

THESIS

**THE ESTABLISHMENT OF CONSTRUCTION
CONTRACT CLAUSES ON NEGOTIATION AS AN
ALTERNATIVE DISPUTE RESOLUTION USING
FUZZY LOGIC**



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STATEMENT OF ORIGINALITY

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That the thesis under the title of :

The Establishment of Construction Contract Clauses on Negotiation as an Alternative Dispute Resolution using Fuzzy Logic

is my original work under the supervision of my advisor. I do not conduct any plagiarisms or illegal citations under the scientific norms which apply in the academic community. Should there be found any violations in terms of previously mentioned norms in my thesis, any formal or informal charges on originality of my work, I am willing to bear all the risks and consequences including the revocation of my academic title given by Universitas Katolik Parahyangan.

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ABSTRACT

Disputes in construction are almost inevitable in every project. As disclosed in the Act No. 2 of 2017 on Construction Services, preferred method to resolve disputes in construction is through the negotiation alternative based on the spirit of mutual interests and bipartisan consensus. As negotiation has always been the first and preferred alternative, this study aims to pinpoint some of the most detrimental factors which can be resolved through negotiation in residential projects by utilizing the fuzzy logic algorithm. Furthermore, suggested clauses alongside the negotiation process framework for each dispute artifacts are also provided. From the first stage analysis, four factors which satisfy the threshold 0,5 on their defuzzified values are the design and information factor, financial factor, quality factor, and client-related factor by a score of 0,68 ; 0,65 ; 0,59 ; 0,51 respectively. Development of clauses on highlighted factors mainly covers the objectives and several technical issues such as time limits, specifications, and other necessary actions need to be taken to reach settlements. Finally, negotiation process frameworks on correlating factors are proposed to assist small-scale contractors while pursuing the alternative starting from the preparation stage, information exchange and validation stage, bargaining stage, concluding stage, until its execution stage.

Keywords: Disputes, Small-scale Contractors, Residential, Fuzzy Logic, Negotiation.

PEMBENTUKAN KLAUSULA KONTRAK KONSTRUKSI TENTANG NEGOSIASI SEBAGAI ALTERNATIF PENYELESAIAN SENGKETA MENGGUNAKAN *FUZZY LOGIC*

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ABSTRAK

Sengketa merupakan suatu hal yang hampir mustahil untuk dihindari dalam setiap proyek konstruksi. Seperti dijelaskan dalam Undang – Undang No. 2 Tahun 2017 tentang Jasa Konstruksi, metode penyelesaian sengketa menganut prinsip – prinsip dasar dan semangat musyawarah untuk mencapai mufakat. Karena negosiasi merupakan alternatif pertama dan paling disarankan dalam penyelesaian sengketa, maka penelitian ini bertujuan untuk mengetahui faktor – faktor dominan yang berpotensi menghasilkan sengketa dan dapat diselesaikan melalui proses negosiasi pada proyek – proyek residensial menggunakan algoritma perhitungan *fuzzy logic*. Lebih lanjut, penelitian ini juga menyediakan usulan – usulan mengenai klausula – klausula dan proses negosiasi untuk setiap faktor terpilih. Dari hasil penelitian tahap pertama, ada 4 (empat) faktor utama yang memenuhi nilai *defuzzified value* di atas 0,5, yaitu faktor desain dan informasi, faktor finansial, faktor kualitas, dan faktor yang berkaitan dengan pengguna jasa dengan nilai *defuzzified value* sebesar 0,68 ; 0,65 ; 0,59 ; dan 0,51 untuk masing – masing faktor. Pembentukan klausula dari faktor – faktor yang disebutkan secara umum mengatur tentang tujuan dan beberapa aspek teknis seperti batas waktu, spesifikasi, dan kebutuhan lainnya untuk mencapai kesepakatan. Kemudian, usulan mengenai proses negosiasi untuk setiap faktor yang telah disebutkan bertujuan untuk membantu kontraktor skala kecil dalam menempuh proses negosiasi yang dimulai dari tahapan persiapan, tahapan pertukaran informasi dan validasi, tahapan negosiasi, tahapan kesimpulan, sampai dengan tahapan implementasi.

Kata Kunci: Sengketa, Kontraktor Skala Kecil, Residensial, *Fuzzy Logic*, Negosiasi.

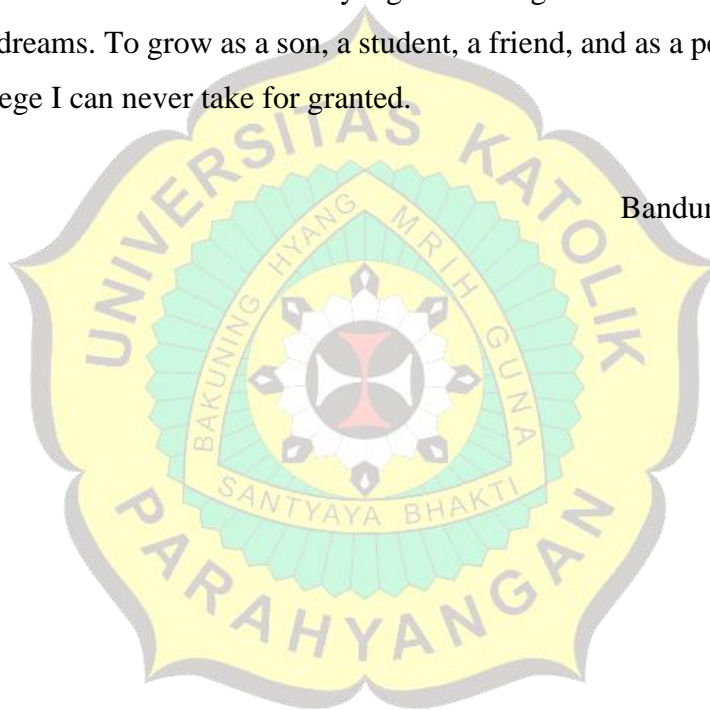
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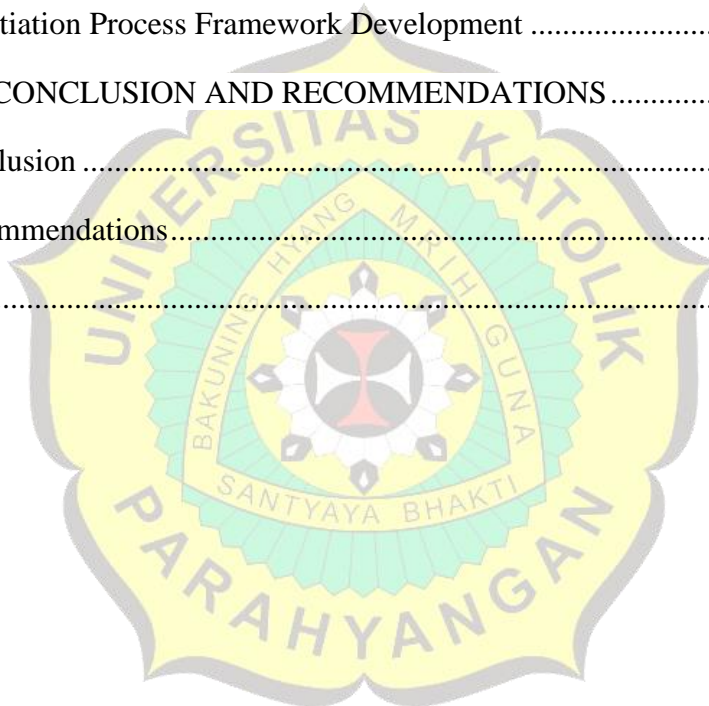
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LIST OF NOTATIONS AND ABBREVIATIONS

<i>BPS</i>	:	<i>Badan Pusat Statistik</i>
<i>GDP</i>	:	Gross Domestic Product
<i>PPN</i>	:	<i>Perencanaan Pembangunan Nasional</i>
<i>BAPPENAS</i>	:	<i>Badan Perencanaan Pembangunan Nasional</i>
<i>FIDIC</i>	:	<i>Fédération Internationale des Ingénieurs-Conseils</i>
<i>AIA</i>	:	American Institute of Architects
<i>IBM</i>	:	International Business Machines
<i>SPSS</i>	:	Statistical Package for the Social Sciences
<i>SNI</i>	:	<i>Standar Nasional Indonesia</i>
<i>OE</i>	:	Owner's Estimate



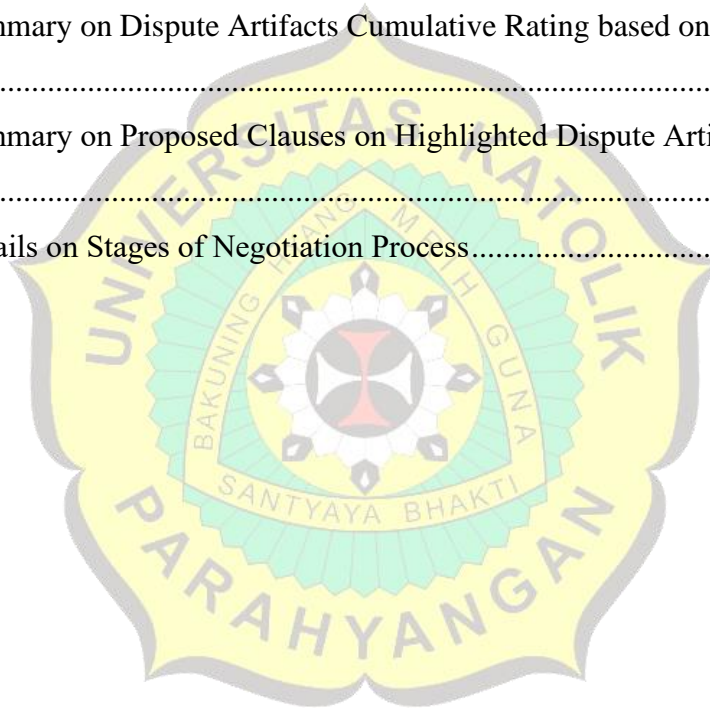
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CHAPTER 1

INTRODUCTION

1.1 Background Introduction

Construction industry has been a key player in accelerating the economic growth of Indonesia. In 2021 alone, the government has significantly increased its infrastructure budget to Rp 417,8 trillion compared to 2020 Rp 281,1 trillion, which indicates that this sector remains the center focus of the officials. Over the past five years, according to the Center Bureau of Statistics (BPS), the construction sector listed among the top contributors of the National Gross Domestic Product (GDP) with the proportion of more than 10%. Amid the 2020 crisis that hit all industries at the global level, the construction industry still positively contributes 10,7%, 10,56%, and 10,6% to the National Gross Domestic Product in the first, second, and third quarter of 2020 respectively. Furthermore, the Ministry of National Development Planning of the Republic of Indonesia (PPN/BAPPENAS) projected that the construction sector will have an accelerated growth at a rate of 5,2% to 6,7% in 2021. This prospective outlook supported by the intervention of the government officials on the urgency of the development across Indonesia proves that there is enough room for the industry to improve.

Unfortunately, aside from the prospective future of the industry in Indonesia, the construction sector has been long-known for its risks, uncertainties, inadequate contract documentation, and its behavioral factors among the involving parties (Cheung, 2013). Both exogenous and endogenous factors such as adverse weather conditions, changes in scope, fluctuating productivity, unprecedented accidents, and other force majeure conditions have been some of the constant threats to the industry. These disruptive occurrences often lead to conflicts among contracting parties. Escalated issues alongside with different perceptions concerning the context of the contracts might just result to violations on the terms of the agreements, and such disputes may arise from unresolved claims (Kumaraswamy, 1997).

Faced with growing number of conflicts, the lawmakers in Indonesia then formulated a framework on resolving construction disputes as stated in the Act No. 18 of 1999 on Construction Services through litigation and non-litigation process. However, the litigation process in project disputes does not always provide decisions in accordance with the area of knowledge and best practices in the field of construction (Hardjomuljadi, 2017). Aside from the litigation process, the disputing parties may proceed to the alternative dispute resolution path as disclosed in the Act No.2 of 2017 on Construction Services and the Act No. 30 of 1999 on Arbitration and Alternative Dispute Resolution through consultancy, negotiation, mediation, conciliation, expert judgement, or arbitration. The purpose of these alternatives is to assist and it goes in accordance with the fact that court proceedings are extremely costly and time consuming, and are generally considered ineffective in construction dispute resolution (Song, 2012).

Negotiation as one of the alternative dispute resolutions provided by the acts is considered the preferred method for owners and contractors (Lu, 2015). Not only because it is not a lengthy process as its counterpart is, but it also plays an important role in resolving claims, preventing disputes, and keeping an amicable relationship between owners and contractors (Ren et al., 2003). Unfortunately, stakeholders involved in the construction project dispute negotiation often refuse to proceed through this alternative as it is seldom learned by construction practitioners as part of their formal education process but rather through experience (Yiu, 2011). Therefore, this study aims to encourage the stakeholders in construction project disputes through research on potential causes which can lead to conflict that can be resolved by negotiation.

Even so, there are still some concerns which put the stakeholders in construction industry at an unease position when faced with project disputes. Small-scale contractors for example, tend to give in when confronted with such occurrences. Under article No. 20 in the Act No. 2 of 2017 on Construction Services, small-scale contractors are classified as those who provide construction services in a market which has small risks, noncomplex technologies, and operates within a low budget. By this

definition, most construction types that goes under the scope of small-scale contractors is likely those of small-scale projects such as residential buildings. As a matter of fact, because the scope of the residential building project is relatively small compared with the other types of buildings, it makes the market share of small-scale contractors comparably insignificant among their competitive peers. Other matters regarding the sustainability of the business in the long run such as goodwill, reputation, and on-going relationship between contractors and owners for instance, have always been the inhibitors on the practice of construction project dispute negotiation. Thus, valid and clear clauses are essential to accommodate the need of construction professional service providers in order to avoid possible conflicts and to resolve such disputes by negotiation throughout the completion of the project.

Having been more concerned on the matter of the dispute resolutions, past studies by experts tried to uncover means and methods to identify the most potential factors of the causal features on construction claims as they have become an inevitable part of modern contract system (Cheung and Yiu, 2006). As a result, payment and completion delays, dual interpretation regarding the contract documents, also inadequacy in technical and managerial skills of both parties are some of the most detrimental factors of construction disputes in Indonesia (Hartono and Hidayat, 2019). Moreover, past research has shown that most construction contracts are incomplete in terms of the inability to incorporate provisions to deal with all the possible contingencies whereas on its fundamental basis, construction contracts act as a ground for reinstating the intention of both the contracting parties (Cheung, 2013). Hence, it is vital for every project to have clear statements regarding the context of every specific matter governed by the contract.

To provide clauses regarding the potential causal features of construction project claims and disputes which can be resolved by negotiation, Fuzzy Logic is employed in this study to select and identify the most detrimental factors that affect the residential building projects conducted by small-scale contractors. Unlike its counterpart the Boolean theory which states 0 (zero) and 1 (one) as the true or false statement respectively, fundamentally Fuzzy Logic is an idea to assign object a grade

of membership ranging between 0 (zero) and 1 (one) (Zadeh, 1965). By this, the likelihood of an occurrence to happen can be quantified using Fuzzy Logic by letting 0 (zero) as the “unlikely” and 1 (one) as the “likely” possibility of an event.

1.2 Core of Study

As aforementioned, it is obvious that construction disputes are still inevitable in most projects handled by small-scale contractors. Therefore, this study is conducted to help develop clauses on negotiation as a mean to resolve such conflicts based on its potential factors which can lead to construction disputes among residential buildings.

1.3 Study Objectives

The objectives of this study are:

1. To identify potential dispute-causing factors on residential buildings.
2. To develop clauses on negotiation as an alternative dispute resolution based on potential dispute-causing factors.
3. To provide a framework on construction project dispute resolution using negotiation for small-scale contractors.

1.4 Coverage of Study

In this study, several limitations are applied throughout the research as follows:

1. The classification of contractors and projects used as subjects and objects in this study are limited to small-scale contractors and residential buildings in Bandung region.
2. This study refers to the standard clause as provided by FIDIC Green Book Short Form Contract and the Ministerial Regulation of Indonesia No. 31 of 2015 on the Procurement Standards and Guidelines on Construction Works and Consultancy Services.

3. Variables used for the fuzzy logic analysis in this study are the 7 (seven) linguistic variables in triangular membership functions as confirmed by Zhao and Bose (2003).
4. This study adopts the scoring system used in the study by Cheung (2013).
5. This study focuses on the potential factors occurring at the construction phase.

1.5 Research Methods

The methods of research conducted in this study are as follows:

1. Literature Review

The literature review is conducted to find eligible sources to support reviews and theories used in this research.

2. Survey

The survey is conducted to gather primary data set from construction professional service providers for research purposes.

3. Data Analysis

The data analysis is conducted to calculate the aggregated fuzzy parameters alongside their defuzzified values of the primary data sets obtained from the questionnaire and to develop clauses and negotiation process framework on corresponding dispute artifacts.

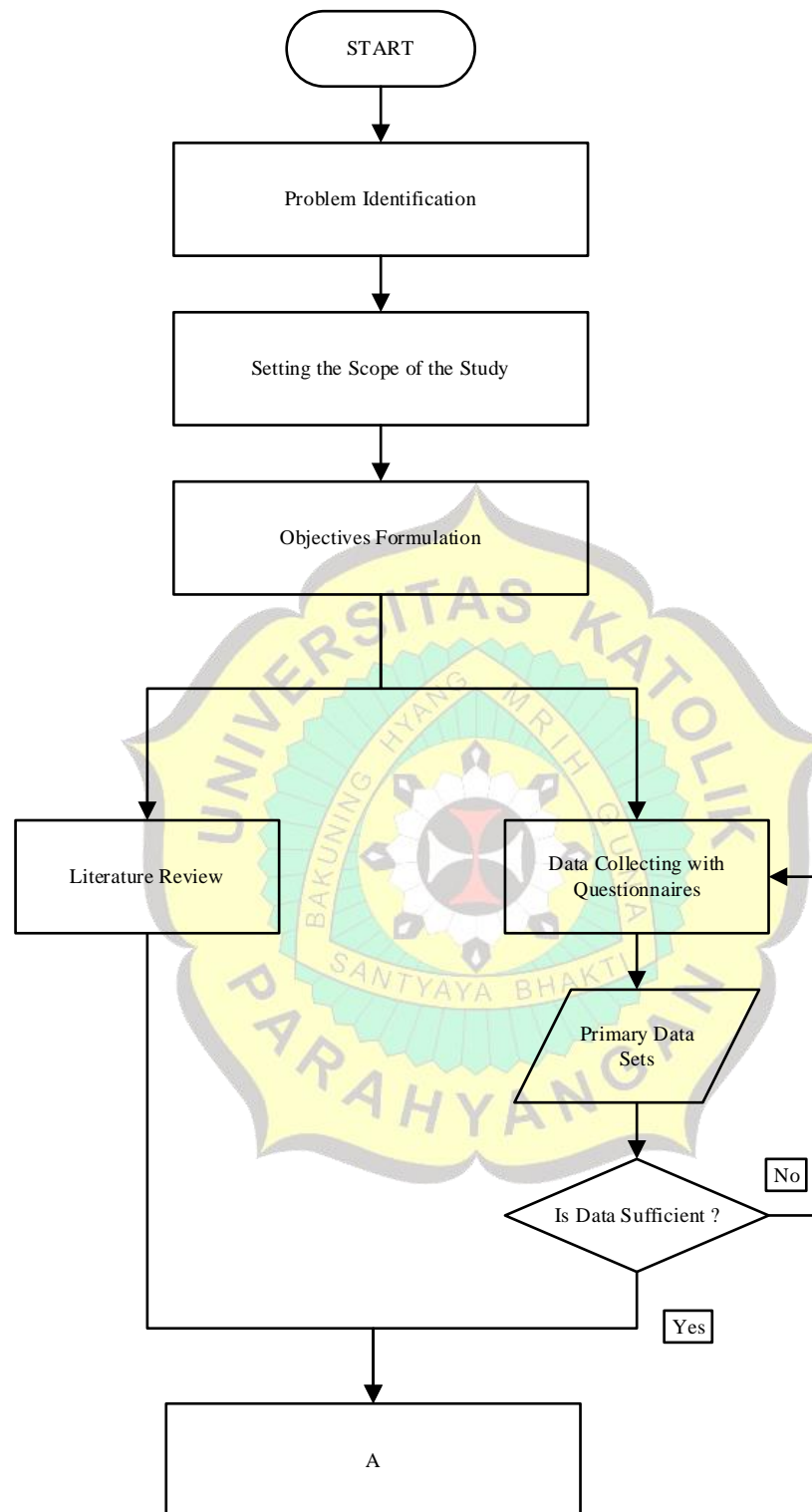


Figure 1.1 Research Methods Flowchart

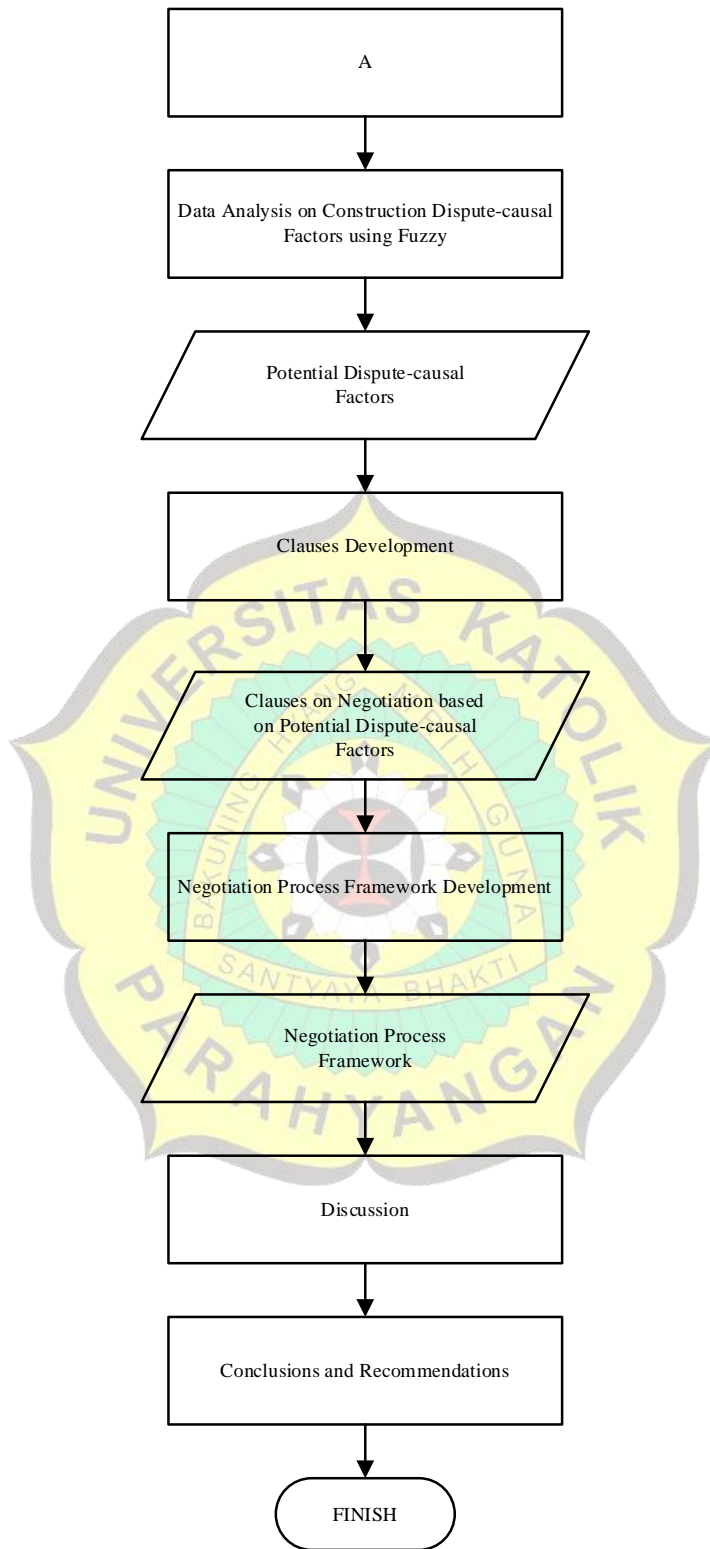


Figure 1.1 (cont.) Research Methods Flowchart

1.6 Writing Systematics

The writing systematics of this study will be as follows:

CHAPTER 1 INTRODUCTION

This chapter covers the background, core, objectives, coverages, research methodology overview, and writing systematics of this study.

CHAPTER 2 LITERATURE REVIEW

This chapter covers the theories on eligible sources which act as a basis in logical reasoning of the following study.

CHAPTER 3 RESEARCH METHODS

This chapter covers the methodologies used in this study to provide a systematic approach on conceptual frameworks of this study.

CHAPTER 4 DATA ANALYSIS

This chapter covers the analysis of the data by previous methodology to present a valid set of results concerning the objectives of this study.

CHAPTER 5 CONCLUSION AND RECOMMENDATIONS

This chapter covers the final interpretation of the study alongside its recommendations for future researches.