Developing Agile ICT Project Model using Input-Process-Output Logic

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Abstract. Competition in the industrial world to retain consumers and win competitions are important for business needs. This change in business needs has caused many ICT projects to be cancelled or failed to be implemented. The use of agile principles is expected to change things, accelerate development time and produce good quality. The ability to respond change the implementation of a project will be a factor that needs to be calculated to minimise project failure. The researcher developed a new model by adopting, combining and adapting from the previous model and applying based on input-process-output logic. This study aims to understand the application of agile in the Information Communication and Technology project in Indonesia and develop a research model that represents the phenomenon mentioned above. The proposed research model can help the research process, which is useful for guiding the model and development of research instruments.

Keywords: agile, project management, IS model, ICT, IPO

1 Introduction

Rapid changes that occur in the business environment and are unpredictable as well as, customers demand continuous innovation, resulting in higher experimental costs that signify significant changes from anticipatory to adaptive development styles. Companies will try to develop in turbulent economic conditions so that they must change their processes and perspectives on changes in scope, features, architecture, technology that occur in a relatively short time. Agility is the ability to respond to changes in a turbulent business environment. [1].

Global IT development is becoming increasingly dominant. Even so, most IS projects are not satisfied - many IS projects fail [2]. There are around 60% of IS projects having problems with costs and time [3].

Modern project management approaches have evident useful in the world of new economics, with characteristics of project situations that are more complex and full of uncertainty [4]. Agile project management (APM) is a topic that often arises as a way of managing new projects [4].

This study aims to explore the advanced influence of agility on the model of project success in the context of using input-process-output logic.

Q1: How to understand the correlation between agility and project success model in Information and Communication Technology Project

Q2: How to adoption and combine agility model and project success model in the circumstances of the Information and Communication Technology Project

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This study divided into five sections. The first one elucidates the research program of study. In the second part describes the literature review of related works and the basic theoretical framework used in this study. Then followed by methodological parts of the implementation of the research in the third step. The results section and research discussion are discussed in step four.. The fifth step, this paper is then concluded by the conclusion section in the fifth step.

For project development, Xu, Zhang, and Barkhi [5] illustrate that ICT is also used alternately with information technology (IT) or information system (IS) development projects, related to the development of business processes and services in an organization.

2 Literature Review

Projects and project management are becoming increasingly complex because the business environment is more complex and faster changing [4]. The main problems in project management are planning, project implementation, excess costs and time, and non-achievement quality. To ensure the achievement of expected performance, project managers need to get a better understanding of the meaning of project success and the element that assist to the success of the project [4].

APM is a very iterative and gradual process, where stakeholders and developers work together closely to understand domains, determine requirements, and prioritize functions [6].

Processional and Causal Models The IS D & M model has become the dominant basis for the measurement of IS success over the past two decades [7]. Adoption of processions and models because using IPO logic, carried out by several researchers [7, 8].

3 Research Method

The development of this model will be implemented throughout Indonesia by using four steps (Figure 1). First, the preliminary study was carried out by retrospectively reviewing behaviour, organizational themes, and social studies of the Project success. There are two things done after conducting a preliminary study, namely making a model initialization and formulating a research program. The second stage is developing the model. This model development was started by developing an assumption set based on the initiated and selected theories. The third stage is operationalization that consist defines variable, define indicator, and development questionary. In the final stage, the research model that has been developed and the data collection instruments that have been determined are then proposed in the reporting phase of the research implementation.

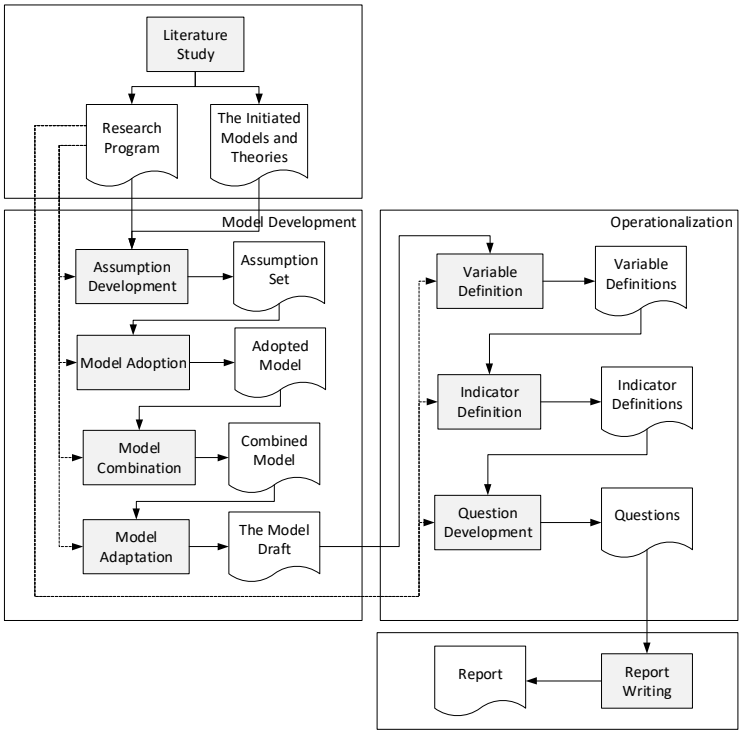

Figure 1. The research procedure

Based on previous research [9-12] based on logic input-process-output [13] [14] in the development of research models.

Table 1. List of the model and theories

Model and Theories	References
IS Success Model	[7] [15]
Project Success Model	[16] [17] [18]
Agility Model	[19]
Procession and causal of model development	[15] [17]

4 Result And Discussion

The model adopted by Subiyakto [11] project model. Figure 2. shows the proposed model with nine variables and twenty-eight relational hypotheses.

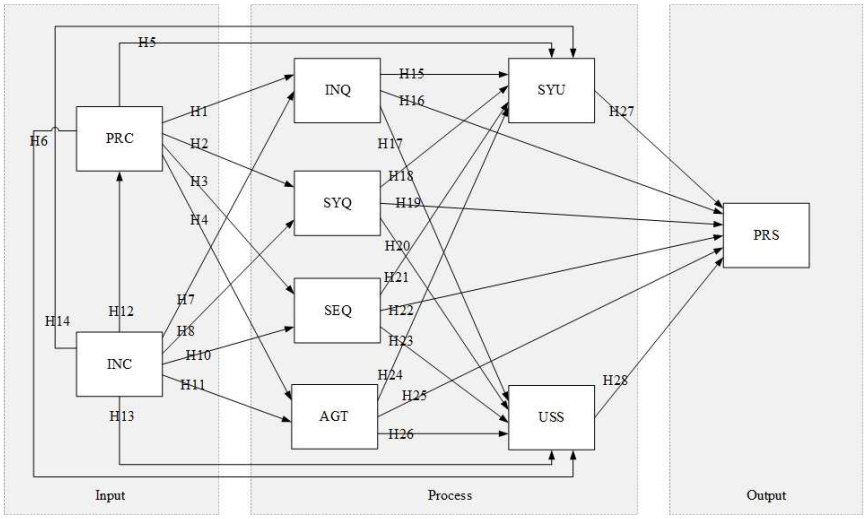

Figure 2. The model proposed for the Agile ICT Project

The development of the Agile ICT Project Model was inspired by adopting, combining, and adapting Project Success [11] and Agility models [19] with nine variables, Project Content (PRC), Institutional Culture (INC), Information Quality (INQ), Quality Systems (SYQ), Service Quality (SEQ), System Usage (SYU), User Satisfaction (USS), Agility (AGT), and Project Success (PRS)

Table 2. List of Variables [11, 19]

Var	Definitions
PRC	Linkages to project content
INC	Linkages to institutional culture
INQ	Linkages to information quality
SYQ	Linkages to system quality
SEQ	Linkages to service quality
SYU	Linkages to system use
USS	Linkages to user satisfaction
PRS	Linkages to project success
AGT	Linkages to agility

Table 3. List of Indicators and Definitions [11, 19]

Indicators	Definitions
Project Size (PRC1)	Associations with project size
Project Complexity (PRC2)	Relation to project complexity
Cost Availability (PRC3)	Relation to the availability of costs for the project
Human Resources availability (PRC4)	Linkages to the availability of human resources for the project

Indicators	Definitions
Clarity of the Project Management Structure (PRC5)	Linkages with Clarity of Project Management Structure
Institutional Culture (INC1)	Relation to culture in the institution
Institutional Police (INC2)	Linkages with policies at the institution
Institutional Project Experience (INC3)	Linkages to institutional experience in implementing a project
System Existence (INC4)	Linkages to system availability needed
Infrastructure Availability (INC5)	Linkages with available infrastructure
External Environment (INC6)	Linkages with external environmental factors
Accuracy (INQ1)	Relation to the accuracy of information quality
Timelines (INQ2)	Linkages with the timeliness of information quality
Completeness (INQ3)	Relation to the completeness of the quality of information
Consistency (INQ4)	Relation to the consistent quality of information
Relevance (INQ5)	Linkages with good quality information, directly connected with and important for something else
Easy of Use (SYQ1)	Linkages with ease in using system quality
Maintainability (SYQ2)	Maintenance linkages in using system quality
Response Time (SYQ3)	Linkage of response time in the use of system quality
Functionality (SYQ4)	Linkage of functionality in the use of system quality
Safety (SYQ5)	The relationship of safety in the use of system quality
Responsiveness (SEQ1)	Linkage of response to service quality
Flexibility (SEQ2)	Linkage of flexibility to service quality
Security (SEQ3)	Security linkages to service quality
Functionality (SEQ4)	Linkage of functionality to service quality
Extension (SEQ5)	Linkage extension to service quality
Data Processing Use (SYU1)	Linkage of data processing usage in system usage
Data Storage Use (SYU2)	Linkage of data storage usage in system usage
Data Communication Use (SYU3)	Linkages to the use of data communication in system usage
Intensity of Use	Linkage of the intensity of use in system usage

Indicators	Definitions
(SYU4)	
Extent of Use	Linkage of time usage level to system usage
(SYU5)	
Efficiency	Efficiency linkages to user satisfaction
(USS1)	
Effectiveness	Effective linkages to user satisfaction
(USS2)	
Flexibility	Flexible connection to user satisfaction
(USS3)	
Overall satisfaction	Overall satisfaction with user satisfaction
(USS4)	
Project Efficiency	Project efficiency linkages to project success
(PRS1)	
Project Effectiveness	Project effective linkages to project success
(PRS2)	
User Satisfaction	Linking user satisfaction to project success
(PRS3)	
Productivity Improvement	The linkage of increased productivity to project
(PRS4)	success
Competitive Advantage	Linkage of competitive advantage to project
(PRS5)	success
Organizational culture	Linkage of organizational culture to agility
(AGT1)	
Empowerment project team	Linking the empowerment of the project team to
(AGT2)	agility
Communication team	The relationship of team communication to agility
(AGT3)	
Collaboration team	Linkage of team collaboration to agility
(AGT4)	
Cohesiveness team	Linkage of team integration to agility
(AGT5)	

Table 4. List of the questionnaire statements

Indicators	Statement of Questionnaires
PRC1	Project content is related to project size
PRC2	Project content is related to project complexity
PRC3	Project content is related to the availability of costs
PRC4	Project content is related to the availability of human resources
PRC5	Project content is related to the clarity of project management structure
INC1	The institutional context is related to institutional culture
INC2	The institutional context is related to institutional policy
INC3	The institutional context is related to institutional project experience
INC4	The institutional context is related to the current system conditions
INC5	The institutional context is related to external factors
INQ1	The quality of information is produced accurately
INQ2	The quality of information is produced according to the right time
INQ3	The quality of information is complete
INQ4	The quality of information is produced consistently
INQ5	The quality of information is generated by relevance
SYQ1	Easy to use quality system
SYQ2	System quality that is easy to maintain

Indicators	Statement of Questionnaires
SYQ3	Quality system that is easily responded to
SYQ4	System quality is easy in functionality
SYQ5	The quality of the system is safe to use
SEQ1	Quality of service related to the speed of response
SEQ2	Quality of service with the ability to adapt to existing changes
SEQ3	Quality of service is safe against unexpected attacks
SEQ4	Quality of service according to functional requirements
SEQ5	Quality of service that can provide additional goals
SYU1	Use of systems related to data usage
SYU2	Use of the system related to data storage needs
SYU3	Use of systems related to the use of data communication
SYU4	Use of systems with data distribution needs
SYU5	Use of the system with the time used
USS1	Users are satisfied with system efficiency
USS2	Satisfied users are related to system effectiveness
USS3	Satisfied users are associated with flexibility
USS4	Users are satisfied with overall satisfaction
PRS1	Project success due to project efficiency
PRS2	The project is successful because of the effectiveness of the project
PRS3	Project success because of user satisfaction
PRS4	Project success because of increased productivity
PRS5	Project success because of competitive advantage
AGT1	Agility is influenced by organizational culture
AGT2	Agility is influenced by project empowerment
AGT3	Agility is influenced by team communication
AGT4	Agility is influenced by team collaboration
AGT5	Agility is influenced by team cohesiveness

Related to the research questions mentioned above, the following description explains the two questions.

First, the relationship between agility and project success can be illustrated sequentially throughout a retrospective analysis of quality of information, institutional culture, quality of system, quality of service, agility, user satisfaction, utilize of system and the construct of project success.

Second, the Agility ICT Project model developed (Figure 2) is one of the developments of new models. Adoption, combination, and adaptation techniques of agility [19] and Project success [11] models are implemented by researchers based on input-process-output (IPO) [] assumptions, as also presented by previous studies [7, 8]. In the context of input-process-output logic, the model developed has also been broken down into the instrument of data collection by adopting and adapting the study context.

In summary, it can be seen that the Project Agility ICT model was developed to prove the possibility of developing new models by combining, adopting, and adapting agility [19] and project success [11]. The basic assumptions of model development, research methods, and the author's understanding may be the limitations of model development studies. Differences in assumptions, methods, and understanding can produce different models. Thus, it is recommended that the limitations of the study be taken into consideration by subsequent studies.

5 Conclusion

This successful project has become an exciting issue for practitioners and researchers for decades. This prompted researchers to develop the Agile IT Project Model by adopting, combining, and adapting the model of project success and agility. The authors use the IPO logic and procession and causal models of the IS success model as the assumption of model development. The proposed model consists of nine variables with 28 indicators. This study has also offered 44 question items for the development of the next questionnaire.

Apart from several things that have been mentioned before, the assumptions used from the development of the model, research methods, and understanding of the author can be the limitations of the study. Other studies that use different assumptions, methods, and understandings can present different propositions. In addition, limitations can help for further study, specifically the correctness of the proposed model. Also, the transparency from the model development process and the beliefs of the basic model and theory used can also be well-thought-of as a model of trust points.

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