



# Public Acceptance of Electronic Land Certificate

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**Abstract.** In the frame of e-government, the Ministry of Agrarian Affairs and Spatial Planning/National Land Agency recently issued an electronic land certificate policy through ministerial regulation number 1 of 2021 concerning electronic certificates. Since this is a relatively new policy and its acceptance level is still unidentified, this paper is aimed to measure the public acceptance index of the electronic land certificate by conducting an online survey in DKI Jakarta Province because it is included as one of the pilot projects provinces for the policy implementation. This research is a quantitative study, and the primary data were collected by conducting an online survey using the questionnaire; however, only 101 out of 1,625 respondents answered the survey questionnaire. Data comprised 48 respondents in the control group and 53 in the treatment group. We further estimated the effect of attaching detailed information about the electronic land certificate in the questionnaire on the acceptance level using coarsened exact matching. The acceptance level in DKI Jakarta is relatively high; it is 3.33, 3.40, and 3.47 (1 to 5 Likert scale) for each statement of acceptance. We found that attaching detailed information about the electronic land certificate in the questionnaire has no significant effect on its acceptance. We suggest the government should consider not only the readiness of the internal aspect but also the public acceptance, and it is necessary to measure the public acceptance of the policy in other provinces to enlarge the observations because public acceptance reflects the size of the benefits derived from the electronic land certificate policy.

**Keywords:** Public Acceptance · Electronic Land Certificate · Coarsened Exact Matching

## 1 Introduction

The urgency of e-government as good governance lies in its dualistic approach to the modernization of state tasks, and they are an approach to administrative reform and the public as a state customer [1]. The gap in the e-government field between developed and

developing countries is vast. Therefore, developing countries should overcome the barriers during e-government development for internal factors, including the organization's internal infrastructure, regulations, and work systems, and external factors, including social and political conditions of society [2]. E-government is the implementation of an electronic-based government system that utilizes information technology advances to improve the quality and capacity of the state apparatus [3]. The adoption and use of the e-government strategy can provide significant benefits for the government in delivering more effective and efficient information and services to all e-government sectors [4]. Following the implementation of e-government, the Ministry of Agrarian Affairs and Spatial Planning/National Land Agency (ATR/BPN) issued an electronic land certificate (ELC) policy through ministerial regulation number 1 of 2021 concerning electronic certificates. Basically, ELC is a form of media transfer from a paper-based certificate into a digital form.

The land certificate media transformation, from paper-based to electronic-based, leads to different acceptance by the public. According to mass media, the issue of ELC raised public concern regarding corruption, private data security, and long processing time. Konsorsium Pembaruan Agraria (KPA) - an independent and non-government organization in the form of a consortium that aims to fight for the creation of a just agrarian system and to ensure an even distribution of land resources for all Indonesian people - argued that a paper-based land certificate has a sacred value for the public and it is irreplaceable, so the ELC should only function as a backup document when it is lost [5]. Moreover, a quite viral rumor mentions that the media transformation of land certificates is mandatory, so the entire paper-based land certificates must be withdrawn from their holders. However, the Minister of ATR/BPN dismissed the rumor and explained that there is no such a withdrawal, only re-verifying and recording the data electronically to obtain valid data [6].

ELC is a new issue in Indonesia and has not been fully implemented. The implementation of ELC will be tested in several big cities first. From previous experience in other countries, the ELC policy implementation does not always run smoothly and is accepted by the community immediately because it has the potential to alter the obsolete perspective or people's habits toward paper-based certificates. In Queensland, Australia, the implementation of ELC faced strong resistance initially because the government performed public communication measly, and the resistance mainly came from the legal practitioner and conservatism [7]. In 2009, the transformation from manual to electronic submission in the Torrens system (a land titling system established in South Australia in 1958 and adopted throughout Australia and New Zealand, which records and registers land interests and land ownership) in New Zealand also met a relatively high repudiation at the beginning [8].

A few examples of electronic transformation in Indonesia that have been proven successful in general service sectors are banking, taxation, and business license. The application of electronic services in the banking sector has been proven to increase the effectiveness and efficiency of services [9–11], public participatory of tax services in Malang using e-registration, e-SPT, e-Filling, and e-Billing systems increased every year [12]. One Single Submission (OSS), an electronically integrated business licensing service system launched by the Indonesian Investment Coordinating Board (BKPM) in

the frame of electronic transformation, can shorten service time in processing a Company Business License (SIUP) in Magelang from 5 days to only 1 h, and the challenge in the adaptation process for the OSS system transformation is the low awareness of business actors regarding OSS application [13].

Public acceptance is crucial in widely adopting new technology [14]. Public acceptance of a new government policy on renewable energy in Kenya showed that 73% of respondents strongly agree with the renewable energy policy implementation [15]. In China, involving public participation in government program implementation can enhance public acceptance of new government programs for waste-fueled energy generator projects [16]. Public acceptance of new technology is mostly determined by the level of public awareness [17–19], and awareness is an important part of an individual's mindset in the process of adopting a new form of technology [20, 21].

This paper is aimed to measure the level of public acceptance of the ELC in the capital city of Indonesia, Jakarta, through an online survey using questionnaires. Furthermore, we estimate the effect of attaching information about several ELC's characteristics, advantages, and security systems in the questionnaire on the acceptance level. Attaching this kind of information in the questionnaire is to give detailed information about the ELC to the respondents as the treatment assignment and to see whether giving the information via questionnaire can affect the acceptance level. Thus, we can estimate the effect of giving detailed information about the ELC on the level of acceptance. We conducted a quasi-experiment and utilized coarsened exact matching (CEM) technique to estimate the effect of attaching ELC's information in the questionnaire on the acceptance level.

## 2 Method

This paper is a quantitative study. The dataset is collected by individual surveys in the Special Area of Capital (DKI) Jakarta Province. DKI Jakarta was chosen as the study location because it is included as one of the pilot project provinces for ELC policy implementation. The online questionnaires were distributed using Whatsapp contact numbers. Respondent's contact numbers were obtained from all Land Offices (Kantah) in DKI Jakarta Province (except for the Kantah Kepulauan Seribu Regency) through a list of mobile phone numbers of people who have been registered for accessing land services from September 2020 to May 2021. The questionnaire was distributed and filled out from June 8 to July 21, 2021. We sent the online questionnaire to 1,625 respondents. However, only 101 respondents participated in filling out the questionnaire, so the level of survey participation in data collection was only about 6.22%.

A baseline questionnaire was designed to capture the respondent's demographic, namely gender, age, level of education, and primary occupation. A modified questionnaire is similar to the baseline but includes additional information about the ELC. Additional information was taken from the Ministry of ATR/BPN material for internal socialization, which has relatively never been published to the public before. It contains detailed characteristics of the ELC in terms of data security systems, comparatives between electronic and paper-based land certificates, benefits of the ELC, and the future appearance of the ELC. The second section of the questionnaire asks the type of media source (television, radio, internet, newspaper, and oral) from which the respondent obtained the

information about the ELC policy before. As the main part of the questionnaire, three statements were asked of the respondents: a) ELC is very important to be applied; b) ELC has more advantages compared to a paper-based land certificate, and c) I am willing to convert my paper-based land certificate into ELC. From each statement, respondents were required to choose 5 Likert scales as the level of their acceptance: (1) strongly disagree; (2) disagree; (3) neutral; (4) agree; and (5) strongly agree. The descriptive statistics analysis was used to capture the public acceptance level of the ELC policy.

To estimate the effect of attaching information about several ELC characteristics, advantages, and security systems in the questionnaire on the level of acceptance, we divided the respondents into 2 groups, namely the treatment and control groups. The unit of analysis is the individual, and the treatment group is the individuals who were sent the online questionnaire with additional information about ELC. In contrast, the control group is the individuals who received the baseline questionnaire without additional information, and the outcome variable is the acceptance level of the ELC. The source of randomization in this study is using the respondents' mobile phone numbers. The control group is represented by the respondents whose mobile phone numbers are odd, while even mobile phone numbers represent the treatment group. In an observatory dataset, matching is a nonparametric technique to control the confounder problem. The basic purpose of matching is to eliminate observations from the dataset to enhance the balance between the treated and control groups in the remaining data [22].

CEM is a recent matching method for exacerbating causal effects estimation by lowering the imbalance among control and treated groups in terms of their covariates. CEM is argued to be easier to comprehend, simpler, and faster than other matching methods [23, 24]. Moreover, it is very useful and reliable when there is a huge covariates imbalance between the treatment and control groups [25, 26]. After checking the covariates' balance, we identified the imbalance level (L1) before and after matching using STATA14. The perfect imbalance is denoted by  $L1 = 1$ , while the perfect balance is denoted by  $L1 = 0$  [23]. Eventually, we estimated the effect of attaching information in the questionnaire on the acceptance level by running ordinary least squares (OLS) regression after matching these groups using CEM.

## 3 Results and Discussions

### 3.1 The Public Acceptance of ELC

From the survey, we obtained 101 respondents and divided them into 2 groups (our data comprising 53 individuals as treated and 48 individuals as control), then we matched each observation in terms of the demographic data (age, gender, level of education, main occupation) and type of media source (television, radio, newspaper, internet, and oral) where the respondents obtained information about the ELC policy before. Table 1 shows the descriptive statistics of our sample. We found that 66% of the sample was male, and the average age was 43.72. Our sample was mostly undergraduate degrees (40%), works as private employees (30%), and PPAT (18%). The media sources most widely accessed about ELC were the internet (70%) and television (33%).

Figure 1 shows that in the first statement (ELC is very important to be applied), most respondents stated agreed (31.68%) and neutral (28.71%). From the second statement

**Table 1.** Descriptive statistics of the respondents.

Variable	Mean	sd	Min	Max
Gender (male = 1)	0.66	0.47	0	1
Age (years old)	43.72	10.07	27	79
Education Level				
Elementary School = 1	0.02	0.14	0	1
Junior High School = 1	0.03	0.17	0	1
Senior High School = 1	0.27	0.44	0	1
Diploma = 1	0.10	0.30	0	1
Undergraduate = 1	0.40	0.49	0	1
Master = 1	0.18	0.38	0	1
Doctoral = 1	0.01	0.10	0	1
Main Occupation				
Unemployment/Job Seeker = 1	0.02	0.14	0	1
Entrepreneur = 1	0.17	0.38	0	1
Public Employee = 1	0.11	0.31	0	1
Private Employee = 1	0.30	0.46	0	1
Land Deed Officer (PPAT) = 1	0.18	0.38	0	1
Non-Permanent Labor = 1	0.07	0.26	0	1
Retirement = 1	0.07	0.26	0	1
Housewives = 1	0.09	0.29	0	1
Information Source on ELC*				
Television = 1	0.33	0.47	0	1
Newspaper = 1	0.08	0.27	0	1
Radio = 1	0.04	0.20	0	1
Internet = 1	0.70	0.46	0	1
Oral = 1	0.19	0.39	0	1

\* Respondents were allowed to choose more than 1 source

(ELC has more advantages compared to a paper-based land certificate), most of the respondents chose neutral (33.66%) and agreed (29.7%). In the third statement (I am willing to convert my paper-based land certificate into ELC), respondents chose to agree (36.63%) and neutral (29.7%) largely. We took the average score from each statement to identify the acceptance level, and the acceptance level was 3.47, 3.40, and 3.33 (from 1 to 5 Likert scale) of all the statements in sequence.

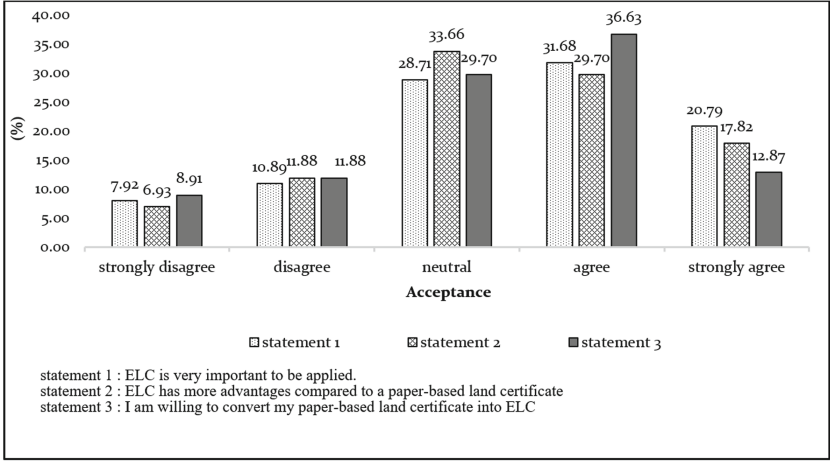


Fig. 1. Public acceptance of ELC.

### 3.2 The Effect of Attaching ELC’S Characteristics Information in the Questionnaire on the Acceptance Level

Checking the covariates balance between the control and treatment group before the treatment assignment was done to investigate if there was no systematic difference among them. Balance check shows that there was a systematic difference between these groups for age, educational level (diploma), main occupation (private employee and retirement), and media source (newspaper). Overall, 5 out of 22 variables show significant differences: age, educational level of diploma, private employee, retirement, and newspaper. Table 2 shows that the treatment group was 3.3 years younger than the control group, there were 20.9% more respondents who work as private employees in the treatment group than in the control group, and 11.1% more respondents read the newspaper to obtain news about ELC in the treatment group than in the control group.

The imbalance level among these groups was identified using an imbalance level (L1) analysis. The result shows that the multivariate imbalance level (L1) was 0.805. We coarsened three variables: age, educational level, and main occupation. Age was coarsened into 4 quartiles, educational level into 2 quartiles (binary), and main occupation into 4 quartiles. After matching, the multivariate imbalance level was  $L1 = 0$ , representing the perfect balance in covariates between the treatment and control groups. However, the sample size was reduced from 101 to only 27 observations because the CEM method dropped the unmatched observations.

As the control and treatment groups were in perfect balance, the treatment effect was estimated using OLS. The effect of attaching detailed information in the questionnaire on the acceptance level of ELC is illustrated in Table 3. From our regression, we indicated that attaching detailed information about ELC’s characteristics in the questionnaire had no significant effect on the acceptance level.

**Table 2.** Balance check for treatment and control group variables.

Variable	Treatment (n = 53)		Control (n = 48)		Difference (n = 101)	
	Mean	sd	Mean	sd		
Gender (male = 1)	0.660	0.478	0.667	0.476	-0.006	(0.095)
Age (years old)	42.151	7.789	45.458	11.957	-3.307*	(1.990)
Education Level						
Elementary School = 1	0.000	0.000	0.042	0.202	-0.042	(0.028)
Junior High School = 1	0.019	0.137	0.042	0.202	-0.023	(0.034)
Senior High School = 1	0.264	0.445	0.271	0.449	-0.007	(0.089)
Diploma = 1	0.151	0.361	0.042	0.202	0.109*	(0.059)
Undergraduate = 1	0.377	0.489	0.417	0.498	-0.039	(0.098)
Master = 1	0.189	0.395	0.167	0.377	0.022	(0.077)
Doctoral = 1	0.000	0.000	0.021	0.144	-0.021	(0.020)
Main Occupation						
Unemployment/Job seeker = 1	0.019	0.137	0.021	0.144	-0.002	(0.028)
Entrepreneur = 1	0.113	0.320	0.229	0.425	-0.116	(0.074)
Public Employee = 1	0.151	0.361	0.063	0.245	0.088	(0.062)
Private Employee = 1	0.396	0.494	0.188	0.394	0.209**	(0.090)
Land Deed Officer (PPAT) = 1	0.151	0.361	0.208	0.410	-0.057	(0.077)
Non-Permanent Labor = 1	0.094	0.295	0.042	0.202	0.053	(0.051)
Retirement = 1	0.019	0.137	0.125	0.334	-0.106**	(0.050)
Housewives = 1	0.057	0.233	0.125	0.334	-0.068	(0.057)
Media Source on ELC						
Television = 1	0.358	0.484	0.292	0.459	0.067	(0.094)
Newspaper = 1	0.132	0.342	0.021	0.144	0.111**	(0.053)
Radio = 1	0.057	0.233	0.021	0.144	0.036	(0.039)
Internet = 1	0.660	0.478	0.750	0.438	-0.090	(0.092)
Oral = 1	0.151	0.361	0.229	0.425	-0.078	(0.078)

Significance level: \*0.1 \*\*0.05 \*\*\*0.01.

*The number in parentheses is the standard error value of the difference.*

**Table 3.** Treatment effect on acceptance level after CEM.

Outcome Variable	Treatment Effect (n = 27)	
Acceptance Level of Statement 1	-0.094	(0.455)
Acceptance Level of Statement 2	0.250	(0.400)
Acceptance Level of Statement 3	0.063	(0.446)

Significance level: \*0.1 \*\*0.05 \*\*\*0.01.

The number in parentheses is the standard error value.

### 3.3 Discussions

According to the results, the acceptance level of the ELC in DKI Jakarta Province is relatively high (3.33 to 3.47). This index indicates that acceptance at the neutral level tends to agree, which might occur for several reasons. First, the population of the survey was the people who have been registered for accessing land services recently, which means that these people have experience in administering their land business, so they know where the land office is and how to access its service. In other words, the population in the survey can be assumed to be the people with a relatively high awareness of land administration and relatively high trustworthiness to the land service provider. This result supports the idea of Ali et al., [17], who claimed that awareness plays an important role in the consumer's decision-making process regarding whether to accept and use the new technology or reject it. The low public trust in the government also determines the low adoption of an e-government program [27].

Second, from the descriptive statistics of the respondents (Table 1), as much as 69% of the sample have high education (university education), and private employees and PPAT dominate the main occupation. Oluoch et al., [15] found a significant correlation between public attitudes and the level of public education toward a new technology application from the government policy. PPAT has a high awareness of land administration since making the land deed related to land administration is one of their main tasks.

Third, another possibility that makes the public acceptance level of ELC in DKI Jakarta relatively high because in 2020, DKI Jakarta was ranked as the highest in the Information and Communication Technology Development Index (ICT-DI) among other provinces in Indonesia [28] (Statistics Indonesia, 2021). This index is relevant and related to the acceptance level of ELC because ELC is a manifestation of information and communication technology development.

The purposes of our treatment assignment are to inform, educate, motivate, and eventually support the decision of the respondents to accept the ELC policy implementation. We utilized CEM as a matching technique to build a comparison group (control and treatment groups) in terms of demographics and media sources where the respondents had obtained information about ELC previously. Using the matching method will be expected to minimize the possible alternative explanations for our treatment effect. Our little experiment found that attaching detailed information on ELC characteristics on the questionnaire has no significant effect on the level of acceptance, even after the matching method was done.



We reckon there are three explanations for this finding. First, referring to several previous studies stated that public acceptance is mostly determined by the level of public awareness [17–19], and awareness is a part of an individual's mindset in the process of accepting a new form of technology [20, 21] so our treatment assignment is expected to be able to change the mindset of the respondents. While changing the mindset required a relatively long and continuous process of communication and education. In the case of our study, it might be ineffective to influence a person's mindset by only giving information at one time (when a respondent filled out the questionnaire). Lallmahomed et al., [29] found that in implementing an e-government program, trustworthiness in the government is negatively correlated with public resistance. So, the government must increase public trust if they want to increase the acceptance rate of ELC before fully implementing it. Furthermore, we could not control whether treated respondents read the information attached to the questionnaire because the survey was conducted online.

Second, as our previous result shows, the acceptance level is relatively high, so the additional information in the questionnaire might not increase the acceptance level. Third, the observation was insufficient, and the sample was not large enough. Moreover, CEM reduced the unmatched observations. Previous studies that use CEM have a relatively large number of samples. For example, Lee et al., [30] applied CEM to 330,414 samples and found that only 21,334 samples were matched; Hametner et al., [31] matched 938 of 1,391 samples; and [32] Guarcello et al., observed 1,145 pupils, and only 588 pupils were matched. Based on these results, we suggest enlarging the sample size by expanding the study to other provinces.

In the frame of e-government, ELC is a policy that utilizes the rapid development of information and communication technology. ELC is believed to have sufficient data security layers, so it is expected to prevent fraud, counterfeiting, and other crime modes related to land [33]. Regardless of our results, the public acceptance index of ELC needs to be measured because it is considered to benefit the holders. An e-government expert in 2006 argued that the public (as the demand side of e-government) has to be benefited from an e-government implementation because misunderstanding what the community needs will cost the government, which will make the government more difficult to develop the concept of e-government, and the public is the subject who determines the size of the benefits derived from e-government [34]. Because the ELC is considered new technology, we also suggest utilizing an alternative measurement method, namely the technology acceptance model (TAM) method, to measure the acceptance level of ELC.

## 4 Conclusions

The public acceptance index of ELC in DKI Jakarta is relatively high because of the demographic characteristics (level of education and occupation), the survey population (has a relatively high awareness of administering the land business), and the ICT-DI of DKI Jakarta (highest index in Indonesia). Attaching detailed information about ELC in the questionnaire has no significant effect on the level of acceptance. It indicates that the government has to figure out other forms of public communication so that the public becomes more aware of ELC. Expanding the study to be applied in other provinces is necessary to attain larger observations since this study is short of observations. The public

acceptance measurement of the ELC in several provinces is also important because it determines the size of the benefits derived from e-government.

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