A THESIS

The Effects of Technical Complexity and Task Interdependence on Successful Information Systems Implementation

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Abstract

Shadily Darma Saputra (2007). An investigation of The Effect of Technical Complexity, and Task Interdependence on Successful information systems implementation. Yogyakarta, International Program, Department of Accounting, University Islam Indonesia.

This research aims to search for the effect of technical complexity and task interdependence on successful information system implementation. This paper tries to define the main factor that influences the successful information system and the factor that increasing the successful information system implementation. Technology information is technical information that includes technical knowledge that can be optimized by systematical writing or patent.

This study takes the data from the Government offices that have a good position and good performance in terms of information system users. BAPPEDA (Badan Perencanaan Pembangunan Daerah) office Yogyakarta. The data is primary data that is collected from the questionnaire for the information system users each of office.

The main result of this research is an Independent Variable (TI) has a positive significant influence to the dependent variable (IS). The result of research in this paper is not too different from the previous research. But for another Independent Variable result (TC) is not significant influence to the dependent variable (IS), this result inconsistent with the previous research.

Keyword: IS implementation, task interdependence, technical complexity, IS success

Abstraksi

Shadily Darma Saputra (2007). An investigation of The Effect of Technical Complexity, and Task Interdependence on Successful information systems implementation. Yogyakarta, International Program, Department of Accounting, University Islam Indonesia.

Penelitian ini bertujuan untuk menemukan pengaruh kesulitan dan tugas yang saling berkaitan terhadap kesuksesan penggunaan system informasi. penelitian ini juga mencoba untuk mencari faktor utama yang mempengaruhi kesuksesan penggunaan sistem informasi dan faktor apa saja yang dapat meningkatkan kesuksesan penggunaan sistem informasi. Informasi teknologi adalah informasi teknik yang meliputi pengetahuan teknis yang dapat dioptimalkan oleh hak paten atau penulisan sistematik.

Studi ini mengambil data dari kantor pemerintahan yang memiliki posisi baik dan pencapaian yang baik dalam hal penggunaan system informasi. Pertama, Badan Perencanaan Pembangunan Daerah, Yogyakarta. Data yang di dapat adalah data primer yang mengumpulkan dengan daftar pertanyaan untuk para pengguna sistem informasi di setiap kantor.

Hasil dari penelitian ini menggambarkan variabel bebas (TI) mempunyai pengaruh positif yang significant terhadap variabel tidak bebas (IS). Hasil dari riset ini tidak jauh berbeda dengan riset sebelumnya. Tetapi untuk hasil variabel bebas yang lain (TC) tidak memiliki pengaruh yang siknifikan terhadap variable tidak bebas (IS), hasil ini tidak sesuai dengan penelitian sebelumnya.

Kata Kunci: Penggunaan IS, Tugas yg saling bergantungan, Teknik Kesulitan, Kesuksesan IS

CHAPTER I

INTRODUCTION

1.1 Background of Study

Nowadays, information system is very important to do some business. Most companies use information technology to support daily activity, because of that implementing information system is a primary necessity for the company. In information systems, an information system consists of three components: human, technology, organization. In this view, information defined in terms of the three levels of semiotics. Data that can be automatically process by the application system corresponds to the syntax-level. In the context of an individual, who interprets the data, this system becomes information, which corresponds to the semantic-level. Information becomes knowledge when an individual knows (understands) and evaluates the information. This corresponds to the pragmatic-level. In general, systems theory, an information system is a system, automated or manual, that comprises people, machines, and methods organized to collect, process, transmit, and disseminate data that represent user information. In rough set theory, an information system is an attribute-value system. In telecommunications, an information system is any telecommunications and computer related equipment or interconnected system or sub systems of equipment that is used in the acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of voice and data, and includes software, firmware, and hardware (Wegner et al. 1985)

To use a newest technology in information system, the institution should understanding about technical complexity and task interdependence first. Both of

them mean that the institution should give the knowledge to the employee how to use technology that implemented in the institution itself. Technical complexity and task interdependence should be developed that includes everyone who will either support or use the new system. Components of implementation system successful, as reported by end user, include technical complexity and task interdependence. Without those, the implementation will take longer, adaptation will be more problematic and frustration will be higher, and the implementation success will not be achieved in the institution. Therefore, to get successful information system implementation, the employees need to do effective technical complexity and task interdependence.

Effective technical complexity and task interdependence is a very important element of any implementation. The time and effort invested in both ensures that all types of users will get the most out of their experience on information system implementation. Each end user will have different perspectives on the usage of the system. Employee users will need to be understanding about technical complexity and task interdependence in the methods for completing employee functions, such as completing the timesheet, interpreting the balance information, submitting leave requests and making inquiries of historical information. Supervisory users will need to be trained as employee users and also be trained in the supervisor functions, such as reviewing and approving timesheets, reviewing and approving leave requests, delegating their authority and administering employee user accounts. Payroll users will often need to know about technical complexity and task interdependence as employee and supervisory users in addition to learning the processing and administration tasks for the system. Technical personnel also may need to get training in the installation, set up and maintenance of the system. Technical complexity and

task interdependence should always be included in the launch of a new intranet or major section, as an important part of the change management process.

Technical complexity and task interdependence at this point helps staff become familiar with the new content or design, and feel comfortable using it. Both of them can be included as part of a regular promotional activity for the intranet. It can also be incorporating into daily work. For example, when talking to a new author or helping a staff member find information, take the opportunity to show them around the intranet and point out how it can help them. Often they are unaware of the intranet's full capabilities. Increasing this awareness can greatly benefit the information system and the team.

There are 5 types of technical complexity and task interdependence element for information system implementation. The first is short information sessions during induction courses or management. Second, information system demonstrations for individual teams or regional offices, third, short articles in paper-based staff newsletters, fourth, short sessions for other business applications that the information system supports, and the last is information system that can be used to provide in the form of short news stories showing new or interesting features.

Technical complexity and task interdependence information can also be included in the help section. The importance of both is how to improve the employee’s skill in term of usage an information technology, because those kind it self influence to the information system implementation success. Implementation success is a more specific construction than the broader concept of information system success proposed by De Lone and McLean (1992). Their comprehensive survey identified six categories of information system success measure: system quality, information quality, use, user satisfaction, individual impact, and

organizational impact. These success measures correspond to three distinct stages of the information system innovation process. System quality and information quality are success measures appropriate for the development stage used and user satisfaction are appropriate for the implementation stage and individual impact and organizational impact are appropriate for the exploitation stage. Identifying different success measures for different stages of the information system innovation process overcomes some of the problems associated with the De Lone and McLean model (Seddon 1997). The key insight here is that success measures for different stages should mirror the managerial challenges faced in the relevant stage.

1.2 Problem Identification

The technical complexity and task interdependence contributes to implementation success. They are individual-based, developing application knowledge and business context knowledge. The other is inter-individual that is based on developing transaction memory and collaborative task knowledge. The problem might happen in government institution whose employee succeed in the training or trial program, but in the real implementation they make a mistake to perform the information system and they do not have adequate knowledge, moreover in the inter-individual cognition. In this part, the shared division of cognitive labour involved in the encoding, storage, and retrieval of information leads to greater efficiency, effectiveness, and coordination in the utilization of knowledge (Brandon and Hollingshead 2004). Groups with a well developed transaction memory system have been found to perform more effectively than groups with impaired transaction memory systems (Argote 2005). It consists of two components: knowledge contained in the memories of individual group members, and knowledge relevant

communication processes among group members (Wegner et al. 1985). A key element of transaction memory systems is knowledge encoded in group members memories. They use the term inter-individual to refer to collectives, including groups and teams that may not meet the conditions of dependency, exchange, and interaction usually implicit in the definitions of terms such as groups and teams.

1.3 Problem Formulation

This research intends to find out what are the effects of technical complexity and task interdependence on the successful information system implementation.

1.4 Research Objective

This research has an objective to test the actual effect of technical complexity and task interdependence on the successful information system implementation. Therefore the researcher can identify whether there is a significant or not between variables stated.

1.5 Contribution of Study

It is expected that this research will give contribution to the following parties;

First, for the researcher, this research can give more knowledge about importance of technical complexity and task interdependence in the usage of information technology in the institutions, so that the writer can find and prove the aspects that affect the implementation success. This thesis, defines all about the information system implementation influenced by the technical complexity and task interdependence. Many type of both that needed to do before information system usage.

Second, for the institution and other parties who participate in this field, this research can contribute one important consideration and knowledge about the method to achieve implementation success. Factor analysis identified three things as being closely related to successful information systems: the quality of the information system implementation, the quality of systems personnel and services, and also the knowledge and involvement of systems personnel in the business.

Third, for the general managers this thesis gives explanation why they need to be involved in information technology implementation. They have to combine all of hardware, software, data, people, and the other information system, because a general manager has main duty in the institution. When general managers are involved in information system, the implementation enables a number of business initiatives, such as gaining a competitive advantage, improving business processes, global expansion, downsizing, and even starting new businesses. Information system implementation can even change industry structures.

CHAPTER II

REVIEW OF RELATED LITERATURE

2.1 Technical Complexity, Task Interdependence and Information System Implementation success

Technical complexity and task interdependence gives a big contribution to the information system implementation success. Both of them are very influential in the implementation success. The success of systems depends on how well both of them have been prepared, because the explanation of the experts is needed for the application to novice users in classroom settings, demonstrate how to use its technical features, observe the learners practicing and provide feedback (Yi and Davis 2003). Training of technical complexity and task interdependence engages end users in cognitive activities through which they acquire knowledge imparted by trainers (Gallivan et al. 2005). Although end users also acquire knowledge from other sources, including situated learning, learning by doing, and learning by using (Attewell 1992).

Technical complexity and task interdependence is an important source of knowledge for them and an important organizational intervention contributing to implementation success (Nelson and Cheney 1987). In the learning method, there is a method known as a cross learning. Cross training is a process of interagency learning in diverse styles on delivery of services, procedures, values, philosophies, and specific types of victimization to ensure that meaningful, cooperative, collaborative, and trusting relationships are developed and maintained between institutions and improve our ability to provide services. To achieve information system success the institution needs assessment that reveals the need to provide technical complexity and task interdependence across institutions and systems. Because most company knew little

about the internal workings of other institution, cross of technical complexity and task interdependence would increase knowledge, awareness, and the effectiveness of referrals among service agencies and allied professionals.

Technical complexity and task interdependence needs some training method; there are four developmental training phases that should be done:

- Commitment Participants and agency executive directors sign a memorandum of understanding that stated a commitment to the training plan and the cultural competency. Participants determined timelines and selected staff members to receive the method.
- Process Development. Participants determine the roles and responsibilities of agency staff, such as who will train and who will coordinate, develop assessment tools to determine the skill levels of staff members, ensure that each training orientation has covered required topics, and develop the evaluation and tracking processes.
- Implementation. The author coordinate the schedules and locations of training orientations using the online training centre, assess individual employee training needs and provide onsite training, and cultural competency training.
- Evaluation. Trainers and participants evaluate onsite training, analyze the evaluation, and recommend plan changes after review of the analysis.

Typically, technical complexity and task interdependence provides a venue and opportunity for group members to gather information about members expertise through watching group members perform tasks and sharing information during conversations (Alavi and Leidner 2001; Brandon and Hollingshead 2004). Consistent

with these processes, groups that train together are found to outperform groups whose members are trained separately (Argote 2005).

2.2 Individual Cognitions and Implementation Success

There are three knowledge domains programs should deliver in the individual cognitions; they are application knowledge covering commands, tools embedded in information system applications and business context knowledge covering the use of information system applications to effectively perform business tasks and collaborative task knowledge covering how others use the application in their tasks. Both programs should be implemented to the users, because capability to controlling technology is important in term of information system implementation success. Individual program is actually used to give specific application knowledge. The individual program can also help create the other knowledge. Explicit application knowledge acquired in the programs can activate other knowledge creating processes that are combined with existing knowledge of task and context to create new knowledge (Alavi and Leidner 2001). Alavi and Leidner identify two models of knowledge creation that can contribute to this process. The combination mode of knowledge creation involves individuals creating new explicit knowledge by merging, categorizing, reclassifying, and synthesizing existing explicit knowledge while the internalization mode of knowledge creation creates new tacit knowledge from explicit knowledge (Alavi and Leidner 2001, p. 116).

Implementation success needs skill and knowledge to controlling information technology. In other ways, technical complexity and implementation has significant relationship, if there is no technical complexity to more exploration about skill and

knowledge, the company will get more problems to achieve information technology implementation success.

2.3 Inter-Individual Cognitions and Implementation Success

Inter-individual is addition to the effects on individual cognitions, and influences implementation success through its effect on inter-individual cognitions, specifically, through the creation of a transaction memory system (Argote 2005; Liang et al. 1995) and the development of collaborative task knowledge (Kang and Santhanam 2003-04). The inter-individual provides individuals with opportunities to obtain reliable information about other group member tasks and expertise, leading to the convergence of shared mental models among group members. Convergent models of collaborative task knowledge enable a form of silent coordination between group members, contributing to group and individual performance. Here, the users should understand the way to face collaborative task knowledge, transaction system and the task interdependence. Differences between individual cognitions and inter-individual cognitions is when the end user working in inter-individual cognitions end user should make sure that they have the same perception and they should have enough sense to combine the information technology that they have. Inter-individual contributes to implementation success by the understanding of how to collaborate the task knowledge. In the group member absolutely has different thought to usage information system, and the group member need to provide discussion about the concept. Task interdependence provides individuals with opportunities to obtain reliable information about other group member's tasks and expertise, leading to the convergence of shared mental models among group members. Gathering models of

collaborative task knowledge enable a form of silent coordination between group members, contributing to group and individual performance.

Because of there are many complex system tools in the information system implementation, the group member need two way communications to achieve a good cooperation. The group member need communication in order to organize system implementation set up to supporting information system implementation success. The conceptualization of inter-individual influences the group performance and is used to keep the relationship among the group member. If the inter-individual, include transaction memory and collaborative task knowledge working consistently in the usage technology application, the government institution will get implementation success.

2.4 Technical Complexity and Task interdependence on Implementation Success

There are two models that influence the success of the implementation; they are models of how to face the technical complexity and how to face task interdependence. Both models will make the users understand how to use the information system and they can also maximize what technology they have. So, if they are successful to expert in both and they can operate the information system technology properly, absolutely they will be satisfied with the information system itself. The implementation success can be measured by the end users satisfaction.

2.4.1 Role of Technical Complexity

Technical complexity aims to determine if there is complexity problem in real time within accuracy that can be used for information system operations. The used for experimental study of complexity should focus on large scale, highly dynamic, yet

easily controlled environment that is representative of actual information exchange in a variety of real information systems implementation. Technical complexity should provide the way how to control and combine the complexity of information system. The benefit of providing is; it offers a rational and helpful way of dealing with a number of practical difficulties that happens to anyone who is trying to make sense of effective research. The end user will get the higher complexity problem in the real implementation that is why the users should try high technical complexity. Under conditions of high technical complexity, it has a strong effect on the implementation success and capability to controlling complexity system and has an important effect too on the task performance.

Information system complexity require to the end user to work with unfamiliar technology and also work in the different way (Attewell 1992; Robey et al. 2002). This requires enhancement to the content of individual cognitions to overcome increased knowledge barriers to end user adoption and implementation success (Attewell 1992; Fichman and Kemerer 1997). Technical complexity affects both the application and business context knowledge that end users need to acquire to effectively use those information system innovations (Kang and Santhanam 2003-04). Expert of the technical complexity are often the primary source for such knowledge and that is a critical intervention through which end users acquire such as knowledge.

2.4.2 Role of Task Interdependence

In the task of interdependence communication is needed among the group member in order to increase group performance. The relationship between task interdependence and the success of implementation is as difficult as increasing the

task interdependence, so if the task interdependence increases, the implementation success will increase too.

There are three aspects of task interdependence in implementation success. First, the end users require collaborating with the other group member to have a good cooperation. Cooperation between many end users needs communication and knowledge of how to enhance the individual cognitions. Then, collaboration in the usage of newest technology application has affects in the business process, because in the business process requires the task interdependence among a group member. To get a good collaboration, meeting with the users is necessary to make sure about their expectations. This is needed in order to understand those attributes of business information systems by which users perceive success and failure, and through which they establish their expectations.

Second, the models to cover or handle task interdependence. The users should know the way how to interact with the other member and then how to make the same perception among a group. The implementation success depends on task interdependence and also depends on own capability to controlling a newest technology information, moreover the end user has to collaboration task knowledge with the other end user in term usage a newest technology.

Third, implementation success also depends on transaction memory. Higher task interdependence has affect on the transaction memory, because of that technology facilitates communication and improves the accuracy and effectiveness of transaction memory (Brandon and Hollingshead 2004). The other reason is that transaction memory has a strong effect on implementation success when task interdependence is high. Because when the task interdependence is higher, the implementation success will be high too. It is because the end user will better

understand how to collaborate in the group member and also understand how to improve their skill to achieve great group performance.

The aspects above show the importance of task interdependence of end user's skills and end user's knowledge to get successful information system implementation, this involves the strategy of how to collaboration with the other end user and how to improve individual cognitions to be inter-individual cognitions.

2.5 Hypothesis

The researcher has two hypotheses stated below:

$H_{1:}$ *The effect of training on implementation success is a positive function of technical complexity.*

In their research, Rogers (1962,1983), Fichman (1992), suggest that the technical complexity will improve users skill in term of usage information system implementation. In this research, the researcher wants to prove whether the technical complexity has positive effect related to the implementation success. Technical complexity teaches to the end user how to improve their knowledge in using newest technology in the information system. In other way, the trainer also has a big effect to the technical complexity training. The training requires end user to effectively use information system innovations.

The above analysis show that training has a strong effect for the technical complexity, and the technical complexity itself influence in implementation success. So, when the technical complexity is high, implementation success will be high too. Conversely, when the technical complexity is low, the company will be hard to achieve implementation success.

$H_{2:}$ *The effect of training on implementation success is a positive function of task interdependence.*

Like a technical complexity, task interdependence also has a strong effect for the implementation success. Different from the technical complexity, in task interdependence end user is required to collaborate with the other group member. In the success of information system implementation, it needs a team work with the same perception to use information technology. So, the successful implementation depends on effective group performance. In the task of interdependence, it is required for the member to have a good skill and knowledge about information technology. For the training of task interdependence, trainer also has a big support in task interdependence success. They should give the training of how to collaborate the knowledge among the group member. There are many complex system tools in the information system implementation and the group member need two way communication to achieve a good cooperation. If the inter-individual, include transactive memory and collaborative task knowledge work consistently in using technology application, the government institution will get implementation success.

CHAPTER III

RESEARCH DESIGN

3.1 Population and Sample

The population is a group of comprehensive elements that is usually in the form of people, working activity where we are interested to learn or to become the research object (Kuncoro, 2003). The population that is taken for this study refers to the government institution which uses the information system implementation, like in the BAPPEDA office. Because that institution always use information system implementation on daily working activity, this research uses the questionnaires method to collect the data that has relationship with information system implementation in order to know about information system implementation success in that institution. The purpose of the research is to analyze the relation between technical complexity and task interdependence in to information system implementation success. The users or the institution must be given the limited time available and the time required for a longitudinal study, it is decided that this cross sectional approach would be most appropriate. The questionnaire that is distributed to the users or institution is about the technical complexity, task interdependence and also implementation success. From the questionnaire the researcher can measure how the success of the technical complexity and task interdependence influences the implementation success.

The institutions that have been taken for the population sample are the representation for the other institution which uses information system. Then, the researcher will prove that the technical and task interdependence success has a big effect to the implementation success, how many end users who can handle the various

technology and how many users who can collaborate knowledge in the task interdependence. Based on the hypothesis, the technical complexity and task interdependence is positively related to the effect of implementation success.

3.2 Variables

This research has one dependent variable and two independent variables which influence the dependent variable itself.

3.2.1 *The dependent variable in this research is the implementation success*.

The way how to measure implementation success is from the use and user satisfaction (Alavi and Joachimsthaler (1992) and Sharma and Yetton (2003)). Users satisfaction measured is to know how the information system technology can help their job and also how they can operate that information system. The method to measure implementation success is by using a questionnaire. From the questionnaire there will be the result whether the end users are satisfied or not in term usage a information system success.

There are two independent variables in this research, technical complexity and task interdependence.

3.2.2 Technical complexity

There are three items selected to measure the technical complexity success:

1. The system information perform consistently for the users (Reverse Coded) (Attewell 1992)

2. The continued technical assistance are required by the users (Attewell 1992)
3. The skill that is needed to use the system information is too complex or not for the users (Cho and Kim Premkumar and Roberts 1999)

3.2.3 Task interdependence

There are six items selected to measure task interdependence success:

1. The users can perform fairly independently when they do task interdependence (Reverse Coded)
2. The users only need little coordination when they plan task interdependence (Reverse Coded)
3. The users do not need many requirement information from the other in order to complete task interdependence (Reverse Coded)
4. The other individuals unaffected of performance of task interdependence (Reverse Coded)
5. Coordination with the effort of users required in task interdependence.
6. Receiving accurate information from the users affecting task interdependence performance.

The technical complexity and task interdependence success should have a strong influence to the information system implementation success. The prediction is that technical complexity and task interdependence ($R_{\text{training implementation success}} = b_0 + b_1(TC) + b_2(TI) + \text{error}$) has also a strong influence to the implementation success.

3.3 Operational Hypothesis

Based on the problem statement and the review of the related literature, the alternative hypothesis and the hypotheses that are proposed in this research are:

$H_{o1:}$ The technical complexity is not positive related to the effect of training on implementation success.

$H_{a1:}$ The technical complexity is positively related to the effect of training on implementation success.

$H_{o2:}$ The task interdependence is not positive related to the effect of training on implementation success.

$H_{a2:}$ The task interdependence is positively related to the effect of training on implementation success.

3.4 Statistical Tools

3.4.1 Equation

This research basically uses regression model, the model that is stated below is used to test the hypothesis that the technical complexity and task interdependence are related on implementation success:

- Technical complexity measurement

  $TC = b_0 + b_3 (T) + b_2 (T I)$ ……(3.1)

- Task Interdependence measurement

  $TI = b_0 + b_3 (T) + b_1 (T C)$ ……..(3.2)

- Implementation success measurement

  $IS = b_0 + b_3 (T) + b_2 (T I) + b_1 (T C)$ …….(3.3)

  Where

- TC = Technical Complexity
- TI = Task Interdependence
- IS = Implementation Success
- T = Training

From the hypothesis formulation, the researcher will do hypothesis testing to answer the question on that hypothesis. Based on that hypothesis, the researcher will use analysis of statistical test to test the relationship of implementation success as the dependent variable and the technical complexity and task interdependence as the independent variable. The analysis of this hypothesis by using significant level (t) = 5% with the standard that H_0 is rejected if t-value of test ≤ t (0, 05)

3.4.2 How H_0 will be rejected

From the equation 3.3 it can be concluded that H_{01} is rejected if b_1 has positive sign and significance at 5% level ($t \leq 0.05$). This means that the technical complexity has a strong effect to the implementation success.

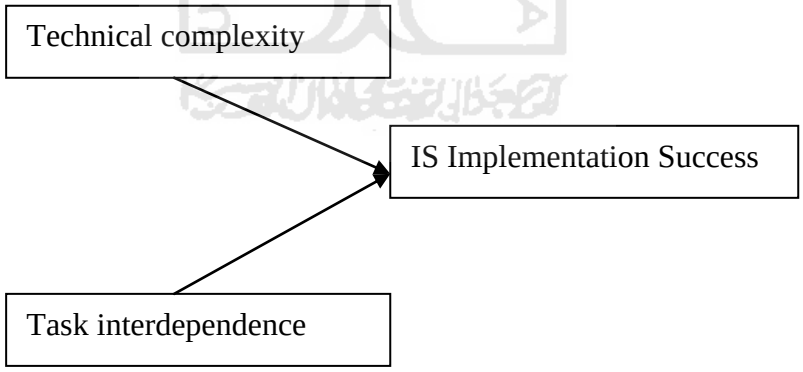
From the equation 3.3 it can be concluded that H_{02} is rejected if b_2 has positive sign and significance at 5% level ($t \leq 0.05$). This means that the task interdependence has a strong effect to implementation success.

$H_{o\ 1}$: $b_1 \leq 0$: The technical complexity is not positive related to the effect of training on implementation success

$H_{a\ 1}$: $b_1 > 0$: The technical complexity is positively related to the effect of training on implementation success.

$H_{o\ 2}$: $b_2 \leq 0$: The task interdependence is not positive related to the effect of training on implementation success.

$H_{a\ 2}$: $b_2 > 0$: The task interdependence is positively related to the effect of training on implementation success.



CHAPTER 4

DATA ANALYSIS

4.1 Descriptive Data

1. Respondent Based on Age

Based on the research, a result of age of the respondent is:

Table 4.1

Respondent based on Age

AGE	AMOUNT	PERCENTAGE
20-30	17	16%
31-40	38	37%
>40	48	47%
AMOUNT	103	100%

Based on table 4.1, the most dominant respondents are those who are >40 years old (47%), a second is from 31-40 years old (37%) and the third is from 20-30 years old (16%). It means an average of the user of information system implementation based on the research is >40 years old.

2. Respondent Based on Gender

Based on the research, the gender of the respondent is:

Table 4.2

Respondent Based on Gender

GENDER	AMOUNT	PERCENTAGE
MALE	66	64%
FEMALE	37	36%
AMOUNT	103	100%

Based on table 4.2 male respondent (64%) is higher than female respondent (36%). It is stated that the most dominant user of information system implementation are male.

3. Respondent Based on education

Based on the research, a result based on education is:

Table 4.3

Respondent Based on Education

EDUCATION	AMOUNT	PERCENTAGE
High School	23	22%
D3	13	13%
S1	54	52%
S2	13	13%
S3	0	0%
AMOUNT	103	100%

Based on the table 4.3 the highest respondent is from S1 (52%), the second is high school (22%), followed by D3 and S2 that have the same percentage (13%) and no respondent whose education background is S3. The average of information system implementation users are from S1.

4.2 Validity Test

Validity test in this research is applied to know that unobserved variable is measurable by using observed variable, confirmatory factor analysis (CFA) or ordinary called as factor analysis. If the loading of value from every validity test is more than 0.05 (b = 0,05), it is valid, or equal with that unobserved variable that is measurable by using each observed variable.

4.2.1 Technical Complexity

A result of confirmatory factor analysis (CFA) is:

Diagram 4.2.1

Technical Complexity

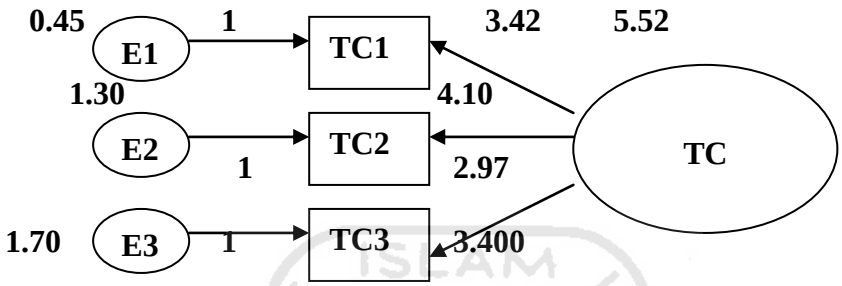


Table 4.4

Technical Complexity

Regression weights:

	Estimate	S.R	C.R	P	Label
Tc3<--- tc	1.000				
Tc2<--- tc	2.971	2.398	1.239	.215	par_3
Tc1<--- tc	5.571	4.899	1.126	.260	par_4

Based on diagram 4.2.1 and table 4.4 the indicator at technical complexity variable is valid, because it has value factor loading (estimate) above 0,05 (b = 0,05)

4.2.2 Task Interdependence

A result of confirmatory factor analysis (CFA) is:

Diagram 4.2.2

Task Interdependence

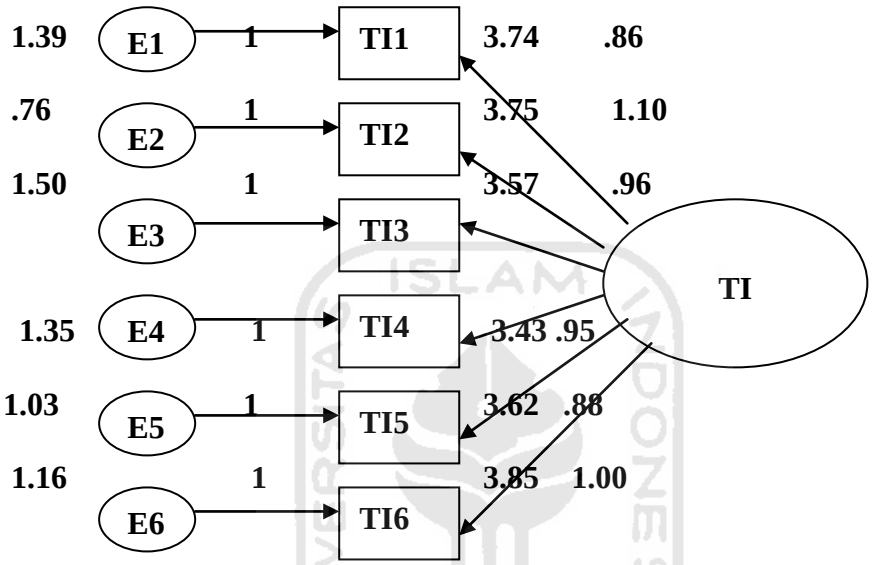


Table 4.5

Task Interdependence

Regression weights:

	Estimate	S.R	C.R	P	Label
Ti6<--- ti	1.000				
Ti5<--- ti	.885	.278	3.182	.001	par_5
Ti4<--- ti	.950	.290	3.272	.001	par_6
Ti3<--- ti	.956	.302	3.168	.002	par_7
Ti2<--- ti	1.096	.325	3.376	***	par_8
Ti1<--- ti	.860	.323	2.665	.008	par_9

Based on diagram 4.2.2 and table 4.5 the indicator at task interdependence variable is valid, because it has value factor loading (estimate) above 0,45 (b = 0,45)

4.2.3 Implementation Success

A result of confirmatory factor analysis (CFA) is:

Diagram 4.2.3

Implementation Success

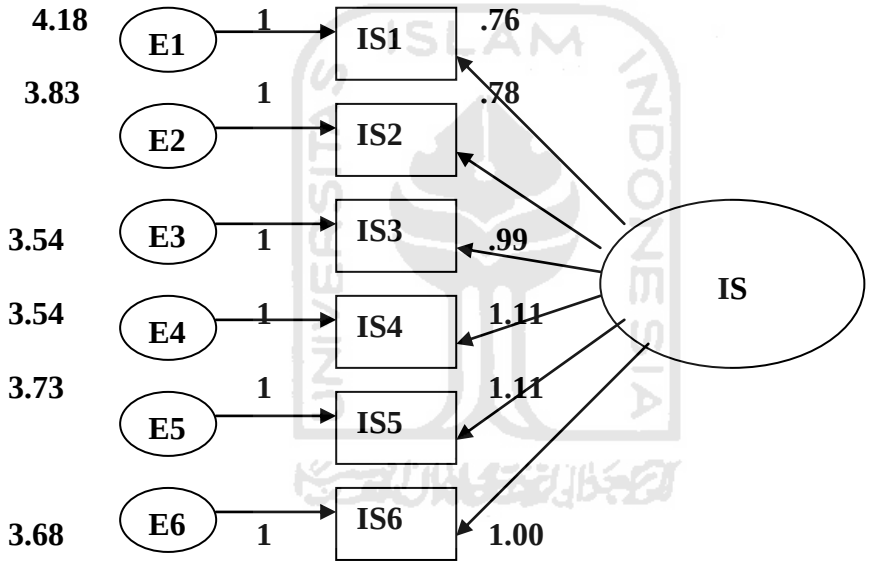


Table 4.6

Implementation Success

	Estimate	S.R	C.R	P	Label
Is1<--- is	1.000				
Is2<--- is	1.112	.166	6.711	***	par_10
Is3<--- is	1.112	.163	6.806	***	par_11
Is4<--- is	.994	.149	6.656	***	par_12
Is5<--- is	.777	.143	5.440	***	par_13
Is6<--- is	.760	.145	5.255	***	par_14

Based on diagram 4.2.3 and table 4.6, the indicator at implementation success variable is valid, because it has value factor loading (estimate) above 0,14 (b = 0,14), for Is4, Is5, Is6 it shows that the implementation is negative, therefore the data is valid.

4.3 Reliability Test

The reliability test in this research is used to know how far the measurement result is consistent, whether it shows the same effect or not by using same questioner. Researcher does reliability test to calculate Alpha from each item in a variable.

Reliability test can be applied to all item questions that has attempt validities test. Each criterion applied to the level of reliability is the level of value of Alpha. The value of Alpha that is closer to the number 1.0 is indicating that the reliability instrument is higher. Value of alpha between 0.69 – 1.0 is categorized as good reliability. Value of alpha between 0.50 – 0.69 is categorized as received reliability and the value of alpha is less than 0.50 is categorized as unfavorable reliability. The result examination variable reliability has presented in table 4.7

Table 4.7

Summary of Reliability Test

No	Variable	Alpha	Explanation
1	Task Interdependence	.7475	Good Reliability
2	Technical Complexity	.6161	Received Reliability
3	Implementation Success	.9080	Good Reliability

Based on table 4.7 it shows that any question is applied for measuring each certifiable research variable or reliable, because the value of alpha is above critical value (0.05)

4.4 Hypothesis Testing

Test of this hypothesis is used to see the probability value (P), if P is >0.05 hence variable is independent and do not have any effect to variable dependent and if P is <0.05 hence variable is independent and have an effect to variable dependent. The examination result of this hypothesis can be seen in table 4.8

Table 4.8

Hypothesis Test Result

Regression weights:

	Estimate	S.R	C.R	P	Label
TC <--- IS	.135	.120	1.122	.262	
TI <--- IS	.514	.151	3.408	***	

4.4.1 Test Result of First Hypothesis

Based on the table 4.8, the first hypothesis expresses the following:

$H_{o\ 1}$: $b_1 \leq 0$: The technical complexity is not positively related to the effect of training on implementation success

$H_{a\ 1}$: $b_1 > 0$: The technical complexity is positively related to the effect of training on implementation success.

The significance test to the first hypothesis is obtained by probability 0.262, which is bigger than 0.05, therefore it is not significant at level significance 5%. This influences the estimation result of technical complexity that the implementation success is not positive if obtained by line coefficient (standardized regression weight estimate) = 0.135. It means that the relation between technical complexity with implementation success is not positive.

Therefore, from the result that is collected from BAPPEDA, it can be interpreted that the first hypothesis indicates positive influence technical complexity to the implementation success, but the data does not support it. However, the research result is inconsistent with the result of research from Attewell (1992) and Premkumar and Roberts (1999). They explain that earning positive influence from technical complexity is not significant. So, BAPPEDA should improve the training of technical complexity in order to achieve significant to the implementation success.

4.4.2 Test Result of Second Hypothesis

Based on the table 4.8, the first hypothesis expresses the following:

$H_{o\,2}$: $b_2 \leq 0$: The task interdependence is not positively related to the effect of training on implementation success.

$H_{a\,2}$: $b_2 > 0$: The task interdependence is positively related to the effect of training on implementation success.

From the test of the second hypothesis, the estimation result on regression weights of task interdependence to implementation success is smaller than 0.05. It indicates that the probability is significant shown by the stars symbol, which means it is significant in the significant level of 5%. This means that the relationship between task interdependence with implementation success is positive.

Therefore, from the result that is collected from BAPPEDA, it can be interpreted that the second hypothesis indicates positive influence of task interdependence and the data of the implementation success supports it. This research result is consistent with the result from the Sharma and Yetton (2003). They explain that task interdependence with implementation success is significant.

4.5 Explanation

The result of analytical use of the AMOS software can explain that a technical complexity does not have significant positive influence to implementation success. Meanwhile, the task interdependence has a significant positive influence to the implementation success.

Based on the task Interdependence hypothesis testing result, the researcher finds out that it has positive influence to the usage of information technology for the BAPPEDA office. It happens in BAPPEDA because the employees of BAPPEDA have many experiences to have cooperation between the other employees in the usage of information technology.

The task interdependence itself is a connectivity task between the employees of institution. So, it can ease them to have cooperation in conducting their job that insists them to work together. By the task interdependence, the employee of the institution will get a good cooperation with others, and then the employees will increase the usage of information technology. When the task interdependence has a good result, the information technology will be successfully developed within BAPPEDA.

The result above can be useful for BAPPEDA to motivate the employees to use information technology in terms of having cooperation with other departments. For system designers, this research contributes to satisfy expectations of task interdependence of information technology users. Besides that, this research can be applied as a guideline to improve the information technology user's skill.

For the technical complexity hypothesis testing result, the researcher finds out that it does not have positive influence to the usage of information technology for the BAPPEDA office. It possible that it is happens in BAPPEDA office because the

employees of BAPPEDA do not have enough capability and knowledge to handle the complexity of the information technology.

Technical complexity is a difficulty faced when using the information technology and applying the knowledge with accuracy in the information system. By the technical complexity, the employees of BAPPEDA would be contributes to finished the complexity problem in information technology. But, the technical complexity hypothesis result is unproven in BAPPEDA.

The result above shows that the employees of BAPPEDA office have less understanding to handle the complexity of the information technology. So, BAPPEDA should be improve the technical complexity in the institution in order to satisfy the expectations of technical complexity of information technology users. And, this research can be the motivator of the employees of BAPPEDA to increase the knowledge about technical complexity to achieve success in the information technology usage.

CHAPTER V

CONCLUSION

5.1 Research Conclusion

This study developed a model in which training influences implementation success through its effect on both individual and inter-individual cognitions. Following from the model, the effect of the implementation success is contingent task interdependence and technical complexity. Training is a necessary and critical component of a successful implementation strategy when technical complexity and task interdependence are high, but a weak and non-critical component when they are low. Based on the question of the problem statement

This research aims to measure the effect of technical complexity to the implementation success and to measure the effect task interdependence to the implementation success, and the results are:

1. One of variable has a significant effect to influence successful information system implementation, and one of variable does not have significant effect to influence successful information system implementation. It means that the independent variable technical complexity (TC) does not have a significant influence on successful information system implementation. Conversely, task interdependence (TI) has a significant influence on successful information system implementation.
2. Task interdependence has a very significant effect to successful information system implementation. So based on the result the major factor that influence successful information system implementation is task interdependence.

5.2 Limitation and Suggestion

Although this research have a maximum strived, but this research have some limitation. The sample used in this research is taken from BAPPEDA (Badan Perencanaan Pembangunan Daerah) office Yogyakarta. This research contributes to broaden the knowledge of information technology users by examining the role of an organizational intervention, end user training, in overcoming knowledge barriers. This research contributes to the identification of the role of supply division in the institutions that process the required technology that is related with the information technology knowledge through interventions including consulting and outsourcing.

This research gives opportunity for doing further research after studying other variable that has not been observed by researchers in this area. Variable like emulation demand is available for pushing progress of successful information system implementation.

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Appendix 1

Kepada:
Yth. .....
di Yogyakarta

Dengan hormat,

Sehubungan dengan penelitian untuk sekripsi untuk program SI Fakultas Ekonomi Jurusan Akuntansi UII Yogyakarta, saya memerlukan informasi untuk mendukung penelitian saya yang berjudul " The contingent effects of training, technical complexity, and task interdependence on successful information systems implementatioan ". Oleh karena itu saya mohon kesediaan bapak/ibu untuk mengisi kuisioner terlampir

Kesediaan Bapak/Ibu mengisi pertanyaan-pertanyaan yang disampaikan dalam kuisioner ini merupakan bantuan yang sangat berharga untuk keberhasilan penelitian ini. Semua isian yang Bapak/Ibu berikan akan dirahasiakan.

Atas bantuan dan partisipasi Bapak/Ibu, saya mengucapkan terimakasih.

Yogyakarta, September 2007

Pembimbing	Peneliti
Drs. H. Hadri Kusuma, MBA, Ph.D	Shadily Darma Saputra

KUISIONER

Identitas Responden

Individual characteristics

Demographics

Jabatan

:.....

Umur :…….. Tahun

Jenis kelamin : □ Laki-laki □ Perempuan

Pendidikan : □ SMP □ SMA □ D3

□ S1 □ S2 □ S3

Untuk pertanyaan di bawah ini angka 1 untuk sangat tidak setuju - angka 6 untuk sangat setuju.

Technical complexity

***Adalah teknik umtuk menghadapi kesulitan penggunaan dalam sistem informasi*.**

No	Keterangan	1	2	3	4	5	6
1	Sistem informasi keuangan daerah di kantor anda bekerja secara konsisten						
2	Anda memerlukan bantuan tenaga ahli yang berkelanjutan untuk menggunakan sistem informasi keuangan daerah						
3	Keahlian yang di butuhkan untuk menggunakan sistem informasi keuangan daerah terlalu rumit untuk anda						

Task interdependence

Adalah tugas yang membutuhkan kerja sama dan ketergantungan antar sesama pemakai sistem informasi.

NO	Keterangan	1	2	3	4	5	6
1	Dengan sistem informasi keuangan daerah, tugas dapat di laksanakan dengan tidak bergantung pada orang maupun departemen lain						
2	Dengan sistem informasi keuangan daerah, perencanaan tugas dapat dilakukan dengan sedikit membutuhkan koordinasi dengan bagian lain						
3	Dengan sistem informasi keuangan daerah, hanya membutuhkan sedikit informasi dari orang lain untuk menyelesaikan perkerjaan.						
4	Dengan sistem informasi keuangan daerah, penyelesaian pekerjaan tidak dipengaruhi oleh orang lain maupun departemen lain.						
5	Dengan sistem informasi keuangan daerah, penyelesaian pekerjaan sering membutuhkan koordinasi dengan orang lain.						
6	Dengan sistem informasi keuangan daerah, performa dalam penyelesaian pekerjaan tergantung oleh informasi yang di dapat dari orang lain.						

Information Implementation Success

Adalah Kesuksesan atas penggunaan sistem informasi

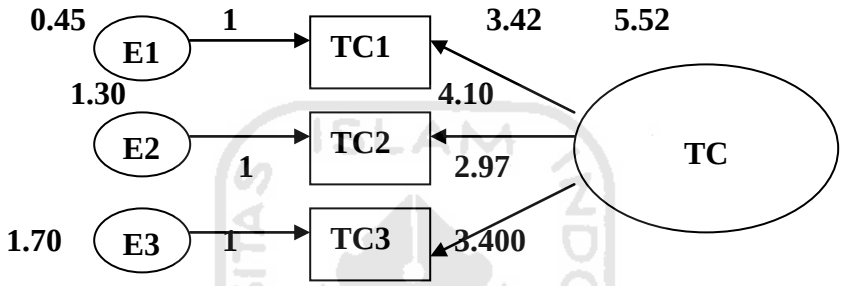
NO	Keterangan	1	2	3	4	5	6
1	Kualitas sistem informasi keuangan daerah dikantor anda memenuhi kebutuhan kantor anda						
2	Kualitas informasi yang dihasilkan sistem informasi keuangan daerah sangat memadai						
3	Pemakaian sistem informasi keuangan daerah dikantor anda telah digunakan dengan baik						
4	Anda merasa puas dengan sistem informasi keuangan daerah dikantor anda						

5	Sistem informasi keuangan daerah dikantor anda memberi dampak positif bagi pekerjaan anda pribadi						
6	Sistem informasi keuangan daerah dikantor anda memberi dampak positif bagi kantor anda						

Appendix 2

VALIDITY

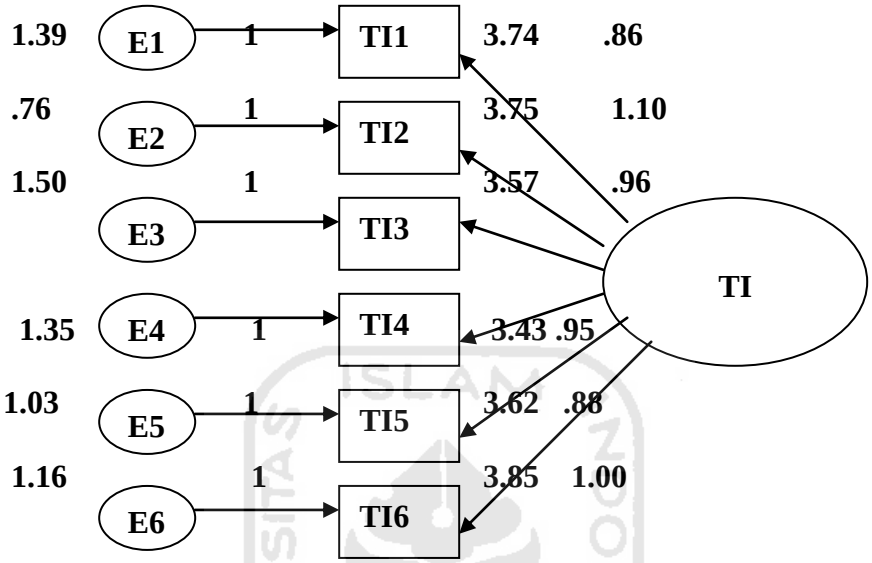
Technical Complexity



Regression weights:

	Estimate	S.R	C.R	P	Label
Tc3<--- tc	1.000				
Tc2<--- tc	2.971	2.398	1.239	.215	par_3
Tc1<--- tc	5.571	4.899	1.126	.260	par_4

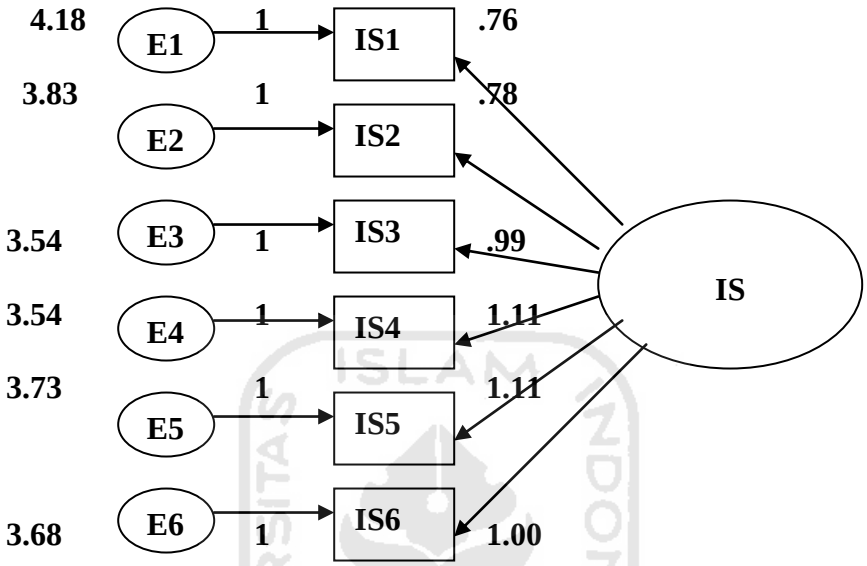
Task Interdependence



Regression weights:

	Estimate	S.R	C.R	P	Label
Ti6<--- ti	1.000				
Ti5<--- ti	.885	.278	3.182	.001	par_5
Ti4<--- ti	.950	.290	3.272	.001	par_6
Ti3<--- ti	.956	.302	3.168	.002	par_7
Ti2<--- ti	1.096	.325	3.376	***	par_8
Ti1<--- ti	.860	.323	2.665	.008	par_9

Implementation Success



Regression weights:

	Estimate	S.R	C.R	P	Label
Is1<--- is	1.000				
Is2<--- is	1.112	.166	6.711	***	par_10
Is3<--- is	1.112	.163	6.806	***	par_11
Is4<--- is	.994	.149	6.656	***	par_12
Is5<--- is	.777	.143	5.440	***	par_13
Is6<--- is	.760	.145	5.255	***	par_14

Appendix 3

RELIABILITY

Technical Complexity

```
****** Method 2 (covariance matrix) will be used for this analysis
******
```

```
  R E L I A B I L I T Y   A N A L Y S I S   -   S C A L E   (A L P H
A)

                                Mean        Std Dev       Cases

  1.     TC1                  3.4175         1.3899       103.0
  2.     TC2                  4.0971         1.3174       103.0
  3.     TC3                  3.4175         1.3025       103.0


                    Correlation Matrix

               TC1          TC2          TC3

TC1            1.0000
TC2             .4328       1.0000
TC3             .1844        .4332       1.0000


        N of Cases =       103.0

Item Means           Mean    Minimum    Maximum      Range
Max/Min   Variance
                    3.6440     3.4175     4.0971      .6796
1.1989      .1540

Inter-item
Correlations         Mean    Minimum    Maximum      Range
Max/Min   Variance
                     .3501      .1844      .4332      .2488
2.3495      .0165
```

Reliability Coefficients 3 items

Alpha = .6161 Standardized item alpha = .6178

Task Interdependence

****** Method 2 (covariance matrix) will be used for this analysis ******

R E L I A B I L I T Y A N A L Y S I S - S C A L E (A L P H A)

		Mean	Std Dev	Cases
1.	TI1	3.7379	1.3573	103.0
2.	TI2	3.7476	1.2345	103.0
3.	TI3	3.5728	1.4660	103.0
4.	TI4	3.4272	1.4115	103.0
5.	TI5	3.6214	1.2534	103.0
6.	TI6	3.8544	1.3461	103.0

Correlation Matrix

	TI1	TI2	TI3	TI4	TI5
TI1	1.0000				
TI2	.4458	1.0000			
TI3	.5196	.3786	1.0000		
TI4	.4735	.4789	.7145	1.0000	
TI5	.2004	.1974	-.0249	.0812	1.0000
TI6	.2043	.2550	.3010	.3272	.3273

	TI6
TI6	1.0000

N of Cases = 103.0

Item Means	Mean	Minimum	Maximum	Range	Max/Min	Variance
	3.6602	3.4272	3.8544	.4272	1.1246	.0230

Inter-item Correlations	Mean	Minimum	Maximum	Range	Max/Min	Variance
	.3253	-.0249	.7145	.7394	- 28.7340	.0336

Reliability Coefficients 6 items

Alpha = .7475 Standardized item alpha = .7431

Implementation Success

****** Method 2 (covariance matrix) will be used for this analysis ******

R E L I A B I L I T Y A N A L Y S I S - S C A L E (A L P H A)

		Mean	Std Dev	Cases
1.	IS1	3.6796	1.3077	103.0
2.	IS2	3.7282	1.2303	103.0
3.	IS3	3.5437	1.2893	103.0
4.	IS4	3.5437	1.2663	103.0
5.	IS5	3.8350	1.3583	103.0
6.	IS6	4.1845	1.3339	103.0

Correlation Matrix

	IS1	IS2	IS3	IS4	IS5
IS1	1.0000				
IS2	.6278	1.0000			
IS3	.6044	.6565	1.0000		

IS4	.6332	.6307	.6939	1.0000
IS5	.6543	.6065	.4828	.6227
1.0000				
IS6	.6019	.5506	.5397	.6481
.7853				

	IS6
IS6	1.0000

N of Cases = 103.0

Item Means	Mean	Minimum	Maximum	Range
Max/Min Variance				
	3.7524	3.5437	4.1845	.6408
1.1808 .0573				

Inter-item Correlations	Mean	Minimum	Maximum	Range
Max/Min Variance				
	.6226	.4828	.7853	.3025
1.6266 .0046				

Reliability Coefficients 6 items

Alpha = .9080 Standardized item alpha = .9082

Appendix 4

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	93	69,631	42	,005	1,658
Saturated model	135	,000	0		
Independence model	30	854,280	105	,000	8,136

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	,918	,796	,966	,908	,963
Saturated model	1,000		1,000		1,000
Independence model	,000	,000	,000	,000	,000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	,400	,367	,385
Saturated model	,000	,000	,000
Independence model	1,000	,000	,000

NCP

Model	NCP	LO 90	HI 90
Default model	27,631	8,544	54,606
Saturated model	,000	,000	,000
Independence model	749,280	659,824	846,199

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	,683	,271	,084	,535
Saturated model	,000	,000	,000	,000
Independence model	8,375	7,346	6,469	8,296

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	,080	,045	,113	,075
Independence model	,265	,248	,281	,000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	255,631	290,236		
Saturated model	270,000	320,233		
Independence model	914,280	925,443		

ECVI

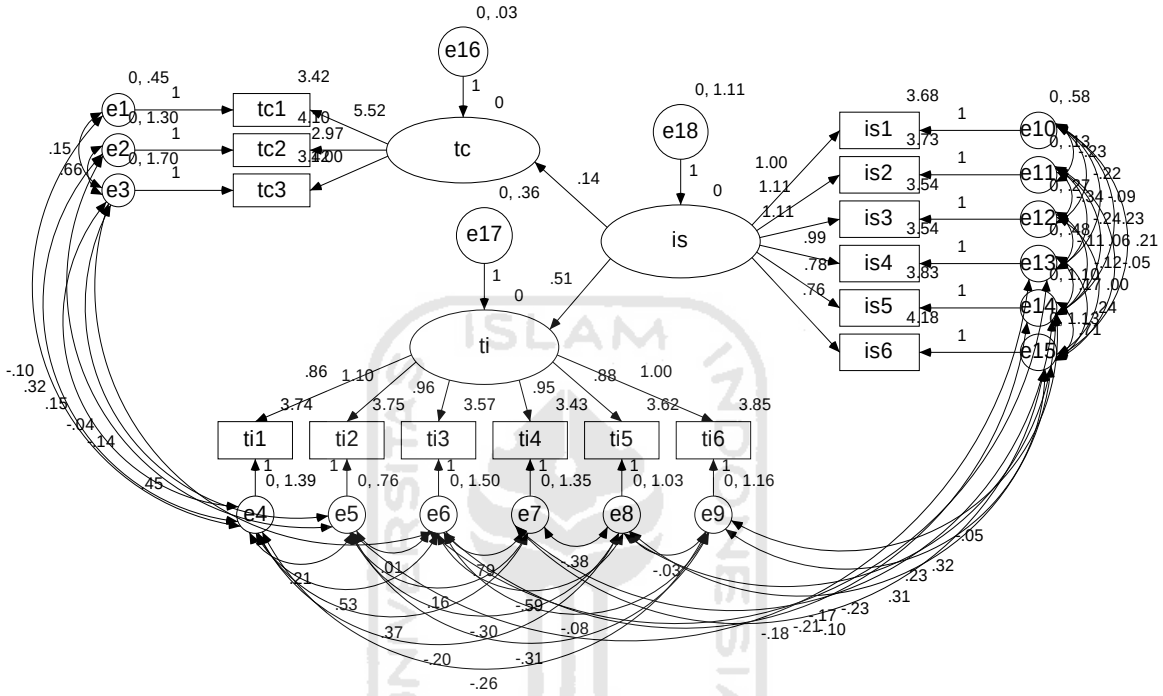
Model	ECVI	LO 90	HI 90	MECVI
Default model	2,506	2,319	2,771	2,845
Saturated model	2,647	2,647	2,647	3,140
Independence model	8,964	8,087	9,914	9,073

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	86	97
Independence model	16	17

Appendix 5

MODEL



Estimates (Group number 1 - Default model)

Scalar Estimates (Group number 1 - Default model)

Maximum Likelihood Estimates

Regression Weights: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P	Label
tc <--- is	,135	,129	1,050	,294	par_1
ti <--- is	,514	,149	3,447	***	par_2
tc3 <--- tc	1,000				
tc2 <--- tc	2,971	2,398	1,239	,215	par_3
tc1 <--- tc	5,517	4,899	1,126	,260	par_4
ti6 <--- ti	1,000				
ti5 <--- ti	,885	,278	3,182	,001	par_5
ti4 <--- ti	,950	,290	3,272	,001	par_6
ti3 <--- ti	,956	,302	3,168	,002	par_7
ti2 <--- ti	1,096	,325	3,376	***	par_8
ti1 <--- ti	,860	,323	2,665	,008	par_9
is1 <--- is	1,000				
is2 <--- is	1,112	,166	6,711	***	par_10
is3 <--- is	1,112	,163	6,806	***	par_11
is4 <--- is	,994	,149	6,656	***	par_12
is5 <--- is	,777	,143	5,440	***	par_13
is6 <--- is	,760	,145	5,255	***	par_14

Variances: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P	Label
e18	1,110	,351	3,165	,002	par_76
e16	,028	,047	,594	,553	par_77
e17	,356	,209	1,705	,088	par_78
e3	1,702	,247	6,892	***	par_79
e2	1,297	,206	6,290	***	par_80
e1	,445	,343	1,299	,194	par_81
e9	1,155	,256	4,516	***	par_82
e8	1,031	,282	3,656	***	par_83
e7	1,349	,254	5,317	***	par_84
e6	1,497	,298	5,030	***	par_85

	Estimate	S.E.	C.R.	P	Label
e5	,762	,331	2,303	,021	par_86
e4	1,391	,317	4,387	***	par_87
e10	,584	,283	2,062	,039	par_88
e11	,127	,317	,401	,688	par_89
e12	,275	,301	,912	,362	par_90
e13	,481	,283	1,700	,089	par_91
e14	1,096	,270	4,055	***	par_92
e15	1,129	,239	4,732	***	par_93

Appendix 6

THE DATA

ti1	ti2	ti3	ti4	ti5	ti6	is1	is2	is3	is4	is5	is6
4	3	3	2	4	3	2	3	3	4	3	4
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4	6	5	3	4	3	3	4	3	5	4	6
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6	6	6	6	1	1	1	1	1	1	1	1
3	4	3	2	3	3	2	2	2	2	2	2
2	3	2	2	4	3	2	3	2	3	3	3
1	6	1	3	6	2	6	5	5	4	6	6
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