

# Design of Cataloging System for Users of Micro, Small, and Medium Enterprises (MSMEs) in Indonesia

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## Abstract

Micro, small and medium enterprises (MSMEs) are one of the most important aspects of economic growth in Indonesia. Information technology that developed in the industrial era 4.0, has become one of the components that have an important impact on the growth and progress of MSMEs in Indonesia. Information technology has many positive impacts on the growth and progress of MSMEs in Indonesia. However, there are also negative impacts of information technology that are detrimental to MSMEs actors in Indonesia. The example of these detrimental activities such as illegal e-commerce, customer hijacking, predatory pricing, etc. Many MSMEs actor, who use information technology in Indonesia are negatively affected because there is no system to help directing Indonesian customers to choose and to make transaction with verified and valid MSMEs actors from Indonesia. Based on this case, regarding to existence problems that are detrimental to MSMEs actors, as well as to promote MSMEs in Indonesia and helping Indonesia's economic growth, it is necessary to conduct research to design a verified formal cataloging system for MSMEs users in Indonesia. This research is to design a cataloging system for MSMEs users in Indonesia using the modification of soft system methodology and hermeneutic. The intended design is result of implementation from soft system methodology stages one until four (extracting from MSMEs actors who are object of research), then it will be combined with the application of hermeneutic method to obtain a definition and a conceptual model of the cataloging system for MSMEs users. The results of this research are intended so MSMEs customers in Indonesia can be directed to choose and use the products or services of MSMEs actors in Indonesia that have been tracked and verified with a valid, formal and scientific fundamental.

*Keywords:* cataloging, system, enterprise, soft system methodology, hermeneutic

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## 1. Introduction

Micro, small and medium enterprises (MSMEs) are one of the most important aspects of economic growth in Indonesia. The Indonesian government as the official regulator of MSMEs, plays an active role in helping the lifecycle of MSMEs in Indonesia. Based on the job creation regulation, article number 90 in paragraph 1 obliges the central government and local governments to facilitate, support, and stimulate activities of medium and large business partnerships with cooperatives, micro-enterprises, and small-scale businesses to increasing competence and business level. Information technology which is developing in current industrial 4.0 era (current era), is also one of the important components for the progress of MSMEs in Indonesia. This circumstances is be in accordance with regulation of Republic of Indonesia number 20 in 2008, which stipulates that the central government and regional governments facilitate business development by providing incentives for MSMEs to develop technology and environmental sustainability so that it is not only MSMEs who gain benefit, but also the other parties involved, such as medium and large businesses that create partnership with MSMEs can gain benefit as well. Information technology has many positive impacts on the progress of MSMEs in Indonesia. However, there are many negative impacts also of information technology to MSMEs actors in Indonesia. Quoting from the speeches of Mr. President Joko Widodo and Mr. Minister of Trade Lufi in 2021, there are many activities that detrimental the MSMEs actors in Indonesia related to the use of information technology. This detrimental activities such as illegal e-commerce, customer hijacking, predatory pricing, etc. Many MSMEs actors that using information technology in Indonesia are negatively affected by illegal e-commerce, customer hijacking predatory pricing due to the absence of a system to help guiding customers in Indonesia to choose and create transaction with verified and valid MSMEs actors from Indonesia. This is intended to help promote MSMEs from Indonesia. This is in line with Mr. President Joko Widodo's campaign that encouraging Indonesian citizens to love and use products from Indonesia always, in order to specifically promote Indonesian MSMEs as well as will help Indonesia's economic growth in general. According to that circumstances, regarding the existence of illegal e-commerce activities, customer hijacking, predatory pricing, etc. that are detrimental to MSMEs actors, as well as to help the growth and lifecycle of MSMEs and Indonesia's economic in general advance, it is necessary to conduct research to design a verified formal cataloging system for micro, small and medium enterprises (MSMEs) actors in Indonesia. This is intended so that MSMEs customers in Indonesia can be directed to choose and use products or services of micro, small and medium enterprises (MSMEs) actors in Indonesia that have been verified validly. This study designed a cataloging system for micro, small and medium enterprises (MSMEs) customers in Indonesia using the modified soft system methodology and hermeneutic approach.

## **2. Literature Review**

### **2.1. Model, Architecture, Framework and Features**

The definition of a model is a representation of a variety of different shapes, sizes, and styles which are used to assist individuals in understanding the real world system. The application of a model has the aim of simplification the opinion in identifying conditions, so as to provide convenience when implementing the model in the real world. There are several types of models that exist, such as conceptual models, namely qualitative models that describe the relationship between processes and real-world systems. Then there is what is called an interactive lecture demonstration, namely a physical system model that has characteristics such as a key feature system, then a mathematical and statistical model, and a visualization model (Elin, et al, 2016). The model was developed with the aim of representing the unity of several elements so as to help deepen understanding of a concept (Dalkir, 2005). Architecture is a description of the components of hardware and software specifically, technically and in depth (Kaluz, 2015). While the framework is a basic conceptual structure that is used to find solutions to complex problems, it can be a set of tools, materials or components. In the context of software, the framework is used as a name for various types of toolset and basic components (Kumar, 2012). The framework helps identify and cataloging various types of knowledge that are suitable for information systems projects (Alawneh, 2016). A feature is defined as a function and special characteristics that exist in a tool/system to achieve a certain goal (Lee, 2015).

### **2.2. Catalog and Cataloging System**

Catalog is a list of a collection of items, products, and services that are presented in a brochure, magazine, and book. In business, the basic purpose of a catalog is to show some information about a product to a targeted customer, in order to convince that customer before making a purchase (Ahsan, 2019). So based on the basic essence of implementing a catalog, it is optimized as a media knowledge base of a product, either in the form of certain items or in the form of a service for new prospective customers and existing customers. In its implementation in everyday life, many cataloging systems use e-catalog and e-brochure. As in (Chen, 2010) conducted research on customer-oriented theory based on e-catalog ontology for automatic construction. This is in line with (Cecep, 2019) implementing a virtual reality-based kampung hijrah housing catalog to optimize customer experience in accessing the housing catalog. While the definition of electronic catalog (e-catalog) in regulation of the head of goods/services procurement policy institute, government of the republic of Indonesia number 14 of 2015 concerning e-purchasing, says that an electronic catalog (e-catalogue) is an electronic information system that contains a list, types of, technical specifications and prices of certain goods/services from various government goods/services providers.

### **2.3. Micro, Small and Medium Enterprises (MSMEs)**

Micro, small and medium enterprises (MSMEs) are business activities running by individuals, households, or small business entities. The classification is based on the amount of income per year, the amount of wealth or assets, and the number of employees employed. The full definition and rules related to MSMEs have been formulated in regulation number 20 of 2008 concerning MSMEs. Based on regulation number 20 of 2008, micro-enterprises are productive businesses owned by individuals and/or individual business entities that meet the criteria for micro-enterprises. The maximum income from micro businesses is 300 million rupiah with total business assets of 50 million rupiah (excluding land and building assets). Micro-enterprises have not implemented a professional financial system yet. Examples of micro-enterprises are coffee shops, hawkers, barbershops, and market traders. Small business is a productive economic business that stands alone, carried out by individuals or business entities that are not subsidiaries or branches of companies that are owned, controlled, or become a part either directly or indirectly of a medium or large business. The net worth of small businesses ranges from 50 million rupiahs to 500 million rupiahs with annual sales of between 300 million rupiahs to 2.5 billion rupiahs. For small businesses, financial management is more professional compared to micro businesses. Examples of small businesses are catering, laundry, and motorcycle repair shops. Medium-sized business is a productive economic business that stands alone, carried out by individuals or business entities that are not subsidiaries or branches of companies that are owned, controlled, or become a part either directly or indirectly. The criteria for medium-sized businesses are having a net worth of more than 500 million rupiahs up to a maximum of 10 billion rupiahs (not including land assets and business premises). In addition, medium-sized businesses also have annual sales of more than 2.5 billion rupiah up to a maximum of 50 billion rupiah. Characteristics of medium-sized businesses, the financial management more professional and has legal legality. Examples of medium-sized businesses are large restaurants, bakeries, and building shops. The role of Indonesian government in supporting performance of MSMEs is represented in job creation act regulation chapter 90 paragraph 1 which states that it is mandatory for central government and regional governments to facilitate, support, and stimulate activities of medium and large business partnerships, with cooperatives, micro-enterprises, and small-scale businesses to increase competence and business level. This is align with the republic of Indonesia regulation number 20 of 2008 which stipulates that the central government and regional governments facilitate business development by providing incentives for MSMEs to develop technology and environmental sustainability.

## 2.4. Relevant Research

Several studies related to the topic of cataloging system research and MSMEs have been conducted. The following are some of the studies that have been carried out related to these topics such as:

1. (Ahsanullah., et. al., 2019), The result of this research is the development of a 3D-based (three-dimensional) car catalog application.
2. (Cecep., et. al., 2019), the result of this research is the development of an e-catalog system based on virtual reality technology for the kampoeng hijrah residence housing catalog.
3. (Ariani., et. al., 2017), the result of this research produces a SWOT analysis related to various MSMEs problems and formulates a strategy model to overcome its problems.
4. (Tanatsugu., et. al., 2011),tThe result of this research is to provide procedural recommendations for e-catalog system developers so that the system can be adapted to international standards from ISO.
5. (Chen., et. al., 2010), the result of this research is a method for developing a customer-oriented ontology-based e-catalog with a meta model and standard for e-commerce website classification.

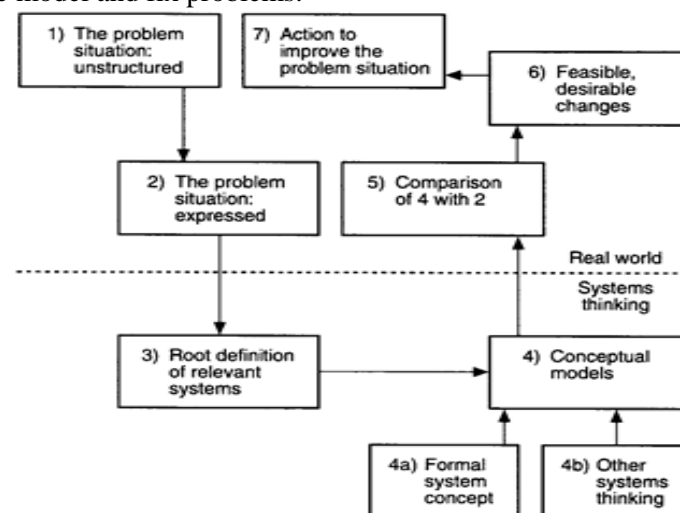
Based on the results of previous study, it appears that there is a high probability for further research to be carried out related to the application of the cataloging system especially in aspects of MSMEs.

## 3. Research Methods, Stages and Materials

### 3.1. Research Methods

#### 3.1.1. Soft System Methodology

Soft systems methodology (SSM) is a holistic approach in looking at the real and conceptual aspects of society. SSM sees everything that happens as a human activity system, because a series of human activities can be called a system (Hidayatullah, 2011). The soft system methodology has been widely used to develop a conceptual model for a system. Some examples include (Ramadhan., et. al, 2011), proposing a methodology for developing e-government systems by combining soft systems methodology (SSM) and focus group discussion (FGD). With the combination of SSM and FGD, it is hoped that social interactions from stakeholders can be accommodated properly so that failures in an e-government system development can be reduced. Research of (Rozali., et. al, 2010) proposes the integration between soft systems methodology (SSM) and design science research (DSR), for future development, design, and socio-technical solutions in knowledge sharing. Soft systems methodology (SSM) consists of 7 (seven) steps related to each other, namely: 1. Identify the problem situation of concern, 2. Express the problem situation, 3. Formulate the “root definition” of the relevant system, 4. Build a conceptual model, 5. Comparing the conceptual model with reality in the real world, 6. Make changes to the model to accommodate the interests of several actors involved, 7. Perform various activities to apply the model and fix problems.

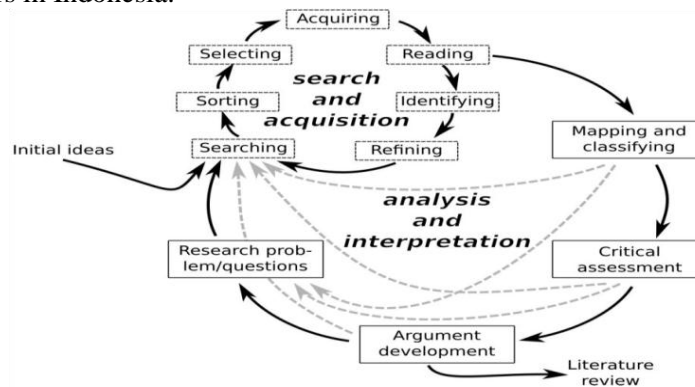


**Figure 1: Soft System Methodology**

#### 3.1.2. Hermeneutic Approach

Hermeneutic approach is an interpretative approach to text translation, text analysis, reading text, and sense data, especially with regard to the meaning of the text. This approach is closely related to the interpretivist philosophical perspective of qualitative studies, which allows an in-depth understanding of the experience of experts (Fauzie et al., 2016). The hermeneutic principle shows that all human understanding is achieved by iterating between considerations of the interdependence of meanings, of the parts and the whole form. The interpretive process moves from an initial understanding of the passages to the overall context, back to a better understanding of each passage (Ramadhan et al.,

2012). The urgency of applying this hermeneutic approach is to obtain a definition of the cataloging system design (a valid and structured scientific formal definition, along with its conceptual model) for micro, small and medium enterprises (MSMEs) users in Indonesia.



**Figure 2:** Hermeneutic Approach

### 3.2. Research Stages and Materials

The research hypothesis is that the modification of soft system methodology and hermeneutic approach can help researchers to produce a cataloging system design for micro, small and medium enterprises (MSMEs) users. Explanation of the stages of the research as follows:

- **Stage 1 (Literature Study).** Author conducts a literature study to find research hypotheses carried out, namely the modification of soft system methodology and hermeneutic approach, can help researchers produce a cataloging system design for MSMEs users in Indonesia. The research framework is based on theoretical foundations, research taxonomies, and relevant previous research.
- **Stage 2 (Data Collection).** Author begins to enter stages 1 and 2 in the soft system methodology, namely problem identification and problem expression. The author conducted in depth interviews with actors, users, and visitors of MSMEs in the Bogor city, Indonesia.
- **Stage 3 (Data Analysis).** At this stage, the author enters stage 3 of the soft system methodology namely root definition (CATWOE analysis). The author elaborates on the rich picture that has been developed from the object of research. The rich picture elaboration is then analyzed with the results of the root definition (CATWOE analysis).
- **Stage 4 (Definition and Conceptual Model).** At this stage, the author enters stage 4 in the soft system methodology and combining it with the hermeneutic approach to establishing the definition of cataloging system for users of MSMEs and making a conceptual model. Determination of cataloging system definition and development of conceptual model is based on results of previous stages. The conceptual model will become the fundamental for developing a next/future cataloging system design.
- **Stage 5 (Results Determination and Discussion).** At this stage, the authors determine results and discussion from the definition and conceptual model development of cataloging system design for micro, small and medium enterprises (MSMEs) users in Indonesia.
- **Stage 6 (Conclusions and suggestions).** At this stage, the authors draw conclusions from the research conducted and provide suggestions from the conclusions obtained.

The following is an elaboration table of research stages that contains the approach, input, process, and output of the research conducted to obtain a cataloging system design for MSMEs users. The table is as follows:

**Table 1:** Research Stages Elaboration

Point	Approach		Input		Process		Output
1	SSM	⇒	Interview points to resource persons	⇒	Problem identification	⇒	Problem identification results
2	SSM	⇒	Problem identification results	⇒	Problem expression	⇒	Problem expression rich picture
3	SSM	⇒	Output from point 1 and 2	⇒	Root definition	⇒	CATWOE analysis
4	SSM and Hermeneutic	⇒	Output from point 1, 2, and 3	⇒	Conceptual model	⇒	Identification of cataloging system definition
5	SSM	⇒	Output from point 1, 2, 3, and 4	⇒	Conceptual model	⇒	Conceptual model of cataloging system
6	SSM and Hermeneutic	⇒	Conceptual model of cataloging system	⇒	Activities on the conceptual model	⇒	Design of cataloging system

In the soft system methodology stage 1, focusing on the real world to collect information and views on a collection of situations that are considered problematic in condition of MSMEs as objects of research. The main topics of the in depth interviews with resources persons such as:

1. Knowledge sharing activities between MSMEs actors, users, and visitors of Bogor city.
2. Problems often occur in knowledge sharing activities between MSMEs actors, users, and visitors of Bogor city.
3. Visibility of MSMEs actors for users and visitors of Bogor city.
4. Traceability of MSMEs actors for users and visitors of Bogor city.
5. Direction availability of MSMEs actor for users and visitors of Bogor city.
6. Manual cataloging activities of micro, small, and medium enterprises (MSMEs) actors.
7. Online cataloging activities of micro, small and medium enterprises (MSMEs) actors.
8. Manual trading activities between MSMEs actors, users and visitors of Bogor city.
9. Online trading activities between MSMEs actors, users and visitors of Bogor city.
10. Manual promoting activities between MSMEs actors, users, and visitors of Bogor city.
11. Online promoting activities between MSMEs actors, users, and visitors of Bogor city.
12. Manual pricing between MSMEs actors, users, and visitors of Bogor city.
13. Online pricing between MSMEs actors, users, and visitors of Bogor city.
14. Transaction and discount mechanism between MSMEs actors and users.
15. Manual buying and selling activities between MSMEs actors and users.
16. Online buying and selling activities between MSMEs actors and users.
17. Manual after sales activities between MSMEs actors and users.
18. Online after sales activities between MSMEs actors and users.

## 4. Results and Discussion

The following will describe results along with a discussion of the research that has been carried out. Outputs of the results and discussion are obtained from soft system methodology approach stages 1 until 3. After getting results of stages 1 until 3 from soft system methodology approach, then it will be formulated with a hermeneutic approach to find a formal definition of cataloging system for user of micro, small, and medium enterprises (MSMEs) users in Indonesia. The root definition result is from in–depth interviews with MSMEs actors, users, and visitors of Bogor city (who become the object of research). After find a formal definition, then the conceptual model of cataloging system for micro, small, and medium enterprises (MSMEs) users in Indonesia can be developed.

### 4.1. Problem Identification Results of Cataloging System for User of MSMEs

The following are the results of problem identification based on in–depth interviews with micro, small, and medium enterprises (MSMEs) actors, users, and visitors of Bogor city in Indonesia.

**Table 2:** Problem Identification Results

No.	Problem Identification Results
1.	Requires a cataloging system that contains valid and clear data of all micro, small, and medium enterprises (MSMEs) actors for users and visitors of the Bogor city.
2.	Requires a cataloging system with a complete knowledge base about micro, small, and medium enterprises (MSMEs) actors for users and visitors of the Bogor city.
3.	Requires a cataloging system that can make it easy for micro, small, and medium enterprises (MSMEs) users to trace MSMEs actor existence valid and clear.
4.	Requires a cataloging system for micro, small, and medium enterprises (MSMEs) actors that can be integrating with a digital map service provider system in a valid and clear manner.
5.	Requires a cataloging system for grouping MSMEs actors according to their available regional valid and clear.
6.	Requires a cataloging system that can facilitate the promotion cycle of micro, small, and medium enterprises (MSMEs) actors with users and visitors of Bogor city.
7.	Requires a cataloging system that can facilitate the sales and purchase transaction cycle of micro, small, and medium enterprises (MSMEs) actors with users.
8.	Requires a cataloging system with valid and clear grouping of micro, small, and medium enterprises (MSMEs) actors according to the type of goods being traded.
9.	Requires a cataloging system with valid and clear data about goods traded by MSMEs actors.
10.	Requires a cataloging system with valid and clear data about the availability of goods traded by micro, small, and medium enterprises (MSMEs) actors.
11.	Requires a cataloging system with knowledge base pricing for goods traded by MSMEs actors valid and clear.
12.	Requires a cataloging system for grouping MSMEs actors according to the type of service being traded.
13.	Requires a cataloging system with valid and clear data about services traded by MSMEs actors.
14.	Requires a cataloging system with valid and clear data about the availability of services traded by micro, small, and medium enterprises (MSMEs) actors.

15.	Requires a cataloging system with knowledge base pricing for services traded by micro, small, and medium enterprises (MSMEs) actors in a valid and clear manner.
16.	Requires a cataloging system with a valid and clear knowledge base related to payment procedures provided by micro, small, and medium enterprises (MSMEs) actors to users.
17.	Requires a cataloging system with a valid and clear knowledge base related to price discounts given by micro, small, and medium enterprises (MSMEs) actors to users.
18.	Requires a cataloging system with a valid and clear knowledge base related to “after sales” facilities provided by micro, small, and medium enterprises (MSMEs) actors to users.

#### 4.2. Root Definition Cataloging System for Users of MSMEs

The following discussion is the formulation of the root definition (CATWOE analysis), in finding a statement of purpose to capture important essences, with the aim of obtaining a structured scientific formal definition from cataloging system for users of micro, small and medium enterprises (MSMEs) in Indonesia.

**Table 3: CATWOE Analysis**

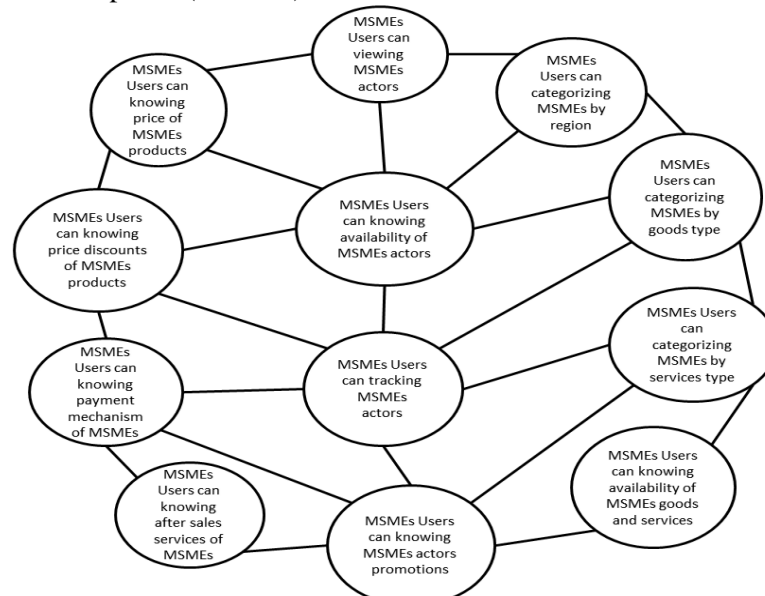
C= Customer	MSMEs actors, MSMEs user, visitors of Bogor city.
A= Actor	MSMEs users, visitors of Bogor city.
T= Transformation Process	Improve the overall transaction activities of MSME actors.
W= World View	Cataloging system that improves the traceability process, promotion process, transaction process, buying and selling process, after sales process, regional grouping, goods grouping, service grouping, and data grouping of all MSME actors.
O= Owner	MSMEs actors.
E= Environment Constraint	Government regulation/policies,

The structured scientific formal definition of cataloging system for MSMEs users in Indonesia based on output formulation of soft system methodology stages 1 until 3 with a hermeneutic approach as follows:

- Cataloging system for micro, small, and medium enterprises (MSMEs) users in Indonesia is a system that helps MSMEs users to be able to view, track, and categorize the types of MSMEs they want based on region, goods, and services. This system can also assist MSMEs users in knowing about promotions, price, payment mechanisms, price discounts, after-sales services that provided by MSMEs actors.

#### 4.3. Conceptual Model of Cataloging System for Users of MSMEs

Based on the results of the root definition formulation, the conceptual model development of a cataloging system for micro, small, and medium enterprises (MSMEs) users in Indonesia is as follows:



**Figure 3: Conceptual Model of Cataloging System for Users of MSMEs**

## 5. Conclusion

Based on results and discussion analysis, a conclusion given is that the structured scientific formal definition and conceptual model of the cataloging system for micro, small, and medium enterprises (MSMEs) users in Indonesia have been obtained. Suggestions that can be given are that further research can be carried out such as expanding the scope of research and developing prototypes of the cataloging system using other tools or approaches.

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