2011 International Conference on Electrical Engineering and Informatics
17-19 July 2011, Bandung, Indonesia

Using Organizational Culture Approach and COBIT Framework in Designing of Information Technology Governance on Non ministrial Government Institute (LPNK), Case Study: Center for Scientific Documentation and Information – Indonesian Institute of Sciences

Budi Nugroho [#1], Kridanto Surendro [*2]

[#]*Center for Scientific Documentation and Information, Indonesian Institute of Sciences*
Jl. Jend. Gatot Subroto 10 Jakarta - Indonesia
[1]budinugroho78@gmail.com

[*2]*School of Electrical Engineering and Informatics – Bandung Institute of Technology*
Jl. Ganesha 10 Bandung - Indonesia
[2]endro@informatika.org

Abstract— **This study developed IT governance model that can be used to assess the delivery and support of information service in PDII-LIPI. The assessment is conducted through the control and performance indicators based on the COBIT 4.1 framework domain Delivery and Support (DS), adjusted for the condition of IT governance in PDII-LIPI. To examine aspects of policy implementation strategy also conducted an assessment of organizational culture through organizational culture assessment instrument (OCAI) based on the theory of competing values framework. By competing value framework can be mapped up the delivery and support of model maturity level so that it can measure how well the existing processes of information technology and evaluate the aspects that needed to be improved.**

Keywords— **IT governance, COBIT framework, organizational culture, change management, PDII-LIPI.**

I. INTRODUCTION

Center for Scientific Documentation and Information (PDII) is one of organization units in Indonesian Institute of Sciences (LIPI). The management of organization units in LIPI organized by a particular organization management that secure the resources availability to perform main tasks and functions (tupoksi) established by Government of Republic of Indonesia. For securing the organizational resources availibility need an internal operation mechanism with the result that organizational main tasks and functions can be achieved. Internal operation mechanism included two scope areas, first, the organizational activities scope area named organizational governance (enterprise governance), second, management and data/information processing scope area that support organizational decision making process named information technology governance (IT governance).

This study developed IT governance model that can be used to assess the delivery and support of information service in PDII-LIPI. The assessment is conducted through the control and performance indicators based on the COBIT 4.1 framework domain Delivery and Support (DS), adjusted for the condition of IT governance in PDII-LIPI. To examine aspects of policy implementation strategy also conducted an assessment of organizational culture through organizational culture assessment instrument (OCAI) based on the theory of competing values framework. By competing value framework can be mapped up the delivery and support of model maturity level so that it can measure how well the existing processes of information technology and evaluate the aspects that needed to be improved.

II. LITERATURES REVIEW

The use of information technology (IT) today has undergone a huge change from just a tool of the components of the organization's business processes. Lin (2008) states that organizations using IT need to do for IT governance can provide the maximum benefit. IT governance can be described as the management of software and hardware are expected to develop and improve the profitability of information systems and contribute long-term benefits for the organization [1].

Based on the above description, the implementation of IT governance depends on the management of risks associated with IT. DETIKNAS, 2007, in the General Guide Information

978-1-4577-0752-0/11/$26.00 ©2011 IEEE

and Communication Technology Agency (PUTIKN), assurance of value (value) managed IT is a requirement to increase control over information assets. Value of IT (IT value) is a key element of administrative business processes supporting the implementation of IT governance. Achieving value of IT requires a framework (framework) that can control the organization's governance [2].

Implementation of information technology governance in PDII-LIPI still experiencing some problems, among others: demand for research has not been sufficient data, the need for internal information for research purposes does not match records, a lack of attention in training, and lack of attention in the care facilities and technology infrastructure information. This causes low quality of information (information quality) is needed for organizational decision making and information services for users. Lee, et. al. (2002), states that the problem of low quality of information has become a critical concern of organizations and is a research topic of interest in the field of systems and information technology. The growth of data warehouse and direct access to information from various sources by managers and users of information has increased the need for, awareness, and high-quality information within the organization [3].

Increased demand, awareness, and high quality information in an organization requires in-depth study related to aspects of technology and organizational culture. Wijaya (2007) states that the application of information technology to support e-government is the government's efforts to adopt information technology in order to improve the quality of public services. Technology acts as a "tool" that is believed to increase the efficiency and effectiveness of services. Problems in the effectiveness of e-government will touch things related to "organizational problem" by not leaving the "problem of smelly technology." Organizational culture is an organizational problem associated with the problem of implementing e-government readiness [4].

Al Gahtani, S. et. al. (2007), conducting research related to the organizational culture of acceptance and use of IT in organizations using a model based on the theory of "unified of acceptance and use of technology (UTAUT)" [5]. Next Woong Chul Choi and Dae Hun Yoo (2009) assessment of IT governance using the COBIT framework to prioritize IT investments in the organization [6].

PUTIKN addition, in designing IT governance in PDII-LIPI use framework Control Objectives for Information and related Technology (COBIT) version 4.1. COBIT version 4.1 is the standard model of IT management has gained widespread recognition, developed by the Information Technology Governance Institute (ITGI) from Information Systems Audit and Control Association (ISACA). Menurut IT Governance Institute, 2007, states that in version 4.1 is described good practices, domain-domain and process framework (framework) IT is there. In addition, version 4.1 also explains the problems of managing IT processes and forms of activities (process and activity) and has a very logical structure [7].

The success of an organization in managing information as a strategic asset is the ideal function of the infrastructure, processes, people and culture. Davis (2006) put forward a concept of maturity of the organization through a model called the model of the evolution of information (information evolution model). Information Evolution Model is unique because it acknowledges the complex relationships between these dimensions. One very important dimension in management information systems and organizational change are aspects of organizational culture [8].

Cameron & Quinn (1999), defines organizational culture is a social glue that exist within the organization, contains the values, customs, beliefs that characterize the characteristics of the organization and all members of the organization. Cultures become pressure points in organizational change. Organizational Culture Assessment Instrument (OCAI) is a tool used to diagnose / find culture / culture of an organization. OCAI based on a theoretical model called the competing values framework [9].

Arifin (2005) argued that market conditions, product and competition, bringing the management is always faced with the changes. Therefore, a manager's future should be a renewal experts, because the task managers of the future will be more dynamic and challenging. Thus, future managers need to be proactive in the sense of able to anticipate patterns of change in human beings themselves, markets, products and technologies. This means that in realizing the changes must be planned. For that there are three things that need to be done by the managers in the face of change [10]:

1. Improve organizational ability to adapt to changes.
2. Using a dynamic approach to kesisteman as capital for the ongoing changes in the chill.
3. Recognizing the importance of transformation within the framework of organizational development.

All in all a very important role of management becomes even very dominant, as management becomes driving force of change, helped convince the members of the organization that certain changes needed, and become agents for the organization they lead reformer.

According to Palmer, et al (2009) the role of manager changes are based on managers' views on management and expected results of the change process. This is termed by images of managing change and images of change outcomes [11].

Images of managing change is a fundamental characterization of management activities that include planning (planning), organizing (organizing), Commanding (setting), coordinating (coordination), and controlling (control). Management activity is defined as a view which is top down and hierarchical. Because of this organization is treated as if the machine with a variety of instruments that can be used to achieve certain goals. Thus a central role in directing manager of machine organization, told the role of each member, to allocate resources so the organization can operate efficiently, and produce required products or services.

Images of change for outcomes provide the view that management is the process of forming an organization and what happens in it. A picture of a participatory management style that encourages member organizations to be involved in decision making and help identify how the work can be done better. So that more management is defined as managing human being related to how to shape their behavior in ways that encourage them to take action most beneficial to the organization.

Manager-type changes navigator images of managing change control priority (control) in the management actions to achieve planned change by embracing theory kontekstualisme or change process. It is based on the assumption that the change runs differently from time to time and in accordance with organizational context. Program changes need to be planned, and then re-planned as the new information to be clear and varied. In the navigator view, change is a process that unfolds through the interaction of several variables, namely the context, the political process, and the consultations conducted in an organization.

III. METHODS

The research methodology used is mixed methods. Techniques of data collecting conducted are survey research, field research and literature review. Surveys were conducted by using questionnaires to obtain quantitative data. While the field research carried out by using in-depth interviews and observation. Surveys and interviews conducted on key respondents/informants that are supposed to represent groups of related research problems. While the observation of activities carried out by participant observation with making records/documentation. Secondary data collection techniques performed through a literature review based on literature and electronic journals.

In this research, the data collection instrument in the form of closed questionnaires for quantitative analysis phase consists of the organizational culture questionnaire (OCAI) to assess the profile and organizational cultural competencies, management awareness questionnaire to assess the identification of risk management of IT processes, and maturity levels questionnaires to assess the level of maturity, both in condition as is or to be in the process of data management. All three of these questionnaires are designed to complement each other in defining the comprehensive solution in the form of model design and implementation strategy for IT governance improvements in data management processes in PDII-LIPI.

IV. RESULTS

Assessment of management awareness suggest that the majority of respondents in the amount of 42.61% stated that the level of performance in the process of data management in PDII-LIPI is adequate or medium. Furthermore, 39.66% indicated that the level of performance in the process of data management is still low or less. And 17.73%, the remaining states that the level of performance has been good of data management process. This demonstrates the fact that the level of management performance in the PDII-LIPI data are lacking or are likely to be improved.

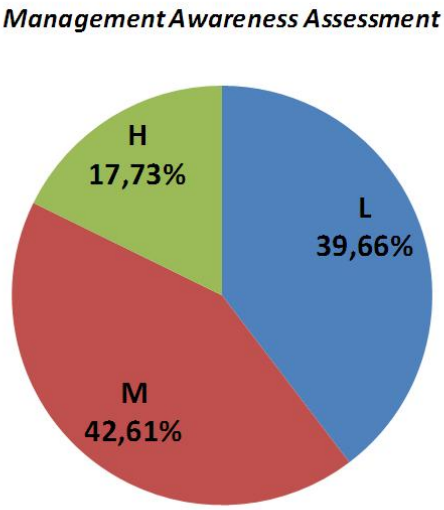

Figure 1. Management Awareness Assessment

Level maturity assessment states that the tendency of the data management process maturity level (DS11) in PDII-LIPI between the existing condition (as is) is at level 2 that is repeatable but intuitive and expected condition (to be) is at level 4, which is managed and measurable. Except on the maturity attribute awareness and communication, level of maturity as is the level 2 repeatable but intuitive while to be at level 3 defined. So generally, there is still a gap between the "as is" conditions and the "to be" condition. Therefore it needed improvement action.

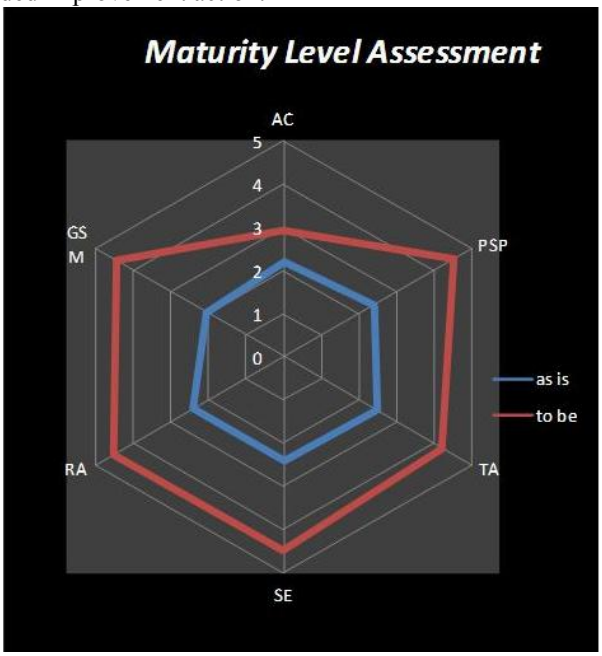

Figure 2. Maturity Level Assessment

The result of organizational culture assessment is clan culture as the most dominant organizational culture in PDII-LIPI. This means the majority of respondents considered that

the PDII-LIPI is a friendly workplace where people share between them. Like a big family. The leaders act as mentors, and even have a figure as a parent. The organization is bound by loyalty and tradition, and high commitment. The organization focuses on long-term benefits from the development of human resources and prioritizes the importance of integrity and morals. The success is defined in terms of relating to sensitivity and respect for human consumers. The organization is very concerned with teamwork, participation, and consensus. This is reinforced by the fact that the majority of respondents wanted the clan culture conditions which are stronger in the future.

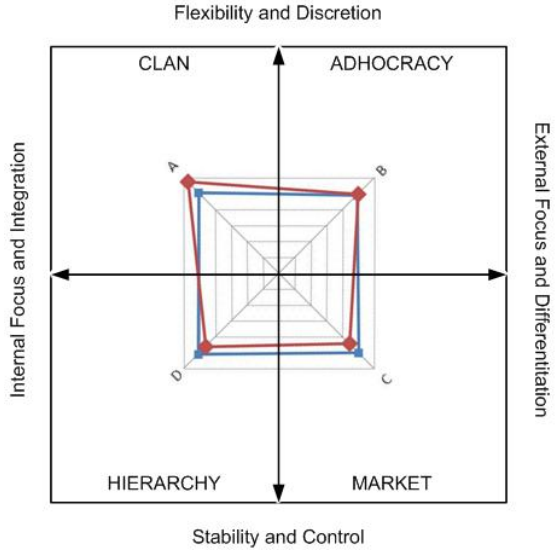

Figure 3. Organizational Culture Assessment

With reference to the three of these questionnaires and the identification the main components of IT governance based on depth interviews and observations of ITBSC and CSF analysis, then the solutions are defined in the form of model design and implementation strategy of IT governance.

V. DISCUSSION

Assessment of organizational culture aims to profile the organization so that it can be seen that dominate organizational culture PDII-LIPI. By getting an idea of cultural profiles, the profiles can be interpreted from the point of view / perspectives. There are at least six standards of comparison: type (type) culture that dominated the organization, the difference (discrepancy) between the current culture with the desired culture, the strength (strength) of the type of culture that dominated the organization, similarity (congruence) of the culture profiles made on different attributes and with that made by different individuals within the organization, comparison (comparison) of an organization's own culture profile with an average owned by other organizations, and alignment (comparability) organization with several trends that have been known.

It can be concluded that the most dominant organizational culture in PDII-LIPI is a clan culture. This means the majority of respondents considered that the PDII-LIPI is a friendly workplace where people share between them. Like a big family. The leaders act as mentors, and even have a figure as a parent. The organization is bound by loyalty and tradition, and high commitment. The organization focuses on long-term benefits from the development of human resources and prioritize the importance of integrity and morals. The success / success is defined in terms of relating to sensitivity / sensitivity and respect for human consumers. The organization is very concerned with teamwork, participation / participation, and consensus. This is reinforced by the fact that the majority of respondents wanted the clan culture conditions which are stronger in the future.

The key to successful implementation of IT governance policies, especially in the management of associated data in organizational culture is the clan is commitment of the leadership. The approach taken in the form of top-down approach so that the leadership acted as coordinator, giving examples as well as determining any measures taken. Also required clarity of vision, mission, strategy and targets to be achieved. Therefore we need also the openness and willingness to change work patterns in the form of cultural change, the efficient use of technology, and innovation as the renewal effort. To bridge these organizations need to build a PDII-LIPI IT user community through a series of training that can be followed by all employees in accordance with their competence.

The data above demonstrates the fact there are problems faced by the organization PDII-LIPI in data management. Soerjono (2001) stated that the problem can be defined as something that can cause a gap, both one's achievement, the performance of a system, the performance of an activity, and the achievement of a plan. The problem has several characteristics that is singular and specific nature, there must be the owner, yet unknown cause, and still within reach of people who handle it [12].

PDII - LIPI in order to carry out the duties and functions upon him, need to optimize the preparation of the plan of activities so that targets can be achieved optimum performance. In order to know the problems faced can be used the problem tree analysis techniques. Tree trouble identifying all the problems in certain conditions and demonstrate the information as a causal relationship.

In the identification problem discussed is related to factors affecting the achievement of particular levels of IT process performance data management is not optimal PDII-LIPI. As for the factors affecting them are:

1. There is awareness of the need for data management (AC).
2. Ownership of data in general have been applied (RA).
3. The need for security in data management have been documented, although still on an individual basis (PSP).
4. Supervision of data management activities have been conducted primarily on such vital activities as backup, restoration, and removal (GSM).
5. Responsible for data management on an informal basis has been established (RA).

Based on the assessment of maturity levels for the conditions to be located on level 4, the characteristics of IT processes, especially data management in PDII-LIPI can be explained as follows:

1. The need for data management has been understood and the necessary actions have been accepted in the organization (AC).
2. Responsibility of ownership and data management are clearly defined, assigned and communicated within the organization (RA).
3. These procedures have been formalized and widely known and performed knowledge sharing (PSP).
4. Use the latest tools have begun to be exploited (TA).
5. Achievement of objectives and performance indicators agreed upon and monitored by the user-defined process (GSM).
6. Formal training on data management staff have been made (SE).

In this research has been produced Model of IT governance in Data Management in PDII-LIPI and the draft Data Management Policy which is focused on managing IT processes, particularly the management of data through the mechanism of guidance, monitoring and evaluation. The design of the policy carried out through four stages, namely: (1) defining the improvement actions, (2) defining performance indicators and objectives, (3) defining IT governance model, and (4) defining the implementation strategy. Next has also produced Model IT Governance Implementation Strategies in Data Management in PDII-LIPI that combines Prosci change management process approach, competency profiles and clan organizational culture in PDII-LIPI and improvement actions based on the six attributes of maturity

VI. CONCLUSIONS

Based on the above results it can be concluded that this study succeeded in providing answers to the problem formulation, goals and outcomes research. As related to the research question it was explained that IT governance is needed in PDII-LIPI because the increasing of growth data and direct access to information from various sources by management and users need for awareness, and high quality information within the organization. While the current policy of PDII-LIPI not fully in compliance with IT governance outlined in PUTIKN and COBIT 4.1. The results also indicate that organizational culture is influential in design of IT governance, especially in the aspects of strategy implementation.

REFERENCES

[1] C. Lin, G. Pervan, and D. McDermit, "A Survey of IS/IT Investment Evaluation Practices in Australia: Some Preliminary Results," Curtin University Departmental Working Paper 20680, 2000. [Online]. http://espace.library.curtin.edu.au/R?func=dbin-jump-full&local_base=gen01-era02&object_id=20680

[2] Kementerian Komunikasi dan Informatika RI, *Peraturan Menteri Komunikasi dan Informatika Nomor 41/PERMEN.KOMINFO/11/2007 tentang Panduan Umum Tata Kelola Teknologi Informasi dan Komunikasi Nasional*. Jakarta, Indonesia: Kementerian Komunikasi dan Informatika RI, 2007.

[3] Y. W. Lee, D. M. Strong, B. K. Kahn, and R. Y. Wang, "AIMQ : A Methodology for Information Quality Assessment," *Information & Management*, no. 40, pp. 133-146, 2002.

[4] S. W. Wijaya, "Budaya organisasi dan efektifitas penerapan e-government," in *Seminar Nasional Aplikasi Teknologi Informasi 2007 (SNATI 2007)*, Yogyakarta, 2007.

[5] S. S. Al Gahtani, G. S. Hubona, and J. Wang, "Information technology (IT) in Saudi Arabia : Culture and the acceptance and use of IT," *Information & Management*, no. 44, pp. 681-691, 2007.

[6] W. C. Choi and D. H. Yoo, "Assessment of IT Governance of COBIT Framework," *Communications in Computer and Information Science*, vol. 62, 2009.

[7] IT Governance Institute, "COBIT 4.1: Framework, Control Objectives, Management Guidelines, Maturity Models," IT Governance Institute, 2007. [Online]. http://www.itgi.org

[8] J. Davis, G. J. Miller, and A. Russell, *Information Revolution, Using the Information Evolution Model to Grow Your Business*. New Jersey, USA: John Wiley & Sons, Inc., 2006.

[9] K. S. Cameron and R. E. Quinn, *Diagnosing and Changing Organizational Culture based on The Competing Values Framework*. San Francisco, United States of America: John Wiley & Sons Inc., 2006.

[10] N. Arifin, "Performing Organization Sebuah Format Pengembangan Organisasional (PO) dalam Era Perubahan," *Jurnal Siasat Bisnis on Human Resources*, no. Edisi Khusus, 2005.

[11] I. Palmer, R. Dunford, and G. Akin, *Managing Organizational Change - A Multiple Perspectives Approach*, 2nd ed. New York, United States of America: McGraw-Hill/Irwin. The McGraw-Hill Companies Inc., 2009.

[12] M. A. Soerjono, *Pemecahan Masalah dan Pengambilan Keputusan (PMPK), Bahan Ajar Diklatpim Tingkat IV*. Jakarta, Indonesia: Lembaga Administrasi Negara-RI, 2001.