APPENDIX A

Mutual Agreement Form for Co-Authorship

(Adopted from Philippine Association of Institutions for Research (PAIR), Inc.)

WE, the researcher, and research adviser/consultant, have worked together in a capstone project from January 2024 to August 2024.

WE have used various forms of contact during the thesis work such as Microsoft Teams and Facebook.

WE agree that

- the academic partnership leads to publication of the manuscript with the research consultant as the author and the researcher, the primary author.
- the paper be presented in public forum by the researcher if available at such an opportunity or by the research adviser/consultant if the researcher is no longer around.
- only the name of the oral presenter shall be submitted to the Conference organizer.

WE agree to dress formally and prepare adequately for the formal oral presentation in both the oral defense panel and the public presentations.

Signed this 27th of July in the year of our Lord 2024 in Bacolod City, Philippines.

THALEA PRINCE P. BALADHAY
Researcher

ELMER T. HARO, Ph.D.
Adviser

MARVIN JOMEL O. FELIPE
Researcher

REINHARDT D. FIRMEZA, MIT Candidate
Witness

BERNARD ANTON J. MILLARO
Researcher

APPENDIX B

HydroSense Concept Paper.

<table>
<tr><td>Project Concept Title</td><td colspan="2">HydroSense</td><td>Technical Consultant</td></tr>
<tr><td>Main Proponent</td><td colspan="2">Millaro, Bernard Anton J.</td><td>Elmer T. Haro, Ph.D.</td></tr>
<tr><td rowspan="2">Collaborators</td><td>Felipe, Marvin Jomel O.</td><td>Team name</td><td>Consultant's Appointment Status</td></tr>
<tr><td>Baladhay, Thalea Prince P.</td><td>Stealthy Kitten</td><td>☒In Agreement
☐To be Approached</td></tr>
<tr><td colspan="4">Rationale of the Concept Paper</td></tr>
<tr><td colspan="4">Clean water is essential to life, as hydration is the most basic function of water, necessary to keep the body of a living organism hydrated. It is important to preserve and sustain the availability of water for our bodies that rely on water for digestion, metabolism, transportation of nutrients, and temperature regulation [PM2024]. One of the Sustainable Development Goals (SDGs) is the SDG 6, clean water and sanitation adopted by the United Nations (UN). SDG 6 clean water and sanitation goal is to ensure availability and sustainable management of water sanitation for all and achieve universal and equitable access to safe and affordable drinking water for all. [OD2021]

HydroSense is not just a technological advancement. It is a solution for communities grappling with waterborne diseases due to not having access to clean water. It goes beyond mere detection. It acts as a driving force for data-driven decision-making. It provides legitimate articles and guides about hydrology based on credible sources, offering guidance on how to manage water. These resources serve as references for understanding water and ways to manage it, including purification methods. Through seamless integration, our software – hardware integration application empowers communities to proactively monitor and manage their water resources, mitigating risks and safeguarding public health.</td></tr>
<tr><td colspan="4">Features and Functions</td></tr>
<tr><td colspan="4">HydroSense, powered by Arduino and essential sensors, offers real-time water quality monitoring with TDS, turbidity, temperature, and pH data. Its user-friendly web app provides actionable insights, purification recommendations, and hydrology resources for effective water management.
1. Contaminant Detection
HydroSense's sensors for TDS, turbidity, temperature, and pH provide real-time water quality data, enabling accurate assessment of harmful substances. This empowers users with tailored purification recommendations, ensuring clean water access and proactive quality management.

2. Data Visualization
HydroSense visualizes water quality through real-time graphs and historical trends for TDS, turbidity, temperature, and pH. Users can view current values, track changes over time, and download data in CSV format for analysis or sharing, enhancing water quality monitoring and management.</td></tr>
</table>

3. Water Quality Recommendation
   HydroSense's recommendation system analyzes sensor data to provide tailored water purification advice, helping users address contaminants effectively and maintain access to clean water.

4. Hydrology Resources
   HydroSense offers resources on water quality, safety, and purification, featuring guides on monitoring, health impacts of contaminants, and best practices. Content from trusted sources like WHO and CDC ensures accuracy and relevance.

Technical Requirements
Arduino TDS sensor pH sensor Turbidity sensor Water temperature sensor Bluetooth or Wi-Fi for wireless data transfer Database for storing data of the sensors Real-time graphing of data framework
Project Usability / Justification of Benefits
Enable users to monitor TDS in water in real-time for early detection of pollution or contaminants. A tool for users to ensure safety in their water supply or sources
Anticipated Challenges
Calibrating TDS Data transmission security between devices
References
https://www.aquasana.com/info/tds-meter-what-is-it-and-do-you-need-it-pd.html

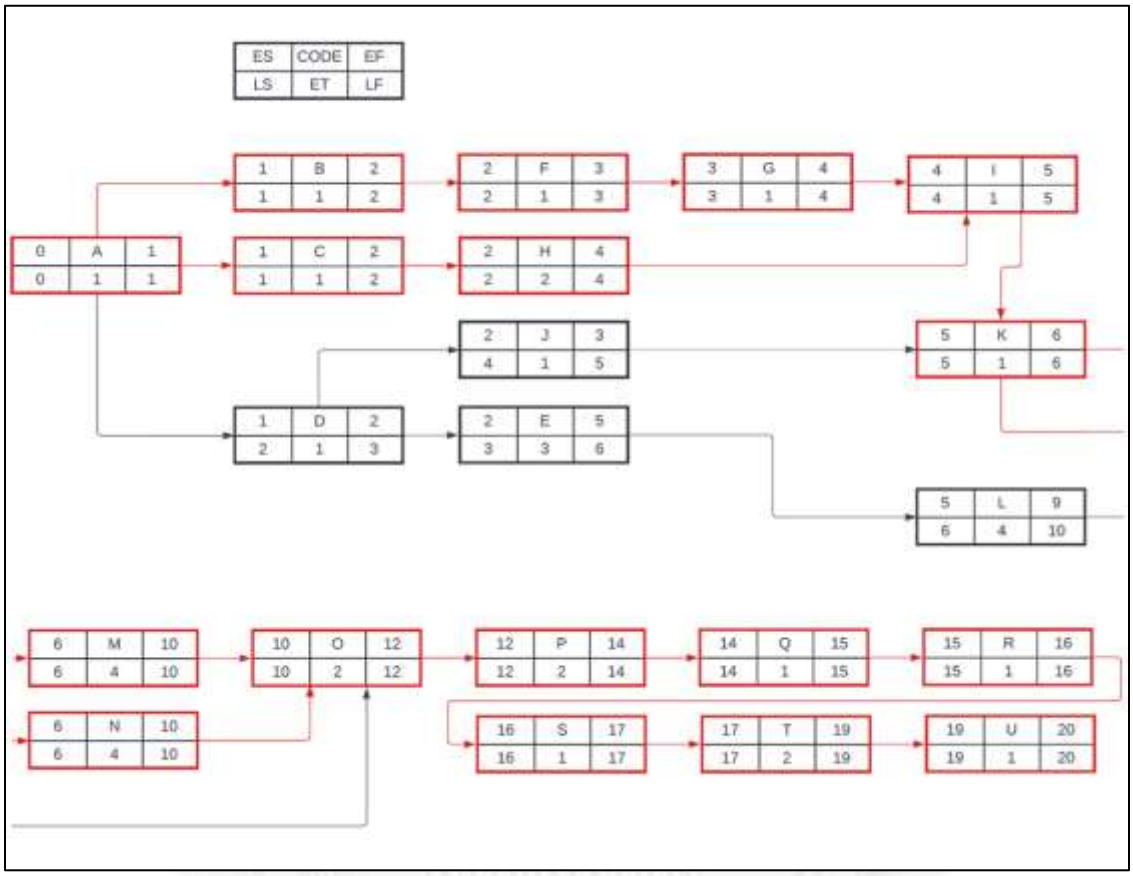
APPENDIX C

PERT Table.

CODE	ACTIVITIES	PREDECESSOR	DURATION (in week/s)
A	Identify the project requirements	-	1
B	Identify projects scope	A	1
C	Identify projects target users	A	1
D	Identify projects hardware and software specification	A	1
E	Procure hardware components	D	3
F	Search for related apps	B	1
G	Analysis of existing similar apps	F	1
H	Conduct an interview	C	2
I	Analyze gathered data	G, H	1
J	Make a draft of the web pages	D	1
K	Evaluate the functionalities and design	J, I	1
L	Develop hardware prototype	E	4
M	Website front-end coding	K	4
N	Website backend coding	K	4
O	Finalize hardware project	L, M, N	2
P	Integration of Web and Hardware	O	2
Q	Recognize and fix errors	P	1
R	Test execution	Q	1
S	User acceptance testing	R	1
T	Recognize and fix errors	S	2
U	General Release	T	1

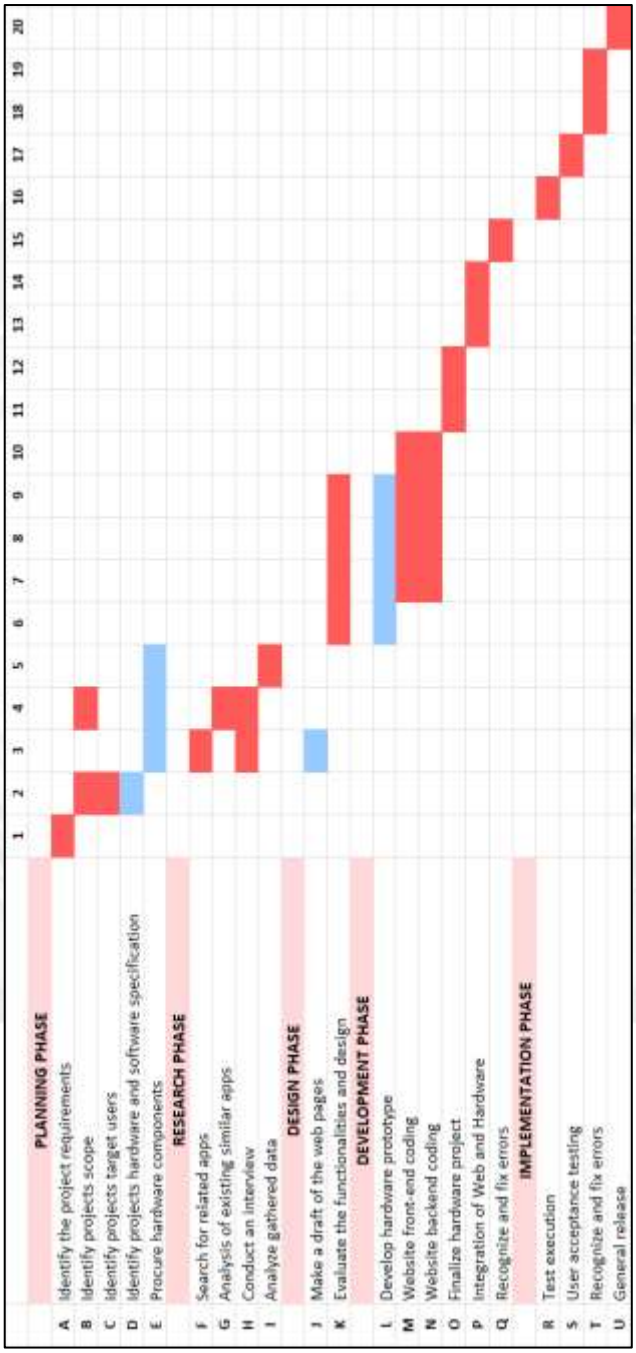
APPENDIX D

PERT Diagram.



APPENDIX E

Gantt Chart.



APPENDIX F

Project Cost.

Project Cost		
Hardware Cost	Product	Price
	Arduino ESP32-WROOM-32D	₱ 179.00
	OLED Screen 0.96in	₱ 78.00
	Temp Sensor 1SET	₱ 91.00
	Turbidity Sensor	₱ 314.00
	pH 0-14 module	₱ 459.00
	ESP32 Adapter 38P	₱ 90.00
	Micro SD Card storage module	₱ 23.00
	Dupont Jumper Wire	₱ 116.00
	TDS Sensor	₱ 226.00
Total Hardware Cost:		₱ 1,576.00
Operation Cost	Product	Price
	3D Printer	₱ 2,100.00
	Filaments	₱ 2,800.00
Total Operation Cost:		₱ 4,900.00
Total Project Cost:		₱ 6,476.00

APPENDIX G

Minutes of the Capstone Project Proposal Defense.

May 31, 2024 | 6:30 pm – 8:00 pm
College of Information Technology
University of Negros Occidental – Recoletos

Project Proposal Title	HydroSense
Group Members	Thalea Prince Baladhay Marvin Jomel Felipe Bernard Anton Millaro
Panel Members	Reinhardt D. Firmeza Elmer T. Haro, Ph.D. Reymund L. Sabay
Interpellators	Kristian Franco Christian Javier Alfie Mondia

1. The conference started with a prayer led by Marvin Felipe.
2. The group members were introduced by Marvin Felipe.
3. The oral presentation was delivered by Thalea Prince Baladhay, Marvin Jomel Felipe and Bernard Anton Millaro.
4. After the presentation, the following are the suggestions, recommendations of the interpellators and the panel members:

Chapter/Section	Recommendations/ Suggestion	Proponent	Action Taken	Reference / Proof
System Features and Functionalities	Issues in storage limitation	Reinhardt D. Firmeza	Added to recommendations	Hardware
Product Prototype/Interface	Overly loaded System	Reinhardt D. Firmeza	Revised the interface for the overly loaded system.	Page 63
	Methods and legends on reports	Elmer T. Haro	Added to the interface in data insights	Page 64

	Issues on the layout of the interface	Alfie Mondia	Change the layout of the interface	Page 63 to Page 70
References	Consult experts on water quality	Reymund L. Sabay	Added to recommendations	
	Availability of the websites for user		Added to the hydrological resources	Page 67

5. After the deliberation of the interpellators and panel members, the proposal is considered accepted with revisions in the documentation and in the prototype.

6. The conference ended 8:10 PM.

Transcribed by : Thalea Prince P. Baladhay

Noted by : Elmer T. Haro, Ph.D.

APPENDIX H

Product Logo.

The proponents choose the colors and elements, which have an interpretation that reflects the application purpose. Each color symbolizes the application values and interests, as well as to draw attention of users and be more recognizable. Blue gradient emphasizes the water and cleanliness, as blue recognizes security and creativity since it produces a slow physiological response. However, interpretations of blue can be paradoxical, as it's also associated with calmness and serenity due to its connection with bodies of water.

The logo of the application incorporates various elements and illustrations, each symbolizing a key aspect of the project's purpose. The water droplet shape is designed to resemble the letter "S," emphasizing the "sense" in HydroSense product. Additionally, the two radio waves at the bottom interpret the product's connectivity and communication capabilities, illustrating its seamless data gathering and transmission functionalities.

APPENDIX I

Group Logo.

The colors and elements that comprise the team's logo indicate their characteristics and expertise. The grey gradient symbolized formality and sophistication with elegance and simplicity. The team's mascot, a kitten, represents playfulness and the importance of learning through play to develop adult skills.

APPENDIX J

Product Poster.

APPENDIX K

Product Packaging.

Front

Side (right and left)

Back

Top Side

Bottom

APPENDIX L

Minutes of the Capstone Project Final Defense.

August 8, 2024 | 4:30 pm – 6:30 pm
College of Information Technology
University of Negros Occidental – Recoletos

Project Proposal Title	HydroSense
Group Members	Thalea Prince Baladhay Marvin Jomel Felipe Bernard Anton Millaro
Panel Members	Reinhardt D. Firmeza Elmer T. Haro, Ph.D. Reymund L. Sabay
Interpellators	Alexander Nicole Bravo Christian Javier Alijah Mckale Rodis

1. The conference started with a prayer led by Marvin Felipe.
2. The group members were introduced by Marvin Felipe.
3. The oral presentation was delivered by Thalea Prince Baladhay, Marvin Jomel Felipe and Bernard Anton Millaro.
4. After the presentation, the following are the suggestions, recommendations of the interpellators and the panel members:

Chapter/Section	Recommendations/ Suggestion	Proponent	Action Taken	Reference / Proof
Title and Front Matters				
Introduction and System Decomposition	Technical details of the hardware in simplified version	Alijah Mckale V. Rodis	Simplified technical details of the hardware ensure easy understanding and accessibility for users.	Page 20
Product Prototype/Interface	Improve the case of sensors	Christian Javier	The sensor casing was improved for enhanced durability and protection.	Hardware
	Adjust the size and design of the hardware	Alexander Nicole Bravo	The hardware was resized and redesigned for	Hardware

			improved usability and portability.	
	Hydrology Resources properly cited	Reinhardt D. Firmeza	Properly cited hydrology resources ensure credibility and accuracy of the provided information.	Page 67
	Reports and recommendations	Reymund L. Sabay	Reports and recommendations provide users with clear insights and actionable steps for improving water quality.	Page 63
	Presentations of graphs	Alijah Mckale V. Rodis	Graphs are presented in an intuitive format, enabling easy interpretation of water quality data.	Page 64, Page 65
Appendices	Improve the promotional video and product packaging	Elmer T. Haro, Ph.D.	Enhancements were made to the promotional video and product packaging to better showcase features and attract users.	Page 172, Page 173
References	Ensure that the citation is properly specified in the references section	Reinhardt D. Firmeza	Rephrased the sentence for clarity and grammatical correctness.	Page 203

5. After the deliberation of the interpellators and panel members, the proposal is considered accepted with revisions in the documentation and in the prototype.

6. The conference ended 6:00 PM.

Transcribed by : Thalea Prince P. Baladhay

Noted by : Elmer T. Haro, Ph.D.

APPENDIX M

Internal Quality Measurement Results in Software.

Hydrology Resources	
Understandability	
X = A / B A = Number of UI functions whose purpose is understood by user. B = Total number of interface functions.	
Functions	Status
View Hydrology Resources Topics	Understood
View Hydrology Resources Articles	Understood
View Hydrology Resources Guides	Understood
View Hydrology Resources Video	Understood
Search Bar	Understood
Topic Sorting	Understood
Start Logging button	Not Understood
Computations (6 / 7) * 100 = 85.71%	
TOTAL	85.71%
Learnability	
X = 1 - A / B A = Number of incomplete help topics. B = Total number of help topics.	
Functions	Status
View Hydrology Resources Articles	Help Topics Available
View Hydrology Resources Guides	Help Topics Available
View Hydrology Resources Videos	Help Topics Available
Computations (3 / 3) * 100 = 100.00%	
TOTAL	100.00%
Operability	
X = A / B A = Number of customizable functions. B = Total number of functions requiring customization.	
Functions	Status
Customizable Search Filters	Completed

Computations (1 / 1) * 100 = 100.00%	
TOTAL	100.00%
Attractiveness	
X = A / B A = Number of customized interface elements. B = Total number of interface elements.	
Functions	Status
Responsive Web Interface	Implemented
Cohesive Color Scheme	Implemented
Custom Icons and Graphics	Implemented
Computations (3 / 3) * 100 = 100.00%	
TOTAL	100.00%
ISO/IEC-9126 Compliance	
X = A / B A = Number of correctly implemented compliance items. B = Total number of compliance items.	
Functions	Status
Compliance with WHO Content Standards	Implemented Correctly
Compliance with FDA Content Standards	Implemented Correctly
Compliance with CDC Content Standards	Implemented Correctly
Regularly Updated Content	Delayed
Computations (3 / 4) * 100 = 75.00%	
TOTAL	75.00%

Contaminant Detection	
Accuracy	
X = 1 - A / B A = Number of data items with incorrect precision. B = Total number of data items requiring precision.	
Functions	Status
Water pH Level Detection	Accurate
Water TDS Level Detection	Accurate
Water Turbidity Level Detection	Accurate
Water Temperature Level Detection	Accurate
Computations	

(4 / 4) * 100 = 100.00%	
TOTAL	100.00%
Interoperability	
X = A / B A = Number of correctly implemented data formats. B = Total number of required data formats.	
Functions	Status
JSON Data Format Compatibility	Implemented
HTTP Communication	Implemented
CSV format in saving data	
Computations (3 / 3) * 100 = 100.00%	
TOTAL	100.00%
ISO/IEC-9126 Compliance	
X = A / B A = Number of correctly implemented compliance items. B = Total number of compliance items.	
Functions	Status
Intuitive User Interface	Implemented Correctly
Error Handling	Implemented Correctly
Icons for each level	Not Implemented Correctly
pH level gauge	Implemented Correctly
TDS level gauge	Implemented Correctly
Turbidity level gauge	Implemented Correctly
Water temperature gauge	Implemented Correctly
Computations (6 / 7) * 100 = 85.71%	
TOTAL	85.71%

Data Visualization	
Resource Utilization	
X = A / B A = Number of I/O error messages. B = Number of lines of code related to system calls.	
Functions	Status
I/O Error Handling	No Errors
System Calls for Data Loading	No Errors

Memory overflow when refreshed	Error
Data Export Operations	No Errors
Computations (3 / 4) * 100 = 75.00%	
TOTAL	75.00%
Time Behavior	
X = A / B A = Number of time delays. B = Total number of data streams.	
Functions	Status
Real-time Data Stream 1 (pH Sensor)	No Delays
Real-time Data Stream 2 (TDS Sensor)	No Delays
Real-time Data Stream 3 (Turbidity Sensor)	No Delays
Real-time Data Stream 4 (Temperature Sensor)	No Delays
Group/Ungroup Toggle for Line Chart	No Delays
Computations (5 / 5) * 100 = 100.00%	
TOTAL	100.00%
ISO/IEC-9126 Compliance	
X = A / B A = Number of correctly implemented compliance items. B = Total number of compliance items.	
Functions	Status
Compliance with data visualization performance standards	Implemented Correctly
Compliance with real-time data monitoring requirements	Implemented Correctly
CSV export functionality compliance (Data Integrity)	Implemented Correctly
Computations (3 / 3) * 100 = 100.00%	
TOTAL	100.00%
Data Handling and Visualization	
X = A / B A = Number of data types processed and visualized correctly B = Total number of data types	

Functions	Status
pH sensor data visualization	Correct
TDS sensor data visualization	Correct
Turbidity sensor data visualization	Correct
Temperature sensor data visualization	Correct
CSV export for historical data analysis	Correct
Computations (6 / 6) * 100 = 100.00%	
TOTAL	100.00%
User Interaction and Customization	
X = A / B A = Number of customizable or interactive features implemented B = Total required customizable features	
Functions	Status
Customizable chart views (grouping/ungrouping sensors)	Correct
Historical data download in CSV format	Correct
Turbidity sensor data visualization	Correct
Ability to zoom and filter data for specific timeframes	Correct
Computations (4 / 4) * 100 = 100.00%	
TOTAL	100.00%
Real-time Capability	
X = A / B A = Number of real-time updates provided B = Total number of required updates	
Functions	Status
Real-time updates for pH sensor data	Real-time
Real-time updates for TDS sensor data	Real-time
Real-time updates for turbidity sensor data	Real-time
Real-time updates for temperature sensor data	Real-time
Computations (4 / 4) * 100 = 100.00%	
TOTAL	100.00%

Water Quality Recommendation
Understandability

X = A / B A = Number of UI functions whose purpose is understood by user. B = Total number of interface functions.	
Functions	Status
pH level display	Understood by User
Turbidity level display	Understood by User
TDS level display	Understood by User
Water temperature display	Understood by User
Water Quality Recommendation Based on Sensor Data	Understood by User
Computations (6 / 6) * 100 = 100.00%	
TOTAL	100.00%
Learnability	
X = 1 - A / B A = Number of incomplete help topics. B = Total number of help topics.	
Functions	Status
Explanation of TDS levels and health impacts	Comprehensive
Explanation of pH levels and health impacts	Comprehensive
Explanation of turbidity and its health risks	Comprehensive
Explanation of water temperature and its significance	Comprehensive
Health Impact of Unsafe Water	Comprehensive
Water purification method recommendations	Comprehensive
Computations (6 / 6) * 100 = 100.00%	
TOTAL	100.00%
Operability	
X = A / B A = Number of customizable functions. B = Total number of functions requiring customization.	
Functions	Status
Customizable sensors update time	Not Completed
Customizable water quality thresholds (safe TDS range)	Implemented

Customizable water quality thresholds (safe pH range)	Implemented
Customizable water quality thresholds (safe Turbidity range)	Implemented
Customizable water quality thresholds (Temperature range)	Implemented
Computations (4 / 5) * 100 = 100.00%	
TOTAL	100.00%
ISO/IEC-9126 Compliance	
X = A / B A = Number of correctly implemented compliance items. B = Total number of compliance items.	
Functions	Status
Compliance with real-time monitoring requirements	Complaint
Compliance with water safety standards (WHO)	Complaint
Computations (2 / 2) * 100 = 100.00%	
TOTAL	100.00%

APPENDIX N

Internal Quality Measurement Results in Hardware.

IoT system trustworthiness characteristics	
Availability	
X = A / B A = Number of unplanned hardware downtimes. B = Total number of operational instances.	
Functions	Status
pH sensor	Operational
pH sensor interface board	Operational
TDS sensor	Operational
TDs sensor interface board	Operational
Turbidity sensor	Operational
Turbidity sensor interface board	Operational
Temperature sensor	Operational
Arduino Uno	Operational
ESP32	Operational
Computations (1 – 0 / 9) * 100 = 100.00%	
TOTAL	100.00%
Confidentiality	
X = A / B A = Number of secure transmissions. B = Total number of data transmissions.	
Functions	Status
Wi-Fi data encryption	Secure
pH sensor data encryption	Secure
TDS sensor data encryption	Secure
Turbidity sensor data encryption	Secure
Temperature sensor data encryption	Secure
Single user can login per device	Not Secure
Computations (5 / 6) * 100 = 83.33%	
TOTAL	83.33%
Integrity	

X = A / B A = Number of correctly transmitted data packets. B = Total number of transmitted packets.	
Functions	Status
pH sensor data integrity	Correct
TDS sensor data integrity	Correct
Turbidity sensor data integrity	Correct
Temperature sensor data integrity	Correct
Saved data integrity	Correct
Computations (4 / 4) * 100 = 100.00%	
TOTAL	100.00%
Reliability	
X = A / B A = Number of consistent sensor readings. B = Total number of sensor readings.	
Functions	Status
pH sensor consistency	Consistent
TDS sensor consistency	Consistent
Turbidity sensor consistency	Consistent
Temperature sensor consistency	Consistent
Computations (4 / 4) * 100 = 100.00%	
TOTAL	100.00%
Resilience	
X = A / B A = Number of successful recoveries from system failures. B = Total number of system failures.	
Functions	Status
Recovery from network disruption	Successful
Recovery from power failure	Successful
Recovery from sensor malfunction	Successful
Computations (3 / 3) * 100 = 100.00%	
TOTAL	100.00%
Safety	
X = A / B A = Number of safe operational instances.	

B = Total number of operational instances.	
Functions	Status
Safe sensor operation during data handling	Safe
Electrical safety for hardware components	Safe
Computations (2 / 2) * 100 = 100.00%	
TOTAL	100.00%

IoT system architecture characteristics	
Heterogeneity	
X = A / B A = Number of successfully integrated sensor types. B = Total number of sensor types.	
Functions	Status
pH Sensor Integration	Successful
TDS Sensor Integration	Successful
Turbidity Sensor Integration	Successful
Temperature Sensor Integration	Successful
Computations (4 / 4) * 100 = 100.00%	
TOTAL	100.00%
Modularity	
X = A / B A = Number of replaceable modular components. B = Total number of modular components.	
Functions	Status
pH Sensor	Replaceable
TDS Sensor	Replaceable
Turbidity Sensor	Replaceable
Temperature Sensor	Non-Replaceable
Computations (3 / 4) * 100 = 75.00%	
TOTAL	75.00%
Network Connectivity	
X = A / B A = Number of successful network connections.	

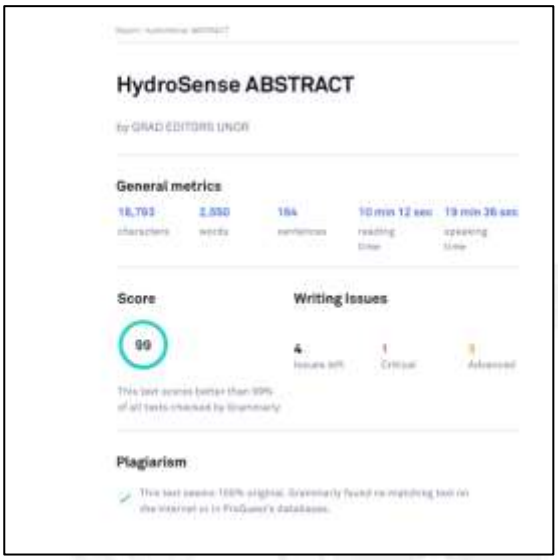
B = Total number of connection attempts.	
Functions	Status
Android Phone #1	Successful
Android Phone #2	Successful
Android Phone #3	Successful
Laptop #1	Successful
Laptop #2 20 meters away	Unsuccessful
Computations (4 / 5) * 100 = 80.00%	
TOTAL	80.00%

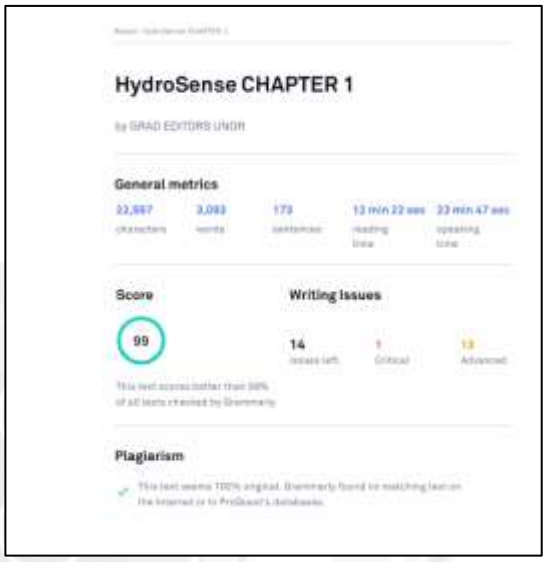
IoT system functional characteristics	
Compliance	
X = A / B A = Number of compliances with performance and operational requirements. B = Total number of hardware elements.	
Functions	Status
Sensor data compliance with system performance standards	Compliant
Sensor operation compliance with specified response times	Compliant
Sensor compliance with data accuracy thresholds	Compliant
Sensor compliance with real-time monitoring standards	Compliant
Computations (4 / 4) * 100 = 100.00%	
TOTAL	100.00%
Data Characteristics	
X = A / B A = Number of data types processed correctly. B = Total required data types.	
Functions	Status
pH sensor data processing	Correct
TDS sensor data processing	Correct
Turbidity sensor data processing	Correct
Temperature sensor data processing	Correct
Water recommendation data processing	Correct
Health risk data processing	Correct
Computations	

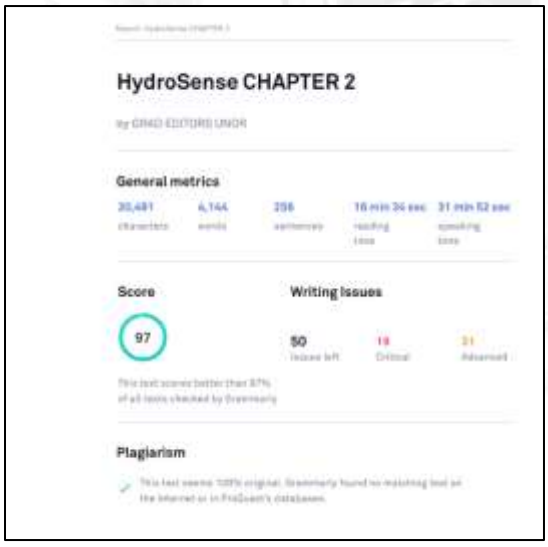
(6 / 6) * 100 = 100.00%	
TOTAL	100.00%
Real-time Capability	
X = A / B A = Number of real-time updates provided. B = Total number of required updates.	
Functions	Status
pH sensor updates	Real-time
TDS sensor updates	Real-time
Turbidity sensor updates	Real-time
Temperature sensor updates	Real-time
Water recommendation updates	Real-time
Health risk updates	Real-time
Hydrology resources updates	Delayed
Computations (6 / 7) * 100 = 85.71%	
TOTAL	85.71%

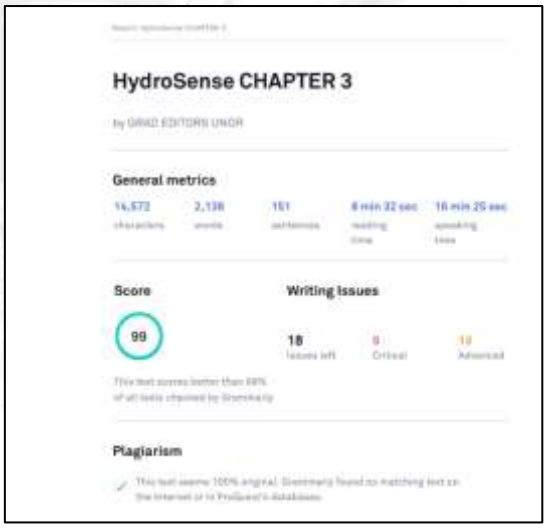
APPENDIX O

Grammarly Results.









HydroSense CHAPTER 4

by GRAD EDITORS UNOR

General metrics

16,458 characters | 2,358 words | 124 sentences | 9 min 25 sec reading time | 18 min 7 sec speaking time

Score

98

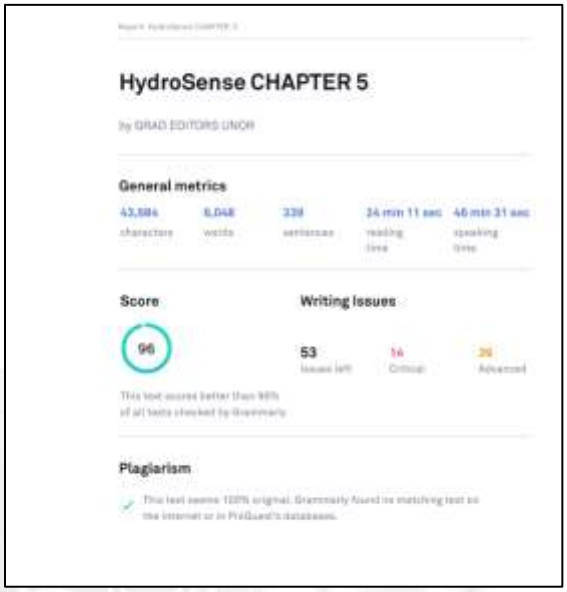
This text scores better than 98% of all texts checked by Grammarly

Writing Issues

21 issues left | 8 Critical | 13 Advanced

Plagiarism

This text seems 100% original. Grammarly found no matching text on the internet or in ProQuest's databases.



HydroSense CHAPTER 5

by GRAD EDITORS UNOR

General metrics

43,584 characters | 6,048 words | 328 sentences | 34 min 11 sec reading time | 46 min 31 sec speaking time

Score

96

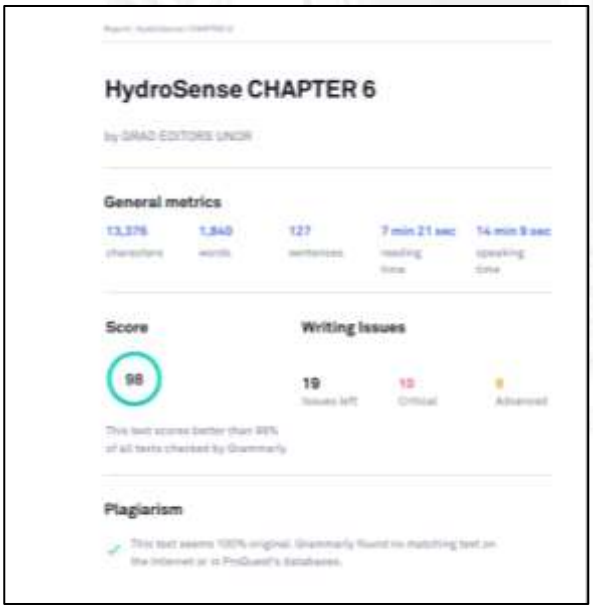
This text scores better than 96% of all texts checked by Grammarly

Writing Issues

53 issues left | 14 Critical | 26 Advanced

Plagiarism

This text seems 100% original. Grammarly found no matching text on the internet or in ProQuest's databases.



HydroSense CHAPTER 6

by GRAD EDITORS UNOR

General metrics

13,376 characters | 1,940 words | 127 sentences | 7 min 21 sec reading time | 14 min 9 sec speaking time

Score

98

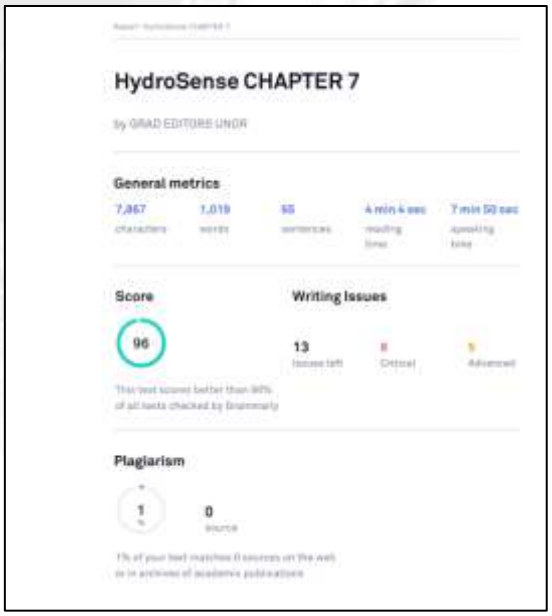
This text scores better than 98% of all texts checked by Grammarly

Writing Issues

19 issues left | 10 Critical | 8 Advanced

Plagiarism

This text seems 100% original. Grammarly found no matching text on the internet or in ProQuest's databases.



HydroSense CHAPTER 7

by GRAD EDITORS UNOR

General metrics

7,867 characters | 1,019 words | 65 sentences | 4 min 4 sec reading time | 7 min 50 sec speaking time

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Writing Issues

13 issues left | 8 Critical | 5 Advanced

Plagiarism

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APPENDIX P

Turnitin Results.

APPENDIX Q

Water Safety Sources in Hydrology Resources.

Source	Type	Title	Link
YouTube	Video	When is water safe to drink?	https://www.youtube.com/watch?v=G244Q4AGJ7U
World Health Organization (WHO)	Guide	Guidelines for drinking-water quality	https://www.who.int/publications/i/item/9789240045064
World Health Organization (WHO)	Article	Drinking-water	https://www.who.int/news-room/fact-sheets/detail/drinking-water
IntechOpen	Book	Safe Drinking Water: Concepts, Benefits, Principles and Standards	https://www.intechopen.com/chapters/57345
National Library of Medicine	Book	Water Supply, Sanitation, and Hygiene	https://www.ncbi.nlm.nih.gov/books/NBK525207/

APPENDIX R

pH Level Sources in Hydrology Resources.

Source	Type	Title	Link
YouTube	Video	Acid and Base | Acids, Bases & pH	https://www.youtube.com/watch?v=V5MqcL9Bck
DataStream	Guide	Physical & Chemical Characteristics (pH)	https://datastream.org/en-ca/guidebook/ph
MedicalNews Today	Article	The pH of water: What to know	https://www.medicalnewstoday.com/articles/327185
Wastewater Digest	Article	What is pH?	https://www.wwdmag.com/what-is-articles/article/10940015/what-is-ph
ScienceNews Explores	Article	Scientists Say: pH	https://www.snexplores.org/article/scientists-say-ph

APPENDIX S

Turbidity Level Sources in Hydrology Resources.

Source	Type	Title	Link
YouTube	Video	What Is Turbidity In Water? 6 Things You Should Know	https://www.youtube.com/watch?v=vuFweYh8VRI
HELCOM	Guide	Guidelines for monitoring of turbidity	https://helcom.fi/wp-content/uploads/2019/08/Guidelines-for-measuring-turbidity.pdf
Wastewater Digest	Article	What is Turbidity?	https://www.wwdmag.com/what-is-articles/article/10939754/what-is-turbidity
United States Geological Survey	Article	Turbidity and Water	https://www.usgs.gov/special-topics/water-science-school/science/turbidity-and-water
International Association of Dredging Companies	Articles	Turbidity	https://www.iadc-dredging.com/subject/environment/turbidity/

APPENDIX T

TDS Level Sources in Hydrology Resources.

Source	Type	Title	Link
YouTube	Video	Best bottled water pH TDS test	https://www.youtube.com/watch?v=D5jvCN6FqOs
Kent Health Care Products	Guide	What are Total Dissolved Solids (TDS) & How to Reduce Them?	https://www.kent.co.in/blog/what-are-total-dissolved-solids-tds-how-to-reduce-them/
Safe Drinking Water Foundation	Article	TDS and pH	https://www.safewater.org/fact-sheets-1/2017/1/23/tds-and-ph
ResearchGate	Study	A Study on the Total Dissolved Solids and Hardness Level of Drinking Mineral Water in Bangladesh	https://www.researchgate.net/publication/313103314_A_Study_on_the_Total_Dissolved_Solids_and_Hardness_Level_of_Drinking_Mineral_Water_in_Bangladesh
Fresh Water Systems	Blog	What Is TDS in Water & Why Should You Measure It?	https://www.freshwatersystems.com/blogs/blog/what-is-tds-in-water-why-should-you-measure-it

APPENDIX U

Water Temperature Sources in Hydrology Resources.

Source	Type	Title	Link
YouTube	Video	MEASURE THE TEMPERATURE OF WATER WHEN IT'S HEATED, BOILING AND COOLING	https://www.youtube.com/watch?v=lLSfLMZHVGw
Safe Drinking Water Foundation	Article	WATER TEMPERATURE FACT SHEET	https://www.safewater.org/fact-sheets-1/2018/8/15/water-temperature-fact-sheet
National Library of Medicine	Book	The effect of water temperature and voluntary drinking on the post rehydration sweating	https://pmc.ncbi.nlm.nih.gov/articles/PMC3762624/
United States Geological Survey	Article	Temperature and Water	https://www.usgs.gov/special-topics/water-science-school/science/temperature-and-water
Multidisciplinary Digital Publishing Institute	Article	Drinking Water Temperature around the Globe	https://www.mdpi.com/2073-4441/12/4/1049

APPENDIX V

Filtration Sources in Hydrology Resources.

Source	Type	Title	Link
YouTube	Video	Determine Water Quality using Arduino and Turbidity Sensor	https://www.youtube.com/watch?v=MytUqOz5vbY
YouTube	Video	Filtration Testing & Piloting Guidelines	https://www.youtube.com/watch?v=h_aTYKtBSvw
ScienceDirect	Article	Water Filtration	https://www.sciencedirect.com/topics/chemical-engineering/water-filtration
ScienceDirect	Article	Filtration Process	https://www.sciencedirect.com/topics/engineering/filtration-process
National Library on Medicine	Book	Effectiveness of Membrane Filtration to Improve Drinking Water	https://pmc.ncbi.nlm.nih.gov/articles/PMC5094238/

APPENDIX W

Aeration Sources in Hydrology Resources.

Source	Type	Title	Link
YouTube	Video	Water aeration principle	https://www.youtube.com/watch?v=uLOZblR1VyY
University of Massachusetts Amherst	Article	Aeration Treatment of Drinking Water Supplies	https://ag.umass.edu/cafe/fact-sheets/aeration-treatment-of-drinking-water-supplies#:~:text=Aeration%20treatment%20consists%20of%20passing,to%20volatilize%20into%20the%20air.
National Library on Medicine	Book	Field Research on Mixing Aeration in a Drinking Water Reservoir	https://pmc.ncbi.nlm.nih.gov/articles/PMC6862099/
Wastewater Digest	Article	What is Aeration for Wastewater Treatment?	https://www.wwdmag.com/what-is-articles/article/10939130/what-is-aeration-for-wastewater-treatment
Solitude Lake Management	Article	Oxygenate Your Waterbody with Aeration	https://www.solitudelakemanagement.com/top-3-aeration-articles/

APPENDIX X

Water Distillation Sources in Hydrology Resources.

Source	Type	Title	Link
How to Make Distilled Water	Video	How to Make Distilled Water	https://www.youtube.com/watch?v=VHZitT0-fCY
University of Nebraska–Lincoln	Book	Drinking Water Treatment: Distillation	https://extensionpubs.unl.edu/publication/g1493/2013/pdf/view/g1493-2013.pdf
MedicalNews Today	Article	Is distilled water safe to drink?	https://www.medicalnewstoday.com/articles/317698
Wastewater Digest	Article	What is Water Distillation?	https://www.wwdmag.com/what-is-articles/article/10940138/what-is-water-distillation
IWA Publishing	Article	Distillation Treatment and Removal of Contaminants from Drinking Water	https://web.archive.org/web/20240625080557/https://www.iwapublishing.com/news/distillation-treatment-and-removal-contaminants-drinking-water

APPENDIX Y

Sedimentation Sources in Hydrology Resources.

Source	Type	Title	Link
YouTube	Video	Sedimentation	https://www.youtube.com/watch?v=YQ2kIXaRNWE
Etch2o	Guide	2023 Guide to Sedimentation in Water Treatment	https://www.etch2o.com/sedimentation-in-water-treatment/
IOPscience	Paper	Increasing the efficiency of sedimentation tanks for drinking water treatment	https://iopscience.iop.org/article/10.1088/1755-1315/1076/1/012049
Taylor & Francis	Paper	Reduction of sedimentation and water turbidity at intakes of drinking water treatment plants	https://www.tandfonline.com/doi/full/10.1080/23570008.2023.2210892
IWA Publishing	Article	Sedimentation Processes	https://web.archive.org/web/20240720121731/https://www.iwapublishing.com/news/sedimentation-processes

APPENDIX Z

Boiling Water Sources in Hydrology Resources.

Source	Type	Title	Link
YouTube	Video	Boiling Water Bubbles, what makes them exactly? What are they made of?	https://www.youtube.com/watch?v=egwCLxxSfwI
CDC	Guide	Boil Water Advisory	https://web.archive.org/web/20240822023550/https://www.cdc.gov/healthywater/emergency/drinking/drinking-water-advisories/boil-water-advisory.html
CDC	Guide	Making Water Safe in an Emergency	https://web.archive.org/web/20240208041305/www.cdc.gov/healthywater/emergency/making-water-safe.html
MedicalNews Today	Article	What are the benefits of drinking hot water?	https://www.medicalnewstoday.com/articles/319673
YouTube	Video	Boiling Water Bubbles, what makes them exactly? What are they made of?	https://www.youtube.com/watch?v=egwCLxxSfwI

APPENDIX AA

Water Treatment Sources in Hydrology Resources.

Source	Type	Title	Link
YouTube	Video	How Do Water Treatment Plants Work?	https://www.youtube.com/watch?v=0_ZcCqqpS2o
CDC	Guide	A Guide to Drinking Water Treatment and Sanitation for Backcountry and Travel Use	https://web.archive.org/web/20240807060639/https://www.cdc.gov/healthywater/drinking/travel/backcountry_water_treatment.html
ScienceDirect	Articles	Drinking Water Treatment	https://www.sciencedirect.com/topics/earth-and-planetary-sciences/drinking-water-treatment
SafetyCulture	Articles	A Guide to Understanding Water Treatment	https://safetyculture.com/topics/water-treatment/
ScienceDirect	Article	Water Management, Treatment and Environmental Impact	https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/water-treatment

APPENDIX AB

Alkaline Water Sources in Hydrology Resources.

Source	Type	Title	Link
YouTube	Video	How to make Alkaline Water	https://www.youtube.com/watch?v=s7KKost6a34
Distillata	Guide	A Complete Guide to Alkaline Water	https://distillata.com/blog/a-complete-guide-to-alkaline-water/
Healthline	Articles	What Is Alkaline Water, and What Are the Benefits?	https://www.healthline.com/health/food-nutrition/alkaline-water-benefits-risks
National Library of Medicine	Book	Alkaline Water and Longevity	https://pmc.ncbi.nlm.nih.gov/articles/PMC4906185/
MedicalNews Today	Article	Is alkaline water good for you?	https://www.medicalnewstoday.com/articles/313681