA PRIORITIZATION

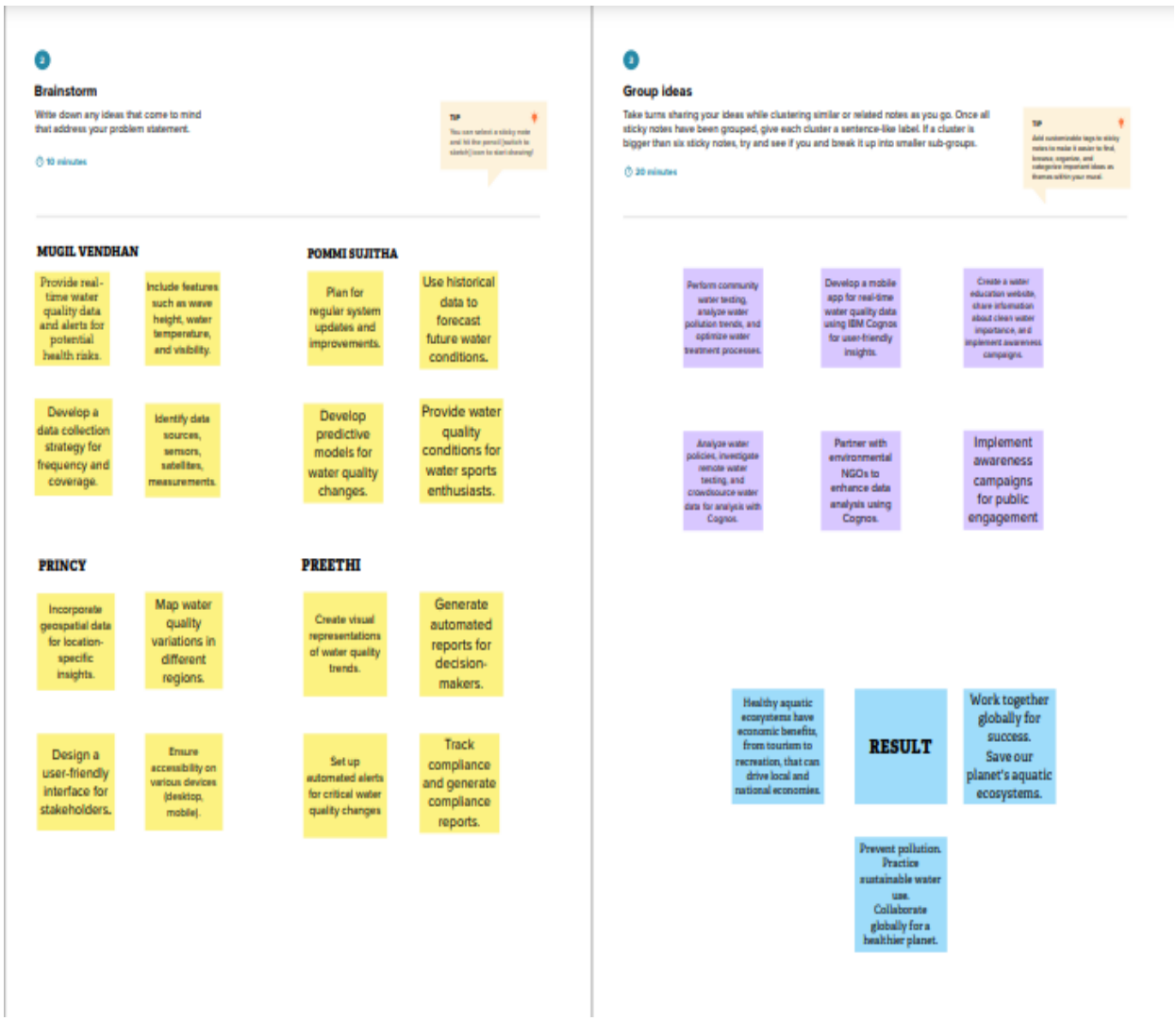


Fig. No. 3.3.2 BRAINSTROMING & IDEA PRIORITIZATION

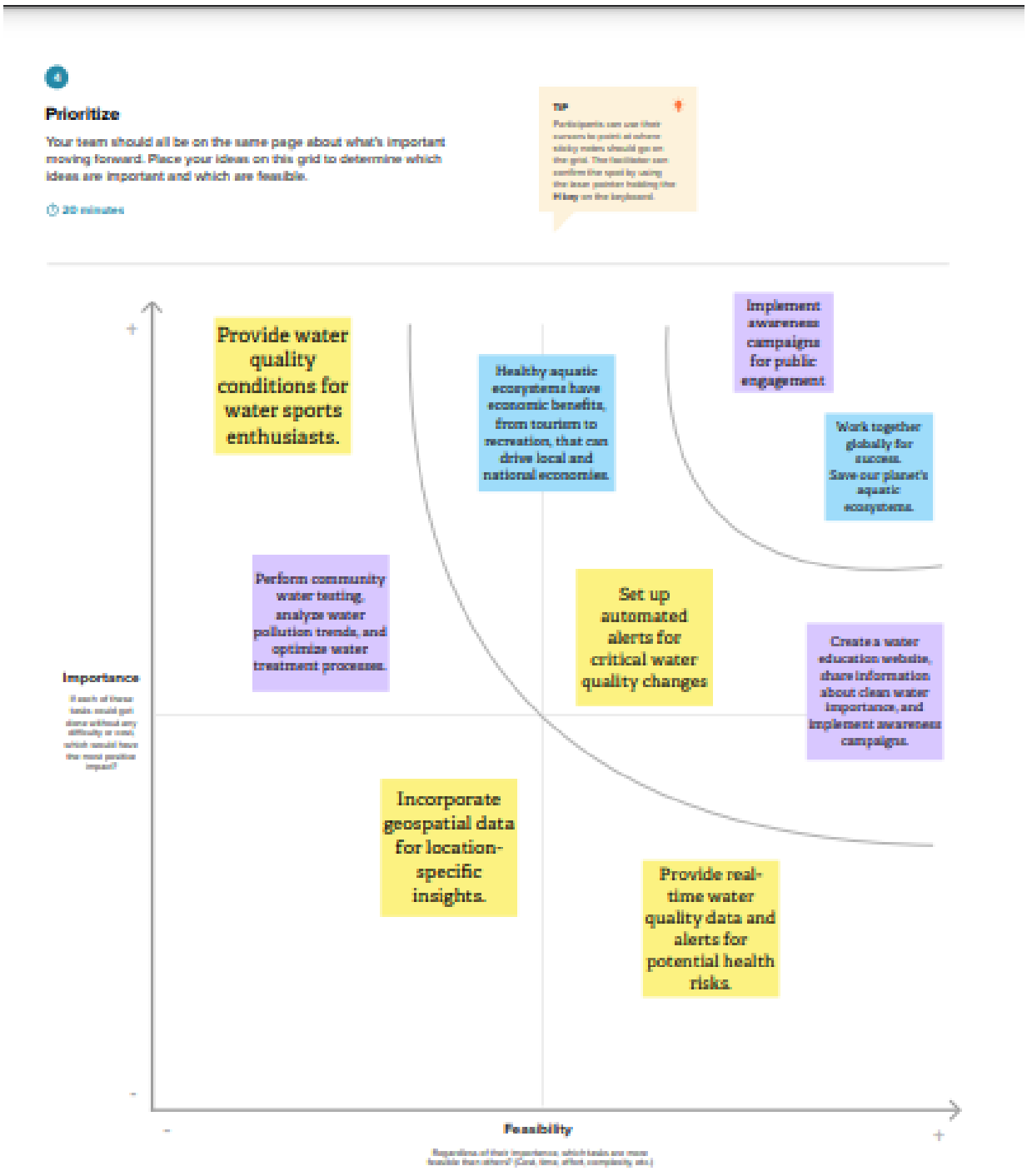


Fig. No. 3.3.3 BRAINSTROMING & IDEA PRIORITIZATION

3.4 PROPOSED SOLUTION

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	We all certainly know that there is a drinking water crisis that appears in many countries to the extent that many Countries buying drinking water and transport it through water tankers, and the crisis will be worsen in the future
2.	Idea / Solution description	To ensuring water quality is essential to public health and environmental sustainability
3.	Novelty / Uniqueness	This project will be done by all sources and Supported by all Versions of Windows.
4.	Social Impact / Customer Satisfaction	To perform in-depth data analysis, allowing for accurate and real-time assessment of water portability.
5.	Business Model (Revenue Model)	The technology to automate data collection and analysis, making the process more efficient.
6.	Scalability of the Solution	It working toward the provision of clean and safe drinking water, a fundamental human right.

REQUIREMENT ANALYSIS

CHAPTER - 4

REQUIREMENT ANALYSIS

4.1 FUNTIONAL REQUIREMENTS

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	**User login**	Login through website link
FR-2	**Login**	The user should login to the website of our project
FR-3	**Frames**	Cognos used to analyze dataset. Users must use valid credentials to log in to the system.
FR-4	**Dataset**	Upload dataset into the analytics tool.
FR-5	**Analysis**	It involves gathering all the information, processing it and exploring the data, then analysis the dataset for user output.

4.2 NON - FUNTIONAL REQUIREMENTS

NFR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	Resource optimization makes it accessible to all.
NFR-2	**Security**	Access to Dashboards/Templates is granted to anyone with the correct login credentials.
NFR-3	**Reliability**	Templates are dependable since we upload and access them via the cloud.
NFR-4	**Performance**	It exhibits top-tier performance and exceptional efficiency.
NFR-5	**Availability**	It is accessible to anyone interested in sales data at no charge.
NFR-6	**Scalability**	The dashboards and templates are highly scalable, allowing users to customize metrics at their discretion.

PROJECT DESIGN

CHAPTER - 5
PROJECT DESIGN

5.1 DATA FLOW DIAGRAMS

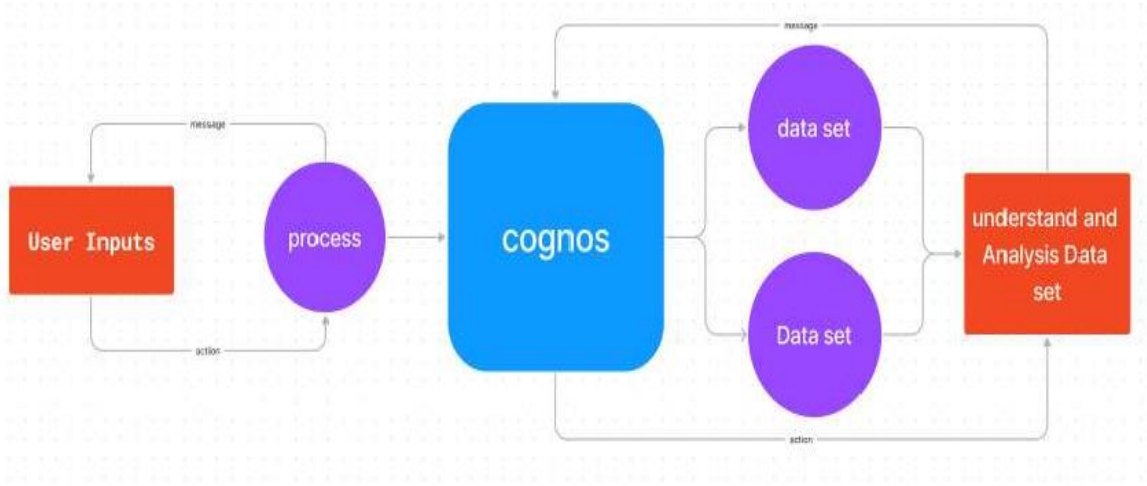


Fig. No. 5.1 DATA FLOW DIAGRAMS

5.2 SOLUTION & TECHNICAL ARCHITECTURE

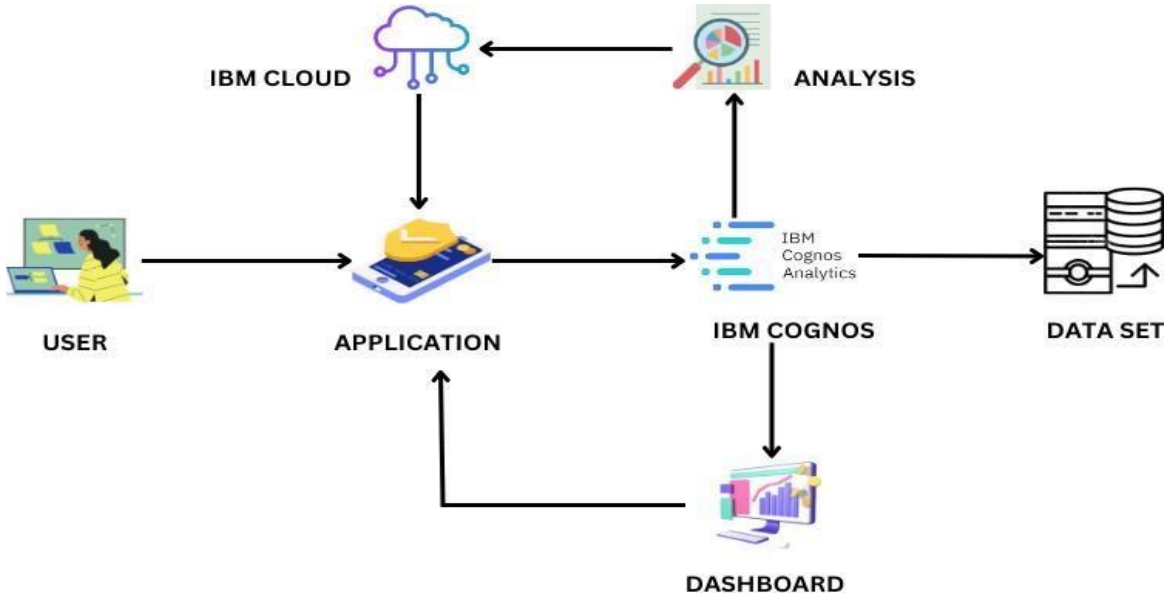


Fig. No. 5.2. SOLUTION ARCHITECTURE

5.3 USER STORIES

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Team Member
Customer (user)	login	USN-1	As a user, I can log into the application by entering my email & password	I can access my pass	High	Mugil Vendhan
	Dashboard	USN-2	I can see and upload the dataset	Cognos analysis	High	Pommi
Admin		USN-3	If the user already used the Cognos analytics, we can able to see the previously uploaded dataset		High	Preethi
Admin		USN-4	As an admin, I can access the dashboard other activities of the application	Access the dashboard	High	Princy

5.3.1 Components & Technologies

S. No.	Component	Description	Technology
1.	User Interface	How user interacts with application	HTML, CSS
2.	Application Logic-1	Logic for a process in the application	Python
3.	Application Logic-2	Logic for a process in the application	CSV
4.	Database	Data Type, Configurations etc.	MySQL
5.	File Storage	Dataset	Csv dataset file
6.	Outcome of analysis process	The user will see the visualization through display.	cognos

CODING & SOLUTIONING

CHAPTER - 6

CODING & SOLUTIONING

6.1 FEATURE 1

DASHBOARD

```
<!DOCTYPE html>
<html lang="en">

<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-
scale=1.0">
    <title>Aquatic insights</title>
    <link rel="stylesheet" href="styles.css">
    <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-
awesome/5.15.4/css/all.min.css">
</head>

<body>
    <header class="head">
        <a href="#" class="logo"><i class="fas fa-heart"></i> Aquatic
insights <i class="fas fa-heart"></i></a>
        <nav class="navbar ">
            <a href="#" class="active">Home</a>
            <a href="#dashboard">Dashboard</a>
            <a href="#story">Story</a>
```

```
            <a href="#report">Report</a>
            <a href="#contact">Contact</a>
        </nav>
        <div id="menu-bar"><i class="fas fa-bars"></i></div>
    </header>
<!DOCTYPE html>
<html lang="en">

<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-
scale=1.0">
    <title>Aquatic insights</title>
    <link rel="stylesheet" href="styles.css">
    <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-
awesome/5.15.4/css/all.min.css">
</head>

<body>
    <header class="head">
        <a href="#" class="logo"><i class="fas fa-heart"></i> Aquatic
insights <i class="fas fa-heart"></i></a>
        <nav class="navbar ">
            <a href="#" class="active">Home</a>
            <a href="#dashboard">Dashboard</a>
            <a href="#story">Story</a>
            <a href="#report">Report</a>
```

```
            <a href="#contact">Contact</a>
        </nav>
        <div id="menu-bar"><i class="fas fa-bars"></i></div>
    </header>
    <!--------------------------Home--------------------->
    <section class="home" id="home">
        <form action="#">
            <div class="search-box">
                <h1>AQUATIC INSIGHTS: COGNOS -POWERED WATER
PORTABILITY ANALYSIS</h1>
                <a href="#dashboard"><button class="btn" style="margin-right:
20px;">Dashboard</button></a>
                <a href="#story"><button class="btn" style="margin-right:
20px;">Story</button></a>
                <a href="#report"><button class="btn">Report</button></a>
            </div>
        </form>
    </section>
    <div class="wrapper">
        <div class="dashboard" id="dashboard">
            <div class="title" >
                <h1><span>D</span>ashboard</h1>
            </div>
             <iframe
src=”https://us1.ca.analytics.ibm.com/bi/?perspective=dashboard&id=i88DA
B0BD4EFE40EDA9B489857ABDF210&objRef=i88DAB0BD4EFE40EDA
9B489857ABDF210&options%5BdisableGlassPrefetch%5D=true&options
%5Bcollections%5D%5BcanvasExtension%5D%5Bid%5D=com.ibm.bi.das
```

hboard.canvasExtension&options%5Bcollections%5D%5BfeatureExtension%5D%5Bid%5D=com.ibm.bi.dashboard.core-features&options%5Bcollections%5D%5Bbuttons%5D%5Bid%5D=com.ibm.bi.dashboard.buttons&options%5Bcollections%5D%5Bwidget%5D%5Bid%5D=com.ibm.bi.dashboard.widgets&options%5Bcollections%5D%5BcontentFeatureExtension%5D%5Bid%5D=com.ibm.bi.dashboard.content-features&options%5Bcollections%5D%5BsaveServices%5D%5Bid%5D=com.ibm.bi.dashboard.saveServices&options%5Bcollections%5D%5Btemplates%5D%5Bid%5D=com.ibm.bi.dashboard.templates&options%5Bcollections%5D%5BvisualizationExtension%5D%5Bid%5D=com.ibm.bi.dashboard.visualizationExtensionCA&options%5Bcollections%5D%5BboardModel%5D%5Bid%5D=com.ibm.bi.dashboard.boardModelExtension&options%5Bcollections%5D%5BcontentTypes%5D%5Bid%5D=com.ibm.bi.dashboard.contentTypes&options%5Bcollections%5D%5BserviceExtension%5D%5Bid%5D=com.ibm.bi.dashboard.serviceExtension&options%5Bcollections%5D%5BlayoutExtension%5D%5Bid%5D=com.ibm.bi.dashboard.layoutExtension&options%5Bcollections%5D%5BcolorSetExtensions%5D%5Bid%5D=com.ibm.bi.dashboard.colorSetExtensions&options%5Bconfig%5D%5Bproduct%5D=CA&options%5Bconfig%5D%5BeditPropertiesLabel%5D=true&options%5Bconfig%5D%5BenableCustomVisualizations%5D=true&options%5Bconfig%5D%5BassetTags%5D%5B%5D=dashboard&options%5Bconfig%5D%5BfilterDock%5D=true&options%5Bconfig%5D%5BshowMembers%5D=true&options%5Bconfig%5D%5Bupgrades%5D=dashboard-core%2Fjs%2Fdashboard%2Fupgrades&options%5Bconfig%5D%5BassetType%5D=exploration&options%5Bconfig%5D%5BgeoService%5D=CA&options%5Bconfig%5D%5BsmartTitle%5D=true&options%5Bconfig%5D%5BnavigationGroupAction%5D=true&options%5Bconfig%5D%5BenableDataQuality%5D=false&options%5Bconfig%5D%5BmemberCalculation%5D

=false&isAuthoringMode=false&boardId=i88DAB0BD4EFE40EDA9B489857ABDF210” frameborder="0" gesture="media" allow="encrypted-media" allowfullscreen=""></iframe>

6.2 FEATURE 2

REPORT

```
<div class="wrapper">
<div class="report" id="report">
        <div class="title">
          <h1><span>R</span>eport</h1>
        </div>
         <iframe
src=”https://us1.ca.analytics.ibm.com/bi/?perspective=authoring&id=iD46AC20A1840426BA097CFC286C905B2&objRef=iD46AC20A1840426BA097CFC286C905B2&action=run&format=HTML&cmPropStr=%7B%22id%22%3A%22iD46AC20A1840426BA097CFC286C905B2%22%2C%22type%22%3A%22interactiveReport%22%2C%22defaultName%22%3A%22AQUATIC%20INSIGHTS_report%22%2C%22permissions%22%3A%5B%22execute%22%2C%22read%22%2C%22setPolicy%22%2C%22traverse%22%2C%22write%22%5D%7D” frameborder="0" gesture="media"
allow="encrypted-media" allowfullscreen=""></iframe>
</div>

 allowfullscreen=""></iframe>
     </div>
   </section><!-- End Your Report Se
```

6.3 FEATURE 3

STORY

```
<div class="story" id="story">
        <div class="title">
           <h1><span>S</span>tory</h1>
        </div>
<iframe
src=”https://us1.ca.analytics.ibm.com/bi/?perspective=story&id=i585902A6
BA114B258BB8CC2557BC8FE7&objRef=i585902A6BA114B258BB8CC
2557BC8FE7&options%5BdisableGlassPrefetch%5D=true&options%5Bcol
lections%5D%5BcanvasExtension%5D%5Bid%5D=com.ibm.bi.dashboard.c
anvasExtension&options%5Bcollections%5D%5BfeatureExtension%5D%5
Bid%5D=com.ibm.bi.dashboard.core-
features&options%5Bcollections%5D%5Bbuttons%5D%5Bid%5D=com.ib
m.bi.dashboard.buttons&options%5Bcollections%5D%5Bwidget%5D%5Bi
d%5D=com.ibm.bi.dashboard.widgets&options%5Bcollections%5D%5Bcon
tentFeatureExtension%5D%5Bid%5D=com.ibm.bi.dashboard.content-
features&options%5Bcollections%5D%5BsaveServices%5D%5Bid%5D=co
m.ibm.bi.dashboard.saveServices&options%5Bcollections%5D%5Btemplate
s%5D%5Bid%5D=com.ibm.bi.dashboard.templates&options%5Bcollections
%5D%5BvisualizationExtension%5D%5Bid%5D=com.ibm.bi.dashboard.vis
ualizationExtensionCA&options%5Bcollections%5D%5BboardModel%5D
%5Bid%5D=com.ibm.bi.dashboard.boardModelExtension&options%5Bcoll
ections%5D%5BcontentTypes%5D%5Bid%5D=com.ibm.bi.dashboard.cont
entTypes&options%5Bcollections%5D%5BserviceExtension%5D%5Bid%5
D=com.ibm.bi.dashboard.serviceExtension&options%5Bcollections%5D%5
BlayoutExtension%5D%5Bid%5D=com.ibm.bi.dashboard.layoutExtension
&options%5Bcollections%5D%5BcolorSetExtensions%5D%5Bid%5D=co
m.ibm.bi.dashboard.colorSetExtensions&options%5Bconfig%5D%5BliveW
```

idgetExtras%5D%5B%5D=reveal&options%5Bconfig%5D%5Bproduct%5D=CA&options%5Bconfig%5D%5BeditPropertiesLabel%5D=true&options%5Bconfig%5D%5BenableCustomVisualizations%5D=true&options%5Bconfig%5D%5BassetTags%5D%5B%5D=story&options%5Bconfig%5D%5BfilterDock%5D=true&options%5Bconfig%5D%5BshowMembers%5D=true&options%5Bconfig%5D%5Bupgrades%5D=dashboard-core%2Fjs%2Fdashboard%2Fupgrades&options%5Bconfig%5D%5BassetType%5D=exploration&options%5Bconfig%5D%5BgeoService%5D=CA&options%5Bconfig%5D%5BsmartTitle%5D=true&options%5Bconfig%5D%5BnavigationGroupAction%5D=true&options%5Bconfig%5D%5BenableDataQuality%5D=false&options%5Bconfig%5D%5BmemberCalculation%5D=false&isAuthoringMode=false&boardId=i585902A6BA114B258BB8CC2557BC8FE7&sceneId” frameborder="0" gesture="media" allow="encrypted-media" allowfullscreen=""></iframe>

</body></html>

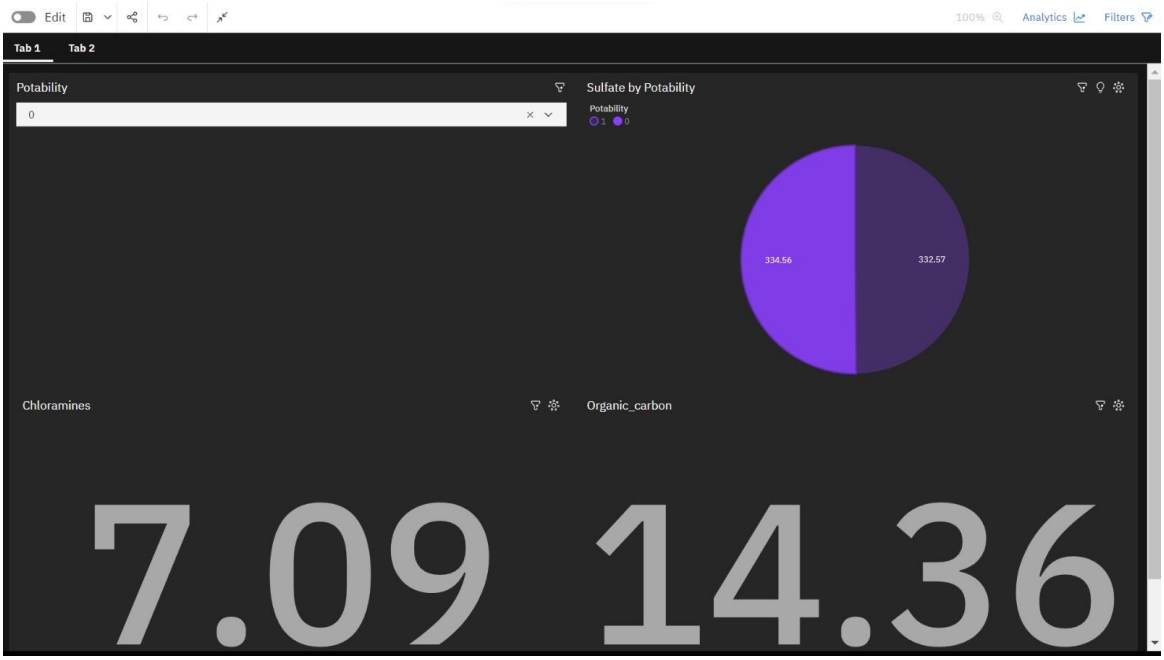
RESULTS

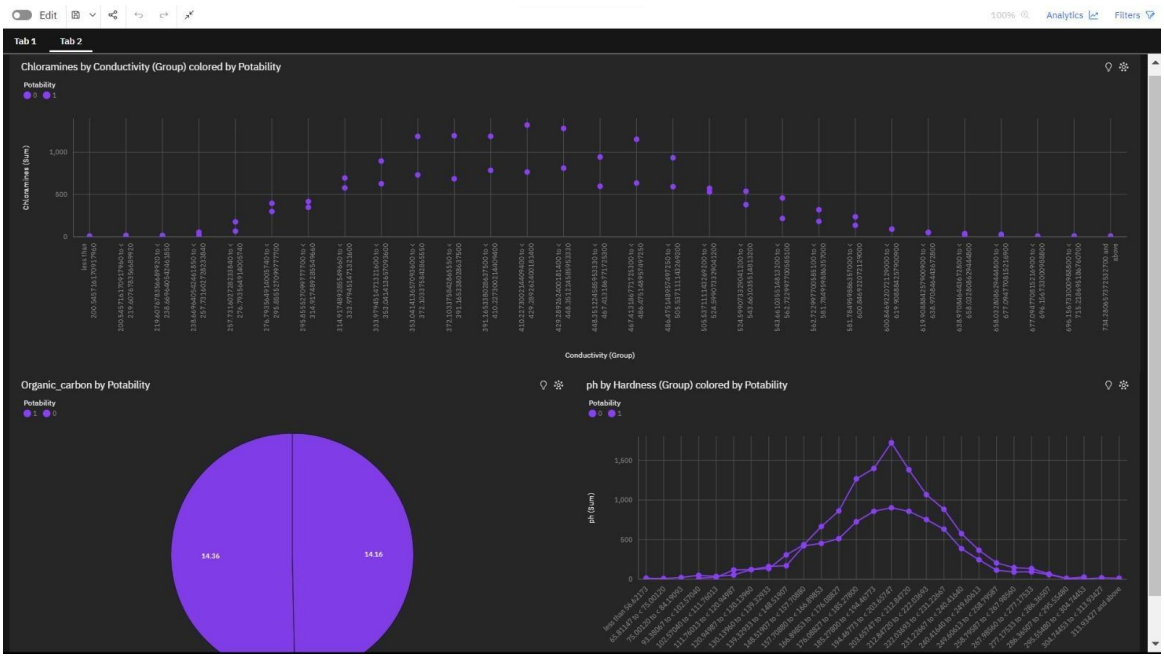
CHAPTER - 7
RESULTS

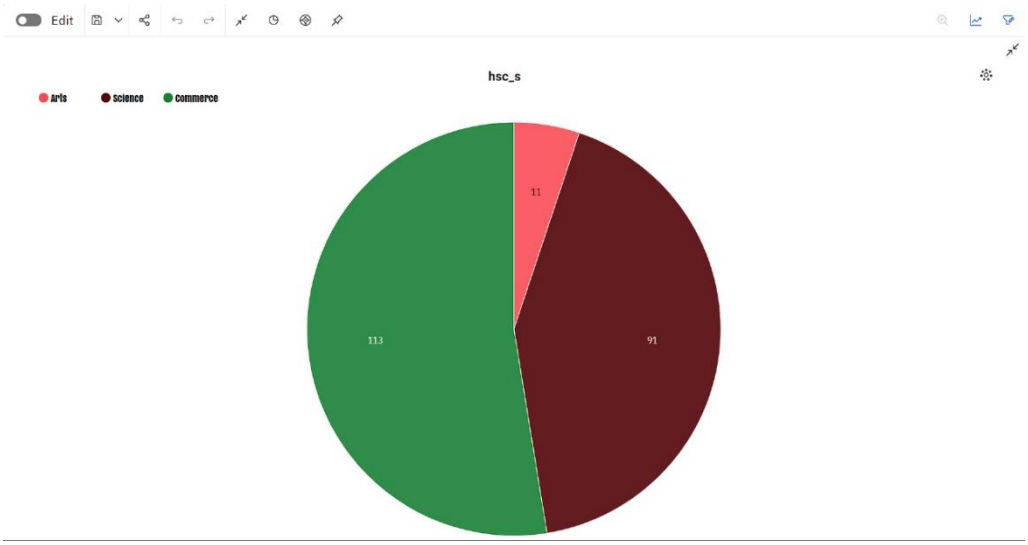
7.1 PERFORMANCE METRICS

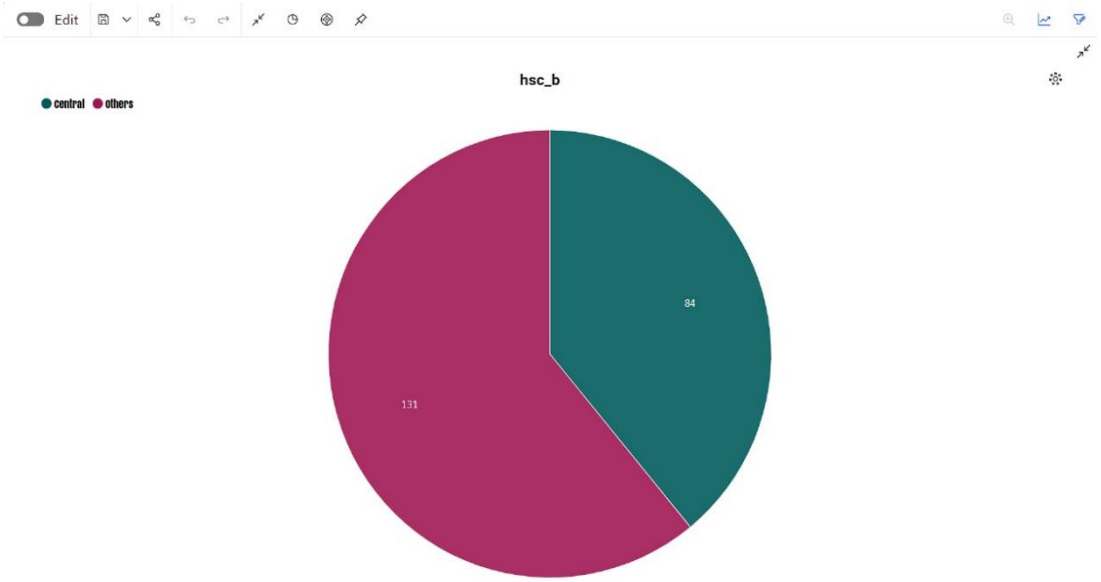
7.1.1 Utilization of Data Filters

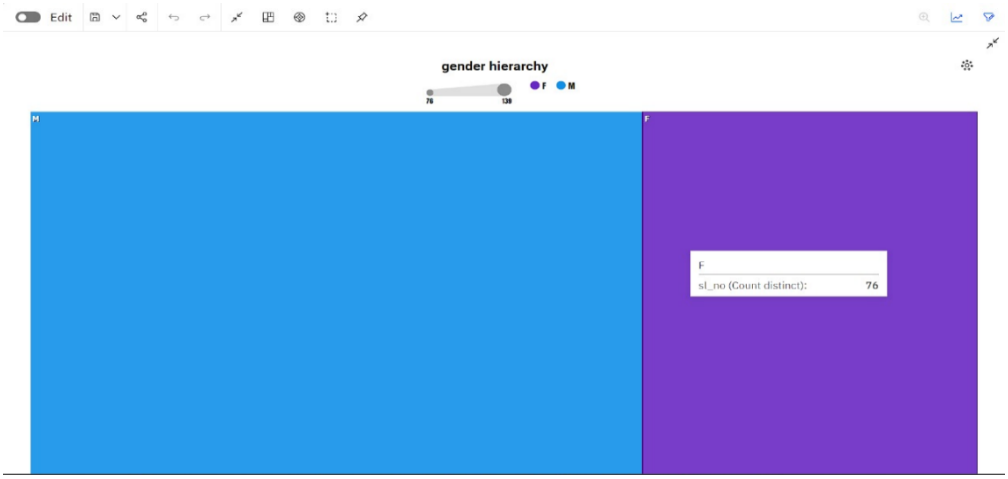
Dashboard

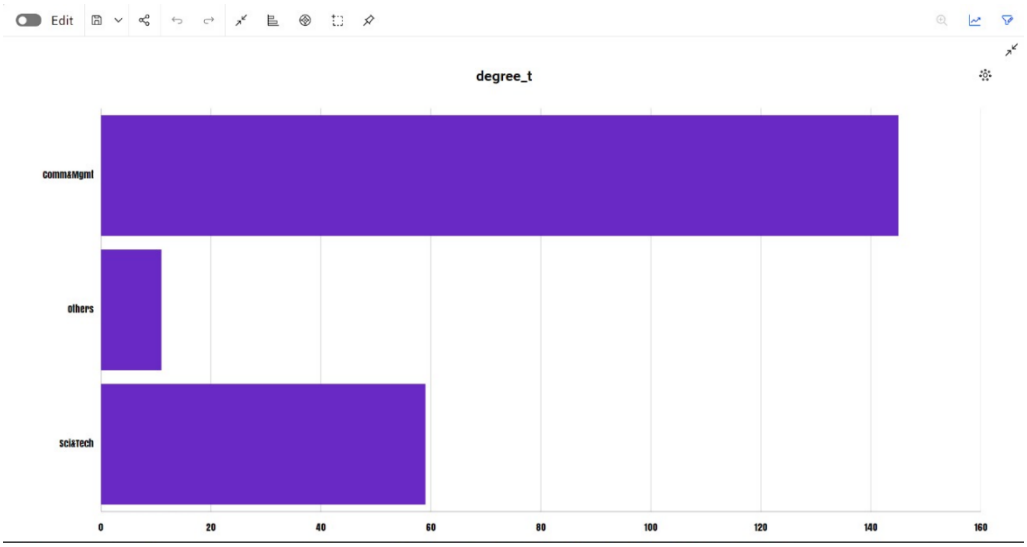


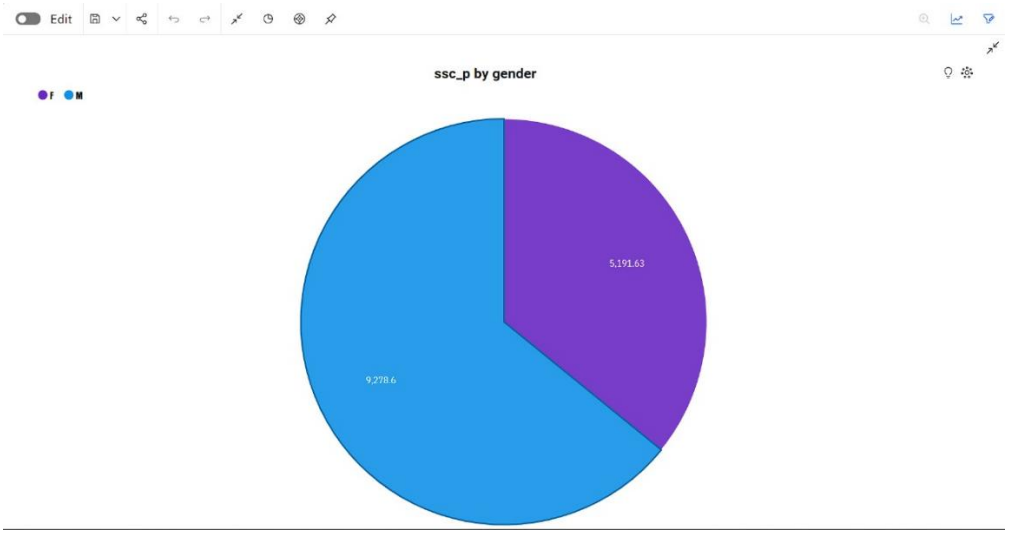


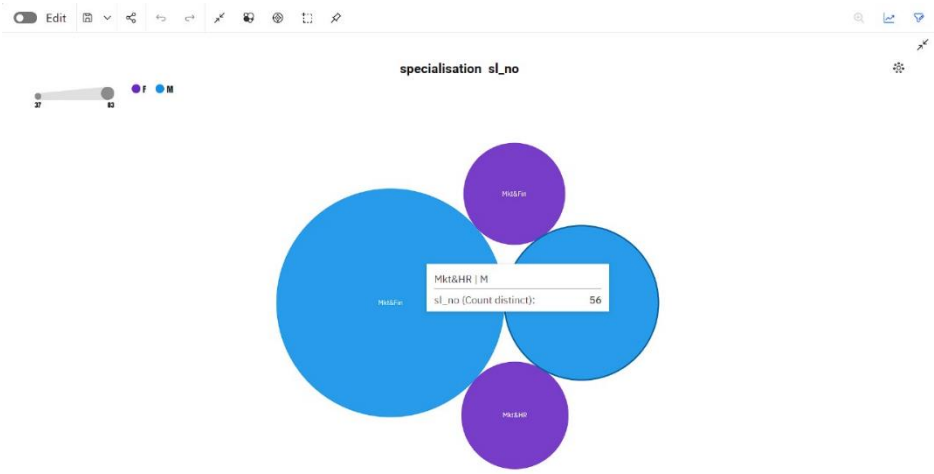

Edit
hsc_s
Arts
science
commerce
11
91
113


Edit
hsc_b
central
others
84
131

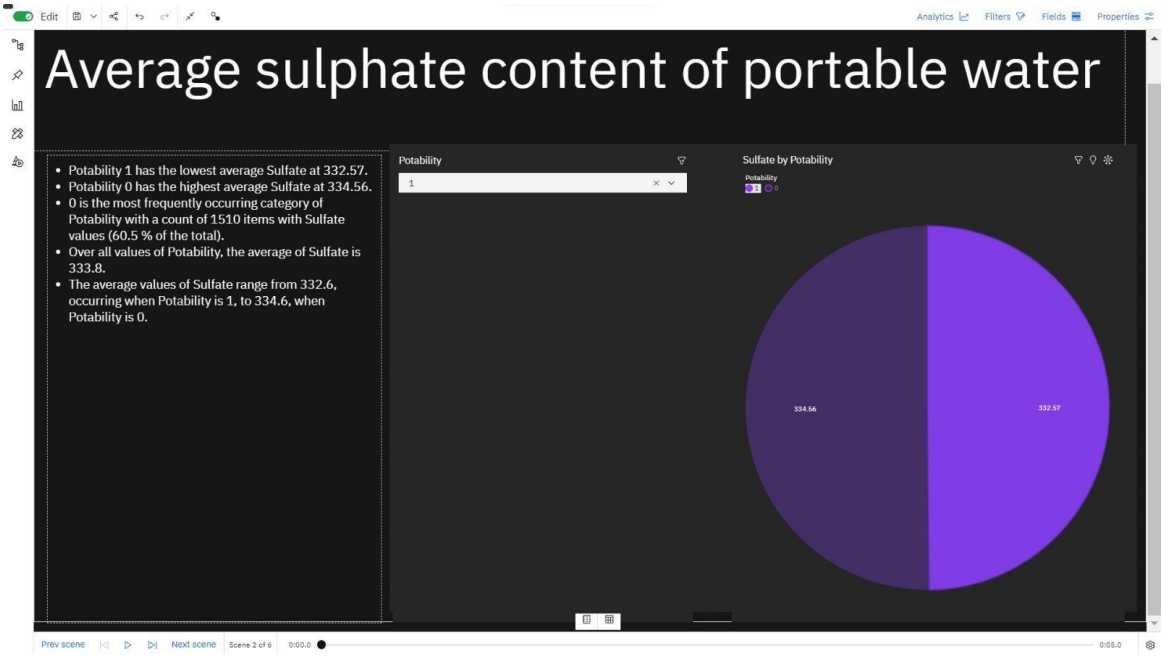

Edit
gender hierarchy
F
M
70
130
M
F
F
sl_no (Count distinct):
76

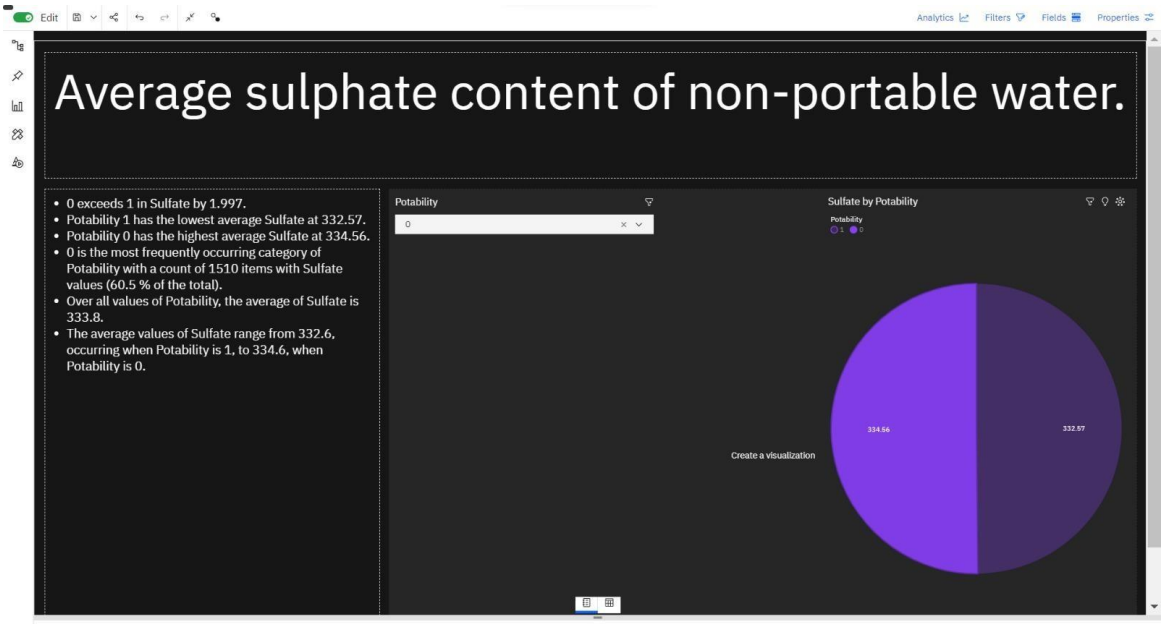

Edit
degree_t
comm&mgmt
others
sci&tech
0
20
40
60
80
100
120
140
160

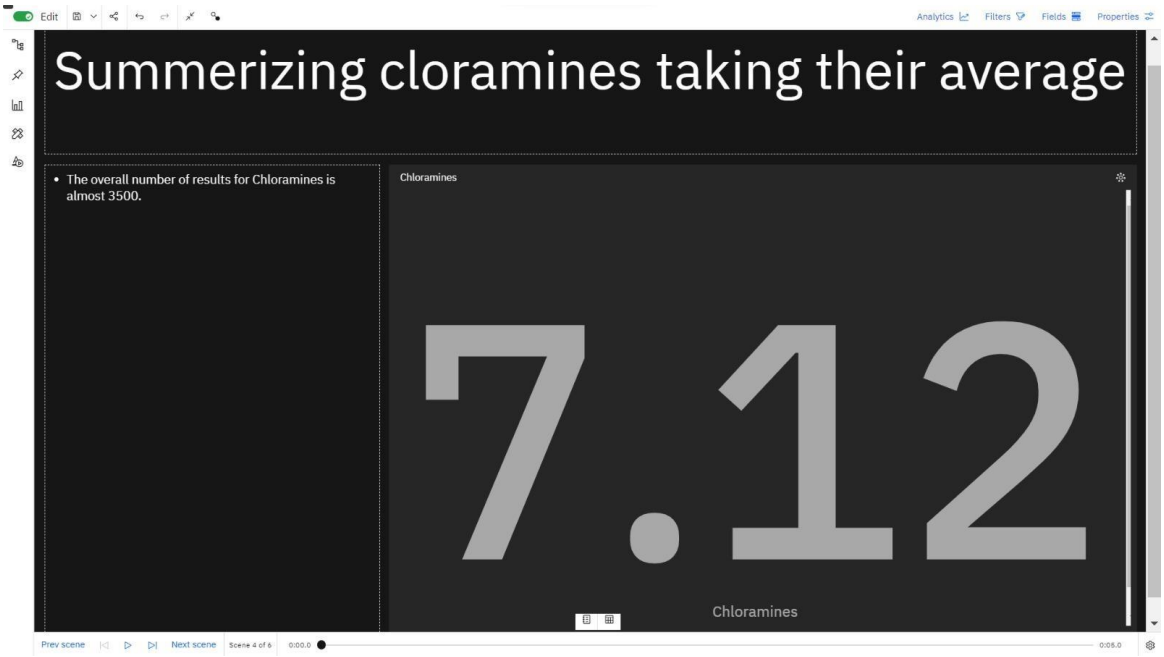

Edit
ssc_p by gender
F
M
5,191.63
9,278.6

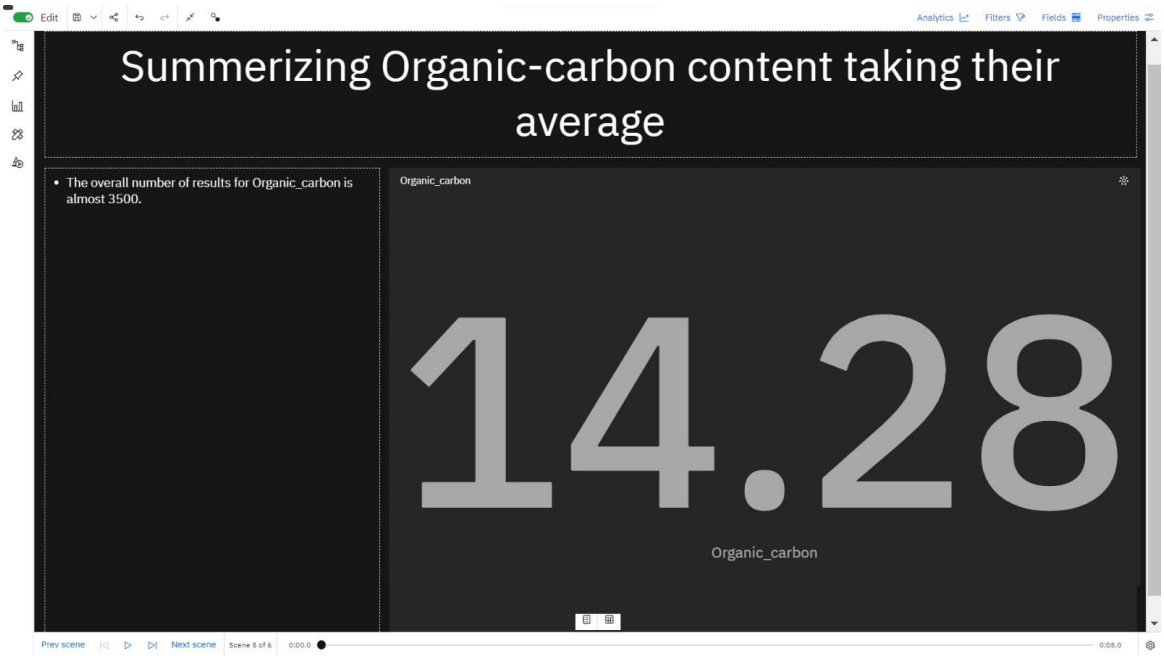

Edit
specialisation sl_no
F
M
Mkt&HR | M
sl_no (Count distinct): 56

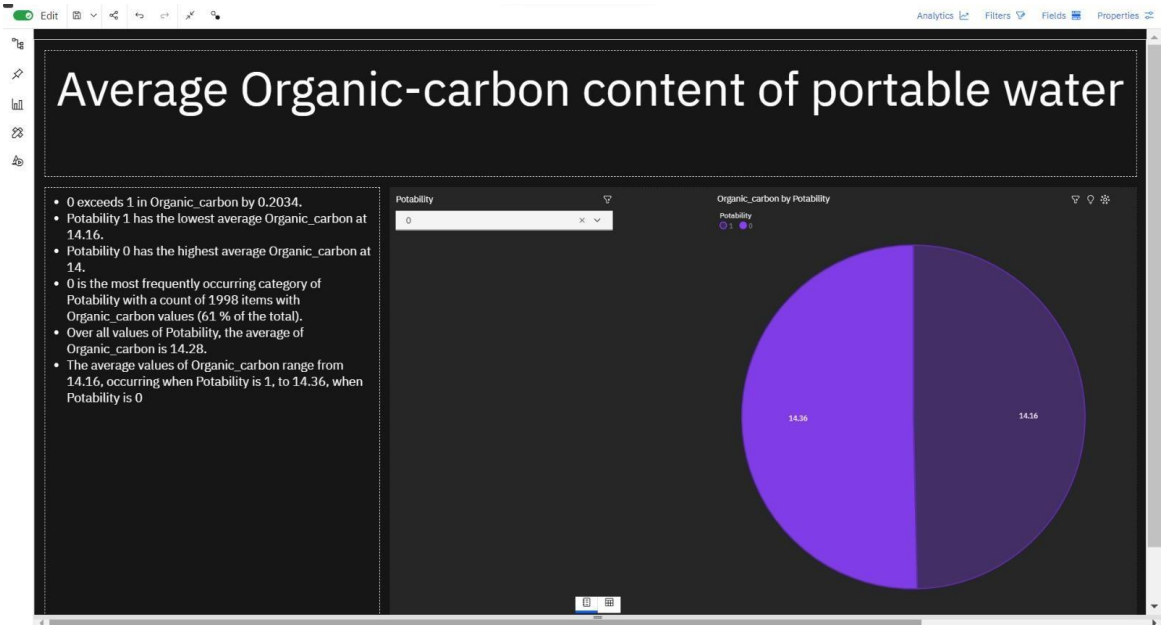
Story

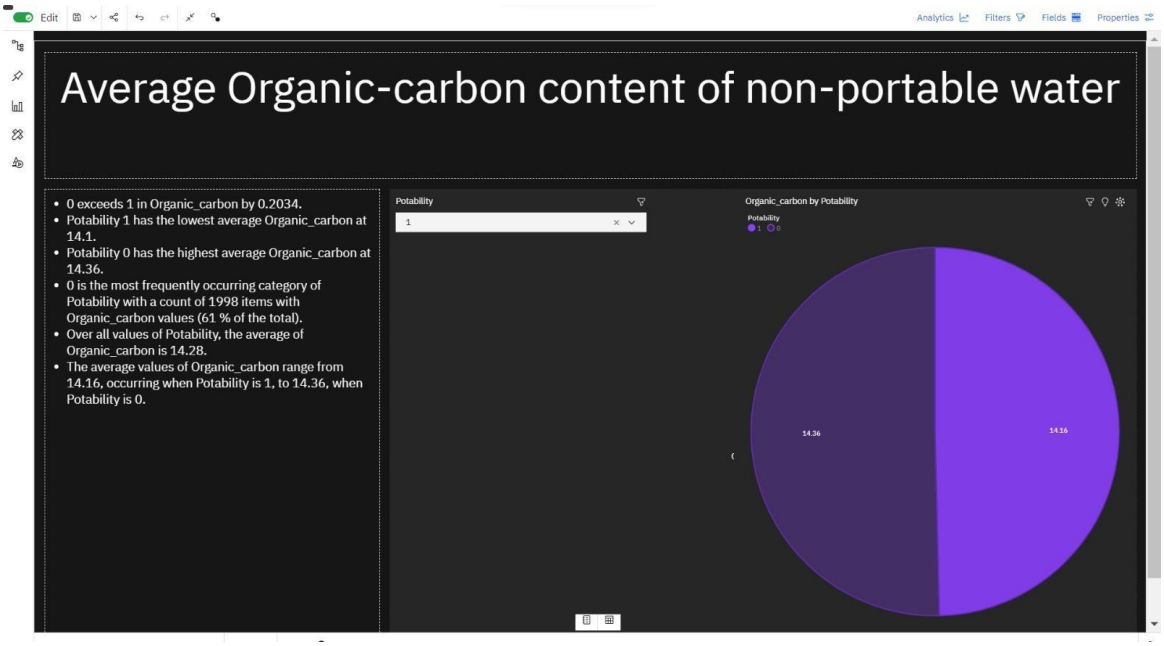

Edit
Analytics
Filters
Fields
Properties
Average sulphate content of portable water
Potability 1 has the lowest average Sulfate at 332.57.
Potability 0 has the highest average Sulfate at 334.56.
0 is the most frequently occurring category of Potability with a count of 1510 items with Sulfate values (60.5 % of the total).
Over all values of Potability, the average of Sulfate is 333.8.
The average values of Sulfate range from 332.6, occurring when Potability is 1, to 334.6, when Potability is 0.
Potability
1
Sulfate by Potability
Potability
334.56
332.57
Prev scene
Next scene
Scene 2 of 6

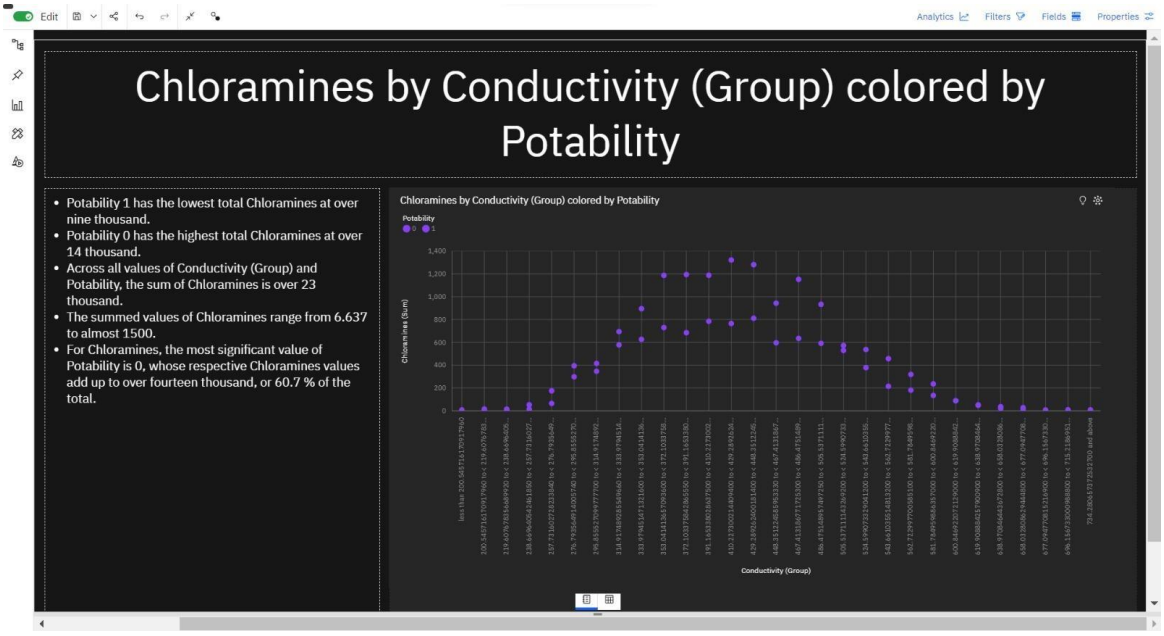

Edit
Analytics
Filters
Fields
Properties
Average sulphate content of non-portable water.
0 exceeds 1 in Sulfate by 1.997.
Potability 1 has the lowest average Sulfate at 332.57.
Potability 0 has the highest average Sulfate at 334.56.
0 is the most frequently occurring category of Potability with a count of 1510 items with Sulfate values (60.5 % of the total).
Over all values of Potability, the average of Sulfate is 333.8.
The average values of Sulfate range from 332.6, occurring when Potability is 1, to 334.6, when Potability is 0.
Potability
0
Sulfate by Potability
Potability
1
0
334.56
332.57
Create a visualization

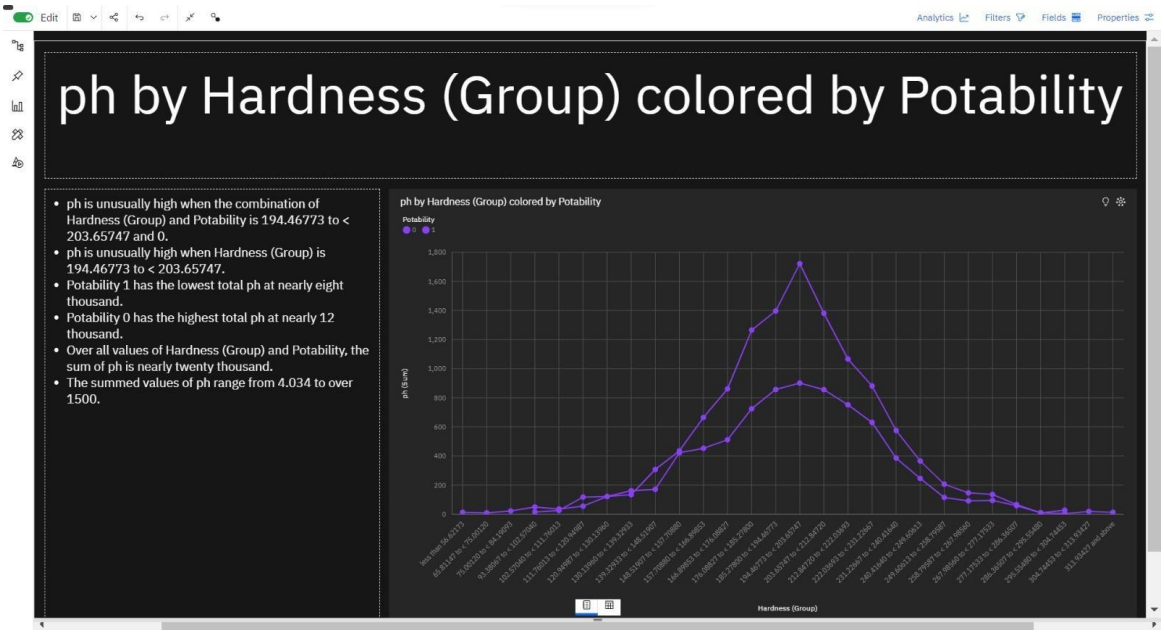

Edit
Analytics
Filters
Fields
Properties
Summerizing cloramines taking their average
The overall number of results for Chloramines is almost 3500.
Chloramines
7.12
Chloramines
Prev scene
Next scene
Scene 4 of 6
0:00.0
0:05.0


Edit
Analytics
Filters
Fields
Properties
Summerizing Organic-carbon content taking their average
• The overall number of results for Organic_carbon is almost 3500.
Organic_carbon
14.28
Organic_carbon
Prev scene
Next scene
Scene 5 of 6
0:00.0
0:05.0

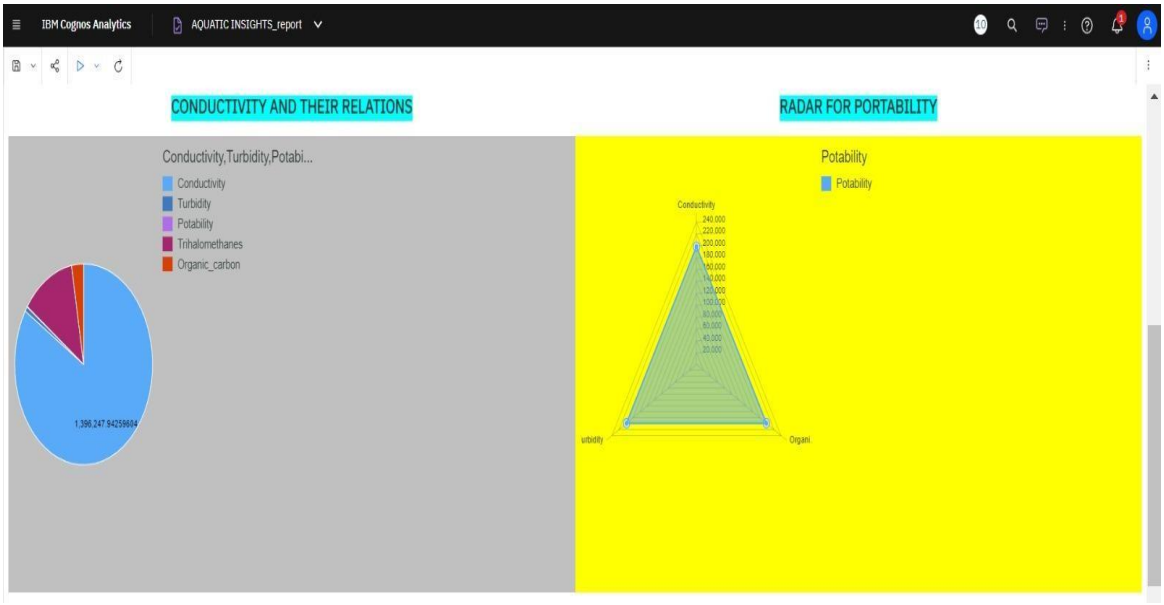

Edit
Analytics
Filters
Fields
Properties
Average Organic-carbon content of portable water
• 0 exceeds 1 in Organic_carbon by 0.2034.
• Potability 1 has the lowest average Organic_carbon at 14.16.
• Potability 0 has the highest average Organic_carbon at 14.
• 0 is the most frequently occurring category of Potability with a count of 1998 items with Organic_carbon values (61 % of the total).
• Over all values of Potability, the average of Organic_carbon is 14.28.
• The average values of Organic_carbon range from 14.16, occurring when Potability is 1, to 14.36, when Potability is 0
Potability
0
Organic_carbon by Potability
Potability
1
0
14.36
14.16

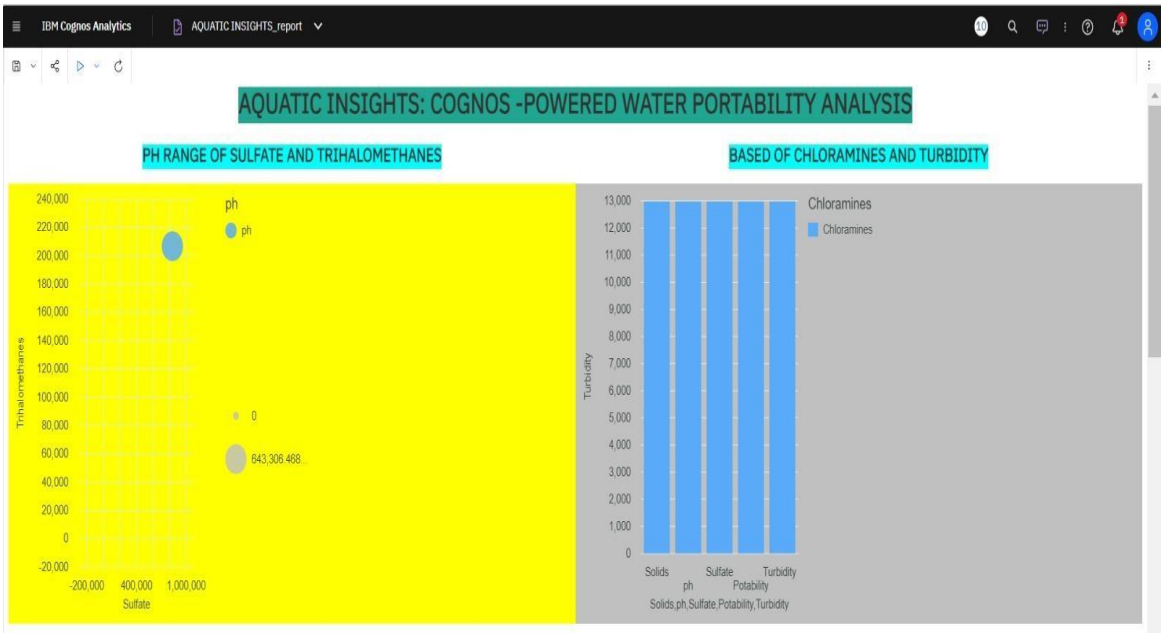

Edit
Analytics
Filters
Fields
Properties
Average Organic-carbon content of non-portable water
0 exceeds 1 in Organic_carbon by 0.2034.
Potability 1 has the lowest average Organic_carbon at 14.1.
Potability 0 has the highest average Organic_carbon at 14.36.
0 is the most frequently occurring category of Potability with a count of 1998 items with Organic_carbon values (61 % of the total).
Over all values of Potability, the average of Organic_carbon is 14.28.
The average values of Organic_carbon range from 14.16, occurring when Potability is 1, to 14.36, when Potability is 0.
Potability
1
Organic_carbon by Potability
Potability
1
0
14.36
14.16

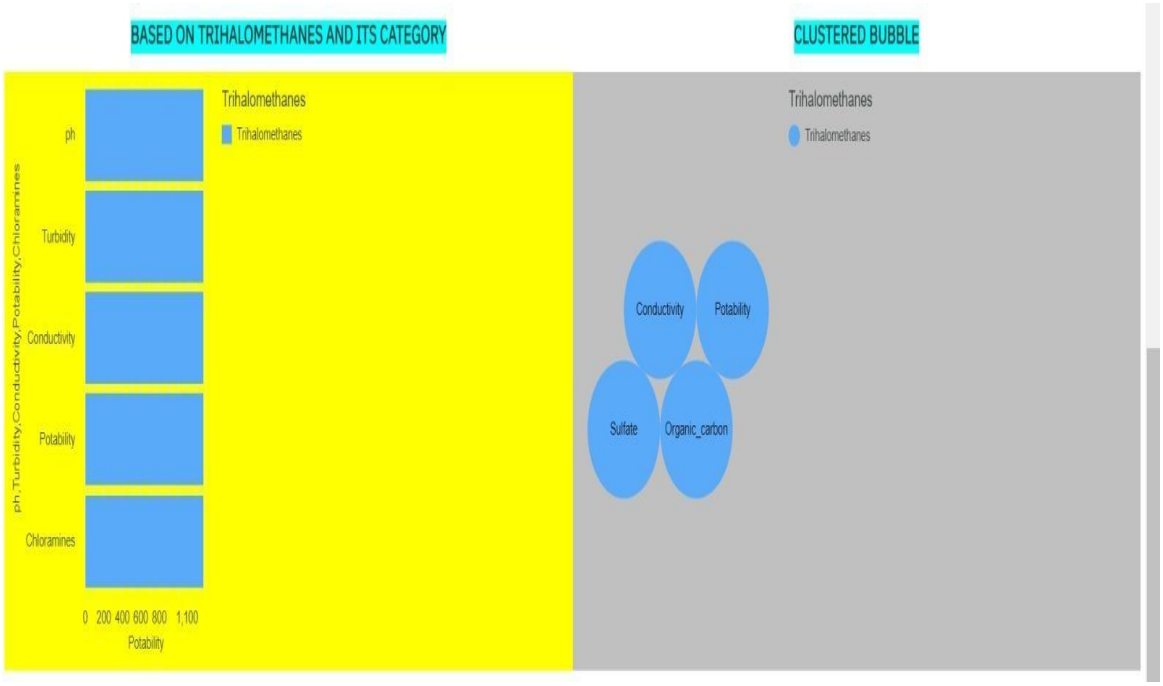

Edit
Analytics
Filters
Fields
Properties
Chloramines by Conductivity (Group) colored by Potability
Potability 0 has the lowest total Chloramines at over nine thousand.
Potability 1 has the highest total Chloramines at over 14 thousand.
Across all values of Conductivity (Group) and Potability, the sum of Chloramines is over 23 thousand.
The summed values of Chloramines range from 6.637 to almost 1500.
For Chloramines, the most significant value of Potability is 0, whose respective Chloramines values add up to over fourteen thousand, or 60.7 % of the total.
Chloramines by Conductivity (Group) colored by Potability
Potability
0
1
Chloramines (Sum)
Conductivity (Group)


Edit
Analytics
Filters
Fields
Properties
ph by Hardness (Group) colored by Potability
ph is unusually high when the combination of Hardness (Group) and Potability is 194.46773 to < 203.65747 and 0.
ph is unusually high when Hardness (Group) is 194.46773 to < 203.65747.
Potability 1 has the lowest total ph at nearly eight thousand.
Potability 0 has the highest total ph at nearly 12 thousand.
Over all values of Hardness (Group) and Potability, the sum of ph is nearly twenty thousand.
The summed values of ph range from 4.034 to over 1500.
ph by Hardness (Group) colored by Potability
Potability
0
1
ph (Sum)
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
Hardness (Group)

Report


IBM Cognos Analytics
AQUATIC INSIGHTS_report
CONDUCTIVITY AND THEIR RELATIONS
Conductivity,Turbidity,Potabi...
Conductivity
Turbidity
Potability
Trihalomethanes
Organic_carbon
1,396,247.94259604
RADAR FOR PORTABILITY
Potability
Potability
Conductivity
240.000
220.000
200.000
180.000
160.000
140.000
120.000
100.000
80.000
60.000
40.000
20.000
urbidity
Organi


IBM Cognos Analytics
AQUATIC INSIGHTS_report
AQUATIC INSIGHTS: COGNOS -POWERED WATER PORTABILITY ANALYSIS
PH RANGE OF SULFATE AND TRIHALOMETHANES
BASED OF CHLORAMINES AND TURBIDITY
240,000
220,000
200,000
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
-20,000
Trihalomethanes
-200,000
400,000
1,000,000
Sulfate
ph
ph
0
643,306.468
13,000
12,000
11,000
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
Turbidity
Chloramines
Chloramines
Solids
ph
Sulfate
Potability
Turbidity
Solids,ph,Sulfate,Potability,Turbidity


BASED ON TRIHALOMETHANES AND ITS CATEGORY
Trihalomethanes
Trihalomethanes
ph
Turbidity
Conductivity
Potability
Chloramines
ph,Turbidity,Conductivity,Potability,Chloramines
0 200 400 600 800 1,100
Potability
CLUSTERED BUBBLE
Trihalomethanes
Trihalomethanes
Conductivity
Potability
Sulfate
Organic_carbon

ADVANTAGES & DISADVANTAGE

CHAPTER - 8

ADVANTAGES & DISADVANTAGES

ADVANTAGES:

Data-Driven Decision Making: Informed decisions based on real-time and historical data.

Comprehensive Water Quality Assessment: Integrates data from various sources for a holistic view.

Real-Time Monitoring: Immediate response to changing water conditions.

Improved Resource Allocation: Efficient allocation of resources, leading to cost savings.

Environmental Compliance: Helps meet water quality regulations and standards.

Research and Scientific Advancements: Valuable for scientific studies and experiments.

Risk Mitigation: Swift identification and mitigation of potential risks and issues.

Historical Data Analysis: Identifies long-term patterns and trends.

Predictive Analytics: Forecasts water quality trends and suggests proactive measures.

Customizable Dashboards: Tailored information for different stakeholders.

Integration with IoT Sensors: Seamless integration with water quality monitoring sensors.

DISADVANTAGES:

Cost: Implementation and maintenance can be expensive.
Licensing Cognos software may strain budgets.

Complexity: Cognos can be challenging to configure and use effectively. Requires training and expertise, which can be a barrier.

Data Integration Challenges: Data from various sources can be hard to integrate. Incompatible formats and data quality issues may complicate implementation.

Hardware and Software Requirements: Specific hardware and software requirements can be demanding. Ensuring infrastructure meets these requirements can be costly.

Scalability: Scaling to accommodate increased data or users can be complex. May require additional investments in hardware and expertise.

Data Security: Sensitive water quality data raises data security and privacy concerns. Proper data protection measures are necessary.

Maintenance and Support: Regular maintenance is essential. Ongoing costs and the need for IT staff can add to expenses.

Vendor Lock-In: Choosing Cognos can result in vendor lock-in. Switching to a different platform can be challenging and costly.

CONCLUSION

CHAPTER - 9
CONCLUSION

In conclusion, "Aquatic Insights: Cognos-Powered Water Portability Analysis" represents a significant step forward in our understanding of water quality and its implications for environmental and public health. This innovative analysis, utilizing the power of IBM Cognos, has provided a comprehensive and data-driven examination of water portability, offering valuable insights into the management and improvement of water resources.

Through this analysis, we have been able to:
Gain a deeper understanding of water quality parameters: The utilization of Cognos has allowed us to explore various factors affecting water portability, including chemical composition, temperature, turbidity, and microbial contamination. This comprehensive approach enhances our ability to address water quality concerns.

Predict and prevent waterborne diseases: The insights derived from this analysis can aid in forecasting and preventing waterborne diseases, protecting public health, and reducing the economic burden associated with treating water-related illnesses.

Optimize resource allocation: By harnessing the power of Cognos, water management authorities can make informed decisions about where to allocate resources to ensure that clean and portable water is accessible to communities in need.

FUTURE SCOPE

CHAPTER – 10

FUTURE SCOPE

The future scope for Aquatic Insights, a Cognos-powered water portability analysis system, is promising. As water quality and availability become critical global concerns, this innovative technology will play a pivotal role in ensuring access to safe drinking water. Its advanced analytics and data-driven insights will empower policymakers and communities to make informed decisions, improve water management strategies, and enhance water quality monitoring. With growing environmental challenges, Aquatic Insights is poised to be a crucial tool in safeguarding water resources, promoting sustainability, and addressing the world's evolving water needs. The future scope for Aquatic Insights, leveraging the power of Cognos analytics, is exceptionally bright. In a world where water scarcity and pollution are increasingly urgent issues, this technology is set to revolutionize water portability analysis. By harnessing data-driven insights, it will enable governments, organizations, and communities to make more informed decisions about water resource management, distribution, and quality control. With environmental challenges intensifying, Aquatic Insights has the potential to be a pivotal tool for ensuring water sustainability, safeguarding public health, and addressing the evolving global demand for clean and accessible water sources.

APPENDIX

CHAPTER - 11

APPENDIX

A.1 SOURCE CODE

```
<!DOCTYPE html>
<html lang="en">

<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-
scale=1.0">
    <title>Aquatic insights</title>
    <link rel="stylesheet" href="styles.css">
    <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-
awesome/5.15.4/css/all.min.css">
</head>

<body>
    <header class="head">
        <a href="#" class="logo"><i class="fas fa-heart"></i> Aquatic
insights <i class="fas fa-heart"></i></a>
        <nav class="navbar ">
            <a href="#" class="active">Home</a>

            <a href="#dashboard">Dashboard</a>
            <a href="#story">Story</a>
            <a href="#report">Report</a>
```

```
            <a href="#contact">Contact</a>
        </nav>
        <div id="menu-bar"><i class="fas fa-bars"></i></div>
    </header>
    <!--------------------------Home--------------------->
    <section class="home" id="home">
        <form action="#">
            <div class="search-box">
                <h1>AQUATIC INSIGHTS: COGNOS -POWERED WATER
PORTABILITY ANALYSIS</h1>
                <a href="#dashboard"><button class="btn" style="margin-right:
20px;">Dashboard</button></a>
                <a href="#story"><button class="btn" style="margin-right:
20px;">Story</button></a>
                <a href="#report"><button class="btn">Report</button></a>
            </div>
        </form>
    </section>
    <div class="wrapper">
        <div class="dashboard" id="dashboard">
            <div class="title" >
                <h1><span>D</span>ashboard</h1>
            </div>
             <iframe
src=”https://us1.ca.analytics.ibm.com/bi/?perspective=dashboard&id=i88DA
B0BD4EFE40EDA9B489857ABDF210&objRef=i88DAB0BD4EFE40EDA
9B489857ABDF210&options%5BdisableGlassPrefetch%5D=true&options
%5Bcollections%5D%5BcanvasExtension%5D%5Bid%5D=com.ibm.bi.das
hboard.canvasExtension&options%5Bcollections%5D%5BfeatureExtension
```

%5D%5Bid%5D=com.ibm.bi.dashboard.core-features&options%5Bcollections%5D%5Bbuttons%5D%5Bid%5D=com.ibm.bi.dashboard.buttons&options%5Bcollections%5D%5Bwidget%5D%5Bid%5D=com.ibm.bi.dashboard.widgets&options%5Bcollections%5D%5BcontentFeatureExtension%5D%5Bid%5D=com.ibm.bi.dashboard.content-features&options%5Bcollections%5D%5BsaveServices%5D%5Bid%5D=com.ibm.bi.dashboard.saveServices&options%5Bcollections%5D%5Btemplates%5D%5Bid%5D=com.ibm.bi.dashboard.templates&options%5Bcollections%5D%5BvisualizationExtension%5D%5Bid%5D=com.ibm.bi.dashboard.visualizationExtensionCA&options%5Bcollections%5D%5BboardModel%5D%5Bid%5D=com.ibm.bi.dashboard.boardModelExtension&options%5Bcollections%5D%5BcontentTypes%5D%5Bid%5D=com.ibm.bi.dashboard.contentTypes&options%5Bcollections%5D%5BserviceExtension%5D%5Bid%5D=com.ibm.bi.dashboard.serviceExtension&options%5Bcollections%5D%5BlayoutExtension%5D%5Bid%5D=com.ibm.bi.dashboard.layoutExtension&options%5Bcollections%5D%5BcolorSetExtensions%5D%5Bid%5D=com.ibm.bi.dashboard.colorSetExtensions&options%5Bconfig%5D%5Bproduct%5D=CA&options%5Bconfig%5D%5BeditPropertiesLabel%5D=true&options%5Bconfig%5D%5BenableCustomVisualizations%5D=true&options%5Bconfig%5D%5BassetTags%5D%5B%5D=dashboard&options%5Bconfig%5D%5BfilterDock%5D=true&options%5Bconfig%5D%5BshowMembers%5D=true&options%5Bconfig%5D%5Bupgrades%5D=dashboard-core%2Fjs%2Fdashboard%2Fupgrades&options%5Bconfig%5D%5BassetType%5D=exploration&options%5Bconfig%5D%5BgeoService%5D=CA&options%5Bconfig%5D%5BsmartTitle%5D=true&options%5Bconfig%5D%5BnavigationGroupAction%5D=true&options%5Bconfig%5D%5BenableDataQuality%5D=false&options%5Bconfig%5D%5BmemberCalculation%5D=false&isAuthoringMode=false&boardId=i88DAB0BD4EFE40EDA9B489857ABDF210” frameborder="0" gesture="media" allow="encrypted-media"

allowfullscreen=""></iframe>

6.2 FEATURE 2

REPORT

<h1>Report</h1>

<iframe

src=”https://us1.ca.analytics.ibm.com/bi/?perspective=authoring&id=iD46AC20A1840426BA097CFC286C905B2&objRef=iD46AC20A1840426BA097CFC286C905B2&action=run&format=HTML&cmPropStr=%7B%22id%22%3A%22iD46AC20A1840426BA097CFC286C905B2%22%2C%22type%22%3A%22interactiveReport%22%2C%22defaultName%22%3A%22AQUATIC%20INSIGHTS_report%22%2C%22permissions%22%3A%5B%22execute%22%2C%22read%22%2C%22setPolicy%22%2C%22traverse%22%2C%22write%22%5D%7D” frameborder="0" gesture="media"

allow="encrypted-media" allowfullscreen=""></iframe>

allowfullscreen=""></iframe>

</section><!-- End Your Report Se

6.3 FEATURE 3

STORY

```
            <h1><span>S</span>tory</h1>
        </div>
<iframe
src=”https://us1.ca.analytics.ibm.com/bi/?perspective=story&id=i585902A6
BA114B258BB8CC2557BC8FE7&objRef=i585902A6BA114B258BB8CC
2557BC8FE7&options%5BdisableGlassPrefetch%5D=true&options%5Bcol
lections%5D%5BcanvasExtension%5D%5Bid%5D=com.ibm.bi.dashboard.c
anvasExtension&options%5Bcollections%5D%5BfeatureExtension%5D%5
Bid%5D=com.ibm.bi.dashboard.core-
features&options%5Bcollections%5D%5Bbuttons%5D%5Bid%5D=com.ib
m.bi.dashboard.buttons&options%5Bcollections%5D%5Bwidget%5D%5Bi
d%5D=com.ibm.bi.dashboard.widgets&options%5Bcollections%5D%5Bcon
tentFeatureExtension%5D%5Bid%5D=com.ibm.bi.dashboard.content-
features&options%5Bcollections%5D%5BsaveServices%5D%5Bid%5D=co
m.ibm.bi.dashboard.saveServices&options%5Bcollections%5D%5Btemplate
s%5D%5Bid%5D=com.ibm.bi.dashboard.templates&options%5Bcollections
%5D%5BvisualizationExtension%5D%5Bid%5D=com.ibm.bi.dashboard.vis
ualizationExtensionCA&options%5Bcollections%5D%5BboardModel%5D
%5Bid%5D=com.ibm.bi.dashboard.boardModelExtension&options%5Bcoll
ections%5D%5BcontentTypes%5D%5Bid%5D=com.ibm.bi.dashboard.cont
entTypes&options%5Bcollections%5D%5BserviceExtension%5D%5Bid%5
D=com.ibm.bi.dashboard.serviceExtension&options%5Bcollections%5D%5
BlayoutExtension%5D%5Bid%5D=com.ibm.bi.dashboard.layoutExtension
&options%5Bcollections%5D%5BcolorSetExtensions%5D%5Bid%5D=co
m.ibm.bi.dashboard.colorSetExtensions&options%5Bconfig%5D%5BliveW
idgetExtras%5D%5B%5D=reveal&options%5Bconfig%5D%5Bproduct%5
D=CA&options%5Bconfig%5D%5BeditPropertiesLabel%5D=true&options
%5Bconfig%5D%5BenableCustomVisualizations%5D=true&options%5Bco
nfig%5D%5BassetTags%5D%5B%5D=story&options%5Bconfig%5D%5Bf
```

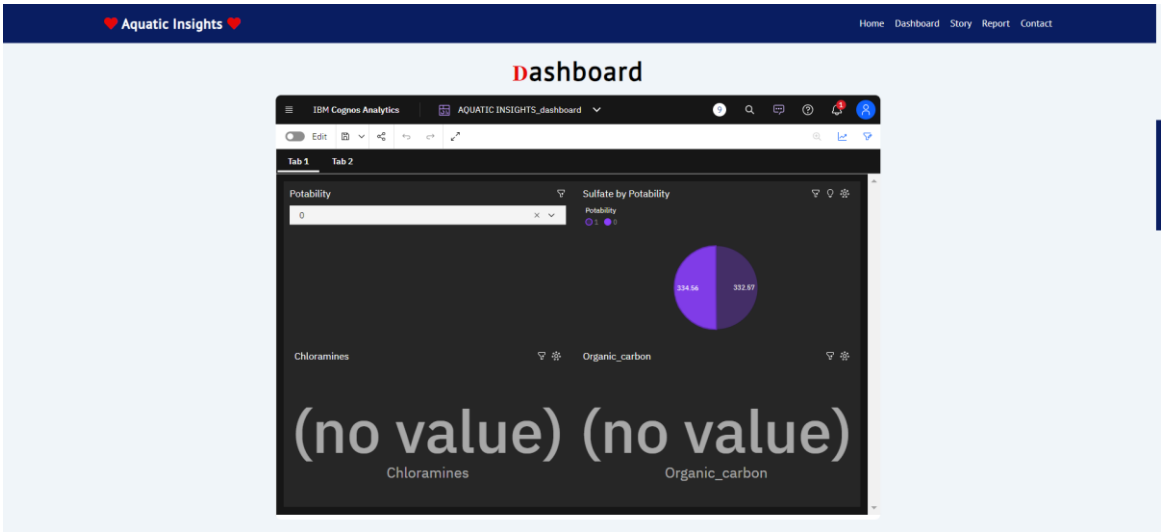
ilterDock%5D=true&options%5Bconfig%5D%5BshowMembers%5D=true&options%5Bconfig%5D%5Bupgrades%5D=dashboard-core%2Fjs%2Fdashboard%2Fupgrades&options%5Bconfig%5D%5BassetType%5D=exploration&options%5Bconfig%5D%5BgeoService%5D=CA&options%5Bconfig%5D%5BsmartTitle%5D=true&options%5Bconfig%5D%5BnavigationGroupAction%5D=true&options%5Bconfig%5D%5BenableDataQuality%5D=false&options%5Bconfig%5D%5BmemberCalculation%5D=false&isAuthoringMode=false&boardId=i585902A6BA114B258BB8CC2557BC8FE7&sceneId” frameborder="0" gesture="media" allow="encrypted-media" allowfullscreen=""></iframe>

</body></html>

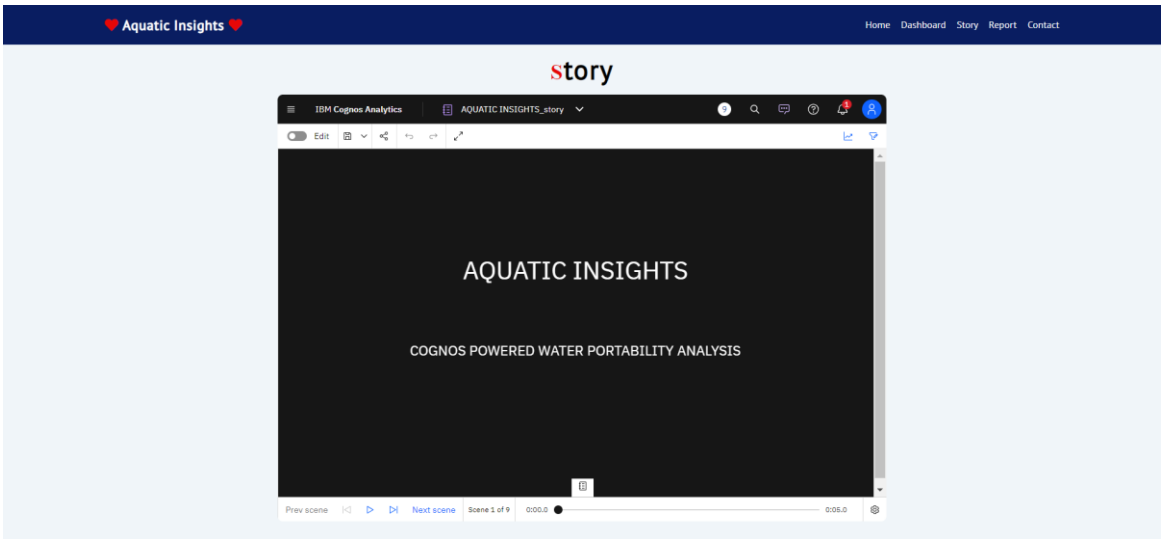
A.2 SCREEN SHOT

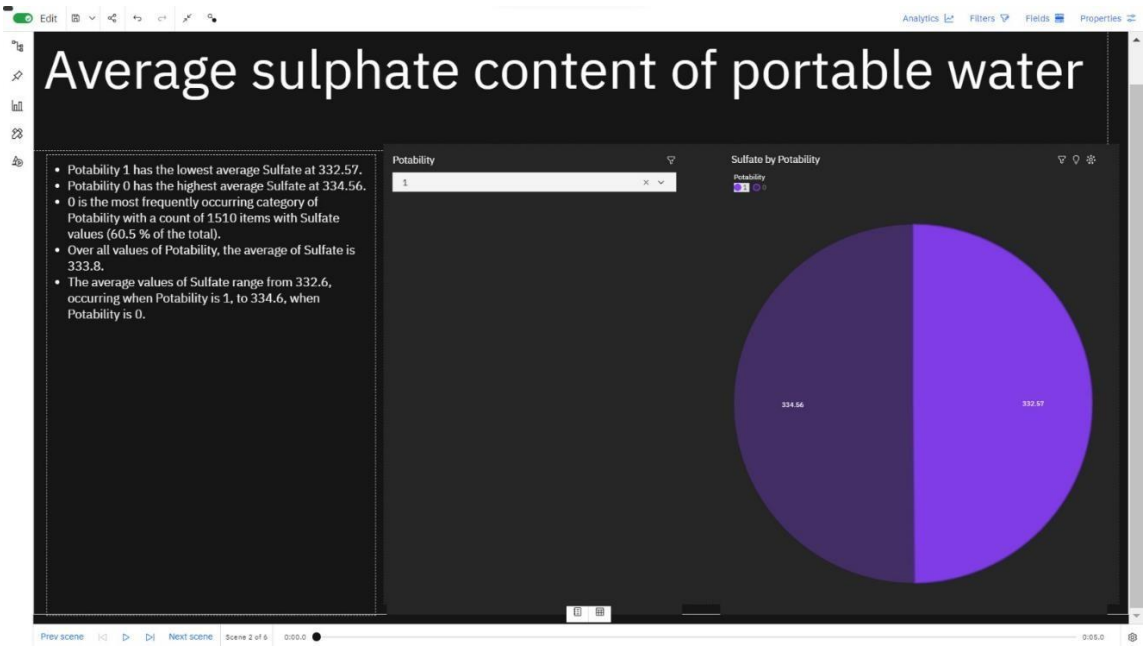
11.1 SOURCE CODE & SCREENSHOTS

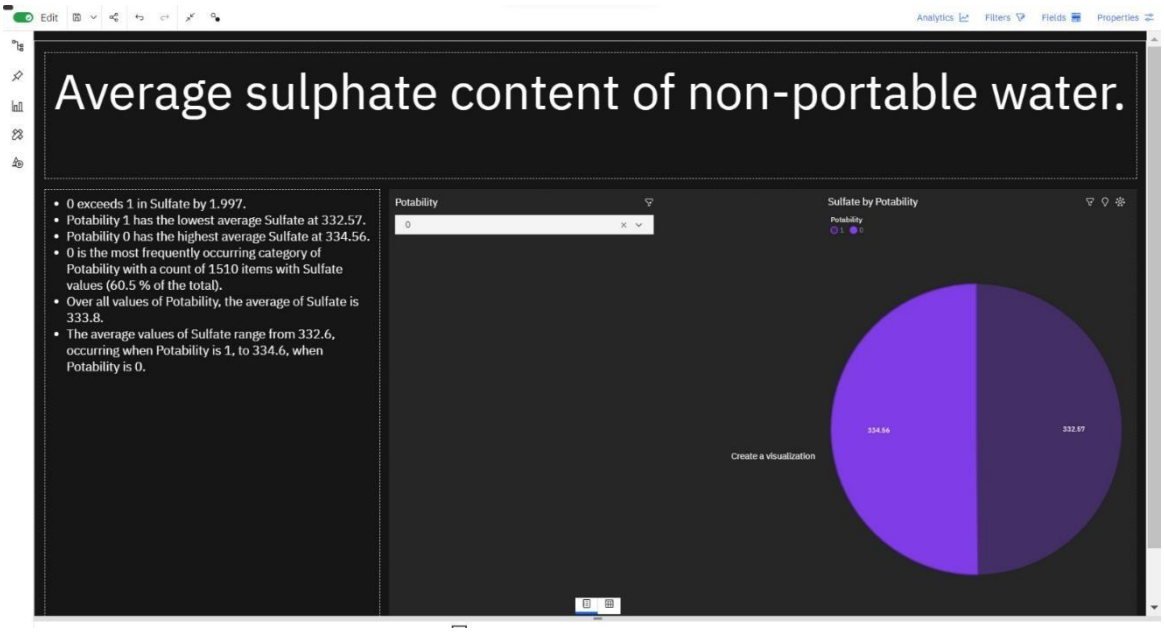
Dashboard:

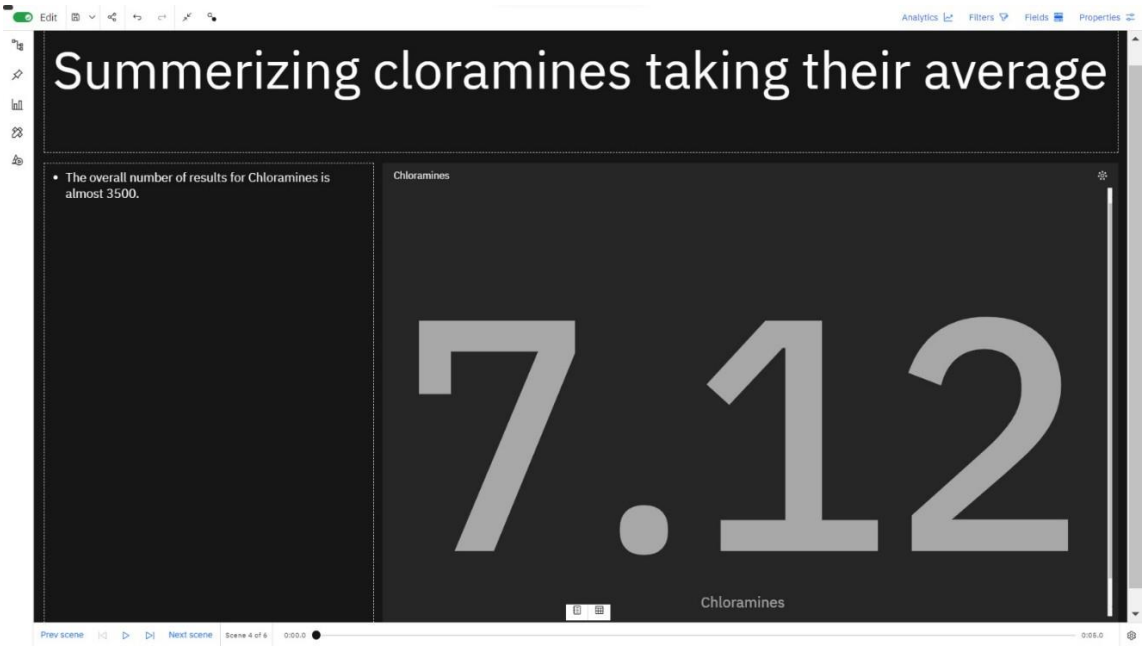


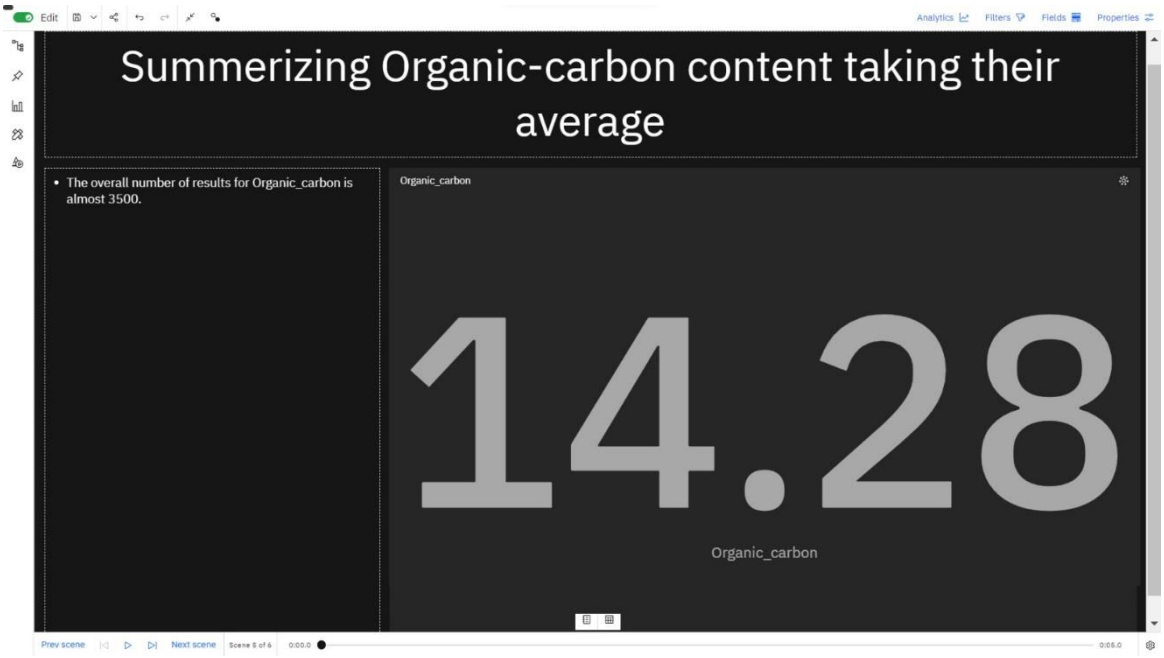
Story:

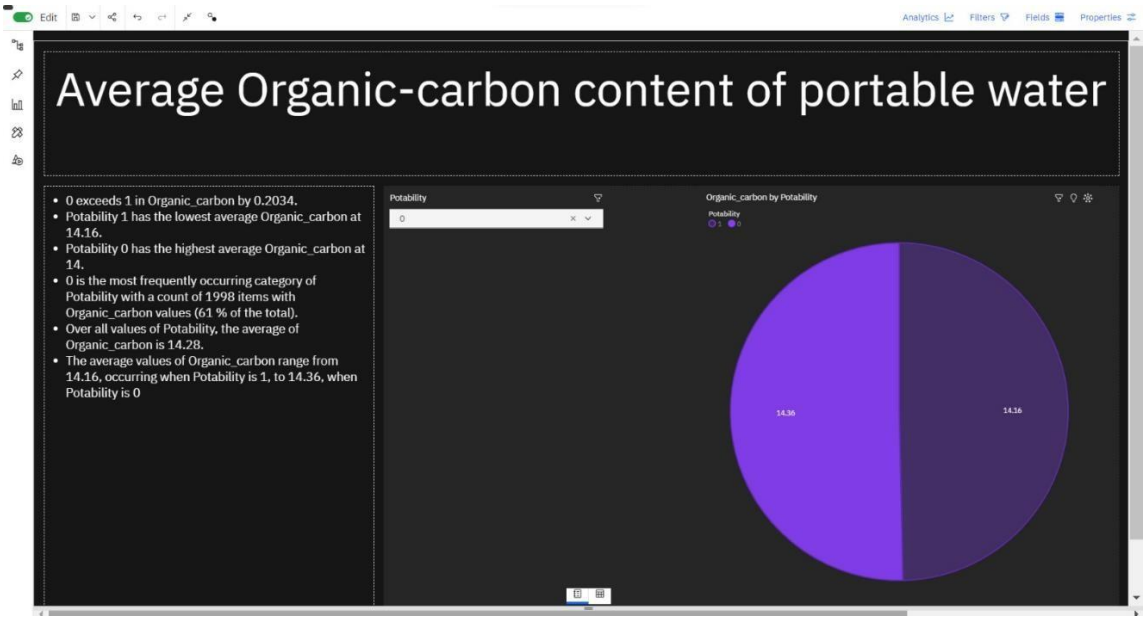

Aquatic Insights
Home Dashboard Story Report Contact
story
IBM Cognos Analytics
AQUATIC INSIGHTS_story
Edit
AQUATIC INSIGHTS
COGNOS POWERED WATER PORTABILITY ANALYSIS
Prev scene
Next scene
Scene 1 of 9

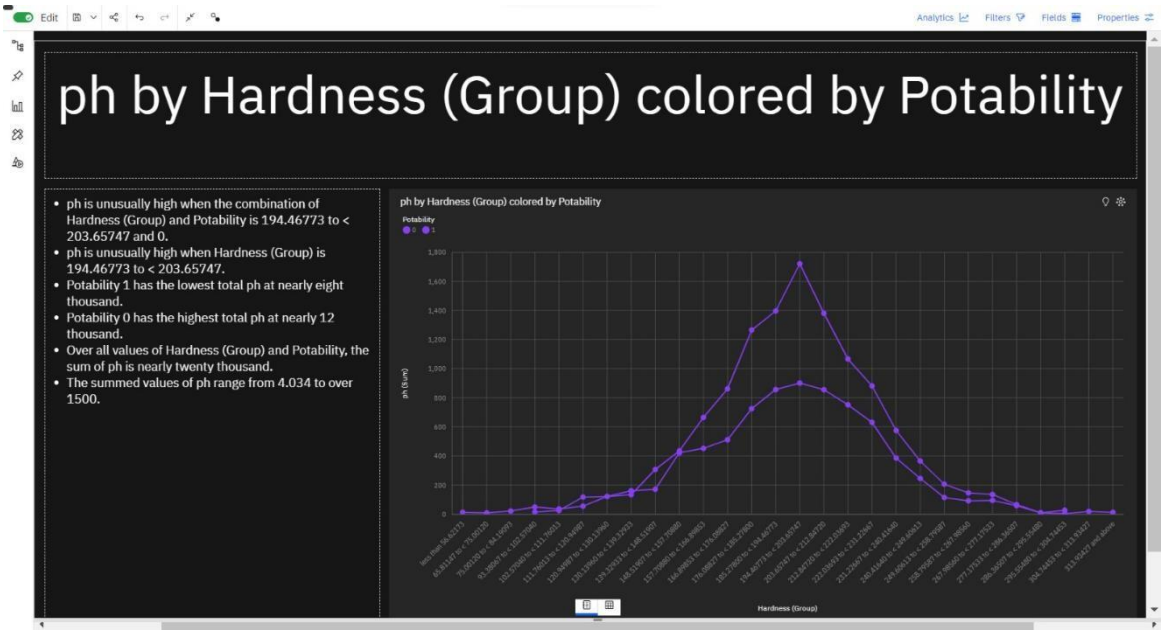

Edit
Analytics
Filters
Fields
Properties
Average sulphate content of portable water
Potability 1 has the lowest average Sulfate at 332.57.
Potability 0 has the highest average Sulfate at 334.56.
0 is the most frequently occurring category of Potability with a count of 1510 items with Sulfate values (60.5 % of the total).
Over all values of Potability, the average of Sulfate is 333.8.
The average values of Sulfate range from 332.6, occurring when Potability is 1, to 334.6, when Potability is 0.
Potability
1
Sulfate by Potability
Potability
334.56
332.57
Prev scene
Next scene
Scene 2 of 6


Edit
Analytics
Filters
Fields
Properties
Average sulphate content of non-portable water.
0 exceeds 1 in Sulfate by 1.997.
Potability 1 has the lowest average Sulfate at 332.57.
Potability 0 has the highest average Sulfate at 334.56.
0 is the most frequently occurring category of Potability with a count of 1510 items with Sulfate values (60.5 % of the total).
Over all values of Potability, the average of Sulfate is 333.8.
The average values of Sulfate range from 332.6, occurring when Potability is 1, to 334.6, when Potability is 0.
Potability
0
Sulfate by Potability
Potability
1
0
334.56
332.57
Create a visualization

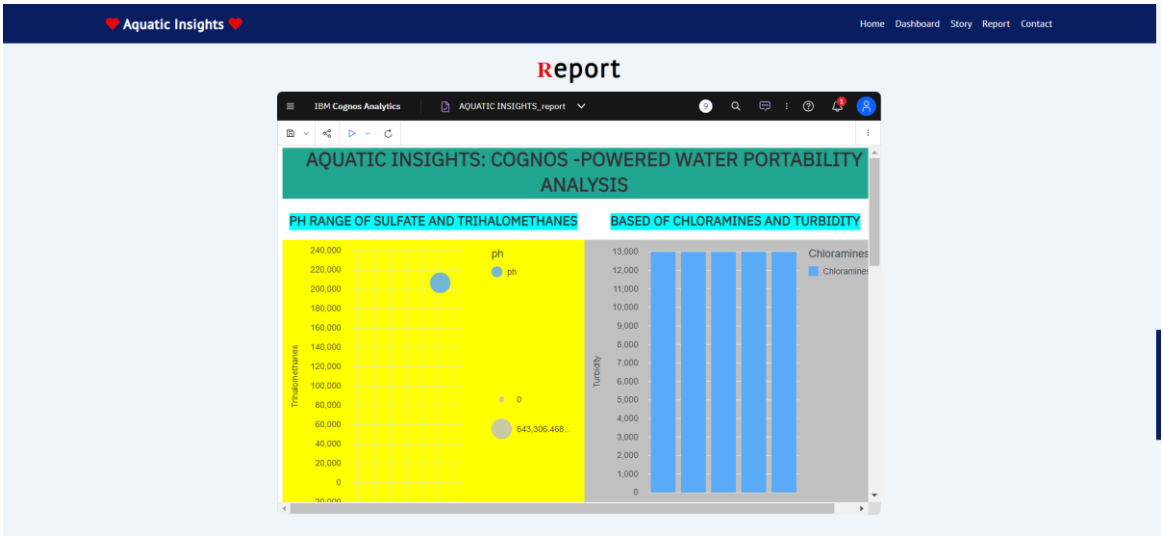

Edit
Analytics
Filters
Fields
Properties
Summerizing cloramines taking their average
The overall number of results for Chloramines is almost 3500.
Chloramines
7.12
Chloramines
Prev scene
Next scene
Scene 4 of 6
0:00.0
0:05.0

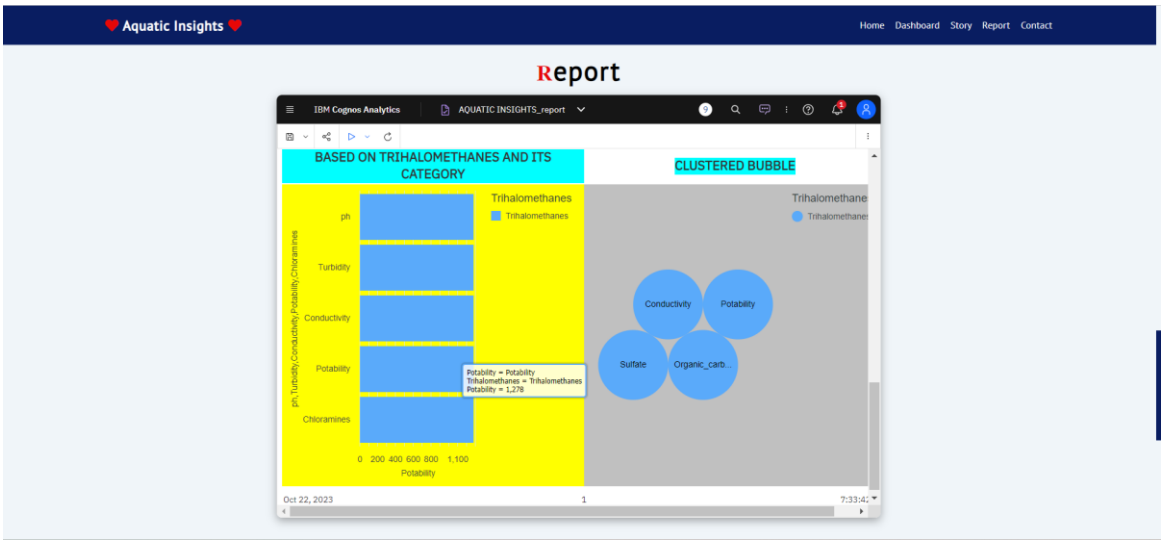

Edit
Analytics
Filters
Fields
Properties
Summerizing Organic-carbon content taking their average
• The overall number of results for Organic_carbon is almost 3500.
Organic_carbon
14.28
Organic_carbon
Prev scene
Next scene
Scene 5 of 6


Edit
Analytics
Filters
Fields
Properties
Average Organic-carbon content of portable water
• 0 exceeds 1 in Organic_carbon by 0.2034.
• Potability 1 has the lowest average Organic_carbon at 14.16.
• Potability 0 has the highest average Organic_carbon at 14.
• 0 is the most frequently occurring category of Potability with a count of 1998 items with Organic_carbon values (61 % of the total).
• Over all values of Potability, the average of Organic_carbon is 14.28.
• The average values of Organic_carbon range from 14.16, occurring when Potability is 1, to 14.36, when Potability is 0
Potability
0
Organic_carbon by Potability
Potability
14.36
14.36

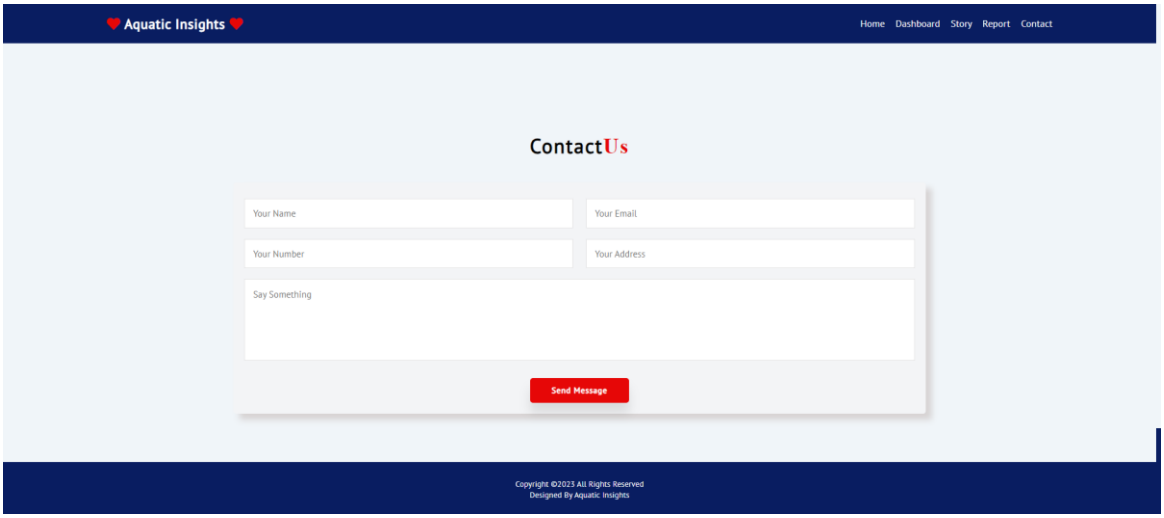

Edit
Analytics
Filters
Fields
Properties
ph by Hardness (Group) colored by Potability
ph is unusually high when the combination of Hardness (Group) and Potability is 194.46773 to < 203.65747 and 0.
ph is unusually high when Hardness (Group) is 194.46773 to < 203.65747.
Potability 1 has the lowest total ph at nearly eight thousand.
Potability 0 has the highest total ph at nearly 12 thousand.
Over all values of Hardness (Group) and Potability, the sum of ph is nearly twenty thousand.
The summed values of ph range from 4.034 to over 1500.
ph by Hardness (Group) colored by Potability
Potability
ph (Sum)
Hardness (Group)

Report:


Aquatic Insights
Home
Dashboard
Story
Report
Contact
Report
IBM Cognos Analytics
AQUATIC INSIGHTS_report
AQUATIC INSIGHTS: COGNOS -POWERED WATER PORTABILITY ANALYSIS
PH RANGE OF SULFATE AND TRIHALOMETHANES
BASED OF CHLORAMINES AND TURBIDITY
ph
Trihalomethanes
Turbidity
Chloramines


Aquatic Insights
Home Dashboard Story Report Contact
Report
IBM Cognos Analytics
AQUATIC INSIGHTS_report
BASED ON TRIHALOMETHANES AND ITS CATEGORY
CLUSTERED BUBBLE
Trihalomethanes
Trihalomethanes
ph
Turbidity
Conductivity
Potability
Chloramines
0 200 400 600 800 1,100
Potability
Trihalomethane
Conductivity
Potability
Sulfate
Organic_carb...
Oct 22, 2023
1

Contact:


Aquatic Insights
Home Dashboard Story Report Contact
ContactUs
Your Name
Your Email
Your Number
Your Address
Say Something
Send Message
Copyright ©2023 All Rights Reserved
Designed By Aquatic Insights

11.2 GITHUB & PROJECT VIDEO DEMO LINK

GITHUB LINK:

https://github.com/Mugilvendhan/NaanMuthalvan_DataAnalytics_NM2023TMID01874 git

PROJECT VIDEO DEMO LINK:

https://www.loom.com/share/fc963a81502b4eec9f261b2cec8d5426?sid=37de8071-7fe4-4a76-a568-8fa66a083293

REFERENCES

CHAPTER – 12
REFERENCES

1. 2017 International Conference on Energy, Communication, Data Analytics and Soft Computing (ICECDS)
2. 2007 Asia and South Pacific Design Automation Conference
3. 2021 5th International Conference on Computer, Communication and Signal Processing (ICCCSP)
4. 2008 Asia and South Pacific Design Automation Conference
5. 2009 IEEE/PES Power Systems Conference and Exposition.