

DESIGN OF WATER QUALITY MODEL TO SUPPORT THE INDOONESIAN HEALTHY PROJECT

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ABSTRACT

Water is a basic need for the living things, especially for human. The human body consist of 70 % water that used for cell metabolic processes, so that the quality and quantity should be adequated to mantain health and survival of the human. The main problem of standart quality drinking water is the less of awareness to ensure the quality of drinking water of itself. There's amount of water depot refill (DAMIU) who haven't done the testing process to be an optimal quality water, there is no transparency of information between DAMIU to consumers and the less of optimal supervision provided by the government agencies. The purpose of this research is to design databased of e-health assurance quality water refill to succeed Indonesian Heathy 2010. The stages of this reaserch, a detailed and structured quality assurance process including of DAMIU existance identification, explore the public perceptions and opinions about the importance of DAMIU quality assurance and determine the factor that affect the DAMIU's quality. The data were processed by using a stastistical test, then the result will be used to design a quality e-health assurance using web and mobile phone based on techno industrial cluster (DAMIU integration, community and labkesda). The study was conducted in the water depot refill in Semarang that incorporated in Aspami (Association of Water Depot Refill). Information of the sistem that is built, will be transferred to the user through web media and mobile phone for free. Sustainability is supported by Aspami which is wish to conduct quality of the assurance to enhance its brand image.

Key words: *quality assurance, drinking water, healthy, techno-industrial cluster.*

1. INTRODUCTION

The society awareness of the importance quality of drinking water is less. More than 1 billion people around the world has lost access to clean the water resources. Data from The World Heath Organization (WHO), about 1,6 million worldwide children die from unfulfilled basic need and access to safe tha sanitation. By addressing the root causes of diseases such as water and sanitation, it can reduce 24 % of the global disease due to environmental concern.

Considering the importance of clean water, the water refill business is increase. In 2003, the number of water depot refill in indonesia reached about 3000 depots. According to the data from Association of Employers, Suppliers, and Distribution of water depot Indonesia (Apdamindo), in 2009 there were over than 9000 depots in remote areas and

it's still increase about 7-8 percent per month (Darmawan, 2009). But there are about 25 % of water depot refill employers still can't get the fixed standart of healthy. It happens because most of employers are not routinely drinking the tested quality water.

Based on RI No. 492/ Menkes/ Per/ IV/ 2010 in article 2 about the quality of drinking water. People are entitled to coverage of drinking water consumption. This study was to determine the factors that influence the quality of the water depot refill asurance (DAMIU), designing e-health quality assurance DAMIU and looking for the effectiveness of the quality assurance process of dissemination DAMIU. Information technology is designed by using web and mobile phone based on techno-industrial clusters that integrate the need of industrial water depot in Central Java, Kemenkes (Central Java High Officer) and

University (Dian Nuswantoro) that lost the character of the nation that was built through the public policy, peoples's behavior, and management are able to guarantee a well-market of the product (quality assurance).

2. LITERATURE REVIEW

Several studies related to quality of the drinking water assurance among others, reasearch conducted by Asfawi (2004). The study, explained that the process of the quality assurance in DAMIU Semarang is not optimal, yet. The implementation of DAMIU quality test is not going periodically. This study also supported by reasearch from Sulistyandari (2009) which states that the result of the Health Laboratory in Central Java on November 21, 2008 in 95 DAMIU Kendal showed that 85 % of examined samples, it obtained the result of Alkyl Benzene Sulfonates detergent (ABS) which ranged from 0,003 to 0,006 ug/ l. The result of the investigation showed that the quality of drinking water refill in Kendal contaminated with detergent.

In reasearch by Sulistyandari (2009), it stated from 50 DAMIU obtained: raw water source are not eligible to be DAMIU with the number of 18 (36 %); material equipment are not eligible to be DAMIU with the number of 28 (56 %); water process treatment that is not proper with DAMIU condition with the number of 21 (42 %); Sanitation ineligibile to 27 DAMIU (54 %) and detergent contaminated in DAMIU with the number of 30 (60 %). Therefore, they are need for assurance and quality control processes are integrated DAMIU Aspami, Labkesda, and government.

To get the quality assurance of the drinking water, The Indonesia's government has several provisions on water quality as stated on decision of The Health Minister of Indonesia: 907/ MENKES/ SK/ VII/ 2002 about the number of condition and quality of drinking water are to be under surveillance The Health Minister of Indonesia. The quality of the water requirements bacteriological, chemical and physical radioactivity. The potential health consequence of contamination ond control should always be

the main interest and should not be aside (Irtanto, 2010).

In previous studies, reffering to minoster of health numbr 907 in 2002, there are from 38 samoles AMIU in Jakarta, Tangerang and Bekasi in 2004. The number of samples which is not required of the total coli is about 11 samples (28,9 %), 7 samples for fecal coli (18,4 %). (Athena et al, 2004) In this reasearch, a qualitative analysis of coliform becteria in drinking water depot refill in Singaraja, Bali (2004), the study subjectes as much as 3 samples. Each samples had MPN value about 0, it means that the result of the test showed that all of them were qualified because it didn't found caliform microbes (Irtanto, 2010). Production of mineral water is usually done by large industry through automatic process and it's accompanied by quality water test before it is released, but as long as it's going, that the more expensive is water on the bottled.

Then the people began to turn to drinking water because the water are obtained by filling gallon AMIU depot caries. Take a look from the price, AMIU is much better cheap at only 1/ 3 price of the water on the bottled (Athena etal, 2004). Therefore, it's necessary to make an invention of the technologies appropriate with the standart quality assurance applied in DAMIU to produce the portable water.

The technological development of quality assurance in drinking water is quiet rapidly. The technology used is UV, Ozonisasi (OZ) and reverse osmosis (RO). This is has the same line with reasearch from Sitorus (2009). It stated that municipalities DAMIU in Samarinda were tested using UV, reistered 293 depots, using ozonation (OZ) as many as 14, and using RO is about 10. Thus the three technologies that appropriate with the standart PEM MEN KES RI no. 907/ MENKES/ SK/VI/2002.

Problem Formulation

1. Knowing the quality of the assurance process water depot refill (DAMIU) in Semarang.
2. Knowing the public in Semarang about opinons and perceptions that will need to assurance quality of drinking water.

3. Determining the factors that influence actors in process of quality assurance DAMIU in Semarang.
4. Designing the e-health guarantee of quaiy water depot refill.

3. RESEACH METHODS

The object reasearch in DAMIU Semarang, Central Java. The sample is about 30 DAMIU. This reasearch has 5 variable X and

1 variable Y. Material, production process, tool and machine, employee, work environment/ sanitation are include in X variable. Water quality is Y variable.

Step Stastical Test:

1. Classic assumption testing
 - 1.1 Normalized test
 - 1.2 Regression Model
2. Hipotesis Testing
 - 2.1 Partial testng (T-test)
 - 2.2 Simulatanous testing (F-test)
3. Coefisien Determinination Analysis

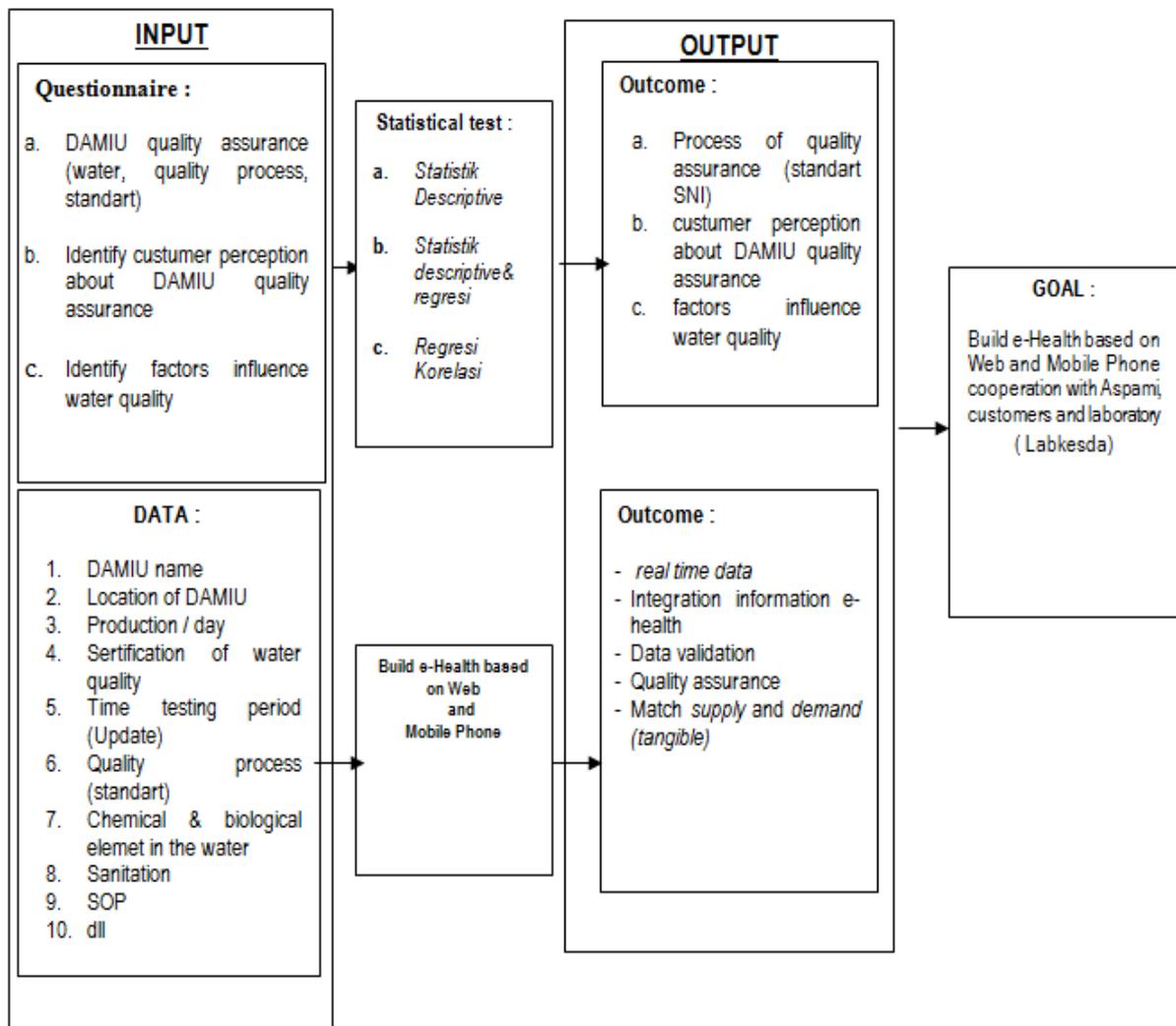


Figure 1. Roadmap Research

4. RESULT AND DISCUSSION

Stages of this research, a detailed and structured quality assurance processes including identification of existing DAMIU, explore the perceptions and opinions of the public about the importance of quality assurance DAMIU and determine the

factors that affect the quality DAMIU. The data were processed using a statistical test, then the results will be used to design the wake of e-health quality assurance using the web and mobile phone based techno industrial cluster (DAMIU integration, community and labkesda).

Table 1. Regression Test

(a)

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.929 ^a	.863	.834	1.302

a. Predictors: (Constant), X1, X5, X4, X3, X2

b. Dependent Variable: Y

(b)

ANOVA^b

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regres	256.9	5	51.387	30.	.000 ^a
	Residual	40.9	24	1.705		
	Total	297.8	29			

a. Predictors: (Constant), X1, X5, X4, X3, X2

b. Dependent Variable: Y

(c)

Model	Unstandardized Coefficients		Standardized Coefficients		t	Sig.
	B	Std. Error	Beta			
1 (Const)	6.146	2.303		2.66		.013
X5	-.070	.557	-.013	-.126		.901
X4	.604	.335	.212	1.80		.084
X3	.580	.236	.331	2.45		.022
X2	.522	.206	.517	2.53		.018
X1	-.095	.480	-.031	-.198		.844

Regression test is $Y = 6,146 - 0,95X1 + 0,522X2 + 0,58X3 + 0,604X4 - 0,7X5$.

That means production process is dominant variabel can affect water quality. From questionnaire result costumers need water quality assurance. To improve costumers satisfaction DAMIU must publish certification of water quality from Laboratory. From 30 sampel DAMIU be distingushed 11 Damiu content coliform positive, 4 DAMIU content colifeal positif and the other is standardization.

4.1. Database model information system e-Health

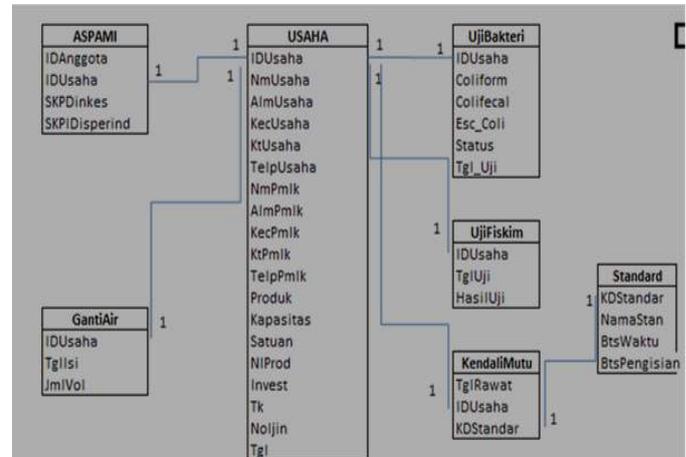


Figure 2. Database e-Health

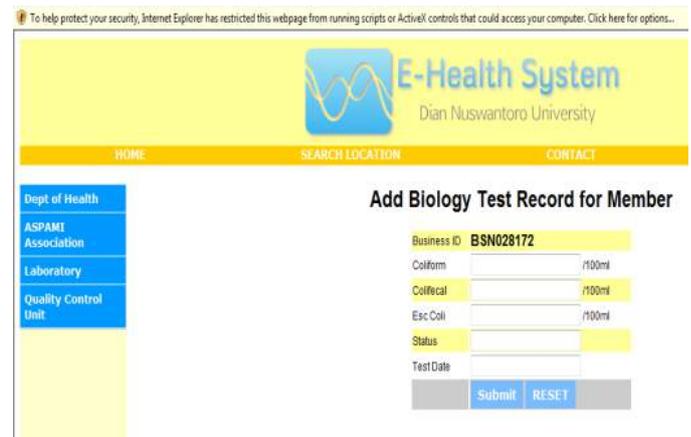


Figure 3. Biological Test Record



Figure 4. Water Standarization

5. CONCLUSION

1. Customer DAMIU in Semarang city need water quality assurance
2. Production process of water (DAMIU) affect quality product
3. Quality Assurance must be implemented DAMIU

6. ACKNOWLEDGMENTS

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