Journal of Theoretical and Applied Information Technology
31st August 2018. Vol.96. No 16

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

APPROACH USING INTERPRETIVE STRUCTURAL MODEL (ISM) TO DETERMINE KEY SUB-FACTORS AT FACTORS: BENEFITS, RISK REDUCTIONS, OPPORTUNITIES AND OBSTACLES IN AWARENESS IT GOVERNANCE

[1]UKY YUDATAMA, [2]ACHMAD NIZAR HIDAYANTO, [3]BOBBY A.A NAZIEF

[123]Faculty of Computer Science, University of Indonesia, Depok 16424, Indonesia

E-mail: [1]uky.yudatama@ui.ac.id, [2]nizar@cs.ui.ac.id, [3]nazief@cs.ui.ac.id

ABSTRACT

This study aims to find the factors and sub-factors important in awareness IT Governance. This is necessary because it has a major influence on the successful implementation of IT Governance within an organization. The data were collected through interviews with 3 competent experts in the field of IT Governance, the best data suitability that has been obtained from these experts, then considered and to be processed using Interpretive Structural Model (ISM). This method is considered very effective to obtain the hierarchical structure and the relationship between each factor and sub-factor. The final results of this study obtained some important factors and sub-factors in awareness of IT Governance among others: benefits, risk reduction, opportunities, and obstacles. Of the four factors are divided into 14 sub-factors, and from the result analysis by using ISM obtained: (a) differences in viewpoint about business and IT objectives; (b) the ownership of data that is still tied between sections and (c) lack of technical knowledge, these three are important sub-factors (sub-factors key) that may affect success in the implementation of IT Governance, therefore these sub-factors need to get serious attention for the implementation of IT Governance can run well so as to improve the quality and performance of the organization in the future.

Keywords: *Factor, Sub-factor, Awareness, IT Governance, Interpretive Structural Model*

1. INTRODUCTION

Information Technology has been widely used in various organizations around the world [1], [2]. Utilization of Information Technology to improve efficiency, effectiveness, transparency, and accountability [2], [3], [7]-[11]. Development of information technology is done through the arrangement of management systems and work processes by optimizing the utilization of information technology. The success of IT Governance is largely determined by alignment between IT implementation and organizational goals [1], [2], [5], [12], [13]. Therefore, in order that IT can be utilized in accordance with expectations, it needs good IT governance [7], [14]–[19].

IT Governance is required by all types of organizations to support and run all of its activities [4], [10], [20]. Implementation of IT Governance requires huge investment [2] and many have failed to implement it [10], [16], [21]. Therefore, knowing and understanding the key sub-factors that can affect failure is very important and necessary [10], [11], [15], [22]–[24]. It is intended that the alignment between organizational goals with business objectives can be achieved [17], [24], [25].

According to a large Indonesian dictionary, consciousness is concerned with something that has been received or used. Awareness is closely related to human factors especially in terms of communication and behavior [21], [26]. Humans are users who have participation that can be influenced by the social culture of the environment around which this is an important factor that can support, even can also disrupt the success in implementation [15]. In the management of human knowledge is the main domain especially those having skills [4], this means that human beings are important factors that can support in the management of IT and business [1], therefore it needs special attention.

Awareness of the implementation of IT Governance is essential to understandable [27], [28] because as an effective and positive control tool in a systems, to create two-way communication between user communities and management on the level

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

that IT Governance implementation gets a response well, so that the business can succeed optimally in line with expectations [5].

Lack of awareness can mean that the organization is at significant risk especially regarding the protection of security and asset [29]. It is therefore very important to awaken them to care and participate in the successful implementation of IT Governance. In addition, awareness of all parties involved (stakeholders) within an organization or company can determine the successful implementation of IT Governance.

In awareness of the implementation of IT Governance, there are 4 factors that can influence it. These factors are benefits, constraints, risk reduction and opportunities [29]. These factors can affect success in the implementation of IT Governance, especially with regard to awareness, therefore it is important to know and understand it because it can interfere with an organization's performance because it can determine the success or failure of the organization in achieving objectives business.

The relationship between factors and sub-factors needs to be analyzed because it can help to plan the strategies to be taken in terms of knowing and understanding which factors and sub-factors are key and the relationship of the hierarchical structure. Therefore, how to know the factors and key sub-factors, and hierarchy of relationships of each becomes important and necessary to do a research.

Currently, very rare research that discusses the awareness, especially related to IT Governance, therefore this becomes an opportunity and challenge to do it. As for some research that has done that is research that discusses awareness of IT governance in terms of senior manager's perspective [30]. Similarly, there are those discussing IT Governance awareness by considering benefits, risk reductions, opportunities and obstacles [29].

Based on the above description, a study that discusses the important factors and sub-factors in IT Governance awareness in the hierarchical structure relationship review has not been done, therefore this research is important to do, so that the implementation of IT Governance can be done well, in the hope of quality and the performance of an organization in the future may increase from before.

Therefore the research question raised in this paper is how to determine the key sub-factors of the factors in IT Governance awareness as well as how is the hierarchical relationship between these sub-factors?

The issues raised in this research are to know and analyze the important factors and key sub-factors as well as the hierarchical relationship structure of each sub-factor in the awareness of the implementation of IT Governance

The method used to determine the key sub-factors in this study is to use Interpretive Structural Model [31], where this method can find key sub-factor and able to give a real picture about sub-factor hierarchy structure as knowledge base that can be useful to help strategize planning strategy relation to better implementation of IT Governance in the future.

The results of this study are expected to give a real contribution in the field of IT Governance, especially related to awareness of the implementation of IT Governance, so that later can succeed well, that is by knowing the key factors and key sub-factors that can provide benefits and added value, especially on the basis of improvement in an effort to improve the quality of IT Governance implementation in the future.

2. STUDY OF LITERATURE

The searching and selecting of articles have been done based on PRISMA guidelines (Preferred Reporting Items for Systematic Review and Meta-analysis). A total of 97 articles have been checked 5 pieces of articles indicated as duplicate articles, so it is necessary to be excluded from the list of articles. The next process is screening, 92 articles examined by looking at the title and looking at the abstract, found 76 articles that match the topic sought. After getting these 59 articles, the next process looks at the feasibility of each of these articles by checking and assessing the complete and detailed content. The final result obtained only 45 articles that can be reviewed and used as the main literature. Figure 1 shows the flow chart of the literature search process.

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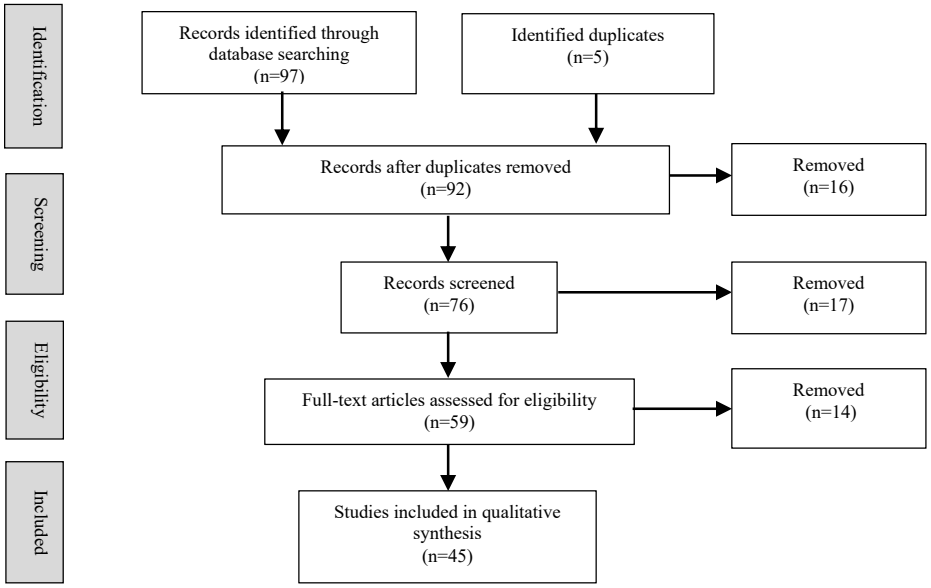

Figure 1 Flowchart of the article search process.

The end result of the literature study found several factors and sub-factors that may affect awareness of the implementation of IT Governance as shown in table 1.

Table 1 Result of literature review

Factors	Sub-factors	Reference
1. Benefits	1.1. Lighten work.	[1],[33], [35-36], [38], [42]
	1.2. Speed up the process and save time.	[34], [36], [38], [42-44]
	1.3. Improving the quality of Information.	[1], [17], [33], [39], [43], [45]
	1.4. Save money.	[1], [17], [29],[34], [36], [40], [42], [44]
2. Risk Reduce	2.1. Business losses can be suppressed.	[1],[17],[35-36],[38],[40], [43], [45]
	2.2. Delay can be avoided.	[32], [34-35]
3. Opportunities	3.1. Opportunity for competitive advantage.	[29],[32-34], [36], [40]
	3.2. Can provide new opportunities	[34],[36], [38],[42]
	3.3. Opportunity to increase productivity.	[32-33], [36], [39]
	3.4. Opportunity to provide added value and profit.	[33-[36], [40], [45]
4. Obstacles	4.1. The potential loss is quite large on the network.	[29],[39], [42-44]
	4.2. Different points of view about business objectives and IT.	[35-36], [38], [45]
	4.4. Ownership of the data is still bound.	[17],[34], [43], [45]
	4.5. Lack of knowledge on the technical side.	[1], [29],[33-34], [36], [43]

3. RESEARCH METHODOLOGY

Implementation of this research is divided into three stages: (1) tracing the literature to be used as reference materials, especially related to factors and sub-factors that can affect awareness in implementation of IT Governance; (2) identify the results of the literature that have been obtained to find the factors and sub-factors that can influence awareness of the implementation of IT Governance based on the benefits, risk reduction, opportunities and obstacles, (3) to analyze the factors and sub-factors by using Interpretive Structural Modeling ISM) to determine the hierarchical structure and its relationship. Data were obtained by using a descriptive explored method from interview result by involving 3 competent experts in IT Governance. The best data conformity that has been obtained from the interviews of these experts is then considered and processed using Interpretive Structural Model (ISM).

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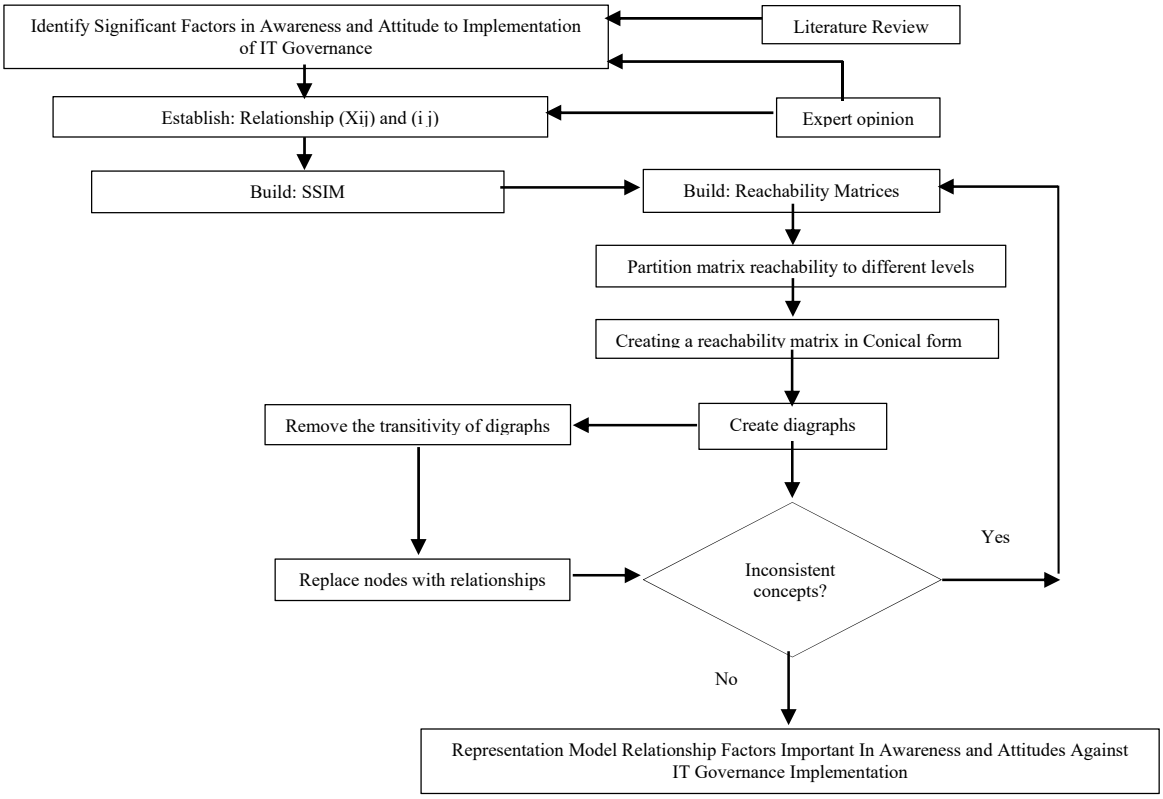

Figure 2 ISM Flowchart to determine important factors and sub-factors in awareness of IT Governance implementation, adoption [31].

The steps in data processing using Interpretive Structural Model (ISM) method, as shown in figure 2 can be explained as follows:

Step 1: Identify the factors and sub-factors that affect awareness of the implementation of IT Governance.

Step 2: Create a contextual relationship, between each of the factors and sub-factors, which have been identified in step 1.

Step 3: Create a Structural Self-Interaction Matrix (SSIM).

Step 4: Formulate the SSIM Reachability Matrix and examine the same section for contextual transitivity relationships. This is the basis of the ISM technique, which states that if a Driver 'X' corresponds to 'Y' and 'Y' with 'Z', then 'X' corresponds to 'Z'.

Step 5: The final Reachability matrix obtained from step 4 is then partitioned into different levels.

Step 6: Create a Digraph based on the relationship of the final Reachability Matrix, and remove the transitive relationship.

Step 7: The resulting digraph is converted to ISM model form by substituting sub-factor.

Step 8: The ISM model generated through development in step 7 is then checked to check whether it is necessary to make modifications.

4. RESULTS AND ANALYSIS

The data in this study were obtained through interviews and discussions with 3 experts who are competent in the field of IT Governance, where they have long working experience in the field of IT Governance as well as being top management level in their organization so that their capability is reliable. Therefore it related to the accuracy (validation) data from the interviews and discussions we have done with these experts it is reliable scientifically. The data obtained from the experts is then processed into SSIM-VAVO as shown in Table 2.

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Table 2 Structural self-interaction matrix (SSIM-VAXO)

	K14	K13	K12	K11	K10	K9	K8	K7	K6	K5	K4	K3	K2
K1	A	A	A	A	O	V	O	O	V	O	V	O	V
K2	A	A	A	A	V	V	O	V	V	V	V	V	
K3	A	A	A	A	V	V	V	V	V	V	O		
K4	A	A	A	A	X	X	O	X	A	V			
K5	A	A	A	A	X	X	O	O	X				
K6	A	A	A	A	X	X	O	O					
K7	A	A	A	A	X	X	X						
K8	A	A	A	A	X	X							
K9	A	A	A	A	X								
K10	A	A	A	A							-		
K11	A	O	O										
K12	X	X											
K13	A												

Information :
K1: Lighten the job.
K2: Speed up the process and save time.
K3: Improve the quality of information.
K4: Save money.
K5: Business losses can be suppressed.
K6: Delays can be avoided.
K7: Opportunities in competitive advantage.
K8 : Can provide new opportunities.
K9 : Opportunities to increase productivity.
K10: Opportunity to provide added value and profit.
K11: The potential loss is quite large on the network.
K12: Differences point of view about business and IT objectives.
K13: Ownership of data that is still bound.
K14: Lack of technical knowledge.

Table 3 Initial reachability matrix

	K14	K13	K12	K11	K10	K9	K8	K7	K6	K5	K4	K3	K2	K1
K1	0	0	0	0	0	1	0	0	1	0	1	0	1	1
K2	0	0	0	0	1	1	0	1	1	1	1	1	1	0
K3	0	0	0	0	1	1	1	1	1	1	0	1	0	0
K4	0	0	0	0	1	1	0	1	0	1	1	0	0	0
K5	0	0	0	0	1	1	0	0	1	1	0	0	0	0
K6	0	0	0	0	1	1	0	0	1	1	1	0	0	0
K7	0	0	0	0	1	1	1	1	0	0	1	0	0	0
K8	0	0	0	0	1	1	1	1	0	0	0	0	0	0
K9	0	0	0	0	1	1	1	1	1	1	1	0	0	0
K10	0	0	0	0	1	1	1	1	1	1	1	0	0	0
K11	0	0	0	1	1	1	1	1	1	1	1	1	1	1
K12	1	1	1	0	1	1	1	1	1	1	1	1	1	1
K13	0	1	1	0	1	1	1	1	1	1	1	1	1	1
K14	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Initial Data Reachability Matrix from Table 2 (SSIM-VAXO), then converted to binary Reachability Matrix (RM), as shown in Table 3. A transitive test for the consistency of Reachability Matrix (RM) is required to obtain the Final Reachability Matrix as shown in Table 4.

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Table 4 Final reachability matrix

	K14	K13	K12	K11	K10	K9	K8	K7	K6	K5	K4	K3	K2	K1	**Driving Power**	**Level**
K1	0	0	0	0	*1	1	*1	*1	1	*1	1	*1	1	1	**10**	IV
K2	0	0	0	0	1	1	*1	1	1	1	1	1	1	0	**9**	III
K3	0	0	0	0	1	1	1	1	1	1	*1	1	0	0	**8**	II
K4	0	0	0	0	1	1	*1	1	*1	1	1	0	0	0	**7**	I
K5	0	0	0	0	1	1	*1	*1	1	1	*1	0	0	0	**7**	I
K6	0	0	0	0	1	1	*1	*1	1	1	1	0	0	0	**7**	I
K7	0	0	0	0	1	1	1	1	*1	*1	1	0	0	0	**7**	I
K8	0	0	0	0	1	1	1	1	*1	*1	*1	0	0	0	**7**	I
K9	0	0	0	0	1	1	1	1	1	1	1	0	0	0	**7**	I
K10	0	0	0	0	1	1	1	1	1	1	1	0	0	0	**7**	I
K11	0	0	0	1	1	1	1	1	1	1	1	1	1	1	**11**	V
K12	1	1	1	*1	1	1	1	1	1	1	1	1	1	1	**14**	VI
K13	*1	1	1	*1	1	1	1	1	1	1	1	1	1	1	**14**	VI
K14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	**14**	VI
Dependent	**3**	**3**	**3**	**4**	**14**	**14**	**14**	**14**	**14**	**14**	**14**	**7**	**6**	**5**		

From Table 5 above, it can be seen that the sub-factor K4-K10 with Driver Power value (DP = 7) and has the smallest dependency value (Dependent = 14). Table 6 shows that the first iteration process begins with respect to the smallest Driver Power value (DP = 7) resulting in K4, K5, K6, K7, K8, K9 and K10 sub-factors as level 1.

Table 5 Iteration I (K4, K5, K6, K7, K8, K9, K10)

	Reachability set	**Antecedent set**	**Intersection set**	**Level**
K1	1,2,3,4,5,6,7,8,9,10	1,11,12,13,14	1	
K2	2,3,4,5,6,7,8,9,10	1,2,11,12,13,14	2	
K3	3,4,5,6,7,8,9,10	1,2,3,11,12,13,14	3	
K4	4,5,6,7,8,9,10	1,2,3,4,5,6,7,8,9,10,11,12,13,14	4,5,6,7,8,9,10	I
K5	4,5,6,7,8,9,10	1,2,3,4,5,6,7,8,9,10,11,12,13,14	4,5,6,7,8,9,10	I
K6	4,5,6,7,8,9,10	1,2,3,4,5,6,7,8,9,10,11,12,13,14	4,5,6,7,8,9,10	I
K7	4,5,6,7,8,9,10	1,2,3,4,5,6,7,8,9,10,11,12,13,14	4,5,6,7,8,9,10	I
K8	4,5,6,7,8,9,10	1,2,3,4,5,6,7,8,9,10,11,12,13,14	4,5,6,7,8,9,10	I
K9	4,5,6,7,8,9,10	1,2,3,4,5,6,7,8,9,10,11,12,13,14	4,5,6,7,8,9,10	I
K10	4,5,6,7,8,9,10	1,2,3,4,5,6,7,8,9,10,11,12,13,14	4,5,6,7,8,9,10	I
K11	1,2,3,4,5,6,7,8,9,10,11,12,13,14	11,12,13,14	11,12,13,14	
K12	1,2,3,4,5,6,7,8,9,10,11,12,13,14	12,13,14	12,13,14	
K13	1,2,3,4,5,6,7,8,9,10,11,12,13,14	12,13,14	12,13,14	
K14	1,2,3,4,5,6,7,8,9,10,11,12,13,14	12,13,14	12,13,14	

Table 6 shows the second iteration process taking into account the second largest dependency rating (Dependent = 7), resulting in the K3 sub-factor as level 2 and in Table 7 showing the third iteration process with respect to the third largest dependency value (Dependent = 6) K2 as level 3.

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

Table 6 Iteration II (K3)

	Reachability Set	Antecedent Set	Intersection Set	Level
K1	1,2,3	1,11,12,13,14	1	
K2	2,3	1,2,11,12,13,14	2	
K3	3	1,2,3,11,12,13,14	3	II
K11	1,2,3,11,12,13,14	11,12,13,14	11,12,13,14	
K12	1,2,3,11,12,13,14	12,13,14	12,13,14	
K13	1,2,3,11,12,13,14	12,13,14	12,13,14	
K14	1,2,3,11,12,13,14	12,13,14	12,13,14	

Table 7 Iteration III (K2)

	Reachability set	Antecedent set	Intersection set	Level
K1	1,2	1,11,12,13,14	1	
K2	2	1,2,11,12,13,14	2	III
K11	1,2,11,12,13,14	11,12,13,14	11,12,13,14	
K12	1,2,11,12,13,14	12,13,14	12,13,14	
K13	1,2,11,12,13,14	12,13,14	12,13,14	
K14	1,2,11,12,13,14	12,13,14	12,13,14	

Table 8 shows the fourth iteration process with respect to the value of fourth rank dependency (Dependent = 5), resulting in K1 sub-factor as level 4 and in Table 9 shows the fifth iteration process, taking into account the fifth rank dependency value (Dependent = 4) K11 as level five, while in Table 10 shows the sixth iteration process with respect to the smallest dependency value (Dependent = 3) yields sub-factor K12, K13, and K14 as level six.

Table 8 Iteration IV (K1)

	Reachability set	Antecedent set	Intersection set	Level
K1	1	1,11,12,13,14	1	IV
K11	1,11,12,13,14	11,12,13,14	11,12,13,14	
K12	1,11,12,13,14	12,13,14	12,13,14	
K13	1,11,12,13,14	12,13,14	12,13,14	
K14	1,11,12,13,14	12,13,14	12,13,14	

Table 9 Iteration V (K11)

	Reachability set	Antecedent set	Intersection set	Level
K11	11,12,13,14	11,12,13,14	11,12,13,14	V
K12	11,12,13,14	12,13,14	12,13,14	
K13	11,12,13,14	12,13,14	12,13,14	
K14	11,12,13,14	12,13,14	12,13,14	

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

Table 10 Iteration VI (K12, K13. K14)

	Reachability set	Antecedent set	Intersection set	Level
K12	12,13,14	12,13,14	12,13,14	VI
K13	12,13,14	12,13,14	12,13,14	VI
K14	12,13,14	12,13,14	12,13,14	VI

4.1. MICMAC ANALYSIS.

MICMAC *(Matrice des Impacts Croises Multiplication Appliquee a un Classement)* is used to analyze Driving Power and Dependence Power of each factor so as to identify which sub-factors are key to moving the analyzed system.

At this stage are grouped sub-factors based on Driving Power (DP) and Dependence (D) as shown in Figure 3. Classification of sub-factors after grouped produces sectors:

Sector 3, Strong driver-strongly dependent variables (Linkage). Sub-factors included in this category are K4, K5, K6, K7, K8, K9, and K10. Where on this sub-factor has strong driving power and dependency, or in other words become the important key that can influence significantly.

Sector 4, Strong driver-weak dependent variables (Independent). Sub-factors fall into this category is K1, K2, K11, K12, K13, and K14. Where this sub-factor has a strong driving force and weak dependence on other sub-factors, it this can also be a sub-factor of success that can influence significantly.

K3 is a special and interesting sub-factor among other sub-factors because it is located squarely on two sectors in sector 3 with sector 4, so it can have two characters. With this position, the K3 sub-factor is very special compared to other sub-factors.

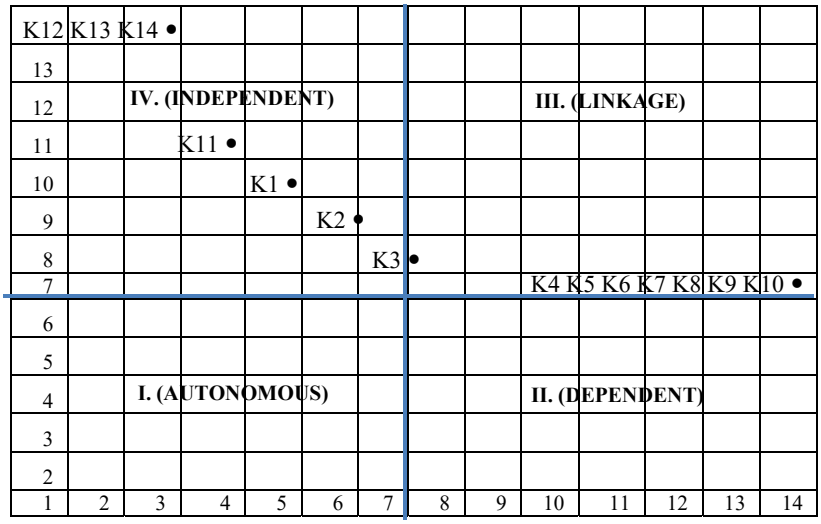

Figure 3: MICMAC analysis for awareness of the implementation of IT Governance

Table 11 below shows a summary of the results of all the influencing sub-factors in awareness of the implementation of Good IT Governance. From the results only get the division into two sectors only, namely the Independent sector and the Linkage sector. There are six sub-factors that enter into the independent sector that is sub-factor K1 (Relieve the work), sub-factor K2 (Accelerate process and time saving), sub-factor K11 (Potential loss big enough in network), sub-factor K12 (Difference point of view about business purpose and IT), sub-factors K13 (ownership of still-bound data) and sub-factor K14 (Lack of technical knowledge). For other sub-factors are in the position of sector Linkage.

Table 11 Summary of the classification results

Variable	Driving Power	Dependence Power	Category
K1	Very High	Low	Independent
K2	Very High	Low	Independent
K3	High	High	Linkage
K4	High	High	Linkage
K5	High	High	Linkage
K6	High	High	Linkage
K7	High	High	Linkage
K8	High	High	Linkage
K9	High	High	Linkage
K10	High	High	Linkage
K11	Very High	Low	Independent
K12	Very High	Low	Independent
K13	Very High	Low	Independent
K14	Very High	Low	Independent

4.2. ISM MODELING

Figure 4 is the end result of a series of processes using ISM methods in the form of models of several factors influencing awareness in the implementation of IT Governance. From the figure is based on the hierarchy that the higher sub-factor has a strong influence on sub-factor below it.

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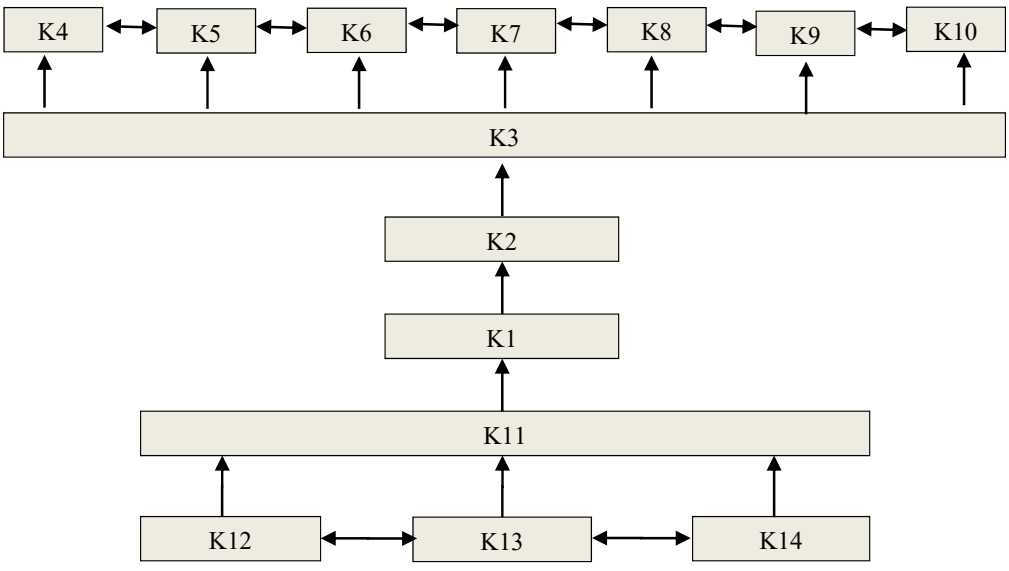

Figure 4 ISM model for awareness of IT Governance implementation.

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

5. DISCUSSION AND CONCLUSIONS

The results of this study have identified a number of 14 sub-factors of four factors: benefits, risk reduction, opportunities, and obstacles, which can qualitatively affect awareness in the implementation of IT Governance to achieve success. Sub-factors have been analyzed using the Interpretive Structural Model (ISM) method, which has been able to classify the overall sub-factor by splitting into two sectors based on Driver Power (DP) and Dependent (D) into the hierarchical structure based on its rating, so that important sub-factor of awareness of the implementation of IT Governance has been found.

K12 sub-factors (different viewpoints concerning business and IT objectives), K13 sub-factors (ownership of still-bound data) and K14 sub-factors (lack of technical knowledge). All three of these sub-factors become the foundation or foundation for the other sub-factors especially those located on the position above.

The final result of this research, sub-factor K3 (improving the quality of information), from the analysis of MICMAC, lies in the coordinate position (8.7) where the location of this coordinate is the boundary between Independent sector and Linkage sector. It can be interpreted that this sub-factor has strong Driver Power (DP) and Dependent (D), but may also be weak if the sub-factor at the lower level is less supportive. The K3 sub-factor can be achieved if supported by sub-factor K2 (accelerate the process and save time) and get support also from K1 sub-factor (can alleviate the work) and K11 sub-factor (network problem to avoid loss or always kept smooth).

K4 sub-factor (cost-effective), K5 sub-factor (business loss can be reduced), K6 sub-factor (delay can also be avoided), K7 sub-factor (potentially in competitive advantage), K8 sub-factor new), sub-factor K9 (opportunity to increase productivity) and K10 sub-factor (can provide added value and profit). These six sub-factors are the key sub-factor, therefore top management leaders should focus and fully concentrate on giving very serious attention.

6. IMPLICATIONS

Interpretative Structural Modeling Methods (ISM) can find several key sub-factors that can have a major impact on awareness of IT Governance implementation, besides this method can provide an overview of the hierarchical relationship between sub-factors. This is very important to know because most policymakers usually focus on just one sub-factor. The Interpretative Structural Modeling Method used in this study provides a clear picture to policymakers to better understand the key sub-factors, which is very influential in the implementation of IT Governance. Decision makers should be aware of the importance of a key sub-factor in awareness of the implementation of IT Governance, although based on expert opinions. The results of this study will certainly help a lot in implementing better, more effective and more efficient IT Governance. In addition, it can also help to create and develop strategic and tactical plans for policymakers within an organization. The Key sub-factors are encouraged to be optimized, while less important sub-factors need to be paid attention and get special attention so that in the future be expected can to give the satisfactory result.

From a series of analytical processes using the ISM method for awareness of the implementation of IT Governance, it is helpful to find and know key sub-factors where it is important in relation to policy by the organization's leaders. In the ISM method used is different from other models such as AHP and TOPSIS, because it not only finds priorities but also provides information about hierarchical relationships between sub-factors, which does not apply to AHP and TOPSIS methods. Therefore, ISM method is very special and has advantages compared with other methods.

The important thing to note in the ISM method is the accuracy (validation) of the data. The data taken must come from a reliable and scientifically reliable source. Therefore need to involve some experts in accordance with the field. Experts involved should have specific criteria to be invited to discuss so that later results obtained have validation that can be relied upon.

7. FUTURE RESEARCH

In this study, it is limited to only 4 factors and 14 sub-factors have been found to be issues that focus on IT Governance awareness, and perhaps in the future, there will be more to be found, especially on sub-factors. We assume that the addition of reference and literature review in subsequent research can be used to enrich insight and knowledge primarily with the addition of sub-factors. Certain factors may experience addition or even subtraction of sub-factors. This research uses

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

ISM method that tends to qualitative, for further research can be used quantitative, so that can complement each other. For quantitative purposes, the data taken can be through the spread of the questionnaire by involving many people. Data was processed using statistical processing or using Structural Equation Modeling (SEM) and validity testing was done mathematically, so this was different compared to ISM method.

ACKNOWLEDGEMENTS

The author would like to thank the friends of Doctoral Program of the Computer Science University of Indonesia force 2016 for their support so that this research can be completed well and smoothly as expected. This research is a Thesis Grant for the doctoral student of University of Indonesia with number: 1562 / UN2.R3.1 / PPM.00.01 / 2018, besides this research has too no conflict of interest with anyone and any group.

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