ISSN No:-2456-2165

Improving the Quality of the Procurement of Information Systems in the Indonesia Flight Calibration (BBKFP) with Soft System Methodology

Danang Ary Yunanto[1], Saddam Rasis Rabathi[2], Daddy Kadarsan[3], Erry Rimawan[4]
Master of Industrial Engineering, MercuBuana University,
Jakarta, Indonesia

Abstract:- Indonesia flight calibration (BBKFP) is currently developing its business processes to be able to compete in the global market. To support its activities, it is necessary to develop information technology both hardware and software in designing its business processes. Problems of procurement procedures, initial planning that is not optimal as well as the limitations of delivering information from users to developers causes unexpected procurement of information systems projects. The Soft System Methodology (SSM) approach is expected to be able to offer significant substance in managing expectations and requirements for the procurement of information systems. The purpose of this research is to identify the challenges and problems that will be found when carrying out the information system procurement activities at BBKFP. The SSM approach shows that with good and in-depth planning, periodic system reviews, documentation, structured user guides and structured supervision will improve the quality of the information system procurement at BBKFP.

Keywords:- *Procurement, Information system, Soft System Methodology (SSM).*

I. INTRODUCTION

A. Background

Indonesia Flight Calibration Center, hereinafter abbreviated as BBKFP, which is under the Directorate General of Civil Aviation of the Ministry of Transportation, is the representative of State in carrying out its obligations to ensure all service facilities, procedures and aircraft landing and take-off facilities at airports meet standards set by ICAO and the Government of Indonesia.

In supporting its business processes, BBKFP requires effective information technology facilities to improve its performance. The information technology mentioned is in the form of hardware and software with appropriate specifications so that it helps BBKFP in carrying out its business processes as well as the coordination and communication among its divisions. The procedure for procuring information technology facilities is carried out through the auction process. The developer, who wins the auction, will begin to identify the needs of information technology facilities needed by BBKFP.

The experience of procuring information technology facilities at BBKFP has not been maximized or could be said to be a failure, since information technology facilities, especially software, have not been used optimally by users.

B. Problems Formulation

Based on the background above, the formulation of the problems in this paper are as follows:

- How to design a soft system methodology for improving the quality of information system procurement at BBKFP;
- How to create an information system that corresponds to the needs of users at BBKFP.

C. Objectives

The objectives of this writing are as follows:

- To find out the design of soft system methodology for information systems at BBKFP;
- To get recommendations for improvements to be applied in improving the quality of the procurement of information systems at BBKFP.

II. RESEARCH METHODS

The following are the steps taken during the research activities:

- The author conducted interviews with several staff appointed as PICs in the procurement of information technology facilities at BBKFP and also to developers to identify problems arise during the information systems procuring process.
- After recognizing the problems, the author performs the stages of the SSM approach to analyze the problems arise to get problem solutions

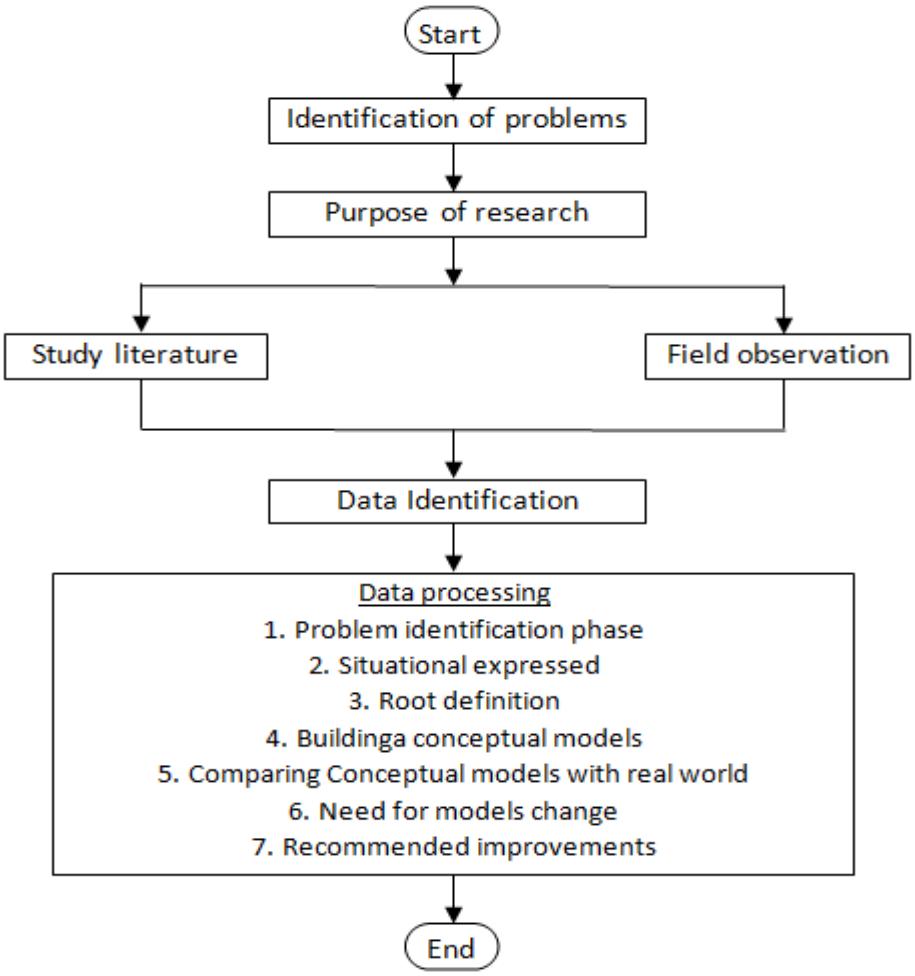

Fig 1:- Flow diagram research method

III. DISCUSSION

The discussion in this chapter is to describe the stages in the soft system methodology (SSM) in improving the quality of the information system procurement at BBKFP.

Problem Identification Phase

The author conducted interviews with several BBKFP staff / personnel and information system developers. The following is a list of respondents related to the research:

Description	Numbers
Internal	
BBKFP Procurement Officer	1 person
AMO Division (Maintenance)	2 persons
AOC Division (Inventory)	2 persons
Training Center Division	2 persons
External	
Developer's programmer	3 persons
Developer's Project Manager	1 person

Table 1:- Research respondent

Based on interviews with prospective user and developer, data was obtained from 3 (three) projects providing information systems that have been and are being developed by companies related to research including:

- Information System for aircraft maintenance data base (2016);
- Aircraft spare parts (inventory) information system (2014);
- Training center Information System (in 2018).

For the aircraft maintenance database information system and inventory information system that was developed in 2016 and 2014 for now it is no longer used by the user because the software is not updated with the growing business.

In general, situational problems are based on findings in the process of procuring information systems that involve developer and user information systems (problem domains) at BBKFP, including:

- Correspondence failure, there is an unstructured coordination process between user and developer, this can complicate adjustments the work which consequently create discrepancy in project management which impact the uncontrolled use of resource including time, people and costs incurred.
- Interaction failure, with a lack of information gained from user interaction with developer during planning, results dissatisfaction from user in using the Information System in which implementation should

help workmanship but in fact it actually adds the user's workmanship.

- Expectation failure, nonconformity in project management that impacts uncontrolled use of resources creates the expectations not distributed to each stakeholder involved in the system.
- Process failure, the absence of standardization applied in the project resulted in repetition of the procedures process, starting from the process of planning, analysis, development both from technical to non-technical aspects.
- Procedure failure, the procedure for procuring information systems is carried out through a procurement contract with the developer within one year, so that after the handover of the goods there is no follow-up actions to the software update from the developer while the business process continues to develop

A. Situational Expressed

From the identification stage of the problem above, a rich picture diagram is made as follows:

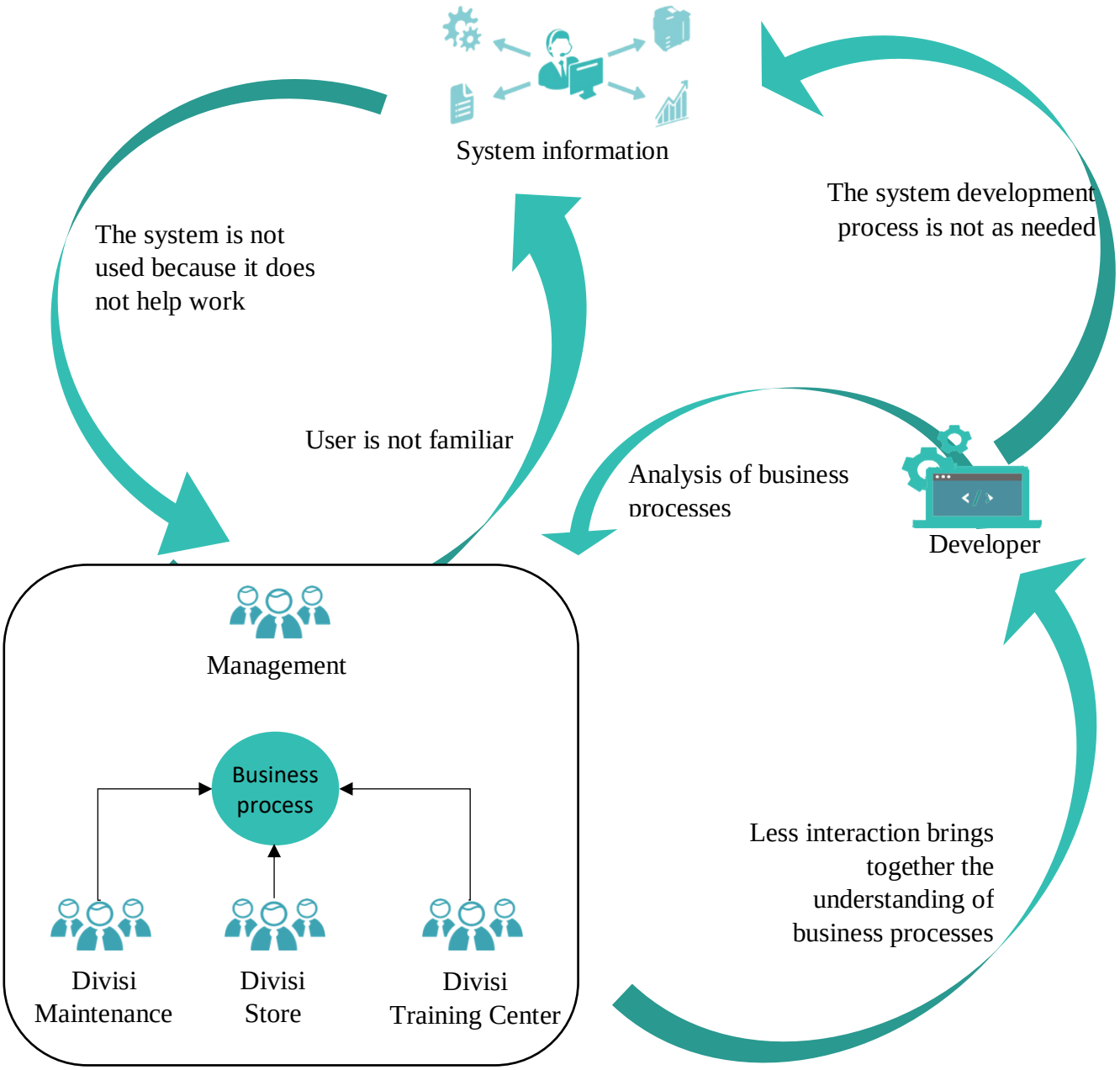

Fig 2:- Diagram rich picture

ISSN No:-2456-2165

B. Root Definition

The right root definition to describe the results of the analysis of the problem situation and rich picture is in the form of a model with the following meanings:

"All staff divisions communicate with each other and exchange information to get a structured process in processing data to be able to create an information system project that is supported by a model that is able to explore, validate, analyze the need to build a new system (Customization) that correspond to the stakeholder's needs ".

Then in this phase a description of the conditions is carried out using the CATWOE formula and the determination of concepts from a different perspective from rich picture. CATWOE consists of customer, actor, transformation, worldview, owner, environment. The following is an analysis with CATWOE on the procurement of information systems at BBKFP.

Customer	Management and internal divisions of BBKFP
Actor	Procurement committee, appointed staff as PIC, developers and consultants
Transformation	The need for a model that is able to explore, analyze and validate needs so that quality information systems can be built and distributed according to the needs of stakeholders
Worldview	Improve the performance and business processes of the company
Owner	BBKFP
Environment	Procurement procedures, standards applied and use of information and technology framework used

Table 2:- CATWOE analysis

C. Building a Conceptual Model

By referring to root definition, then a picture of the conceptual model is developed in identifying the activities needed in the HR development system that was built. This conceptual model is an adaptive process, where the activities of the actors occur and there is feedback between the process and actors in the system. In the initial stage, the actual model will be built, then it will be repaired into a conceptual model.

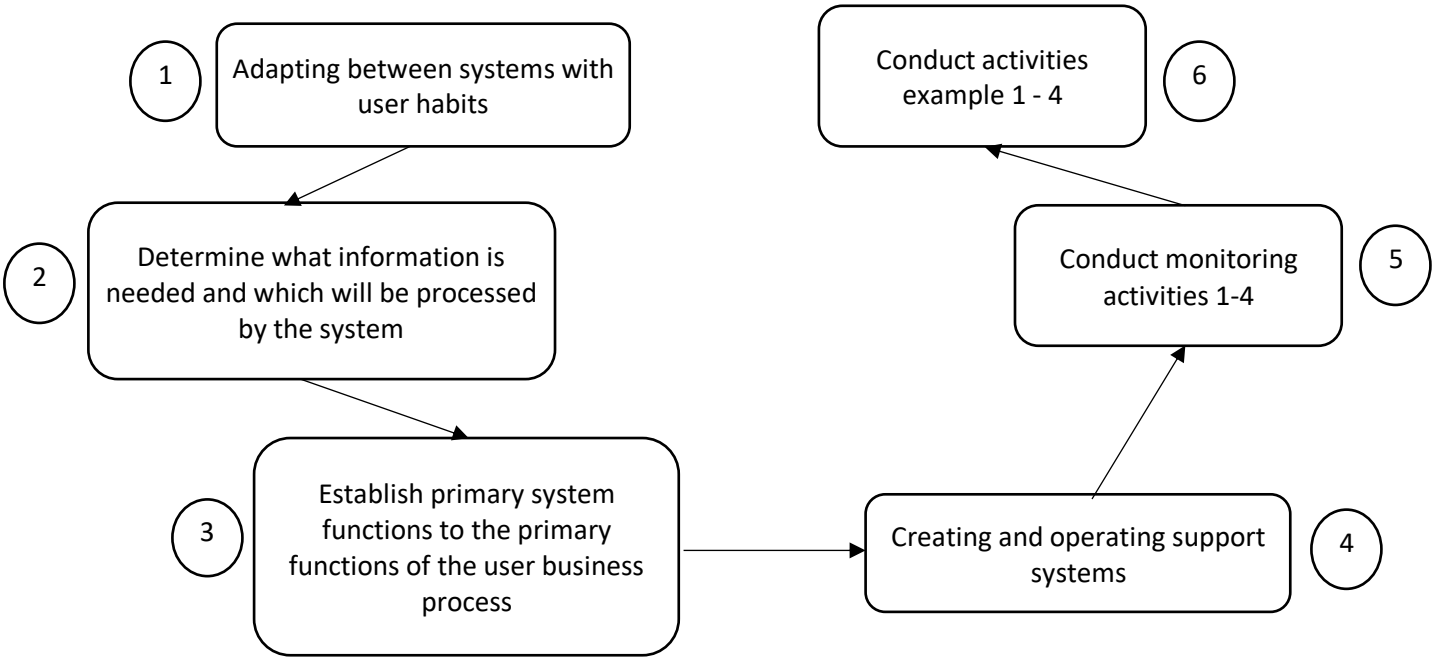

Fig 3:- The present conceptual model

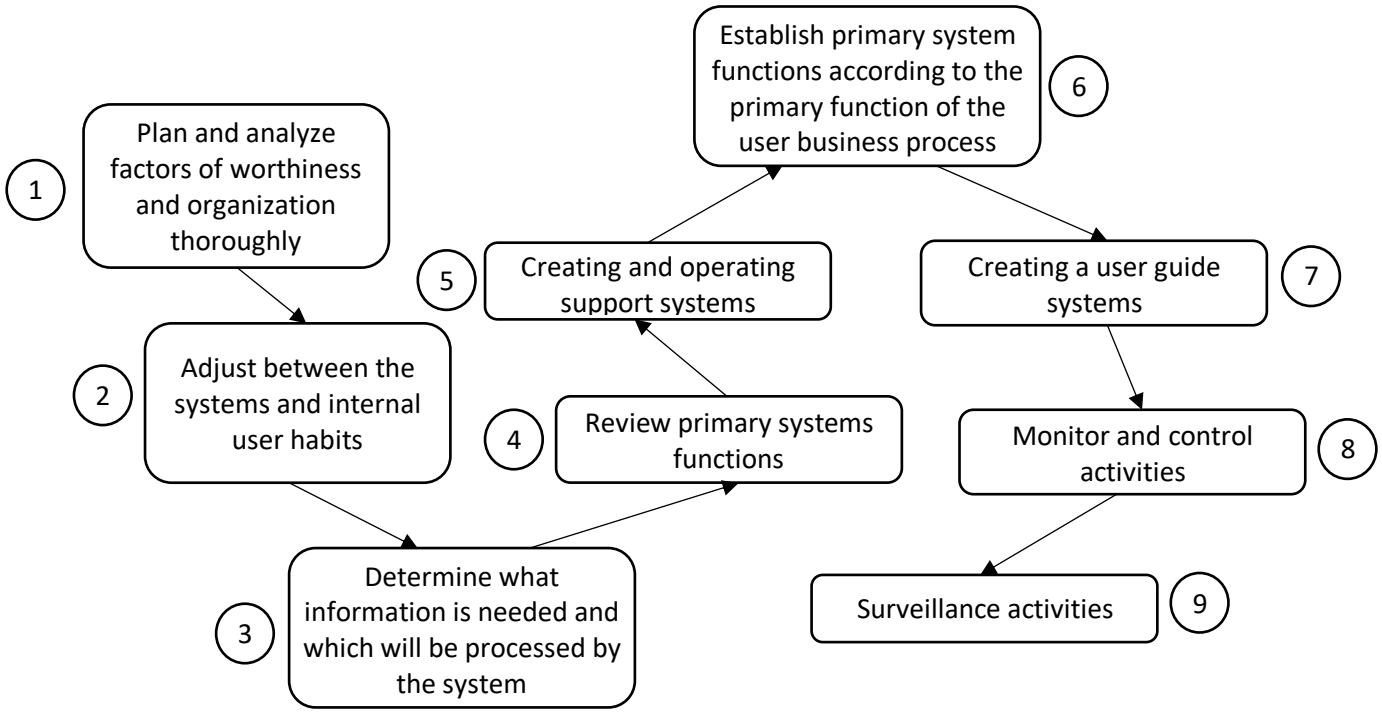

Fig 4:- Conceptual models of improvement

The results of the conceptual model design can be declared valid if they meet the 3E criteria (Efficacy, Efficiency and Effectiveness), including the following:

- *Efficacy (E1):*

Planning, system review, documentation and monitoring activities will ensure the development of information systems in BBKFP becomes more focused in coordination between user and developer so that the management information system is expected to be realized;

- *Efficiency (E2):*

Good early planning and analysis activities will have an impact on time and resource efficiency;

- *Effectiveness (E3):*

Planning and supervision activities will make the information system development process more effective, especially in terms of coordination between developer and user.

D. Comparing Conceptual Models with Real World

To be able to realize the conceptual model to be more comprehensive and in accordance with the real problem situation there are four major groups of main activities added to the system, more fully displayed in the table as follows :

Activities	Real World	Conceptual
Planning	Planning is not mature and unstructured	Need a thorough pre analysis and planning study (Resource analysis, feasibility study, Organizational aspect analysis)
System review	Not available	The business process is constantly changing, therefore the information system must be updating to adjust the business processes
User guide documentation	Not available	Make documentation and user guide systems updating so that users can continue to use
Surveillance	The surveillance activities have not been maximized	Using team of surveillance in charge of overseeing and escorting projects to achieve a goal

Table 3:- A Conceptual comparison with real world

E. Need for Model Change

There are several important needs and changes that must be anticipated by the model after analysis of the rich picture, the initial conceptual model and the conceptual model of improvement

ISSN No:-2456-2165

No	Activities	Change Model
1.	Planning	Pre analysis a. BBKFP must really understand what kind of information system is needed, the first step is to form a team that focuses on software development, in this case BBKFP requires serious management. To realize this, the director of BBKFP issued a decree establishing the information system development team; b. The stages of the auction in order to attract potential developers must be carried out thoroughly from the elements of corruption, collusion and nepotism. This aims to get developer who is truly professional so as to produce output as expected. • Change in cooperation contract The procurement of information systems that have been implemented in 2014 and 2016 has a duration of 1 (one) year, so that after the contract ends there is no follow-up. For this reason, in the future there needs to be a multi-year cooperation contract (more than a year), so that the update process, socialization and implementation of the information system will be more maximal; • Good project management planning Management together with developer develop time scheduling in implementation so that procurement projects will be truly effective and on target; • BBKFP needs to consider using the services of a planning consultant so that the initial stages run smoothly.
2.	System Review	The business process at BBKFP is very dynamic, in which changes can occur very quickly. For that reason, features, menus and procedures in information systems must also be updated following changes in business processes, so that the information system will help the work of the user.
3.	Documentation and User Guide	Management must have strong intention so that the information system that is built really can be implemented. User who input the data and business processesmust be surely familiar with the information system. For this reason, socialization, training and the creation of a user guide are needed to support it.
4.	Supervision	• Supervision of the information system development process In the early stages of development, interaction activities between user and developer, then how to deliver information and coordination between developer and user must be continuously monitored so that the goal of providing a qualified information system can be realized; • Supervision of information system implementation After development stage, the next step is the implementation of the information system. At this stage a strong commitment from the top management to the lower level is needed to make this information system a part of its business process; • BBKFP needs to consider using the services of a supervision consultant so that all stages of the information system procurement are as expected.

Table 4:- Need for model change

F. Recommended improvements

Based on the above findings, a work plan can be designed as a solution or change made in order to improve the system in the procurement of information systems, including:

1. There must be good validity of overall feasibility and organizational aspects;
2. Changing the duration of the contract with the developer to be multiyear is needed to ensure the continuity of the implementation of the information system;
3. There must be a process that determines what information is needed and relevant that the system will process;
4. To further convince users when using the system, a review of the main functions that will be used by the user is necessary to avoid user dissatisfaction;
5. Making a User Guide and training requires the user to get to know the system that will be used;
6. It is necessary to monitor the behavior of the environment where organizational aspects are very influential on the continuity of the system;
7. There must be good project management during the processes carried out so that analysis, plans and targets that have been agreed upon previously are achieved.

IV. CONCLUSION

- The auction process for the procurement of goods and services that are transparent and clean, management commitment from the top to the bottom and structured procurement projects management greatly determines the realization of the good quality of procurement of management information systems in BBKFP;
- Based on the results of the discussion above, the writer recommends implementation of the following: a good and in-depth planning study, system review, documentation, user guide creation and supervisory

activities in the process of procuring information systems at BBKFP;
- The soft system methodology approach is able to describe the problem well and find recommendations for improvements to unstructured problems, for example in improving the quality of procurement of management information systems at BBKFP.

SUGGESTION

- Because the procurement of the previous information system, which is an aircraft maintenance information system and inventory information system, is no longer used, BBKFP should rebuild management information systems that are integrated among all its divisions;
- As a public service body that has the freedom to manage its own budget, BBKFP should change the information system procurement contract to be a long life contract, since there will always be changes in business processes that require information system updates.

REFERENCES

[1]. Checkland P, Tsouvalis C. Reflecting on SSM: the link between root definitions and conceptual models. Systems Research and Behavioral Science 1997; 17: 153–68.
[2]. Checkland, P.B. & Scholes, J. (1990): “Soft Systems Methodology in Action”. Chichester: John Wiley & Sons.
[3]. Andrews, C. L. (2000). “Restoring legitimacy to the systems approach”. IEEE Technology and Society, 19 (4), 38-44.
[4]. Customer Value. A Framework for Analysis and Research”. London: Routledge, 1-28.