Customer satisfaction of urban farming application services: "e-Buruan Sae"

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Abstract — This study evaluates the customer satisfaction model in adopting the Web 2.0-based e-Buruan Sae application. The e-Buruan Sae application is an interactive Web 2.0-based application used by the government and the people of Bandung City to manage urban farming activities. This research is quantitative correlational research and applies a research method based on Design Research Methodology (DRM). The stages of this research are the literature review stage with the output of research objectives, the initial empirical analysis stage with the outputs of the hypothesis and research model, the experimental stage for data collection, and the final empirical analysis stage with the output of the data analysis results. This study has six hypotheses about influencing factors of customer satisfaction in adopting Urban Farming Application Services, namely the e-Buruan Sae application. This study conducts and calculates six factors to evaluate customer satisfaction. All factors are ease of use, service quality, interactivity, trust, customer satisfaction, and Information Technology (IT) development. This study uses all factors because of the Web 2.0 technology adoption model. These research results show that only H2, H3, and H4 positively influence the customer satisfaction of potential users in Bandung City. On the other hand, the results of empirical testing also show that H1 and H5, which are the ease of use and IT development, do not positively affect the customer satisfaction factor. This research successfully answers the aim of producing measurements to evaluate customer satisfaction on the Web 2.0-based urban farming application.

Keywords – Customer satisfaction model, urban farming, web 2.0

I. INTRODUCTION

The increasing population in urban areas and the decrease in agricultural land have an impact on increasing the food crisis [1], [2]. These conditions encourage urban communities to produce food by utilizing available land. Bandung City is one of the big cities in West Java Province, Indonesia, with the most populous population with a population density of 14,630 people per km [3]. It has an average population growth rate of 5,726 people per year [4]. Bandung has an area of 167.31 km^2 and only has an agricultural area of 12.14 km^2 (approximately 7.26% of the total area [5]. This condition causes 96.47% of Bandung's food supply from other cities [6]. Urban agriculture or urban farming provides a solution to the provision of food for the people of the city of Bandung. Urban farming is not just cultivating plants and raising animals in cities with limited space but also includes producing and marketing agricultural products [7]. Urban farming activities include growing vegetables and medicinal plants, and cultivating fruit, raising animals on a small scale by utilizing various types of media (*e.g.* hydroponics, aquaponics, aeroponic, *etc.*) and organic recycles as fertilizer [8]–[10]. Most of the urban farming is done by farmers at low level organizations (can be done individually and is not the main job), so the results of urban farming are fresh products without further processing.

In 2020, the Bandung City Government launched the Buruan Sae program, which is an urban
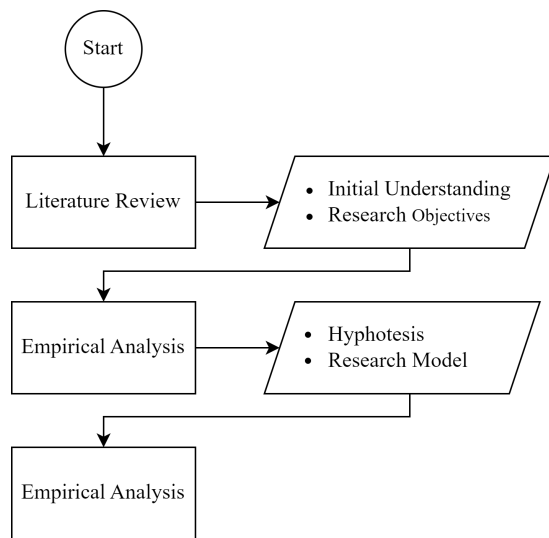
Fig. 1. Research method.

farming program in Bandung City to provide healthy independent food (which is self-produced which is supervised and controlled), natural (using organic materials for fertilizer and pest control), and economical (can be consumed alone or sold on a micro scale) [11]. The Buruan Sae program is managed by the Dinas Ketahanan Pangan dan Pertanian (DKPP) or the Food and Agriculture Security Service the Bandung City by involving communities who are members of small groups known as "Kelompok Berkebun" (PokBun) or gardening groups. The activity sectors of the Buruan Sae Program: fish farming, livestock cultivation, vegetable, fruit and medicinal plant cultivation, nurseries, and composting from household organic waste.

The number of Pokbun participating in the Buruan Sae program reached 335 groups (and the number continues to grow). In contrast, the number of officers tasked with assisting and fostering is very limited. This condition requires DKPP to utilize various information technologies in the management and operation of the program. One of the information technologies used by DKPP Bandung City to manage data and provide information is a website application called e-Buruan Sae. This application is built using Web 2.0 technology which provides advantages in communicating and collaborating, thereby reducing production time and increasing user satisfaction [12]. The e-Buruan Sae application functions to update data on the sectors of the Buruan Sae program. The e-Buruan Sae application can be accessed by DKPP as an operator and by gardening groups as users. The challenge of implementing information technology is a good relationship between users and technology [13]. The form of good relations between users and information technology is represented in user satisfaction in using technology [14].

This study aims to measure the adoption of

the use of the application e-Buruan Sae based on user satisfaction. User satisfaction represents customer satisfaction or dissatisfaction as measured from the aspect of quality awareness and achievement of expectations (before and after using) the e-Buruan-Sae application [15]. This study uses the model proposed by Sharma and Baoku, which uses five constructs: ease of use, service quality, interactivity, trust, and IT development to measure customer satisfaction [12].

For a better understanding, the rest of this paper is organized as follows. Section II discusses the stages in formulating hypotheses, data collection, and statistical data analysis. The results of the model hypothesis analysis are discussed in section III. Discussion of each hypothesis used in this study is discussed in section IV. Finally, section V is the conclusion of this research.

II. RESEARCH METHOD

This study uses Design Research Methodology (DRM) proposed by Blessing and Chakrabarti [20]. The research method is based on DRM, with the results as shown in Fig. 1. There are four stages carried out: conducting a literature review, initial empirical analysis, experiment, and final empirical analysis.

A. Literature Review

This stage aims to identify the initial understanding of research on similar topics and develop research objectives. The results of the initial identification are helpful for providing the position of this study against published studies. Several publications investigating technology adoption by measuring user satisfaction were published by Wang *et al.* [16], which measured customer satisfaction and technology readiness with travel technologies. They built a tourism satisfaction model consisting of Technology Enable Service (TES) quality, satisfaction with TES, and overall satisfaction. Still, on travel research, Hemdi *et al.* [17] publish about technology readiness at airport self-service check-in. The author uses the construct in the Technology Readiness Index (optimism, innovativeness, discomfort, and insecurity). The primary reference for this research is the publication of Sharma and Baoku [12], which measures customer satisfaction with Web 2.0. This publication was carried out to evaluate customer satisfaction with the Massively Multiplayer Online Role-Playing Game (MMORPG). Sharma and Baoku stated that the proposed model can validate the evaluation of user customer satisfaction. This study applies the model proposed by Sharma and Baoku to different technologies and environments. The summary of related studies is presented in Table 1.

The next objective of this stage is to develop research objectives. The main objective of this research is to measure the adoption of the e-Buruan Sae application based on customer satisfaction. From this
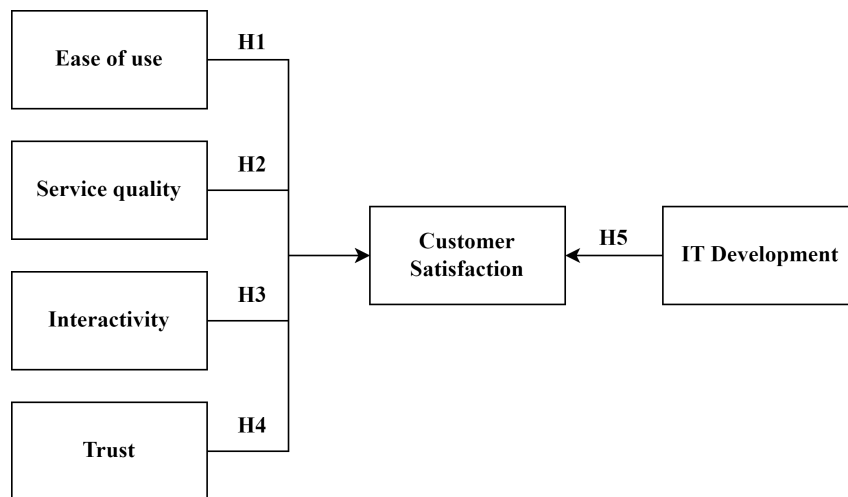
Fig. 2. Model customer satisfaction on Web 2.0 technology adoption.

Table 1. Related Studies

Study	Models and Scope	Findings
Sharma and Baoku [12]	This study proposes five factors influencing customer satisfaction for Massively Multiplayer Online Role-Playing Games (MMORPG). The five factors are ease of use, service quality, interactivity, trust, and IT development.	This study concludes that the five proposed factors positively influence customer satisfaction.
Wang *et al.* [16]	This study proposes seven constructs to measure future behavioral intention based on overall satisfaction. The seven constructs are optimism, innovativeness, insecurity, discomfort, Technology-enabled Services Quality (TESQUAL), Satisfaction with Technology-enabled Service (STES), and overall satisfaction. Data were collected from three countries: the United States, China, and Australia. The application being tested is a website application for travel.	The results show that the constructs of insecurity and discomfort do not positively affect customer satisfaction.
Hemdi *et al.* [17]	This study uses the construct of the Technology Readiness Index published by Parasuraman [18]. This study measured customer satisfaction using self-services technology at Kuala Lumpur International Airport (KLIA2) Malaysia.	The results of this study indicate that the three TRI constructs: optimism, innovativeness, and discomfort, influence customer satisfaction, while the insecurity construct has no effect.
Pereira *et al.* [19]	This study measures user satisfaction with website purchases in tourism. The constructs used in this study: website perceptions, online routines, online knowledge, and innovativeness. This research was conducted in Portugal.	This study shows that the innovativeness factor is rejected because it does not affect customer satisfaction.
This research	This study uses the model proposed by Sharma and Baoku [12] to measure customer satisfaction for the e-Buruan Sae website application (an application for urban farming).	The test results show that the constructs of service quality, interactivity, and trust positively affect customer satisfaction for the e-Buruan Sae application. In comparison, the ease of use and IT development constructs do not affect customer satisfaction. This study differs from the studies referred to based on the type of website users, the topic, and the website users.

main objective, there are three research objectives: (1) identifying influential factors/constructs/variables, (2) developing an adoption model, and (3) evaluating the adoption model. The output of this stage is used as the basis for the initial empirical analysis stage.

B. Initial Empirical Analysis

The research model and research hypothesis are the two outputs of this stage. The research model of this study refers to the model of Sharma and Baoku [12]. The image of this research model is shown in Fig. 2. There are two blocks in the model used. The first block consists of four dependent variables: ease of use, service quality, interactivity, and trust, and one independent variable called customer satisfaction. In the second block, the IT development variable is the independent variable that affects the dependent variable, customer satisfaction.

1) Ease of use

Davis defines ease of use as the degree to which users believe that when using technology, the user does not expend effort [21]. In the context of the website, the ease of use variable measures the ease of understanding and operating the website [22]. An assessment of navigability is measured, indicating the ease with which users can navigate the website and understand their current position [23]. Doll and Torkzadeh [24] define the ease of use as one of the five factors in End User Computing Satisfaction (EUCS) instruments that affect customer satisfaction.

Table 2. Survey Question

Id	Variables	Indicators	Questions
EoU1	Ease of use	Easy to understand	The menus on the website are easy to understand and use easy-to-understand language.
EoU2		Easy to operate	The menu on the website is designed to make it easier for me to operate it.
EoU3		Free of effort	To get the information, I do not need to expend effort.
SQ1	Service quality (SQ)	Service satisfaction	I am satisfied with the services provided by my website to support my work.
SQ2		Deliverable	I think the appearance of this website makes it easier for me to help my work, such as adding data, deleting data, and editing data is not confusing.
SQ3		User expectations	I am satisfied with the service ability of this website in helping my work.
INT1	Interacitcity (INT)	User interaction	This website allows me to enter data, delete, and edit data anytime and anywhere using various types of devices connected to the internet.
INT2		Continue to use	I will use this website to help with my work.
INT3		Website control	I find it easy to control and interact with this website.
TR1	Trust	Safe	I think this website is safe and not easy to access by unauthorized people.
TR2		Protect information	I feel that my personal data on the website is safe.
CS1	Customer Satisfaction (CS)	Usability	I will use this website at work because it provides all the features I need in my job
CS2		Technology development	When there are technical problems or the need to develop new features, I believe website development can be carried out quickly and precisely without disrupting work.
ITD1	IT Development (ITD)	Effective and efficient	Website development can be carried out on target and does not require many resources.
ITD2		Management support	I feel that the use of this website is supported by the managerial DKPP.
ITD3		Service quality expectation	I feel that website development is always attempted to achieve user expectations.

2) Service quality

Gronroos [25] defines service quality as a comparison between user expectations and perceptions of the service obtained. Furthermore, Tan [26] defines service quality as service satisfaction and delivery. On a website-based platform, the user's desire to continue to use website-based services depends on the user's perception of quality benefits [27]. Sureshchandar *et al.* [28], Chia *et al.* [29], and Molinari *et al.* [30] show that service quality produces user satisfaction and behavioral intentions.

3) Interactivity

Interactivity is how users can participate in technology by modifying or modifying content in real-time [31]. Web 2.0 allows users to modify and participate in customization, interactivity, service delivery processes, real-time responses, and website security [12]. An interactive website is a website that provides free control to users to personalize information. The greater the user's control over the website, the higher the level of user satisfaction [32].

4) Trust

Two factors influence the trust variable in online communication: security and privacy issues [33], [34]. According to Aladwani, trust is one of the critical elements in activities in the online world [35]. Customer satisfaction is directly influenced by trust, which can be seen from the behavior of users who will continue to use the service when the service provided is reliable [36].

5) Customer satisfaction

Customer satisfaction has a vital role in the success of a website-based business. Schaupp and Belanger propose a conceptual model of e-satisfaction: technological factors, factors that affect users during and after purchasing a service, and factors related to the quality of the product or service offered [37]. Companies must focus on IT development to ensure all factors are met and guaranteed [12].

6) IT development

IT development has a vital role in building customer satisfaction. Good quality IT development is proven effective in improving service quality to users [38], [39]. As a result, companies must invest in IT development. Various studies show that the dependence on IT companies is very high. The greater the investment in IT to produce high-quality IT development, the greater the effect on company performance [40]–[42]. Given that customer satisfaction is one factor in measuring company performance, it is necessary to measure the influence of IT development on customer satisfaction.

From the developed model and the definition of each variable, in this study, five hypotheses were formulated as shown at Fig. 2:

H1 : Ease of use has a positive impact on customer satisfaction.

H2 : Service quality directly has a positive impact on customer satisfaction.

H3 : Interactivity has a positive impact on customer

satisfaction.

H4 : Trust has a positive impact on customer satisfaction.

H5 : IT development has a significant impact on customer satisfaction.

C. Experiments (Data Collection)

This study uses a correlational quantitative research method. The result of this stage is a statistical data survey. Data was collected through surveys to respondents using online media. The respondents of this study were users of the e-Buruan Sae application consisting of DKPP employees and gardening group members. The survey questions represent each hypothesis submitted with a response in the form of a Likert scale with five answer criteria: strongly disagree, disagree, neutral, agree, and strongly agree.

The list of questions for each hypothesis given to respondents through the survey is shown in Table 2.

D. Final Emperical Analysis

The data obtained from the survey were analyzed using validity and reliability tests, then linear regression and hypothesis testing. A validity test is carried out to measure whether the test instrument provides an accurate value. This study uses the Pearson Product Moment correlation formula to measure the validity of the questionnaire instrument. Meanwhile, the reliability test was used to test the consistency of the questionnaire instrument. Cronbach's alpha with a value greater than 0.6 is used as a tool to test reliability. Linear regression is used to measure the impact of the independent variable on the dependent variable, while the hypothesis test used is the t-test with a significance level of 5%.

III. RESULT

This section discussed the validity test, realibility test, and t-test.

A. Validity Test

With a significance level of 5%, the number of respondents is eight. The results of calculations with Pearson Product r-table value is 0.707. The test results for each question are shown in Table 3.

Of the sixteen questions sent to the respondents, the validity test results show that ten questions have an r-value below 0.707, and six questions have a value above 0.707. Furthermore, the calculation will not include ten questions with "not valid" results.

B. Reliability Test

The reliability test of the six valid questions was then carried out with Cronbach's Alpha. The results of the calculation of the reliability test are shown in Table 4. The results obtained are $\alpha \geq 0.9$, indicating excellent consistency of values.

Table 3. Validity Test Result

Id	Variables	r-count	Result
EoU1	Ease of use	0.67	Not valid
EoU2		0.494	Not valid
EoU3		0.552	Not valid
SQ1	Service quality (SQ)	0.829	Valid
SQ2		-0.108	Not Valid
SQ3		0.534	Not Valid
INT1	Interacitcity (INT)	0.925	Valid
INT2		0.205	Not Valid
INT3		0.815	Valid
TR1	Trust	0.925	Valid
TR2		-	Not Valid
CS1	Customer Satisfaction (CS)	-	Not Valid
CS2		0.815	Valid
ITD1	IT Development (ITD)	0.881	Valid
ITD2		0.319	Not Valid
ITD3		0.173	Not Valid

Table 4. Reliability Test Result

Cronbach's Alpha	N	Result
0.943	6	Valid

C. T-test

The t-test aims to examine the effect between the independent variable and the dependent variable. The validity test results show that all questions on the "ease of use" variable are worth less than the r-count or are invalid. The updated model at the t-test stage after the validity test process is shown in Fig. 3. The t-test will be conducted on four hypotheses: H2, H3, H4, and H5.

1) The t-test for H2 (the effect of service quality variable on customer satisfaction variable)

The results of testing the H2 hypothesis are shown in Table 5. The results of linear regression calculations on service quality variables' effect on customer satisfaction show a B value of 0.667. These results indicate that the customer service variable positively affects the service quality variable. When there is a 1% increase in the customer satisfaction variable, the value of service quality will increase by 0.677 and add a constant value of 1.333. The regression equation for the relationship between the two variables is $y = 1.333 + 0.667x$, where y is the service quality variable, and x is the customer satisfaction variable.

With a df value of 6, this hypothesis's t-table value is 1.943, but the t-count is 2.739, indicating that the value of t-count $>$ t-table. It can infer that H2 is suitable.

2) The t-test for H3 (the effect of the interactivity variable on the customer satisfaction variable)

Table 6 displays the findings of the H2 hypothesis test. Based on Table 6, the relationship between the interactivity variable and the customer satisfaction variable is positive, with a coefficient value of 0.900. So, the regression formula for the interactivity variable is $y = 0.500 + 0.900x$, where y is the value of the interactivity variable and x is the customer satisfaction variable. For every 1% increase in the customer satisfaction variable, the value of the interactivity variable will increase 0.900 times and be added 0.500.

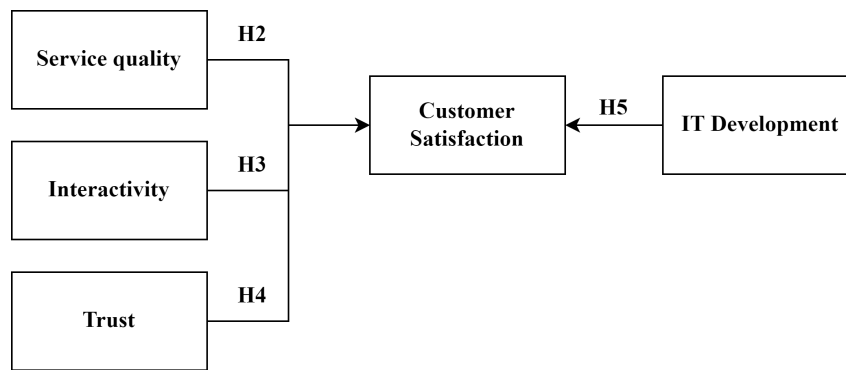The t-table value in this hypothesis is 1,943, with

Fig. 3. Updated model customer satisfaction.

Table 5. H2 *t*-test

Model	Unstandardized Coefficients Result		Unstandardized Coefficients	*t*	Sig.
	B	*Std. Error*			
Constant	1.333	1.072	-	1.244	0.260
Customer satisfaction	0.667	0.243	0.745	2.739	0.034

Table 6. H3 *t*-test

Model	Unstandardized Coefficients Result		Unstandardized Coefficients	*t*	Sig.
	B	*Std. Error*			
Constant	0.500	0.587	-	0.852	0.427
Customer satisfaction	0.900	0.133	0.940	6.750	0.001

Table 7. H4 *t*-test

Model	Unstandardized Coefficients Result		Unstandardized Coefficients	*t*	Sig.
	B	*Std. Error*			
Constant	1	1.174	-	0.852	0.427
Customer satisfaction	0.8	0.267	0.775	3	0.024

df value is 6, and the *t*-count value is 6,750. So the value of *t*-count > *t*-table. These results indicate that H3 is acceptable.

3) The t-test for H4 (the effect of the variable trust on the customer satisfaction variable)

The results of testing the H2 hypothesis are shown in Table 7. The relationship between the trust and customer satisfaction variables is positive, with a value is 0.800. So that a regression function can be formulated for the relationship between the trust variable and the customer satisfaction variable: $y = 1,000 + 0.800x$, where y is the value of the trust variable, and x is the value of the customer satisfaction variable.

With df value is 6, then the *t*-table in this hypothesis is worth 1.943. The *t*-count value is 3,000, so the value of *t*-count > *t*-table. So, it can be concluded that H4 is acceptable.

4) The t-test for H5 (the influence of the IT development variable on the customer satisfaction variable)

The results of testing the H5 hypothesis are shown in Table 8. The value of B, which shows the relationship between the IT development variable and the customer satisfaction variable, is worth 0.467, so it can be concluded that the IT development variable positively affects the customer satisfaction variable. Every 1% increase in the value of IT development will increase the value of customer satisfaction by 0.467 times, plus a constant value of 2,333. So the regression formula for the relationship between these two variables is $y = 2.333 + 0.467x$, where y is the value of the customer satisfaction variable and x is the value of the IT development variable.

The *t*-count value in this hypothesis is 1.292, while the *t*-table is 1.943. So, H5 is invalid because the value of *t*-table > *t*-count.

IV. DISCUSSION

The evaluation of the adoption of the e-Buruan Sae application has been successfully carried out empirically. Of the three objectives of this study, identifying factors or variables that affect customer satisfaction produces six variables: ease of use, service quality, interactivity, trust, IT development, and customer satisfaction. The six variables are then compiled into a customer satisfaction model for adopting the Web 2.0-based e-Buruan Sae application. Five hypotheses are drawn up that describes the correlation between variables. Based on the model, sixteen questions were compiled that identify indicator variables. Evaluation of the model using the validity and reliability tests produces the latest model by removing the ease-of-use variable from the variables that affect customer satisfaction from the e-Buruan Sae application. The results of the evaluation of the relationship between variables in the form of hypotheses found that three hypotheses were declared

Table 8. H5 *t*-test

Model	Unstandardized Coefficients Result		Unstandardized Coefficients	*t*	Sig.
	B	*Std. Error*			
Constant	2.333	1.589	-	1.468	0.192
Customer satisfaction	0.467	0.361	0.467	1.292	0.244

valid, namely H2, H3, and H4. In comparison, one variable is declared invalid, namely H5.

Although the model in this study refers to the model published by Sharma and Baoku with the results of the five valid hypotheses [12], there are differences in the values of the hypotheses obtained. The difference between the types of applications tested is one of the reasons for the difference in the value of the hypothesis. The e-Buruan Sae application is a website application whose use is to input, update, and read information. At the same time, the MMORPG has different characteristics from the aspect of the intensity of user interaction with the application, the number of menus or functionalities, tolerance for system delay, variations in user activity with the application. Systems, and system development. This study shows that the characteristics of the system/application can affect the variables used and the influence between variables. This study also shows that several variables such as service quality, interactivity, and trust affect customer satisfaction with the application.

The limitation of this study is the number of samples or populations used. With the increasing number of users of the e-Buruan Sae application, increasing the number of samples is necessary to cover more perceptions of the entire population. In addition, this study looks at from two different user perspectives, namely operators from DKPP who have more access to system functionality than users from gardening group members who have limited access to application functionality. There is an opportunity to conduct research to measure customer satisfaction with the e-Buruan Sae application separately from the operator or end-users' perspective.

V. CONCLUSION

The Web 2.0-based e-Buruan Sae application helps the process of receiving and processing data for Buruan Sae urban farming activities in Bandung City. The e-Buruan Sae application can be accessed anytime and anywhere. This study applies a DRM-based research method to determine the variables that affect customer satisfaction, create and evaluate models. The evaluation results found that H2, H3, and H4 are accepted or the service quality, interactivity, and trust variables positively affected customer satisfaction in adopting e-Buruan Sae. In contrast, H1 and H5 are rejected or the ease of use and IT development variables did not affect customer satisfaction. This research contributes to identifying the variables in the customer satisfaction

model that affect the application of data management for the Web 2.0-based urban farming program.

REFERENCES

[1] P. M.-F. al., "Perspective for aquaponic systems: 'omic' technologies for microbial community analysis," *Int. Biomed Res*, vol. 2015, p. 480386, October 2015.

[2] T. Y. Kyaw and A. K. Ng, "Smart aquaponics system for urban farming," *Energy Procedia*, vol. 143, pp. 342–347, December 2017.

[3] B. P. S. Jabar, "Kepadatan penduduk jawa barat menurut kabupaten/kota (jiwa/km), 2019-2021," *Badan Statistik Provinsi Jawa Barat [Online]. Available: [Accessed: 02-July-2022]*, 2022.

[4] B. S. K. Bandung, "Jumlah penduduk kota bandung 2015-2020," *Badan Pusat Statistik Kota Bandung [Online]. Available: [Accessed:10-July-2022]*, 2021.

[5] B. K. Bandung, "Luas panen, produktivitas dan produksi padi di kota bandung (ha), 2018 dan 2019," *Badan Pusat Statistik Kota Bandung [Online]. Available: [Accessed:19-June-2022]*, 2020.

[6] D. A. Soraya, *Sumber Pangan Kota Bandung 96,47 Persen Masih Bergantung dari Luar Daerah*. Republika.co.id, 2022.

[7] F. Orsini, R. Kahane, R. Nono-Womdim, and G. Gianquinto, "Urban agriculture in the developing world: a review," *Agron. Sustain. Dev.*, vol. 33, pp. 695–720, October 2013.

[8] A. W. Drescher and D. Iaquinta, *Urban and peri-urban Agriculture: A new challenge for the UN Food and Agriculture Organisation (FAO)*. Rome: FAO, 1999.

[9] L. J. A. Mougeot and Others, "Urban agriculture: definition, presence, potentials and risks," *Growing cities, growing food: Urban agriculture on the policy agenda*, vol. 1, p. 42, 2000.

[10] S. Ghosh, "Food production in cities," in *International Conference on Urban Horticulture 643*, pp. 233–239, 2002.

[11] D. K. P. dan Pertanian (DKPP) Kota Bandung, "Buruan sae," *Buruan Sae - Integrated Urban Farming*, Jul 2020.

[12] G. Sharma and L. Baoku, "Customer satisfaction in web 2.0 and information technology development," *Information Technology & People*, vol. 26, pp. 347–367, January 2013.

[13] N. K. Arora, "Interacting with cancer patients: the significance of physicians' communication behavior," in *Soc. Sci. Med*, vol. 57, pp. 791–806, 2003.

[14] P. Greenburg, *CRM at the Speed of Light: Social CRM Strategies, Tools andTechniques for Engaging Your Customer*. USA: McGraw Hill Company, 2010.

[15] M.-T. Tsai, C.-L. Tsai, and H.-C. Chang, "The effect of customer value, customer satisfaction, and switching costs on customer loyalty: An empirical study of hypermarkets in taiwan," *Social Behavior and Personality: an international journal*, vol. 38, no. 6, pp. 729–740, 2010.

[16] Y. Wang, K. K. F. So, and B. A. Sparks, "Technology readiness and customer satisfaction with travel technologies: A cross-country investigation," *J. Travel Res.*, vol. 56, p. 563–577, May 2017.

[17] M. A. Hemdi, S. A. S. Rahman, and M. H. Hanafiah, "Airport self-service check-in: The influence of technology readiness on customer satisfaction," in *" Proc. Conf. Army Physicians Cent*, Mediterr. Forces, 2016.

[18] A. Parasuraman and C. L. Colby, "An updated and streamlined technology readiness index: Tri 2.0," *J. Serv. Res*, vol. 18, p. 59–74, February 2015.

[19] H. G. Pereira, M. de Fátima Salgueiro, and P. Rita, "Online determinants of e-customer satisfaction: application to website purchases in tourism," *Serv. Bus*, vol. 11, p. 375–403, June 2017.

[20] Blessing and Chakrabarti, *DRM, a design research methodology.* Dordrecht: Springer, 2009.

[21] F. D. Davis, "Perceived usefulness, perceived ease of use, and user acceptance of information technology," *Miss. Q.*, vol. 13, no. 3, p. 319–340, 1989.

[22] B. Merrilees and M.-L. Fry, "Corporate branding: A framework for e-retailers," *Corporate Reputation Review*, vol. 5, p. 213–225, October 2002.

[23] M.-O. Richard and R. Chandra, "A model of consumer web navigational behavior: conceptual development and application," *J. Bus. Res.*, vol. 58, p. 1019–1029, August 2005.

[24] W. J. Doll and G. Torkzadeh, "The measurement of end-user computing satisfaction," *Miss. Q.*, vol. 12, no. 2, p. 259–274, 1988.

[25] C. Grönroos, "Marketing services: the case of a missing product," *Journal of Business & Industrial Marketing*, vol. 13, January.

[26] C.-W. Tan, I. Benbasat, and R. Cenfetelli, *Understanding the antecedents and consequences of E-government service quality: Transactional frequency as a moderator of citizens' quality perceptions*. 2010.

[27] P. G. Patterson, E. Cowley, and K. Prasongsukarn, "Service failure recovery: The moderating impact of individual-level cultural value orientation on perceptions of justice," *International Journal of Research in Marketing*, vol. 23, p. 263–277, September 2006.

[28] G. S. Sureshchandar, C. Rajendran, and R. N. Anantharaman, "The relationship between service quality and customer satisfaction – a factor specific approach," *J. Serv. Mark*, vol. 16, p. 363–379, July 2002.

[29] J. Hsu and C. Hsu, "The relationships between service quality and customer satisfaction in a leading chinese web 2.0 company," The Business Review, 2008.

[30] L. K. Molinari, R. Abratt, and P. Dion, "Satisfaction, quality and value and effects on repurchase and positive word-of-mouth behavioral intentions in a b2b services context," *J. Prof. Serv. Mark*, vol. 22, p. 363–373, August 2008.

[31] B. Laurel, ""interface agents: Metaphors with character,"," in *Human Values and the design of Computer Technology*, p. 207–219, 1997.

[32] H. Marmorstein, D. Grewal, and R. P. H. Fishe, "The value of time spent in price-comparison shopping: Survey and experimental evidence," *J. Consum. Res*, vol. 19, p. 52–61, June 1992.

[33] G. M. M. H. and L. C. Harris, "Online behavioural intentions: an empirical investigation of antecedents and moderators," *Eur. J. Mark*, vol. 41, p. 512–536, January 2007.

[34] M. K. O. Lee and E. Turban, "A trust model for consumer internet shopping," *International Journal of Electronic Commerce*, vol. 6, p. 75–91, September 2001.

[35] A. M. Aladwani, "Online banking: a field study of drivers, development challenges, and expectations," *Int. J. Inf Manage*, vol. 21, p. 213–225, June 2001.

[36] C.-J. Liang and H.-J. Chen, "A study of the impacts of website quality on customer relationship performance," *Total Qual. Manage. Bus. Excel.*, vol. 20, p. 971–988, September 2009.

[37] L. C. Schaupp and F. Bélanger, "A conjoint analysis of online consumer satisfaction," *Journal of electronic commerce research*, 2005.

[38] S. Rathnam, V. Mahajan, and A. B. Whinston, "Facilitating coordination in customer support teams: A framework and its implications for the design of information technology," *Manage Sci.*, vol. 41, p. 1900–1921, December 1995.

[39] J. Karimi, T. M. Somers, and Y. P. Gupta, "Impact of information technology management practices on customer service," *Journal of Management Information Systems,*, vol. 17, p. 125–158, March 2001.

[40] P. E. D. Love, Z. Irani, and D. J. Edwards, "Researching the investment of information technology in construction: An examination of evaluation practices," *Autom. Constr.*, vol. 14, p. 569–582, August 2005.

[41] M. F. Thouin, J. J. Hoffman, and E. W. Ford, "The effect of information technology investment on firm-level performance in the health care industry," *Health Care Manage. Rev.*, vol. 33, p. 60–68, January 2008.

[42] F. Ahmad and N. H. Arshad, "Value delivery of information technology investment: A conceptual framework," *Int. j. comput. theory eng.,*, vol. 6, no. 2, pp. 150–154, 2014.