Integrating the Readiness and IS-Impact Constructs in the Rural Area Context: A Model Development

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Integrating the Readiness and IS-Impact Constructs in the Rural Area Context: A Model Development

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Abstract. The purpose of this research is to develop a new model by integrating the impact and readiness of the model that has been done before. The steps are taken a start from adopting, combining and adapting the previous model, namely by identifying the impact of ICT readiness in the countryside. The researchers developed the model based on the input-process-output logic and the processional and causal model of the IS impact models. This study has identified 9 variables and 45 indicators that have a relationship between impact and readiness. The findings of this study are the limited number of human resources who control ICT, the inequality of networks, the adequacy of institutional needs and the existence of budget support from authorized institutions and information systems that have not accommodated all service needs and have not been implemented in all villages. The conclusion of this study is combination model by integrating four preparedness model variables and five variables from the success model. In addition to the development process, clarity of coherent relationships between models, variables, indicators, and questions from each indicator are also presented in this study.

1. Introduction

The development of ICT is an important topic of interest, nowadays, we can see this from the research that has been carried out in academic journals and international conferences with the same theme. The development of ICT in Indonesia in 2018 has had an influence in almost all areas of life. The social, economic, political and cultural fields are the aspects that are most affected, both directly and indirectly. Electronic media such as mobile phones, the Internet, and social media applications such as Facebook, Twitter, Youtube, Whatsapp have become the necessities of daily living, this can be seen based on a survey conducted by APJII in 2017, namely 143.26 million internet users or 54.7% of Indonesia's population. However, if viewed from the viewpoint of Indonesia's diversity which stretches from Sabang to Merauke, the development of ICT infrastructure and content in Indonesia is still concentrated in urban areas. Only a small proportion is absorbed in the countryside. At a more practical level, the use of ICT is allegedly not able to answer the real problems of society. The use of ICT for example, has not yet had an impact on improving the welfare of the community [1]. The phenomenon of ICT in the midst of people's lives, from several pieces of literature, has been known to have played many roles in improving the quality of human civilization, especially in relation to life activities in the field of communication and information. Telephones, photographs, films, videos, radio, and television, may be examples of the form of ICT products that used to be so big in the daily lives of people. However, the appearance of these ICT products has become old-fashioned or old ICT when rapid and sophisticated technological developments have succeeded in realizing modern ICT products capable of carrying out a digital revolution through internet media [2]. ICTs have a major influence on rural development. The villages

that have been marginalized in ICT maps are now slowly becoming known globally. Digitizing ICTs supported by the development of cellular communication network infrastructure opens access to connectivity between villages and other communities. This condition is like answering Marshall McLuhan's predictions when introducing the idea of a global village (global village) half a century ago. The global village explains that there is no time limit or place. Information generated from ICT can also be referred to as Information Systems (SI), where information can move from one place to another in a very short time. The concept of a global village in context has actually occurred in the rural communities of Indonesia today as a result of SI [3]. SI is an integral part of the business. Therefore the SI strategic plan must be in accordance with the strategic plan of the village government office [4].

The success of SI is an important topic of interest, nowadays, we can see this from the research that has been carried out in academic journals and international conferences with the same theme. These findings suggest that methodological empirical studies are dominant, especially the notion of "success" represented by individual benefits, where the DeLone & McLean model as the basis [5, 6]. The research on combining the technology readiness model in the success model of information systems that has been done by previous researchers states that most IS models are developed by adopting, combining, and adapting previously, where the development of models is based on input-process-output logic and processional and causal models from the IS success model [7, 8]. Based on this, the researchers assumes that the constructs are interrelated between one another, and some constructs are combined with others. For example, the theory of technology readiness and acceptance of models [9-12]. Therefore, researchers assume that this phenomenon is interesting to study further, how to continue the study of the impact of IS readiness by developing a new model that was developed through stages of adoption, combination or adaptation of the existing IS models.

The purpose of this study is to explore further the effect of technological readiness on the construction of success of IS and develop a model of Information System Readiness Impact (ISRI) by adopting, combining, and adapting technological readiness [13] and the IS success model [14]. Based on the explanation above, two research questions were obtained, which were then proposed to guide the implementation of this exploration research, namely:

RQ1. How to explore the study of conditions for rural ICT readiness?

RQ2. How do you know the impact of readiness for the success of ICT in rural areas?

This research is divided into five parts, the first part explains the introduction of research. Then in the second part followed by a literature review, the third part is the research method, the fourth part is the result and discussion, and the fifth part is the conclusion.

Bouwman defines that ICT is a combination of telecommunications and computer technology [15]. ICT can be interpreted as Information System (SI), this was demonstrated by Xu in his research stating that how to support the integration of business processes and services within an organization [16]. Information Systems (IS) has a very important role and significantly influence the business world [17]. Therefore, IS can have a good impact that is beneficial to the owner, but they must be successful in implementing it [18, 19]. This proves that the success of IS is a challenge for users before getting the benefits of the system [16]. In his research, Irani stated that the success of the system must be thoroughly examined, this is done to ensure that the benefits of the system can be realized [6]. The impact of IS indirectly can be influenced by many factors, such as humans, organizations and the environment [17]. The relationship between readiness and the impact of IS success can be illustrated sequentially throughout a retrospective analysis of usability, satisfaction, readiness, acceptance, and success constructs, for example, a computer-based system [20]. In the case of system integration, IS can be successfully developed technically, even though it has not yet received optimal benefits. Therefore to find out the factors that influence integration is the initial stage of integration itself [21]. At present IS Integration has become the focus of many people and institutions, so that it is inevitable that integration is very important [22], in terms of function, autonomy, diversity, and business distribution problems between organizations [23]. But in reality, many organizations ignore aspects of internal readiness in developing their IS [13].

Model development can be done by adopting, combining, and adapting the previous IS model, this is the researchers' assumption based on indications that are consistent with the tendency of research on the IS model [8, 24-31].

2. Research Method

The researchers developed the model based on the input-process-output logic and the processional and causal model of the IS impact models. This model development study was performed throughout its four main stages. First, the preliminary study (S1) was conducted by reviewing retrospectively the behavioural, of the IS studies, e.g., the readiness, success, and the impact themes [5, 8, 32-34]. Second, was also performed to formulate the research programs. The stage was then followed by the modelling works in the second stage (S2). The developed model then was broke down into the research instrument level in the operationalization stage (S3). Finally the developed research model and its data collecting instrument were then proposed within the reporting stage, in terms of the research implementation (S4). In simplifying the path to research on the development of this model, in this study it was divided into several strategies. This strategy is carried out to facilitate the course of research, namely by dividing the four main stages of research, these four stages consist of S1, S2, S3, and S4. (See Figure 1).

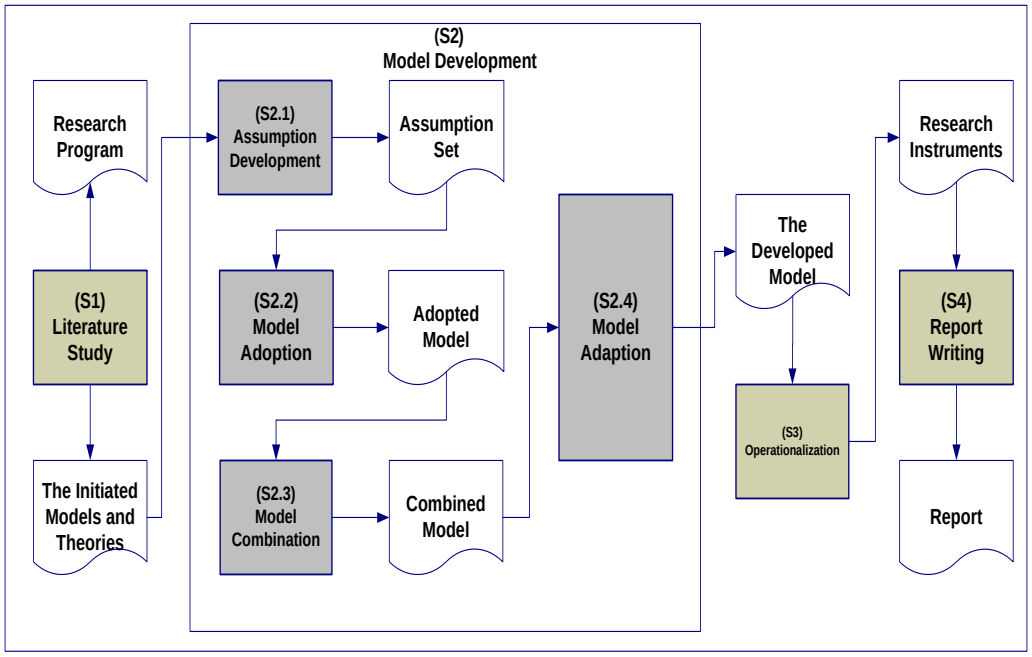

Figure 1. The Research Procedure [35]

The first strategy is represented by S1, which is a preliminary study, namely conducting studies by reviewing retrospectively by studying the themes of behavior, organization, and social IS, for example, usability, satisfaction, readiness, acceptance, and success [6, 7, 13, 17, 36]. This retrospective review of the literature was carried out in order to formulate a research program. The second strategy is represented by S2, which is to develop modeling. At the development stage this model is further divided into 4 sub-stages, starting from the first sub-stage which is represented by (S2.1) which is useful in developing assumptions based on the theory used, which is based on assumptions found in research on model readiness technology developed by Parasuraman and Colby [13], In addition to the readiness model technology, it also refers to the IS success model developed by DeLone and McLean [14], then the researcher adopts, merges, and adapts in the second sub-stage which is represented by (S2.2), combining is done in the third sub-stage represented by (S2.3), then the adaptation is done in the fourth sub-stage which is represented by (S2. 4). The third strategy represented by S3 is a transformation process from the sub-stage of model development to the operational stage, namely by using research instruments. The fourth or final strategy is represented by (S4), which is a research model that will be developed, in which there is a data collection instrument which is then proposed in the implementation of this research. (See Table 1).

Table 1. List of the basic models and theories

The Basic Models and Theories	References
Information processing theory	[8, 37]
IS success model	[8, 14, 17, 38-40]
Technology readiness Model	[13]
Processional and causal models of a model development	[6, 17, 41-43]

3. Result and Discussion

The ISRI model is the model proposed in this study, presented in Figure 2. The development of the ISRI model was inspired by the development of the model carried out by previous researchers [6], the following is a model development carried out by Anfara and Mertz [44] and Research conducted by Belout and Gauvreau [45], where the research indicates that most SI research models tend to be developed practically using previous models rather than based on empirical studies. In general, the model is developed through several stages, namely by adopting, combining, and adapting technological readiness [13] and IS model success [14] with the nine variables, namely, Optimism (OPT), Innovativeness (INV), Discomfort (DCF), Insecurity (ISC), Impact of Individuals (II), Organizational Impact (OI), Quality System (SQ), Information Quality (IQ), and Impact of System Integration Success (IS-Impact). The first four variables were adopted from the Technology Readiness Model [13] and others from the IS success model [6, 8, 14, 17].

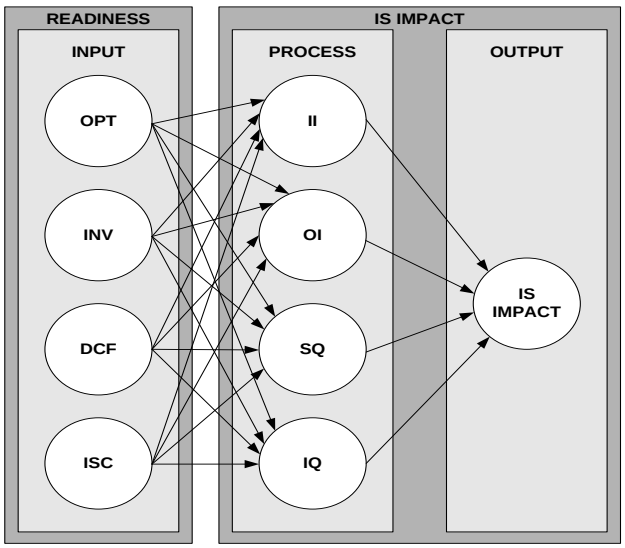

Figure 2. The proposed model ISRI

IS integration can be done with the Input, Process, Output (IPO Logic) [37, 41], this is based on research on model development that has been carried out by previous researchers [8, 18, 26, 28, 30]. Whereas in the context of the professional and causal dimensions of the model about the IS success model in the process and output on the dimensions of the IPO logic the researcher refers to the Delone and McLean models [14].

Viewed from a more detailed perspective, system development and system usage dimensions are assumed in one process, this is the life cycle of a product [43]. Here, an integrated system can be assumed as the output of the process. Whereas in professional and causal models of system integration,

researchers believe that system readiness is also one of the input factors [13, 46, 47]. In other words, technological readiness [13] and IS success [14] can be done through construction and then adopting, combining and adapting research into the development of the ISRI model to assess system readiness factors for the success of IS integration.

Referring to previous research [13, 46, 47] there are indications that IS implementation can be influenced by preparedness construction. While in the context of IPO logic towards IS integration, construction is assumed to be a dimension of logic input. Therefore, in terms of adoption and combination of technological readiness [13] and IS Success [14], hence the researcher assumes that each variable from the input dimension affects each variable from the output process. The dimensions of system creation will affect the use of a system, this is revealed by research on the success of the information system carried out by DeLone and McLean [14]. This assumption is similar to the research conducted by Jugdev and Muller [43]. Therefore researchers assume that every dimension in system development affects system variables. Referring to previous research [8, 14, 17, 37, 41] about developing professional and causal models, revealing the output dimension is influenced by the dimensions of the process. So the researcher hypothesizes that each variable from the process dimension will affect the output dimension variable. For further variables and indicators to be defined in the following table 2, table 3 and table 4.

Table 2. List of The Variables [13, 14, 40]

Variable	Definisi
OPT	Level to believe that IS might occur
INV	The level to see that IS is the advanced level of the system
DCF	The level of knowledge that IS is an uncomfortable thing
ISC	The degree of distrust that IS integration can be properly implemented and concerns about potentially dangerous consequences
II	The level of benefits received by the recipient IS because of the IS application
OI	The level of company benefits received by the organization due to the SI application
SQ	The desired level of characteristics of the IS application
IQ	The desired level of characteristics of the system output
ISI	The level of achievement of IS is based on the planning of its implementation

Table 3. List of the Indicators [13, 14, 28, 40]

Indicators	Definitions
Easiness (OPT1)	The level is related to the ability of information and communication technology in providing freedom from obstacles, difficulties, and problems
Connectivity (OPT2)	The level of the system's ability to connect successfully with other systems
Efficiency (OPT3)	The level associated with achieving the system to produce output compared to the resources needed to achieve output
Effectiveness (OPT4)	Levels related to the ability of the system to achieve its intended use
Productivity (OPT5)	The level associated with the support of the system to produce output compared to the resources needed to produce output
Problem Solving (INV1)	Levels related to system support to find solutions to problems
Independence (INV2)	The level associated with the system's ability to support its users is free of control or influence
Challenge (INV3)	The level associated with system support is to successfully deal with or achieve something in a difficult situation or problem
Stimulation (INV4)	Levels related to system support to encourage things to happen, develop, or improve
Competitiveness (INV5)	Levels related to system capabilities to support users to be more successful than their competitors

Indicators	Definitions
Complexity (DCF1)	The levels associated with system features are confusing or difficult to understand
Difficulty (DCF2)	Levels related to system conditions that cannot be operated easily
Dependence (DCF3)	The level associated with the condition of the system that requires another party to operate it
Lack of Support (DCF4)	Levels associated with systems that do not have, or are sufficient, from support in their operations
Inappropriateness (DCF5)	Level associated with inappropriate conditions
Failure (ISC1)	The level associated with the possibility that an unpleasant or dangerous system might occur
Threat (ISC2)	Levels related to system situations that can cause danger or threats
Reducing Interaction (ISC3)	The level associated with the implementation of the system makes human interaction less in size, number, and importance
Distraction (ISC4)	The level associated with using the system gets attention and prevents people from concentrating on something else
Incredulity (ISC5)	The level associated with the system is hesitant about its utilization
Learning (II1)	The level of effort is made to get something new
Awareness (II2)	The level of feeling knowing or remembering
Decision effectiveness (II3)	The level of decision making that produces decisions that can solve problems
Individual productivity (II4)	Levels related to Determine productivity and direct behavior
Organizational cost (OI1)	The level associated with the initial costs incurred to make the company
Staff requirements (OI2)	Levels related to job categories or job codes for parts of the day, day, or shift.
Cost reduction (OI3)	Levels related to processes used by companies to reduce costs and increase their profits.
Overall productivity(OI4)	The level of the overall ability to produce goods or services
Improved outcome (OI5)	The level of quality and cost target of health care organizations is trying to be improved
Easy of Learning (SQ1)	The level of activities or processes gets knowledge or skills by learning, practicing, being taught, or experiencing IS
Easy of use (SQ2)	The degree of freedom by IS from obstacles, difficulties, and problems during its use
Access (SQ3)	The level associated with obtaining, checking, or retrieving (data or files)
User requirements (SQ4)	The level of documents that are usually used in software engineering that determines what software users expect to do
System feature (SQ5)	Levels that are related to the typical nature of goods or services that distinguish them from similar items
Importance (IQ1)	The situation or fact becomes very important or valuable.
Availability (IQ2)	Quality can be used or obtained.
Usability (IQ3)	The extent to which something can or is suitable for use
Format (IQ4)	The way in which something is set
Content accuracy (IQ5)	The level of how data is collected and is usually assessed by comparing several measurements from the same or different sources
IS Efficiency (ISI1)	The level associated with the comparison of the value of the IS output and the resources needed to reach the output
IS Effectiveness (ISI2)	The level associated with the ability of the system's ability to meet the needs of users to achieve their goals
User satisfaction (ISI 3)	The extent to which IS helps users create value for their business

Indicators	Definitions
Productivity improvement (ISI4)	The level associated with system support is to increase output compared to the resources needed to produce output
Competitive Advantage (ISI5)	Levels associated with favorable positions of IS users are integrated to compete in business competitions

Table 4. List of the questionnaire statements

Variable	Statements of the questionnaires
OPT1	The system is free of obstacles, difficulties, and problems
OPT2	The system can be easily connected with other systems
OPT3	The system operates in minimal resources
OPT4	The system operates in maximum output
OPT5	The system can be operated efficiently and effectively
INV1	System is a problem-solving tool for users
INV2	System helps users to be free from control or influence
INV3	The system supports users to achieve goals in difficult situations or problems
INV4	The system encourages users to reach the destination
INV5	System supports users to be more successful than their competitors
DCF1	System confuses users in their operations
DCF2	The system cannot be operated easily
DCF3	The system cannot be operated freely
DCF4	The system is operated without full support operation
DCF5	The system is not in accordance with the development plan
ISC1	The system is not successfully operated in accordance with its development planning
ISC2	System in situations that can cause danger or danger
ISC3	The system makes users less in interaction
ISC4	The system makes users not focus on their interests
ISC5	This system is doubtful to use
II1	The level of effort is made to get something new
II2	The level of feeling knowing or remembering
II3	The level of decision making that produces decisions that can solve problems
II4	Levels related to Determine productivity and direct behavior
OI1	Initial costs incurred to make the company
OI2	Degrees related to job categories or job codes for parts of the day, day or shift.
OI3	Levels related to processes used by companies to reduce costs and increase their profits.
OI4	The level of the overall size of the ability to produce goods or services
OI5	The level of quality and cost targets of health care organizations is trying to be improved
SQ1	The level of activity or process of gaining knowledge or skills by learning, practicing, being taught, or experiencing IS
SQ2	The level of freedom by IS from obstacles, difficulties, and problems during its use
SQ3	Degrees related to obtaining, checking, or retrieving (data or files)

Variable	Statements of the questionnaires
SQ4	Levels of documents that are usually used in software engineering that determine what software users expect to do
SQ5	Degrees that have the characteristic of goods or services that distinguish them from similar items
IQ1	The situation or fact becomes very important or valuable.
IQ2	Quality can be used or obtained.
IQ3	The extent to which something can or is suitable for use
IQ4	The way in which something is set or set
IQ5	The level of how data is collected, and usually assessed by comparing several measurements from the same or different sources
ISI1	The level associated with the comparison of the value of the IS output and the resources needed to reach the output
ISI2	Levels related to the ability of the system's ability to meet the needs of users to achieve their goals
ISI3	The extent to which IS helps users create value for their business
ISI4	Levels related to system support to increase output compared to the resources needed to produce output
ISI5	Levels associated with favorable positions from integrated IS users to compete in a business competition

Regarding the research question mentioned earlier, the following description explain and respond to the two questions. First, the relationship between technological readiness and construction of IS success can be illustrated by the sequence in all retrospective analyzes of the usefulness, satisfaction, readiness, acceptance, and construction of the success of computer-based systems. For example, research conducted by Robey [20] illustrates that the user's psychological reactions and organizational factors contribute to the success of the system. While in terms of model development, Venkatesh and Davis [48] expand the theory of acceptance and usability by combining the two constructs in a combination model. On the other hand, research conducted by Lin, Shih, and Sher [10] has integrated technology readiness and construction acceptance in an integrated model. Similarly, adoption of system usage and user satisfaction factors can also be seen in the IS success model carried out by DeLone and McLean [14]. DeLone and McLean explain that technological readiness and construction of IS success are connected in the context of sequential influences. This is consistent with the indications of previous research [8, 24-31] which shows that adoption, combination, or adaptation of the previous model in social studies is the development of a general model, in terms of exploring new models.

Second, the ISRI model developed (Figure.2) is one of the developments of new models. Adoption, combination, and adaptation techniques of technological readiness [13] and the IS success model [14] applied by researchers based on the input-process-output (IPO) assumption [37, 41], as also presented by previous research [8, 18, 26, 28, 30]. In the context of the assessment of IS integration, the model developed was also broken down into several data collection instruments by adopting and adapting the context of the study. Based on this, it can be clearly seen that the development of the ISRI model proves the possibility of developing new models by combining, adopting, and adapting technological readiness [13] and success of IS [14]. Despite the fact that, the study of the development of an exploration model carried out by researchers in understanding themselves by adopting, combining, and adapting the two previous models [13, 14] based on selected assumptions (Table 1), this research can contribute theoretically by proposing an ISRI model. Practically, the transparency of the development of the proposed models and models and the data collection instruments may be useful for further research. In addition, the transparency of the model development process and the credibility of the basic model and the theory used can present the points of trust of the research [42]. On the other hand, the basic assumptions of developing models, research methods, and understanding of researchers may be a

limitation of this model development study. Differences in assumptions, methods, and understanding can produce different models. Thus, it is recommended that the limitations of this study be taken into consideration for further research.

4. Conclusion

This research shows how to understand the relationship between preparedness factors and the impact of successful use of IS and how to combine models of readiness and success in terms of information and communication technology. The researcher proposes a combination model by integrating four preparedness model variables and five variables from the success model. In addition to the development process, clarity of coherent relationships between models, variables, indicators, and questions from each indicator are also presented in this study. This study proposes and evaluates the measurement model for ICT use in rural areas. The focus of this research is on village ICTs in Indonesia. The findings from the model tests have shown that there is a.significant relationship between the five dimensions of IS success and that the scale developed for each factor is rational and supported by other studies

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