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Credit Analysis Tool System Application Using Cobit 4.1 Method Approach

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Abstract— *The application of credit analysis is required by the Bank to achieve the objectives appropriately, successful in implementing in a timely manner. The application being audited has the objective of testing whether the control is in accordance with the procedure or not. Use of COBIT 4.1 as an appropriate guide to audit SABAK applications. Researchers use COBIT 4.1 to get the final audit results so that companies can find out the mistakes that occur in the application. In addition, the company can evaluate and improve the system that runs on a proposed system of researchers. Overall, SABAK gained level 4.1.*

Keywords— *Audit, COBIT 4.1, Credit Analys, Bank, Maturity Level*

I. INTRODUCTION

The development of technology can grow rapidly due to the progress of culture and civilization levels in humans, because the more advanced culture than the technology will continue to grow[1]. The development of information technology especially in Indonesia is increasing rapidly with the modernization in the technology-based software to business activities run in each company as a medium of information, the information system that can help bring the message in real time to smooth business in each company. The role of the Information System is significant that of course must be balanced with the proper arrangements and management so possible losses may be avoided [2].

To ensure that the audit process is carried out properly or in accordance with procedures, it is necessary to analyze the activities therein, so that it can be seen whether what has been done has achieved the objectives to be achieved by an organization or can still be further enhanced by adding elements of assessment that will improve the quality part of the assessed organization[3].

Based on the XYZ Annual Report in 2016, there are 4 types of operational performance of the operating segment. One of them is Medium Distribution by Sector. Many of the middle segments in question include, Industry, Trade, Agriculture, Business Services, Construction, Mining, and others listed in the report. By 2015, the total loan from all middle segments is 51,147 Milliar Rupiah. During the following year, the total loan from all segments was 61,330 billion rupiah. Loan growth in 2015 to 2016 was 19.99% [4].

The banks recognize the need for a system that can assist in the process of analyzing the financial aspects and risk profile of the prospective borrower, so that the analysis process can be done more quickly, accurately and consistently. Credit Analysis Tools System (SABAK) into a system that will be implemented in XYZ to answer this.

One way of controlling the information system is to audit the information system. Information system audit is conducted to find out how far the implementation of the system in accordance with the objectives and avoid fraud, so as to create good governance. To perform the information system audit process, the method used is the COBIT framework 4.1. The election of COBIT in this study is because it provides internationally accepted standards for technological management practices and references [5].

Inadequate management of the Credit Analysis System will impact on the low quality of service, the level of customer satisfaction, so that it can affect the stakeholders' trust in the institution. Thus, it is necessary to evaluate this SABAK application in order to provide the role of good information technology.

II. METHOD

Management of Academic Information System that is not well managed will affect the low quality of service, low level of customer satisfaction, so that it can affect the level of trust stakeholders of the institution [6]. The method used to find the best solution is COBIT 4.1 (Control Objectives for Information and Related Technology). COBIT is a set of documentation and guidance that leads to IT Governance and management that can help auditors, management, and users to bridge the divide between business risk, control needs, and technical problems that occur [7].

The COBIT framework is a collection of best practices and is generic, is used as a reference in determining the control objectives and IT processes required in IT management. The COBIT framework identifies 34 IT processes grouped into 4 main domains: Plan and Organize (PO), Acquire and Implement (AI), Deliver and Support (DS), and Monitor and Evaluate (ME) domains. Each domain has different characteristics [8]. Furthermore, management will benefit in IT investing decisions along with infrastructure, strategic IT plan planning, choosing an information architecture and system procurement [9].

COBIT is divided into 4 main domains:

- 1) Plan and Organize (PO) - This domain covers strategy and tactics, and concerns the identification of the way IT can best contribute to the achievement of the business objectives. The realization of the strategic vision needs to be planned, communicated and managed for different perspectives. A proper organization as well as technological infrastructure should be put in place.
- 2) Acquire and Implement (AI) - To realize the IT strategy, IT solutions need to be identified, developed or acquired, as well as implemented and integrated into the business process. In addition, changes in and maintenance of existing systems are covered by this domain to make sure the solutions continue to meet business objectives.
- 3) Deliver and Support (DS) - This domain is concerned with the actual delivery of required services, which includes service delivery, management of security and continuity, service support for users, and management of data and operational facilities.
- 4) Monitor and Evaluate (ME) - All IT processes need to be regularly assessed over time for their quality control and compliance with requirements. This domain addresses performance management, monitoring of internal control, regulatory compliance and governance.

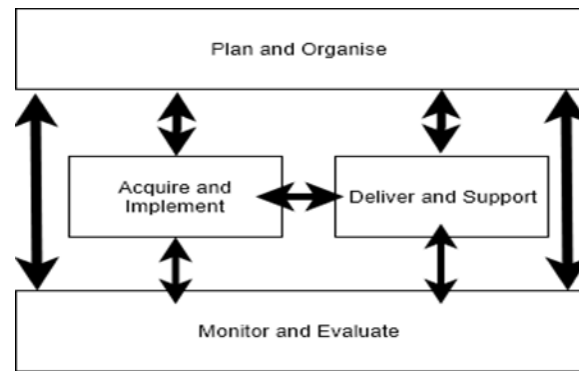


Fig 1 Main Domain of Cobit 4.1

The framework used in this study is based on the COBIT 4.1 framework

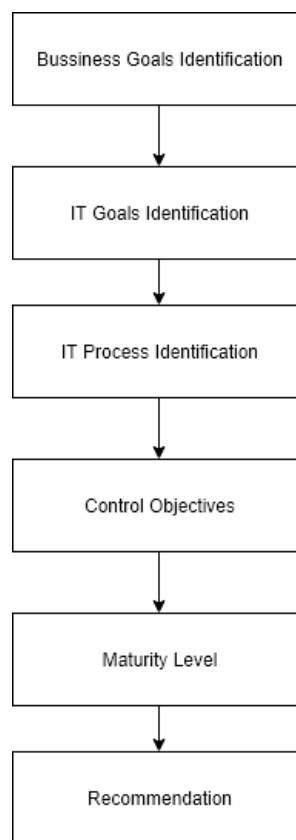


Fig. 2 COBIT Framework 4.1 [10]

The following Framework Descriptions will be applied to this research:

- 1) Business Goals Identification - This stage will be done Credit Risk analysis that exists in SABAK for a description of where the direction of this application will be addressed. Then the business goals are adjusted according to the views of the existing domain in COBIT 4.1
- 2) IT Goals Identification - This stage will be identified objectives based on Credit Risk on the application. This stage, the goal of IT Goals will be obtained by connecting business goals with IT Goals based on COBIT 4.1.

- 3) IT Process Identification - At this stage will be identified process, information technology that has been predetermined. At this stage the process of information technology will be obtained from the linkage between the information technology process that runs in the process of information technology based on COBIT 4.1 framework.
- 4) Control Objectives - Control Objectives are part of the details of the information technology process, where not all objective controls will be used in the information technology process.
- 5) Maturity Level - In the fifth stage of this study is the maturity level calculation, in accordance with the maturity model based on the COBIT framework 4.1.

Measurement of maturity level is set at COBIT for management level and enables managers to know how IT management and processes are in the organization so that it can be known at what level of management. The maturity model of COBIT is a tool used to measure how well IT management processes relate to internal IT controls that are also related to the organization's business objectives [9]. In general, the maturity level assessment range is described as follows:

- 1) Level 0 (non-existent) - The company has no management in a process, not even being able to assess what issues to consider. On this scale, it is important to evaluate the controls and serve as important findings.
2. Level 1 (initial level) The company has been aware of issues to consider. The company does not have standardized processes, but an informal process that tends to be applied individually on a case by case basis and in general (still reactive or in line with unannounced needs), the approach has not been well organized. On this scale, the probability of risk occurrence is not as large as 0 (zero) scale.
3. Level 2 (repeatable level) - The company already has a pattern for managing processes based on repeated experience that has been done before. However, the pattern has not been standardized and communicated, and there has been no formal training to every employee regarding the procedure so that the expertise of the expert staff is limited, in addition to the responsibility given entirely to the individual so that the possibility of irregularities may occur.
4. Level 3 (Defined level) - Management has succeeded in creating standard of management of related processes, and has been communicated, although not yet implemented in an integrated, but has been required in its implementation. The procedure is still simple and inadequate, has not got the evaluation process, so there is still the possibility of deviation.
5. Level 4 (Managed level) - The process has been closely monitored and evaluated as to the extent of compliance with the established procedures, and is able to take the necessary action if the existing process does not work properly. Various automated tools and systems are being used even if they are limited.
6. Level 5 (Optimized level) - The process has reached the level of Best Practices (best guidelines) due to continuous improvement and comparison with other companies. Information technology is used in running the workflow. Provide tools supporting the effectiveness and quality of processes that encourage corporate adaptation to the changes.

The Decision Support System (DSS) is interactive, computer-based systems and subsystems intended to help decision makers in using communication technologies, data, documents, knowledge and/or models to complete decision process tasks, explain in[11].

III. Result

This stage determines the information technology process in accordance with COBIT standard. To identify Business Goals from SABAK, researchers use their application function as Business Goals. The concentration of application functions to be audited is the Credit Risk section. Credit Risk There are 3 parts in it. Namely Credit Application, Risk Ratings, and Reporting and Analysis. These three sections will be in the process of identifying Business Goals to conclusions.



Fig. 3 Credit Risk Management Ambit Optimist

A. Business Goals Identification

At this stage will be mapping between Business Goals SABAK with table from COBIT 4.1 to identify. Of the three concentrations of application functions, the following identification results obtained Business Goals:

Table I
Linking Business goals SABAK to COBIT 4.1 Business Goals

No	Function of SABAK	No	Business goals COBIT	Business goals perspective COBIT
1	Credit Application	9	Obtain reliable and useful information for strategic decision making.	A Customer perspective
2	Risk Rating	1	Provide a good return on investment of IT-enabled business investments.	Financial Perspective
		2	Manage IT-related business risk.	Financial Perspective
		3	Improve corporate governance and transparency	Financial Perspective
		9	Obtain reliable and useful information for strategic decision making	A Customer perspective
		11	Lower process costs.	An Internal perspective
3	Reporting and analysis	1	Provide a good return on investment of IT-enabled business investments	Financial Perspective
		2	Manage IT-related business risk.	Financial Perspective
		3	Improve corporate governance and transparency	Financial Perspective
		15	Improve and maintain operational and staff productivity.	An Internal perspective

B. IT Goals Identification

After identifying the Business Goals, the researcher identifies IT Goals in accordance with the existing COBIT. Here's an explanation of the identified COBIT IT Goals:

Table II
Identification of Business Goals of IT Goals

No	IT Goals
2	Respond to governance requirement in line with board direction
4	Optimize the use of information
7	Acquire and maintain an integrated, standardized application systems
8	Acquire and maintain an integrated, standardized IT infrastructure
11	Ensure seamless integration of application in business process
12	Ensure transparency and understanding of IT cost, benefits, strategy, policies and service levels
13	Ensure proper use and performance of the application and technology solutions
14	Account for and protect all IT assets
15	Optimize the IT infrastructure, resources, and capabilities
17	Protect the achievement of IT objectives
18	Establish clarity of business impact of risk to IT service disruption or change
19	Ensure that critical and confidential information is withheld from those who should not have access to it
20	Ensure the automated business transaction and information exchange can be trusted
21	Ensure that IT services and infrastructure can properly resist and recover from failures due to error, deliberate attack or disaster
22	Ensure minimum business impact in the event of an IT service disruption or change
24	Improve IT's cost-efficiency and its contribution to business profitability.

C. IT Process Identification

The next stage, establishing IT Process that is in line with COBIT. The following explanation of the IT Process has been identified and the selection of what domain will be used:

Table III.
IT Process Identification

No	IT Domain	IT Process
1	Plan and Organize	PO1, PO2, PO3, PO4, PO5, PO6, PO9, PO10
2	Acquire and Implementation	AI2, AI3, AI4,
3	Deliver and Support	DS1, DS3, DS6, DS11
4	Monitor and Evaluation	ME1, ME4

D. Control Objectives

After the IT Process is identified, the scope of auditing SABAK applications uses the processes used in the auditing:

1) PO1 Defined a Strategic Plan

IT strategic planning is required to manage and direct all IT resources in line with the business strategy and priorities. For that then do the questions related to the cobit itself, as follows:

PO1.1 IT Value Management

PO1.2 Business-IT Alignment

PO1.3 Assessment of Current Capability and Performance

PO1.4 IT Strategic Plan

PO1.5 IT Tactical Plans

PO1.6 IT Portfolio Management

2) *PO2 Define the Information Architecture*

This process improves the quality of management decision-making by ensuring that reliable and secure information is provided, and this allows the rationalization of information systems resources to adapt business strategy appropriately.

PO2.1 Enterprise Information Architecture Model

PO2.2 Enterprise Data Dictionary and Data Syntax Rules

PO2.3 Data Classification Scheme

PO2.4 Integrity Management

3) *PO3 Determine Technological Direction*

This process examines how technology is planned and what or how it is planned and also looks at what technology standards are.

PO3.1 Technological Direction Planning

PO3.2 Technology Infrastructure Plan

PO3.3 Monitor Future Trends and Regulations

PO3.4 Technology Standards

PO3.5 IT Architecture Board

4) *PO4 Define the IT Processes, Organization and Relationships*

An IT organization is defined by considering requirements for staff, skills, functions, accountability, authority, roles and responsibilities, and supervision. This organization is embedded into an IT process framework that ensures transparency and control as well as the involvement of senior executives and business management

PO4.1 IT Process Framework

PO4.2 IT Strategy Committee

PO4.3 IT Steering Committee

PO4.4 Organisational Placement of the IT Function

PO4.5 IT Organisational Structure

PO4.6 Establishment of Roles and Responsibilities

5) *PO5 Management the IT Investment*

A framework is established and maintained to manage IT-enabled investment programs and that encompasses cost, benefits, prioritization within budget, a formal budgeting process and management against the budget.

PO5.1 Financial Management Framework

PO5.2 Prioritization Within IT Budget

PO5.3 IT Budgeting

PO5.4 Cost Management

PO5.5 Benefit Management

6) *PO6 Communicate Management Aims and Direction*

This process looks at how companies communicate between company policies and rules

PO6.1 IT Policy and Control Environment

PO6.2 Enterprise IT Risk and Control Framework

PO6.3 IT Policies Management

PO6.4 Policy, Standard and Procedures Rollout

PO6.5 Communication of IT Objectives and Direction

7) *PO9 Assess and Manage IT Risks*

The framework documents a common and agreed-upon level of IT risks, mitigation strategies and residual risks.

PO9.1 IT Risk Management Framework

PO9.2 Establishment of Risk Context

PO9.3 Event Identification

PO9.4 Risk Assessment

PO9.5 Risk Response

PO9.6 Maintenance and Monitoring of a Risk Action Plan

8) *PO10 Manage Projects*

This process is undertaken a defined project and program management approach applied to IT projects and facilitates stakeholder participation overseeing project risks and project progress

PO10.1 Program Management Framework

PO10.2 Project Management Framework

PO10.3 Project Management Approach

PO10.4 Stakeholder Commitment

PO10.5 Project Scope Statement

9) *AI2 Acquire and Maintain Application Software*

Applications are made available in line with business requirements. This process covers the design of the applications, the proper inclusion of application controls and security requirements, and the development and configuration in line with standards. This allows organizations to properly support business operations with the correct automated applications.

AI2.1 High-level Design

AI2.2 Detailed Design

AI2.3 Application Control and Auditability

AI2.4 Application Security and Availability

AI2.7 Development of Application Software

10) AI3 Acquire and Maintain Technology Infrastructure

Provides the right platform for business applications in accordance with the IT architecture and defined technology standards

AI3.1 Technological Infrastructure Acquisition Plan

AI3.2 Infrastructure Resource Protection and Availability

AI3.3 Infrastructure Maintenance

AI3.4 Feasibility Test Environment

11) AI4 Enable Operation and Use

Knowledge of the new system is available. This process requires the production of documentation and manuals for users and IT, and provides training to ensure the proper use and operation of applications and infrastructure

AI4.1 Planning for Operational Solutions

AI4.2 Knowledge Transfer of Business Management

AI4.3 Knowledge Transfer to End Users

AI4.4 Knowledge Transfer to Operations and Support Staff

12) DS1 Define and Manage Service Levels

Effective communication between IT management and business customers regarding services required is enabled by a documented definition of and agreement on IT services and service levels. This process also includes monitoring and timely reporting to stakeholders on the accomplishment of service levels. This process enables alignment between IT services and the related business requirements.

DS1.1 Service Level Management Framework

DS1.2 Definition of Services

DS1.3 Service Level Agreements

DS1.4 Operating Level Agreements

DS1.5 Monitoring and Reporting of Service Level Achievements

13) DS3 Manage Performance and Capacity

The need to manage performance and capacity of IT resources requires a process to periodically review current performance and capacity of IT resources. This process includes forecasting future needs based on workload, storage and contingency requirements. This process provides assurance that information resources supporting business requirements are continually available.

DS3.1 Performance and Capacity Planning

DS3.2 Current Performance and Capacity

DS3.3 Future Performance and Capacity

DS3.4 IT Resources Availability

DS3.5 Monitoring and Reporting

14) DS6 Identify and Allocate Costs

The need for a fair and equitable system of allocating IT costs to the business requires accurate measurement of IT costs and agreed with business users on fair allocation. This process includes building and operating a system to capture, allocate and report IT costs to the users of services. A fair system of allocation enables the business to make more informed decisions regarding the use of IT services.

DS6.1 Definition of Services

DS6.2 IT Accounting

DS6.3 Cost Modelling and Charging

DS6.4 Cost Model Maintenance

15) DS11 Manage Data

Effective data management requires identifying data requirements. The data management process also includes the establishment of effective procedures to manage the media library, backup and recovery of data, and proper disposal of the media. Effective data management helps ensure the quality, timeliness and availability of business data.

DS11.1 Business Requirements for Data Management

DS11.2 Storage and Retention Arrangements

DS11.3 Media Library Management System

16) ME1 Monitor and Evaluate IT Performance

Effective IT performance management requires a monitoring process. This process includes defining relevant performance indicators, systematic and timely reporting of performance, and prompt acting upon deviations. Monitoring is needed to make sure that the right things are done and are in line with the set directions and policies

ME1.1 Monitoring Approach

ME1.2 Definition and Collection of Monitoring Data

ME1.3 Monitoring Method

ME1.4 Performance Assessment

17) ME4 Provide IT Governance

Establishing an effective governance framework includes defining organizational structures, processes, leadership, roles and responsibilities to ensure that enterprise IT investments are aligned and delivered in accordance with enterprise strategies and objectives.

ME4.1 Establishment of the IT Governance Framework

ME4.4 Resource Management

ME4.5 Risk Management

ME4.6 Performance Measurement

E. Maturity Level

Maturity level obtained from the average questionnaire distributed to respondents a number of 8 respondents. The application can now be seen from the calculation of maturity level, which can be seen in the following table

Table IV. Maturity Level of Domain Plan and Organize

No	Domain	Process	Average Level
1	PO1	Defined a Strategic IT Plan	4,4
2	PO2	Define the Information Architecture	3,3
3	PO3	Determine Technological Direction	4,3
4	P04	Define the IT Processes, Organization and Relationships	4,2
5	P05	Managing the IT Investment	4,2
6	P06	Communicate Management Aims and Direction	4,2
7	P09	Assess and Manage IT Risks	4,3
8	P010	Manage Projects	4,3
Average Amount			33,1
Average			4,1

In Table IV, it can be concluded that the average in the Plan and Organize domains is at level 4 (defined) which already has the best strategy, tactics, and identification contribution for the company

Table V Maturity Level of Acquire and Implement

No	Domain	Process	Average Level
1	AI2	Acquire and Maintain Application Software	4,1
2	AI3	Acquire and Maintain Technology Infrastructure	4,2
3	AI4	Enable Operation and Use	4,2
Average Amount			12,4
Average			4,1

In Table V, it can be concluded that the average of Acquire and Implement domains is at level 4 (defined). That implementation is good enough.

Table VI. Maturity Level of Deliver and Support

No	Domain	Process	Average Level
1	DS1	Define and Manage Service Levels	4,2
2	DS3	Manage Performance and Capacity	4,1
3	DS6	Identify and Allocate Costs	4,2
4	DS11	Manage Data	4,1
Average Amount			16,5
Average			4,1

In Table VI, Deliver and Support obtains level 4. On the delivery or delivery aspects of IT is quite good.

Table VII. Maturity Level of Monitor and Evaluate

No	Domain	Process	Average Level
1	ME1	Monitor and Evaluate IT Performance	4,1
2	ME4	Provide IT Governance	4,0
		Average Amount	8,1
		Average	4,0

In Table VII, it can be concluded that the average in the Monitor and Evaluate domain is at level 4. In this domain will be emphasized to the importance of all information technology, processes need to be accessed periodically to maintain quality and conformity with predefined standards

Table VIII Overall Maturity Level 4 Domains

No	Domain	Average Level
1	Plan and Organize	4,1
2	Acquire and Implement	4,1
3	Deliver and Support	4,1
4	Monitor and Evaluate	4,0
Average End Result		4,1

In Table VIII is the last result of the whole domain and it is concluded in this study that the end result is level 4.

IV. CONCLUSION

In the Plan and Organize, Acquire and Implement, and Deliver and support domains have the same value of 4.1. Monitor and Evaluate got a score of 4. From this research, it is concluded that SABAK is at level 4 (Managed). The process has been closely monitored and evaluated as to the extent of compliance with established procedures, and is able to take the necessary action if the existing process does not work properly. Various automated tools and systems are being used even if they are limited. SABAK is optimal to get level 4. But there is a weak domain among other domains. Namely PO2 Define the Information Architecture. An evaluation of the domain is required.

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