

ISMS Evaluation Using KAMI Index v.4 Based on ISO/IEC 27001:2013 (Case Study: Koperasi XYZ)

I Putu Noven Hartawan¹, Made Sudarma² and Widyantera, I.M.O.^{3*}

¹Department of Electrical and Computer Engineering, Post Graduate Program, Udayana University

^{2,3}Department of Electrical and Computer Engineering, Udayana University

*oka.widyantera@unud.ac.id

Abstract Koperasi are one of the main pillars in supporting the Indonesian economy. Koperasi are based on the principle of kinship. Capital from the koperasi business is obtained from all its members. Koperasi XYZ has 1341 members. The koperasi XYZ savings and loan unit uses an information system to manage data. The application of this information provides a gap in the security of member information. In order to maintain the trust of members, the koperasi XYZ must take steps to secure the information held. Information Security Management System (ISMS) is a policy that can be taken to solve information security problems. ISO / IEC 27001 is an international standard in the application of ISMS. The Ministry of Communication and Informatics released the KAMI index evaluation alt which is SNI ISO / IEC 27001. The ISMS audit on the koperasi XYZ shows that the importance of electronic systems in the koperasi XYZ is included in the high category. And the US index results show that the koperasi XYZ is not yet feasible / meets ISO / IEC 27001: 2013 standards.

Keywords—Koperasi, ISMS, ISO. KAMI.

I. INTRODUCTION

KOPERASI as one of the main pillars in supporting the Indonesian economy, koperasi are based on the principle of kinship. Therefore, koperasi in Indonesia have helped the wheels of the economy, especially for the middle to lower class communities. Capital from the koperasi business is obtained from all its members, so that the running of this business must match the aspirations and needs of all.

Koperasi XYZ has a savings and loan unit. This unit handles financial transactions such as member savings, savings, time deposits, loans, and various other savings and loan products. The members of the Koperasi XYZ are 1341 members. All data is managed using the application. There are 4 applications used by the koperasi, namely recording / transaction applications, finance, mobile collectors, mobile members. Because the koperasi XYZ has implemented an information system from the system for internal koperasi management to information to members. Application of this information system will provide a gap in member information security. Organizations / companies must understand that information is a very valuable asset so that it must be properly protected and managed [1]. Koperasi with good management can support the success of the koperasi in increasing income and member trust [2]. Actions that can be taken in an effort to manage koperasi properly is to secure member information.

Policies that can be taken by organizations to overcome information security problems are to implement an Information Security Management System (ISMS) [2]. An ISMS is a collection of policies and procedures for systematically managing sensitive data belonging to an organization. The purpose of the ISMS itself is to minimize risks and ensure business continuity in a proactive manner to limit the impact of security breaches. The ISMS must also refer to existing national or international standards so that the quality of the security provided is high and is able to overcome any problems.

ISO 27001 is a standard issued by the International Organization for Standardization. ISO 27001 is a standard that is intended to assist companies in protecting the security of company assets and to protect an information security management system (ISMS) [3]. The Indonesian National Standard in the application of ISO / IEC 27001 is to use the KAMI v.4 index evaluation tool. The KAMI Index is an evaluation tool released by the Ministry of Communication and Information Technology [4].

By using the KAMI v.4 index the researcher wants to know the level of maturity and readiness of the koperasi XYZ for information security.

II. KAMI INDEX V.4

The KAMI index is an evaluation tool to analyze the level of information security readiness in an organization. This evaluation tool is not intended to analyze the

feasibility or effectiveness of existing forms of security, but rather as a tool to provide an overview of the readiness conditions (completeness and maturity) of an information security framework to the leadership of the agency / company. Evaluation is carried out on various areas that are the target of implementing information security with a scope of discussion that also meets all security aspects defined by the ISO / IEC 27001: 2013 standard [5].

The evaluation form applied in the KAMI index is designed to be used by an organization of various levels, sizes, and levels of importance of using ICT in supporting the implementation of existing processes. The data used in this evaluation will later provide an overview of the readiness index from the aspects of completeness and maturity of the applied information security framework and can be used as a comparison in order to formulate corrective steps and determine priorities. This KAMI Index evaluation tool can be used by organizations on a national scale, as well as small ones.

The evaluation process is carried out through a number of questions in each of the areas below.

- 1) Category of Electronic Systems used by Agencies
- 2) Information Security Governance
- 3) Information Security Risk Management
- 4) Information Security Framework
- 5) Information Asset Management, and
- 6) Information Technology and Security
- 7) Supplement: Evaluation areas for aspects of Safeguarding Third Party Involvement Service Providers, Safeguarding Cloud Infrastructure Services (Cloud Service) and Protection of Personal Data

III. METHODOLOGY

Fig. 1 describes the flow of conducting an audit. There are several stages, namely: data collection, audit with the US Index, final result analysis and suggestions for improvements.

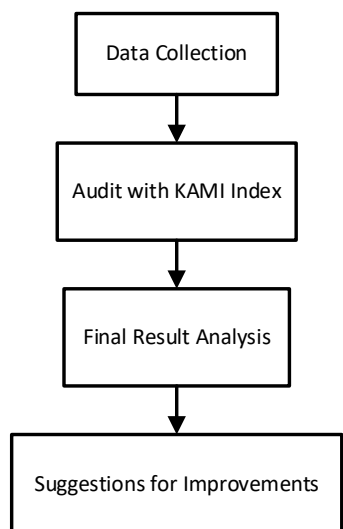


Figure 1 Audit Flow

A. Data Collection

At this stage there will be data collection related to the information system used in the koperasi XYZ. Data obtained by conducting interviews with all koperasi managers who use the system.

B. Audit with KAMI Index

The KAMI index v.4 is carried out by the management of the koperasi. The information systems that are audited are all information systems implemented in the koperasi XYZ. The information system owned by the koperasi XYZ is a transaction management system, financial system, collector's mobile application and member mobile application.

C. Final Result Analysis

At this stage an analysis of the results of the KAMI index score is carried out. Drawing conclusions about the readiness of the koperasi XYZ in terms of ISMS is carried out at this stage. The conclusion is used to determine the suggestions that will be given at the next stage.

D. Suggestions for Improvements

After analyzing the results of the KAMI index, we will provide suggestions for improvement for each question in the existing area. The suggestions given aim to improve the ISMS that will meet the requirements of the ISO / IEC 27001: 2013 standard.

IV. RESULT AND DISCUSSION

This section will explain the results of the ISMS analysis at the Koperasi XYZ using the KAMI v.4 index. There are 6 sections, namely: electronic system category, governance, risk, framework, asset management and technology. As well as an additional part, namely supplements. Here is an explanation.

A. Electronic System Category

The first part of the KAMI index determines the category of electronic systems in the koperasi XYZ. This category (Table 1) is used in determining the level of interest of koperasi in using electronic systems. The level of importance is used to determine the range of values required in the evaluation results. There are 10 questions in this section. Each question has 3 assessment criteria, namely: A = 5, B = 2, C = 1.

TABLE I
ELECTRONIC SYSTEM CATEGORY

Low		Final Score		Status
10	15	0	174	Not Feasible
		175	312	Need Improvement
		313	535	Enough
		536	645	Good
High		Final Score		Status
16	34	0	272	Not Feasible
		273	455	Need Improvement
		456	583	Enough
		584	645	Good

Strategic		Final Score		Status
35	50	0	333	Not Feasible
		334	535	Need Improvement
		536	609	Enough
		610	645	Good

The results of the assessment of the level of importance of electronic use in the koperasi XYZ get a score of 16, so that the koperasi XYZ is included in the high category in the interest of using electronic systems.

B. Governance

Table II states that the governance assessment of the koperasi XYZ gets a total score of 24 out of the 22 questions given. The maturity level of koperasi in the governance section is I +.

TABLE II
GOVERNANCE LEVEL

Control Category	Question	Score
1	8	2
2	8	22
3	6	0
Total	22	24

The maturity level of I + in the Governance section shows that the koperasi XYZ is only at the initial stage in handling governance.

C. Risk

Table III shows that the risk assessment on the koperasi XYZ gets a total value of 19 out of the 16 questions given. The level of maturity of the koperasi in the risk section is I +.

TABLE III
RISK LEVEL

Control Category	Question	Score
1	10	15
2	4	4
3	2	0
Total	16	19

The maturity level of I + in the risk section shows that the koperasi XYZ has just arrived at the initial stage of risk handling.

D. Framework

Table IV shows that the research framework on the koperasi XYZ gets a total score of 49 from the 29 questions given. The level of maturity of koperasi in this part of the framework is I +.

TABLE IV
FRAMEWORK LEVEL

Control Category	Question	Score
1	12	19
2	10	30
3	7	0
Total	29	49

The maturity level of I + in the framework section shows that the koperasi XYZ has only reached the initial stage of handling the framework.

E. Asset Management

Table V shows that the ISMS asset management research at the koperasi XYZ gets a total score of 89 out of the 38 questions given. The maturity level of the koperasi in the asset management section is II.

TABLE V
ASSET MANAGEMENT LEVEL

Control Category	Question	Score
1	24	59
2	10	30
3	4	0
Total	38	89

Maturity level II in the asset management section shows that the koperasi XYZ has only reached the stage of implementing a basic framework in handling asset management.

F. Technology

Table II states that the governance assessment in the koperasi XYZ gets a total score of 70 out of the 26 questions given. The maturity level of koperasis in the technology sector is II.

TABLE VI
TECHNOLOGY LEVEL

Control Category	Question	Score
1	14	28
2	10	36
3	2	6
Total	26	70

Maturity level II in the technology sector shows that the koperasi XYZ is only at the initial stage in handling technology.

G. Supplement

To find out the readiness of the koperasi XYZ for rapid technological developments, where there are new information security risks. There are three new risk areas in the supplement section which are listed in Table VII.

TABLE VII
RESULT SUPPLEMENT AREA

Area	Q	Score	%
Safeguarding the Engagement of Third-Party Service Providers	27	2.19	73%
Safeguarding Cloud Infrastructure Services (Cloud Service)	10	2.00	67%
Personal Data Protection	16	1.75	58%

In the supplement section, the third party engagement security area with a value of 2.19 if presented to 73%, the cloud infrastructure service security area with a value of 2.00 if presented becomes 67%, the personal data protection

area with a value of 1.75 if presented to 58%. Among the three areas in the supplement section none of them reached 100%, so it can be concluded that the koperasi XYZ has not met the requirements in the supplement section.

H. Final Result Analysis

Fig. 2 describes the overall assessment of the KAMI v.4 index. It can be seen that the level of maturity of the koperasi XYZ in all parts is at level I-II. The score obtained is 251 out of a total score of 645.

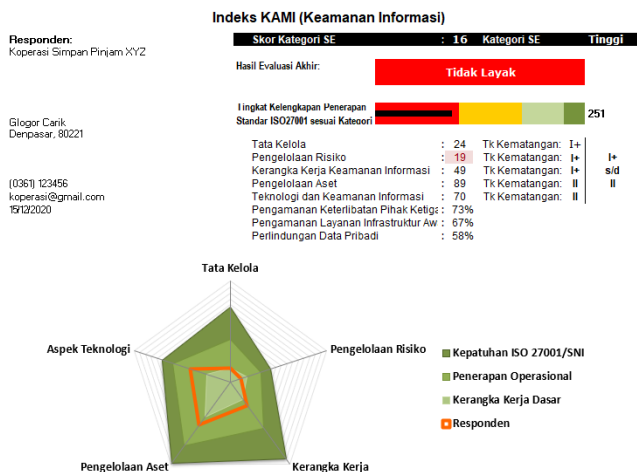


Figure 2 Dashboard KAMI Index of Koperasi XYZ

From the overall level of maturity obtained, it shows that the koperasi XYZ is only at the initial stage in the application of the ISMS. Based on the koperasi XYZ electronic system category which is high and the total score obtained is 251, it can be concluded that the koperasi XYZ is still not worthy of the ISO / IEC 27001: 2013 standard.

I. Suggestions for Improvements

After conducting an assessment with the KAMI v.4 index and knowing the results of each section. The next stage is to make recommendations in the form of suggestions for each question whose assessment status is still lacking. Recommendations are given to questions that score 0 or not. Table VIII is one of the suggested improvements given.

TABLE VIII
SUGGESTIONS FOR IMPROVEMENTS

No.	Question	Status	ISO
2.2	Does your agency/company have a function or division that specifically has the task and responsibility of managing information security and maintaining compliance?	Is not done	A.6.1.1 A.6.1.2
Suggestion for Improvements			
It is necessary to create a division or work unit that specifically handles information security. If it cannot be			

done, assign the employee a task to conduct a temporary information security evaluation.

V. CONCLUSION

From the results of research conducted at the Koperasi XYZ with the KAMI v.4 index based on ISO / IEC 27001: 2013, the following conclusions were obtained:

1. The result of the assessment for the electronic system category is 16 out of a total of 50. This shows that the Koperasi XYZ has high needs for the use of electronic systems. Where the use of electronic systems cannot be separated from the work process
2. The total score of the KAMI Index is 251 out of a total of 645. This shows that the maturity level of the Koperasi XYZ is at level I-II. Where this is still in the initial conditions and conditions for implementing the basic framework for implementing information security.
3. Based on the results of the evaluation of the KAMI v.4 index, it states that the Koperasi XYZ is not yet feasible / meets ISO / IEC 27001: 2013 standards.
4. Researchers provide recommendations to create a special division in handling ISMS. Policies also need to be made to reinforce the ISMS. The ISMS evaluation needs to be done twice a year to find out the progress of the ISMS in the koperasi.
5. By evaluating the KAMI v.4 index so that you can find out about analyzing the readiness of the ISMS contained in the Koperasi XYZ. So that the koperasi can take corrective steps towards unfulfilled questions in the KAMI v.4 index based on ISO / IEC 27001: 2013.

REFERENCES

- [1] D. Proença and J. Borbinha, *Information security management systems - A maturity model based on ISO/IEC 27001*, vol. 320. Springer International Publishing, 2018.
- [2] D. M. Wiharta and N. P. Sastra, "Pembinaan manajemen koperasi berbasis teknologi informasi di kabupaten klungkung," vol. 19, no. April, pp. 210–215, 2020.
- [3] S. Ariyani and M. Sudarma, "Implementation Of The ISO / IEC 27005 In Risk Security Analysis Of Management Information System," vol. 6, no. 8, pp. 1–6, 2016.
- [4] M. Kurnianto and D. Anggraini, "Analysis of Complete Levels and Level of Maturity Security Information Social Insurance Companies Using Kami Index Version 3.1," vol. 4, no. 3, pp. 340–346, 2019.
- [5] "INDEKS KAMI | bssn.go.id." <https://bssn.go.id/indeks-kami/> (accessed Jan. 05, 2021).