Integrating the Readiness and IS-Impact Constructs in the Rural Area Context: A Questionnaire Testing

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Abstract. The purpose of this study is to examine the model of readiness and success of Rural ICT that is integrated with assessing the impact of Rural ICT use in Indonesia. Based on Rural ICT user data collected through surveys obtained, structural equation modeling (SEM) and path analysis were used to test the research model. The sample consisted of Rural ICT users from a number of villages in Indonesia. The research sample was obtained by distributing questionnaires through WA Group and e-mail, there were 80% of respondents filling out questionnaires from various stakeholders, respondents stated readiness in using Rural ICT. The results revealed that optimism and innovation had a positive effect on the use of the system. The quality of the system and the quality of information quality were found to be the main factors driving the use of the system. In addition, this study tries to provide a review of the literature from the latest studies published in the field of Rural ICT.

Keywords: Assessment, IS model, Technology Readiness, IS-Impact, ICT Rural Area.

1 Introduction

The use of ICT is found in almost all fields and has an impact on the development of the world, therefore an assessment of ICT is needed and an important research topic [1]. ICT is widely recognized as an important source for socio-economic progress in developed and developing countries [2]. By definition ICT refers to technology that provides access to information through telecommunications, but focuses on communication technology, including the Internet, wireless networks, cellphones, and other communication media [3]. The word ICT and Information System (IS) can be exchanged in the context of showing how to support the services of an organization, in this case the village government in Indonesia [4]. Administrative management in rural areas is currently required to use information systems [5], several studies of information systems have noted that there has been an increase in demand for information systems relating to rural areas. [2, 5-7]. The rapid spread of mobile phones, the internet, and the use of IS have encouraged considerable investment, this is estimated to have contributed to the growth of the world economy [8]. However, on the other hand in particular at a more practical level that the information system is allegedly unable to solve problems that occur in rural communities, especially in improving the welfare of the community [9]. Therefore, further research is needed in the context of testing with questionnaires to stakeholders. Many IS survey

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studies previously used questionnaires adopted and adapted from previous works [10-15]. This relates to the question of whether the new instrument is suitable for this study. On the other hand, technological developments have developed since the beginning of the study [16]. In addition, instrument assessment still tends to be the only stage to evaluate whether the respondent has a problem responding to the questionnaire [17].

The use of statistical analysis in measuring this model is based on each indicator of each variable. The purpose of this questionnaire is to measure statistically from a model that has been previously made, with the hope that this research will enrich and provide input for future researchers who will test models of information systems in rural areas. Therefore, the following research questions will provide guidance on the conduct of this research:

T1. What are the effects of the readiness and success of Rural ICT?

T2. What are the results of the Rural ICT assessment in terms of readiness and success in changing existing variables and indicators?

Next in sequence, this paper explains the theoretical framework used in research. The next part is the implementation of the research methodology. Then proceed with a discussion of the results of research and discussion. While the conclusion is the end of this paper, which is the concluding section.

2 Research Method

The research method used consisted of a preliminary study (ie a review of the literature on the readiness and impact of the Information System, the development of the Information Systems model, and studies on the development of its instruments). Furthermore, sequentially starting from determining the research program, developing models from previous models, developing research models, developing instruments, applying research instruments, the process of collecting data, then analyzed according to needs, then the results of the analysis are interpreted and written as the results of the analysis and as a report. for more clearly can be seen in Figure 1. Then the model that has been made before (Figure 2), produces a questionnaire that must be evaluated.

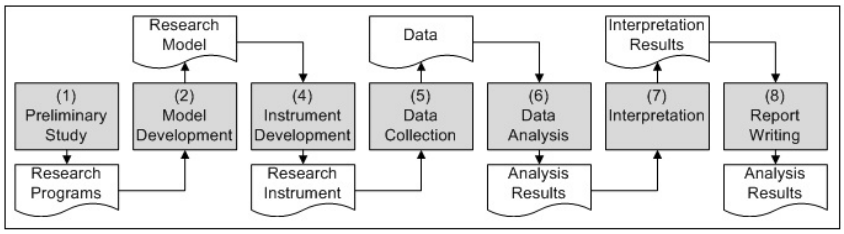

Figure 1. The Research Procedure [18]

This study measures the readiness model and impact of success with a questionnaire (Figure 2). Measurement of the model used is indirectly inspired by the measurement of models that many other researchers [15], such as the development of models carried out by Antara and Mertz [19, 20], viewed from the practical side that Information Systems research tends to be developed from previous models rather than based on empirical studies[21]. Therefore the measurement of the model in this study follows the previous researchers with the following stages, namely by adopting, combining, and adapting the previous model [22-24], The following

nine variables are used in this study, consisting of four readiness variables and five information system impact variables. First is Optimistic attitude (OPT), second is innovative attitude (INV), third is discomfort attitude (DCF), and fourth is Insecurity attitude (ISC), fifth is Individual Impact (II), sixth is Organizational Impact (OI), seventh is the Quality System (SQ), the eighth is Information Quality (IQ), and the ninth is the Impact of a successful Information System (IS-Impact). The first four variables are adopted from the Technology Readiness Model[22] and the other from the IS success model[12, 15, 23, 25, 26]. The results of the development of models that have been developed previously in the form of questionnaires derived from variables and indicators can be seen in the model (Figure 2) and (Tables 1and 2).

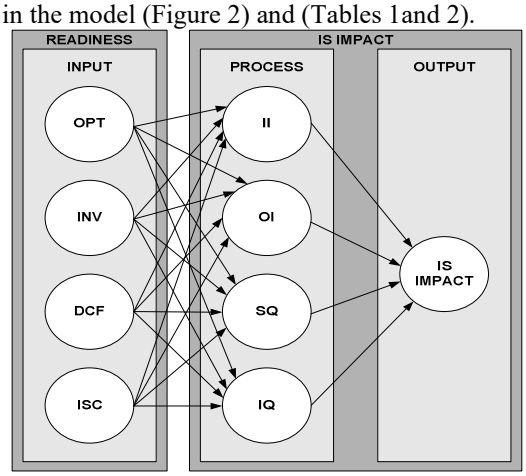

Figure 2. The Integrating the Readiness and IS-Impact Model [21]

The questionnaire was distributed as many as 80 copies online, which was distributed based on the respondents' profile experience. Questionnaires are distributed through WA Group and e-mail to fill in the questionnaire form that has been made. Then the researchers processed the data based on the incoming form using SmartPLS 2.0. then the PLS-SEM method is used in the analysis phase to determine indicators of reliability, internal consistency reliability, convergent validity, and discriminant validity assessment.

Table 1. List of the questions [21-23, 27, 28]

Code	Questionnaires
OPT1	This system is free from problems of use
OPT2	The system can communicate with other systems
OPT3	The system runs even at low specifications
OPT4	The system works to the maximum
OPT5	The system operates efficiently and effectively
INV1	The system can solve problems
INV2	The system can help users
INV3	The system supports users
INV4	The system helps users in achieving goals
INV5	The system supports users to be more successful
DCF1	The system confuses users
DCF2	The system is difficult to use
DCF3	The system is operated with limited
DCF4	The system is not fully supported

Code	Questionnaires
DCF5	The system is not according to plan
ISC1	The system is not in accordance with its development planning
ISC2	The system can cause danger
ISC3	The system interacts less
ISC4	The system out of focus
ISC5	The system is doubtful
II1	The system can produce something new
II2	The system can know or remember
II3	The system can produce decisions that can solve problems
II4	The system can determine productivity and behavior directly
OI1	The system requires an initial fee
OI2	The system consists of job categories
OI3	The system can reduce costs and increase their profits.
OI4	The system produces goods or services
OI5	The system can improve the quality and cost of health care organizations
SQ1	The system can increase activities or processes to gain knowledge or skills
SQ2	The system is free from obstacles, difficulties, and problems during its use
SQ3	The system can obtain, check, or retrieve (data or files)
SQ4	The system is used in determining the expectations software users do
SQ5	The system has the characteristics of goods or services
IQ1	The system can be an important or valuable fact.
IQ2	The system has qualities that can be used.
IQ3	The system is suitable for use
IQ4	The system can be arranged
IQ5	The system processes data from the same or different sources
ISI1	The system can compare IS results and resources
ISI2	The system has the ability to meet the needs of users in achieving their goals
ISI3	The system can help users in creating their business
ISI4	The system can support the increase in output compared to the resources needed
ISI5	An integrated system can benefit business competition

Table 2. List of variables and indicators [21]

Variables	Indicators
Optimism	Easy, connection, efficient, effective, productive.
Innovation	solving problems, being independent, accepting challenges, receiving stimulation, having competitiveness
Discomfort	Complex, have difficulty, dependence on the system, lack of support, less accurate
Insecurity	Failure can occur, there can be threats, reduce interaction, have disturbances, are doubtful
Individual Impact	Enhance learning, increase awareness, increase Decision Effectiveness, increase Individual Productivity
Organization Impact	increase organizational costs, raises staff requirements, reduce operational costs, increase productivity, better results
System Quality	Easy to learn, easy to use, easy to access, requires user requirements, complete system features
Information Quality	The Importance of Information, Availability of Information, Usefulness of Information, Format of Information, Accuracy of Information
Information System Impact	Efficient information systems, effective information systems, information systems that satisfy users, information systems that can increase productivity, information systems that can enhance competitive advantage

3 Result and Discussion

3.1 Demographic Information

The following table 3 will present the characteristics of respondents based on education, skill level, position, and experience in terms of IS-Impact Rural. While Table 4 below shows the characteristics of respondents based on readiness and IS-Impact in rural areas of Indonesia. These results are expected to provide recommendations for further researchers.

Table 3. Profile of questionnaire respondents

Measures	Items	%
Education	High School	75.4
	Diploma	1.6
	Bachelor	9.3
	Master	13.1
	Doctor	0.5
Position	Top Level Leader	1.6
	Middle Level Leader	4.9
	Staff	9.8
	Society	83.6

Table 4. Readiness and IS-Impact profiles

Measures	Items	%
Optimistic Status of readiness and IS-Impact Rural in Indonesia	free from obstacles	87
	easily connected to other systems	82
	operate in minimal resources	56
	operate at maximum results	82
	efficiently and effectively	91
Innovative Status of Rural Readiness and IS-Impact in Indonesia	problem-solving tool	87
	help users to be free	61
	support users to achieve goals	90
	achieve goals	83
	users success	85
Discomfort Status of Rural Readiness and IS-Impact in Indonesia	confuse users in their operations	84
	difficult to operate easily	90
	limited operation	86
	operated without full support	82
	accordance without planning	92
Insecurity Status of Rural Readiness and IS-Impact in Indonesia	not been successfully operated	83
	situations that can be danger	79
	make users less interacting	78
	makes users not focus	73
	doubtful to use	83
Individual Impact Status of Rural Readiness and IS-Impact in Indonesia	get something new	78
	feeling knowing or remembering	85
	decisions that can solve problems	90
	determining productivity	87
Organizational Impact Status of Rural Readiness and IS-Impact in Indonesia	Initial costs	46
	Degrees related to job categories	63
	reduce costs and increase profits	80
	services of ability	79
	quality and cost	87
System Quality Status of Rural Readiness and IS-Impact in Indonesia	level of activities or processes	66
	level of freedom from obstacles	75
	Degrees related data or files	68
	documents	85
	Degrees of characteristics	83

Measures	Items	%
Information Quality Status of	facts become very important	85
Rural Readiness and IS-Impact in	Quality can be used or obtained	63
Indonesia	suitable for use	72
	arranged or established	73
	level of how data is collected	82
Information System Impact	comparison of the value	75
Status of Rural Indonesia	level associated with the ability	87
	create value for business	86
	support is to increase output	86
	compete in business competition	79

Table 4 shows an overview of the characteristics of respondents in the readiness and IS-Impact questionnaire in rural areas of Indonesia. These results are expected to provide recommendations for further researchers.

3.2 Results of Statistical Analysis

The results of the statistical analysis consist of several stages, the first stage is evaluating the reflective measurement model and evaluating the structural model. Where the evaluation of this reflective measurement is the stage of evaluating the value of reliability of internal consistency using Composite Reliability (Table 4 and Table 6), the next step is evaluating the Reliability Indicator indicated by (Table 5), Convergence Validity is contained in (Table 7), while Discriminant Validity is shown in (Table 8). Structural Model Evaluation is the stage in determining whether a hypothesis can be based on the research model (Table 9), then assesses R2 which is an endogenous latent variable in the pathway model shown by (Table 10) and the last stage is the assessment of the contribution of exogenous constructs to the latent variable endogenous ones shown in (Table 11).

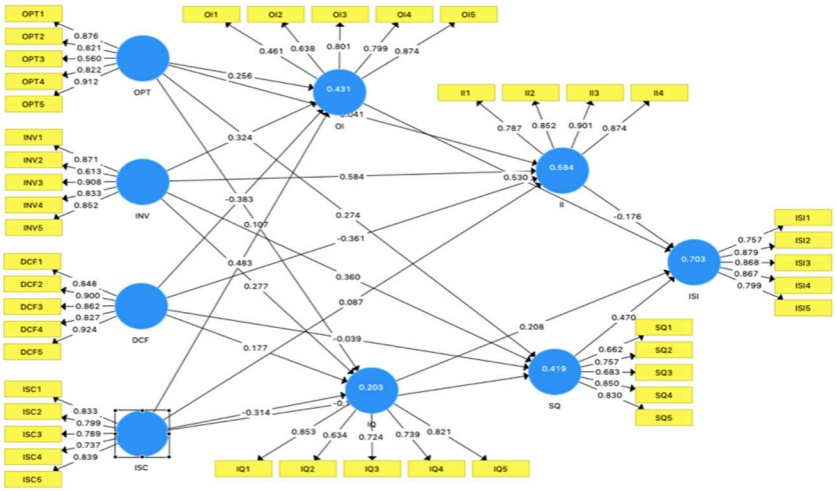

Figure 3. Research model Readiness and Impact (ISRI)

Table 5. Construct reliability and validity ISRI Model

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
DCF	0.922	0.927	0.941	0.762
II	0.876	0.884	0.915	0.730
INV	0.875	0.889	0.911	0.676
IQ	0.814	0.836	0.870	0.575

ISC	0.862	0.894	0.899	0.640
ISI	0.891	0.896	0.920	0.698
OI	0.770	0.821	0.845	0.533
OPT	0.859	0.878	0.902	0.652
SQ	0.816	0.830	0.871	0.578

Table 5 shows the composite reliability for all reflective constructions higher than 0.708, this shows that the reliability of internal consistency has a high value.

Table 6. Outer loadings ISRI Model

	DCF	II	INV	IQ	ISC	ISI	OI	OPT	SQ
DCF1	0.848								
DCF2	0.900								
DCF3	0.862								
DCF4	0.827								
DCF5	0.924								
II1		0.787							
II2		0.852							
II3		0.901							
II4		0.874							
INV1			0.871						
INV2			0.613						
INV3			0.908						
INV4			0.833						
INV5			0.852						
IQ1				0.853					
IQ2				0.634					
IQ3				0.724					
IQ4				0.739					
IQ5				0.821					
ISC1					0.833				
ISC2					0.799				
ISC3					0.789				
ISC4					0.737				
ISC5					0.839				
ISI1						0.757			
ISI2						0.879			
ISI3						0.868			
ISI4						0.867			
ISI5						0.799			
OI1							0.461		
OI2							0.638		
OI3							0.801		
OI4							0.799		
OI5							0.874		
OPT1								0.876	
OPT2								0.821	
OPT3								0.560	
OPT4								0.822	
OPT5								0.912	
SQ1									0.662
SQ2									0.757
SQ3									0.683
SQ4									0.850
SQ5									0.830

Table 6 shows that the IQ2, OI1, OI2, SQ1, and SQ3, OPT3 indicators have values below 0.708, so the five indicators in this model need to be analyzed in relation to the deletion effect on the indicators found on AVE and the composite reliability shown by (Table 5). Therefore, if the release can increase the measurement, the reflective indicator needs to be removed from the

model, but if elimination cannot increase the measurement, then the reflective indicator needs to be maintained because it matches the criteria.

Table 7. Composite reliability from ISRI Models

Composite Reliability	Full Model	Model Revision (Deletion Indicator IQ2, OI1, OI2, SQ1, and SQ3, OPT3, INV2)
DCF	0.941	0.761
II	0.915	0.731
INV	0.911	0.773
IQ	0.870	0.648
ISC	0.899	0.639
ISI	0.920	0.698
OI	0.845	0.740
OPT	0.902	0.761
SQ	0.871	0.730

Table 8. Convergent validity from ISRI Models

AVE	Full Model	Model Revision (Deletion Indicator IQ2, OI1, OI2, SQ1, and SQ3, OPT3, INV2)
DCF	0.762	0.684
II	0.730	0.908
INV	0.676	0.687
IQ	0.575	0.737
ISC	0.640	0.766
ISI	0.698	0.761
OI	0.533	0.753
OPT	0.652	0.740
SQ	0.578	0.817

Table 7 shows that the removal of IQ2, OI1, OI2, SQ1, and SQ3, OPT3, INV2 indicators shows an increase in the value of composite reliability. Because the AVE value on all variables shows a number higher than 0.5, it can be concluded that the convergent validity can be confirmed. While Table 8 shows that all external indicators contain higher construction values compared to other construction values, this explains that the discriminant validity can be confirmed [39].

Table 9 shows that a hypothesis is based on a research model. Therefore, in assessing the significance of the path coefficient and the 5% significance level, one-way testing is used, so that the significance level is 1.64.

Table 10 shows the R2 values which are the endogenous constructs of each variable, namely Optimism and Innovation, each of which is substantial. While the endogenous construct of the Efficiency and Discomfort variable shows a weak value. While the endogenous construct of Organizational Impacts, Satisfaction has a moderate value. Meanwhile Table 11 shows all the contributions of exogenous constructs to their endogenous latent variables [39].

Table 9. Cross loadings of ISRI Model revision

DCF1	0.854	-0.450	-0.337	-0.092	0.378	-0.571	-0.464	-0.503	-0.452
DCF2	0.901	-0.396	-0.178	-0.103	0.646	-0.310	-0.177	-0.280	-0.337
DCF3	0.862	-0.459	-0.326	-0.122	0.497	-0.396	-0.251	-0.338	-0.335
DCF4	0.819	-0.426	-0.265	-0.266	0.558	-0.400	-0.158	-0.417	-0.256
DCF5	0.923	-0.439	-0.274	-0.126	0.688	-0.354	-0.174	-0.430	-0.311
II1	-0.418	0.791	0.492	0.499	-0.231	0.508	0.599	0.416	0.439
II2	-0.421	0.855	0.568	0.317	-0.276	0.494	0.585	0.489	0.402
II3	-0.418	0.899	0.600	0.332	-0.222	0.446	0.631	0.494	0.494
II4	-0.451	0.870	0.657	0.466	-0.267	0.594	0.667	0.444	0.559
INV1	-0.233	0.599	0.878	0.367	-0.218	0.510	0.412	0.491	0.487
INV3	-0.325	0.604	0.925	0.215	-0.224	0.462	0.433	0.568	0.453
INV4	-0.365	0.613	0.842	0.346	-0.291	0.394	0.318	0.494	0.434
INV5	-0.222	0.581	0.868	0.316	-0.133	0.525	0.446	0.457	0.532
IQ1	0.021	0.397	0.343	0.831	-0.054	0.605	0.413	0.110	0.446
IQ3	-0.289	0.262	0.155	0.768	-0.440	0.420	0.056	0.315	0.332
IQ4	-0.173	0.323	0.153	0.792	-0.365	0.275	0.050	0.276	0.266
IQ5	-0.112	0.501	0.420	0.827	-0.172	0.578	0.410	0.280	0.600
ISC1	0.691	-0.333	-0.222	-0.276	0.841	-0.349	-0.019	-0.401	-0.409
ISC2	0.486	-0.103	-0.179	-0.247	0.799	-0.164	0.094	-0.156	-0.155
ISC3	0.355	-0.133	-0.117	-0.175	0.785	-0.115	0.114	-0.080	-0.211
ISC4	0.238	-0.137	-0.084	-0.244	0.729	-0.100	0.111	0.036	-0.215
ISC5	0.568	-0.345	-0.320	-0.218	0.838	-0.177	0.038	-0.456	-0.234
ISI1	-0.380	0.411	0.489	0.305	-0.229	0.761	0.466	0.414	0.614
ISI2	-0.355	0.548	0.469	0.652	-0.195	0.875	0.556	0.371	0.521
ISI3	-0.512	0.621	0.509	0.438	-0.193	0.871	0.677	0.486	0.632
ISI4	-0.437	0.421	0.430	0.457	-0.197	0.872	0.502	0.480	0.624
ISI5	-0.306	0.493	0.359	0.685	-0.236	0.790	0.465	0.303	0.552
OI3	-0.261	0.569	0.397	0.224	0.101	0.565	0.828	0.318	0.275
OI4	-0.250	0.550	0.235	0.197	0.063	0.488	0.854	0.388	0.260
OI5	-0.258	0.742	0.521	0.392	0.014	0.594	0.898	0.469	0.272
OPT1	-0.365	0.502	0.414	0.425	-0.286	0.372	0.385	0.894	0.352
OPT2	-0.453	0.487	0.485	0.266	-0.393	0.288	0.268	0.844	0.303
OPT4	-0.299	0.432	0.514	0.117	-0.176	0.482	0.535	0.830	0.432
OPT5	-0.496	0.462	0.582	0.226	-0.245	0.559	0.388	0.917	0.479
SQ2	-0.326	0.435	0.564	0.239	-0.234	0.618	0.284	0.478	0.870
SQ4	-0.129	0.444	0.349	0.626	-0.258	0.480	0.172	0.287	0.818
SQ5	-0.501	0.545	0.453	0.560	-0.349	0.676	0.320	0.371	0.875

Table 10. Assessment of the significance of path coefficients on the ISRI Model

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Results
DCF -> II	-0.361	0.059	0.224	0.281	0.779	Insignificant
DCF -> IQ	-0.232	-0.230	0.188	1.237	0.216	Insignificant
DCF -> OI	-0.407	-0.401	0.165	2.471	0.014	Significant
DCF -> SQ	-0.305	-0.307	0.198	1.538	0.125	Insignificant
II -> ISI	-0.131	-0.141	0.187	0.702	0.483	Insignificant
INV -> II	-0.123	-0.120	0.168	0.730	0.466	Insignificant
INV -> IQ	0.147	0.153	0.122	1.201	0.230	Insignificant
INV -> OI	0.349	0.365	0.134	2.603	0.010	Significant
INV -> SQ	0.269	0.259	0.152	1.769	0.077	Significant
IQ -> ISI	0.194	0.200	0.129	1.497	0.135	Insignificant
ISC -> II	0.275	0.270	0.136	2.021	0.044	Significant
ISC -> IQ	0.228	0.231	0.150	1.518	0.130	Insignificant
ISC -> OI	0.257	0.281	0.118	2.169	0.031	Significant
ISC -> SQ	-0.230	-0.207	0.193	1.053	0.293	Insignificant
OI -> ISI	-0.051	-0.068	0.190	0.266	0.790	Insignificant

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Results
OPT -> II	-0.034	-0.033	0.188	0.182	0.856	Insignificant
OPT -> IQ	-0.108	-0.110	0.185	0.582	0.561	Insignificant
OPT -> OI	-0.154	-0.162	0.193	0.796	0.426	Insignificant
OPT -> SQ	-0.140	-0.147	0.144	0.971	0.332	Insignificant
SQ -> ISI	0.129	0.109	0.144	0.895	0.371	Insignificant

Table 11. R Square

	R Square	R Square Adjusted
II	0.563	0.510
IQ	0.193	0.095
ISI	0.744	0.713
OI	0.394	0.321
SQ	0.366	0.289

Table 12. F- Square

	DCF	II	INV	IQ	ISC	ISI	OI	OPT	SQ
DCF		0.128		0.019			0.112		0.018
II						0.055			
INV		0.435		0.056			0.103		0.169
IQ						0.172			
ISC		0.007		0.066			0.199		0.010
ISI									
OI						0.536			
OPT		0.016		0.014			0.064		0.014
SQ						0.584			

4 Conclussion

The conclusion of this research is to measure the model with a questionnaire in conducting statistical analysis through the values of validity and reliability that are used as a reference in revising the model that was built before going through the stages of integration and adoption of several previous models. The results of this study did not change the model and questionnaire, this was caused by the validity and reliability values that were in accordance with the criteria. However, this can be used as a reference for further researchers who are interested in developing and measuring it further.

Therefore greater attention is needed in relation to the sample used, bearing in mind that the sample used in this study is only in rural areas of Indonesia, so it would be better for other researchers to try to apply the measurement model that was constructed including various questionnaires.

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