

water collection and management system

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A Study on

Water Collection and Management System using Smart Home Technology

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Saint David

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Declaration

I have read and understood that the university regulations concerning plagiarism, and I undertake:

- That any quotation or paraphrase from published and unpublished works of another person or scholar has been duly acknowledged in this project



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Abstract

Smart home technology used for water collection and management is still a new innovation, but there are more considerations on the western world with much emphasis being laid of developing economies which the researcher intends to understudy. Water collection and management have been one of the most troubling issues that arouse the attention of researchers and scientists and this gave rise to the innovation of smart home technology for water collection and management. One of the main objectives of this study is to examine the smart home technology market and align this innovation with the interest of users in proper water collection and management. The study reviewed scholar views of early adoption of smart home technology in water collection and management, and benefits and risks of smart home technology in water collection and management. The study adopted survey research design and research approach of qualitative and quantitative method of data collection as methodology of the research. In the presentation and analysis of result, the study came with the innovation of experimentation of proper water management using a smart water tank using IoT innovation as a means for proper water collection and management. The study therefore recommended that, there should be a novel architecture with a view of achieving low cost and flexibility in the use of smart home technology in water collection and management.

Acknowledgment

In the cause of this research study, I will love to acknowledge the guide and direction accorded me by my project supervisor, who was always handy to guide me through the part of organizing my thoughts and selecting proper literatures for this study. I will not fail to also acknowledge the advice and suggestions of some of my Lecturer and in class whose critique to my project topic gave me the courage to put in my best to achieve this research work.

Chapter One

Introduction

Smart home technology used in the management of water collection has been one of the innovations that have changed the narrative in the technological industry, especially in Europe and most developed economies. According to a report by European Commission (1) that posits that special attention has been given to the strategic energy technological plan aimed at creating technologies and services for smart home as it has to do with the management of water collection to provide smart solution to energy consumers. This strategic plan has been projected to put in place a visionary action plan for electricity market and management of water collection in European countries aimed at delivering a new deal for consumers of smart homes, data management and protection.

Lewis (2) and Firth et al. (3) are of the view that the policy of engaging in smart homes aimed at enabling technologies to be able to meet up with the latent demands of households for energy control and water management have become very pertinent and important. Therefore, smart homes are seen as an integral part of a future energy efficient system projected to reduce the overall demands as well as helping to solve the constrains period of peak load in water management.

Balta-Ozkan et al. (4) posits that the European Union's widespread diffusion and diversity in homes situated within United Kingdom have already anticipated the policy document of making use of smart home technology in the proper management of water collection through making use of smart home technology, and this is seen as an anticipation or importance of building block of smart grid. Therefore, smart homes experts have agreed that climate change and energy policy will be a wonderful initiative to drive the United Kingdom's smart home market towards are better development.

Harms (5) argued that smart home technologies have become increasingly on sale off the shelf with abundant professional installations from well trained professional engineers in the field. A good example of this can be seen in the availability in the UK homes system where there is the control of heating and hot water system, and the smart home heating appliances and lighting have become a common phenomenon with the UK home system. Today, the global market for smart home appliances is being projected to grow by 650-fold from \$40million in 2018 to \$73million in 2020.



Therefore, this study will be addressing the issue of water collection and management system using smart home technologies with its attendant risk to its users who have adopted the use of the innovation as the best approach to addressing the challenges in water collection and management in the society.



Statement of the problem

Water collection and management have been one of the most troubling issues that arouse the attention of researchers and scientists into trying to look for lasting solution to this challenge, and this gave rise to the innovation and invention of smart home technologies that came to light in early 1990s in Europe and some other technological advanced countries. Even though this seems to have become the answer to proper water collection and management in the society, it also has its attendant risks to its users which have questioned the technology's harmfulness to its users, but unfortunately, this has not been properly addressed till date. And as long as this remains the case, the use of smart home technology in water collection and management has remained a challenge.

Objectives of the study

The main objective of the study is to properly address the issue of adopting smart home technology in proper water collection and management system in the society

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Other objectives are:

1. To ascertain benefits and risk of prospective users of smart home technologies in water collection and management.
2. To ascertain how the perception early adoption of smart home technologies have been distinctive
3. To find out how the industry market of smart home technologies have been able to align with the perception of prospective users as it concerns proper water collection and management system.

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Chapter Delineation

The preceding chapters will be discussing the early adoption of smart home technology in water collection and management; benefits and risks of smart home technology in water collection and management. The research design and implementation which encapsulates: survey design and research approach. The fourth chapter of the study will be looking at data presentation and analysis of result, and this will have: data presentation, data analysis and results, and the experimentation of proper water management. And the last chapter will be looking at the conclusion and recommendations.

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Chapter Two

Review of Related Literature

Early Adoption of Smart Home Technology in Water Collection and Management

Research has shown that the early adoption of smart home technology in proper water collection and management have been perceived to have its attendant benefits and risks to its users, but this has not deterred the rising number of those who have adopted the technology today, especially in UK and few other technologically advanced societies (6). According to Mann-Whitney (7), in his research study noted that early users of smart home technologies in water collection and management have argued that the technology have been more beneficial for their use, irrespective of its attendant risks which are usually caused where the users fails to adhere to the terms and conditions stipulated in its usage.

Benefits and Risks of Smart Home Technology in Water Collection and Management

Strengers (8) have argued that prospective users of smart home technology in water collection and management have aligned their faith in the multiple functionality of managing the use of energy, control of domestic environment and improving in security within their homes because of the efficiency of the device. Prospective users have also aligned their perception of the cost, control and convenience the device tend to provide, and this is why the technological device have grown a large market in UK and most other European nations.

Koomey et al. (9), they have argued that the positive or negative impact of smart home technologies have remained unclear and less explained for its users, which has become a risk factor in itself.

Chapter Three

Design and Implementation

Survey Design

This research will be adopting a combination of qualitative and quantitative research **survey design**  in expert opinions and scholarly views will be reviewed, and government policy documents will also be analyzed on water collection and management system using smart home technology. This approach was taken with the cognizance of the questions put in place to guide the issue of water collection and management using smart home technology in the chosen survey area as to proper guide the survey method adopted for this research. **A ten year policy document of**  government will be taken into consideration with the view of looking at the future as to enable exploration of possible different types of benefits that may arise in the application of water collection and management in the study area.

Research Approach

The study will be adopting a hypothetical narrative approach on the multiple potential future on water collection and management using smart home technology, and this will only be possible depending on the decision that are made by policy makers at critical junctures. The policy of decision makers on this is aimed at raise critical questions across the connection of social, environmental and institutional system. This approach will also explore different sets of extreme trajectories in isolation as to ascertain the best approach to be adopted in achieving a better water collection and management using smart home technology

Chapter Four

Presentation and Analysis of Results

Data Presentation

Data collated from policy documents and scholar literatures will be used to guide the presentation of the study. These views and policy documents will be used to analyze the variable - water collection and management system using smart home technology. The data gathered will be synchronized during analysis as it deals mainly on important documentaries that will be adopted in the cause of the study.



Data Analysis and Results

In most developing economies, unlike in Europe, the issue of water collection and management has become a major challenge. Water shortage is one major challenge the state have been combating over the years (10). Water desalination, water distribution, and water treatment have received significant attention, but the problem has remained in place (11). The desalinated water pipelines that run through urban metropolitan cities have not been enough to attend to the challenges of water collection and management, hence the importance of adopting smart home technology in the collection and management of water distribution. Consumers are made to get water supply at great cost, but despite this, the quality of water supply has remained very low (12).

Different diagrams will be displayed in the appendices where the use of smart home technology, such as IoT, using hybrid application of IoT device to make up the hybrid system and this device helps to measure water tank height, and sends real time information to the cloud through the use of smart technological device.



The use of the GSM device in the application of smart home technology sends a signal to another device – a motor-controlled device, which activates and deactivates

the motor signal automatically. And with the use of this technology, taking care of any possible leakage in the measurement of the hybrid application would have been properly taken care of. All the device needs is a constant data connection to monitor the real time connection between the devices (13).

Chapter Five

Conclusion and Recommendations

The study was able to examine the risk and prospect of using smart home technology is water collection and management using the IoT new innovation in the management of water collection and distribution in the case study area. The technology was able to ascertain the perception of early adoption of smart home technology for both commercial and private usage in homes and commercial centres with government intervention and adequate policies from policy makers in government. The scholarly views aligned with how the industry market of smart home technology have been able to properly address the issue of proper water collection and management system in the study area. The study therefore recommended that:

There should be a novel architecture with a view of achieving low cost and flexibility in the use of smart home technology in water collection and management, with emphasis on developing economies (14)

Additional innovation should be added to the smart home technology for proper and efficient water collection and management as to attend to the issue of poor network connection, high data consumption, and low risk for its users, this is necessary for low income earners and developing economies (15)

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Appendices

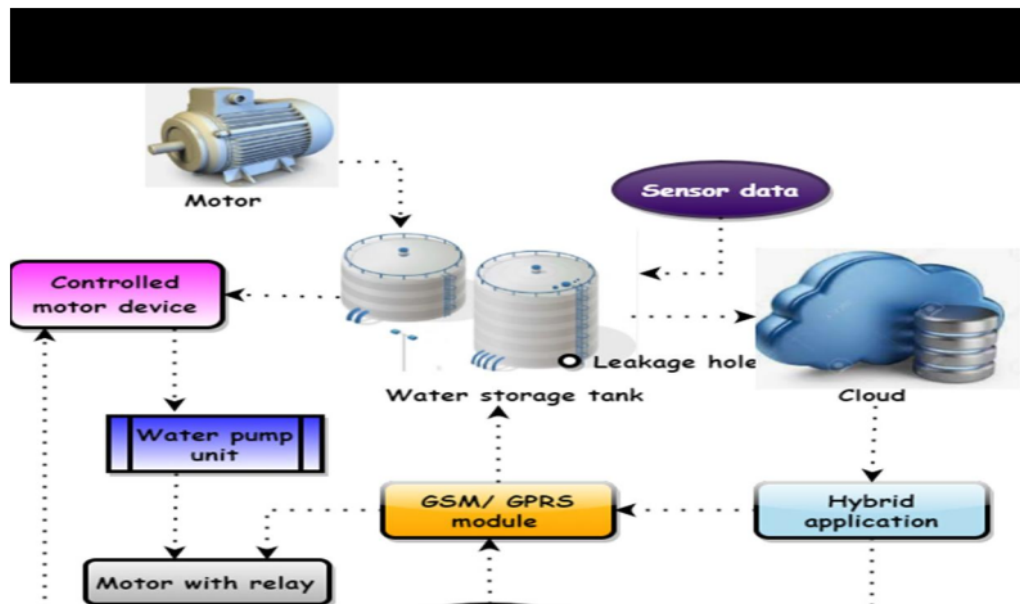


Figure 1: Smart water tank using IoT (AlGhamdi and Sharma, 2022)

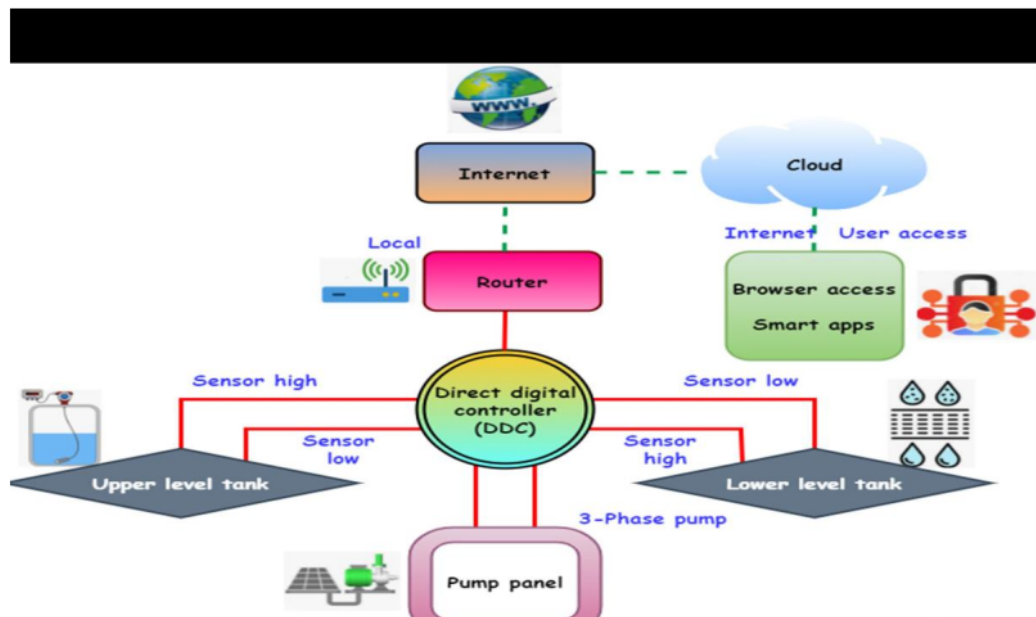


Figure 2: IoT-based smart water management systems (AlGhamdi and Sharma, 2022)

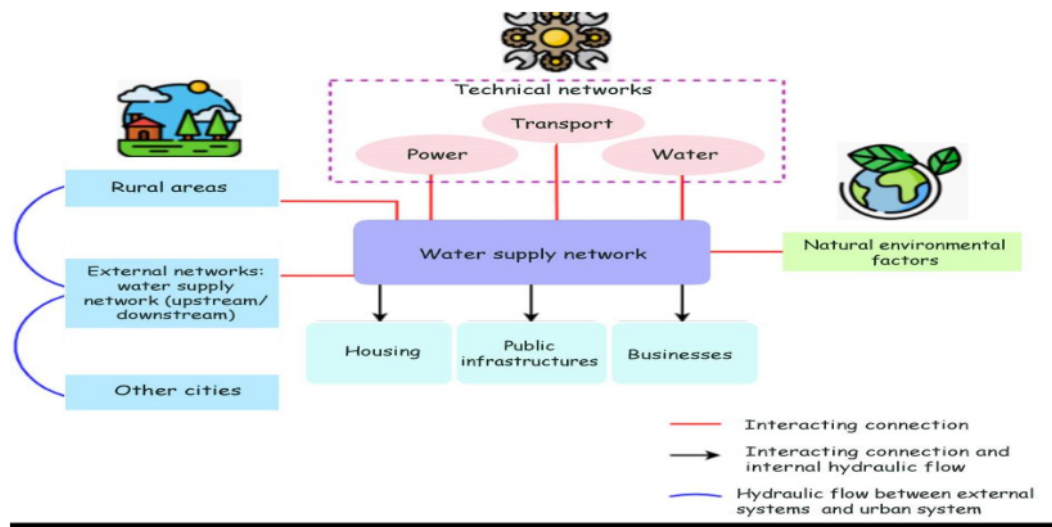


Figure 3: The strategy of a water supply network (AlGhamdi and Sharma, 2022)

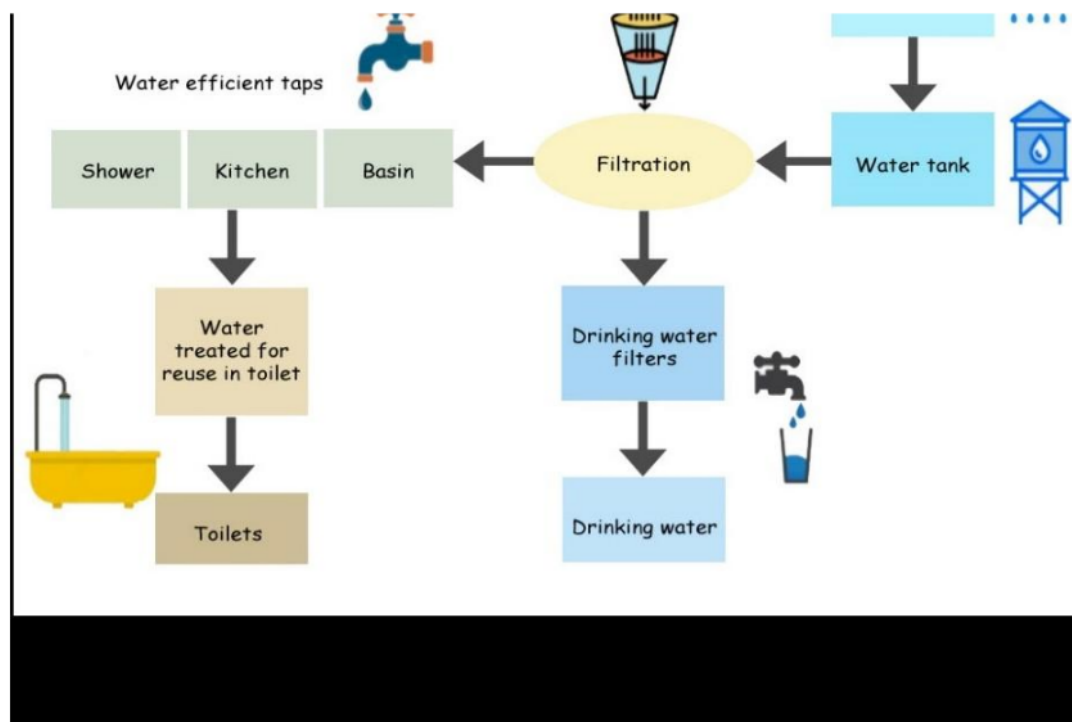


Figure 4: Greywater recycling system for the residence (AlGhamdi and Sharma, 2022)

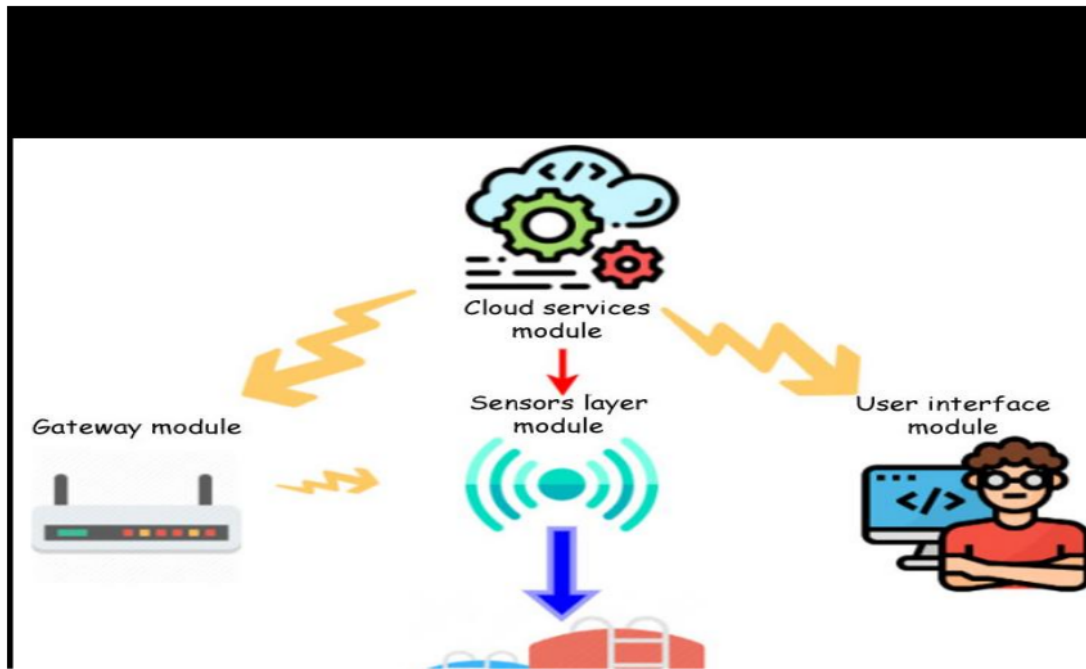


Figure 5: Automatic Quality Control for Water (AlGhamdi and Sharma, 2022)

water collection and management system

GRADEMARK REPORT

FINAL GRADE

44/100

GENERAL COMMENTS

Instructor

A very good front page in addition to the declaration page, and the table of contents. A few punctuation and grammatical errors.

Problem statement clearly defined along with concise objectives. Though a list of literature has been cited which is a good sign but there is a lack of critical evaluation of the cited literature. There is no indication of any experimental data, tables, graphs, and charts in the entire report. At this level learners are expected to extract useful data from the literature and use it for the purpose of their own research. This is missing in your report.

Additionally, there is a mention of "Government policy" and "Survey" in your report. But they are nowhere to be found in the report. That is also misleading and should be avoided in all circumstances for the future coursework.

It is not a usual practice to cite the references in the conclusion and recommendation sections. This is the section where learners should write their own findings of the literature review and analysis of the data from the cited literature. This is not impressive!



Your title page contains the useful information such as your name, student id, project title, supervisor's name, name of your program.

However, you can improve by using appropriate spacing and correct punctuations. See below:

Student Name: Nelson Oigbochie

Student ID: 2122737

Supervisor's Name: Dr Shahid Mehmood

You can also use the logo of UWTSD in your title page



Comment 2

Your report should contain date of 5th May 2023 and not March 2023.

PAGE 2



Comment 3

That is nice you have made declaration regarding your work. This is good habit. Keep doing this in all your future work:: either presentation or reports

PAGE 3



Comment 4

Nice Table of contents. It is very useful piece of information as it guides readers to choose if they are interested to read a certain component of the report.

You must have a uniform spacing between the lines in the Table of Contents and every where else in your report.

PAGE 4



Comment 5

no comment



Comment 6

no sign of any survey in the report. That is misleading the readers



Comment 7

It is always nice to appreciate others for their time and guidance. Keep doing this in your future courseworks: either reports, presentation or other piece of work. Brilliant!



Comment 8

and the most developed economies



Comment 9

It is too long a sentence. It is very difficult to follow for someone who is reading the report first time and do not know have any knowledge. In future avoid using long sentences



Comment 10

This statistic should be referenced.



Comment 11

Good background knowledge is provided here from various cited literature.



Comment 12

Very clearly described the main objective of the study



Comment 13

again very clear objectives described here. How are you going to achieve these objectives in this report?



Comment 14

have you designed your survey? Where it is? I can not see it. You must reference it in this section.



Comment 15

I could not see any data/tables/graphs in your report. Where it is?



Comment 16

Your title is about early adoption but you are talking about risks. You must ensure in your report that headings match with the contents or alternatively try to minimize the number of headings



Comment 17

in the UK



Comment 18

This is very useful point you have raised in the context of the cited literature. But you need to elaborate more as readers are not aware of what do you meant by risks?



Comment 19

It would be nicer to see some numbers here as you are talking about market size



Comment 20

How it has become risk factor?

PAGE 10



Comment 21

I look forward to see the survey and its results



Comment 22

That is very useful approach to follow Government policy document. I look forward to see some data in this context in the coming sections!

PAGE 11



Comment 23

where is the data?

where is the survey results?

where is the Government policy document?

You mentioned all these but I can not see these.



Comment 24

nice diagrams and explanation of the use of various technologies for your project.



Comment 25

incorrectly claimed. I did not see any of the policies



Comment 26

You should not use references in the conclusion. It is not acceptable. This is where you need to bring your contribution and write your thoughts.



Comment 27

I am more interested to know about your thoughts and not what others think and say in the conclusion section.



Comment 28

Comprehensive list of references