Pr edicting Smart Regency Readiness on Sub-Urban Area in Indonesia: A perspective of Technology Readiness Index 2.0

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***Abstract*— Many e-Government studies have devised different ways to measure how ready a smart city is to use ICT. But many research notes show that the conceptual readiness framework is hard for e-Government researchers to understand. These challenges have included a lack of a scientifically valid model framework and readiness models for village and sub-urban areas, which have been common in numerous developing countries like Indonesia. This study aims use a readiness model from Parasuraman's (2015) Technology Readiness Index 2.0 (TRI 2.0) framework to determine how ready Sub Urban areas in Indonesia are. By looking at how the mobile-based Smart Regency services were used, the TRI 2.0 framework was changed so that it could be used to measure sub-urban areas in Sumenep and Pamekasan Regencies, Madura Island Districts. A random, stratified, and purposeful sampling method was used to get information from 148 service users and smart city stakeholders. Analysis of data using SmartPLS 3.2 software and structural equation modeling indicated that the four TRI 2.0 model aspects, namely Innovativeness (5,669), Optimism (3,813), Discomfort (7,033), and Insecurity(7,096), all of these have significant effects on Smart Regency Readiness. This research provides a scientific contribution by adapting the TRI 2.0 model in Sub Urban in Indonesia, which is still rarely studied. This research makes a practical contribution by recommending that smart regency stakeholders pay close attention to important factors that affect how ready smart regency development is in underdeveloped countries, especially Indonesia.**

Keywords- technology readiness index, e-readiness, smart regency, e-government

I. INTRODUCTION

Smart Regency is a strategy aiming to improve ICT in Sub-Urban areas of Indonesia. This concept was inspired by the development of smart cities in Indonesia that have been adapted to rural areas[1]. This is because the reason Indonesia's territory is distributed out indicates that there are four times as many districts (415) as cities (93)[2]. As a result, research on smart regency development should be more intense than smart city development because cities and regencies are very different in terms of varying economic conditions, life, and policies, as well as economic, legal and geographical conditions, and job conditions challenges, solutions, and problems. environment[1]. The district's potential is four times greater than that of the city. However, according to the literature search, very few still explore smart regency readiness factors in e-Government and have come up with different ways to measure how ready a city is to become a smart ty. One of these models is called The Assessment of China's Readiness for Smart City Construction, Which uses e CRITIC-G1 Technique and the Bonferroni Integrator[3], An Integrated Conceptual Framework for Evaluating Small and Rural Municipalities' Readiness for Smart City Implementation[4], Malang City's Readiness for Smart Tourism Using a New Integrated E-Readine Model[5], Towards an integrated framework for assessing the readiness of cities to become smart: The instance of Iranian cities[6], Structural Equation Modeling of Smart City Readiness and Determining Factors[7],[8], Preparing for a paradigm shift in urban sustainability: a road plan for smart, sustainable cities[9], How Ready Is Malaysia for a Smart City? The Role of HCI and UX[10], Modeling the Preparedness of Smart Cities That use the Technology-Organization-Environment (TOE) Architecture and Its C sequences on Adaptation[11], Preparedness of smart cities based on the smart city council's preparedness framework[12] and Developing a model for continually assessing cities' readiness to adopt smart city technology[13].

However, researchers in the area of e-Government must contend with the absence of a reliable scientific conceptual framework for selecting the index selection procedure and the inability of the smart city preparedness assessment process to identify its strengths and limitations[3]. An even more challenge is that most stable-ready models are made for cities or large towns. Still, there aren't many models of readiness for rural and semi-urban areas[4], which are very common in places like Indonesia that are still developing.

This research aims to adopt a readiness model from the Technology Readiness Index 2.0 (TRI 2.0) to measure how ready Sub Urban areas in Indonesia are. The TRI 2.0

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framework was changed so that smart mobile-based applications could measure Sub Urban areas in the Sumenep and Pamekasan Regencies in East Java Province. This research provides a scientific contribution by adapting the TRI 2.0 model in Sub Urban in Indonesia, which is still very rarely sd. And make a practical contribution by recommending that smart regency stakeholders pay enough attention to important factors that affect the readiness of smart regency in developing countries, specifically Indonesia.

II. Literature Review

A. The Smart Regency Development in Indonesia

The idea of Smart Regency is to keep using ICT in Indonesian suburbs. Smart City is more well-known than Smart Regency. Smart Regency has been the subject of more than one study. One of them focused at just how user-centered behavioral due to continuing can be employed to measure user experience[14], MECUE implementation and adaptation for User Experience development[15], [16], community participation for smart people development[17], exploration of usability dimensions with SUS adaptation[18], The System for Managing Knowledge[19], Putting policies in place to promote tourism[20], various applications for smart city implementation in Blora[21], Public service on Smart Netizens[22], identification of critical factors with balance score card and fuzzy topsis[23], e-Service Quality analysis[24], holistic value and social dimension on citizen perspective[25], application of fuzzy mamdani for traffic[26], application of the concept of Smart Governance policy[27], exploration of success factors with TRUTAUT[28], Indonesians' Intention to Continue Using Mobile Apps[29], Service Maturity Levels to be Identified [30], Explore Smart Sustainable Adoption Factors[31], E-Service Quality Assesment[32], A Smart Village Model for Rural Communities[33], Community Readiness Measurement[34], Inclusive Development Through Smart Economy[35], Smart Tourism Destination Management[36], smart villages and the rise of tourism[37], synergic and simultaneous bureaucration reform[38], SOA-Based E-Government Integration[39], Smart Villages are being built to make smart cities and smart regencies stronger[40], and Information System Design for Smart MSMEs[41].

B. Technology Readiness Frameworks

Technologies readiness is a person's willingness to adopt and use new technology to help them achieve their objectives[42],[43]. In 2000, Parasuraman developed the TRI scale, a 36-item instrument with four dimensions. It measures "optimism, innovativeness, insecurity, and discomfort." An existing study using the earlier version of TRI 1.0 shows a link between how a person thinks about technology and whether or not they use a ICT model[44], [45]. The 36-item TRI 1.0 scale measures four dimensions: "optimism, innovativeness, discomfort, and insecurity." Optimism and inventiveness motivate technological preparedness, but discomfort and insecurity are considered inhibitors. Individuals may be confronted with either a motivator or a deterrent emotion towards technology[42]. Optimism is a favorable attitude towards technology; a belief in technology's ability to improve people's quality of life is a key component of this ideology.

The desire to be a trailblazer in adopting new technology is seen as an incentive for technological readiness. New technology can cause discomfort, which suggests an uneasy relationship with it. However, a lack of confidence in new technologies is reflected in insecurity. This may be due to worries about technology's accuracy and possible detrimental effects. In light of these stories, people differ in their willingness to embrace new technology. As a result, the technology readiness index may be linked to potential consumers' acceptance and use of e-health.

Since its inception, TRI has found widespread application in various sectors. Notable examples include self-serv areas[46]–[49]. Scholars have also brought together the "unified theory of technology acceptance and use" (TRI) and the TRI model (UTAUT)[50], [51]. Others adopted the TAM[44], [45]. When Chen et al. (2013) used the "expectation-confirmation paradigm for TRI, the results were consistent.[49]. In 2015, Parasuraman and Colby made TRI 2.0, a dated and simpler version of TRI 1.0. They did this because more people were using TRI 1.0, and people were worried about how many parts it had. As a result, the TRI 1as improved and simplified to become the new TRI 2.0, proving that technology degrades over time and new technological improvements emerge quickly[42]. The TRI 2.0 scale is restricted to academic and empirical studies because of recent technological advancements.

TABLE I. Instrument Of Variables And Indicators Of TRI 2.0 Framework[42]

No	Variables	Indicators	Symbols
1	Optimism	advancing technology improves the quality of living	OPT1
		Because of technological advancements, I can move around more freely	OPT2
		As a result of technological advancemen people now have more power and control over their daily lives.	OPT3
		Because of tech logy, I'm able to accomplish more in my personal life	OPT4
		Technology gives people the freedom to live and work wherever they choose.	OPT5
		I appreciate the technology that allows me to personalize my experience	OPT6
		Because of technological advancements, I can perform my job more quickly and effectively.	OPT7
		Because of the technological system, I am confident in its ability to carry out my instructions.	OPT8
		Using updated products and services with the latest technology is much easier.	OPT9
		To stay current on issues that interest me, I use technology	OPT9
		People's relationships are strengthened thanks to the internet and other forms of electronic communication.	OPT10
2	Innovative ness	Other people seek my guidance on the latest technological developments	INN1
		I'm usually one of the first in my friends to get their hands on the latest gadgets.	INN2
		New high-tech products and services normally don't require the support of others. For me	INN3

		The most recent technological advancements in the fields that fascinate me are always on my mind.	INN4
		High-tech gadgets excite me because of the challenge of solving them	INN5
		With technology, I have far fewer problems than most individuals	INN6
		I prefer to work with the most up-to-date technology	INN7
		I find new technology exciting because it challenges my brain abilities	INN8
		It can be as rewarding to learn about technology as it is to use it.	INN9
3	Discomfort	When I ask for technical support from a high-tech product or service provider, I sometimes feel like I'm being taken advantage of by someone who knows more than I do	DIS1
		I've come to believe that technology systems aren't meant to be used by the average person at all times.	DIS2
		High-tech products and services don't have user guides available in plain language.	DIS3
		It is embarrassing to encounter a problem with a high-tech gadget in front of others.	DIS4
		You can never be certain that the information you supply to a technology-based system will reach the intended recipient.	DIS5
		My pals appear to have a better grasp of the latest technology than I do	DIS6
		Because new technology isn't always dependable, it's necessary to exercise caution while trying to replace essential human functions with automated ones.	DIS7
		Doing business online is not something I trust	DIS8
		When technology fails, it always happens when you least expect it	DIS9
		People don't learn about new technology's potential health or safety hazards until they've already started using them.	DIS10
		As far as high-tech items and services are concerned, I prefer to get the most basic version rather than the most advanced one.	DIS11
		People in my social circle are looked up to more when they have the most up-to-date technology.	DIS12
4	Insecurity	Over-reliance on technology has resulted in a lack of self-reliance among many people.	INS1
		People have become overly reliant on technology to carry out their daily tasks.	INS2
		Because of the decrease in face-to-face time, technology harms human connections.	INS3
		A corporation I can only contact via the internet does not inspire confidence in me when doing business with them.	INS4
		I'm concerned that others could misuse the information I post online	INS5
		Doing business with a company means you need to get to know the people behind the brand.	INS6
		A human being is preferable to an automatic system when I call a firm	INS7
		Whenever a process is automated, it is imperative that any errors made by the system be identified and corrected.	INS8
		If you conduct a business transaction over the internet, you should follow up with a written confirmation.	INS9
		Thanks to new technology, governments and corporations have made it too easy to snoop on people.	INS10
		Personal information should not be transmitted via the Internet, in my opinion.	INS11

C. *Smart Regency Service in the Districts of Madura Island*

Using mobile-based infrastructures, such as the Pamekasan Smart and Sym applications, Madura Island has undergone several Smart Regency development projects. Research on the evolution of user interface and user experience to Webqual 4.0 is just one example of the many studies conducted on Madura Island's Smart Regency Facilities[52], Using Hien's Framework to test the quality of an information system[53], investigation of the excellence of e-service[24] and Adoption of smart regency apps for mobile devices with the TOE framework[54].

III. Methodology

The Technology Readiness Index version 2 (TRI 2.0) measures this quantitative, descriptive study. A TRI 2.0 model questionnaire with four variables and 42 measurement points was used to collect the data. The information was provided by a stratified random sample of 148 people from the regencies of Sumenep and Pamekasan who have used smart regency services. This research will focus on the smart regency mobile app as a case study evaluating government, public, and health service delivery in the digital age. Questionnaires can be distributed in various ways, including through online and offline surveys and one-on-one interviews. "1" means "far from one," "2" means "disagree," "3" means "not sure," and "4" means "agree." "5" means you agree on a lot. The data was then looked at with SmartPLS 3.2 software.

This analysis uses data collecting tests to describe and empirically test four research hypotheses. The study framework, which is based on the TRI 2.0 paradigm, demonstrates the following:

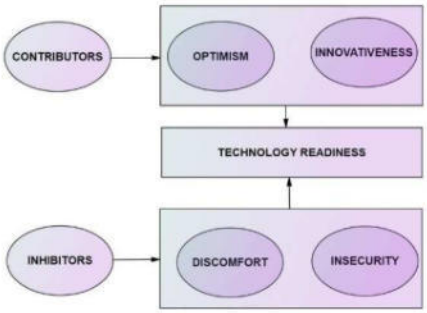

Fig. 1. Research Model based on the concept of TRI 2.0[42]

IV. Result and Discussion

A. Characteristics of The Population and The Sample

Demographic characteristics and samples show that 64.86 percent are male and 35.15 percent are female. 38.51 percent of respondents are aged 18-23 years, 31. Seventy-five percent are 24-29 years old, and 29.73 percent are over 30 years old. 32.43 percent of respondents work as Students and Teachers, 34.45 percent as businessmen, 13.51 percent as Government employees, 14.86 percent as Private employees, and the other 4.73 percent.

TABLE II. Demographics of Respondents

Factors		Frequency	Percentage
Gender	Male	96	64.86
	Female	52	35.13
Age	18-23	57	38.51
	24-29	47	31.75
	>30	44	29.73
Profession	Students and Teachers	48	32.43
	Businessman	51	34.45
	Government employees	20	13.51
	Private employees	22	14.86
	Etc	7	4.73

B. Model Reliability and Validity

SmartPLS 3.2 was used to create a measure with five observed 14nt constructs. According to the results of route analysis, the four aspects of TRI 2.0 are Innovativeness, Discomfort, Optimism, and Insecurity.

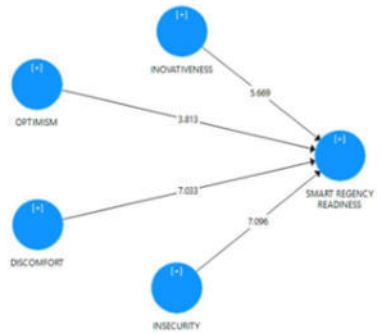

Fig. 2. Analysis result with SmartPLS 3.2

The internal consistency is determined by its CR and Cronbach Alpha values, which must be satisfactory. Each has a Cronbach Alpha score greater than 0.7, which indicates they are reliable. These findings are summarised in the following table:

TABLE III. Item Reliability Measurement

Construct	Rho_A	Cronbach Alpha	Composite Reliability	AVE
Innovativeness	0.893	0.867	0.918	0.490
Discomfort	0.909	0.904	0.894	0.484
Optimism	0.936	0.919	0.932	0.537
Insecurity	0.952	0.947	0.954	0.655
Smart Regency Readiness	0.883	0.881	0.918	0.737

A further consideration is the discriminant validity of the studied constructs, which is evaluated to establish how they are genuinely different from one another. When the extracted mean variance's square root is considered, these supported discriminant validity outcomes are revealed (AVE). The data show that the importance of each concept outweighs the association between them. The variable composite reliability scores demonstrated a higher level of convergent validity, ranging from 0.87 to 0.96. Each model construct's AVE values exceeded the 0.50 cutoff point.

TABLE IV. Discriminant Validity Value

	Discomfort	Innovativeness	Insecurity	Optimism	Smart Regency Readiness
Discomfort	0.696				
Innovativeness	0.884	0.700			
Insecurity	0.912	0.882	0.809		
Optimism	0.924	0.934	0.939	0.733	
Smart Regency Readiness	0.841	0.915	0.923	0.934	0.858

When applied to a comprehensive dataset, the findings of route analysis reveal that all TRI 2.0 dimensions have an impact on the readiness of Smart Regency Readiness, which supports all of the assumptions tested in this study, as given in table 5 below:

TABLE V. Relationships Between Constructs

Hypothesis	R2	Std error	T Value	P-Value	F2
Innovativeness→Smart Regency Readiness	0.373	0.066	5.669	0.000	0.382
Optimism→Smart Regency Readiness	0.440	0.116	3.813	0.000	0.441
Discomfort→Smart Regency Readiness	0.357	0.051	7.033	0.000	0.385
Insecurity→Smart Regency Readiness	0.507	0.071	7.096	0.000	0.500

In this investigation, the outcomes of the relationship hypothesis are presented in Table 5, which summaris5 the findings. This demonstrates that the entire construct has a highly significant positive effect on the outcome.

5

V. Conclusions and Recommendations

The research's purpose is to modify the model used during the creation of TRI 2.0 to evaluate the state of Smart Regency Readiness in Indonesia's exurbs. Smart Regency Readiness was found to be significantly affected across all four dimensions of the TRI 2.0 model: innovativeness (5.669), optimism (3.813), discomfort (7,033), and insecurity (1.689). (7,096). This research aims to determine whether or not the most up-to-date TRI 2.0 components are suitable for implementation in Smart Regency Readiness infrastructure in exurban settings. This is useful for studies of people's technological readiness. Other factors might have caused the studied correlations.

Accocherrding to these data, the government, and policymakers building smart regencies should pay more attention to the four pillars of the TRI 2.0 model to boost community happiness and involvement in using smart, sustainable district and sub-district services.

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