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Proposing new system for handling business data systems with more functionality and usability

Proponiendo un nuevo sistema para el manejo de sistemas de datos comerciales con más funcionalidad y usabilidad

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ABSTRACT

This paper focuses on creating a Water Refiling Station Management System (WRSMS) for selected water refilling stations in Havana, Cuba as most of them still operate by means of pen and paper, a tedious as well as time-consuming process when it comes to recording, manipulating, editing, and retrieving data, which leaves room for errors. The WRSMS is capable of storing, processing, and monitoring sales, customer, employee, inventory and attendance data, which it can be used to create financial statement reports. Furthermore, expressive investigation technique is used in this paper to assess current system of selected water stations and the WRSMS in terms of functionality and usability. It also helped to determine the noteworthy alteration among current system and WRSMS assessment. The researcher used purposive sampling technique and an industry-validated instrument to assess functionality and usability of employees from selected water stations in the area and was able to get the participation of 15 different water-refilling stations and 30 employees. Some statistical tools are used for this research paper to have sufficient evidence to conclude that the majority of employees "agree" that their current system is functional and usable. However, once presented with the WRSMS, most employees "strongly agree" that the system is more useful to handle business data. The used t-test strengthens the point that the noteworthy alteration exists among ratings of the present system in addition to WRSMS when it comes to functionality and usability.

Key words: Water station, T-test analysis, Statistical result, Usability of systems.

RESUMEN

Este artículo se centra en la creación de un Sistema de Gestión de Estaciones de Recarga de Agua (WRSMS) para estaciones de recarga de agua seleccionadas en La Habana, Cuba, ya que la mayoría de

ellas todavía funcionan con lápiz y papel, un proceso tedioso y lento cuando se trata de registrar, manipulando, editando y recuperando datos, lo que deja margen para errores. El WRSMS es capaz de almacenar, procesar y monitorear datos de ventas, clientes, empleados, inventario y asistencia, que se pueden usar para crear informes de estados financieros. Además, en este artículo se utiliza una técnica de investigación expresiva para evaluar el sistema actual de estaciones de agua seleccionadas y el WRSMS en términos de funcionalidad y usabilidad. También ayudó a determinar la alteración notable entre el sistema actual y la evaluación WRSMS. El investigador utilizó una técnica de muestreo intencional y un instrumento validado por la industria para evaluar la funcionalidad y usabilidad de los empleados de las estaciones de agua seleccionadas en el área y pudo obtener la participación de 15 estaciones de llenado de agua diferentes y 30 empleados. Algunas herramientas estadísticas se utilizan para este trabajo de investigación para tener evidencia suficiente para concluir que la mayoría de los empleados "están de acuerdo" en que su sistema actual es funcional y utilizable. Sin embargo, una vez presentado el WRSMS, la mayoría de los empleados “están totalmente de acuerdo” en que el sistema es más útil para manejar datos comerciales. La prueba t utilizada refuerza el punto de que existe una alteración notable entre las calificaciones del sistema actual además de WRSMS en lo que respecta a funcionalidad y usabilidad.

Palabras clave: Estación de agua, Análisis T-test, Resultado estadístico, Usabilidad de sistemas.

1. INTRODUCTION

In the last few decades, there have been giant leaps in the field of Information Technology in Cuba. Local technology start-ups like iRemit, a remittance company, Chikka, an instant messaging application provider and Sulit.com, an online platform for exchanging goods originated from Cuba; foreign companies such as Twoanyone, Grab and Uber have set up shop as well (DICT, 2015). In Havana, it has changed the lifestyle of individuals, and the way business is conducted. Individuals may now book a ride within a few seconds with the help of Uber or Grab without needing to wait in line. Others can now get their favourite meals from their favourite restaurants delivered to their doorsteps through Twoanyone. The technological trends have made life more convenient, and it continues to do so with constant innovations that complement business practices. Adapting to IT for businesses includes the benefits of usefulness, functionality, organisation creativity, insight, information, expertise, operative arrogances, acceptance, as well as offerings. It is also capable of employing tools that can provide accurate, relevant, complete, timely and economical information that affect the decision making process and in return manage opportunities and threat in businesses. In other words, it is beneficial for companies to adopt the usage of Information Technology, considering the growth of its kind (Anwar, 2011).

In Cuba, small businesses and expanding conglomerates are driving opportunity growth outside Havana [4]. With the fast-growing economy presenting a lot of opportunities for these businesses in the rural areas of the country and mentioning how information technology has benefited multiple companies, it is only highly significant as an organizational attribute in these areas to adapt to IT in order to achieve success and survival in business endeavours, considering the competition that grows every day (Anwar, 2011).
One of the fastest-growing businesses with high potential in achieving greater success with the use of IT could be water-refilling stations in the rural regions. They are given massive importance concerning business growth and health matters for the citizens. These existing micro businesses continue to run their current system using traditional methods, a simple but tedious way of handling a business. As such, a standalone system is ideal for water stations, as it does not rely on other software or software packages to run. It can function without the internet or another computer process as long as an operating system is present on the computer (Asangansi, 2008).

Given the prevalence of internet and Information Technology adaption in developed areas of the country, the researcher aims to conduct the study that focuses on developing a Water Refilling Station Management System (WRSMS) for selected water stations in the emergent province of Havana, Cuba, in relation to the

opinion of the employees utilizing the WRSMS. The below chart, describes theoretical basis of this revision in terms of following activities which are defined as input process and ultimately output. The input includes logbook and demographic profile, which function as the basis for creating the WRSMS. The process tends to assess how WRSMS will be perceived in terms of usability and functionally. The output is a working prototype of the WRSMS that can be used by water refilling stations as an alternative to managing and organizing their activities. Lastly, the feedback determines whether the WRSMS matched the initial input (Asangansi, 2008).

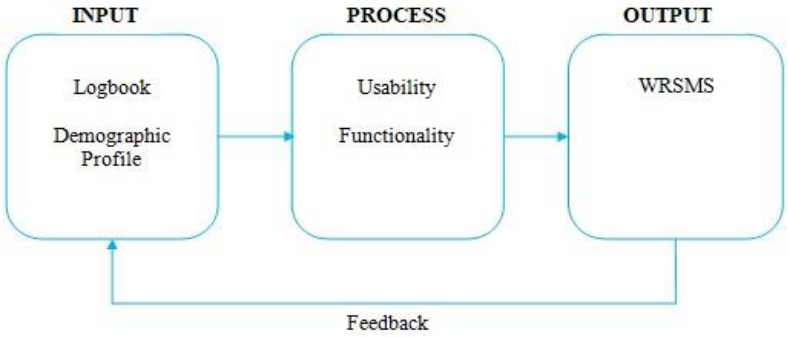

Figure 1. Theoretical Basis

Water refilling stations are one of the fastest expanding businesses in Cuba and its adjacent industrial towns with around 8000+ stores around this region; the emergence became evident in the 1980s due to the rapid industrialization and increasing population in Havana (DEOH, 2014). The rise in water refilling stations gaining significant foothold can be attributed to the lack of clean and secure piped water systems. Figure 2 illustrates the factors that constitute the result of unsafe drinking water and water-borne diseases. Families needed to find alternative water sources to avoid biological contaminants and chemical disinfection by-products that can be root causes of health problems. According to the DEOH, many cholera, typhoid fever, and acute gastroenteritis's outbreaks, from 1990-1998, were the results of contaminated and un-processed drinking water which caused the deaths of hundreds (Nguyen, 2015).

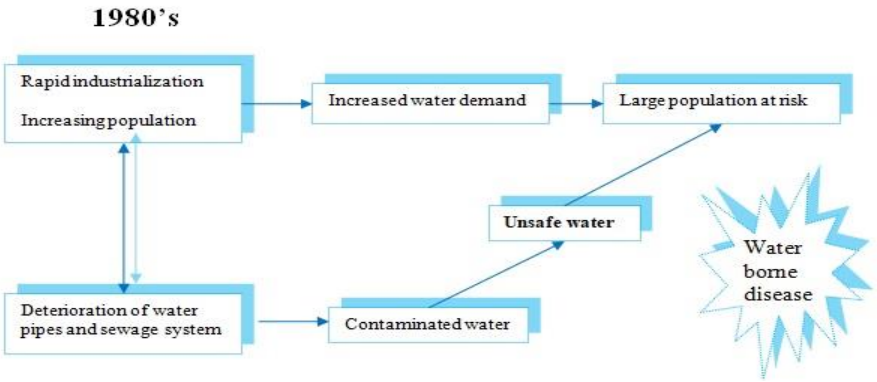

Figure 2. Water Refilling Stations Emergency (Derived from DEOH, 2014).

Aside from biological contaminants, the taste and odour of chlorine is another reason for families to tend to search for alternative water sources. The government has come to accept private water refilling stations as a necessary weapon to fight against waterborne diseases, and in turn, it tried to regulate their activity through quality control policies. Given the crucial role that water-refilling stations play to our surrounding communities, it is essential to note that they are the results that originated from the inability of the municipal authorities to produce potable water. They do not address the long-term water delivery or

sanitation infrastructure needed to provide pure water for all, but at the same time, they will not disappear anytime soon either. Therefore, the question is not whether they are here to stay or not, but rather, how we can improve them so that they can serve their communities better (Nguyen, 2015).

One study in operational performance of a purified water refilling station in Batangas City, has conveyed that the lack of advertising, equipment maintenance and the inefficiency of employees are the factors hindering the business to unlock its full potential. Bottle inventory tracking, water loss, pilferage, and undocumented sales are other concerns that need to be addressed. These are all typical characteristics of a manual based management system. Additionally, a great deal of research, focused on the business aspect of a water refilling station; this includes the procurement of capital, location, permits, equipment, and human resources. Other researches, like Drinking Water as a Source of Income by Bayer (2013), are more focused on the challenges and reasons on why water-refilling stations are being established (Domingo, 2017).

Relational database management systems are typically rooted from interactive prototypical which was a method for dealing with information by employing arrangement as well as philological, where data is grouped into relations. Databases are used to store all sorts of information that range from financial, logistics, manufacturing, personnel, etc. They are mostly used by businesses to be more organized. Archiving software stocks information inside of a file in addition to employs facilities of archiving organisation system for regaining as well as modernising information. At the same time, it also protects and maintains data. Databases are managed with the help of three different languages, namely the information description philological, information interrogation, as well as information handling linguistic. The persistence of information description linguistic was constructing a model of information to be used by the database. Lastly, the data manipulation language allows the changing of information, which is kept in archive. Utmost extensively employed databases include Oracle, MySQL, and IBM DB2. According to Gartner (2012), top five foremost profitable interactive database sellers through income are Oracle (47.9%), IBM (21.0%), Microsoft (16.9%), SAP (4.5%) and Teradata (4.0%) (Domingo, 2017).

Similar to banking applications and online reservations, a Water Refilling Station deals with plenty of short transactional data for sales, employees, customers, inventory, etc. This includes more structured data such as numbers, and names, which are organized into rows and columns for easier processing and retrieval, rather than unstructured data such as images. The data has to be consistent, isolated, and durable to ensure its integrity. For a standalone system such as the WRSMS, that processes thousands of transactions, a relational database is just the right match (Domingo, 2017).

Some focuses have been given on improving the overall effectiveness of water refilling stations through an upgrade from a manual based management system to an electronic document management system. A limited number of studies exist for this type of potentially progressive phase in the water refilling station business, a rationale that could perhaps be explained by a study from another industry. For example, in the health care industry of developing countries, it was explained that the barriers to progression and adaption of technology from a manual based system could be attributed to absence of substructure, charge, practical sophistication, non-existence of expert individual assets as well as absence of materials of therapeutic specialists (Bandao, 2007).

To measure adaptability for the WRSMS survey, data can be processed in several ways. It can be classified, categorized and quantified. To get the necessary data to process, a sampling technique needs to be chosen. A study by Zwaan, showed that purposive sampling following a cross-sectional quantitative survey technique was employed to gather data from a sample size of 221 in the subsequent branches: individual assets, persistent management, dispensing chemist's, practical provision facilities, as well as treatment. Due to its efficiency in the research, this sampling technique can be used potentially for our following research. A statement that can be further justified by stating that this technique relies on

selecting the sample based on the researcher's expertise. Although, it comes with a downside as it can undermine the ability of a researcher to draw generalizations due to biased samples. Categorizing information can also be useful to determine specific associations in data given the right statistical tools. To emphasize this, in, the authors bargained the relations among uncompromising parameters such as population outline, competency, medical record system and other essential associations using statistical tools such as frequencies, chi-square and fisher's meticulous assessment. On the contrary to classification as well as categorization, Likert scale with options 1-5 enables the researcher to quantify the results. Boone & Boone in, suggested that Likert data can be analysed according to type and scale, where statistical tools can determine central tendency, variability, and association (Bandao, 2007).

2. METHODS AND PROCEDURES

In this paper, we will use the quantitative method coupled with a descriptive research approach. The quantitative research design answered the research questions in terms of the Likert scale, which is from a range of 1-5. The answers most often reflect a deterministic philosophy in the post-positivist paradigm where reality can only be discovered imperfectly, in the sense of probability, variables and the relationship among them. Ultimately, the descriptive research type described the employee demographic variables, employee's assessment towards the existing system versus WRSMS and if there are some noteworthy alteration among dual organizations like usability and functionality. We will use cross-sectional quantitative survey for regulating the demographic variables, usability, as well as functionality view towards the WRSMS for a selected sample of water station employees. Cross-sectional in a sense that the water station employees were measured only once at a specified period. The survey questions tend to be rather specific since they are meant to get precise information as much as possible from the samples. It included the Likert gage where user have to degree from a scale of 1-5. The Likert scale part of the survey ranged from toughly differ, differ, unbiased, approve, and powerfully approve as follows (Bayawon, 2016);

Table 1. Likert dimension

Dimension	Rating	Verbal Clarification
5	4.21-5.1	Powerfully Approve
4	3.41-4.20	Approve
3	2.61-3.4	Unbiased
2	1.81-2.6	Differ
1	0.99-1.8	Powerfully Differ

A Cronbach Alpha analysis is conducted for assessing dependability and Fleiss Kappa to determine the validity of the instrument. In this study, for functionality test, Cronbach's Alpha is.839, which is regarded as excellent reliability. When it comes to the Usability scale, the Alpha is.880, which is also excellent reliability (Bayawon, 2016).

To ensure the scales' validity, three experts were asked to rate each question on an importance-to-include scale, fluctuating as of 1 (Not Applicable), 2 (Less Applicable), 3 (Applicable with Minor Revisions) to 4 (Extremely Applicable). The first expert was used to measure the validity of the research instrument among the three experts. all the three experts valued all of the questions as "Highly Applicable" and that therefore all of them should be included in the scales (Bayawon, 2016).

The participants for this study are selected by using the purposive sample technique for the cross-sectional categorical-quantitative survey. Purposive sampling can be used in both qualitative and quantitative studies, and the statistical power increases together with the sample size. It is constructed in a way to serve a particular purpose of determining which part of the survey is. For this reason, target is a significant factor for the choice, as the respondents should include all parties that are working in the water refilling station for them to be considered as employees. The researcher considered water stations near Havana,

Cuba, willing to take the survey, regardless of the number of employees. Moreover, in the given model rooted from thirty or extra clarifications, the selection circulation of average is assumed to remain reasonable, note that the minimum number of samples that this research is aiming for, is 30 (Bayawon, 2016).

2.1 Statistical Mechanisms and Data Analysis

To aid in the process of the obtained survey data, some analytical and data analysis techniques are used, those are Weighted Average Percentage, Standard deviation, Coefficient of Variation and Likert Scale statistical formula that is in the form below (Sánchez-Muros, 2014):

$$x = \frac{\sum w_X}{N} \tag{1}$$

where w is the Likert Scale rates 1-5 and X and N are the number of respondents by mass and the total number of respondents, respectively (Sánchez-Muros, 2014).

T-test: This study used the two-tailed t-test to determine the statistical difference between two means between the current ($\bar{x}_c$) d the proposed method ($\bar{x}_p$). In our case we want to learn whether the current as well as planned scheme is different in accuracy and serviceability. He alpha is considered to be 0.05. Note that if the p-value falls below the significance level of 0.025 it is considered significant, otherwise, it will not be substantial anymore. The formula that is used, is as follows (Sánchez-Muros, 2014):

$$t = \frac{\bar{x}_p - \bar{x}_c}{\sqrt{\frac{(var)_p}{n_p} + \frac{(var)_c}{n_c}}} \tag{2}$$

where$n_p$and n_c are the number of respondents in two publications about our proposed method and the current one (Sánchez-Muros, 2014).

2.2 Software Development Procedure

The software methodology used in this paper is the spiral development model. It is a powerful and popular development method, which is both linear and iterative. This software methodology handles developments quickly. Developments follow two approaches. Firstly, a cyclic approach for incrementally growing a system's degree of understanding while reducing the risk. Secondly, an anchor point milestone to ensure that clients are part of the development process and satisfied with system outputs. This quickly gives the customer something to work with to provide feedback regarding the delivery and requirements. The whole process is then iterated until a satisfactory product has been created. It offers the advantage of changing conditions, prototyping and accurate identification of needs, additionally, the users are able to see the changes early (Codd, 1990).

The Spiral methodology is chosen for this paper since it can return to earlier phases, considers proper risk evaluation and cost-effective, and most importantly provides a working product at the end of each life cycle. In addition, since it follows an iterative and linear approach, each phase can be done one at a time, even when working as a sole developer (Codd, 1990).

The life cycle of the Spiral was poised of 4 stages: necessities arrangement, operator plan, swift structure, and changeover. Each stage follows a process as identification, design, construct and risk analysis. The following figure, illustrates the Spiral life cycle stages where each cycle produces an output and repeats

the cycle, until there be a desirable product that can be accepted as a formulation that is inherently adaptable through iteration and experimentation (Codd, 1990).

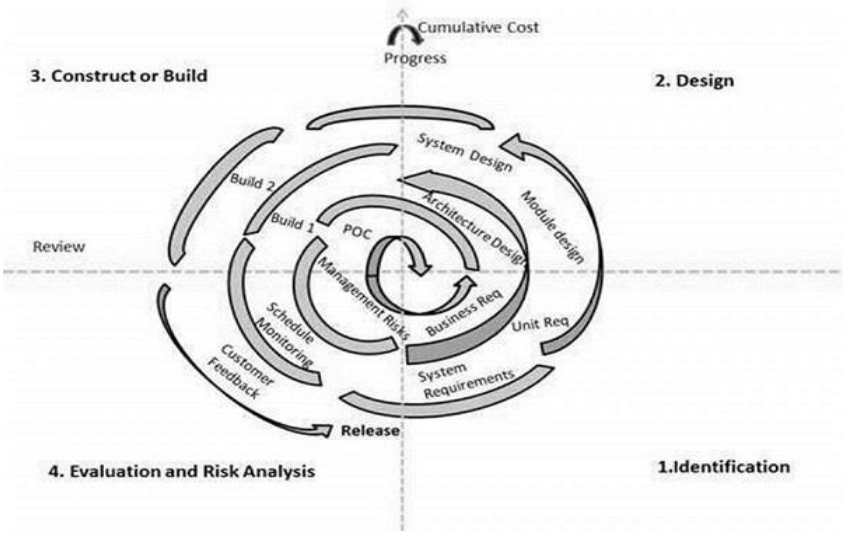

Figure 3. Spiral Life Set Stages.

3. INVESTIGATIVE TOOLS

Database model diagram is a data model for describing a database in a logical way. It establishes how data can be stored, organized and eventually manipulated. The session chart delivers outline of objective scheme through explaining matters, modules in the scheme and associations among those. This chart offers extensive diversity of conventions, which range as of simulating domain-particular information arrangement toward comprehensive enterprise of objective scheme. By use of portion of prototypical amenities, one would reprocess the class prototypical at collaboration chart aimed at stimulating complete plan of active performance. The software used to obtain the class diagram is Class-Visualizer (Bergholt, 1998).

In the use-case analysis diagram, the components identify the system requirements based on the use-case diagram. The proponents describe and define the user-visibility to the different features and flow of process of WRSMS. And These also create the use-case analysis diagram of the WRSMS that serves as the blueprint of the development of the proposed system or program (Bergholt, 1998).

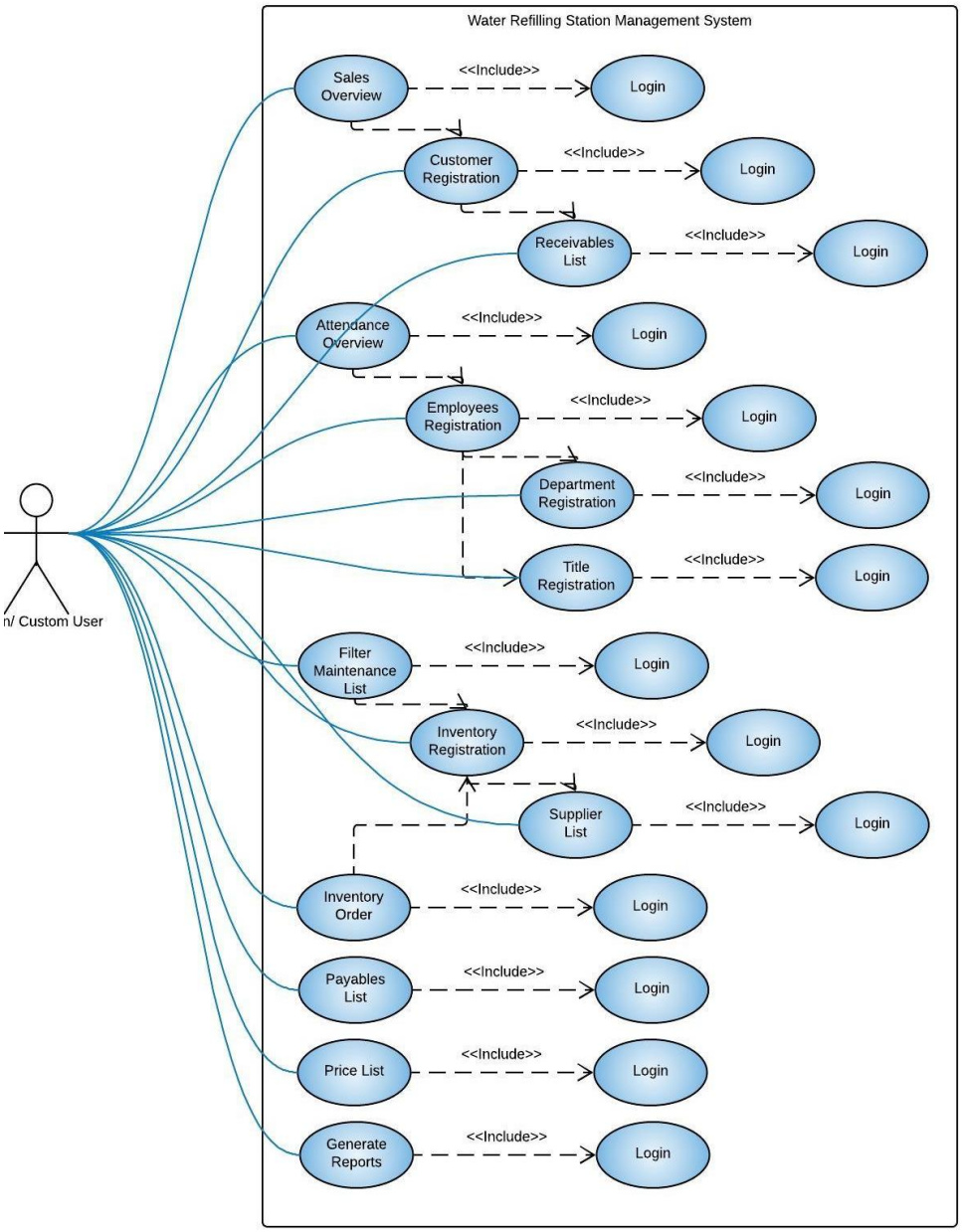

Figure 4. Use Case Diagram

The process flow diagram demonstrates in which way and what sequence the components word by each other. The proponents established the flow of the WRSMS based on the different steps required to create a report as follows (Bayer, 2013);

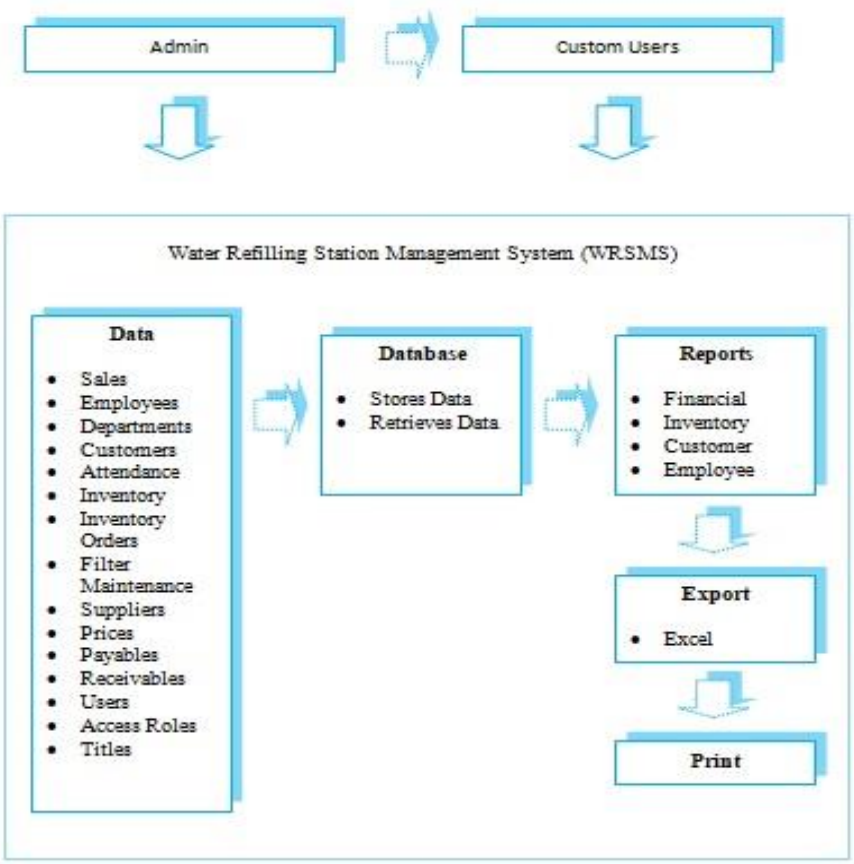

Figure. 5 Process Flow Diagram.

4. DEMONSTRATION, INVESTIGATION AND CLARIFICATION OF DATA

This section presents the findings and data analysis obtained from the questionnaires completed by the respondents, which focuses on the development of the WRSMS. In particular, it seeks to answer the following problems (Bayer, 2013):

1. What is the demographic profile of the respondents?
2. How will the respondents assess the existing system of Water Refilling Stations in terms of the functionality and usability?
3. How will the respondents evaluate the process in the proposed method in term of functionality and usability?
4. Is there a significant difference between the current system and the WRSMS in term of functionality and usability?

As it was mentioned before, in this study, there were 30 respondents from 15 different water stations, of which 23 men (76.7%) and seven women (23.3%), with average time of life 27.33 years and standard deviation of 9.43, with minimum age 16 and maximum 54. Eight of them were owners (26.7%) and 22 not (73.3%). The majority graduated from college (53.3%, N=16), 13 (43.3%) from high school and one respondent finished only elementary school. The mean working career at the current stations is 2.33 years with standard deviation of 2.26. On average, an employee at a water refilling station would handle at least three positions that range from being a manager, book-keeper, administrative assistant, technical assistant, front liner or delivery (Bayer, 2013).

5. EXPERIMENT AND RESULTS

In this section, we are going to provide all the assessments and the idea of our attenders in the sample space about the functionality and usability of the current system and our proposed system WRSMS, and then compare these ones together. To do so, consider the tables below that are found by applying some statistical analysis on the data (Belara, 2011);

Table 2. Functionality of the Current System

No.	Question	Weighted Average	SD	Clarification
1	current scheme enables me for achieving jobs faster	3.99	1	Approve
2	current system has improved the quality of job	3.89	0.71	Approve
3	The current scheme makes the job easier	3.93	0.87	Approve
4	The current system only allows authorized personnel to view & manipulate transactions	2.73	1.31	Neutral
5	The current system increases the controlability of our job	3.5	1.00	Approve
6	The current system allows me to create correct financial statement reports	2.7	1.09	Neutral
	Total	3.48	1.14	Approve
	Coefficient of Variation	0.33		

Table two illustrates assessment of the respondents about the functionality of the current system. Take note that only questions 4 and 6 were interpreted as "Neutral" and the rest were "Agree". This means that the employees of selected water stations have a neutral view about "the current system allowing only authorized personnel to view & monitor transactions" and "the creation of correct financial statement reports". This can be further seen as the weighted mean for questions 4 and 6 that are 2.73 and 2.7 respectively. Conversely, they approve that "the current scheme helps them to achieve jobs swiftly", "the current scheme improved the quality of job," "the current scheme made it easier for performing the work", and "the current scheme gives better control over the job at hand." This can be seen as the weighted mean for questions 1, 2, 3 and 5 that are 4.03, 4.1, 3.93 and 3.4 respectively. Generally, the employees "agree" by biased average mean of 3.48 which shows that the current scheme's performance is enough when it comes to monitoring sales, employee attendance, inventories, customers and creating financial reports. Besides, based on the coefficient of variation of 0.33, it can also be inferred that there is a low- variance when it comes to the functionality rating, which means that the level of dispersion from the mean is quite small (Belara, 2011).

Table 3. Usability of the Current System

No.	Question	Weighted Mean	SD	Interpretation
1	My collaboration by current scheme have been perfect as well as comprehensible	4.07	0.83	Approve
2	Overall, the current scheme was stress-free for employing and easy to cope with.	3.99	0.80	Approve
3	Learning to operate the current system is stress-free for us	4	0.89	Approve
4	I infrequently turn out to get confused while using the current system	3.63	1.03	Approve
5	I infrequently make faults once employing the current system	3.7	0.84	Approve
6	I infrequently unfulfilled once employing the current	3.63	0.99	Approve

	system			
	Total	3.84	0.92	Approve
	Coefficient of Variation	0.24		

Table three shows the assessment and analysis of the respondents for the current system when it comes to usability. It is clear from the table that "the collaboration by current scheme has been perfect as well as comprehensible" is leading by weighted average of 4.07, accompanied with "current scheme was stress-free for employing" with 4.1, "educating current system is easy to operate" with 3.9 (Sari, 2020), "I infrequently make faults while employing existing scheme" with 3.7, "I infrequently turn out to be disordered once I employ current system" with 3.63 and "I am infrequently frustrated once employing current system" with 3.63. When interpreted, all of the questions are agreed upon by the respondents. That means the respondents "agree" on the usability of the current system when it comes to managing their business data. In addition, based on the coefficient of variation of 0.24, it can also be concluded that there is a low- variance when it comes to the functionality rating. Meaning that the level of dispersion from the mean is quite low (Sari, 2020).

Now, let us have a look at the assessment about the functionality and usability of the proposed method in this paper. Tables 4 and 5 are the summary of the ideas of respondents.

Table 4. Functionality of the WRSMS

No.	Question	Weighted Mean	SD	Interpretation
1	The system allows us for completing taks much faster	4.60	0.68	Completely approve
2	The system have enhanced our excellence of duty	4.70	0.47	Completely approve
3	The current arrangement causes it simpler for doing our duty	4.57	0.57	Completely approve
4	The WRSMS only allows authorized personnel for viewing & manipulating transactions	4.87	0.35	Completely approve
5	It's arrangement enables us with more governance beyond our duty	4.73	0.58	Completely approve
6	Such an arrangement enables us for generating correct financial statement reports	4.84	0.38	Completely approve
	Over-all	4.72	0.52	Completely approve
	Coefficient of Variation	0.11		

The table above, shows that all questions were interpreted as "Strongly Agree". This means that the employees of selected water stations strongly agree on "the MRSMS allows authorized personnel to view & manipulate transactions" with a weighted mean of 4.87, "the system allows us to create correct financial statement reports" with mean of 4.83, "The current arrangement enables us with more governance beyond our duty" with 4.73, "current arrangement has improved our quality of work" with 4.70, "the current arrangement allows us for completing our jobs much faster" with 4.60, "current arrangement causes it more simpler for completing my duty" with 4.57 (Sima, 2013). As it can be seen, the highest-rated question was question number 4 which was about "the current system only allows authorized personnel to view & manipulate transactions" with a weighted mean of 4.87 while the lowest-rated question was question number 3, "the current arrangement causes it much simpler for completing our duty" with a weighted mean of 4.57. Generally, the employees "Strongly Agree" that the WRSMS's functionality is better suited when it comes to monitoring sales, employee attendance, inventories, customers and creating financial reports. Besides, based on the coefficient of variation of 0.11 it can also be inferred that there is a low-variance when it comes to the functionality rating, which means that the level of dispersion from the mean is quite small (Sima, 2013).

Table 5. Usability of the WRSMS

No.	Question	Weighted Mean	SD	Interpretation
1	Our collaboration by current arrangement have been flawless as well as comprehensible	4.43	0.68	Completely approve
2	Overall, the proposed system is much simpler for using	4.40	0.56	Completely approve
3	Working with the new system is more simpler	4.27	0.98	Completely approve
4	Seldom, I became muddled by the current system	3.97	1.07	approve
5	Seldom, I have faults while employing the current system	4.20	0.71	Completely approve
6	Seldom, I became unfulfilled while using current arrangement	4.53	0.64	Completely approve
	Over-all	4.3	0.80	Completely approve
	Coefficient of Variation	0.19		

Table above shows the assessment of the respondents for the WRSMS when it comes to usability. It is clear from the table that "Seldom, I became unfulfilled while using current arrangement" is leading with the highest weighted mean of 4.53, followed by "Our collaboration by current arrangement have been flawless as well as comprehensible, and by "My interaction with the current system has been clear and understandable" with 4.43, "Totally, current arrangement was much simpler for using" with the mean of 4.40, "Working with the current system is more simpler" with 4.27, "Seldom, I have faults while employing the current system" with 4.20 and lastly, the lowest-rated problem was question number 4, "Seldom, I became muddled by the current system" with a weighted mean of 3.97 (Bucao, 2020). When interpreted, all of the questions except for question number 4 are strongly agreed upon by the respondents. Question number 4 was the only question that was interpreted as agreed. Generally, this means the respondents "strongly agree" on the usability of the WRSMS when it comes to managing their business data (Bucao, 2020).

Now, we are in the place of comparing the functionality and usability of the current system in the selected water station and the WRSMS. One can find the result of comparison, that is found by applying t-test by considering df=29 as a constant during the experiment in the following table,

Table 6. Dependent Samples t-test Results

	df	t	p
Functionality: current vs WRSMS	29	-10.56	0.000
Usability: current vs WRSMS		-2.466	0.020
Whole: current vs WRSMS		-12.21	0.000

Although, there are differences in assessed functionality and usability of the two systems, autonomous models t-test is used. Outcomes are illustrated in Table 6. As could be seen, there are significant differences in both aspects of the systems as the p-values are both lower than 0.05. When one looks at the means provided in tables 2, 3,4 and 5, it can be seen that both functionality and usability of WRSMS are evaluated higher than the current system's. In terms of functionality, the current has a mean of 3.48, and WRSMS 4.72. On the other hand, usability for the current system has a mean of 3.84 compared to 4.30 of WRSMS. That means that WRSMS is better evaluated, and that is significantly better to apply (Bergholt, 1998).

6. CONCLUSION

The study emphasizes the development of the WRSMS, and how selected water refilling station employees perceived their current systems against it in terms of functionality and usability. The statistical techniques used were weighted mean, percentages, t-test, coefficient of variation and standard deviation.

The Likert Scale was then used to interpret the results from a scale of 1-5 in terms of powerfully differ, differ, unbiased, approved in addition to strongly approved and at the end the results showed that the workers and managers of the selected water refiling station eager to apply the proposed system since they have found it easier to cope with and faster to operate.

7. REFERENCES

Anwar, F., Shamim, A., & Khan, S. (2011). Barriers in adoption of health information technology in developing societies. Int J Adv Comput Sci Appl, 2(8), 40-5.

Asangansi, I. E., Adejoro, O. O., Farri, O., & Makinde, O. (2008). Computer use among doctors in Africa: Survey of trainees in a Nigerian teaching hospital. Journal of Health informatics in developing countries, 2(1).

Nguyen, T. H., Newby, M., & Macaulay, M. J. (2015). Information technology adoption in small business: Confirmation of a proposed framework. Journal of Small Business Management, 53(1), 207-227.

Domingo, M. D., Karelia, G. C., Maria Eugenia, T. R., Mayda, C. R., & Maureen, L. S. (2017, November). Estrategias antivectoriales con deltametrina en Santiago de Cuba para el control de Aedes aegypti (Diptera: Culicidae. In Cuba Salud 2018.

Bandao, L. C., Gano, M. M., Babaran, Richard. P., Sagario, M. T. (2007). Don Bosco High School student record management system. (Unpublished undergraduate thesis). Saint Mary's University, Bayombong, Nueva Vizcaya, Philippines.

Bayawon, D.D., Belingon, K.G., Dama-On, L.M., Garcia, L.G. (2016). Information technology investment in relation to financial performance. (Unpublished undergraduate research paper). Saint Mary's University, Bayombong, Nueva Vizcaya, Philippines.

Sánchez-Muros, M. J., Barroso, F. G., & Manzano-Agugliaro, F. (2014). Insect meal as renewable source of food for animal feeding: a review. Journal of Cleaner Production, 65, 16-27.

Codd, E. F. (1990). The relational model for database management: version 2. Addison-Wesley Longman Publishing Co., Inc.

Bergholt, L., Due, J. S., Daimi, T. H., Knudsen, J. L., Nielsen, K. H., Olesen, T. S., & Pedersen, E. H. (1998). Database management systems: relational, object-relational, and object-oriented data models.
Bayer, R.(2013). Drinking Water as a Source of Income. (Master's thesis). Lund University, Sweden. Retrieved from https://lup.lub.lu.se/luur/

Belara, A. (2011, 12). Water Refilling Station Management System. Behance.net. Retrieved 01, 2018.

Sari, S. Y. I., Faisal, M., Raksanagara, A. S., Agustian, D., & Rusmil, K. (2020). Water Quality and Factors Associated with Compliance of Drinking Water Refilling Stations as a Choice for Middle–Low Urban Households in Developing Countries. Journal of Water and Environment Technology, 18(1), 27-36.

Sima, L. C., & Elimelech, M. (2013). More than a drop in the bucket: Decentralized membrane-based drinking water refill stations in Southeast Asia.

Bucao, S. D. C., Carreon, A. B. G., Lauengco, T. J. D., & Young, M. N. (2020, April). Designing a Computer Based Inventory System of Crystal Clear Water Refilling Station: A Case Study. In 2020 IEEE 7th International Conference on Industrial Engineering and Applications (ICIEA) (pp. 625-629). IEEE.

Bergholt, L., Due, J. S., Daimi, T. H., Knudsen, J. L., Nielsen, K. H., Olesen, T. S., & Pedersen, E. H. (1998). Database management systems: relational, object-relational, and object-oriented data models.