Journal of Artificial Intelligence and Engineering Applications

Website: https://ioinformatic.org/

15th June 2025. Vol. 4. No. 3; e-ISSN: 2808-4519

Information Technology Governance Audit at STIKOM Artha Buana Kupang Using ITIL Version 4

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Abstract

In the ever-evolving digital era, advances in information and communication technology affect various aspects of life, including education. STIKOM Artha Buana, as a higher education institution, has an important role in preparing competent human resources. However, there are problems in information technology governance management, especially in the administration department, which results in inefficiency and slow response to user needs. This research aims to evaluate information technology services at STIKOM Artha Buana by applying Availability Management, Problem Management, Capability Management, and Change Control work practices from the Information Technology Infrastructure Library V4. The methodology used includes qualitative and quantitative data analysis with data collection through surveys, interviews and questionnaires to identify non-compliance and non-conformity of processes that hinder service performance. As a result of this research, the author provides strategic recommendations for improving information technology governance at STIKOM Artha Buana to improve incident management, operational efficiency, and IT risk management, thereby supporting the achievement of the vision and mission of STIKOM Artha Buana as a superior higher education institution in the field of information technology.

***Keywords**: Audit, Availability Management, Capacity Management, Change Control, ITIL V4 Framework, Problem Management.*

1. Introduction

In today's digital era, the development of information and communication technology continues to progress rapidly and affects almost all aspects of life, including the education sector. Appropriate utilisation of information technology can improve productivity, operational efficiency, and provide more interactive and accessible education services for students [1].

As a higher education institution that focuses on the field of information technology, STIKOM Artha Buana has an important role in preparing competent human resources in the digital era. However, in its implementation, there are still various obstacles in the management of information technology service governance, especially in the administration section. The system used is not optimal and has not completely replaced the manual process, causing inefficiency, service delays, and data access difficulties for students and staff.

An information technology governance audit is a strategic step to obtain a comprehensive overview of the current state of the service, while identifying non-compliance and non-conformity of processes that have the potential to hinder service performance. Audit activities not only serve as an evaluation tool, but also as a means to improve service quality, ensuring the alignment of information technology services with the institution's strategic goals [2].

To support these improvements, the Information Technology Infrastructure Library (ITIL) V4 framework is one solution that can be implemented. This framework offers best practices in information technology service management through the Service Management Practices domain, which includes several important subdomains such as Availability Management, Problem Management, Capacity Management, and Change Control. By adopting these practices, it is expected that information technology services at STIKOM Artha Buana can be more optimal, efficient, and adaptive to the needs of the digital era, and support the achievement of the institution's vision and mission [3].

2. Methodology

The framework used in this research is the Information Technology Infrastructure Library (ITIL) version 4, which is a globally recognised information technology service management framework designed to help organisations manage IT services effectively, efficiently, and in line with business needs in the digital era [4]. ITIL V4 focuses on a value-driven approach and continuous service improvement. In this research, the focus is on the Service Management Practices domain which consists of four subdomains, namely Availability Management, Problem Management, Capacity Management, and Change Control. This framework was chosen because it is

able to provide best practice guidelines in improving the quality of information technology services at STIKOM Artha Buana [5]. This research uses qualitative and quantitative to provide a comprehensive picture of the governance of information technology services at STIKOM Artha Buana.

The research process includes six main stages: literature review, problem analysis, data collection, data analysis, recommendations and evaluation, and conclusions and suggestions.

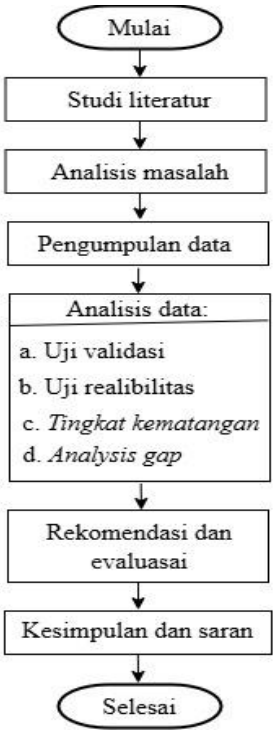

Fig. 1. Research Phases

2.1 Literature Study

The first stage was a literature study to collect data and compile a theoretical basis, with references in the form of journals, manuals, and previous research.

2.2 Problem Analysis

In the second stage, the author analyses the problem, determines the domain and sub-domain, and determines the sample and population.

1. there are problems in the management of information technology governance, especially in the administration, which results in inefficiency and slow response to user needs.
2. The domain used is Service Management Practices which consists of four subdomains, namely Availability Management, Problem Management, Capacity Management, and Change Control. These domains and subdomains were chosen because they are suitable for overcoming problems in the administration, which result in inefficiency and slow response to user needs.
3. The determination of respondents in this study is based on the total population at STIKOM Artha Buana which consists of 175 people, with details of 165 students and 10 lecturers / staff. To determine the minimum number of samples required, the author uses the Slovin formula with a margin of error of 10% [6], the calculation is as follows:
   Description:
   N = Population size (total number of population members)
   n = Required sample size
   e = Margin of error
   Known:

$$n = \frac{N}{1 + N\ x\ (e)^2} \quad \text{.....(1)}$$

$$n = \frac{175}{1 + 175\ x\ (10\%)^2}$$

$$n = \frac{175}{1 + 175\ x\ 0{,}01}$$

$$n = \frac{175}{1 + 1.75} \quad n = \frac{175}{2.75} = 63.64$$

Based on the calculation, the minimum sample size required with a 10% margin of error is 63.64. To anticipate invalid data, this research set 64 respondents from students and lecturers/technicians of STIKOM Artha Buana.

2.3 Data Collection

1.Interview
At this stage the researchers conducted direct interviews with the leadership, lecturers and students of STIKOM Artha Buana regarding the problems that occurred. The questions asked were in the form of obstacles faced in the use of information technology services implemented at STIKOM Artha Buana.
2.Observation
Observation is done by observing information technology devices in the form of hardware, software and administrative processes that run at STIKOM Artha Buana.
3.Questionnaire
The questionnaire in this study was developed based on three main indicators, namely usability, ease of use and satisfaction. Before being used in the main data collection, the questionnaire was tested on 30 respondents to test its validity and reliability. Validity is assessed by comparing the significance value of 0.05, if the significant value is ≤ 0.05, it is declared valid while ≥ 0.05 is declared invalid, while reliability is tested using the Cronbach's Alpha value through SPSS software, with a minimum limit of 0.60 [7]. The results of this test are the basis for revising the statement items so that the instruments used are truly valid and reliable.
After the statement items on the questionnaire are declared valid and reliable, the next step is to distribute questionnaires to 64 respondents, namely students and lecturers / staff of STIKOM Artha Buana for the data collection process.

2.4 Data Analysis

The collected data was analysed using a descriptive statistical approach, to determine the average value of each statement item in order to obtain the maturity level of each subdomain used. The maturity level used is level 0 - level 5 [1], which is presented in the following table:

Table 1: Maturity level

Level	Maturity Model	Measuring Scale
0	None	0.00 - 0.50
1	Initial	0.51 – 1.50
2	Repeatable	1.51 – 2.50
3	Defined	2.51 – 3.50
4	Managed	3.51 – 4.50
5	Optimised	4.51 – 5.00

In this study, the authors used a Likert scale which aims to determine the extent to which the respondents agree or disagree with the statements given in the questionnaire contained in table 2 as follows:

Table 2: Likert ccale

No	Statement	Score
1	Strongly agree	5
2	Agree	4
3	Disagree	3
4	Disagree	2
5	Strongly disagree	1

3. Results and Discussion

3.1. Description of Respondents

Of the 64 respondents with a percentage of 100%, the most respondents were male with 34 respondents with a total percentage of 53% and female respondents as many as 30 respondents with a total percentage of 47% which are contained in the following table:

Table 3: Profile of respondents in gender category

Gender		
Gender	**Number of respondents**	**Submit a reply % of the total**
Male	34	53%
Women	30	47%
TOTAL	64	100%

Of the 64 respondents with a percentage of 100%, the most respondents were students with 55 respondents with a total percentage of 86% and lecturer / staff respondents totalling 9 respondents with a percentage of 14% which are contained in the following table:

Table 4: Profile of respondents in status category

Status		
Status	**Number of respondents**	**Submit a reply % of the total**
Lecturer	9	14%
Student	55	86%
TOTAL	64	100%

3.2. Validity and Reliability Test

3.2.1. . Validity test

After the data is analysed using SPSS, a significant value (sig) is obtained for each statement item in the questionnaire. Items are declared valid if the sig value generated is smaller than 0.05 [7]. The validity test results for all questionnaire items are presented in the following table:

Table 5: Validity Test Results

Subdomain	Item	Sig value	Description
Availability management	P1	000	Valid
	P2	000	Valid
	P3	000	Valid
	P4	000	Valid
	P5	001	Valid
	P6	000	Valid
	P7	000	Valid
	P8	000	Valid
	P9	000	Valid
Problem management	P10	000	Valid
	P11	000	Valid
	P12	000	Valid
	P13	000	Valid
	P14	000	Valid
	P15	000	Valid
	P16	000	Valid
	P17	000	Valid
	P18	001	Valid
	P19	000	Valid
Capacity management	P20	000	Valid
	P21	002	Valid
	P22	001	Valid
	P23	001	Valid
	P24	000	Valid
	P25	000	Valid
	P26	000	Valid
	P27	000	Valid
Change control	P28	001	Valid
	P29	000	Valid
	P30	000	Valid
	P31	000	Valid
	P32	000	Valid
	P33	000	Valid
	P34	000	Valid
	P35	000	Valid
	P36	000	Valid

Based on the validity test results in table 5, all statement items in the questionnaire are declared valid because they have a significance value (Sig.) below 0.05. Thus, the questionnaire instrument used is suitable for use in the data collection process of this study.

3.2.2. Reliability Test

Reliability testing in this study was carried out to ensure that the questionnaire instrument used had a good level of consistency in measuring the variables studied. Reliability testing is important so that the data obtained is truly reliable and can be used in the further analysis process. The Cronbach's Alpha value is used as a reference in determining the reliability of the instrument, provided that a value above 0.60 indicates that the questionnaire is classified as reliable [6].

Table 6: Reliability Test Results

No	Subdomain	*N of items*	*Cronbach's Alpha*	*Limit of reliability*	Criteria
1	*Availability management*	9	0,818	0,60	Reliabel

2	*Problem management*	10	0,866	0,60	Reliabel
3	*Capacity management*	8	0,806	0,60	Reliabel
4	*Change control*	9	0,861	0,60	Reliabel

Based on the results of the reliability test using the Cronbach's Alpha value, all sub domains in this study show reliable results because each has a value above the minimum limit of 0.60. Thus, all questionnaire instruments in the four sub domains have good consistency and are suitable for use in data collection in this study.

3.3. Maturity level

After collecting data through distributing questionnaires to 64 respondents consisting of students, lecturers, and education staff at STIKOM Artha Buana, an analysis was then carried out to measure the maturity level of information technology services in the availability management, problem management, capacity management, and change control subdomains which are the focus of the research. The analysis is carried out by calculating the total score of each statement item based on a Likert scale of 1 - 5, the average of each statement item is obtained, then the maturity level value is calculated by means of the total SUM score divided by the result of the number of respondents multiplied by the number of statement items to determine the position of service achievements in the maturity level category [8] if described in the formula then as follows:

$$maturity\ level = \frac{\text{Total skor } (SUM)}{\text{Jumlah soal } x \text{ jumlah responden}} \quad \text{.....(2)}$$

The maturity level value obtained is then compared with the predetermined level criteria, in order to determine the maturity position and recommendations needed for service improvement.

Table 7. Maturity level availability management

Availabiliti management						
No	**Statement**	**Responden**	**Total score**	**Average of each item**	**Expectation level**	***Maturity level***
1	Layanan TI di STIKOM Artha Buana tersedia untuk digunakan sesuai dengan waktu yang dijadwalkan.	64	246	3,84	Level 4 3.50 – 4.50	3,67
2	Saya merasa bahwa layanan TI sering tersedia tanpa gangguan yang signifikan.	64	223	3,48		
3	Infrastruktur dan aplikasi yang digunakan di STIKOM Artha Buana dirancang untuk memenuhi tingkat ketersediaan yang diperlukan.	64	238	3,71		
4	Target ketersediaan yang disepakati sesuai dengan kebutuhan pengguna.	64	229	3,57		
5	Saya merasa bahwa pemantauan ketersediaan membantu dalam mendeteksi masalah sebelum berdampak pada pengguna.	64	218	3,40		
6	Ketersediaan layanan TI mendukung saya dalam menjalankan tugas akademik dan administratif dengan baik.	64	255	3,98		
7	Pemantauan ketersediaan layanan dilakukan secara rutin dan efektif.	64	241	3,76		
8	Layanan ketersediaan data selalu tersedia dan mudah diakses untuk analisis lebih lanjut.	64	239	3,73		
9	Analisis data ketersediaan dilakukan secara berkala untuk mengidentifikasi tren dan pola.	64	229	3.57		
Total score SUM			2.118			

Hasil perhitungan maturity level pada subdomain Availability Management pada 9 item pernyataan menunjukkan nilai 3,67, yang masuk dalam kategori Level 4 (Dikelola). Ini menandakan bahwa pengelolaan ketersediaan layanan teknologi informasi di STIKOM Artha Buana sudah dilakukan secara terstruktur dan sesuai dengan standar yang diterapkan, sehingga layanan dapat diandalkan dalam memenuhi kebutuhan pengguna.

Table 8: Maturity level problem management

Problem management						
No	**Statement**	**Respond en**	**Total score**	**Average of each item**	**Expectation level**	***Maturity level***
1	Saya sering mengalami masalah yang berulang dalam penggunaan layanan TI di STIKOM Artha Buana.	64	219	3,42	Level 4 3.50 – 4.50	3.74
2	Sistem yang digunakan mampu mendeteksi masalah duplikat dan berulang dengan efektif.	64	223	3,48		
3	Terdapat visi yang jelas guna menghindari terulangnya insiden yang terjadi di perusahaan	64	234	3,65		
4	Solusi yang diterapkan berdasarkan analisis akar penyebab efektif dalam mengatasi masalah.	64	243	3,79		
5	Tim TI secara aktif mengidentifikasi dan mencatat masalah yang terjadi dalam layanan.	64	249	3,89		
6	Setelah masalah dilaporkan, tim TI biasanya menyelesaikan masalah tersebut dalam waktu yang wajar.	64	249	3,89		
7	Sebagian masalah besar yang saya laporkan telah diselesaikan oleh tim TI.	64	254	3,96		
8	Setelah penyelesaian masalah, tinjauan dilakukan untuk menyoroti efektivitas solusi yang diterapkan.	64	243	3,79		
9	Setelah masalah terselesaikan, tim TI mengambil Langkahlangkah untuk mencegah terulangnya masalah yang sama.	64	240	3,75		

Problem management						
No	**Statement**	**Respond en**	**Total score**	**Average of each item**	**Expectation level**	***Maturity level***
10	Saya merasa bahwa tim TI memenuhi ekspektasi saya terkait waktu dan kualitas penanganan masalah.	64	240	3,75		
Total score SUM			2.394			

The results of the maturity level calculation in the problem management subdomain on 10 statement items show a value of 3.74, which is included in the Level 4 (Managed) category. This shows that the problem management process at STIKOM Artha Buana has been running quite well and structured, where most problems can be handled effectively, and steps to prevent recurring problems have begun to be applied consistently.

Table 9: Maturi level capacity management

Capacity management						
No	**Statement**	**Responden**	**Total score**	**Average of each item**	**Expectation level**	***Maturity level***
1	Layanan TI di STIKOM Artha Buana memiliki kapasitas yang optimal untuk memenuhi kebutuhan pengguna.	64	225	3,51	Level 4 3.50 – 4.50	3.53
2	Saya merasa bahwa layanan TI dapat menangani beban puncak dengan baik.	64	224	3,5		
3	Saya merasa bahwa kebutuhan kapasitas saat ini dan masa depan telah diidentifikasi dengan baik.	64	219	3,42		
4	Saya jarang menunggu lama untuk mendapatkan jawaban dari layanan TI.	64	217	3,39		
5	Waktu respos layanan TI di STIKOM Artha Buana relatif cepat.	64	235	3,67		
6	Saya merasa bahwa banyak tugas dapat diselesaikan dalam waktu yang relatif singkat.	64	223	3,48		
7	Saya merasa bahwa tim TI mampu merespons perubahan permintaan dengan cepat dan efisien.	64	239	3,73		
8	solusi yang diterapkan untuk optimasi kapasitas efektif dalam meningkatkan kinerja layanan.	64	229	3,57		
Total score SUM			1.811			

The results of the calculation of the maturity level in the capacity management subdomain on 8 statement items indicate a value of 3.53, which is included in the level 4 (managed) category. This indicates that capacity management at STIKOM Artha Bauana has been running quite well and structured, which is able to meet user needs, handle peak loads, and respond to requests and changes quickly and effectively.

Table 10: Matury level change control

Change control						
No	**Statement**	**Responden**	**Total score**	**Average of each item**	**Expectation level**	***Maturity level***
1	Prosedur perubahan layanan TI di STIKOM Artha Buana cukup kompleks dan detail.	64	226	3,53	Level 4 3.50 – 4.50	3,62
2	Proses identifikasi perubahan yang terjadi dilakukan secara sistematis dan menyeluruh.	64	227	3,54		
3	Implementasi perubahan dilakukan sesuai dengan rencana yang telah ditetapkan.	64	235	3,67		
4	Pengujian dilakukan untuk memastikan bahwa perubahan tidak menyebabkan masalah baru.	64	235	3,67		
5	Implementasi perubahan layanan TI dilakukan secara bertahap dan kontrol yang ketat.	64	233	3,64		
6	Informasi mengenai perubahan yang akan dilakukan selalu diinformasikan secara efektif kepada semua pemangku kepentingan.	64	236	3,68		
7	Uji coba dilakukan untuk memastikan bahwa perubahan tidak menyebabkan masalah baru dalam sistem.	64	233	3,64		
8	Dokumentasi terkait perubahan diperbarui dengan lengkap dan akurat setelah implementasi.	64	227	3,54		
9	Evaluasi pasca-implementasi dilakukan untuk menilai efektivitas perubahan.	64	234	3,65		
Total score SUM			2.086			

The results of the calculation of the maturity level in the change control subdomain on 9 statement items indicate a value of 3.62, which is included in the level 4 (managed) category, this indicates that the IT service change process at STIKOM Artha Buana has been well run and structured, starting from identification, planning, implementation, to post-implementation evaluation.

3.4. Gap Analisys

Gap is done to find out the difference between the current state of maturity and the expected level of expectation [4], if formulated as follows:

Expectation level - Matury level .....(3)

The results of the gap can be the basis for providing recommendations for improvement to improve service quality in accordance with the expected targets of STIKOM Artha Buana.

Table 11: Gap analisys

No	Subdomain	Maturity level	Expectation level	Level 4 index value	Gap	Description
1	*Availability Management*	3,67	Level 4	3.50 – 4.50	0	Achieving the target
2	*Problem Management*	3,74	Level 4		0	Achieving the target
3	*Capacity Management*	3,53	Level 4		0	Achieving the target
4	*Change control*	3,62	Level 4		0	Achieving the target
	Average	3,64				

Based on the results of the calculation, all subdomains of information technology services at STIKOM Artha Buana have reached Level 4 (Managed) in accordance with the level 4 expectation (managed) because the maturity level value of each subdomain has passed the lower limit of the level 4 category, namely 3.50, which means that each sub domain has reached the expected target.
However, to achieve level 4 with a maximum index value of 4.50, there is still a gap in each subdomain. The availability management subdomain has a gap of 0.83, problem management of 0.76, capacity management of 0.97, and change control of 0.88. Although all subdomains have met the Level 4 category target, the gap shows that there is still room for improvement that needs to be done so that the IT service management process in each area can achieve optimal results and be ready for Level 5 (Optimised).

4. Conclusion

All subdomains that have been evaluated have successfully reached Level 4 (Managed) maturity level in accordance with the established expectation level of level 4 (managed).
Although all subdomains have met the Level 4 (Managed) category, there are still gaps in each subdomain to reach the maximum Level 4 value, which is 4.50. The gaps are 0.83 for availability management, 0.76 for problem management, 0.97 for capacity management, and 0.88 for change control..
These results indicate that the information technology service governance process at STIKOM Artha Buana has been running well, effectively, and according to established standards. However, to maintain the sustainability of service quality and improve the performance of IT services optimally, improvements and strengthening are needed in each subdomain in order to reach the maximum level of maturity and prepare for Level 5 (Optimised).

5. Advice

Based on the conclusions obtained from the results of the maturity level audit of information technology services at STIKOM Artha Buana, the authors provide several recommendations that can be proposed as follows:

1. *Availability management*
   It is necessary to strengthen the process of monitoring service availability on a regular basis, improve service disruption mitigation procedures, and optimise system documentation in order to reduce the gap of 0.83 towards the maximum achievement of Level 4 and preparation for Level 5.
2. *Problem management*
   It is recommended to increase the effectiveness of root cause analysis, accelerate the process of handling recurring incidents, and improve the IT team's ability to detect and resolve problems so that the gap of 0.76 can be minimised.
3. *Capacity management*
   More mature and accurate information technology resource capacity planning, regular workload monitoring, and service capacity evaluation are needed to ensure the system can accommodate current and future needs, so that the gap of 0.97 can be minimised.
4. *Change control*
   The change control process needs to be further tightened through complete documentation, pre-implementation testing, and consistent post-implementation evaluation, in order to close the gap of 0.88 towards the maximum score of Level 4.

Acknowledgements

Thanks to my parents who always support me, I also thank Mrs Mardhalia Saitekela as my supervisor who has guided me in doing this research.

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