THE SUCCESS OF ONLINE PASSPORT QUEUE REGISTRATION APPLICATIONS USING DELONE AND MCLEAN MODELS

Ivan Ramos*)1, Lilik Noor Yuliati), Megawati Simanjuntak**)**

*)School of Business, IPB University
Jl. Pajajaran Bogor 16151, Indonesia
**)Department Family and Consumer Science, Faculty of Human Ecology, IPB University
Jl. Kamper Campus IPB Darmaga, Bogor 16680, Indonesia

Abstract: Advancement in sophisticated information technology can be used for innovation in access to public services. In this study, the public service studied was the Online Passport Queue Registration Application (APAPO) at the Class I Non-TPI Bogor Immigration Office. This study aims to analyze the effect of system quality, information quality, service quality, user characteristics, usage rate, user satisfaction on net benefits APAPO using DeLone and McLean and find out the priority factors for improvement using the Important-Performance Analysis (IPA) method. The sampling technique used was convenience sampling where the sample was people who had applied for a passport using APAPO at the Immigration Office Class I Non TPI Bogor taken as many as 200 respondents with data collection using an online google form questionnaire, and then analyzed using the SEM method. The results of this study indicate that the quality of the system has no significant effect on usage and user satisfaction. The quality of information has no significant effect on usage and user satisfaction. Service quality has a significant effect on usage and has no significant effect on user satisfaction. User characteristics have a significant effect on usage. Usage has a significant effect on user satisfaction and net benefits. And user satisfaction has a significant effect on net benefits. From the results of the IPA analysis, system integration, format of output and assurance are indicators that services need to be improved.

Keywords: DeLone and Mclean Model, APAPO, IPA, SEM, Bogor Immigration Office

Abstrak: Kemajuan teknologi informasi yang canggih dapat dimanfaatkan untuk inovasi akses pelayanan publik. Dalam penelitian ini, pelayanan publik yang diteliti adalah Aplikasi Pendaftaran Antrian Pasport Online (APAPO) pada Kantor Imigrasi Kelas I Non TPI Bogor. Penelitian ini bertujuan untuk menganalisa pengaruh kualitas sistem, kualitas informasi, kualitas layanan, karakteristik pengguna, tingkat penggunaan, kepuasan pengguna pada manfaat bersih APAPO dengan menggunakan model Delone dan Mclean dan mengetahui faktor-faktor prioritas perbaikan dengan menggunakan metode Important-Performance Analysis (IPA). Teknik penentuan sampel menggunakan convenience sampling dimana sampel adalah masyarakat yang pernah mengajukan permohonan pembuatan paspor menggunakan APAPO di Kantor Imigrasi Kelas I Non TPI Bogor yang diambil sebanyak 200 responden dengan pengumpulan data menggunakan kuisoner online google form, untuk kemudian dianalisis dengan menggunakan metode SEM. Hasil penelitian ini menunjukan bahwa kualitas sistem dan kualitas informasi tidak berpengaruh signifikan pada penggunaan dan kepuasan pengguna. Kualitas layanan berpengaruh signifikan pada penggunaan dan tidak berpengaruh signifikan pada kepuasan pengguna. Karakteristik pengguna berpengaruh signifikan terhadap penggunaan. Penggunaan berpengaruh signifikan pada kepuasan pengguna dan manfaat bersih. Kepuasan pengguna berpengaruh signifikan terhadap manfaat bersih. Dari hasil analisis IPA, integrasi sistem, format keluaran dan jaminan menjadi indikator yang perlu ditingkatkan pelayanannya.

Kata kunci: Model Delone dan Mclean; APAPO; IPA; SEM; Kantor Imigrasi Bogor

¹ Alamat Korespondensi:
  Email: immi.ramos@gmail.com

INTRODUCTION

Increasing the quality of public services carried out by government agencies is now increasingly becoming a public demand. This quality is obtained by taking advantage of increasingly sophisticated advances in information technology, where the government seeks to provide added value to public services. The government always strives to deliver innovation in meeting people's needs for convenience, speed, security, and comfort to increase public services supported by sophisticated information technology.

Based on Constitution Number 6 of 2011 concerning Immigration and Circular of the Director-General of Immigration Number IMI-UM.01.01-4166 concerning Online Passport Queue Registration Applications (APAPO) throughout Indonesia, it is an effort to improve the quality of immigration services for Indonesian citizens. The purpose of this circular letter is to provide clarity, order and certainty in the implementation of queuing registration applications for passport issuance online. The purpose of implementing online passport queue registration is to serve as a guide for immigration employees in queuing registration for online passport applications and the Head of the Immigration Division in conducting guidance, control and technical supervision of immigration in implementing queuing registration for passport applications online.

In its implementation, the application experiences various problems. Since it was launched on January 26, 2019, APAPO 2.0 has received multiple public responses. Some give appreciation, but not a few who share negative comments regarding this application. The number of reports related to APAPO 2.0 resistance has increased quite significantly. Trending topics that become complaints from the public are around the material aspects and features of the application.

This data shows that in accessing APAPO 2.0 (Figure 1), the community finds that the quota is always full (47%). This situation is alarming in the aspect of public services. Also, there were reports related to identity cards that were not appropriate (23%). The complaint admin can anticipate this by advising the applicant to adjust the birth date with the identity cards format to be corrected at the immigration office. Furthermore, QR codes that do not appear (13%) even though they have selected the arrival date. Other technical constraints follow this in the form of server errors and an identity revision feature in the application.

Information system success (ISS) has been of enduring interest to information systems (IS) and information technology (IT) research and practice over several decades. Information systems accept data sources as input and process them into information products as outputs (Rahi & Abd.Ghani, 2019). An information system model shows a fundamental conceptual framework for information systems' main components and activities (Jeyaraj, 2020). Research conducted by Kim et al. (2015) to evaluate the m-CRM used by workers proved that the three types of quality (information, systems and services) had a significant effect on employee personal performance through employee satisfaction and system use.
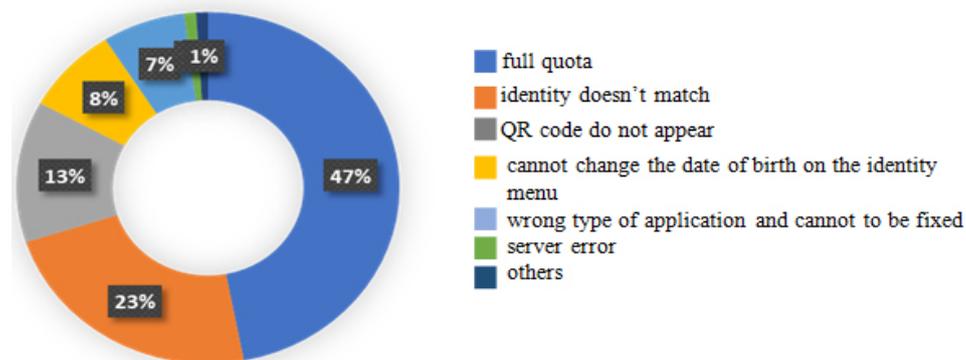

Figure 1. Topic of complaints regarding APAPO

Variation in the application and results of DeLone and McLean (DM) models may be attributed in part to the differences in research contexts. According to Jeyaraj (2020) several relationships found in the DM models have been sporadically supported in empirical research. The findings in Bahaddad (2017) DM were used for ISS in the m-commerce environment, which represents the achievement of success in online commerce systems. Information quality had significant associations with variables like user satisfaction, intention to reuse the site, and perceived benefits of site use in health settings (Shim & Jo, 2020). Jaafreh (2017) revealed in his research adopting information DeLone and McLean model-for assessing is success in the banking system. That there is user satisfaction, Use, and intention to use have a significant positive influence on net benefit. However, DM evaluates IT usage by examining the effect of overall quality (system, information and service quality) on user satisfaction and actual usage, both of which in turn influence performance impact DM has, therefore, become widely used to measure the success of IS (Aldholay et al. 2018).

The most common result of applying information technology systems is that the system is prosperous or successful in an organization. A successful system that provides benefits and benefits is obtained after the system is used (Clark & Mayer, 2016). To evaluate information systems in an organization, a method is needed that can help with this. Evaluation of implementing an information system in an organization can be done using the DeLone and McLean method which has five variables with one of the variables divided into two so that the total variables developed by DeLone and McLean become six variables, there are system quality, information quality, service quality, use, user satisfaction and net benefits. In this study, the DeLone and McLean models were modified by adding user characteristic variables (DeLone & McLean, 2016).

The measurement of the success of APAPO implementation is seen from the characteristics of the users. Therefore, the net benefit indicators are used to refer to operators' benefits from the implementation of APAPO. The difference between this study and previous research is that this study uses the DeLone and McLean success model with a user characteristic variable that shows the value of the success of using APAPO, and uses Importance Performance Analysis to make it easier to submit recommendations for improvements.

Based on the description of the background and the formulation of the problem, some factors influence the success of the APAPO conducted by the Class I Non-TPI Bogor Immigration Office. This study focuses on testing and validating the DeLone and McLean model of APAPO, also known as the DeLone and McLean Information Systems Success (DMISS) Model. These factors are system quality, information quality, service quality, user characteristics, usage, user satisfaction and net benefits. The seven variables are considered to have a significant impact on the success of APAPO. However, this has not been studied in more depth by the Bogor Class I Non-TPI Immigration Office. Based on the background and the identification of the problem, this study aims to analyze the effect of system quality, information quality, service quality, user characteristics, usage rate, user satisfaction on net benefits APAPO using DeLone and McLean and find out the priority factors for improvement using the Important-Performance Analysis (IPA) method.

METHODS

The research was conducted at the Class I Non-TPI Bogor Immigration Office, Bogor City. Data collection was carried out in April-May 2020 and was only limited to evaluating the implementation of the online passport queue registration application. The instrument used in this study, an online questionnaire from Google Form and distributed in the form of a link via email. The samples taken were respondents who had submitted a passport application using the APAPO at the Class I Non-TPI Bogor Immigration Office. Of the 260 respondents who filled out the online questionnaire, only 200 respondents met the criteria as respondents who had used APAPO at the Class I Non-TPI Bogor Immigration Office. Data processing was carried out to analyze the factors that influence the success of APAPO. An importance performance analysis will be carried out to find attributes that perform well and attributes that need to be improved to require immediate action.

Many theories and models have been developed and proposed in the information systems (IS) context in order to predict and explain user behavior with technology. Besides the DeLone and McLean Model of Information Systems Success (DMISM) (DeLone & McLean, 2003; DeLone, W. H., & McLean, 1992). DeLone, W. H., & McLean (1992) formulated IS as a multidimensional measure with six dimensions, there

are information quality (IQ), system quality (SQ), user satisfaction (US), system usage (SU), individual impact (II), and organizational impact (OI). DeLone & McLean (2003) become six variables, there are system quality, information quality, service quality, usage system, user satisfaction and net benefits.

Structural Equation Modeling (SEM) is a statistical model that can explain several variables' relationship (Richter et al. 2014). SEM's main advantage compared to other general linear model applications, is that SEM can study the causal relationship between latent variables. Measurement errors between latent variables and their indicators specifically, and has the advantage of determining whether the proposed model can be accepted or rejected. This study used SEM with the Linear Structural Relationship (LISREL) version 8.8 program (Westland, 2019). SEM (Structural Equation Modeling) with LISREL also provides a t-value for each estimated coefficient. The expected t-count value of each coefficient is ≥ 1.96 (Wibowo et al. 2018).

The technique for calculating the reliability coefficient in this reliability test is using the Cronbach's alpha formula. The Pearson Correlation value obtained states that all r-count (correlation coefficient) obtained from the results of this research data processing is more than r-table (0.361) with a significance level of <0.05, so the validity test results state that all indicators of each variable are declared valid (Knekta et al. 2019). In the reliability test, the Cronbach alpha value of each variable was > 0.60 (Alzahrani et al. 2017).

The questionnaire is divided into three parts. The first part of the questionnaire begins with the respondents' profiling, including name, gender, age, education level, occupation, and expenditure/month. The second stage is profiling to find out the respondent's experience in applying for a passport. The third stage is the main question section regarding system quality, information quality, service quality, user characteristics, usage, user satisfaction and net benefits. This study's framework is based on the success model has been developed DeLone and McLean with modifications or developed through the addition of user characteristic variables, as shown in Figure 2. Consequently, the study chooses to hypothesis that:

H_1: System quality has a significant effect on usage

H_2: The information quality has a significant effect on usage

H_3: Service quality has a significant effect on usage

H_4: User characteristics have a significant effect on usage

H_5: System quality has a significant effect on user satisfaction

H_6: The information quality has a significant effect on user satisfaction

H_7: Service quality has a significant effect on user satisfaction

H_8: The use of the system has a significant effect on user satisfaction

H_9: The system's use has a significant effect on net benefits

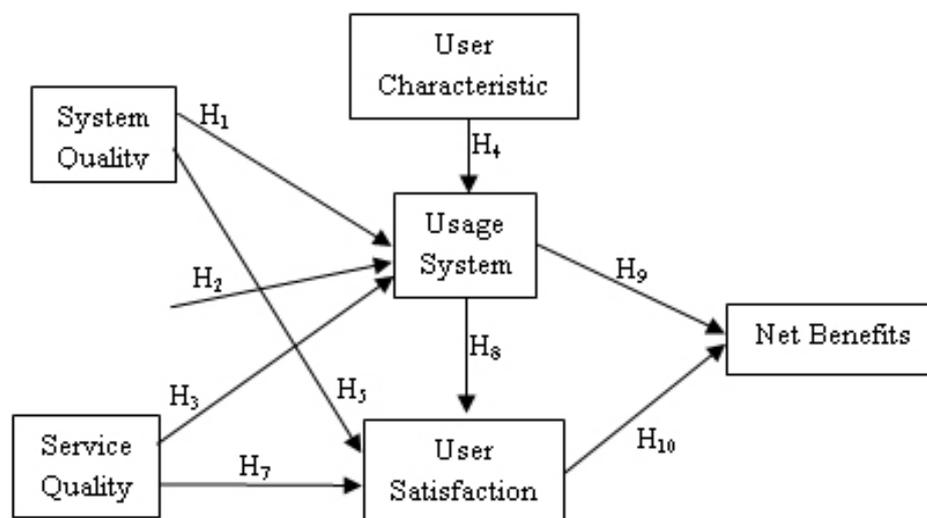H_{10}: User satisfaction has a significant effect on net benefits

Figure 2. Research framework

RESULTS

Important-Performance Analysis (IPA)

Descriptive analysis of 200 respondents identity based on respondents' characteristics using APAPO Class I Immigration Office Non-TPI Bogor shows that the majority of respondents obtained from this study mostly have a domicile in Bogor (75.5%). From the results of the study, the respondents who used the most online passport queue registration applications were men compared to women with a proportion of 74 percent versus 26 percent. From the age range, the majority are in the range of 17-20 years (43.5%) and 21-30 years (39%). This is inseparable from the millennial generation that grows together with technological developments so that the millennial generation takes part if there is a technology in this case a new application to simplify the process of making passports. Respondents who are not married are more dominant (78%) than those who are married (22%). The behavior of making passports shows that 69.5% of respondents have applied for passports for the first time, while the remaining 19% have made passports twice and only 2% have made passports more than five times. In terms of application, as many as 64% of respondents made new passports

and 10% made of electronic passports. Where only 20.5% replaced ordinary passports, and 5.5% replaced electronic passports.

Based on the Importance Performance Analysis (IPA) analysis in general, of respondents' 19 attributes, functionality (X16) considered the essential attribute and reliability (X17) was considered the least important attribute. In terms of performance, the response time (X13) is in the leading ranking, even though respondents think this attribute is less critical (rank 18). To determine which attributes need to be upgraded and maintained, further analysis conducted by creating a Cartesian diagram that maps the average performance level and the average interest rate presented in Figure 3.

Quadrant 1 shows attributes considered very important by respondents in this study, but the Online Passport application has not shown an acceptable performance level. This attribute is system integration, which means that the respondent expects that the APAPO is available and can be downloaded into all versions of the Android and IOS operating systems. It makes it easier for both OSS users to get the same service without replacing or buying a new smartphone.
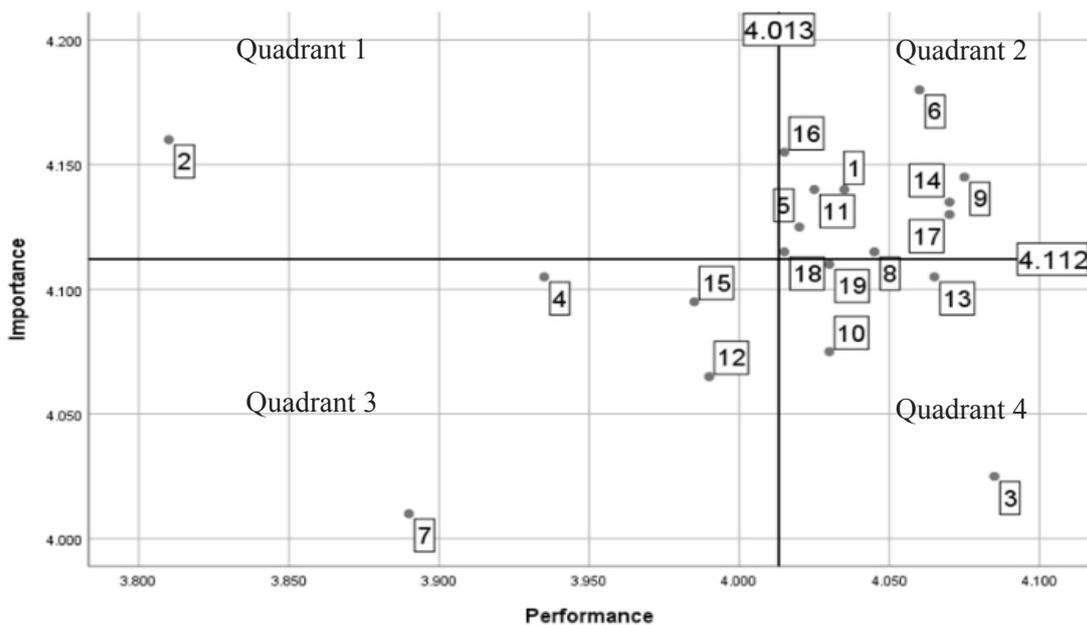

Figure 3. Cartesian diagram of importance level and performance level of system quality attributes, information quality and online passport application service quality

Quadrant 2 shows the attributes considered necessary by the respondent, and in the Passport Online application, it has provided this well (good performance). These attributes are system flexibility, language, functionality, comprehensiveness, output format, relevance, assurance and empathy. The attributes mean that respondents are very concerned about the security features of APAPO. This is inseparable from the many misuses of personal data by specific individuals obtaining personal benefits without the user's consent. Besides, complete information makes it easier for respondents to fill incomplete data and follow the procedures for applying new passports.

Quadrant 3 shows attributes that are considered less critical, and the Online Passport application's performance is also considered flawed by respondents. These attributes are the convenience of access, reliability, currentness, and freshness. A feature in APAPO that allows respondents to revise or correct if there are filling errors is perceived as less critical and does not provide adequate performance. Quadrant 4 shows attributes that are somewhat less important,

according to respondents. However, it has provided good performance in the Online Passport application to feel that it is too much to do. These attributes are response time, quality of information, period, and quality service. This certainly provides an overview for the Class I Non-TPI Bogor Immigration Office in developing online passport applications to suit the respondents' wishes by maintaining attributes in quadrant two and increasing attributes in quadrant 1. Also, consider reducing the performance of attributes in quadrant 4 to develop these applications efficiently.

The contribution of indicator variables to latent variables can be seen based on the factor loading value (Table 1). Based on Table 1, each variable has a factor loading indicator value that contributes significantly. An example is the system quality variable (X1), the indicator that makes the most significant contribution is usability (X18) with a factor loading value of 0.94. In the information quality variable (X2), the indicator that gives the most significant contribution is relevance (X26), which is the factor loading value of 0.95.

Table 1. Contribution of indicators to latent variables

Variables	Indicator		Factor Loadings
System Quality	X11	System flexibility	0.87
	X12	System integration	0.91
	X13	Response time	0.86
	X14	Convenience of access	0.84
	X15	Language	0.92
	X16	Functionality	0.91
	X17	Reliability	0.88
	X18	Uses	0.94
Information Quality	X21	Completeness	0.94
	X22	Conformity	0.91
	X23	Output format	0.92
	X24	Present	0.93
	X25	Period of time	0.92
	X26	Relevance	0.95
Service Quality	X31	Immediacy	0.90
	X32	Guarantee	0.93
	X33	Empathy	0.94
	X34	Readiness	0.97
	X35	Accuracy	0.94

Variables	Indicator		Factor Loadings
User Characteristic	X41	Financial risk	0.75
	X42	Social risk	0.76
	X43	Comfort risk	0.73
	X44	Perceived control over site navigation	0.87
	X45	Content accessed	0.77
	X46	Duration of experience	0.73
	X47	Frequency of use	0.83
Usage	Y11	Nature of use	0.89
	Y12	Suitability of use	0.82
	Y13	Frequency of use	0.65
	Y14	Duration of use	0.74
User Satisfaction	Y21	System satisfaction	0.91
	Y22	Information satisfaction	0.92
	Y23	Service satisfaction	0.92
Net Benefits	Y31	Cost savings	0.73
	Y32	Time Savings	0.91
	Y33	Provides convenience	0.90

In the service quality variable (X3), the indicator that gives the most significant contribution is reliability (X34) which has a factor loading value of 0.97. In the user characteristics variable (X4), the indicator that makes the most significant contribution is the perceived control over site navigation (X44) which has a factor loading value of 0.87. In the use variable (Y1), the indicator that gives the immense contribution is the nature of use (Y11) which has a factor loading value of 0.89. In the user satisfaction variable (Y2), the indicators that provide the most considerable contribution are information satisfaction (Y22) and service satisfaction (Y23), which both have a factor loading value of 0.92. In the net benefit variable (Y3), the indicator that gives the most significant contribution is saving time (X32) which has a factor loading value of 0.91.

The most significant factor loading value reflects the indicator with the most considerable contribution to the latent variable and vice versa. Based on the data in Table 2, each variable has an indicator that has a factor loading value that contributes significantly and to determine the validity and reliability of the entire model. Calculations will be made based on the value of Construct Reliability (CR) and Variance Extracted (VE). The results can be seen in Table 2. Based on the results obtained in Table 2, it can be concluded that the validity of all observed variables for the latent variables is good. From the results of the reliability calculation, it can be seen that all CR values $\geq$ 0.70 and all VE values $\geq$ 0.50. The reliability requirements and it can be concluded that the reliability of the measurement model is good. To find out the path coefficient of each variable and the loading factor value of each indicator, an evaluation of the structural model is presented in Figure 4. In Figure 4, it can be seen that the regression

coefficient of each free latent variable on the latent dependent variable. To analyze the data is described in hypothesis testing.

The Hypothesis Analysis APAPO Using DeLone and McLean

The results of hypothesis effect of system quality on usage (H_1) testing show no significant influence between system quality and usage. This result can be seen from the t value -0.07 (<1.96), thus accept H_0 and reject H_1. This shows that the system's quality in the implementation of APAPO does not have a significant effect on usage; it even tends to decrease. These results correspond to the conclusion that the system's quality is vital but not something important when used. Moreover, its use is rarely used where it is only used if the user feels the need to make changes or apply for a new passport online through APAPO.

These results are consistent with Wu & Wang (2006) research, who concluded that the system's quality is vital but not necessary when used. Moreover, its use is rarely used where it is only used if the user feels the need to make changes or apply for a new passport online through APAPO. However, Al-Fraihat et al. (2019) have different results where system quality positively influences the use of the e-learning system. Thus, providing information about ethical and legal issues prior to using the e-learning system can increase their awareness and significantly influence the success of the system. In addition, system quality also has a significant effect on usage due to factors from the information system development team in the internal e-commerce (Marjanovic et al. 2016).

Table 2. Validity and reliability

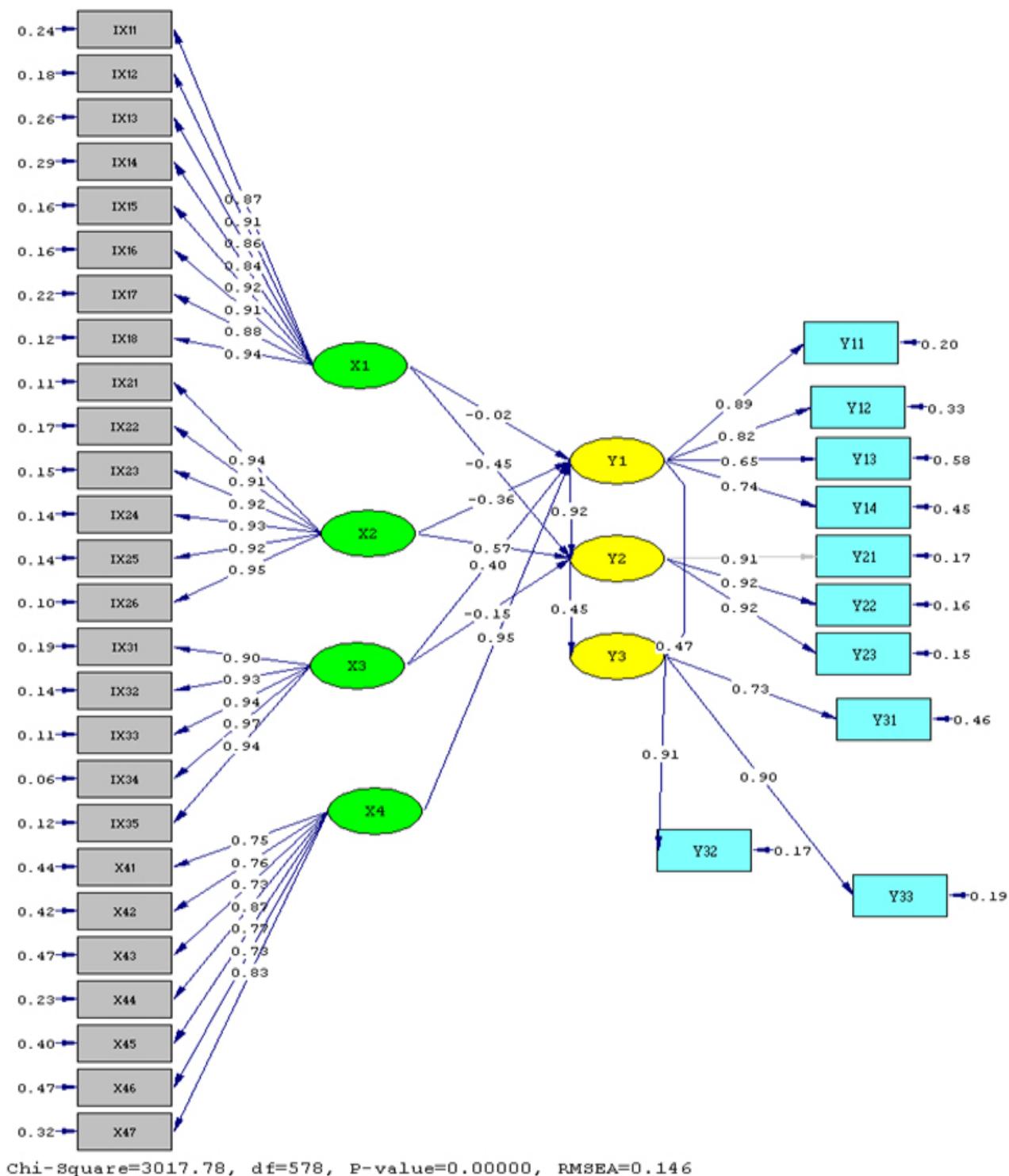| Variable	CR $\geq$ 0.7	VE > 0.5
X1	0.97	0.80
X2	0.97	0.86
X3	0.97	0.75
X4	0.91	0.52
Y1	0.86	0.61
Y2	0.94	0.84
Y3	0.89	0.72

Figure 4. Path diagram analysis

The hypothesis Effect of information quality on usage (H_2) testing results show that there is no significant influence between the quality of usage information. This result can be seen from the t value of -1.37 (<1.96), thus accept H_0 and reject H_2. This shows that the quality of information on the implementation of APAPO has no significant effect on usage, and even tends to decrease. Widiastuti et al. (2019) examined there is positive

but not significant on the use of BKD system. Users judge the information obtained from the system, but the frequency of users accessing the BKD system is not frequent. In contrast to Harr et al. (2019), research conducted found that the quality of information has a significant effect on the use of the Enterprise Content Management System (ECMS).

The results of hypothesis effect of service quality on usage (H_3) testing show a significant influence between service quality and usage. This result can be seen from the t value of 3.13 (> 1.96); thus, H3 is accepted. This shows that service quality in the implementation of APAPO has a significant and positive effect on usage. This result is different from the two initial hypotheses, where service quality is critical in using APAPO applications. The presence of new applications and the lack of socialization from the Immigration Office regarding applying for a new passport online make customer service in responding to user inquiries crucial in increasing usage. Ojo (2017) shows that service quality has a significant effect on hospital information systems in developing countries. According to Dalle et al. (2020) service quality was found to influence the use of the information system and the individual impact that users were likely to see in the interventions. When systems are not safe, reliable, and accurate, users will not see their benefits and may cease relying on them to achieve the desired results. In contrast to Yu & Qian (2018) research, service quality does not have a significant effect on the use of electronic health records (EHR).

The results of hypothesis effect of user characteristics on usage (H_4) testing show a significant influence between user characteristics on usage. The t value of 13.65 (> 1.96), H_4 is accepted. This result shows that user characteristics in the APAPO implementation have a significant and positive effect on usage. This result is because someone is increasingly unfamiliar with the use of new technology. The APAPO application makes someone reluctant to use the application and prefers to come directly to the nearest Immigration Office to queue. Given that most respondents are millennials aged 17-30 years old who were born with technology, there is no problem using this application in applying for a new passport. This research is in accordance with the results revealed by Prihantoro et al. (2018) that perceived usefulness positively influences the behavior of m-commerce application usage. This highlights that when users feel m-commerce applications are easy to use and useful to meet their needs, they will feel confident to continue using the m-commerce applications.

The hypothesis testing results effect of system quality on user satisfaction (H_5) show that there is no significant influence between system quality on user satisfaction. This result can be seen from the t value of -1.59 (<1.96), accept H_0 and Reject H_5. The quality of the system does not influence user satisfaction. It may be caused by several things, such as the research conducted by Aditya et al. (2020) state that the system quality of the KitaBisa application does not have a significant effect on user satisfaction because the application is considered less reliable. This result also relates to consumer expectations that the APAPO application is only stable and useful. Nevertheless, the biggest obstacle is getting a queue quota. No matter how good the application's quality, it will not affect customer satisfaction if deemed less useful.

The results of hypothesis effect of information quality on user satisfaction (H_6) testing show no significant influence on the quality of information on user satisfaction. This result can be seen from the t value of 1.95 (<1.96), thus accept H_0 and Reject H_6. This data shows that the quality of information on the implementation of APAPO has no significant effect on user satisfaction and tends to add. In line with hypothesis 5, the information quality presented in the application does not significantly affect user satisfaction of the application because the information becomes less useful if the respondent does not use the application in applying for a new passport. This hypothesis's results are supported by the research of Ojo (2017), which shows that the information quality significantly influenced the use of the hospital information system.

The results of hypothesis effect of service quality on user satisfaction (H_7) testing show no significant influence between service quality and user satisfaction. This hypothesis can be seen from the value of t count -1.07 (<1.96), thus accept H_0 and reject H_7. This data shows that service quality in the implementation of APAPO has no significant effect on user satisfaction, and even tends to decrease. These results are supported by Yakubu & Dasuki (2018) research, which states that service quality has no significant effect on user satisfaction with Canvas LMS (e-learning system). Service quality yields no significant influence on user satisfaction of Windows Domain Network (WDN) with a case in a University in the Philippines (Himang et al. 2019).

The results of hypothesis effect of use on user satisfaction (H_8) testing show a significant influence between usage on user satisfaction. This hypothesis can be seen from the t value of 14.47 (> 1.96), H_8 is accepted. This data shows that the use of APAPO has a significant and positive effect on user satisfaction. This

result concludes that the higher the frequency of using the APAPO application, the more satisfied it can be seen from the perceived benefits through offline and online comparisons (through applications or WhatsApp). Respondents tend to use the application more often. The existence of a significant relationship between use and user satisfaction is influenced by the frequency of frequent use of the system to gain experience and get to know the functions or features of the system, which if it occurs continuously will provide a higher level of satisfaction (Yang et al. 2017).

The results of hypothesis effect of use on net benefits (H_9) testing show a significant influence between use on net benefits. This hypothesis can be seen from the t value of 3.67 (> 1.96) H_9 is accepted. This data shows that the use of APAPO implementation has a significant and positive effect on net benefits. This result is supported by Jaafreh (2017) research, which states that the use of the banking system has a significant effect on net benefits in Saudi Arabia.

This study shows that using APAPO for several times has made respondents feel some of the benefits received by the new features and added value offered in the application in registering passport queues online compared to the previous walk-in registration system. Conditions in developing countries, information is still classified as asymmetric or unbalanced, which means that this application can help reduce the level of asymmetry by informing the available queue quota that can be accessed anywhere, anytime and by anyone who downloads the application. This resulting study certainly eases the Immigration Office officers' duties in notifying the information and considering efficiency in some workflows with the application.

The results of hypothesis effect of user satisfaction on net benefits (H_{10}) testing show that there is a significant influence between user satisfaction and net benefits. This hypothesis can be seen from the t value of 3.57 (> 1.96). This H_{10} is accepted. This data shows that user satisfaction on APAPO implementation has a significant and positive effect on net benefits. This result is in line with hypotheses 8 & 9, where usage and user satisfaction both positively and significantly affect the net benefits of APAPO.

The more satisfied respondents are using the APAPO application, the more likely they will return to using the application in the future. They feel satisfaction from

their benefits, such as a more manageable process that can save their time in applying for passports online. Moreover, the Immigration Office's operating hours are only on weekdays, so it will be beneficial if they do not need to apply for leave to queue for passports directly. Previous research supported this resulting study, which concluded that user satisfaction could increase productivity, comfort, and effectiveness when using an information system or application (Angelina et al. 2019). Wei et al. (2017) also found that user satisfaction significantly affects the net benefits of the successful implementation of the ward cleaning logistics system at medical centres in Taiwan. IT infrastructure performance is an antecedent of IT infrastructure capability, which directly determines how an e-Government system performs (Dahiya & Mathew, 2018). Based on Tam & Oliveira's (2017) the system quality, information quality, and service quality all together play an important role in user satisfaction, and then enhance continued use of the application system, it is important to periodically monitor the overall quality.

Manajerial Implications

The problem that most users experience in using APAPO is that the quota is always full (47%). This can be corrected by increasing the service quota capacity from the service provider, namely the Immigration Office Class I Non TPI Bogor. In addition, to improve service quality, chatbot services can be applied in APAPO. The chatbot service is expected to be able to provide information on date recommendations that still have an available quota. The results of the IPA research also show two other indicators that need and are important to improve. In the system quality variable, it is found that there is a need to improve the quality of system integration (quadrant 1). The system integration referred to in this study is the ease of getting applications where APAPO is expected to be available on various operating systems (OS).

In the information quality variable, the output format indicator (quadrant 1) needs to be improved. The output format that needs to be considered in this case is the success rate for the emergence of QR Codes, which is still low where is supported by the many complaints related to QR Codes that do not appear due to server and other constraints (13%). Software and QR code server improvements to make it easier to read and use can be done to improve APAPO services. In the service

quality variable, the guarantee indicator (quadrant 1) is expected to improve its quality. The guarantee referred to in this study is a security guarantee with the availability of APAPO customer services which can assure that this application is safe to use. In addition to the availability of customer services, increased security and privacy, as well as socialization from the government, can also be carried out to increase user confidence in security.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Based on the DeLone and McLean model's development, there are 5 out of 10 hypotheses proven empirically. In general, this model is entirely appropriate to evaluate the implementation of APAPO at the Class I Non-TPI Immigration Office in Bogor. The accepted hypothesis is that the APAPO application is influenced by service quality and user characteristics. The readiness of customer service in providing services related to procedures and responding to complaints from respondents affects the application's use. Besides, if the application is deemed safe to use, the respondent will continue to use it if they want to queue for passports online. This study is also supported by a significant indirect influence between service quality and user characteristics on the application's net benefits through usage and user satisfaction.

The 19 attributes in the Importance-Performance Analysis show that there is still a need for improvement in terms of system integration. The priority of improvement proposed in the development of APAPO is that the application can be used in all operating systems (Android / IOS) in the future. For this reason, even though there are many complaints regarding the presence of APAPO in terms of quota limitations. Identity number is not appropriate to the QR Code that does not appear if handled quickly and adequately by the customer service. Consumers will still feel the benefits when using the application to change or make passports in the future.

Recommendations

The research carried out still has several limitations that can be considered in future studies. First conducted direct interviews with several respondents from immigration and APAPO users who were randomly

conducted to strengthen the research results. Further research can be carried out at several Immigration offices in areas with other infrastructure. The Immigration Office can consider using the DeLone & McLane method to identify the APAPO application's benefits. Second, consider conducting further analysis of IPA such as Importance-Importance Analysis (IIA) and Performance-Performance Analysis (PPA) to compare the user and internal perspectives. Third, by using IIA, research can find gaps between respondents' level of interest and internal importance level.

REFERENCES

Aditya HNH, Nurmalasari N, Hendri. 2020. Success analysis of kitabisa mobile application information system by using delone and mclean models. *Jurnal Pilar Nusa Mandiri* 16(1):81–88.

Aldholay A, Isaac O, Abdullah Z, Abdulsalam R, Al-Shibami AH. 2018. An extension of Delone and McLean IS success model with self-efficacy. *Journal of Information and Learning TechnologyJournal of Information and Learning Technology 35*(4):285–304.

Al-Fraihat D, Joy M, Masa'deh R, Sinclair J. 2019. Evaluating e-learning systems success: an empirical study. *Computers in Human Behavior* 10:67-86.

Alzahrani AI, Mahmud I, Ramayah T, Alfarraj O, Alalwan N. 2017. Modelling digital library success using the delone and mclean information system success model. *Journal of Librarianship and Information Science* 1-16.

Angelina R, Hermawan A, Suroso A. 2019. Analyzing e-commerce success using delone and mclean model. *Journal of Information Systems Engineering and Business Intelligence* 5(2):156.

Bahaddad AA. 2017. Evaluating m-commerce systems success: measurement and validation of the delone and mclean model of is success in arabic society (GCC case study). *Journal of Business Theory and Practice* 17(3):156–193.

Clark RC, Mayer R. 2016. *E-Learning and the Science of Instruction: Proven Guidelines for Consumers and Designers of Multimedia Learning* (4th ed.). Wiley.

Dahiya D, Mathew SK. 2018. IT infrastructure capability and eGovernment system performance: an empirical study. *Transforming Government:*

People, Process and Policy 12(1): 16–38.

Dalle J, Hastuti D, Mahmud, Prasetia I, Baharuddin. 2020. DeLone and mclean model evaluation of information system success: a case study of master program of civil engineering universitas lambung mangkurat. *International Journal of Advanced Science and Technology* 29(4): 1909-1919.

DeLone WH, McLean ER. 2003. The delone and mclean model of information systems success: a ten-year update. *Journal of Management Information Systems* 19(4):9–30.

DeLone WH, McLean ER. 2016. *Information Systems Success Measurement In Series in Information Technology Management*. US: Now Publishers Inc., PO.

DeLone WH, McLean ER. 1992. Information systems success: the quest for the dependent variable. *Information Systems Research* 3(1):60–95.

Harr A, Vom B, Urbach N. 2019. Evaluating the individual and organizational impact of enterprise content management systems. *Business Process Management Journal 25*(7):1413–1440.

Himang MM, Mendoza R, Manalastas R, Ocampo L, Himang CM. 2019. Modeling the success of windows domain network (wdn) using the delone and mclean information system (is) success model: a university case. *International Journal of Sociotechnology and Knowledge Development* 11(3):26-42.

Jaafreh, AB. 2017. Evaluation information system success: applied delone and mclean information system success model in context banking system in KSA. *International Review of Management and Business Research 6*(2):829–845.

Jeyaraj A. 2020. DeLone & McLean models of information system success: critical meta-review and research directions. *International Journal of Information Management 54*:102–139.

Kim C, Lee I, Wang T, Mirusmonov M. 2015. Evaluating effects of mobile crm on employees performance. *Industrial Management Data Systems, 115*:40–764.

Knekta E, Runyon C, Eddy S. 2019. One size doesn't fit all: using factor analysis to gather validity evidence when using surveys in your research. *CBE Life Sci Educ, 18*(1).

Marjanovic U, Delić M, Lalic B. 2016. Developing a model to assess the success of e-learning systems: evidence from a manufacturing company in transitional economy. *Information Systems and*

E-Business Management 14(2): 253–272.

Ojo AI. 2017. Validation of the delone and mclean information systems success model. *Healthcare Informatics Research 23*(1): 60–66.

Prihantoro WP, Satria A, Hartoyo. 2018. The determinant factors of behavior in m-commerce application usage for online purchasing. *Indonesian Journal of Business and Entrepreneurship* 4(2): 118-129.

Rahi S, Abd.Ghani M. 2019. Integration of DeLone and McLean and self-determination theory in internet banking continuance intention context. *International Journal of Accounting & Information Management 27*(3): 512–528.

Richter NF, Sinkovics RR, Ringle CM, Schlägel C. 2016. A critical look at the use of SEM in international business research. *International Marketing Review* 33(3): 376–404.

Tam C, Oliveira T. 2017. Understanding mobile banking individual performance. *Internet Research* 27(3): 538–562.

Shim M, Jo HS. 2020. What quality factors matter in enhancing the perceived benefits of online health information sites?: application of the updated delone and mclean information systems success model. *International Journal of Medical Informatics* 137:104093.

Wei K, Tang Y, Kao Y, Tseng L, Wu H. 2017. Using an updated delone and mclean model to assess the success of implementing the ward cleaning logistics system in a medical center. *Journal of Statistics and Management Systems* 20(5): 965–976.

Westland JC. 2019. Full-information covariance sem. *Springer Oceanography*, 39–49.

Wibowo YH, Wijayanto H, Daryanto HK. 2018. Faktor yang memengaruhi minat penggunaan perpustakaan digital (studi kasus pada ipb dan ubinus). *Jurnal Aplikasi Bisnis Dan Manajemen (JABM),* 4(3): 431.

Widiastuti R, Haryono BS, Said A. 2019. Influence of system quality, information quality, service quality on user acceptance and satisfaction and its impact on net benefits (study of information system users lecturer performance load (bkd) in malang state university). *Holistica 10(3)*: 111-132.

Wu JH, Wang YM. 2006. Measuring KMS success: a respecification of the DeLone and McLean's model. *Journal of Information & Management*.

Yakubu M, Dasuki S. 2018. Asessing e-learning systems

success in Nigeria : an aplication of the DeLone and McLean information systems success model. *Journal of Information Thecnology Education: Research* 17:182–202.

Yu P, Qian S. 2018. Developing a theoretical model and questionnaire survey instrument to measure the success of electronic health records in residential aged care. *PLoS ONE 13*(1): 1–18.