

Original Article

The Implementation of Soft System Methodology (SSM) in Designing KJP-Shop Application

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Abstract - Jakarta Smart Card (KJP) is assistance from the DKI Jakarta provincial government in the form of allowances for clothing and food needs for schoolchildren. The funds that have been disbursed by the government are used to buy children's needs provided in KJP markets (markets that provide goods for KJP holders) determined by the government. However, there are some problems faced by KJP holders, KJP markets, and the DKI Jakarta government, in this case, are P4OP and KPKP, during the implementation of this policy in the field. These problems include long queues of KJP holders in KJP markets, inexpensive foodstuffs that are not evenly distributed in KJP markets, and no detailed report to P4OP and KPKP every time KJP shopping transaction is completed. Therefore, the researchers plan to conduct research on the system analysis using Soft System Methodology (SSM) to design the KJP-Shop application. Based on the research conducted using the stages of Soft System Methodology (SSM), the results of the questionnaires on the need for online shopping application shows that 330 out of 350 respondents need the application. Therefore, it is expected that developing the KJP-Shop application be able to ease all parties involved, especially KJP holders, so that the existing problems will be finally resolved.

Keywords - Analysis, Online Shopping, Jakarta Smart Card (KJP), System, Soft System Methodology (SSM)

I. INTRODUCTION

Based on Law Number 11 of 2009 concerning Social Welfare, one of the efforts for overcoming poverty is to provide access to basic education services[1]. To implement this policy, one of the programs implemented by the DKI Jakarta Provincial Government to ensure the availability of funds, services, and facilities for basic education is the Jakarta Smart Card (KJP), which can especially be enjoyed by students at SMA and SMK from less affluent families. Having been implemented for 6 years, on January 6, 2018, the Regulation of the Governor of DKI Jakarta Number 4 of 2018 concerning the Jakarta Smart Card Plus (KJP-Plus)

was implemented. It is hoped that the KJP-Plus help people meet the need for proper basic education. According to the previous evaluation of KJP, which has been implemented for 6 years, the quality of service and program scheme continues to improve each year, but various problems still exist[2]. Thus, the authors would like to examine the existing problems based on the previous studies using the same method.

These problems include long queues of KJP holders in KJP markets, inexpensive foodstuffs that are not evenly distributed in KJP markets, and no detailed report to P4OP and KPKP every time KJP shopping transaction is completed. Based on the overview of the problems that have occurred over the past 7 years, it is necessary to have a further analysis before creating a system that helps overcome the existing problems.

In this study, the authors use the Soft System Methodology (SSM) to analyze the existing problems. This research analyzes several complex problems from the point of view of KJP holders, KJP markets, and the DKI Jakarta provincial government; in this case, they are P4OP and KPKP. It is hoped that the results of this analysis can be used as a strong, accurate, and efficient basis for building a KJP-Shop application. In previous research, SSM was also used in developing ERP systems[13]

The problem formulation that becomes the focus of this research is how to model a system with the ability to manage the KJP affordable foodstuffs shopping transaction. This research aims to obtain an analysis of the results by applying Soft System Methodology (SSM) to design and to develop the KJP-Shop application to support the Jakarta Smart Card Program, especially in people's shopping activities for affordable foodstuffs.

II. LITERATURE REVIEW

A. Jakarta Smart Card (KJP)

To achieve its targeted goals, KJP Plus must be efficient. What is meant by efficiency is that the KJP Plus fund allocation must straightly address to meet the supporting school needs[2]. Based on the information provided on the



KJP Plus website, the following is a table that describes the items that can be purchased using KJP Plus funds:

Table 1.
List Of Types Of Store And Items That Can Be Purchased Using Kjp Plus Funds [3]

Types of Store and Use	Description
Medical Equipment	Medical support equipment (dental health care, hearing aids, and walking aids, etc.)
Pharmacy or Drugstore	Medicines and Vitamins
Optics	Vision aids (glasses)
Clothing/Shoe Store	Uniforms, shoes, and accessories
Department Store	Uniforms, shoes, and accessories
Supermarket/Food store	Nutritious food and drinks, as well as equipment for school needs
Bookstore	Books (notebooks, exercise books, drawing books, and textbooks)
Stationery store	Student stationery (stationary, drawing tools, practical tools, and materials)
Sporting goods	Uniforms and sports equipment for sports lessons at school
Activities	Extracurricular activities that are not funded by BOP and BOS
Computer store	Computer/laptop

In addition to the items mentioned on the website, KJP Plus funds can also be used to buy groceries with the following details [4]:

Table 2. List Of Kjp Affordable Foodstuffs

Types of groceries	Price list of the KJP Affordable Foodstuffs
Premium Quality Rice	Rp30,000.00 per sack 5kg (1sack/month)
Beef	Rp35,000.00 (1kg/month)
Chicken	Rp8,000.00 (1kg/month)
Mackerel	Rp13,000.00 1 kg containing 6-7 fish (1kg/month)
Eggs	Rp10,000.00 per tray containing 15 eggs (1 tray/month)
UHT milk	Rp30,000.00 per boxcontaining 24 packs (1 box/month)

B. Soft System Methodology(SSM)

The system approach is used to predict the projection of future top events. Meanwhile, forecasting is a mode used by management to estimate the future value [5]. On the other hand, Soft System Methodology (SSM) is theoretically considered a technique used to solve complex and obscure problems. Its complexity and ambiguity generally occur due to its association with human characteristics[6].

The seven stages of SSM are as follows:

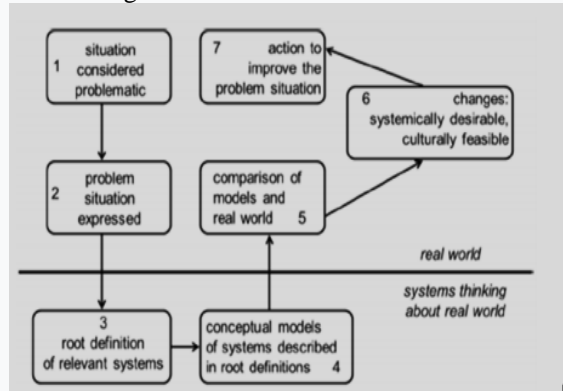


Fig. 1 Stages of SSM [7]

Description of the stages of SSM:

Table 3. Stages of soft system Methodology

No.	Stages	Description
1	Finding out about the situation (<i>Situation considered problematic</i>)	Identifying all attracted problem situations
2.	Expressing problem situation (Problem situation expressed)	Expressing the problem situations not in system terminology but in the form of a rich picture; The purpose of this step is to get a creative understanding of the problem situations.
3.	Defining some Issues Based (IB) and Primary Task (PT) of root definition relevant to the situation	Making a root definition to catch the essence of the relevant system tested by CATWOE Analysis [9] Root definition reflects another way of describing problem situations. Customers: the parties who will get advantages or disadvantages from the problem solving Actor: the one who carries out activities, i.e., all holders Transformation: the thing that has to change in order to transform the input into output Worldview: understanding of various parties about the deep meaning of the problem situation. Owner: who has the power to stop the

		activities Environment Constraint: unavoidable obstacles in the system environment {soft}
4.	Developing a conceptual model (Conceptual Model System)	Establishing a conceptual model based on root definition that illustrates the activity model needed to achieve the transformation after conducting root definition analysis
5.	Comparing (Comparison conceptual model and real-world condition)	Comparing conceptual model with the real-world condition; The purpose of this step is to obtain debatable matters about the possible changes
6.	Defining desirable and feasible changes (Change (system))	In this stage, the possible and feasible changes to be applied are discussed with the actors involved
7.	Taking action (<i>Action to improve the problem situation</i>)	Implementing the feasible changes

C. Information System

Information System is defined as a system that provides information for the management of decision-making [4]. Information systems can also be said as a set of components in a company or organization related to the process of creating and retrieving information [10].

III. RESEARCH METHOD

The research method used in this research ends at the system analysis stage. The research used Soft System Methodology, as explained below

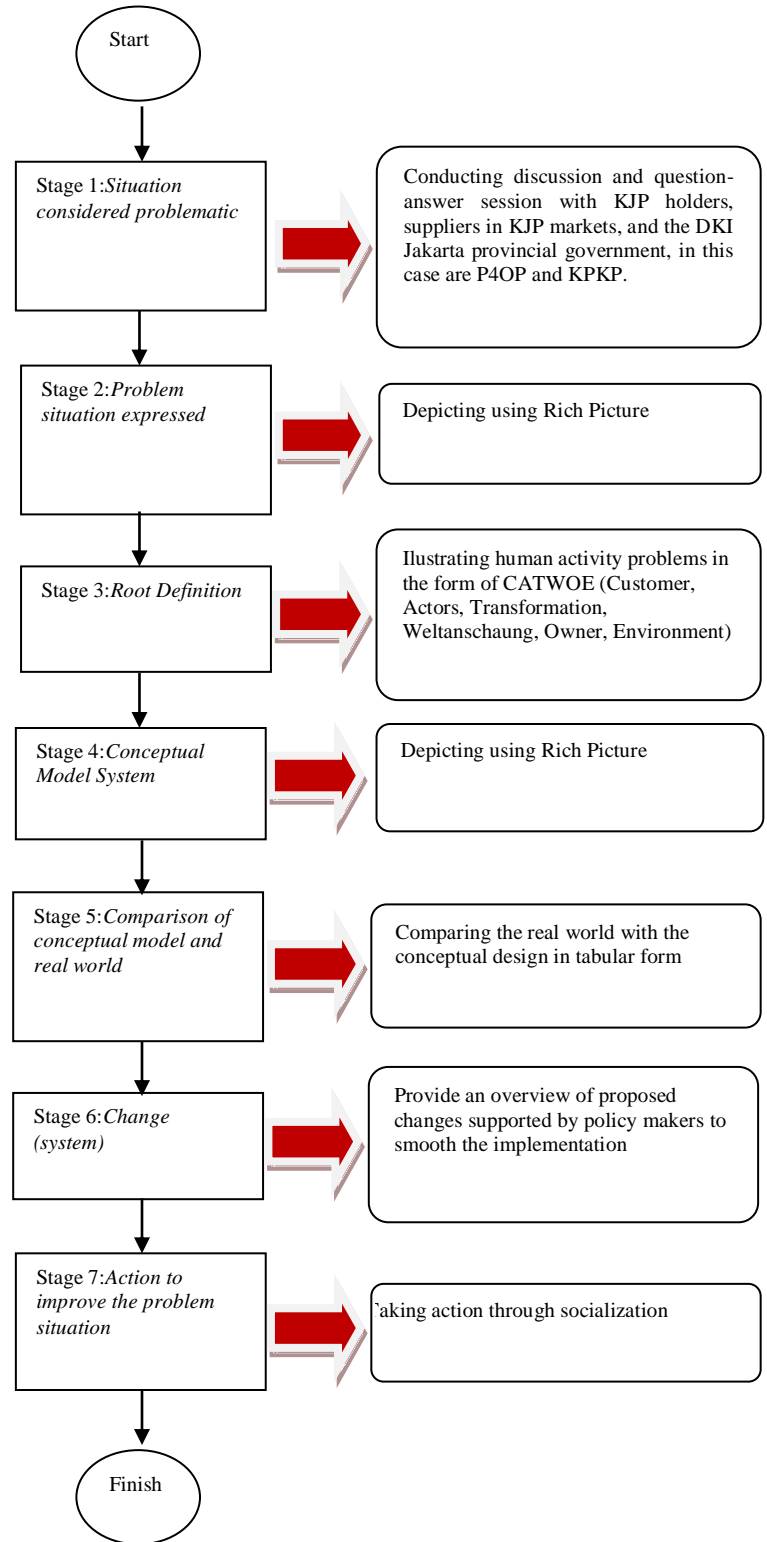


Fig. 2 Stages Diagram Soft System Methodology (SSM) Analysis of KJP-Shop

IV. RESULTS AND DISCUSSION

A. Identifying the problem situation

The first stage of SSM is to recognize and to understand the unstructured problem situation, which is the real problem on the object being studied[11]. This stage started by identifying problems that occurred in the environment around KJP holders, KJP markets, and the DKI Jakarta provincial government, in this case, is P404 and KPKP, through direct interviews and observation on those three environments. It was found that there were several problems faced, namely:

- From the point of view of KJP holders: long queues when picking up the affordable foodstuffs and the absence of information on the availability of the affordable foodstuffs cause KJP holders to visit KJP markets one by one;
- From the point of view of suppliers in KJP markets: the absence of information on the number of KJP holders who will visit the markets and the arrival time of KJP holders;
- From the point of view of the DKI Jakarta provincial government: the absence of information on which markets are most frequently visited by KJP holders and which affordable foodstuffs are most frequently and rarely purchased.

A. Expressing the Problem situation

The purpose of making a rich picture is to obtain and to provide information, to find important or main things, to examine the structure and emphasis in a situation, to observe the way the process runs, to find important issues in a situation, and to create several activity models[11]. The problem situation faced by KJP holders, KJP markets, and the DKI provincial government (P404 and KPKP) is depicted in a rich picture diagram.

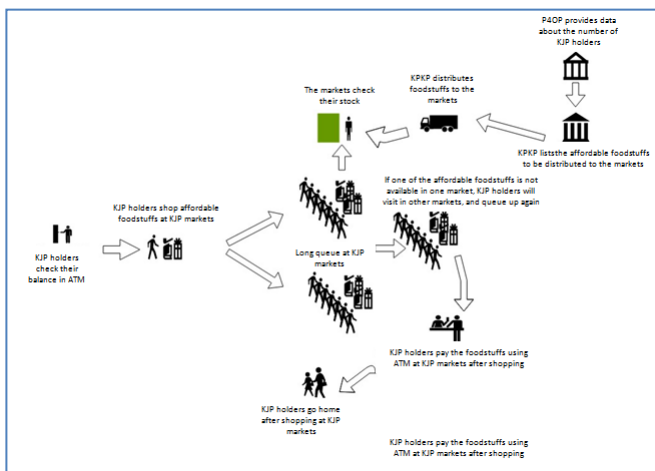


Fig. 3 Rich Picture of the Analysis Results of Soft System Methodology

B. Root Definition

The illustration of the root definition of the KJP shopping process is used for analysis as an appropriate framework for developing the KJP-Shop application. This stage aims to make the implementation of KJP-Shop to achieve the conceptual model that has been compared to several holons of the KJP shopping process using CATWOE analysis [12].

The purposes of developing KJP-Shop application of human activities are presented using CATWOE (Customer, Actors, Transformation, Weltanschauung, Owner, Environment)[8]

Table 5. Catwoe Implementation

No.	Elements	Description
1.	Holon 1	Shopping transaction between KJP holders and suppliers in KJP markets
	Customer	KJP holders
	Actors	KJP holders, suppliers in KJP markets
	Transformation	KJP holders must visit KJP markets one by one to find complete available goods
	World View	Data synchronization on the KJP-Shop application
	Owner	DKI Jakarta provincial government
2.	Environmental Constraint	KJP foodstuffs are not evenly distributed in KJP markets
	Holon 2	Services regarding KJP shopping transaction are still conventional, and there is no detailed KJP report to improve the service
	Customer	KJP holders
	Actors	KJP holders, suppliers in KJP markets, and the DKI provincial government
	Transformation	KJP shopping transaction can be done online by selecting the location and items needed by the children
	World View	The items that have been ordered can be picked up at the selected market without having to queue
Owners	Owners	The DKI provincial government
	Environmental Constraint	The server might be interrupted due to the simultaneous execution of transactions

3.	Holon 3	KJP shopping transactions are monitored by the DKI Jakarta provincial government
	Customers	KJP holders and suppliers in KJP markets
	Actors	KJP holders, suppliers in KJP markets, and the DKI provincial government
	Transformation	DKI Jakarta provincial government can find out how many items are the most frequently bought by KJP holders.
	World View	KJP markets can provide up-to-date data about the items purchased by KJP holders.
	Owners	The DKI provincial government
	Environmental Constraints	All items purchased using KJP can be monitored through an online application.

C. Conceptual Model System

A conceptual model (an activity system model consisting of several activity element models that are obtained by extracting all verbs that have an impact on the root definition) is based on the third stage (Neilin, Iriani, & Hartomo, 2020).

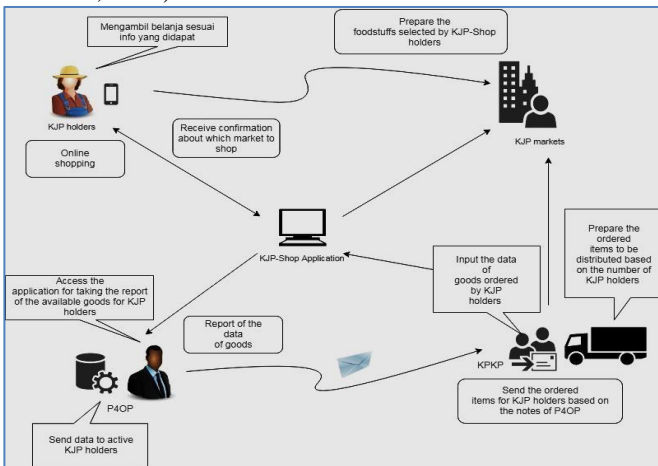


Fig. 4 Rich Picture of Conceptual Model

D. Comparison between the conceptual model and the real world

The conceptual model is compared with the situation described in the second stage[12]. It is carried out by comparing the conceptual model of KJP-Shop application design with the real-world situation of KJP holders, KJP markets, and P4OP and KPKP when the KJP-Shop application was not yet applied. This test aims to compare the model with the real-world situation.

Table 4. The comparison of model and real-world situation

No.	Activity	Real World	Model
1.	KJP holders purchase goods at KJP markets	Visiting KJP markets for buying needs by queuing	KJP holders do online shopping transactions using the KJP-Shop application, select the foodstuffs that they need, and choose the location of the market to pick up the selected items.
2.	KJP holders shop at KJP markets	If one market does not have available goods, KJP holders must visit other markets regardless of the distance of the markets from home	KJP holders choose the closest market to their home that supplies goods available for KJP; if the quota for KJP holders is full, the second-closest market from home will be chosen.
3.	The market serves KJP holders	KJP markets are always overwhelmed by the number of KJP holders who shop for needs because there is no limitation on the number of KJP holders per market.	Since the quota of KJP holders has been allocated, each market will serve the same number of KJP holders when shopping for their needs, so there will be no long queue.
4.	KJP markets receive the distribution of goods from KPKP	KJP markets receive a number of goods from KPKP without knowing the number of KJP holders who will shop there. Some items are not available, and some other items are leftover.	KJP markets receive goods according to the number of items ordered by KJP holders via the KJP-Shop application, so there will be not many items left in the markets.

5.	P4OP receives a report on the implementation of KJP shopping	There is no report on the implementation of KJP shopping transactions	A more detailed and accurate report per shopping transaction is provided, so the implementation of KJP shopping transactions can be monitored well.
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E. Change (system)

The sixth stage consists of the steps for making changes in a real-world condition that are considered unfavorable, such as structure, SOP, or individual attitudes[12]. The desired changes/adjustments are carried out systematically and properly according to the procedure for carrying out the online KJP shopping process.

It is expected that the desired changes through KJP online shopping activities bestipulated in the regulation of the DKI Jakarta provincial government. There are still shortcomings in online KJP shopping, such as the system has not been integrated with Bank DKI for the arrangement of spending deposits. This has not been done because KJP shopping transactions can only be done in the market for staple goods.

Conceptual model of KJP-Shop application with integrated data on an online server becomes a means of assisting and facilitating various parties involved in shopping for staple food without having to queue and reporting KJP shopping activities to improve the quality and services of the DKI Jakarta provincial government to the community.

F. Action to improve the problem situation

The seventh stage aims to perfect the existing SOP[12]. Some efforts to improve the real situation in the use of the KJP-Shop application were conducting socialization, training at different KJP holders levels, and changes in the policies when this application was implemented.

G. Questionnaire Analysis

The results of CATWOE analysis for the implementation of the KJP-Shop application all over DKI Jakarta were obtained from the analysis on questionnaires distributed to 1360 respondents, who are KJP holders. The results showed several answers regarding the need for KJP online shopping application (KJP-Shop) to be implemented in DKI Jakarta. The results of the analysis are provided below:

Table 7. Ratio On The Need for Innovation

Scale	Category	Total
0-100	Poor	0
101 – 200	Moderate	20
>201	Good	1340

Table 8. The Need For Kjp Online Shopping System to be Applied

Question	Answer	Total
1	Necessary	1330
2	Unnecessary	30

VI. CONCLUSION

Based on the questionnaire data obtained, it can be concluded that using the Soft System Methodology method, and an analysis is produced that the need for the KJP-Shop application to support the shopping needs of KJP users is needed for facilities that make it easier for KJP users and other related parts so that it is very helpful in a pandemic like today.

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REFERENCES

- [1] DKI. P. Kesejahteraan Sosial, Jakarta: Indonesia (2009).
- [2] Jakarta. D. P., Petunjuk Teknis Bantuan Biaya Personal Pendidikan Melalui Kartu Jakarta Pintar. (2018). <http://kjp.jakarta.go.id/kjp2/berkas/kjp/ea77a564caf897db27d31118040bd5be.pdf>
- [3] Jakarta. D. P., Penggunaan Dana KJP (2019). http://kjp.jakarta.go.id/kjp2/public/informasi_umum.php?id=eydpZCc6JzNjNTlkYzA0OGU4ODUwMjQzYmU4MDc5YTUvNzRkMdc5JywnamVuaXMnOicxNWY0MDI5MTI5OWQ4YzQ3NDMxYzZcwNDVhMDVmOWNmOCd9#
- [4] Pintar. K. J (2019). [http://kjp.jakarta.go.id/kjp2/berkas/kjp/ea77a564caf897db27d31118040bd5be.pdf\(8\)](http://kjp.jakarta.go.id/kjp2/berkas/kjp/ea77a564caf897db27d31118040bd5be.pdf(8))
- [5] Anisarida, Janizar. S, and Prima. G. R, The Approach Soft System Methodology For System Online Management Consultant Construction. DIJDBM (2020).
- [6] Sandirwano.S, Information System FIFO for Publish Journal in Information System Department Faculty of the Computer Science University of Mercu Buana. International Research Journal of Computer Science (IRJCS), 3(8)(2016)
- [7] Barussman. M and Yusuf, S., Soft System Methodology (SSM) Solusi Untuk Kompleksitas Manajemen, Bandar Lampung: UBL Press (2017)
- [8] Utama. D. N and Yusuf, S, Synthesizing a Soft System Methodology Use in Information Systems Research Field: A Systematic Review, International Conference on Information and Communication Technology (ICoICT) (2017).
- [9] Ramadhanti. C. L, Toyosito. R. E, Arianda. Y and Rimawan. E, Proposed Acquisition System Design (Procurement) & Inventory-Based ERP With Soft System Methodology Method in the Manufacturing Industry Bags, International Journal Of Innovative Science and Research Technology (2019) 447.

- [10] Wicaksono. S, Strategi Implementasi Enterprise Content Management System Pada Bidang Usaha Layanan Logistik Perairan : Studi Kasus PT.ADORA LOGISTIC. Jakarta: UI (2015).
- [11] Retnowati. R, Listiyono. H, Purwatiningtyas, Wedaningsih. A. S, and Rahmaziana. L, Analisa Readiness Penerapan Keterbukaan Informasi Publik (KIP) Dengan Pendekatan Soft Systems Methodology (SSM), Jurnal DINAMIKA (2019).
- [12] Rasminto.H, Silalahi. F. D and Hartono. B, Analisis Kebutuhan E-Learning Untuk Pengembangan Mutu KBM Dengan Soft System Methodology Pada SMK di Semarang, Jurnal Ilmiah Ekonomi dan Bisnis (2020) 138-149.
- [13] Surendiran,R., Secure Software Framework for Process Improvement. SSRG International Journal of Computer Science and Engineering (IJCSE), 13(12), ISSN: 2348 – 8387 (2016)19-25.