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**Decision Making in Alternative Dispute Resolution  
(ADR) Use in Construction Projects:  
A Planned Behaviour Approach**

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A thesis submitted in fulfilment of the requirements for the degree of  
Doctor of Philosophy in Civil Engineering, The University of Auckland, 2017.

## **ABSTRACT**

Alternative Dispute Resolution (ADR) is prominent in managing disputes in construction projects. Despite the many positive attributes of ADR, previous studies have discovered that both the appreciation and the actual practice of ADR are disappointingly low, as evidenced by the context of the Malaysian construction industry. Although the literature related to ADR has been growing over the past 30 years and gaining impetus since the mid-1980s, the decision-making process in ADR still remains relatively unknown and under-explored. There is, for example, almost no tested and validated framework to intervene in the use of ADR in the Malaysian construction industry. To address this gap, the main objectives of this doctoral study are fourfold: (1) to perform a systematic review on the factors influencing ADR selection and use, (2) to develop and test an ADR decision-making behavioural model, (3) to determine the factors predicting a decision to use ADR, and (4) to develop and test an ADR intervention framework. To achieve these objectives, a multimethod design study was adopted.

The research first addressed **objective 1** by systematically reviewing 446 articles from 21 construction-related journals. The synthesized factors influencing ADR selection and use were found to be fragmented and overemphasising utility grounds. The relationship between the factors was never empirically established and tested. However, these factors were found to fit the dimensions of the Theory of Planned Behaviour (TPB) model, which offer a plausible development of an ADR decision-making behavioural framework.

To fully address **objective 2** of the study, the TPB framework was integrated with and extended by other behavioural theories. In between, a focus group was utilised and a belief elicitation study conducted to reaffirm the robustness of the conceptual model. Following that, 128 respondents specialising in Building and Civil Engineering works were recruited to test the model. The data was then analysed by using Partial Least Squares–Structural Equation Modelling (PLS-SEM).

To address **objective 3**, the ADR decision-making behavioural model was examined. The findings showed that attitude (ATT) is the main predictor of intention to use ADR (INT), while perceived relative advantage (PA) and perceived ease of use (PE) are the significant predictors of attitude (ATT). The findings were used as the basis to address the subsequent **objective 4**. Six construction professionals were interviewed and these validated the

importance of these variables. Drawing on both qualitative and quantitative findings, an intervention framework was then developed. Both normative pressures (NP) and trust (TR) were conceptualised and shown to be effective macro forces that influence the decision-making process. The framework has high predictive accuracy and predictive relevance.

The contributions of this study are threefold. Firstly, the study progresses and advances theories in ADR selection behaviour through the refinement and extension of the TPB. Secondly, this study pioneers a decision-making model through a robust theoretical approach. The findings show that the dynamics of decision-making in ADR use actually follow a reasoned process. Thirdly, the study develops an intervention framework and demonstrates how micro conditions can be influenced by macro forces.

The outcome of this research is to provide a new and unique model that captivates and extends behavioural and decision-making theories in ADR use in a holistic manner. The results offer practical premises for future interventions in which both the decision-making behavioural model and the intervention framework can be used as possible means to increase and enhance ADR use.

## **DEDICATION**

***“Isn’t it a pleasure to study and practise what you have learned?”*** - Confucius

It is indeed a great pleasure to learn and put into practise with what I have acquired all these years in New Zealand. This doctoral thesis is a special dedication to my dearest father - Mr. Lee, Kee Chin, my dearest mother – Madam Tan, Chun Thoo, and my dearest baby sister, Ms. Lee, Jo Ying. Thank you for always supporting me and showering me with unconditional love.

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## **LIST OF PUBLICATIONS**

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- 2) Lee, C.K., Yiu, T.W., & Cheung, S.O. (2016). "Application of the Theory of Planned Behaviour to Alternative Dispute Resolution (ADR) Selection and Use in Construction Projects". Project Management Journal. Submitted for Review.
- 3) Lee, C.K., Yiu, T.W., & Cheung, S.O. (2016). "Predicting Intention to Use Alternative Dispute Resolution (ADR): An Empirical Test of Theory of Planned Behaviour Model (TPB) Model". Journal of Management in Engineering. Submitted for review.
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- 5) Lee, C.K., Yiu, T.W., & Cheung, S.O. (2016). "A Macro-Micro Framework of Alternative Dispute Resolution (ADR) Use in the Malaysian Construction Industry". Advancement of Construction Management and Real Estate. 14-17 December 2016, Hong Kong.
- 6) Lee, C.K., Yiu, T.W. and Cheung, S.O. (2015). "Perceived Risks, Obligations and Uncertainties: Antecedents of Unpaid Contractors' Intention to Suspend Works against Non-Payment". In ISEC-8: The Eighth International Structural Engineering and Construction. Sydney, Australia, 23-28 November 2015. [Scopus Indexed]
- 7) Lee, C.K., Yiu, T.W. and Gonzalez, V. (2014). "Predicting Contractors' Intention to Suspend works against Non-Payment: Determinants of Contractor's Behavioural Choice in Malaysia". Proceedings of the Australian Academy of Business and Social Sciences Conference 2014 (in partnership with the Journal of Developing Areas).

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## **GLOSSARY**

ADR	Alternative Dispute Resolution
AVE	Average Variance Extracted
CIDB	Construction Industry Development Board
CIPAA 2012	Construction Industry Payment and Adjudication Act
CR	Composite Reliability
DAB	Dispute Adjudication Board
DB	Dispute Review Board
DRB	Dispute Review Board
IEM	Institute of Engineers Malaysia
KS	Kolmogorov-Smirnov
MBAM	Master Builders Association Malaysia
PAM	Persatuan Arkitek Malaysia
PLS	Partial Least Squares
PWD	Public Works Department
PSDC	Professional Services Development Centre
SEM	Structural Equation Modelling
TPB	Theory of Planned Behaviour

## **CO-AUTHORSHIP FORMS**

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- 1) Co-Authorship form for Chapter 2
- 2) Co-Authorship form for Chapter 6
- 3) Co-Authorship form for Chapter 8
- 4) Co-Authorship form for Chapter 9

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Please indicate the chapter/section/pages of this thesis that are extracted from a co-authored work and give the title and publication details or details of submission of the co-authored work.

Chapter 2: Systematic Review on ADR Selection and Use- Reclassification of ADR selection and Use Factors into the TPB Framework.

The content of this chapter is based on the article:

Lee, C.K., Yiu, T.W., and Cheung, S.O. (2016). "Selection and use of Alternative Dispute Resolution (ADR) in construction projects- Past and future research." International Journal of Project Management, 34(3),494-507.

Nature of contribution by PhD candidate	The PhD candidate was the idea originator. He conducted data collection, data analysis,writing and submission of the paper
Extent of contribution by PhD candidate (%)	90

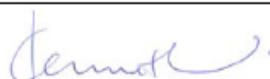
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The undersigned hereby certify that:

- ❖ the above statement correctly reflects the nature and extent of the PhD candidate's contribution to this work, and the nature of the contribution of each of the co-authors; and
- ❖ that the candidate wrote all or the majority of the text.

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Chapter 6: Belief Elicitation Study-Reaffirmation to Conceptual ADR Decision-Making Behavioural Model

Part of this chapter is based on the article: "Application of the Theory of Planned Behaviour to Alternative Dispute Resolution (ADR) Selection and Use" Project Management Journal. Submitted for Review

Nature of contribution by PhD candidate	The PhD candidate was the idea originator. He conducted data collection, data analysis, writing and submission of the paper.
Extent of contribution by PhD candidate (%)	90

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Chapter 8: A Test of Theory of Planned Behaviour - Role of Scenarios in Attitudinal/Behavioural Dimension.

The content of this chapter is based on "Predicting Intention to Use Alternative Dispute Resolution (ADR): An Empirical Test of Theory of Planned Behaviour (TPB) Model" Journal of Management in Engineering. Submitted for review.

Nature of contribution by PhD candidate	The PhD candidate was the idea originator. He conducted data collection, data analysis, writing and submission of the paper.
Extent of contribution by PhD candidate (%)	90

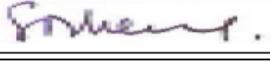
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### Chapter 9: Development of Intervention Framework

Part of this chapter is extracted from the following manuscript: "Understanding Intention to Use Alternative Dispute Resolution (ADR): A Framework Based on Technology Acceptance Model (TAM)". Journal of Legal Affairs and Dispute Resolution in Engineering and Construction. Submitted for review.

Nature of contribution by PhD candidate	The PhD candidate was the idea originator. He conducted data collection, data analysis, writing and submission of the paper.
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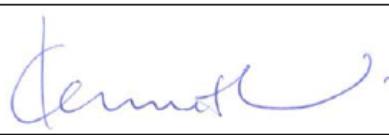
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## **1. CHAPTER 1: INTRODUCTION TO STUDY**

---

### **1.1 Background**

The construction industry plays an important role in propelling a nation's economy. The construction sector has contributed significantly to both wealth creation and the socio-economic development of Malaysia (Khan, Liew, & Ghazali, 2014). Despite its importance, it has been always haunted with a poor reputation in relation to its adversarial nature (Bower, 2003). Disputes are almost inevitable in construction projects (Al-Humaidi, 2014; Cheung & Yiu, 2006). Disputes are detrimental as they lead to claims, project delays and damaged business relationships (Cheung, Suen, & Lam, 2002).

To manage disputes effectively, Alternative Dispute Resolution (ADR) methods have been used. Common types of ADR methods include arbitration (Galloway & Nielsen, 2011; Tanielian, 2013); adjudication (Teo, 2008; Uher & Brand, 2008); negotiation (Galloway, 2013; Yiu & Nog Chung, 2014); mediation (Cheung, Chow, & Tse, 2013; Qu & Cheung, 2012, 2013); dispute resolution advisor system (Cheung & Yeung, 1998; Wall, 1993); and dispute review board (Agdas & Ellis, 2013; Ndekugri, Chapman, Smith, & Hughes, 2014).

ADR had been gaining impetus since the mid-1980s, notably in countries such as Australia and the UK (Collins et al., 2007). In Malaysia, litigation and arbitration are mainly practised, followed by mediation and adjudication (Mohd Danuri, Mohd ishan, Mustaffa, & Jaafar, 2012). According to Cheung (2006), ADR remains largely voluntary. In accordance with the jurisdiction of the court in Thamesa Designs Sdn Bhd & Ors vs Kuching Hotels Sdn Bhd, disputants always maintain their constitutional right to refer disputes to litigation (Lim, 2014).

Despite the benefits of ADR to the Malaysian construction industry, Chong and Mohamad Zin (2012) discovered that appreciation of ADR was low. Reported by Ameer Ali (2010), usage of ADR in Malaysian construction industry, such as mediation, was very low as well. The actual practice of ADR in the construction industry as a whole in fact was disappointingly low (Chong & Mohamad Zin, 2009). For example, a study by Ismail, Abdullah, Hassan, and Mohamad Zin (2010) showed that between 2000-2008, there were only 4 construction mediation cases recorded under the Malaysian Mediation Centre, while a total of 518 arbitration cases were recorded without mediation. A recent report by KLRCA

(2015) also showed that there were only 130 arbitration cases and 29 adjudication cases between 2010 and 2014. Reports from the Prime Minister's Department stated that there were more than 900,000 unresolved cases pending in the lower courts, while there remained a backlog of 91,000 cases at the High Court. ADR methods such as mediation could ensure disputes settlement and a remedy to the mounting backlog of court cases (New-Straits-Times, 2008). This further denotes that, despite the fact the Malaysian Construction industry has been pushing the use of ADR through macro-level interventions such as enforcement of statutory provisions, institutional pressures, and introduction of revised/improved standard forms of contracts, the level of ADR use, although showing improvement over years, remains low.

The macro outcome is actually closely linked with micro conditions (decision-making behaviour at an individual level) (Coleman, 1987, 1990). This implies that macro conditions influence the overall level of ADR use in the construction industry, not directly, but through the myriad of decisions made by construction practitioners. To intervene in the level of ADR use, the decision-making process of ADR users should be first understood. Assumptions and existing beliefs may need to be altered and decision makers exposed to new beliefs about the benefits of ADR. This can be achieved only if the assumptions about the regularities of individual behaviour in ADR use are strongly founded and understood.

## **1.2 Problem Statement**

Previous studies have attempted to understand decision-making in ADR use by looking into the selection and use factors of ADR. Work done by Cheung (1999), Cheung et al. (2002), Chong and Mohamad Zin (2012) attentively examined the factors influencing ADR selection and use, but failed to critically examine the relationship between the factors. These relationships and the interactions between these factors towards ADR selection and use were not established, nor empirically tested. On top of that, several ADR decision-making support technologies and tools (Chan, Suen, & Chan, 2006; Cheung et al., 2002; Gad, Kalidindi, Shane, & Strong, 2011) have been developed to help informed decisions in ADR use. However, these tools stemmed from the basis of the utility of each ADR method, based on weak assumptions and without holistic approach in consideration of normative and control factors.

Although the literature concerning ADR has grown, existing discussions embodied in ADR selection factors are only limited to the outcomes and utilities associated with each type of ADR (Chong & Mohamad Zin, 2012). Studies done by Cheung, Yiu, and Suen (2004c); Cheung and Yiu (2007); Cheung, Chow, and Yiu (2009); Yiu, Cheung, and Siu (2012) emphasized negotiation; while scholarly work done by Yiu, Cheung, and Mok (2006); Yiu and Lai (2009); and Yan (2010) focused attention on the development of mediation. Arbitration opens for further imploration and the development of this area has been well discussed (Al-Humaidi, 2014; Tanielian, 2013). However, the decision-making process in ADR remains unknown and under-explored. There is almost no tested and validated framework for intervening in the use of ADR in the Malaysian construction industry.

This overall explains that, despite the effort that both the industry and researchers put in to enhancing the use of ADR, what has been overlooked is the importance of the decision-making process (micro level conditions) of ADR users. Previous studies have failed to consider the bridging assumptions on how macro social conditions affect decision making, and the information on how the micro-level decision-making process is actually embedded in a macro-level configuration. To date, no framework has demonstrated how micro conditions are linked with macro conditions. Previous studies have also failed to discuss or provide any information on strategically intervening in the decision-making process. The micro domain (decision-making process of ADR use) is open for further investigation. The understanding of macro-micro links (influence of macro conditions on the micro level decision-making process) actually are the corner stones of achieving favourable macro outcomes (Klobas & Ajzen, 2015). Hence, this research strongly addresses a niche: understanding the decision-making process in using ADR in the Malaysian construction industry. To overall improve ADR use and intervene to enable favourable macro outcomes, the decision-making process in ADR use should be thoroughly investigated and researched.

### **1.3 Research Objectives**

To address the problems above, the objectives of this doctoral research are to:

#### **RO1: Perform a systematic review of the factors influencing ADR selection and use.**

- This objective aims to perform systematic reviews on reputable research articles on the important factors influencing ADR selection and use. This process is vital for synthesizing and examining the characteristics and trends of the ADR selection and use factors.

### **RO2: Develop and test an ADR decision-making behavioural model.**

- In order to understand the decision-making process of ADR users, this objective aims to develop and test an ADR decision-making behavioural model. The development of the model requires integration of behavioural theories, so that the relationship between existing factors (identified in objective 1) can be mapped, established, and empirically examined. Development and empirical testing of the model requires both qualitative and quantitative examination.

### **RO3: Determine the factors predicting the intention to use ADR.**

- This objective aims to identify the key factors that predict the intention to use ADR from the ADR decision-making behavioural model. The hypothesis established in the ADR decision-making behavioural model requires rigorous empirical examination.

### **RO4: Develop and test an ADR intervention framework.**

- This research aims to develop and test an ADR intervention framework. The development of the intervention model requires inputs of the established paths identified from objective 3. The intervention model requires further empirical evaluations to affect a parsimonious intervention framework that can be used to intervene, promote, and enhance ADR use in the Malaysian construction industry.

## **1.4 Research Methodology**

Research paradigm must be nominated as the first step to substantiate the philosophy of research (Mackenzie & Knipe, 2006). According to Levers (2013), research paradigm holds ontological, epistemological, and methodological beliefs. Research paradigm dictates important notions such as “what should be studied, how research should be conducted”, and “how results should be explained and interpreted”.

Ontology raises question about the nature of reality is either independent of human consciousness and experience, or reality itself exist within consciousness and only through experience (Levers, 2013). It considers the nature of social entities. There are two opposite ontological positions, namely objectivism, and constructivism. Objectivism assumes that social phenomena and their meanings have an existence that is independent of, and external to social actors. Constructivism on the contrary recognize knowledge as value laden (Levers,

2013). Constructivism assumes that social entities are created by perceptions and actions of social actors, multiple and different for people. It implies that social phenomena are produced through social interactions and current state of revision (Bryman, 2008).

On the other hand, epistemology considers what acceptable knowledge is (Saunders, Lewis, & Thornhill, 2012b). It considers “how to acquire knowledge”, and questions whether the reality can be acquired through natural science method. There are two opposite stances in epistemological positions, namely positivism, and interpretivism. Positivism refers to scientific method that may be applied to social world with the assumption that it can be studied in a similar fashion as the natural world. Positivist researcher commonly adopts quantitative methods of data collection and analysis, which aim to test theories through description with observation and measurement in order to explain the phenomenon and predict the surrounding control forces (Mackenzie & Knipe, 2006). It implies that positivism approach studies causal relationships in data to generate law-like generalizations. On the contrary, interpretivism aims to comprehend the subjective meaning of social interaction (Bryman, 2008). It requires a research strategy that respects the difference between people and social entities and the objects of natural science (Bryman, 2008; Bryman & Bell, 2011).

No specific paradigm actually prohibits the use of any methodological approach. This doctoral research attempts to model the decision-making process through the integration of theories, systematic extensions and decomposition of the TPB model. Although the development of the ADR decision-making behavioural model and the ADR intervention framework are predominantly reserved under the positivism paradigm, they require the aid of the interpretivism approach. Quantitative methods predominate although qualitative were employed in this research.

To achieve the research objectives, this doctoral research adopted a **Multimethod** design that combined both quantitative and qualitative methods. Multimethod design can be signified as qualitative and quantitative projects that are comprehensive by themselves, but are combined together to form essential constituents of a research project. The practice of multimethod research can also be defined as the “practice of employing different types, or styles, of data-collecting methods within the same study, or research program” (p. 577) (Hunter & Brewer, 2003).

In multiple method design, all quantitative and qualitative projects are relatively complete in themselves, but are used together to form essential components of one research program (Esteves & Pastor, 2004; Morse, 1991, 2003; Teddlie & Tashakkori, 2003). However, this does not imply that one must always employ a mix of qualitative and quantitative methods in each project, as it all depends on the nature of the research problems (Hunter & Brewer, 2003; Teddlie & Tashakkori, 2003). Notably, this doctoral research consists of numerous projects/studies that perfectly fit the characteristics of a multimethod research project. Table 1.1 overall shows the research workflow:

**Table 1.1 Research Workflow**

Method	Research Objective	Research Activities	Chapter
Literature Review	RO1	✓ Systematic Review of 927 Articles, from 21 Reputable Construction Journals from Year 1983-2014. ADR selection and use factors were synthesized.	2
Theoretical Model		↓ Theoretical support ✓ Reclassify all ADR selection and use factors into the Theory of Planned Behaviour Framework (TPB)'s dimension.	
Focus Group	RO2	↓ Theoretical support ✓ A focus group (consists of 16 construction professionals) was used to extend the TPB framework.	4
		↓ Theoretical support ✓ An ADR Decision-Making Behavioural full model was conceptualised and hypothesized. ✓ A Main questionnaire measuring the model constructs was developed.	
Belief Elicitation Study	RO2	↑ Reaffirmation ✓ A belief elicitation study was separately designed and carried out. ✓ The findings reaffirms the conceptual ADR decision-making behavioural model was theoretically sound.	6
		↓ Empirical Analysis ✓ The main questionnaire (ADR decision-making model) was responded by 128 contractors. ✓ Structural Equation Modelling was used to analyse path, test hypothesis, evaluate ADR decision-making behavioural model.	
Structural Equation Modelling	RO2	↓ Empirical Analysis ✓ Key paths and variables influencing intention to use ADR were determined and identified.	7,8
		↓ Empirical Analysis ✓ Qualitative interviews with construction experts to seek ways to intervene in ADR use based on the ADR decision-making behavioural model.	
Interview	RO4	↓	9

Structural Equation Modelling	RO4	✓ Combined findings of confirmed paths and qualitative interviews were used to develop an ADR intervention framework.	Empirical Analysis	9
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To address **objective 1**, Chapter 2 presents an extensive systematic review of ADR selection and use factors for the past 32 years. The results suggested that the selection and use factors over-emphasized utility factors, and the dynamics and relationships between these factors towards selection and use were not empirically investigated and validated. Based on this gap, this clearly points to the need for the development of a model that explains and describes the decision-making process of ADR users.

Extensive works were needed to address **objective 2**. Chapters 4, 5, 6, and 7 and 8 mainly address objective 2. Firstly, several behavioural theories were referred to and reviewed. It was found that all selection and use factors fit the dimensions of the Theory of Planned Behaviour (TPB) framework. The reclassification efforts were subject to the researcher's qualitative assessment, and the first extension to the TPB framework was proposed (Chapter 2). The reclassification into the TPB framework provides a preliminary confidence that the TPB model is capable of addressing all selection and use factors holistically.

To understand the capacity of the TPB framework, Chapter 4 presents a study based on focus groups. A focus group was utilised to provide possible salient beliefs to extend and decompose the model. Anchoring on payment disputes, 16 payment experts were recruited and required to discuss and speculate on unpaid contractors' behavioural, normative and control beliefs in ADR use. Accordingly, the TPB framework was extended with an additional five constructs.

Following that, Chapter 5 presents the development of a conceptualised ADR decision-making behavioural model. With reference to the results from Chapter 4, the TPB framework was integrated with other behavioural theories. An ADR decision-making behavioural model was conceptualised. The model overall consists of six major hypotheses, and 20 sub-hypotheses. A set of questionnaire (main survey questionnaire) consisting of items that assess the model constructs were developed. To improve the clarity of the questionnaire, the questionnaire was pre-tested by three construction experts. To reaffirm that

the conceptualised ADR decision-making behavioural model is theoretically sound, a separate Belief Elicitation study was conducted. Chapter 6 presents the results of a belief elicitation study. The participants were 25 contractors specialising in building and civil engineering. The results reconfirmed that the conceptualised ADR decision-making behavioural model was indeed theoretically sound. Minor amendments were done on the survey questionnaire (such as modifications on the items), and further pilot was tested by 20 respondents, and made ready for the main survey.

Chapter 7 presents the result of the main survey. 128 respondents participated in this. Partial least squares modelling was used to test the hypothesis, and assess the overall predictive relevance of the model. To further consolidate the findings, Chapter 8 compares the application of original the TPB model in two distinct scenarios.

To address **Objective 3**, the confirmed path influencing “intention” was identified and extracted from the model (discussed and presented in Chapter 7). The extracted confirmed path predicts the intention to use ADR. It was used as valuable input for the development of an ADR intervention framework in Objective 4.

Following that, Chapter 9 presents the development of an intervention framework that addresses **Objective 4**. A total of six construction professionals were interviewed. With reference to the ADR decision-making behavioural model and confirmed paths, the interviewees were asked to provide their opinions on possible ways to intervene in ADR use. Accordingly, the intervention framework was conceptualised and empirically tested.

## 1.5 Originality and Contribution

The empirical result from this research provides a theoretical understanding of the variables in explaining behavioural selection and decision making in ADR methods. Besides refining the original TPB model, it helps better explain the decision-making process in ADR use. Since TPB studies have never been utilized and studied in the field of dispute resolution selection and use behaviour, the validated empirical instruments and model from this research transcend culture and geographical boundaries. It is capable of demonstrating the mobility of the proposed model in diverse cultures, that is, both developing nations like Malaysia and developed countries like New Zealand, through empirical investigations in the future.

Another unique feature of this research lies in extending, developing, pioneering a behavioural model that addresses decision making over and above utility factors. There has been almost no previous empirical effort to explain the micro condition level (the decision-making process) in ADR use. This study has successfully pioneered a decision-making model in ADR use, and demonstrated the dynamics of decision-making in ADR use which actually follows a parsimonious reasoned process. Perceived relative advantage (PA) and perceived ease of use (PE) influence attitude (ATT) towards ADR use, and accordingly, attitude (ATT) influences intention (INT) to use ADR.

The study confirmed that attitudinal dimensions towards ADR are the key determinant of intention to use ADR. It advances knowledge in ADR selection behaviour through the consolidation and progression of behavioural theories. Accordingly, the key determinants that influence intention (selection behaviour) are further proposed and developed into a parsimonious intervening intention-based framework that can be used to promote and enhance ADR use in the Malaysian construction industry. Both normative pressures (NP) and trust (TR) were clearly shown to be influential towards perceived ease of use (PE) and perceived relative advantage (PA) in ADR use. Effective interventions for ADR use could include ADR campaigns and propagation of ADR values that dispel any myths about ADR and foster acceptance of ADR (fostering higher values of normative pressures), and training that enhances competencies of neutrals (fostering higher values of trust in neutrals). Favourable normative pressures (NP) and trusts (TR) would then lead to a favourable attitude (ATT) and increase the overall intention (INT) to use ADR through the interactions of perceived ease of use (PE) and relative advantage (PA) with attitude (ATT).

The results of the study overall contribute a better understanding to practitioners and policy makers in the construction industry which can be beneficial for them to further devise relevant strategies concentrating on intervening perceived ease of use (PE) and perceived relative advantage (PA) in ADR use. The study contributes both theoretical and practical means towards this end.

## **1.6 Ethical Consideration**

This doctoral study has been conducted in accordance with the ethical guidelines provided by the University of Auckland Human Participant Ethics Committee. The overall

doctoral study consists of three scales of research projects, with three different ethical approval codes. Each project was granted for a period of three years from the approval date.

The first project is “Predicting Contractors’ Behavioural Intentions in Remedy Non-Payment: Understanding Decision-Making Experience of Unpaid Contractors” (Code: 012980, Approved on 29 September 2014). The aim of this project was to elicit beliefs of ADR use from a Focus Group. The result of this project is presented in Chapter 4.

The second project is “Determinants of Alternative Dispute Resolution (ADR) Selection and Use in the Malaysian Construction Industry” (Code: 015919, Approved on 21 March 2016). This project comprises a belief elicitation study and pilot test. The results of this project are analysed and presented in Chapters 6 and 7.

The third project is “Determinants of Alternative Dispute Resolution (ADR) Selection and Use in the Malaysian Construction Industry”- (Main Study) (Code: 016869, Approved on 7 March 2016). This project comprises a main survey and model validation interviews. The results of this project are analysed and presented in Chapters 7, 8, 9, and 10. The Approval letters, Participant Information Sheet and Consent Forms are attached in the Appendix sections.

## **1.7 Thesis Outline**

This doctoral thesis is based on manuscripts, known as a thesis with publications. The chapters are arranged based on extraction from a series of published and unpublished articles. The thesis comprises 10 chapters.

**Chapter 1** outlines the research problem, gap and overall methodology to address the research problems. The remaining chapters (Chapters 2, 3, 4, and 5, 6) draw on theoretical concepts and qualitative work towards the development of a conceptual ADR decision-making behavioural model. Chapters 7 and 8 mainly test the conceptual ADR decision-making behavioural model with quantitative work, while Chapter 9 tests and develops a parsimonious framework based on the empirically-determined key variables that significantly influence intention (selection behaviour). The overall outline of the thesis is presented as follows:

**Chapter 2** presents the findings of the factors influencing ADR selection and use in construction projects over the last 32 years (1983-2014). The factors were identified through a rigorous systematic review process. A total of 927 articles from reputable construction journals were reviewed, filtered, and synthesized. Accordingly, the factors were shown to be fragmented, and no research and a priori works had been done to examine the relationship between these factors. Preliminary findings show that all synthesized factors could be classified into the dimensions of the TPB framework.

**Chapter 3** presents the trend of dispute resolution methods over 32 years (1983-2014), and presents the common ADR methods used in the Malaysian Standard Form of Contracts. The trends of each resolution method, such as negotiation, arbitration, adjudication, mediation, mini-trial, dispute review board and dispute review advisor were discussed in detail. The summary of the trends was then discussed and presented accordingly. Investigation of each standard form of contracts gave rise to two potential conceptualised traits, namely “voluntariness in ADR use” and “voluntariness from mutual consent” in conceptualising the ADR decision-making behavioural model.

**Chapter 4** presents an initial study to understand the capacity of the Theory of Planned Behaviour in predicting ADR selection behaviour. The study was based on an online asynchronous focus group that consisted of 16 construction professionals. A hypothetical payment dispute was used to probe the discussions. The focus group members were required to speculate on unpaid contractors' attitudinal/behavioural, normative and control beliefs, and their sets of beliefs were used to span the TPB framework. A preliminary conceptual extended TPB model based on the focus group was proposed.

**Chapter 5** aims to develop and conceptualise an ADR decision-making behavioural model by drawing on the Theory of Planned Behaviour and integrating other theories such as Diffusion of Innovation Theory, Prospect Theory, Motivation Theory, Protection Motivation Theory and Institutional Theory. The conceptual model fully captivated the factors identified in the systematic review (Chapter 2) and the relationships between these factors were theoretically built and established based on the TPB framework and preliminary findings from the focus group. Once the conceptual model was built, a main survey questionnaire assessing the model items was developed and proposed. The questionnaire consists of three important sections: (1) dispute characteristics, (2) selection of ADR method, and (3)

measurement items of the model. Four different dispute scenarios (Scenarios A, B, C and D) were designed and embedded in the questionnaire. The proposed questionnaire was evaluated and pre-tested by three construction experts. The questionnaire was revised and improvised accordingly.

**Chapter 6** aims to reconfirm that the conceptual ADR decision-making behavioural model in Chapter 5 is theoretically sound. To achieve this, a separate belief elicitation questionnaire was designed. Similar to the proposed main survey, it has four different dispute scenarios embedded in the belief elicitation questionnaire. The belief elicitation questionnaire was distributed to 1,000 contractors specialising in building and civil engineering works. Of these, 25 contractors with high ADR decision-making authorities responded to the survey and provided their salient beliefs over the choice of ADR methods towards settling the hypothetical dispute scenarios (Scenario A/B/C/D). Accordingly, the sets of beliefs were again used to decompose the TPB framework. The revised TPB model in Chapter 6 was then compared to the “conceptual extended TPB model based on focus group” (Chapter 4), and the conceptual ADR decision-making behavioural model (Chapter 5). It was found that the conceptual ADR decision-making behavioural model (Chapter 5) shared almost similar dimensions with the others. This further reaffirms the comprehensiveness of the theoretical development of the conceptual model.

**Chapter 7** presents the evaluation of the conceptualised ADR decision-making behavioural model. Following the revisions based on the pre-test (Chapter 5), the main survey questionnaire was first pilot tested by 20 contractors. The feedback was positive and final amendments were made on the questionnaire. The final version of the questionnaire survey was then sent to 2000 contractors, of whom 128 responded to the survey. Collected data was then analysed and the results presented. The background of the respondents and response rates (such as sample size and non-response bias) were examined. Following that, the results of the preliminary data analysis, such as non-response bias, normality and common method variance, were discussed and reported accordingly. After establishing the trustworthiness of the data, the following section provides both measurement and structural model evaluations. The reliability and validity of the constructs were examined and presented (assessment of measurement model). The subsequent section then presents the assessment of the hypothesised paths for the conceptual model (assessment of structural model). All six major hypotheses and 20 sub-hypotheses of the conceptualised model were first tested and

presented for all pooled dispute scenarios [(Scenario A, n=37); (Scenario B, n=13) (Scenario C, n=14] and Scenario D, n=64)] with an overall total of 128 cases. The evaluation of the model then aims to explain and understand the underlying decision-making process in ADR use. The result shows that attitude was the sole predictor that explains behavioural intention to use ADR.

**Chapter 8:** To confirm the significance of attitude towards intention, and due to both the merits and constraints of the sample size obtained for each scenario in this study, the Theory of Planned Behaviour model (without revision) was tested separately and specifically on both scenarios (Scenario A; n=37 and Scenario D; n=64). This chapter finds that attitude remains the sole predictor of intention (selection behaviour) in both scenarios.

**Chapter 9:** The significant paths of the ADR decision-making behavioural model were validated by six construction experts. Based on validated variables in the ADR decision-making behavioural model, this chapter further proposes a parsimonious framework that can be used for future intervention. The framework provides adequate satisfactory predictive accuracy and relevance, adequately mapping the influence of macro conditions (trust and normative pressures) on micro conditions (decision making).

**Chapter 10** aims to discuss all findings and research hypotheses. Overall, all three objectives of the doctoral study are discussed and concluded accordingly. Limitations and future suggestions are presented.

## 1.8 Chapter Summary

Despite the novelty of ADR methods, appreciation and use of ADR is low in Malaysia. Previous studies have shown that arbitration cases and mediation cases are relatively low while the courts in Malaysia are dealing with too many cases. The industry itself has been urging for the use of ADR methods to resolve disputes effectively. To intervene in and promote ADR use effectively, the decision-making process underpinning ADR use needs to be investigated. Yet, there are no studies or any single dynamic model to explain the micro conditions of ADR use and the dynamics of ADR selection remains under investigated. In a dispute scenario, decision makers make decisions in the light of their own attitudes, beliefs and priorities. The decision-making process can be holistically predicted and explained. Therefore, drawing on the TPB, this research attempts to address the knowledge

gaps by developing an ADR selection behavioural model that helps both researchers and practitioners to understand decision-making process in ADR use. Based on the relevant variables, the study further proposes a parsimonious ADR intervention framework.

## **2. CHAPTER 2: SYSTEMATIC REVIEW ON ADR SELECTION AND USE - RECLASSIFICATION OF ADR SELECTION AND USE FACTORS INTO THE TPB FRAMEWORK**

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[Part of this chapter is extracted from the published article: Lee, C. K., Yiu, T. W. and Cheung, S. O. (2016). "Selection and use of Alternative Dispute Resolution (ADR) in construction projects - Past and future research." *International Journal of Project Management*, 34(3), 494-507].

### **2.1 Introduction**

This chapter presents a systematic review of the factors influencing Alternative Dispute Resolution selection and use in construction projects for the last 32 years. To understand the decision-making process of ADR use in the construction industry, 446 articles from 21 construction project-related journals were identified and reviewed. Among these, only 13 articles focused on the factors influencing ADR selection and use. These 13 articles were then analysed, synthesized, and summarized in terms of the *research methods used*, *distribution across countries* and *citation influences*. It was found that previous studies on the selection and use of ADR were mainly based on utility. Conceptually, utility factors offer fewer bases to explain decision making. Past studies also failed to show the relationships and dynamics between the factors towards ADR use.

Drawing on a Theory of Planned Behaviour (TPB) based framework, this chapter reclassified all ADR selection and use factors. It was found that the factors did fit the dimensions of the TPB-based framework.

### **2.2 Study aims**

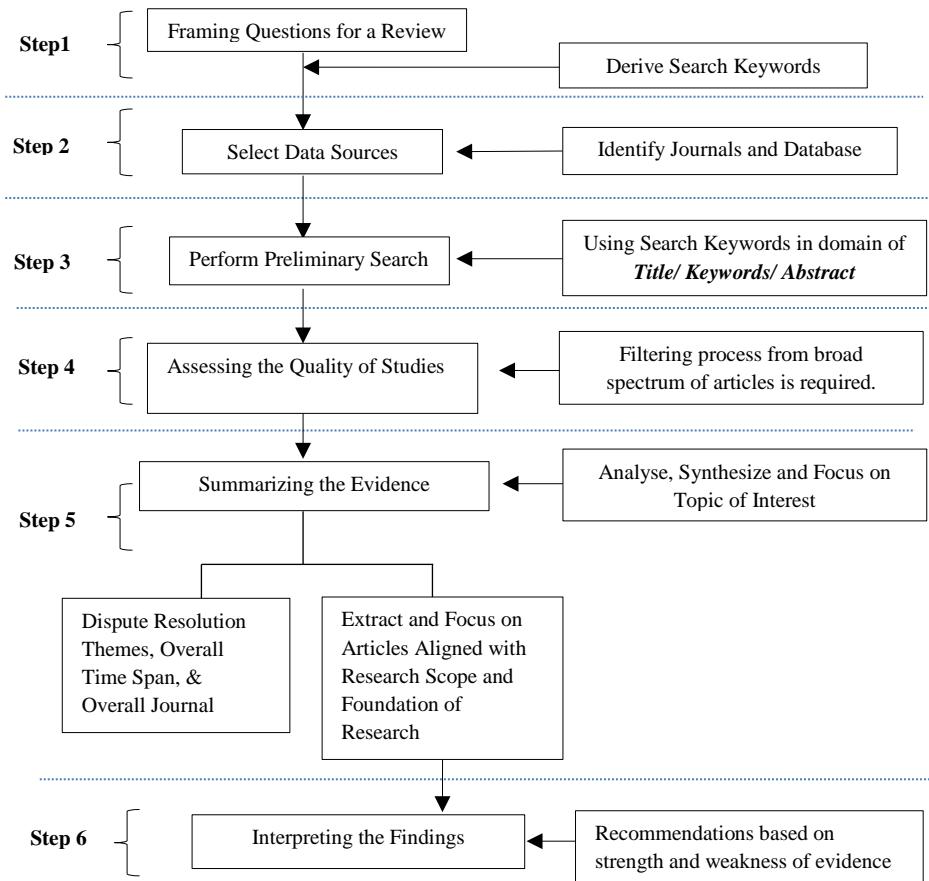
Conflicts are common in project-based organisations. However conflicts can escalate into disputes if not managed properly (Lu, Zhang, & Pan, 2015). When disputes are inevitable, project managers need to handle and resolve them through various resolution processes (Cheung, 1999). ADR techniques have gained popularity as means to manage conflicts and disputes. ADRs are incorporated in the standard form of project contracts as designated means to avoid and resolve project disputes (Chong & Mohamad Zin, 2010; Jannadia, Assaf, Bubshait, & Naji, 2000). Common types of ADR to resolve construction project disputes include ***Arbitration*** (El-adaway, Ezeldin, & Yates, 2009), ***Adjudication***

(Uher & Brand, 2005), *Negotiation* (Lu & Liu, 2014; Murtoaro & Kujala, 2007; Yiu & Lee, 2011), *Mediation* (Qu & Cheung, 2013), *Dispute Resolution Advisor System* (Cheung & Yeung, 1998), *Dispute Review Board* (Ndekugri et al., 2014) and *Mini Trial* (Stipanowich & Henderson, 1993). The literature of ADR has been growing over the last few decades as a new avenue of research to academics and a source of advice to project practitioners.

To effectively promote and intervene in the use of ADR in the construction industry, the factors influencing ADR selection and use need to be researched and fully understood. The investigation of the ADR selection and use factors would assist in decision making and offer practical guidelines for project practitioners (Chong & Mohamad Zin, 2012). In response to this need, this chapter adopts systematic review techniques proposed by Khan, Kunz, Kleijnen, and Antes (2003), Ke, Wang, Chan, and Cheung (2009), and Lu et al. (2014). As most papers reviewed focus only on ADR selection and use factors, the aims of this chapter are to discover the overall trends dispute resolution-related studies through a systematic review, and to identify the factors influencing ADR selection and use.

### 2.3 Methodology

A systematic review was performed to provide evidence for synthesis (Tranfield, Denyer, & Smart, 2003). The overall systematic review process suggested by Khan et al. (2003), Ke et al. (2009), Lu et al. (2014) was operationalized and is presented in Figure 2.1



**Figure 2.1 Systematic Review Framework**

To start a systematic review, research questions need to be addressed unambiguously and in a specified order as part of *Step 1: Framing Questions for a Review* (Khan et al., 2003). Search keywords are required to be set in order to meet the requirements of the study (Ke et al., 2009). To assure search range of the review, plural forms of search keywords are advisable (Lu et al., 2014). In *Step 2: Select Data Sources*, comprehensive and extensive searches from relevant databases and journals is required Khan et al. (2003). Therefore, to capture as many relevant citations, journals in the appropriate domain of study need to be identified and selected (Lu et al., 2014). *Step 3: Perform Preliminary Search* involves a preliminary search by using the search keywords within the defined specific domain of *Titles, Keywords, and Abstract*. These search keywords are inserted and entered into the identified and selected journal databases (Ke et al., 2009; Lu et al., 2014). The search needs to be rigorous, without any language restrictions, and subject to flow from the research questions as priori (Khan et al., 2003). Lu et al. (2014) and Ke et al. (2009) also suggested that this stage should use confined parameter search to ensure consistency. *Step 4: Assessing the Quality of Studies* is carried out to ensure academic rigor (Khan et al., 2003). This implies

that acquired articles for analysis and synthesize should be subjected to assessments. The qualities of the articles acquired from preliminary search need to be filtered. Understandably, the preliminary search conducted in Step 3 would yield a broad spectrum of article themes. Therefore, visual examination of the content of the articles needs to be conducted (Ke et al., 2009). Next, according to *Step 5: Summarizing the Evidence*, a detailed review needs to be conducted to analyse and synthesize the remaining filtered articles, focusing on articles which are only related to topic of interests. It calls for extraction of articles, which is aligned with research scope, and foundation of the research (Lu et al., 2014). Normally, the data are summarized and synthesized in the form of tabulation by study characteristics, quality and effects of study. Statistical methods may be used as appropriate (Khan et al., 2003). To achieve this, this step adopts synthesized outcomes demonstrated by Lu et al. (2014). This chapter will first discuss generic research trends in the form of available *mainstreams (themes)*, *overall time span*, *overall journal shares* and followed separately by *research methods*, *distribution across countries* and *citation influences* pertaining to the topic of interest. Finally, in *Step 6: Interpreting the Findings*, the data are synthesized and interpreted from the tabulation of the studies. Recommendations are made based on evidence of strengths and weaknesses (Khan et al., 2003).

Accordingly, the factors influencing ADR selection and use (the ‘factors’ hereafter) synthesized from the systematic review were first extracted and synthesized. The characteristics of the factors were examined and clustered into their shared dimensions. Any weaknesses and shortcomings identified in the systematic review are duly discussed.

## 2.4 Results

### 2.4.1 Step 1: Framing Questions For a Review

Dispute resolution methods in construction projects can be largely categorized into non-binding methods, such as conciliation, executive tribunal, mediation, dispute review boards, dispute review advisors, mini-trials; and binding methods, which include adjudication, arbitration, expert determination, and litigation (Cheung, 1999; Fenn, Lowe, & Speck, 1997). In this study, the research question was “What influences ADR selection and use?” With this, the search protocol was based solely on the following designated search keywords below to assure the criteria are maintained at a well-defined range:

“*Dispute*”, “*Disputes*”, “*Dispute Resolution*”, “*Dispute Resolution Selection*”, “*Alternative Dispute Resolution*”, “*Alternative Dispute Resolution Selection*”, “*ADR*”, “*Alternative*

*Dispute Resolution Adoption*, “*Alternative Dispute Resolution Choice*”, “*Alternative Dispute Resolution Use*”, “*ADR Selection*”, “*ADR Adoption*”, “*ADR Choice*”, “*ADR Use*”, “*Mediation*”, “*Adjudication*”, “*Conciliation*”, “*Expert Determination*”, “*Mini Trials*”, “*Dispute Review Board*”, “*Dispute Review Advisors*”, “*Negotiation*”, “*Executive Tribunal*”, “*Med-Arb*”, and “*Litigation*”.

#### **2.4.2 Step 2: Select Data Source**

The journals were selected within the domains of building, property, built environment, architecture, engineering, design, and construction project management journals which include ADR within their scope. In addition, the range included journals that were listed in well-known database providers such as Taylor Francis Group, Emerald Insight, Science Direct, Wiley Online Publisher, IEEE Xplore Digital Library; as well as professional institutions such as the American Society of Civil Engineers (ASCE), the International Project Management Association (IPMA), and Project Management Institute (PMI).

In the Taylor & Francis Group Publications database, careful selection of journals under the subject of “Built Environment” was done. Under this domain, both “building project management” and “construction management” themes were explored. The aims and scope of the journals under these themes were investigated and analysed. Journals that were potentially relevant to the research of dispute resolution included (1) *Architectural Engineering and Design Management*, (2) *Construction Management and Economics*, (3) *Engineering Project Organizational Journal*, (4) *Building Research and Information*, (5) *International Journal of Construction Education and Research*, (6) *Structure and Infrastructure Engineering: Maintenance, Management, Life-Cycle Design and Performance*, and (7) *Journal of Civil Engineering and Management*.

Similarly, journals published by Emerald Insight Publisher were reviewed. Subjects under “Property Management & Built Environment” were explored, and the relevant journals identified were (8) *Engineering, Construction, and Architectural Management*; (9) *Construction Innovation*; (10) *Journal of Financial Management of Property and Construction*; and (11) *International Journal of Law in the Built Environment*. As for Science Direct database, two journals were selected, namely (12) *Automation in Construction*; and (13) *International Journal of Project Management* [Endorsement of International Project Management Association (IPMA)]. From the Wiley Online Library databases, (14) *Project*

*Management Journal* – [Endorsement of Project Management Institute (PMI)], and (15) *Computer Aided Civil and Infrastructure Engineering* were enlisted.

The journals selected under the American Society of Civil Engineers (ASCE) library databases were: (16) *Journal of Construction Engineering and Management*, (17) *Journal of Legal Affairs and Dispute Resolution in Engineering and Construction*; (18) *Journal of Management in Engineering*; (19) *Journal of Professional Issues in Engineering Education and Practice*; (20) *Journal of Computing in Civil Engineering*. Lastly, within IEEE Xplore Digital Library, (21) *Engineering Management Journal* was selected.

As a result of these searches, 21 journals were chosen as the sources for the purpose of this review.

#### **2.4.3 Step 3: Perform Preliminary Search**

In this step, the preliminary search was a keywords search (provided in Step 1 earlier) in a specific function of **Title** or **Keywords** or **Abstract**, into the 21 selected journal databases. There was no restriction imposed on the starting date, to capture the earliest published articles. The article search included those published up to year 2014. After this preliminary search was done, 927 articles were retrieved.

#### **2.4.4 Step 4: Assessing the Quality of Studies**

In order to assess the quality of the studies, the 927 articles retrieved in Step 3 were subjected to a filtering process. This requires careful visual examination of all 927 articles in order to filter out non-scholarly papers such as “introductions”, “editorials”, “book reviews”, “discussions and closures”, “letters to editor”, “articles in press”, and “announcements”. Accordingly, articles that were under these broad categories were excluded from detailed analysis. However, articles such as “Forum”, “Case studies”, “Features” and “Scholarly Papers” were retained. After the filtering process, the numbers of articles related to ADR were reduced to 446, with details shown in Table 2.1.

**Table 2.1 Total Articles (Before & After Filter)**

<b>Journals</b>	<b>Before Filter</b>	<b>After Filter</b>
Architectural Engineering and Design Management ( <i>AEDM</i> )	5	2
Construction Management and Economics ( <i>CME</i> )	120	45
Engineering Project Organizational Journal ( <i>EPOJ</i> )	12	1
Building Research and Information ( <i>BUILD RES INF</i> )	52	12
International Journal of Construction Education and Research ( <i>IJCER</i> )	9	3
Structure and Infrastructure Engineering: Maintenance, Management, Life-Cycle Design and Performance ( <i>SIE</i> )	2	1
Journal of Civil Engineering and Management ( <i>JCEM</i> )	16	6
Engineering, Construction, and Architectural Management ( <i>ECAM</i> )	41	23
Construction Innovation ( <i>CI</i> )	13	3
Journal of Financial Management of Property and Construction ( <i>JFMP</i> )	7	2
International Journal of Law in the Built Environment ( <i>IJLBE</i> )	31	21
Automation in Construction ( <i>AUTOMAT-CONSTR</i> )	24	12
International Journal of Project Management ( <i>INT J PROJ MANAGE</i> )	66	31
Project Management Journal ( <i>PMJ</i> )	9	2
Computer Aided Civil and Infrastructure Engineering ( <i>COMPUTAIDED CIV INF</i> )	9	3
Journal of Construction Engineering and Management ( <i>J. CONSTR. ENG. M</i> )	196	95
Journal of Legal Affairs and Dispute Resolution in Engineering and Construction ( <i>J. LEG. AFF. DISPUTE RESOLUT. ENG. CONSTR</i> )	88	58
Journal of Management in Engineering ( <i>J. MANAGE. ENG.</i> )	89	45
Journal of Professional Issues in Engineering Education and Practice ( <i>J. PROF. ISSUES ENG. EDUC. PRACT</i> )	95	62
Journal of Computing in Civil Engineering ( <i>J. COMPUT. CIV. ENG.</i> )	34	13
Engineering Management Journal ( <i>EMJ</i> )	9	6
<b>Total</b>	<b>927</b>	<b>446</b>

#### 2.4.5 Step 5: Summarizing the Evidence

Step 5 aims to analyse and synthesize so as to derive and focus on theoretical explanations towards factors influencing ADR selection and use. To achieve this, all shortlisted 446 project dispute-related articles were analysed. The review process was qualitative and based on careful interpretation. These articles were then organized and segmented into research interest and themes where deemed appropriate. The synthesized themes were:

(1) Dispute Prevention; (2) Effects of Dispute; (3) Dispute & Dispute Resolution as Project Performance Indicator; (4) Legal Review; (5) Evolution of Alternative Dispute Resolution; (6) Predicting the Outcome of Dispute Resolution; (7) Predicting Project Dispute; (8) Dispute Resolution Case Studies; (9) Intrinsic and Transactional Costs in Dispute Resolution; (10) Negotiation; (11) Arbitration (12) Adjudication; (13) Mediation; (14) Litigation; (15) Mini Trial; (16) Dispute Review Board; (17) Dispute Resolution Advisor; (18) Education in Dispute Resolution; (19) Alternative Dispute Resolution (ADR) Selection and Use.

As noted from Table 2.2, the most popular theme was “Dispute Prevention” (140 articles, 31.3%). Second was “Legal Review” (85 articles, 19.2 %), followed by “Negotiation” (37 articles, 8.1 %). On the other hand, the less favoured themes were “Effects of Dispute” (5 articles, 1.1%), “Education in Dispute Resolution” (5 articles, 1.1%), “Dispute Resolution Advisor” (2 articles, 0.5%), and finally with “Mini Trial” (1 article, 0.2%) being the least preferred. There were only 13 articles (2.7%) addressing ADR selection and use.

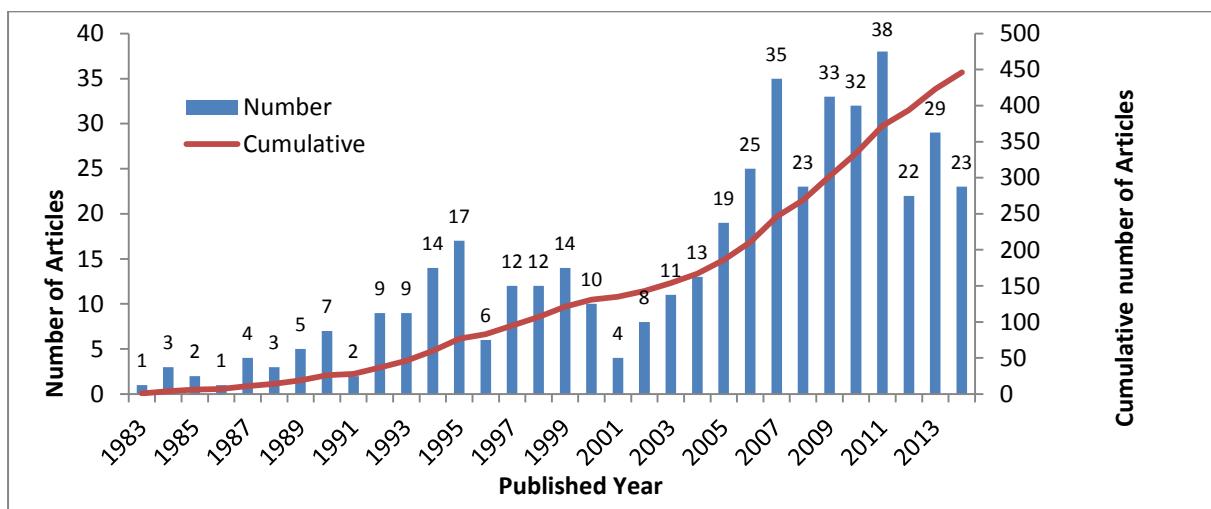
**Table 2.2 Segmentation of Articles According to Themes**

Theme	Number of Articles	Percentage %
Dispute Prevention	140	31.3
Effects of Dispute	5	1.1
Dispute & Dispute Resolution as Project Performance Indicators	18	4
Legal Review	85	19.2
Evolution of Alternative Dispute Resolution	14	3.1
Predicting the Outcome of Dispute Resolution	11	2.5
Predicting Project Dispute	8	1.8
Dispute Resolution Case Studies	15	3.4
Intrinsic and Transactional Costs in Dispute Resolution	9	2
Negotiation	37	8.1
Arbitration	10	2.2
Adjudication	21	4.7
Mediation	28	6.5
Litigation	12	2.7
Mini Trial	1	0.2
Dispute Review Board	12	2.7
Dispute Resolution Advisor	2	0.5
Education in Dispute Resolution	5	1.1
Alternative Dispute Resolution (ADR) Selection and Use	13	2.9
<b>Total</b>	<b>446</b>	<b>100</b>

Based on these 446 articles, the trends of dispute resolution methods were further discussed in the form of *Overall Time Span* (Figure 2.2 refers), *Overall Journal Shares* (Figure 2.3 refers). Subsequently, 13 articles dealing with ADR selection and use were presented in the

form of *Research Methods and Distribution across Countries* (Table 2.3 refers), and *Citation Influence* (Table 2.4 refers).

#### 2.4.5.1 Overall Time Span

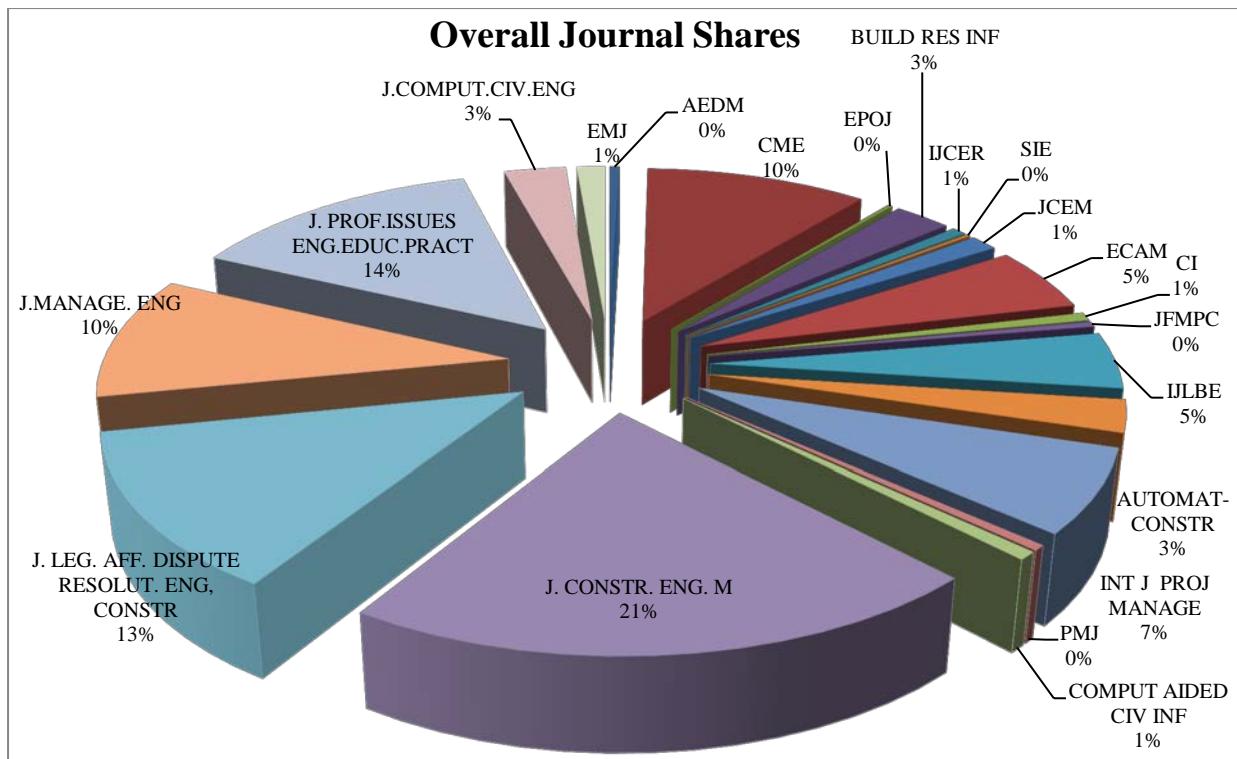


**Figure 2.2 Tabulation of 446 Articles Published 1983-2014**

All 446 articles were tabulated and portrayed according to specified years between 1983 and 2014 in Figure 2.2 above. Beginning with one article in 1983, the annual average climbed to three before entering the 1990s. Although increasing to seven articles by 1990, the number of papers published was remained moderate (not more than 20 from the period of 1990 until 2005). The number of articles rose in 2006 and increased sharply to 35 articles a year later. They were at their peak of 38 in 2011, and dropped to 22 articles in the following year. In 2014, the number was maintained at 23, similar to year 2008. The trend overall showed a significant increase of interest in dispute resolution from the beginning of the 21<sup>st</sup> century.

#### 2.4.5.2 Overall Journal Shares

Figure 2.3 shows the total of 446 articles grouped according to their respective journals. The *Journal of Construction Engineering and Management* (J.CONSTR.ENGINEER.M) published the most articles (95 articles, 21 %), followed by the *Journal of Professional Issues in Engineering Education and Practice* (J.PROF.ISSUES ENG.EDUC.PRACT) (62 articles, 14.0%), and the *Journal of Legal Affairs and Dispute Resolution in Engineering and Education* (J.LEG.AFF.DISPUTE RESOLU.ENGINEER.CONST) (58 articles, 13%).



**Figure 2.3 Overall Journal Shares**

On the other hand, the three journals that published the fewest dispute-related articles were *Architectural Engineering and Design Management* (AEDM) (2 articles, 0.5%), *Engineering Project Organizational Journal* (EPOJ) (1 article, 0.2%), and *Structure and Infrastructure Engineering: Maintenance, Management, Life-Cycle Design and Performance* (SIE) (1 article, 0.2%).

#### 2.4.5.3 Research Methods and Distribution across Countries

Table 2.3 below shows the distribution of research methods in ADR selection and use-themed articles. Most of the articles on these topics (10 in total) were in the form of empirical studies (38.5% being interviews, 30.8% hybrid of surveys and interviews, and 7.7% pure surveys), while three articles were prototypes (23.1%). The empirical studies varied in context: Hong Kong (5 articles), UK (2 articles), Malaysia (1 article), Singapore (1 article), and Taiwan (1 article).

**Table 2.3 Distribution of Research Methods (ADR Selection and Use Factors)**

Method Classification	Published Articles	Percentage
<b>Empirical</b>		
<i>Survey/ Questionnaire</i>	1	7.7%
<i>Interview</i>	5	38.5%

<i>Hybrid Survey + Interview)</i>	4	30.8%
<b>Modelling Prototype</b>	3	23.1%

#### 2.4.5.4 Citation Influences

Table 2.4 shows citation influences for ADR selection and use-themed articles, derived from the Web of Science Database. For this study, citations (excluding self-citations) were used. Table 2.4 clearly shows that Cheung's research team receives the highest citations. Based on a citation report by the Web of Science as of January 2015, the article entitled "Fundamentals of Alternative Dispute Resolution Processes" was separately cited 21 times, with an average of 1.5 citations per year.

**Table 2.4 Citation Influence [Web of Science] (As of January 2015)**

Authors/ Year	Article title	Total Cites	Average Citations Per Year
<b>Cheung, S., Suen, H. and Lam, T. (2002)</b>	Fundamentals of Alternative Dispute Resolution Processes in Construction.	21	1.5
<b>Marzouk, M., El-Mesteckawi, L. and El-Said, M. (2011)</b>	Dispute resolution aided tool for construction projects in Egypt.	4	0.8
<b>Chan, E., Suen, H. and Chan, C. (2006)</b>	MAUT-Based Dispute Resolution Selection Model Prototype for International Construction Projects.	4	0.4
<b>Cheung, S., Suen, H., Ng, S. and Leung, M. (2004)</b>	Convergent Views of Neutrals and Users about Alternative Dispute Resolution	4	0.33
<b>Tsai, J. and Chi, C. (2009)</b>	Influences of Chinese Cultural Orientations and Conflict Management Styles on Construction Dispute Resolving Strategies	3	0.43

#### 2.4.6 Step 6: Interpreting the Findings

Based on the extracted 13 ADR selection and use articles, this step synthesizes the factors influencing ADR selection and use. Accordingly, future research directions on ADR selection and use were recommended based on the evidence of strength and weaknesses.

### 2.5 Discussion

Use of ADR is greatly affected by perceptions that would impede its attractiveness. A perception study by Brooker and Lavers (1997) revealed that the factors influencing ADR use include knowledge of ADR, agreement of both disputants in using ADR, confidence in the

ADR process, perception of relative advantage in time and cost, manipulation by legal practitioners and the use of ADR as a means of achieving delay.

In a later study, Brooker (1999) found that most construction project professionals are not confident about the advantages of ADR. The non-binding nature of ADR is the primary influential factor. On normative grounds, when disputants are engulfed in legal issues, legal advisers such as lawyers are influential as referent groups in the use of ADR or otherwise. It was found that lawyers were unlikely to recommend ADR if the resolution process involved the use of delay by main contractors. Brooker's (1999) study was not the only one that suggested normative factors. According to Tsai and Chi (2009), people's intention and behaviour in managing disputes and preferences on resolution techniques are greatly influenced by cultural orientations. In the Asian context, cultural orientations such as high power distance, femininity, high uncertainty avoidance partially explain why disputes escalate and are mostly dealt with through complex administrative routes.

Research by Cheung (1999) attentively substantiated the critical factors affecting the use of ADR. The factors to be evaluated were in the form of attributes such as bindingness, cost involved, confidentiality, control over the proceeding, remedies, enforceability of decisions, fairness, flexibility of proceedings, privacy, preservation of relationship, and width of remedy. In a subsequent study, Cheung et al. (2002) demonstrated that the top-ranked attributes include preservation of relationships, enforceability, neutrality, and consensus based on a pairwise calculation (Analytical Hierarchy Process). Based on the attributes of ADR use, Cheung and Suen (2002) developed a multi-attribute utility model to aid decision making and dispute resolution choice selection. The attributes were grouped in the form of "utilities" such as overall duration, relative cost, and flexibility in issues, strategy and agreement, confidentiality, preservation of relationship, binding decision and enforcement, degree of control by parties, and degree of control by third party. Perceived benefits and qualities of ADR, such as preservation of relationship, neutrality, cost to obtain, fairness and speed, were the top priorities of ADR features preferred by both users and neutrals for example., mediators and arbitrators (Cheung, Suen, Ng, & Leung, 2004b). In another work by Chong and Mohamad Zin (2012), the subtle factors influencing selection of ADR methods in Malaysian construction projects were combined into seven dimensions, such as benefits of ADR process, outcomes of ADR, informal method of proceedings, traditional approach of proceedings, effect of proceedings, expert ruling, and reliable decision.

To facilitate decision making in ADR, several decision-making tools have been proposed. O'Reilly and Mawdesley (1994) developed a program ("CLARA T!" - Claims, Litigation and Arbitration Risk Assessment Technique) to assist decision making during the dispute resolution process, by addressing the trade-offs between risk and opportunities. Disputes are put on trial when opportunities are perceived to outweigh the risks. Whether to proceed with resolution highly depends on the perceived risks. Chan et al. (2006) developed a prototype model that helps decision makers in choosing litigation, arbitration, adjudication, mediation, expert determination, dispute resolution board, and mini-trial in international projects by drawing on a multi-attribute utility technique. The selection factors were in a similar fashion with "utilities", however with two additions of contexts such as "reducing adverse effects of cultural system", and "different legal system". Following the importance of ADR in international projects, Gad et al. (2011) proposed a Dispute Resolution Method-Risk Matrix to aid decision making in ADR method based on risk factors, such as project specific risks and external risks. On the other hand, Marzouk, El-Mesteckawi, and El-Said (2011) recommended a *Dispute Resolution Strategy Aid Tool* which draws on the consideration of parties' behaviour/relation/involvement, previous experience, mutual agreement on ADR methods, financial status, amount disputed, strength of facts, and complexity of disputes as the profound factors in decision making.

Choice of ADR also depends on the nature of claims being managed and handled, and the perception and faith rested on the perceived fairness, decision outcome of win and losses in claims. Unfavourable decision outcomes highly increase conflict intensities, which in turn influence propensity to dispute (Aibinu, Ling, & Ofori, 2011). Aibinu et al. (2011) showed that perception of fairness and justice influenced 38% of conflict intensity level and altered 46% of a contractor's tendencies and decision to dispute. Indirectly, "perceived fairness and outcomes" could be applied in ADR selection and use counterpart, where perceptions of faith on fairness and impartiality of arbitrators, mediators, and decision outcomes greatly influence their choices in ADR itself.

## 2.6 Findings of the Systematic Review

The findings of the systematic review depicting ADR selection and use are summarized in Table 2.5.

**Table 2.5 Overall Summaries of ADR Selection and Use Factors**

ADR Selection and Use Factors	Authors	Shared Dimensions
<b>Benefits of ADR process</b>	(Chong and Mohamad Zin, 2012),	
<b>Bindingness</b>	(Cheung, 1999, Cheung and Suen, 2002),	
<b>Cost</b>	(Cheung, 1999, Cheung and Suen, 2002, Cheung et al., 2004, Brooker and Lavers, 1997)	
<b>Confidentiality</b>	(Cheung, 1999, Cheung and Suen, 2002)	
<b>Confidence in ADR process</b>	(Brooker and Lavers, 1997, Brooker, 1999)	
<b>Control over the proceeding</b>	(Cheung, 1999, Cheung and Suen, 2002)	
<b>Enforceability of decision</b>	(Cheung, 1999, Cheung et al., 2002)	
<b>Effect of proceedings</b>	(Chong and Mohamad Zin, 2012)	
<b>Expert Ruling</b>	(Chong and Mohamad Zin, 2012)	
<b>Fairness</b>	(Cheung, 1999, Cheung et al., 2004)	
<b>Flexibility of proceedings</b>	(Cheung, 1999)	
<b>Flexibility in issues, strategy and agreement</b>	(Cheung and Suen, 2002)	
<b>Informal method of proceedings</b>	(Chong and Mohamad Zin, 2012)	
<b>Neutrality</b>	(Cheung et al., 2002, Cheung et al., 2004)	
<b>Outcomes of ADR</b>	(Chong and Mohamad Zin, 2012)	
<b>Preservation of relationship</b>	(Cheung, 1999, Cheung et al., 2002, Cheung and Suen, 2002)	
<b>Speed</b>	(Brooker and Lavers, 1997, Cheung et al., 2004, Cheung and Suen, 2002)	
<b>Traditional Approach of proceedings</b>	(Chong and Mohamad Zin, 2012)	
<b>Width of remedy</b>	(Cheung, 1999)	
<b>Lawyer's influence</b>	(Brooker, 1999)	
<b>Cultural orientations</b>	(Tsai and Chi, 2009)	
<b>Legal System</b>	(Chan et al., 2006)	
<b>Perception of Risk</b>	(O'Reilly and Mawdesley, 1994, Gad et al., 2011)	<b>Cognitive Instrument of Risks</b>
<b>Amount disputed</b>	(Marzouk et al., 2011)	
<b>Complexity of disputes</b>	(Gad et al., 2011, Chong and Mohamad Zin, 2012, Marzouk et al., 2011)	<b>Cognitive Instrument of Disputes' Characteristics</b>
<b>Conflict Intensities</b>	(Aibinu et al., 2011)	
<b>Agreement of disputants</b>	(Brooker and Lavers, 1997)	
<b>Parties' Behaviour/relation/involvement, Previous experience, Mutual Agreement on ADR methods, Financial status, Strength of facts</b>	(Marzouk et al., 2011)	<b>Cognitive Instrument of Perceived Self-Ability and Control</b>
<b>Knowledge of ADR</b>	(Brooker and Lavers, 1997)	<b>Self-Awareness Dimension</b>

Based on the systematic review, the factors can be clustered into six major dimensions (Table 2.5 refers). Among these, *Cognitive Instrument of Utilities* contains the most cited factors. It posits that all perceptions of usefulness, benefits, advantages, disadvantages, functionality and relative characteristics of ADR share the same traits and functions under the same cognitive instrument of utilities. The second largest pool of factors can be grouped under *Normative Influence*. This dimension denotes that ADR selection and use factors stem from social pressures and regulatory influences. Decision makers would have function and act under compliance to these social actors. Next, the third dimension is the *Cognitive Instrument of Risks. Perceptions of Risks* stem from uncertainties over the act of selecting and using that particular ADR; or the act of refraining from choosing ADR. Uncertainties over such consequences stem from one's evaluation on the impact and probabilities of any adverse or favourable consequences imposed internally and externally to the project. The fourth distinctive dimension deals with the *Cognitive Instrument of Disputes' Characteristics*. Under this dimension, disputants evaluate the number and complexity of disputes. The decision to litigate, or instigate other means of ADR technique depends on the intricate nature and complexities of disputes. The evaluation of complexities can be readily accessible from the assessment of claims, such as the monetary claim or time (extension of time) claim. The fifth dimension links to the perception of self-control and ability to carry out the behaviour. Factors such as agreement of disputants, parties' behaviour and mutual agreement imply that the decision of selecting and using ADR technique requires the counterpart's agreement and mutual consensus, which is far beyond one decision maker's self-control and ability. Other factors such as financial status and strength of facts deal with the evaluation of self-efficacies in using a particular ADR. The existence of these factors does not promote selection and use; however, the absence of these factors, such as mutual agreement or financial status would suggest predicaments for the decision maker. The final dimension is the *Self-Awareness Dimension*. It is argued that for selection and use to happen, the decision maker must be aware of the existence of ADR techniques. According to Rogers (2003), the level of knowledge acquisition and the level of familiarity with the operationalization of a system/innovation will influence rate of usage. Therefore, there is a plausible explanation for this dimension to influence usage, as the degree of knowledge on ADR will form various degree levels of feelings, attitudes and intention for use.

On several occasions, decision-support technologies and tools by O'Reilly and Mawdesley (1994); Chan et al. (2006); Gad et al. (2011), which have been developed to help

disputants in making informed ADR selection and use, actually stemmed from the basis of utilities of each ADR method. Most of these works strongly assumed decision making in ADR selection and use, and are largely based on the expected utility derivable from the ADR techniques. Aside from the utility factors emphasized by most of the researchers, Marzouk et al. (2011) managed to consider cognitive factors such as experience (satisfaction), and perceptions of parties' behaviour; while Gad's works took into account of perceptions of risks in decision making.

From the systematic review, two research gaps in the field of ADR selection and use are identified:

1. The factors identified from the systematic review are largely based on the Cognitive Instrument of Utilities. According to Beach (1997), utility factors do not provide sufficient explanation, as there are much more complex factors that influence decision making and behaviour rather than utility alone; and
2. The relationships among the factors are fragmented. The relationship and dynamics between *Cognitive Instrument of Utilities, Normative Influence, Cognitive Instrument of Risks, Cognitive Instrument of Disputes' Characteristics, Cognitive Instrument of Self Perceived Ability and Control, and Self-Awareness Dimension* are unknown and unfamiliar. There are almost no behavioural models developed, nor any empirical investigations done to correlate these dimensions towards actual ADR selection and use.

To fill these research gaps, a conceptual framework with multi-dimensional constructs is needed to address and explain ADR selection and use behaviour. This conceptual framework should also clearly explain and model the factors influencing ADR selection and use systematically. With reference to behavioural theories, this chapter draws on the **Theory of Planned Behaviour (TPB)**.

According to TPB, actual behaviour can be predicted by both intention and perceived behavioural control. Intention is formed through attitudinal beliefs, normative beliefs, and control beliefs. Attitudinal beliefs are formed by weighing up the utilities of a given choice (Ajzen & Fishbein, 1969). This implies that attitudinal beliefs posited by the TPB itself would have solely addressed all utility factors of ADR selection and use. This provides a

theoretical foundation to address the first research gap (overemphasis on utilities), by continuing to suggest two additional beliefs, namely normative beliefs, and control beliefs.

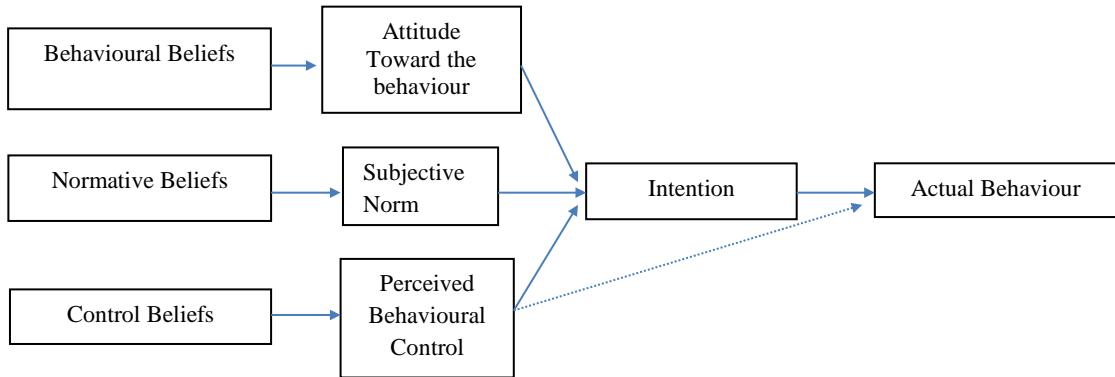
The TPB assumes that actual behaviour is based on systematic decision (Ajzen, 1991). The dynamics influencing behaviour can be systematically mapped as: *attitudinal beliefs*, *normative beliefs*, and *control beliefs* distinctively and jointly influence *intention*, and *intention* thus predicts *actual behaviour*. In a similar fashion, the behaviour of ADR selection and use is assumed to be reasoned and deliberative. Thus the theory is appropriate to address the second research gap (fragmented relationships of ADR selection and use factors), with the possibilities of re-establishing and reclassifying the existing ADR selection and use factors into TPB constructs.

## **2.7 Proposed Reclassification of ADR Selection and Use: Theory of Planned Behaviour**

The TPB asserts that performance of a behaviour is functionally guided and is a joint function of intention (I) and perceived behavioural control (PBC) (Ajzen, 1991). Both intention (I) and perceived behavioural control (PBC) can be used to predict behaviour. However in certain situations only one of the two predictors prevail (Ajzen, 1991). Notably, when a situation permits a person to have complete control over the performance of a behaviour, intentions alone are good predictors of behaviour; however, when there is a lack of complete control, perceived behavioural control can make a significant contribution to the prediction of behaviour (Ajzen, 1991; Fishbein & Ajzen, 2010).

Intention is formed by a combination of attitude, subjective norms, and perceived behavioural control. Adapted from Ajzen (1991), Intention (I) can be mathematically represented as  $I = (W_1) A + (W_2) SN + (W_3) PBC$ , where **I** is intention, **A** is the attitude towards the behaviour, **SN** is subjective norm, **PBC** is perceived behavioural control, and **W<sub>1</sub>**, **W<sub>2</sub>**, **W<sub>3</sub>** are the empirically determined weights.

In short, the more favourable the attitude and subjective norm, and the greater the perceived control over the behaviour, the higher would be a person's intention to perform that behaviour (Figure 2.4) (Ajzen, 2006b).



**Figure 2.4 Theory of Planned Behaviour [Adapted from Ajzen (2006)]**

### 2.7.1 Intention

The most proximal predictor of behaviour is intention. Intention is an indication of how hard people are willing to try, or how much of an effort they are willing to put into performing a behaviour (Ajzen, 1991; Beck & Ajzen, 1991). According to Fife-Schaw, Sheeran, and Norman (2007), a person's decision to act is equivalent to the intention to act. In ADR selection and use, the "strength of intention" often refers to selection or the likelihood of a disputant to use ADR methods to resolve a dispute, and can appear in the form of questions such as "I have an intention to use ADR (e.g., mediation) to resolve this dispute"; "I would commit to using ADR (e.g., mediation) to resolve this project dispute", or even "I would be likely to use ADR (e.g., mediation) to resolve this project dispute". Intentions encapsulate the motivational factors that influence behaviour (Ajzen, 1985, 1991). Intentions and behaviour must be mutually compatible with each other.

### 2.7.2 Attitude

Attitude refers to the favourable/unfavourable feelings towards a given behaviour (Ajzen, 1991; Ajzen & Fishbein, 2000). The decision maker forms a belief about a behaviour that generates his attitude toward the attributes of that behaviour. Underlying the attitude are structures of beliefs, which can be mathematically represented as:  $\sum_{i=1}^n B_i a_i$ , where it is the sum of beliefs about the consequences of performing a given act  $B_i$  (outcome of using ADR, in the form of question such as "Using ADR to resolve project dispute will improve time and cost"), multiply by the evaluation of the consequences  $a_i$  (e.g.; desirability of using ADR in the form of questions such as "Using ADR and saving time and cost is **Good/Bad**") (Ajzen, 1991; Taylor & Todd, 1995). It is in accordance with Edwards (1954) "Decision Theory

Model”, which states that choosing an alternative is seen as a choice that maximizes average gain or minimizes average loss (Ajzen & Fishbein, 1969). This equation of maximizing the subjective expected utility or **SEU** can be well written as:  $\sum_{i=1}^n SP_i U_i$ , where  $SP_i$  is the subjective probability that certain result will follow with certain act, while  $U_i$  is the respective subjective values (Ajzen & Fishbein, 1969)

### 2.7.3 Subjective Norm

Subjective norm can be defined as social pressure felt by the person with regard to that particular intended act, or not performing that action (Ajzen, 1991). It is derived by adding the **product of normative beliefs** ( $N_i$ ) which represents the perceived importance of other people/group by the decision maker (for example the perceived likelihood that the decision maker’s peers, or management team, or stakeholders would support, approve, or exert pressures on his decision in using a particular ADR in resolving project dispute), to  $M_i$ , the **motivation to comply**, which refers to the motivation to comply with the perceived expectations of people/group. For example, in a dispute situation, the disputant may feel strong pressure from the management group to use ADR, but the disputant does not feel it necessary to comply. Overall, the equation can be written as:  $\sum_{i=1}^n N_i M_i$ . The function of this normative belief implies perceived opinions of other important people to the decision makers (Chen & Tung, 2014).

### 2.7.4 Perceived Behavioural Control

Perceived behavioural control (PBC) refers to the perception and confidence in the ability to perform an act. It fits with Bandura (1977) concept of self-efficacy (Ajzen, 1991). It refers to the perceived ease or difficulty in performing a behaviour (López-Mosquera et al., 2014). Along with four sources of self-efficacy theory such as performance accomplishments, vicarious experience, verbal persuasion, and emotional arousal, PBC deals with beliefs based on past behaviour, previous experience, secondary information, and the availability of resource and opportunities. Fewer resources and the absence of opportunity will attenuate the perceived control over the behaviour (Ajzen, 1991; Ajzen & Driver, 1991). PBC can be illustrated with the following equation (Ajzen, 1991),  $\sum_{i=1}^n C_i P_i$ , where  $C_i$  is the **control belief** while  $P_i$  is the **power belief** of that control factor in inhibiting or facilitating that behaviour. For example, a disputant might feel a lack of resources or of experience in using ADR ( $C_i$ ), and the disputant thinks that adequate resources and experience level is very

important in ADR selection and use( $P_i$ ). The greater the perceived control over the act, the greater the intention that person would act on it.

## **2.8 Potential Application of the Theory of Planned Behaviour (TPB) in ADR Selection & Use**

With the application of the TPB, the factors that influence ADR selection and use can be reclassified. The TPB is equipped with the ability to predict and explain the fundamental cognitive pathways of decision makers in making choices. The explanatory power of the TPB is not limited to self-oriented behaviour; it is also applicable in strategic decision making (Riemenschneider, Harrison, & Mykytyn Jr, 2003).

Various attributes can be associated with ADR selection and use. Those inherent utilities and advantages, the complexity of disputes, comparative transactional costs in ADR and existing project risks can be all re-classified under the *attitude* construct of the TPB.

Additionally, a decision to use ADR could stem from social pressures from both internal and external stakeholders. Social influences, which include local customs, cultural and legal systems, are influential in ADR selection and use (Chan et al., 2006). For example, instead of arbitration, unpaid contractors might suspend works due to pressure felt by both management team and sub-contractors. “Pressures felt” from peer influence or team influences can be classified under the *subjective norm* construct of the TPB.

In other situations, a disputant may like to choose arbitration to resolve project disputes; however, lack of money and organizational resources, may serve as impediments for the disputant to use arbitration. Predicaments and facilitating factors for the disputant’s behaviour in ADR selection and use can be classified under perceived behavioural control of the TPB. Earlier work by Marzouk et al. (2011) also showed that past experience with ADR would influence ADR selection. This is consistent with the notion of “Self-Efficacy”, which directly deals with self-perceived capabilities based on secondary information and experience. It fits with and is suitable for a re-classification under *perceived behavioural control*.

The TPB can be extended and decomposed into a model, which can better demonstrate the antecedents of behaviour (Taylor & Todd, 1995). This requires decomposition of those attitudinal, normative, and control beliefs. In short, ADR selection

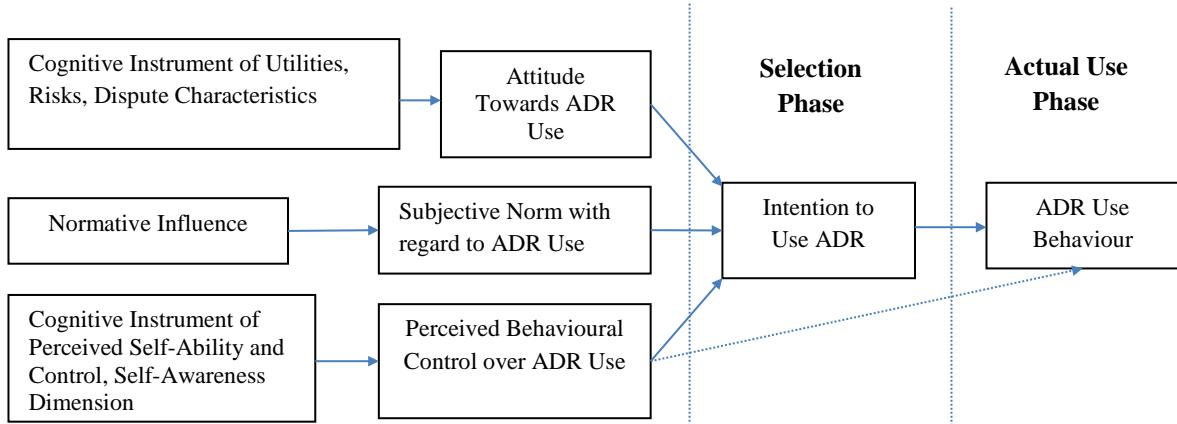
and use is well equipped with the capacities and features to be empirically tested, extended and explained with the TPB. Table 2.6 gives the proposed reclassification of influential ADR selection and use factors into dimensions of beliefs in accordance to the TPB. This model is open for further importation of dimensions of beliefs that can suit the TPB model. Accordingly, the reclassifications proposed under the TPB framework can be validated through empirical studies in the future.

**Table 2.6 Proposed Reclassification of ADR Selection and Use Factors into TPB Dimensions**

ADR Selection and Use Factors	Possible reclassification into TPB Dimensions
Benefits of ADR process, Bindingness, Confidentiality, Confidence in ADR process, Control over the proceeding, Enforceability of decision, Effect of proceedings, Expert Ruling, Fairness, Flexibility of proceedings, Flexibility in issues, strategy and agreement, Informal method of proceedings, Neutrality, Outcomes of ADR, Preservation of relationship, Speed, Traditional Approach of proceedings, Width of remedy, Perception of Risks; Amount Disputed, Complexity of Disputes; Cost Involved in ADR	Attitude
Lawyer's influence, Cultural Orientations, Cultural and Legal System	Subjective Norm
Knowledge of ADR Process, Previous Experience, Financial Status, Strength of Facts, Parties' Behaviour/ Relation/ Involvement, Self -Efficacies	Perceived Behavioural Control

## 2.9 Simulated Scenario of Theory of Planned Behaviour in ADR Selection and Use

This section demonstrates the application of the TPB in predicting and explaining ADR selection and use. Based on Table 2.6, ADR selection and use behaviour can be hypothesized in Figure 2.5 below:



**Figure 2.5 Theory of Planned Behaviour in Explaining ADR Selection & Use**

Notably, ADR selection is strongly linked to “intention”, while ADR use is the same as “behaviour” under the framework of the TPB. In simple form, the combination of the disputant’s attitude, subjective norm and perceived behavioural control will form the decision and intention to use ADR (which is known as the selection phase). With a high intention, and sufficient perceived control on the behaviour, the decision maker decides to select ADR and put the decision to implementation, and accordingly use the respective ADR.

### 2.9.1 Simulated Dispute Scenario: Project Payment Dispute

Assume that there is a project payment dispute between a contractor and an employer. The employer refuses to honour the contract, even though the payment was due. To secure payment and remedy non-payment, the contractor has two distinctive options: Option A: ADR or option B: Litigate. Intention (selection) for both option A and option B can be mathematically expressed below:

$$\text{Option A: Intention}_{\text{ADR}} = (W_1) \sum_{i=1}^n B_i a_i \text{ADR Use} + (W_2) \sum_{i=1}^n N_i M_i \text{ADR Use} + (W_3) \sum_{i=1}^n C_i P_i \text{ADR Use}$$

[Expression 1]

Under Attitudinal construct,  $B_i \text{ADR Use}$  is the belief about the outcome of using ADR; while  $a_i \text{ADR use}$  is the evaluation of the consequences of using ADR. Under the Normative Construct,  $N_i \text{ADR Use}$  is the perceived likelihood that important people would approve or reject use of ADR, while  $M_i \text{ADR Use}$  is the motivation to comply with such expectations. Under Control Construct,  $C_i \text{ADR Use}$  is the control belief of using ADR, while  $P_i \text{ADR Use}$  is the belief that such a control factor will inhibit behaviour of using ADR.

Similarly, litigation can be mathematically expressed as:

$$\text{Option B: Intention}_{\text{Litigation}} = (W_1) \sum_{i=1}^n B_i a_i \text{ Litigation} + (W_2) \sum_{i=1}^n N_i M_i \text{ Litigation} + (W_3) \sum_{i=1}^n C_i P_i \text{ Litigation} \quad [\text{Expression 2}]$$

$B_i \text{ Litigation}$  is the belief about the outcome of litigation, while  $a_i \text{ Litigation}$  is the evaluation of the consequences of litigation.  $N_i \text{ Litigation}$  is the perceived likelihood important people would approve or reject litigation, while  $M_i \text{ Litigation}$  is the motivation to comply with such expectations.  $C_i \text{ Litigation}$  is the control belief of using Litigation, while  $P_i \text{ Litigation}$  is the belief that such control factor will inhibit behaviour of using litigation.

**Assumptions:** For the ease of demonstration and discussion, a number of assumptions have to be made.

Assumption 1: Assume that the empirical weights  $W_1, W_2, W_3$  predicting intention for both ADR and litigation are the same, and that  $W_1, W_2, W_3$  share the same value (constant value).

Assumption 2: There are no perceived behavioural predicaments or any inhibiting factors for either option. The contractor has equally high sufficient resources and high self-efficacies for both option A and B, and have the same perceived value of control for both option A and B, with a fix total value of “30”.

For option A, the contractor perceives the utility of ADR is much higher, and thinks that ADR will most probably remedy this dispute more effectively. Therefore,  $B_i \text{ ADR}$  is given an attitudinal belief value of “5”, and the evaluation of the outcome  $a_i$  is “good”, with an attitudinal evaluation value of “5”. At the same time, the referents of the contractor are likely to support the contractor in using ADR. Therefore the probability of referents to approve such decision,  $N_i \text{ ADR}$  is given a normative value of “5”, while the contractor’s motivation to comply with these referents is high,  $M_i \text{ ADR}$  with a value of “5”. Perceived control for using ADR is high, with a total value of  $C_i P_i \text{ ADR} = “30”$ .

Hence, substituting these values in **Expression 1**,

$$\begin{aligned} \text{Option A: The Intention}_{\text{ADR}} &= (W_1) (5) (5) + (W_2) (5) (5) + (W_3) 30 \\ &= (W_1) 25 + (W_2) 25 + (W_3) 30 \\ &= \text{Empirical Constant} (25+ 25+ 30) \\ &= \text{Empirical Constant} (80) \end{aligned} \quad [\text{Expression 3}]$$

On the other hand, for Option B: the contractor perceives the utility of litigation is lower, and thinks that litigation will take more time to resolve this dispute. Therefore, the outcome of litigation,  $B_i$  Litigation is given an attitudinal belief value of “3”, and the evaluation of this outcome is “moderate”, with an attitudinal evaluation value of “3”. The contractor’s referents are less likely to support him using litigation. Hence, the probability of referents to support litigation decision,  $N_i$  litigation is given a value of “3”, while the contractor’s motivation to comply with such expectation  $M_i$  Litigation is given a value of “3”. Similarly with **Expression 3** above, perceived behaviour control for using litigation is equally high, with a total value of  $C_i P_i$  litigation = “30”

Therefore, substituting these values into **Expression 2**,

$$\begin{aligned}
 \text{The intention}_{\text{Litigation}} &= (W_1) (3) (3) + (W_2) (3) (3) + (W_3) 30 \\
 &= (W_1) 9 + (W_2) 9 + (W_3) 30 \\
 &= \text{Empirical Constant} (9+9+30) \\
 &= \text{Empirical Constant} (48)
 \end{aligned}$$

[Expression 4]

Difference between selection in ADR and Litigation is the difference between Expression 3 and Expression 4:

$$\begin{aligned}
 \text{Intention}_{\text{ADR}} - \text{Intention}_{\text{Litigation}} &= \text{Empirical Constant} (80) - \text{Empirical Constant} (48) \\
 &= \text{Empirical Constant} (32).
 \end{aligned}$$

With a higher intention to use ADR, the contractor is more likely to select and use ADR, compared with the alternative B (Litigation).

## 2.10 Chapter Summary

The main purpose of this chapter is to synthesize the factors influencing ADR selection and use in construction projects, and accordingly propose future directions for ADR selection and use. To achieve this, the chapter has conducted a systematic review of related articles published in 21 selected construction project-related journals. A systematic visual examination has been performed on all ADR-related articles based on **Title, Article, and Abstract**, with the aim of synthesizing the factors influencing ADR selection and use. Usable ADR-related articles began in 1983 and the range was set to 2014. Between 1983 and 2014, 446 usable ADR related articles were identified. The overall trend showed that the importance of ADR was clear, and has been growing consistently over the last three decades.

All 446 articles were grouped into 19 themes. “Dispute Prevention” was found to be the most discussed theme, with a significant 140 articles (31.3%). However, only 13 articles (2.9%) were found to be strictly related to ADR selection and use. Of these, 10 articles carried out empirical investigations while 3 articles were presented in the form of prototypes. Most empirical studies in ADR selection and use were conducted in Asian and South East Asian countries, such as Hong Kong, Taiwan and Singapore and Malaysia.

Based on this systematic review, the factors influencing ADR selection and use were identified and segmented. Existing factors were further segmented into six shared dimensions, namely: Cognitive Instrument of Utilities, Normative Influence, Cognitive Instrument of Risks, Cognitive Instrument of Disputes’ Characteristics, Cognitive Instrument of Perceived Self-ability & Control, and Self-Awareness. However, the dynamics and relationships between these factors and dimensions are unknown.

Most of the selection and use factors are utility oriented. Since the dynamics are fragmented, there is a clear opportunity for the relationships to be conceptualized with theoretical constructs. To address this gap, this study utilizes the Theory of Planned Behaviour (TPB). The existing six shared dimensions were re-classified under attitudinal, normative, and control constructs. Accordingly, existing attitude, subjective norm and perceived behavioural control in the TPB model were used to show the capabilities of this theory to map out relationships. Following this, a simulated dispute scenario based on a project payment dispute was demonstrated to explain the mechanism of TPB.

Despite the predictive capabilities of TPB, the application of this theory in the domain of dispute resolution is novel. This provides several possible directions for further research into ADR. One such direction is to suggest how the TPB can be used to predict and explain ADR selection and use in construction dispute cases.

Another future avenue of TPB research is the continuity of extension of TPB with additional variables to better predict intention and behaviour. TPB has been undergoing evolution since Ajzen (1991) admitted its shortcomings. In one commentary, TPB actually welcomes inclusion of variables and predictors that can predict intentions. Work done by Taylor and Todd (1995) aptly demonstrated the predictive capabilities of a decomposed model of TPB in understanding information usage. The researchers reported the surprising

result that decomposition of TPB increased the explanation of behaviour intention and usage behaviour, in relation to the original TPB model.

According to a meta review by Armitage and Conner (2001), inclusion of additional predictors of the original construct of TPB actually better explains the variation of intentions. Inclusions such as belief salience, habit/past behaviour, self-efficacy, moral norms, self-identity, and affective beliefs have been shown to have considerable empirical support and evidence (Conner and Armitage, 1998).

It is expected the development of model underpins the following:

- (1) **Decomposition of Attitudinal Beliefs:** As attitude influences intention, the study of TPB would offer better insights as to how decision makers feel (*good/bad/pleasant/unpleasant*) towards each dispute resolution method. Elicitation of attitudinal beliefs can be done to understand and explain each disputant's salient behavioural beliefs towards each dispute resolution method, given a free choice to choose between the alternatives such as mediation, arbitration and adjudication. One important purpose of decomposing the attitudinal beliefs encompasses the beliefs about benefits, costs, risks of engaging in the behaviour of ADR selection and use. For example, beliefs about the remedial capabilities (perceived benefits) of ADR in resolving disputes, would refer to settlement of disputes after using ADR; whereas beliefs about potential risks, obligations, and associated costs (perceived disadvantages) in the ADR would concur on the possible perceived deterioration and drawbacks in using ADR. Such decomposition of beliefs should particularly deal with the belief of using ADR's capacities in achieving positive or negative remedial end states.
- (2) **Decomposition of Normative Beliefs:** External pressures could stem from internal and external stakeholders such as the management team, subcontractors, and the labour force. These referent groups can be diversified into groups that overwhelm monolithic structures in normative beliefs.
- (3) **Decomposition of Control Beliefs:** Decomposition of control beliefs could include beliefs about the notion of both personal and organization efficacies. As using the ADR process requires adequate time, money and resources, insufficient resources would prove impediments to disputants' capabilities in using ADR.

(4) **Inclusion of Additional Variables:** The TPB welcomes additional variables. Previous studies have shown that the inclusion of variables is able to extend and explain greater variance in both intention and behaviour.

In view of that, researchers can pioneer an ADR selection and use a model by drawing on the TPB. It offers practical guidelines for both practitioners and scholars to understand ADR selection and use from a measure of their intentions, attitudes, subjective norms and perceived behavioural control. It is hoped that the application of the TPB presented in this chapter is able to provide new directions for researchers to draw on in expanding and understanding ADR selection and use. Potentially, this would take both ADR and TPB studies to greater heights.

### **3. CHAPTER 3: ALTERNATIVE DISPUTE RESOLUTION - TRENDS AND METHODS**

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(Part of this chapter is based on the findings of the paper Lee, C. K., et al. (2016). "Selection and use of Alternative Dispute Resolution (ADR) in construction projects - Past and future research." *International Journal of Project Management*, 34(3): 494-507).

#### **3.1 Introduction**

Based on the systematic review in Chapter 2, this chapter begins by discussing the trends in dispute resolution methods over 32 years (1983-2014), and then presents the common Alternative Dispute Resolution (ADR) methods used in the Malaysian construction industry with reference to Standard Form of Contracts.

Various types of dispute resolution methods such as negotiation, arbitration, adjudication, mediation, mini-trial, dispute review board, and dispute review advisor were discussed in detail. The trends were presented in the form of distribution of research methods, and frequency of citations (in Web of Science). It was found that over three decades, most reputable studies strongly emphasized the application and development of each resolution method. However, studies about the factors influencing the selection and actual use of these methods remain lacking.

It was further conceptualised in the later section Chapter 3, that each of the ADR methods expressed in standard forms actually carry different weights of voluntariness in use and requirement of mutual consent. Analysis of these two traits is useful in conceptualising the ADR decision-making behavioural model (to be further discussed in Chapter 5).

#### **3.2 Disputes & ADR: Definition**

A dispute can be defined as the manifestation of unresolved and prolongation of conflict which requires the awareness of the parties to resolve through a resolution (Aibinu, Ofori, & Ling, 2008). A dispute occurs when negotiation and discussions break down and disputants seek for the involvement of a third party for formal resolution (Aibinu et al., 2008; Cheung, 1999). According to Kumaraswamy (1998), a dispute is the result of unsettled claims where one assertion and claims is rejected, and such rejection is not accepted. When breakdown occurs, other means of formal resolution such as mediation and adjudication are

often opted for (Cheung & Yiu, 2006). When third parties are appointed in facilitating these proceedings and helping disputants ['refers to contractual parties in dispute' (Cheung et al., 2004b)] reach settlement, they are regarded as "neutrals" (Cheung et al., 2004b). The effectiveness of the process depends on the involvement of the third party (Cheung et al., 2002).

According to El-Adaway and Ezeldin (2007), traditional procedures of dispute resolution consist of litigation and arbitration. There are several definitions to ADR itself. ADR can be defined as resolution methods other than negotiation, litigation and arbitration, while mediation and conciliation are treated as synonymous (Cheung, 1999). However, Chong and Zin (2012) point out that arbitration itself has been considered as yet another form of litigation itself, with added procedural complexity. Therefore, scholars such as Cheung (1999), El-Adaway and Ezeldin (2007), Chong and Mohamad Zin (2012) would argue that arbitration is included as a traditional resolution method, rather than an ADR.

However, in Malaysia, arbitration has been an alternative to the conventional litigation method for the past several decades. Arbitration itself is strongly viewed as a trade custom to dispute resolution owing to its availability in the construction contracts regulated by the Arbitration Act 2015 (Mohd Danuri et al., 2012). Scholars such as Zuhairah, Azlinor, and Rozina (2010); Mohd Danuri et al. (2012) maintained the notion that arbitration is widely viewed as one of the mostly used forms of ADR in Malaysia. For this doctoral research, ADR methods are defined as methods other than negotiation and litigation.

### **3.3 Dispute Resolution Methods: Research Trends 1983 - 2014**

Drawing on the results of the systematic review in Chapter 2, the groups of articles filtered for negotiation, arbitration, adjudication, mediation, mini trial, dispute review board, and dispute resolution adviser system are presented in Table 3.1 below:

**Table 3.1 Themes in the Research on Dispute Resolution from Year 1983-2014**

<b>Theme</b>	<b>Number of Articles</b>
Negotiation	37
Arbitration	10
Adjudication	21
Mediation Oriented	28
Mini Trial Oriented	1
Dispute Review Board	12

### 3.3.1 Negotiation

Negotiation was specifically discussed in 37 articles. These articles showed a very significant trend towards negotiation skills and tactics by tapping into psychological theories and constructs. Referring to Table 3.2 below, most of the articles are classified under ‘empirical studies’, which consist of surveys, case studies, interviews and hybrid methods (Total 16 papers, 43.2%). Research conducted purely by a survey method is the most popular in empirical studies (12 papers, 33.3%). However, two papers were conducted through hybrid (mixed) methods, and the remaining two were conducted through case studies. Notably, the data from these empirical studies are distributed across several countries, with 10 papers in Hong Kong; and 1 paper each in Egypt, Thailand, Canada, US; UK; and China.

**Table 3.2 Distribution of Research Methods in Negotiation-Themed Papers**

Method Classification	Published Papers	Percentage
<b>Empirical</b>		
<i>Survey/ Questionnaire</i>	12	32.4
<i>Case Studies</i>	2	5.4
<i>Interview</i>		
<i>Hybrid (Interview/Questionnaire/Case Studies)</i>	2	5.4
<b>Modelling</b>		
<i>Prototype Model/ Experimental</i>	13	35.1
<b>Discussion</b>		
<i>Case Study</i>	4	10.8
<i>Others (Forum/Paper)</i>	4	10.8

The second most popular research method is modelling studies; consisting of prototype and experimental model. This type of research aims to enhance negotiation efficiencies and effectiveness (13 articles, 35.1%). The remaining eight papers on the other hand were in the form of case study discussions (4 articles, 10.8%) and forum discussions (4 articles, 10.8%).

**Table 3.3 Top 15 Most Frequently Cited Negotiation-Themed Papers (Web of Science)**

Authors/ Year	Article title	Total Citations	Average Citations Per Year
<b>Peña-Mora, F. and Wang, C. (1998)</b>	Computer-Supported Collaborative Negotiation Methodology	37	2.06

<b>Kim, K. and Paulson, B. (2003)</b>	Agent-Based Compensatory Negotiation Methodology to Facilitate Distributed Coordination of Project Schedule Changes	25	1.92
<b>Cheung, S., Yiu, T. and Yeung, S. (2006)</b>	A Study of Styles and Outcomes in Construction Dispute Negotiation.	15	1.5
<b>Ren, Z., Anumba, C. and Ugwu, O. (2003)</b>	Multiagent System for Construction Claims Negotiation	15	1.15
<b>Cheung, S., Yiu, K. and Suen, H. (2004)</b>	Construction Negotiation Online	12	1
<b>Cheung, S., Chow, P. and Yiu, T. (2009)</b>	Contingent Use of Negotiators' Tactics in Construction Dispute Negotiation	6	0.86
<b>Peña-Mora, F. and Tamaki, T. (2001)</b>	Effect of Delivery Systems on Collaborative Negotiations for Large-Scale Infrastructure Projects	6	0.4
<b>Xue, X., Shen, Q., Li, H., O'Brien, W. J. and Ren, Z. (2009)</b>	Improving agent-based negotiation efficiency in construction supply chains: A relative entropy method	5	0.71
<b>Chow, P. T., Cheung, S. O. and Yiu, T. W. (2012)</b>	A cusp catastrophe model of withdrawal in construction project dispute negotiation	4	1
<b>Cheung, S., Wong, W., Yiu, T. and Kwok, T. (2008)</b>	Exploring the Influence of Contract Governance on Construction Dispute Negotiation	3	0.38
<b>Cheung, S. and Chow, P. (2011)</b>	Withdrawal in Construction Project Dispute Negotiation	2	0.4
<b>Karakas, K., Dikmen, I. and Birgonul, M. (2013)</b>	Multiagent System to Simulate Risk-Allocation and Cost-Sharing Processes in Construction Projects	1	0.33
<b>Yiu, T., Cheung, S. and Siu, L. (2012)</b>	Application of Bandura's Self-Efficacy Theory to Examining the Choice of Tactics in Construction Dispute Negotiation	1	0.25
<b>Yiu, T. and Lee, H. (2011)</b>	How Do Personality Traits Affect Construction Dispute Negotiation? Study of Big Five Personality Model.	1	0.20
<b>Yiu, T., Keung, C. and Wong, K. (2011)</b>	Application of Equity Sensitivity Theory to Problem-Solving Approaches in Construction Dispute Negotiation	1	0.20

Table 3.3 lists the top 15 most frequently cited papers, based on Web of Science. All self-citations were excluded. A paper by Peña-Mora and Wang (1998) was cited the most, followed by Kim and Paulson (2003), and then by Cheung, Yiu, and Yeung (2006).

Negotiation aims at reaching a rightful resolution through the assertion of claims (Yates, 2011). This technique had aided adversarial parties to resolve intense arguments

towards reaching agreement. In one famous case study of *Surf Rider Foundation and developer of Sandy Beach Apartments*, the dispute was settled through negotiation via the steps of “convene, define, find, and wrap up” (Foley & Singh, 2010). Another type of negotiation, known as Principled Negotiation, offers a great mechanism in resolving disputes in international construction projects; however it needs to overcome several challenges such as cultural issues, expectations and common interest grounds (Ren, Shen, Xue, & Hu, 2011). Using construction management consultants as negotiators, Charoenngam and Mahavarakorn (2011) also found that perception between consultants and contractors may differ due to difference in roles and responsibilities. One major issue in the process of negotiation and bargaining includes tactical miscalculations and mismatch of communications between adversaries (Loosemore, 1999). Lack of planning is another pitfall in the negotiation process (Smith, 1992); while lack of trust impedes negotiation when people do not want to meet (Lau, 2011).

To counter these issues, there is a growing trend in the literature emphasizing the importance of negotiation efficiencies, skills, and tactical disposition. Negotiation is a complex process, and often relies on the skills of the negotiator (Dudziak & Hendrickson, 1988). Drawing on personal experience, Galloway (2013) strongly emphasized that engineers should be trained and equipped with negotiation skills, detail planning and tactical disposition in resolving disputes.

One common trait in all projects is change. Project change affects schedules, scope, and costs. Since change is inevitable, negotiation of such changes among contracting parties to facilitate rescheduling or scope change is often required to advocate interaction and collaboration. Several agent-based models and methodologies have been developed to improve the grounds of negotiation in claims (Kim & Paulson, 2003; Ren, Anumba, & Ugwu, 2003). Strictly acting as an agent-based negotiation process, REANE was developed with the aim of helping negotiators achieve settlement by considering the relative degree of agreement among parties (Xue, Shen, Li, O'Brien, & Ren, 2009).

With the evolution of Information Technologies (IT), computer software has been developed to enhance the utility and effectiveness of mediation. To address geographical barriers and physical constraints, Cheung et al. (2004c) have developed CoNeGo (Construction Negotiation Online), a computer software that enables a negotiation process to

be conducted online. To facilitate negotiation in conflict resolution, Peña-Mora and Wang (1998) developed a computer agent model “CONVINCER” in large-scale civil engineering projects. Based on this model, Peña-Mora and Tamaki (2001) further developed a methodology to assess the effectiveness of a delivery system on a collaborative negotiation methodology.

One notable technique and methodology used in negotiation research is the utilization of multi-criteria analysis. It is often used in prioritizing expectations attributes for negotiation grounds among various stakeholders in projects (Thekdi & Lambert, 2014). For instance, the Analytical Hierarchy Process (AHP) has been utilized as a tool for mediators to understand the gains and losses, and leverage the demands of the adversarial parties (Al - Tabtabai & Thomas, 2004). Confirming that negotiation is the most preferred of the ADR techniques , decision trees and the Analytical Hierarchy Process (AHP) were both utilized for the development of a tool to estimate negotiating amounts during the negotiation process (Marzouk & Moamen, 2009). Besides being utilized to resolve conflicts, negotiation theory and software development is widely used in procurement (Ahadzi & Bowles, 2004) and to enhance fair dealings between contractors and suppliers (Dzeng & Lin, 2005). Computer Aided Systems such as Multiagent system (MAS) offer platforms for multiple parties such as contractor and client to allocate risks and reach consensus (Karakas, Dikmen, & Birgonul, 2013).

As mentioned earlier, negotiators’ traits and skills was one of the domain issues in ADR. According to Yiu and Lee (2011), personality traits of negotiators such as extraversion, openness, and conscientiousness foster positive negotiation outcomes. In the attempt to identify the most effective negotiation skills, Cheung, Yiu, and Chim (2006) examined the relationship between negotiating styles and outcomes and found that an integrating negotiating style leads to more constructive functional outcomes than obliging, dominating, and avoiding styles. Nevertheless, Cheung, Wong, Yiu, and Kwok (2008) also discovered that contract governance impacted negotiators with dominating or obliging styles, with negotiators with a compromising style being the least influenced. When a dispute source is subjected to delay, negotiation tactics which seek for progress are the most versatile (Cheung et al., 2009).

Psychological factors and attitudes of decision makers in a negotiation process require intense consideration. Dealing with multiple adversarial parties and decision makers, Yousefi, Hipel, and Hegazy (2010b) developed an attitude-based strategic negotiation decision support model. Considering negotiators' attitude at both strategic and tactical level, Yousefi, Hipel, and Hegazy (2010a) and Yousefi, Hipel, and Hegazy (2010c) employed a graph model approach in helping negotiators find the best solution to conflict. The optimum solution considers trade-offs, satisfactions, and interests.

Besides having technical skills in negotiating, negotiators need to be emotionally stable. Withdrawal behaviour in the negotiation process is more likely to be found where negotiators are oriented to task, emotion and competition, rather than with relation-oriented negotiators. Through constructive training, the negotiator's emotions can be well contained and improved (Cheung & Chow, 2011). Another study by Chow, Kong, and Cheung (2012a) revealed that a tense negotiator is more inclined to withdraw from negotiation settlement. This drawback can be countered by changing the membership of the negotiation team. Keeping the negotiators at the table and maintaining their commitment from withdrawal is a challenging task. Three important behavioural primers that trigger withdrawal are motivation, cognition and personality (Chow, Cheung, & Yiu, 2012b). Drawing on Catastrophe Theory, Chow et al. (2012b) utilized the Cuspfit programme in examining withdrawal models, and claimed that a "Make or break" attitude can be the catalyst for withdrawal and hinder settlement. To increase harmony and avoid adverse tension and withdrawal in the negotiation process, Yiu and Nog Chung (2014) introduced the concept of "face-saving" tactics. Their work explored psychological constructs and advanced theoretical knowledge in dispute resolution.

The adaptation of psychological theory has become a noticeable trend in the field of negotiation since year 2010. For instance, the potential of "Bandura self-efficacy theory" was introduced and discussed by Yiu and Cheung (2011) for further exploration especially in the field of negotiation. The sense of perceived competence and confidence in negotiation that underpins this theory was shown to influence the outcome of negotiation itself. According to Yiu et al. (2012), perceived efficacy in distributive tactics would yield negative outcomes, while efficacy in integrative tactics would likely bring positive outcomes. Other strategies in negotiation such as the Problem Solving Approach (PSA) are considered successful in reducing non-cooperative behaviour among negotiators. It was found that benevolent ("giver")

negotiators adopt PSA the most frequently (Yiu, Keung, & Wong, 2011). Drawing on “Equity Sensitivity Theory”, negotiators can foresee inequitable responses and proactively restore an equitable environment in the negotiation process (Yiu & Law, 2011).

Apart from depending on the negotiator’s skills and other disposition avenues, disputing parties such as contractors can proactively increase the efficiency and effectiveness of negotiation process. Lu and Liu (2014) suggest that contractors should strive for better improvements in schedule, cost and quality performance when a dispute emerges. This will attenuate disputes and help to regain the owner’s trust.

### 3.3.2 Arbitration

Out of 446 papers, 10 discuss arbitration solely, concentrating on the application and development of its use in resolving disputes since 1987.

As seen in Table 3.4 below, almost half of the papers are in the form of empirical studies, while four are in the form of empirical case studies (U.S, Egypt and Kuwait), and one paper is written based on a survey in the U.S. The remaining five papers are equally in the form of pure discussions. Table 3.4 below lists only two of the articles most frequently cited on the Web of Science. It appears that, compared with other domains, arbitration topics receive less citations (Table 3.5).

**Table 3.4 Distribution of Research Methods in Arbitration-Themed Papers**

Method Classification	Published Papers	Percentage
<b>Empirical</b>		
<i>Survey/ Questionnaire</i>	1	10%
<i>Case Studies</i>	4	40%
<b>Discussion</b>		
<i>Case Study</i>	1	10%
<i>Others (Forum, Features, Scholarly Paper )</i>	4	40%

**Table 3.5 Most Frequently Cited Arbitration-Themed Papers (Web of Science)**

Authors/ Year	Article title	Total Citations	Average Citations Per Year
Kangari, R. (1995)	Construction Documentation in Arbitration	9	0.43
Teo, E. (2007)	Legal Framework for Alternative Dispute Resolution: Examination of the Singapore National Legal System for Arbitration.	1	0.11

Use of arbitration requires contractual agreement. It is claimed to offer more advantages compared to litigation (Galloway & Nielsen, 2011; Tanielian, 2013). And yet some contracts avoid arbitration clauses, due to lack of understanding of the arbitral process (Gardner, 2011). In comparing performances of dispute resolution by arbitration, and litigation, Hester, Kuprenas, and H. Randolph (1987) found that litigation takes longer, however arbitration can be more expensive in terms of settlement. The decision to arbitrate should not be taken lightly, considering the enormous costs of management and arbitration itself (Gaitskell, 1995).

In Singapore, arbitration is strongly supported by the national legal system, and free from intervention from any court. Court proceedings in Singapore are well known for their efficiency and speed in resolution, and arbitration itself is facing the threat of becoming lengthier than court proceedings (Teo & Aibinu, 2007). Despite the merits of arbitration, case studies in Egypt, however, showed that arbitration proceedings in mega construction projects were not always effective. The level of management and administration of claims and disputes were shown to be daunting (El-adaway et al., 2009). Similarly, according to Al-Humaidi (2014), in Kuwait, construction arbitration is not widely practised because most claimants tend to avoid jeopardizing their own reputation with influential employers (Al-Humaidi, 2014).

The nature and characteristics of arbitration have been studied. One study illustrates that arbitration decisions can be found to be inconsistent. Although it offers unbiased and well-reasoned judgment, there is no relationship between award decisions with the experience and level of education of the arbitrators. Empirical findings also show that previous arbitration experiences do not influence an award outcome and arbitration is frequently unpredictable (Ossman, Bayraktar, & Cui, 2010). One important factor that can determine an advantageous outcome in arbitration proceedings is the comprehensiveness of documentation. Efficient documentation improves presentation of information and evidence for the consideration of arbitrators (Kangari, 1995).

### **3.3.3 Adjudication**

In general, the principles of adjudication are temporarily binding, even in the face of evident error, until the decision is revoked in litigation or arbitration (Capper, 1995; Ndekugri & Russell, 2005). In the UK, the adjudication process became more popular after 1998 when

the Housing Grants, Construction and Regeneration Act 1996 (Contract Act) came into operation (Gaitskell, 2002). Following this, the statutory right of adjudication was made available in other countries in their legislation, such as New Zealand, Singapore, Australia, and recently Malaysia.

Earlier studies have pointed to the importance and benefits of adjudication. Intense discussions were made over engineer's role in adjudication (Capper, 1995; Lina, 1997). For example, as expressly stated in Clause 67 in FIDIC, when disputes ensued in projects, engineers have to play the role of adjudicator, which takes more than just a traditional role of safe-guarding the owner's interest on site. However, Lina (1997) has suggested that the engineer should be placed in a more neutral position to foster fairness and efficiency. The concept of the Dispute Adjudication Board in FIDIC contract, was much discussed in Seifert (2005)'s paper.

Overall, there are 21 papers concerned with adjudication. More than half of these (11 articles) focused on the trend, development and performance of adjudication. They include types of disputes adjudicated (Kennedy, 2006); the development and impact on other types of dispute resolution methods (Anderson, 2008; Dancaster, 2008; Gaitskell, 2007; Hill & Wall, 2008; Kennedy, 2008); comparison analysis studies between New South Wales and New Zealand (Uher & Brand, 2007); case reviews of judicial interventions in the adjudicator's decision (Brannigan, 2008); the difference between construction adjudication and consumer adjudication (Coombes Davies, 2008); trends, procedural and clarification of adjudication process (Gould & Linneman, 2008); comparison of statutory adjudication between the law in England and New South Wales pertaining to errors of law in an adjudicator's decision (Coggins & Donohoe, 2012); possibilities of injustice and risks attached to oral contracts to statutory proceedings (Charlson, Baldwin, & Harrison, 2014).

Meanwhile, four articles focused specifically on the perspectives, performances, impacts and trends of adjudication in security of payment acts. With the merits of adjudication enshrined in payment legislation, unpaid claimants can recover and secure their payment. According to Uher and Brand (2005), the degree of success of unpaid claimants in the adjudication process is high. Since the enforcement of Singapore Act in 2005, the Singapore construction industry is reported to have enjoyed great success in remedying non-payment through adjudication (Teo, 2008). Empirical studies in New South Wales show that

claimants (contractors) were satisfied with the adjudication process and agreed with its efficiency in both time and cost (Uher & Brand, 2008). The amendments into the payment amendment Act 2010 (New South Wales) have spurred Brand and Davenport (2012) to investigate the impacts on tripartite parties, namely the principal contractor, claimants, and respondents.

Overall, the distribution of research methods is tabulated in Table 3.6; while the most frequently cited adjudication-themed papers is shown in Table 3.7.

**Table 3.6 Distribution of Research Methods in Adjudication-Themed Papers**

Method Classification	Published Papers	Percentage
<b>Empirical</b>		
<i>Survey/ Questionnaire</i>	1	4.8%
<i>Case Studies</i>	5	23.8%
<b>Discussion</b>		
<i>Contract Studies, Legal Case Reviews</i>	15	71.4%

**Table 3.7 Most Frequently Cited Adjudication-Themed Papers (Web of Science)**

Authors/ Year	Article title	Total Citations	Average Citations Per Year
<b>Teo, P. (2008)</b>	Adjudication: Singapore Perspective	2	0.25
<b>Hill, T. and Wall, C. (2008)</b>	Adjudication: Temporary Binding and Tiered Dispute Resolution in Construction and Engineering: Hong Kong Experience	2	0.25
<b>Dancaster, C. (2008)</b>	Construction Adjudication in the United Kingdom: Past, Present, and Future	2	0.25
<b>Seifert, B. (2005)</b>	International Construction Dispute Adjudication under International Federation of Consulting Engineers Conditions of Contract and the Dispute Adjudication Board	2	0.18
<b>Anderson, R. (2008)</b>	"Adjudication in the United Kingdom: Constitutional Implications." <i>Journal of Professional Issues in Engineering Education and Practice</i>	1	0.12
<b>Kennedy, P. (2008)</b>	Evolution of Statutory Adjudication as a Form of Dispute Resolution in the U.K. Construction Industry	1	0.12
<b>Kennedy, P. (2006)</b>	Progress of Statutory Adjudication as a Means of Resolving Disputes in Construction in the United Kingdom	1	0.10

The majority of the articles are in the form of contract studies and legal reviews (15 articles, 71.4%); while six articles were conducted by empirical studies (5 case studies, 1 survey). The empirical analyses are distributed across Australia (2 articles), UK (3 articles), Singapore (1 article). To date, researchers such as Teo (2008); Hill and Wall (2008); Dancaster (2008); Seifert (2005) were cited at least twice, while Anderson (2008) and Kennedy (2006) were cited at least once.

### 3.3.4 Mediation

Mediation was explicitly discussed in 28 articles. The subjects of the mediation-themed articles are generally dispersed. As depicted in Table 3.8 and 3.9, five articles were in the form of prototypes/ experimental, ten articles were conducted empirically, and the remaining 13 articles were mainly in discussions. Empirical studies are ranged across Finland, Taiwan, Hong Kong (3 articles), UK (4 articles), and Turkey (1). Abourizk and Dozzi (1993)'s paper had the highest number of citations. Researchers such as Yiu, T.W and Cheung, S.O and Qu, Y. contributed most mediation-related papers.

**Table 3.8 Distribution of Research Methods in Mediation-Themed Papers**

Method Classification	Published Papers	Percentage
<b>Empirical</b>		
<i>Survey/ Questionnaire</i>	5	17.9
<i>Interview</i>	2	7.1
<i>Case Studies</i>	2	7.1
<i>Hybrid (Interviews + Survey)</i>	1	3.6
<b>Modelling</b>		
<i>Prototype/Experimental</i>	5	17.9
<b>Discussion</b>		
<i>Discussions, Contract Studies, Legal Case Reviews</i>	13	46.4

**Table 3.9 Most Frequently Cited Mediation-Themed Papers (Web of Science)**

Authors/ Year	Article title	Total Citations	Average Citations Per Year
Abourizk, S. and Dozzi, S. (1993)	Application of Computer Simulation in Resolving Construction Disputes.	18	0.78
Chau, K. (1992)	Resolving Construction Disputes by Mediation: Hong Kong Experience.	6	0.67
Yiu, T., Cheung, S. and Mok, F. (2006)	Logistic Likelihood Analysis of Mediation Outcomes.	5	0.5

<b>Cheung, S., Cheung, K. and Suen, H. (2004)</b>	evaluate-Med: Prototype Web-based Mediator Assessment System for Role-Plays	2	0.17
<b>Qu, Y. and Cheung, S. O. (2013)</b>	Experimental evaluation of logrolling as an effective mediating tactic in construction project management	1	0.33
<b>Qu, Y. and Cheung, S. O. (2012)</b>	Logrolling “Win–Win” Settlement in Construction Dispute Mediation	1	0.25
<b>Yiu, T. and Lai, W. (2009)</b>	Efficacy of Trust-Building Tactics in Construction Mediation	1	0.14
<b>Tserng, H. P. and Teng, W.-K. (2009)</b>	Analysing dispute mediation cases of infrastructure projects through project life cycle	1	0.14

Mediation is a voluntary process aimed at achieving mutual settlement facilitated by a neutral third party (Kerr, 1989). Besides resolving construction disputes, Ng (2011) found that mediation offers a prevention tool for homeless people. Mediation can be largely categorized into facilitative, evaluative, therapeutic, and transformative models (Kumaraswamy & Soo, 2010). According to Yates (2010), mediators do not generally coerce any disputing parties to reach a settlement.

Davies and Wennell (2002) reported that in the UK, reliance on mediation has increased since the introduction of Civil Procedural Rules. The merits of mediation are well discussed. Through case studies, Chau (1992) compared the advantages and disadvantages of mediation, and discussed the implications of this process; Hansbrough and Singh (2014) demonstrated how mediation can be extended to resolve international disputes.

To increase mediation efficiencies and success, computer model prototypes such as CYCLONE (AbouRizk & Dozzi, 1993), Evaluate-Med (Cheung, Cheung, & Suen, 2004a), the computer aided Multi-Objective Decision-making (MODM) model (Qu & Cheung, 2012) were developed. The efficacy of these models hinges on the mediator. Mediator selection holds the key to the success of mediation (Bates & Holt, 2011). To address this notion, Harmon (2006) discussed the skills which a mediator needs to hone. Using a logistic regression model, Yiu et al. (2006) empirically correlated mediator tactics with mediation outcome; Murtoaro and Kujala (2007) presented a negotiation analytic approach (NAA) for developing negotiation skills; Yiu and Lai (2009) researched trust-building tactics among disputing parties; Cheung et al. (2013) showed that trust development and a call for caucus

are two strong mediator tactics, while Qu and Cheung (2013) introduced the concept of logrolling in improving joint value in bargaining exchanges.

Mediation practice is not without its weaknesses. Stressing the importance of a code of conduct, Brooker (2011) found that many mediation providers failed to emphasize party self-determination and inform users about mediator approaches. Several predicaments to the wide acceptance of mediation include negative perceptions of lawyers, lack of monetary incentives, lack of institutional framework, and a low level of knowledge about mediation in the industry (Ilter & Dikbas, 2009). According to Sidoli del Ceno (2011), mediation in commercial property in the UK was facing adverse perceptions from lawyers. Despite some other ambivalent views on mediation, Agapiou and Clark (2011) found that construction lawyers in Scotland were knowledgeable in the process and embraced mediation. To increase knowledge about mediation, Qu and Cheung (2014) suggested the implementation of mediation training in education curriculums through e-learning pedagogies.

The importance of mandatory use of mediation was substantiated in several papers. Failure to refer disputes to mediation may incur penalties by the English Technology and Construction Court (TCC) (Brooker, 2009). Similarly, Cheung (2010) discussed the extent of costs imposed for refusal to mediate under the Civil Justice Reform in Hong Kong. The purpose of these sanctions is to make mediation less voluntary, but more mandatory. Although made mandatory, Sidoli del Ceno (2014) pointed out that mediation is not a bar *per se* to subsequent litigation. To reinforce an institutional framework, the operation of Government Procurement Act (GPA) of 1998 under the aegis of the Taiwanese government witnessed the implementation of the Dispute Mediation System (DMS) in reducing litigation cases (Tseng & Teng, 2009; Yan, 2010). In Germany, Hillig and Huhn (2010) urged law makers to streamline effects to both cross-border and domestic mediation.

### **3.3.5 Mini-Trial**

A mini-trial can be defined as a private process in which the disputing parties present their cases in the presence of designated personnel with legal authority to settle the disputes, in a short condensed form. One paper by Stipanowich and Henderson (1993) stresses mini-trial. An empirical survey with 552 respondents in the US revealed that almost half (47.6%) were very unfamiliar with mini-trials. Compared to the other techniques such as mediation, mini-trials were the least favoured and experienced.

### **3.3.6 Dispute Review Board**

Popular since 1975 in the US, the Dispute Review Board (DRB) functions as a platform for dispute settlements. The members of a DRB usually consist of three-person groups of independent, impartial and preselected neutrals agreed by both the owner and contractor (Thompson, Vorster, & Groton, 2000).

An empirical study by Harmon (2003) showed that almost all the respondents agreed on the effectiveness of the DRB in resolving disputes and reducing future disputes. To improve the effectiveness of the DRB, Harmon (2004) later proposed that DRB building of trust prior to the first hearing of disputes is essential. Trust building encompasses neutrality, integrity and experience. These are conveyed through solid and well-crafted written recommendations. To improve a DRB system, Zhu, Bayraktar, and Chen (2010) present a metadata modelling system in retrieving and managing DRB documents.

Four articles strongly endorsed the effectiveness of DRB in projects. Studies by Menassa and Peña Mora (2010) demonstrated the effectiveness of DRB actually exceeded 90% compared to other form of ADR techniques, based on a study of 1042 projects in the US. Coupled with the partnering concept, the DRB system was found to enhance joint collaboration between prime contractor and owner (Whited & Dohlby, 2011). On top of that, Agdas and Ellis (2013) quantitatively showed that the DRB has a success rate of 97% in settling disputes, and is capable of reducing 6.88% of costs and 12.92% of schedule growth compared to non-DRB projects, based on 3,000 projects over a ten year period (2000-2009). In Egypt, the DRB is well perceived for its advantage over other ADR techniques (El-Adaway & Ezeldin, 2007).

On the other hand, four articles focus on the challenges and weaknesses of the DRB. One major drawback of the DRB can be a mismatch of the selection of members in DRB, which may cause imbalance propositions to either the contractor, or owner. Repercussion of this will lead to clients' over managing, or contractors' unresponsiveness (Yates & Duran, 2006). A DRB's own effectiveness may be impeded by several views, such as it is a prolonged dispute resolution process, adversarial, preparation is time consuming, recommendations are not convincing, and recommended settlement amount process is below historical average (Harmon, 2009). Other deterrents to the DRB include ignorance of the owner, lack of DAB membership and advocacy skills, insufficiency of both remuneration and

understanding in DAB process (Ndekugri et al., 2014). Nevertheless, the DRB process itself is not cheap, as it includes monthly and site visit costs (Harmon, 2011).

Overall, six DRB articles are in the form of discussion, five articles are conducted empirically, while one article proposes a theoretical system model. Four empirical studies were carried out across the US, while one is in Egypt. Researchers such as Thompson, Voster and Groton have the highest number of citations while Harmon contributed four papers with two cited papers on the DRB. Details are shown in Table 3.10 and Table 3.11 respectively.

**Table 3.10 Distribution of Research Methods in DRB-Themed Papers**

Method Classification	Published Papers	Percentage
<b>Empirical</b>		
<i>Survey/ Questionnaire</i>	2	16.7%
<i>Case Studies</i>	3	25.0%
<b>Modelling</b>		
<i>Theoretical Modelling</i>	1	8.33%
<b>Discussion</b>		
<i>Discussion</i>	5	41.7%
<i>Case Study</i>	1	8.33%

**Table 3.11 Most Frequently Cited DRB-Themed Papers (Web of Science)**

Authors/ Year	Article title	Total Cites	Average Citations Per Year
<b>Thompson, R., Vorster, M. and Groton, J. (2000)</b>	Innovations to Manage Disputes: DRB and NEC	11	0.69
<b>Menassa, C. and Peña Mora, F. (2010)</b>	Analysis of Dispute Review Boards Application in U.S. Construction Projects from 1975 to 2007	4	0.67
<b>Agdas, D. and Ellis, R. (2013)</b>	Analysis of Construction Dispute Review Boards	4	0.67
<b>El-Adaway, I. and Ezeldin, A. (2007)</b>	Dispute Review Boards: Expected Application on Egyptian Large-Scale Construction Projects.	2	0.22
<b>Yates, J. and Duran, J. (2006)</b>	Utilizing Dispute Review Boards in Relational Contracting: A Case Study	2	0.2
<b>Harmon, K. (2004)</b>	Dispute Review Boards: Elements of a Convincing Recommendation	2	0.17
<b>Harmon, K. (2003)</b>	Effectiveness of Dispute Review Boards.	2	0.15

### **3.3.7 Dispute Review Advisor**

The “dispute review advisor” is very similar to the dispute review board, and is often used in the US. Overall, there are only two papers which discussed Dispute Review Advisor (DRA) in detail (Table 3.12). There are no citations found for DRA-related papers.

According to Wall (1993), the DRA was jointly implemented in Hong Kong in 23 December 1991. Similar to the DRB, the DRA requires the appointment of advisors, familiarization of monthly site visits. It offers advantages such as flexibility and advice for unsettled disputes. An empirical survey in Hong Kong by Cheung and Yeung (1998) showed that a DRA system effectively expedites resolution of disputes, and most of the users concur that it achieved its designated objectives.

**Table 3.12 Distribution of Research Methods in DRA-Themed Papers**

Method Classification	Published Papers	Percentage
<b>Empirical</b> <i>Survey/ Questionnaire</i>	1	50%
<b>Discussions</b> <i>Discussion</i>	1	50%

### **3.3.8 Overall Summary of Research Trends**

Most studies strongly emphasized negotiation behaviour, while many others focussed on mediation techniques, and issues of voluntariness and mandatory use of mediation in contracts. Nevertheless, studies on dispute review boards, adjudication, and arbitration were equally discussed and open for further exploration. Topics such as the dispute resolution adviser system, and mini-trial attracted the least research interest over the span of 32 years.

## **3.4 Alternative Dispute Resolution Mechanisms in the Malaysian Construction Industry**

When disputes occur, parties can seek formal dispute resolution methods to resolve their dispute. In Malaysia, those rights are enshrined in most of the standard forms of contracts. These rights include, but are not limited to Mediation, Arbitration, Adjudication, Dispute Review Board, Dispute Adjudication Board, and ad-hoc mechanisms such as expert determination. Recently, the Construction Industry Payment and Adjudication Act (2012) has

come into force, specially designated to ease cash flows and circumvent non-payment problems.

Standard forms of contracts used in Malaysia are subject to the type, nature and financing involved (Zakaria, Ismail, & Yusof, 2013). According to Oon (2002), the main standard forms used in Malaysia are produced by institutions, such as (1) The Institution of Engineers, Malaysia (IEM), (2) Pertubuhan Arkitek Malaysia (PAM); (3) the Construction Industry Development Board (CIDB), and (4) the Public Work Department (PWD, or known as JKR).

### **3.5 Dispute Resolution Mechanism under IEM Contracts**

The Institution of Engineers (IEM) has published 2 standard forms of contracts focusing on Civil Engineering construction works. They are:

- 1) IEM.CE.2011: IEM form of Contract for Civil Engineering Works
- 2) IEM.CES 1/90: IEM Standard Conditions of Sub-Contract for use in conjunction with the IEM conditions of Contract for Civil Engineering Works

#### **3.5.1 IEM.CE.2011: IEM Form of Contract for Civil Engineering Works.**

A dispute or difference is said to have arisen when a party has made a claim, and it is denied or ignored by the other party [clause 63.1(8)]. Further expressed in clause 63.1, any dispute between the employer and the contractor must be referred to arbitration, prior to any legal action in court. Arbitration can only commence if mediation does not result in a settlement between the parties [clause 63.1 (2)]. Parties may agree with the appointment of a single arbitrator. The party that starts the reference to arbitration must first serve *arbitration notice* to the other party. The *arbitration notice* can be served only after both parties agree to refer the dispute or difference between them to arbitration. This implies that mutual consent is needed for the initiation of arbitration. The arbitration rules shall comply with The Arbitration Rules published by The Institution of Engineers.

Either party can start the mediation process by sending a notice (to the other party) of his intention to have the dispute resolved by a mediator (clause D2, Option Module D). The parties may mutually agree on the choice of a mediator. However, if they are unable to agree on the choice of a mediator, the president of The Institution of Engineers may appoint the mediator on the request of the person who initiates mediation (Clause D4). With the

agreement of both parties, or with the chosen mediator may choose the mediation rules published by The Institution of Engineers, Malaysia; or Construction Industry Development Board Malaysia, or by the Bar Council, Malaysia.

### **3.5.2 IEM.CES 1/90: IEM Standard Conditions of Sub-Contract for Use in Conjunction with the IEM Conditions of Contract for Civil Engineering Works**

If any dispute arises between the Contractor and the Nominated Sub-Contractor, the dispute shall be referred to the Engineer for a decision [(Clause 36(a)]. If the Engineer fails to give a decision within 84 days being either requested by the contractor or nominated subcontractor, or if both disputing parties are dissatisfied with the Engineer's decision, either the Contractor or the Nominated Sub-Contractor may within 84 days after the expiration of the 84 days require the dispute to be referred to arbitration. Both parties may agree on the choice of arbitrator, and if parties have not agreed on it may apply to the President of The Institution of Engineer for the appointment of the arbitrator.

### **3.5.3 Summary of IEM Contracts**

Based on the overall discussions for both IEM main and sub-contracts, this section overall summarizes the characteristics of IEM Contracts. Table 3.13 below summarizes the contractual ADR rights for IEM Contracts.

**Table 3.13 ADR Rights under IEM Contracts**

<b>Standard Form of Contracts Used</b>	<b>ADR rights</b>	<b>Conceptual Voluntariness in ADR use</b>	<b>Conceptual Voluntariness (Mutual Consent)</b>
<b>IEM.CE.2011</b>	Arbitration	Mandatory in use before legal action	Mutual Consent is needed. Arbitration notice is served after parties agree to use this method.
	Mediation	Not mandatory of use.	Mutual Consent is not needed. Either party may initiate mediation
<b>IEM.CES 1/90</b>	Engineer	Tiered. Mandatory in use.	No mutual consent is needed.
	Arbitration	Tiered (After Engineer's decision)	Either Contractor or Sub-Contractor may initiate it.

### **3.6 Dispute Resolution Mechanism under PAM Contracts**

This section explains the contractual rights available for both the PAM Contract 2006 (Main contracts, i.e. with / without quantities) and PAM Sub Contract 2006 designated for sub-contractor nominated under the PAM Contract 2006.

#### **3.6.1 PAM Contract 2006**

As laid down in clause 34.0 in PAM Contract 2006 (with or without quantities), any disputes that arise under payment issues (set-off issues) before practical completion shall be first referred to adjudication, and shall be condition precedence to arbitration. Notably, any disputes that arise under payment issues (set-off issues) after practical completion shall be referred to arbitration. However, **with written agreement**, parties may freely refer any other disputes to adjudication. Under clause 34.2, where a party requires a dispute or difference to be referred to adjudication, such disputes shall be referred to an agreed adjudicator. This may conceptually imply that mutual consent is not needed in the initiation. If the adjudicator cannot be agreed upon, the party initiating the adjudication process can apply to the President of PAM for the appointment of adjudicator, and shall be deemed to be agreed by the parties to the contract. The initiation of the adjudication process shall be conducted in accordance to PAM Adjudication rules (Clause 34.3).

Nevertheless, disputing parties (between the contractor and the employer) have the right to refer any dispute or differences to arbitration (clause 34.5). **Any party may serve written notice** on the other party that such dispute shall be referred to an arbitrator to be agreed between parties [(Clause 34.6(a))]. Upon appointment of arbitrator, the arbitrator shall initiate arbitration proceedings in accordance to Arbitration Act 2005, or any statutory modification, or re-enactment to the Act and the PAM arbitration rules. Unless with written agreement of the employer and the contractor, arbitration proceedings shall not commence until after Practical Completion of the works (Clause 34.10).

Disputing parties may also refer their disputes to mediation proceedings. **Upon written agreement of both parties** (Employer and Contractor), the parties may refer any dispute for mediation (Clause 35.1). Upon appointment of the mediator, the mediator shall initiate the mediation in accordance with PAM mediation rules or any modification or revision to such rules (Clause 35.1).

### **3.6.2 PAM Sub Contract 2006**

Similarly, the right for ADR under PAM sub-contracts is first expressed in clause 28.1. Under this clause, any disputes between the contractor and sub-contractor regarding claims and set-off before practical completion shall be first referred to adjudication (clause 28.2), and shall be condition precedent to arbitration. On the other hand, any disputes that arise regarding claims and set-off after practical completion shall be referred to arbitration. Parties may also freely refer any disputes to adjudication. If any party requires disputes to be referred to adjudication, such disputes/differences shall be referred to an adjudicator agreed between the parties. If the adjudicator could not be agreed on, the party who initiate the adjudication shall apply to the President of PAM for the appointment of an adjudicator to be agreed by mutual parties.

Upon agreement with the appointment of the adjudicator, the adjudicator shall initiate adjudication in accordance with the PAM adjudication rules or any modification or revision to such rules. The **party initiating the adjudication** shall apply to President of PAM for the appointment of adjudicator to be agreed upon if the adjudicator could not be agreed between the parties earlier. Upon appointment, the adjudicator shall initiate adjudication in accordance to the PAM Adjudication rules (Clause 28.2).

Disputing parties (between contractor and the sub-contractor) may have the right to refer any disputes to arbitration (Clause 29.1). However arbitration proceedings shall not commence until after practical completion. As set out in Clause 29.3, in the event of any disputes arising in connection between the Main Contract and the Sub-Contract, the contractor may issue written notice to the sub-contractor requiring such dispute to be referred to appointed arbitrator under the Main Contract, subject to the agreement of the employer.

Nevertheless, disputing parties may also refer a dispute for mediation. Clause 30.1 says that, upon written agreement of both contractor and the sub-Contractor, the parties may refer any dispute for mediation. Upon appointment, the mediator shall initiate the mediation in accordance with PAM mediation rules.

### **3.6.3 Summary of PAM Contracts**

Based on the overall discussions for both the PAM Contract 2006 (with or without Quantities) and the PAM Sub Contract 2006, this section overall summarizes the

characteristics of PAM Contracts. Table 3.14 below summarizes the contractual ADR rights for PAM Contracts.

**Table 3.14 ADR Rights under PAM Contracts**

Standard	Form of Contracts Used	ADR rights	Conceptual Voluntariness in ADR use	Conceptual Voluntariness (Mutual Consent)
<b>PAM Contract 2006 (With or without quantities)</b>		Adjudication	Voluntary (With agreement, both parties may refer any other disputes to Adjudication)	Mutual Consent is not needed for the use of Adjudication. If a party requires a dispute or difference to be referred to adjudication, the disputes or differences shall be referred to adjudicator to be agreed between parties
		Adjudication for set-off and claims issues before practical completion	Mandatory for any disputes related to set-offs and claims before practical completion.	Mutual Consent is not needed for the use of adjudication in this case.
		Arbitration	Mandatory for any disputes related to set-offs and claims related dispute after practical completion.	Mutual Consent is not needed. Any party may serve notice for the commencement of the proceeding.
		Mediation	Voluntary.	Mutual consent is needed.
<b>PAM Sub Contract 2006</b>		Adjudication	(With agreement, both parties may refer any other disputes to Adjudication)	Mutual Consent is not needed for the use of Adjudication. If a party requires a dispute or difference to be referred to adjudication, the disputes or differences shall be referred to adjudicator to be agreed between parties
		Adjudication for set-off and claim issues before practical completion	Mandatory for any disputes related to set-offs and claims before practical completion.	Mutual consent is not needed.
		Arbitration	Mandatory for any disputes related to set-offs and claims after practical completion	Mutual consent is not needed for the use of arbitration Contractor may issue written notice to the contractor requiring dispute to be referred to appointed arbitrator.
		Mediation	Voluntary	Mutual Consent is needed

### 3.7 Dispute Resolution Mechanism under the Construction Industry Development Board (CIDB)

CIDB contracts include the CIDB Standard Form of Contract for Building Works (2000 Edition), the CIDB Sub-Contract Form [CIDB.B (NSC)/2002], CIDB Model Terms of Construction Contract for Subcontract Work, and the CIDB Standard Form of Sub-Contract for Nominated Sub-Contractor [Form CIDB.B (NSC)/2002].

### **3.7.1 CIDB Standard Form of Contract for Building Works (2000)**

As set out in clause 47.1, any dispute that arises between the employer or the superintending officer and the contractor shall be first referred to the Superintending Officer (S.O). There is no mutual consent needed for the instigation of this ADR right, as it is mandatory for both parties to refer disputes to the S.O for prompt decision. The S.O's decision shall be binding, unless **either party requires** the decision to be referred to mediation under clause 47.2. However, as expressed in Clause 47.4, if the dispute concerns the determination, repudiation, or abandonment of the contract by the contractor, it is imperative that such case shall not be referred to the S.O for decision, but rather referred to mediation, and further proceeds to arbitration.

Clause 47.2 states that if the S.O fails to give decision by the expiry of 30-day period following the date on which the dispute is being referred to, or if either disputing party is dissatisfied with the S.O's decision, then the **employer or the contractor** may within 90 days after the expiration of the said 30-day period give notice to the other party, with a copy to the S.O's of his intention to refer the dispute to mediation. However, if the request for mediation is served after the expiration of 90-Day limit, the recipient **shall not be obliged to participate** in mediation without the recipient's written consent. Mutual consent is needed in this circumstance.

Mediation proceedings shall be conducted in accordance with the CIDB Mediation Rules. If the dispute is settled through mediation, such resolved shall be recorded in a Settlement agreement enforceable by the S.O. If the parties fail to achieve any settlement at mediation, either party may then refer the dispute to arbitration for final decision of the arbitrator.

Upon the termination of mediation, either the employer or the contractor may within 14 days after the termination of mediation, give notice to the other party with a copy to the S.O of his intention to refer the dispute to arbitration. The arbitrator maybe agreed upon by the parties, and if the parties fail to agree on the arbitrator, then either party may request the Appointer of the Arbitrator named in the Appendix to appoint an arbitrator. As outline in Clause 47.3 (b), **arbitration proceedings shall not be initiated** without the other party's consent in writing before the Date of Practical Completion of Works, or the determination of the Contractor's employment under the contract except on the question of:

- (1) whether or not the issue of an instruction is empowered by the contract
- (2) whether or not a payment has been improperly withheld
- (3) whether a payment is not in accordance with the contract; or
- (4) whether either party has withheld or delayed a consent where such consent is not to be unreasonably withheld or delayed.

### **3.7.2 Model Terms of Construction Contract for Subcontract Work**

The model terms offer flexibilities in dispute resolution. As stipulated in Clause 7, parties to a dispute are encouraged to use amicable methods to resolve a dispute. Parties may agree to use mediation, adjudication, and arbitration (subject to certain conditions), and agree to the appointment of neutrals (mediators, adjudicators, and arbitrators). Overall, the model term serves as a ‘standalone’ contract and is compatible and back-to-back with other types of contract such as PWD, IEM, PAM, and CIDB Contracts.

### **3.7.3 CIDB Standard Form of Sub-Contract for Nominated Sub-Contractor [Form CIDB.B (NSC)/2002]**

Any dispute between the contractor and the sub-contractor shall be first referred to the Superintending Officer (S.O) for decision [(Clause 34.1 (a)], except in the case of determination of the employment of nominated sub-contractor, or termination, repudiation or abandonment of sub-contract by either party. If the S.O fails to give his decision within 30 days, or either party is dissatisfied with the decision, then either party may give notice to the other party with a copy to the S.O of his intention to refer the dispute to mediation within a further 90 days after the expiration of 30 days, or within 90 days after receiving the S.O’s decision. However, the recipient of the notice for mediation shall not be obliged to proceed with mediation if the notice is served after the 90 days’ time limit. Mediation proceedings shall comply with CIDB mediation rules.

Mediation shall be a condition precedent to arbitration. If mediation is terminated without settlement, either party may refer the dispute to arbitration [Clause 34.3 (a)]. Upon the termination of mediation, either the employer or the contractor may within 14 days after the termination of mediation, give notice to the other party with a copy to the S.O of his intention to refer the dispute to arbitration. The arbitrator maybe be agreed upon by the parties, and if the parties fail to agree on the arbitrator, then either party may request the Appointer of the Arbitrator named in the Appendix to appoint an arbitrator. As stated in

Clause 34.3 (b), **arbitration proceedings shall not be initiated** without the other party's consent in writing before the Date of Practical Completion of Works, or the determination of the Contractor's employment under the contract except on the question of:

- (1) whether or not the issue of an instruction is empowered by the contract
- (2) whether or not a payment has been improperly withheld
- (3) whether a payment is not in accordance with contract; or
- (4) whether either party has withheld or delayed consent where such consent is not to be unreasonably withheld or delayed.

### 3.7.4 Summary of CIDB Contracts

Based on the overall discussions for both CIDB Standard Form of Contract for Building Works (2000) and CIDB Model Terms of Construction Contract for Subcontract Work, this section overall summarizes CIDB contracts in Table 3.15 below:

**Table 3.15 ADR Rights under CIDB Contracts**

Standard Form of Contracts Used	ADR rights	Conceptual Voluntariness in ADR use	Conceptual Voluntariness (Mutual Consent)
CIDB Standard Form of Contract for Building Works (2000)	Superintending Officer	Tiered (Compulsory), except for dispute concerning the determination, repudiation, or abandonment of the contract by the contractor	Mutual Consent is not needed.
	Mediation	Tiered, compulsory for dissatisfaction with S.O.'s decision; or failure to give decision by S.O.	Mutual consent is not needed within 90 days after the expiration of the said 30-day period give notice to the other party.
	Arbitration	Tiered, conducted after mediation	Shall not be held without other party's consent in accordance to clause 47.3(b)
CIDB Model Terms	Amicable Solutions	Parties may use amicable solutions	Mutual consent is needed for amicable solutions
	Mediation	Not Compulsory.	Both parties may agree on the use of mediation. Mutual consent is needed.
	Adjudication	Not Compulsory	Either the contractor or subcontractor may request in writing to be resolved through adjudication
	Arbitration	Besides other amicable solutions, mediation and adjudication, all disputes must be referred to arbitration. Any disagreements on adjudicator's decision must be referred to arbitration.	No clear mandatory of consent is needed. Both disputing parties may agree on this method freely.
CIDB Standard	Superintending Officer	Tiered (Compulsory), except for dispute concerning the	Mutual Consent is not needed.

<b>Form of Sub-Contract for Nominated Sub-Contractor [Form CIDB.B (NSC)/2002]</b>	determination, repudiation, or abandonment of the contract by the contractor
Mediation	Tiered, compulsory for dissatisfaction with S.O.'s decision; or failure to give decision by S.O.
Arbitration	Tiered, conducted after mediation

Mutual consent is not needed within 90 days after the expiration of the said 30-day period give notice to the other party.

Shall not be held without other party's consent in accordance to clause 34.3(b)

### **3.8 Dispute Resolution Mechanism under Public Works Department (PWD. 203)/JKR**

Popular PWD contracts include PWD 203 (Rev 1. /2010) - Drawing and Specification Forms Part of Contract, PWD 203A (Rev 1. /2010)-Bills of Quantities Forms Part of Contract, PWD 203 (Rev 10/83) - Drawing and Specification Forms Part of Contract, PWD 203A (Rev 10/83) - Bills of Quantities form Part of the Contract, PWD DB/T Rev 2002 (Turnkey), PWD DB Rev 2007 (Design & Build), and PWD 203N (Nominated Sub Contract).

#### **3.8.1 PWD 203 (Rev 10/83)-Drawing and Specification Forms Part of Contract & PWD 203A (Rev10/83) - Bills of Quantities form Part of the Contract**

Any disputes that arise between the Government and the Contractor shall be first referred to Superintending Officer's decision [Clause 54(a), for both PWD 203 (Rev 10/83) & PWD 203A (Rev10/83)]. If the S.O has failed to give decision for a period of 45 days after being requested to do so by the contractor, or the contractor is dissatisfied with the S.O's decision, such dispute shall be referred to agreed arbitrator. Arbitration proceedings shall be held at Regional Centre for Arbitration at Kuala Lumpur, Malaysia.

#### **3.8.2 PWD 203 (Rev 1. /2010)-Drawing and Specification Forms Part of Contract & PWD 203A (Rev 1. /2010)-Bills of Quantities Forms Part of Contract**

In this version, any dispute that arises between the Government and Contractor shall be first referred to the officer named in the Appendix for a decision [Clause 66.1 for both contracts]. If the parties fail to receive decision from the officer within 45 days after the officer has been requested to do so, or is dissatisfied with the decision, then such decision shall be referred to an agreed arbitrator, or appointed by Director of the Regional Centre for arbitration in Kuala Lumpur within 45 days. Either party may make this application.

All disputes, except on any difference on the events and consequences of default by the contractor, shall not be commenced until after the completion of works, or determination of the contractor's employment, or abandonment of works, unless with written consent of both parties (clause 66.4).

### **3.8.3 PWD DB/T Rev 2002 (Turnkey)**

Clause 56.1 of this contract stipulates that any dispute between the government and the contractor shall be referred to the officer named in the Appendix for decision. If the officer fails to give a decision for a period of 45 days after being requested to do so by the contractor, or if the contractor is dissatisfied with any decision by the officer, he may require the dispute to be referred to agreed Arbitrator, or in default agreement appointed by the Director of the Regional Centre for Arbitration, Kuala Lumpur.

### **3.8.4 PWD FORM DB (Rev.1/2010)**

Clause 68.1 of this contract states that any disputes between the government and contractor shall be referred to the officer named in Appendix 1 for a decision. However if the parties fail to receive decision from the officer within 45 days after being requested to do so, or parties are dissatisfied with any decision of the officer, then such dispute shall be referred to arbitration within 45 days to an arbitrator to be agreed between parties. However if both parties failed to agree on the arbitrator, either party may apply to the Regional Centre for arbitration in Kuala Lumpur for the appointment of the arbitrator.

### **3.8.5 PWD 203N (Nominated Sub Contract)**

Clause 39.0 of this contract stipulates that any disputes arise between the contractor and the Nominated Sub-Contractor shall be referred to the Superintending Officer (S.O) for a decision. However, if the parties fail to receive decision from the officer within 45 days after being requested to do so, or parties are dissatisfied with any decision of the officer, then such dispute shall be referred to arbitration within 45 days to an arbitrator to be agreed between parties. However if both parties failed to agree on the arbitrator, either party may apply to the Regional Centre for arbitration in Kuala Lumpur for the appointment of the arbitrator.

### **3.8.6 Summary of PWD Contracts**

Based on the discussions, this section overall summarizes PWD contracts in Table 3.16:

**Table 3.16 ADR Rights under PWD Contracts**

Standard Form of Contracts Used	ADR rights	Conceptual Voluntariness in ADR use	Conceptual Voluntariness (Mutual Consent)
<b>PWD 203 (Rev 10/83) &amp; PWD 203A (Rev10/83)</b>	Superintending Officer	Tiered, Mandatory of Use	Mutual Consent is not needed
	Arbitration	Tiered, conducted after S.O.	Contractor (solely) can refer dispute to arbitration
<b>PWD 203 (Rev 1. /2010 &amp; PWD 203A (Rev 1. /2010)</b>	Superintending Officer	Tiered, Mandatory of Use	Mutual consent is not needed
	Arbitration	Tiered, conducted after S.O.	Either party may apply for arbitration
<b>PWD DB/T Rev 2002 (Turnkey)</b>	Superintending Officer	Tiered, Mandatory of Use	Mutual Consent is not needed
	Arbitration	Tiered, Commence After S.O.	Contractor (solely) can refer dispute to arbitration
<b>PWD FORM DB (Rev.1/2010)</b>	Officer in Appendix	Tiered, Mandatory of use	Mutual Consent is not needed
	Arbitration	Tiered, commence after S.O.	Mutual written consent is only needed only for criteria met under 68.4
<b>PWD 203N (Nominated Sub Contract)</b>	Superintending Officer	Tiered, Mandatory of Use	Mutual Consent is not needed
	Arbitration	Tiered, Commence After S.O.	No Clear Mutual Consent is needed.

### **3.9 Statutory Rights (Statutory Adjudication – The Construction Industry Payment and Adjudication Act 2012)**

Adjudication provides speedy resolution for aggrieved construction parties to resolve disputes effectively. In Malaysia, this right has been included in several standard forms of contracts such as PAM. The principle of Adjudication mainly aims to provide a speedy temporarily binding decision until it would be revoked in arbitration or litigation if any party is dissatisfied with the decision (Capper, 1995; Ndekugri & Russell, 2005). Statutory adjudication was made available in other countries such as New Zealand, Singapore, Australia, and recently Malaysia. Adjudication was made a statutory right for unpaid parties for a speedy recovery through the virtues of Construction Industry Payment and Adjudication Act (CIPAA 2012) since the year 2014.

With the advantages of the Construction Industry Payment and Adjudication Act (CIPAA 2012), unpaid contractors in Malaysia can now use this right for a speedy resolution. CIPAA 2012 applies to every construction contract, but does not apply to a construction contract entered into by a natural person for any building which is less than four storeys high which is intended for his own occupation (Clause 3).

As stated in clause 8 (1), the unpaid party may initiate adjudication proceedings by serving written notice of adjudication to the paymaster. Upon receipt by the respondent of the notice, an adjudicator shall be appointed by agreement of parties in dispute within 10 working days from the service of the notice of adjudication, or by the Director of the KLRCA upon the request of either party, or both parties in dispute. Notably, this statutory process does not require the agreement of the parties to commence the process, and prevails over any contractual agreements to the contrary between the parties. However, it is temporarily binding and it can still be subjected to arbitration, or litigation in court if both parties desire (KLRCA, 2016). Section 37 states that a payment dispute under a construction contract may be referred concurrently to adjudication, arbitration or court. Section 27 (2) further states that the parties to adjudication may at any time in writing extend the adjudication proceedings on any other matter besides payment issues.

### **3.10 Chapter Summary**

This chapter presents the overall trend of dispute resolution methods from 1983-2014, and the contractual ADR rights in standard form of contracts published by IEM, PAM, CIDB, and PWD. Negotiation was highly researched (37 papers), followed by mediation (28 papers), adjudication (21 papers), dispute review board (12 papers), arbitration (10), dispute resolution adviser system (2), mini trial (1 paper). Overall, the contractual ADR rights are summarised in Table 3.17 below.

**Table 3.17 Summarised Contractual ADR Rights**

Standard Form of Contracts	ADR RIGHTS			
	Superintending Officer/Engineer	Mediation	Adjudication	Arbitration
<b>IEM Contracts</b>				
IEM.CE.2011		✓		✓
IEM.CES 1/90	✓			✓
<b>PAM Contracts</b>				
PAM 2006 (With or without Quantities)		✓	✓	✓
PAM Sub Contract 2006		✓	✓	✓
<b>CIDB Contracts</b>				
CIDB (2000)	✓	✓		✓
CIDB Model Terms		✓	✓	✓
CIDB Standard Form of Sub-Contract for Nominated Sub-Contractor[Form CIDB.B (NSC)/2002]	✓	✓		✓
<b>PWD Contracts</b>				
PWD 203 (Rev 10/83)	✓			✓
PWD 203A (Rev10/83)	✓			✓
PWD 203 (Rev 1. /2010)	✓			✓
PWD 203A (Rev 1. /2010)	✓			✓
PWD DB/T Rev 2002 (Turnkey)	✓			✓
PWD DB Rev 2007 (Design & Build)	✓			✓
PWD 203N (Nominated Sub Contract)	✓			✓

## **4. CHAPTER 4: EXTENSION TO THE TPB FRAMEWORK- PRELIMINARY STUDY BASED ON FOCUS GROUP**

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(Part of this chapter is extracted from Lee, C.K., Yiu, T.W., & Cheung, S.O. (2016). “Application of the Theory of Planned Behaviour to Alternative Dispute Resolution (ADR) Selection and Use in Construction Projects”. Project Management Journal. Submitted for Review.)

### **4.1 Introduction**

Following the presentation of the TPB’s capacity to model a decision-making process in ADR, this chapter presents an initial study to decompose and extend the TPB framework by eliciting salient beliefs among construction professionals. Based on a non-payment dispute scenario, this study aimed to identify building contractor’s salient beliefs in using ADR by using an online asynchronous focus group. This focus group consisted of 16 construction payment experts. The preliminary study was approved by the University of Auckland Human Participants Ethics Committee- ref number 012980.

The sets of beliefs from the focus group were qualitatively content analysed. Based on a 10% cut-off frequency prescribed by Ajzen and Fishbein (1980), the behavioural belief structures of the TPB framework spanned seven themes; while normative belief structures concerned only one theme; followed by three themes under control belief structures.

The seven themes of behavioural /attitudinal belief structures were then reclassified and reorganised into three theoretical constructs (*Perceived Relative Advantage, Perceived Ease of Use, and Perceived Risk*); while one theme of normative belief structures was reclassified into one theoretical construct (*Internal Project Team*). Finally, three themes of control belief were reclassified into one theoretical construct (*Organisational Competency*). Accordingly, the decomposition offers a preliminary grounding for practical empiricism of the TPB framework in explaining decision-making process in ADR use.

### **4.2 Study Aims**

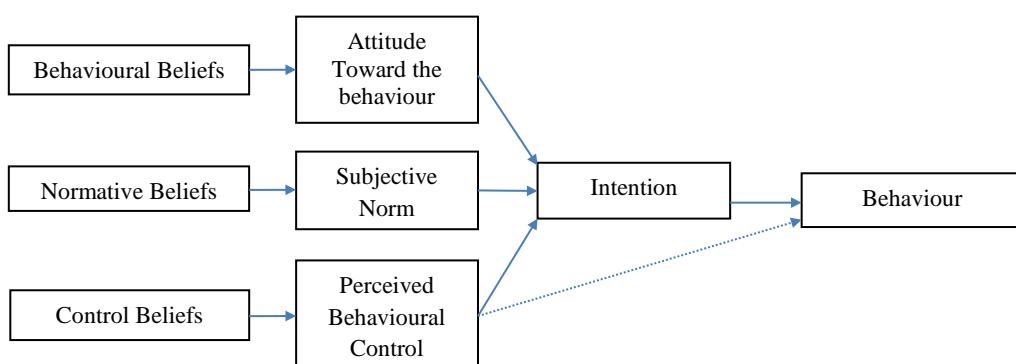
With reference to the guidelines by Ajzen and Fishbein (1980) and Ajzen and Madden (1986), this chapter aims to present an elicitation study of 16 construction payment experts using an asynchronous online focus group. Using a non-payment related dispute as a

hypothetical scenario, the focus group aimed to identify contractors' behavioural/attitudinal, normative, and control beliefs in ADR use for settling non-payment related disputes. Accordingly, the chosen salient beliefs were further used and developed as theoretical extensions to the TPB framework.

#### 4.3 Decomposition of Salient Beliefs: Extending the TPB Framework

The TPB posits that human behaviour is functionally and jointly predicted by intention, and perceived behavioural control (Ajzen, 1991; Madden, Ellen, & Ajzen, 1992). Although both **intention** and **perceived behavioural control** can predict behaviour, however in certain circumstances only one of them contributes significantly to the prediction of behaviour (Ajzen, 1991). Intention solely prevails when the situation permits the decision maker to have full complete volitional control over the performance of the behaviour. However, when the behaviour lacks of volitional control, perceived behavioural control contributes significantly to the prediction of behaviour (Ajzen, 1991; Fishbein & Ajzen, 2010).

Decision makers are considered to be rational in the decision to settle, or to litigate from the economic stand-point (Aibinu et al., 2011). Thus, when decision makers confronts with novel and critical dispute situations, they are most likely to evoke careful deliberation in making ADR choices. A careful and reasoned cognitive process of ADR selection and use is expected in the decision making. Figure 4.1 below shows how behaviour is predicted by intention, followed by the formation of intention by attitude, subjective norm and perceived behavioural control.



**Figure 4.1 Theory of Planned Behaviour (Ajzen, 2006b)**

Determinants of attitude toward behaviour are behavioural beliefs; while normative beliefs influence subjective norm, and control beliefs determine perceived behavioural control.

People may hold large numbers of beliefs. However at a given point, they may only tap into their accessible memory and hold not more than 5 to 9 beliefs, and these prominent beliefs are referred to as “salient” (Ajzen & Driver, 1991; Fishbein & Ajzen, 1975). Salient beliefs are important for understanding behaviour and useful for future behaviour interventions (Ferguson, Cohen, Pooley, & Guilfoyle, 2009). Behaviour can be changed through alteration of existing beliefs and exposure to new beliefs (Ajzen, 2006a). Overall, *behavioural beliefs* influence attitude toward performing the behaviour, whereas *normative beliefs* determine subjective norm, and *control beliefs* underlie perceived behavioural control (Ajzen, 1991; Ajzen, 2002).

#### **4.3.1 Salient Behavioural Beliefs / Attitudinal Beliefs**

Behavioural beliefs can be used interchangeably as “attitudinal beliefs” (Taylor & Todd, 1995). Both terms carry a similar definition. Both terms refer to the beliefs about the likely consequences of the behaviour (Pavlou & Fygenson, 2006; Taylor & Todd, 1995). When the strength of each salient behavioural belief ( $b$ ) is combined in a multiplicative fashion with the evaluation ( $e$ ) of the belief’s attribute, and the resulting products are summed over  $n$  salient beliefs, this would give rise to the explanation of how behavioural beliefs influence favourable or unfavourable attitude toward behaviour (Ajzen, 1991). According to Ajzen (1991), attitude is directly proportional to this summative belief index, which can be mathematically written as  $\text{Attitude (A)} \propto \sum_{i=1}^n b_i e_i$ .

When this attitude model is applied, the salient behavioural belief ( $b$ ) of using ADR can exist in the form of: “Using this ADR method to settle this project dispute would be more economical”; while the evaluation of the consequences ( $e$ ) of this attribute would be “Having a more economical dispute resolution method to settle this project dispute is good”. Positive behavioural beliefs would produce favourable attitude, which in turn foster greater intention to use ADR.

#### **4.3.2 Salient Normative Beliefs**

Salient normative beliefs refer to perceived expectations of important referents. This is concerned with the probability that significant referent individuals or groups approve or disapprove of performing the given behaviour (Ajzen, 1991). If the strength of an individual’s normative belief concerning a particular referent ( $n$ ) is multiplied by the motivation to comply with the referent ( $m$ ); and the products are summed across the  $n$  salient

referents, this would give rise to the explanation of how normative beliefs determine subjective norm (Ajzen, 1991). Subjective norm is then directly proportional to this summative belief index, where, Subjective Norm (SN)  $\propto \sum_{i=1}^n n_i m_i$ .

Similarly, when this normative model is applied, the salient normative belief ( $n$ ) of using ADR can take the form of “My project team strongly wants me to use this ADR to settle the dispute”; while the motivation to comply ( $m$ ) with this pressure would be “I feel compelled to meet with this expectation”. Favourable normative beliefs would produce a favourable subjective norm, and thus influence greater intention to use ADR.

#### 4.3.3 Salient Control Beliefs

Salient control beliefs are concerned with the perception of important factors that might facilitate or inhibit an actor from performing a behaviour, and are assumed to underlie perceived behavioural control (Sutton et al., 2003; Taylor, 2014). Taylor and Todd (1995) found that control beliefs ( $c$ ), which reflect the availability of resources such as time, money and specialised resources needed to perform the behaviour, are termed as “facilitation conditions”, while the beliefs of the individual’s confidence over his/her own abilities to perform the behaviour are termed as “self-efficacy”. When each control belief ( $c$ ) is multiplied by the perceived power ( $p$ ) of the control belief to facilitate or impede behaviour, and the products are summed across  $n$  salient beliefs; this yield perception of behavioural control (PBC). Perceived Behavioural Control can be represented as: PBC  $\propto \sum_{i=1}^n c_i p_i$  (Ajzen, 1991).

Applying this control model, the salient control beliefs about using ADR ( $c_i$ ) could refer to the perceived adequate capabilities and resources of initiating ADR, and these criteria are very important towards ADR use ( $p_i$ ). Greater beliefs of having control in resources and opportunities would produce greater perceived behavioural control, and thus increase intention to use ADR.

#### 4.4 Methodology

The focus group plays an important role in exploring additional salient factors and other factors capable of predicting contractors’ intentions in these remedies. It is a qualitative method that brings several respondents to discuss and articulate comments among themselves

and to the researcher (Morgan & Spanish, 1984). Interactions between group members in focus group are needed to generate and foster ideas that are beneficial for survey expansion and questionnaire validation (Kitzinger, 1994; Powell, Single, & Lloyd, 1996). A focus group can be conducted online, in the form of synchronous or asynchronous communication. Synchronous focus groups are carried out in live sessions while asynchronous sessions take the form of list serve, text-based bulletin boards, and emails, where participants can take their time contributing to any comments without the presence of other people (Rezabek, 2000; Stewart & Williams, 2005).

Online asynchronous discussions such as forums, web message boards allow interaction at the participants' own convenience (Im & Chee, 2006). The study done by Im and Chee (2006) further showed that the use of online focus groups (asynchronous forum) has increasing credibility which denotes a higher retention and response rate. According to reviews done by Tates et al. (2009), the online focus group has comparable quantity and quality of data findings to traditional face to face online groups. Online focus groups have circumvented the problems of being hard to reach, and busy population and provide convenience to both participants and researcher (Rezabek, 2000; Tates et al., 2009). It overcomes the shortcomings of geographical and time constraints of the participants, and serves as cost effective means of qualitative approach (Parker & Tritter, 2007). The feasible number of participants in an online focus group ranges from six to eight people (Murgado-Armenteros, Torres-Ruiz, & Vega-Zamora, 2012). According to Burton and Goldsmith (2002) ,10-15 participants should be invited for asynchronous online focus groups, with at least 10 people fully enrolled in the discussion.

Based on a review of 21 asynchronous studies, William (2009) revealed that the average number of participants in asynchronous focus group was 12. The usual size of groups in health study would be 12-14 participants (Williams, Clausen, & Robertson, 2012). Depending on the questions posed by the researcher, asynchronous online focus group takes a mean length of four weeks (Williams et al., 2012).

This chapter presents a study conducted in the form of asynchronous focus group discussion. Asynchronous discussions allow members to gather discussion and articulate comments among themselves at their own convenience without the presence of other people (Rezabek, 2000; Stewart & Williams, 2005). To overcome geographical and time difficulties

for the participants, this study utilised the advantage of a ***Facebook Group*** as a convenient platform for discussion. To recruit potential participants, 30 invitation emails were sent randomly to real estate and housing developer firms, building and civil engineering contractor companies, and construction consultant firms in Malaysia. The aim of the invitation was to recruit professionals who were expert in the field of payment. 16 project professionals agreed to participate in this study, and duly signed the consent forms. Before the commencement of discussion, participants were advised to maximise their personal ***Facebook*** privacy settings prior to joining the group discussion. The link to the online focus group was first sent to all respondents via email, allowing them to send requests to be accepted in the group. Once their actual matching identity to the focus group had been confirmed, their requests were approved by the researcher accordingly. The discussion commenced for a period of seven weeks. Table 4.1 below shows the profile of the participants in this study.

**Table 4.1 Profile of Participants**

Respondent Code	Type of Organisation	Designated Position	Experience in the Construction Industry
R1	Developer	Assistant Project Manager	5 Years
R2	Developer	Contract Administrator	6 Years
R3	Developer	Contract Administrator	6 Years
R4	Developer	Contract Administrator	7 Years
R5	Contractor	Contract Administrator	5 Years
R6	Contractor	Contract Executive	5 Years
R7	Contractor	Assistant Manager	5 Years
R8	Contractor	Project Manager	6 Years
R9	Contractor	Assistant Quality Controller	6 Years
R10	Contractor	Contract Administrator	7 Years
R11	Contractor	Contract Administrator	7 Years
R12	Contractor	Assistant Project Manager	7 Years
R13	Contractor	Project Executive	8 Years
R14	Consultant	Project Architect	5 Years
R15	Consultant	Senior Project Executive (QS)	5 Years
R16	Consultant	Project Team Leader (QS)	6 Years

Due to careful considerations for ethical, sensitivity and confidentiality issues in the focus group, this study adopted an indirect and different approach of eliciting salient beliefs related to ADR use. Over the years, the Malaysian construction industry has been seriously plagued with payment issues, especially non-payment disputes. These disputes have seriously affected the contractor's cash flow (Pettigrew, 2005; Wu, Kumaraswamy, & Soo, 2008). Non-payment is considered as one of the common causes of disputes faced by the contractor

(Hamimah, Hashim, Yusuwan, & Ahmad, 2012). It triggers drawbacks to all key players in the industry and causes project delay (Sambasivan & Soon, 2007). Therefore, by using non-payment as a hypothetical scenario, this study attempted to identify unpaid contractors' salient beliefs in using ADR to recover payment from the perspectives of developers, contractors, and consultants.

Among the 16 participants, 9 were from contractor organisations, 4 from developer firms, and 3 from consultant companies. The participants were initially given explanations of the concept of "non-payment" faced by contractor, and then the first question followed.

***"What can a contractor do to recover payment if the paymaster defaults in payment?"***

The most popular responses from the participants include "To recover payment, the contractor could initiate: Adjudication (n =16), Mediation (n=16), and Arbitration (n=16)". Following the responses above, the participants were then instructed to consider from the perspective of an unpaid contractor who faces non-payment. They were then asked to discuss and speculate on all possible contractor's behavioural, normative and control beliefs in initiating these ADR: adjudication, mediation, and arbitration for recovering payment (see Table 4.2).

**Table 4.2 Asynchronous Focus Group Guide**

<b>TPB Component</b>	<b>Guiding Discussion</b>
<b>Contractor's Behavioural Beliefs</b>	<ol style="list-style-type: none"> <li>1. What would the contractor see as the advantages of initiating adjudication / mediation/ arbitration?</li> <li>2. What would the contractor see as the disadvantages of initiating adjudication / mediation/ arbitration?</li> <li>3. Is there anything else the contractor might associate with initiating adjudication / mediation /arbitration?</li> </ol>
<b>Contractor's Normative Beliefs</b>	<ol style="list-style-type: none"> <li>1. Are there any individuals or groups who would approve of the contractor in initiating adjudication / mediation / arbitration?</li> <li>2. Are there any individuals or groups who would disapprove of the contractor in initiating adjudication / mediation /arbitration?</li> <li>3. Are there any individuals or groups come to the contractors' mind when the contractor thinks about initiating adjudication /mediation/arbitration?</li> </ol>
<b>Contractor's Control Beliefs</b>	<ol style="list-style-type: none"> <li>1. What factors or circumstances would enable the contractor to initiate adjudication / mediation / arbitration?</li> <li>2. What factors or circumstances would make it difficult or impossible for the contractor to initiate adjudication / mediation /arbitration?</li> <li>3. Are there any issues that come to the contractor's mind when the contractor thinks about the difficulty of initiating adjudication / mediation /arbitration?</li> </ol>

#### 4.5 Results (Key Themes Identified by Focus Group)

The participants in the focus group speculated that the unpaid contractor would consider mediation as an effective mechanism to improve the quality of dispute settlement between parties (n=11); giving both parties greater control over the proceeding (n=11), and being less costly (n=11). Salient advantages of using adjudication includes its effectiveness to secure payment (n=12), capability of settling payment disputes faster (n=13), and being easy to initiate (n=12). As for the disadvantages, most of the participants suggested that unpaid contractors would consider arbitration as a risky decision as it may cause losses and damages to their organisations in the end (n=10).

Under normative beliefs, the participants highlighted that the unpaid contractors would consider their own project team as the most salient referents of their decision to arbitrate, mediate or adjudicate (n=10).

Lastly, the participants posited that the unpaid contractors would consider organisational factors such as expertise (n=10), documentations (n=10), and resources (n=10) as the most salient control beliefs in initiating ADR. Overall, the salient behavioural, normative and control beliefs can be summarised in Table 4.3 below.

**Table 4.3 Key Concepts and Themes Identified by Focus Group (Total N=16)**

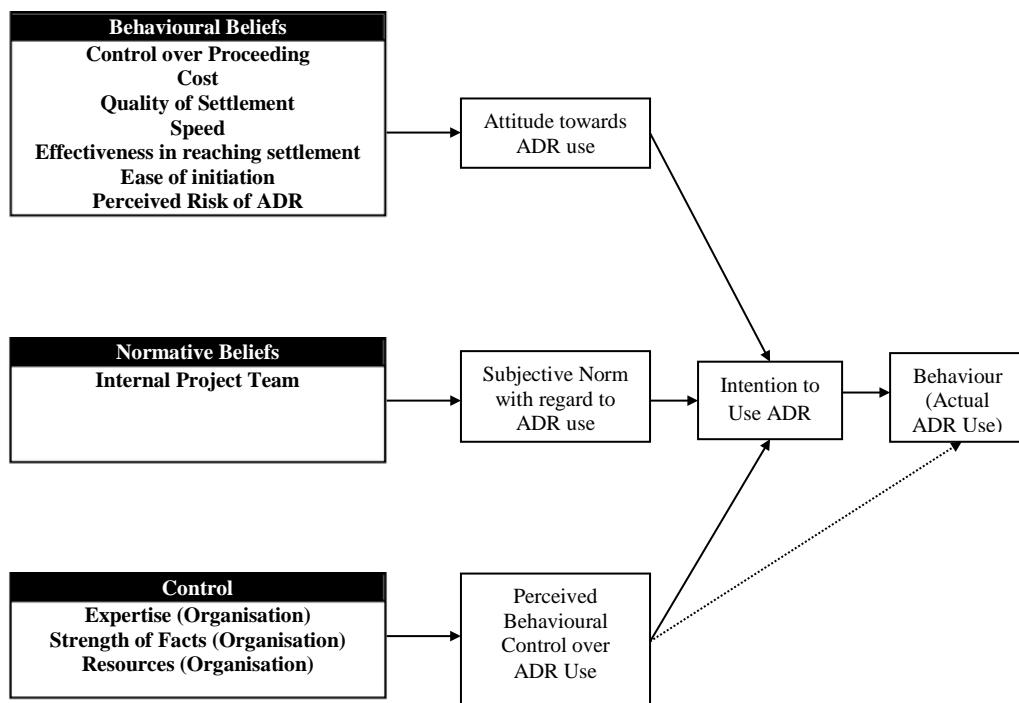
Beliefs	Key Themes	Examples of Quotes
<i>Behavioural Beliefs</i>	Quality of Settlement (n=11, 69%)	“Mediation helps failed negotiations, where an independent third party steps in to solve the issue, and helps to achieve a long lasting agreement”...
	Control over the proceeding (n=11, 69%)	“Mediation is almost akin to negotiation. The mediator advises, instead of giving decisions”...
	Cost (n=11, 69%)	“Mediation is advantageous for both parties. It saves costs for both parties”.
	Effectiveness in reaching settlement (n=12, 75%)	“Adjudication can help contractors to secure payment effectively, especially contractors who are victimised by non-payment issues...”
	Speed (n=13, 81%)	“Adjudication (with the recent Construction Industry Payment and Adjudication Act) is less time consuming...”
	Ease of Use (n=12, 75%)	“In my point of view, adjudication can be applied to each and every contract. This legal process is easy to initiate...”
	Risks (n=10, 62.5%)	“Arbitration will affect commercial relationships, and expose counter claims. It would cause more losses to the

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		organisation ...”
<b>Normative Beliefs</b>	Internal Project Team (n=10, 62.5%)	“Contractor may initiate any ADR method by having the support of their internal own team...”
<b>Control Beliefs</b>	Expertise (Organisation) (n=10, 62.5%)	“If the organisation has ‘claim specialist’ with arbitration background, would assist in paper-works, and documentations. This would be very helpful for the contractor”
	Strength of Facts (Organisation) (n=10, 62.5%)	“The sufficiency of the supporting documents is another factor that enables the contractor to initiate ADR and take on the case...”
	Resources (Organisation)(n=10, 62.5%)	“Value for Money. Contractor would usually weigh out whether is it worth to take actions based on organisation’s resources”

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The derivations of the modal salient beliefs are based on most frequently elicited. Only beliefs mentioned by at least 10% or 20% of the sample should be used as modal salient beliefs (Ajzen & Fishbein, 1980). Evidently, all key themes mentioned by the participants exceeded the 10% or 20% cut-off frequency. Based on the results, the TPB model was extended and illustrated in Figure 4.2 below:



**Figure 4.2 Extended TPB Model Based on Focus Group**

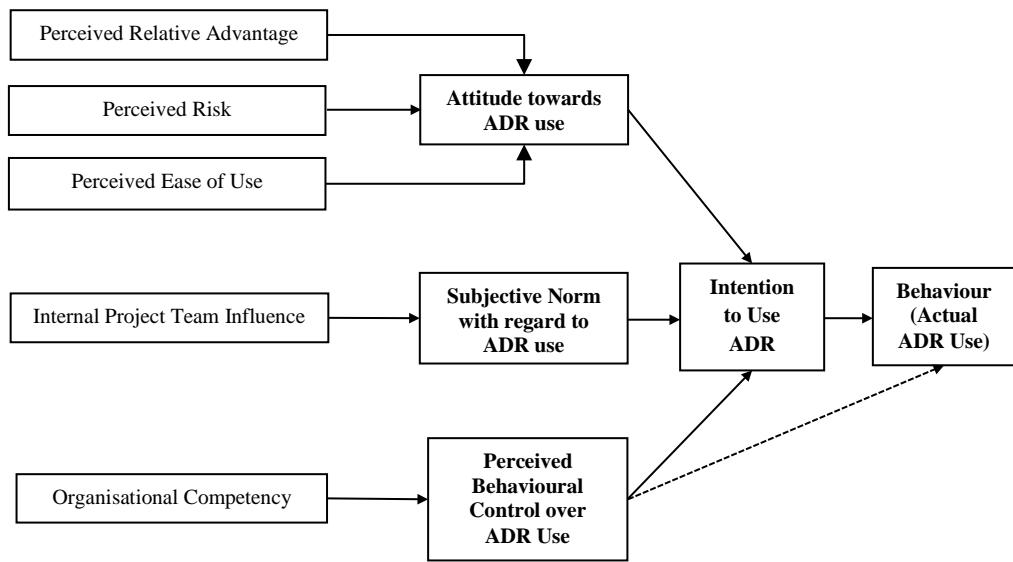
#### 4.6 A Conceptual Extended TPB Model based on Focus Group

The resulting sets of beliefs (*Figure 4.2 refers*) were reclassified based on theoretical, literature, and practical empirical validation grounds. The sets of beliefs underpinning behavioural, normative, and control belief structures were then reclassified into five theoretical constructs. The reclassifications would provide future plausible empirical exposition based on theoretical and literature grounds.

Behavioural belief structures can be decomposed into perceived relative advantage, perceived ease of use, and perceived risk. Normative belief structures can be decomposed into internal team influences. Control belief structures can be decomposed into organisational competency. Overall, the reclassification of sets of belief is shown in Table 4.4 and further displayed in Figure 4.3.

**Table 4.4 Theoretical Construct Based on Focus Group**

Elicited Beliefs	Proposed Theoretical Constructs
<b>Behavioural Beliefs</b>	
Control over Proceeding	
Cost	Perceived Relative Advantage
Quality of Settlement	
Speed	
Effectiveness in reaching settlement	
Perceived risk of ADR	Perceived Risk
Ease of initiation	Perceived Ease of Use
<b>Normative Beliefs</b>	
Internal Project Team	Internal Project Team Influence
<b>Control Beliefs</b>	
Expertise (Organisation)	
Strength of Facts (Organisation)	Organisational Competency
Resources (Organisation)	



**Figure 4.3 Conceptual Extended TPB Model Based on Focus Group**

#### 4.6.1 Decomposition of Behavioural/Attitudinal Beliefs

Drawing on innovations literature, the behavioural belief structures were reclassified into perceived relative advantage, and perceived ease of use. Perceived relative advantage refers to the degree to which an innovation is better than the idea it supersedes (Moore & Benbasat, 1991; Rogers, 2003). Almost consistent with Moore and Benbasat (1991)'s notion of relative advantage, perceived relative advantage of ADR use encapsulates economic factors (cost), speed, effectiveness, control, and quality of settlement. As long as a decision maker views an ADR method as being better and more advantageous than the other resolution method, the more rapid it would be in its rate of use.

Perceived ease of use refers to the degree of difficulty of an innovation to be put into use and executed. It is often linked to the notion of perceived ease, or difficulty (Rogers, 2003). It is also the degree to which a user expects the target system to be effortless (Davis, 1989). Generally, a system that is perceived to be easy to use will tend to generate favourable attitude towards the system (Abroud, Choong, Muthaiyah, & Fie, 2013). This would highly suggest that disputants who view an ADR method to be easy to use and effortless would generally have more favourable attitude towards the method.

Perceived risk can be defined as an expectation of loss (Lee & Rao, 2007). It is the perception of uncertainty and adverse consequences of an outcome (Fu, Farn, & Chao, 2006).

Perceived risk combines the perceived probability of loss and severity of the negative impact (Gewald, 2006). Positive attitude will be generated if the perceived benefits of a decision outweigh the associate risks (Gewald, 2006). It is postulated that when a dispute arises, disputants would try their best to protect, and avoid any further loss of pre-existing gains, such as business reputation, business profit, working relationships, and even time and cost vested in the project. Hence, any choices that allow disputants to contain and avoid any further losses would be favoured (Cohen, 2007). Therefore, it is understandable that disputing parties might seek for settlement through negotiation that offers less risk. However, when a settlement cannot be reached with negotiation, this implies it has already reached an impasse (Chow et al., 2012b). This would necessitate the disputing parties seeking other means of resolution such as ADR. The disputant, for example the contractor in dispute, is in the position of facing two great losses: adverse consequences from the dispute itself, and the consequences of using a dispute resolution with risks for settlement. When a disputant perceives risks in dispute to be high, it would imply the tendency to avoid further risks and exhibit risk avoidance behaviour. Sitkin and Weingart (1995) managed to show that higher levels of perceived situational risk would be negatively related to risky decisions, as risk resembles negative outcomes (losses).

#### **4.6.2 Decomposition of Normative Beliefs**

Based on the responses, the referent groups can be largely decomposed into internal project team influence. This type of referent group can be seen as the most influential referent groups who would support, approve, or exert pressures on the decision maker's motivation to use a particular ADR in resolving project dispute.

#### **4.6.3 Decomposition of Control Beliefs**

Lastly, expertise, strength of facts, and resources are reclassified under the domain of organisational competency. Perceived competence must however exist within the context of some perceived self-determination (Deci & Ryan, 1985). Strong organisational competency would intrinsically motivate the decision maker in a particular resolution method, and give impetus to action.

### **4.7 Chapter Summary**

The main purpose of this chapter is to propose an extended TPB framework in explaining the decision-making process in ADR use by eliciting salient behavioural,

normative and control beliefs among construction professionals in Malaysia. To achieve this, an online asynchronous focus group involving 16 construction payment experts was carried out. Based on a non-payment scenario, these payment experts discussed contractors' beliefs in using ADR. Accordingly, their beliefs were qualitatively content analysed and classified into seven behavioural themes, one normative theme, and three control themes.

The themes were then reclassified into theoretical constructs. Behavioural beliefs structures were further decomposed into three theoretical constructs (*perceived relative advantage, perceived risk, and perceived ease of use*); while normative belief structures were decomposed into one theoretical construct, and followed by one decomposed theoretical construct under control belief structure. The preliminary extended TPB model suggests further plausible development of an ADR decision-making behavioural model (to be further presented in Chapter 5).

## **5. CHAPTER 5: CONCEPTUAL ADR DECISION-MAKING BEHAVIOURAL MODEL**

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### **5.1 Introduction**

According to the Theory of Planned Behaviour (TPB), intentions are the culmination of a decision-making process (Sheeran, Milne, Webb, & Gollwitzer, 2005). Based on the conceptual TPB framework in ADR selection and use (presented in Chapter 2), the selection phase/decision-making process is conceptualised as “intention to use ADR”.

The development of an ADR decision-making behavioural model would require a thorough review of existing behavioural theories that is capable of further predicting and explaining behavioural intention to use ADR. This chapter presents the development of the hypothesized model via theoretical review. The model draws on the TPB (main anchor of the hypothesised model), Diffusion of Innovation Theory, Prospect Theory, Motivation Theory, Protection Motivation Theory, and Institutional Theory.

Accordingly, the hypothesized ADR decision-making behavioural model presented in this chapter is justified in its development through comparison of reclassification work from systematic review (previously discussed in Chapter 2), and preliminary extended TPB framework (presented and discussed in Chapter 4).

### **5.2 Theory of Planned Behaviour (TPB): Intention as the Culmination of the Decision-Making Process)**

The TPB asserts that human behaviour is functionally guided and a direct weighted function of behavioural intention (BI) and perceived behavioural control (PBC). BI is formed by a combination of attitude, subjective norm, and perceived behavioural control. Adapted from Ajzen (1991), the TPB can be mathematically represented with the equation:

$$B \sim BI = (W_1) A + (W_2) SN + (W_3) PBC, \text{ where:}$$

**B** - Overt behaviour,

**BI** - Behavioural intention,

**A** - Attitude towards the behaviour

**SN** - Subjective norm

**PBC**- Perceived behavioural control

**W<sub>1</sub>, W<sub>2</sub>, W<sub>3</sub>** - Are the empirically determined weights.

In short, the more favourable the attitude and subjective norm, and greater the perceived control over the behaviour, the higher would be a person's intention to perform that behaviour (Ajzen, 2006b). An investigation of 16 studies over the period 1985-1991 showed that variance in intentions can be accounted for by the three predictors (attitude, subjective norm, and perceived behavioural control) in the TPB. The multiple correlations ranged from a low of 0.43 to a high of 0.94, with an average correlation of 0.71 (Ajzen, 1991).

Nevertheless, Fishbein and Ajzen (2010) observations from 12 studies (1992-2005) covering a wide range of behavioural domains including health and sports activities, revealed that the multiple correlations ranged from 0.62 to 0.88, which implied that variance in intentions itself can be explained between 39% and 77%. Consideration of attitudes, perceived norms and perceived behavioural control had predicted intentions accurately.

A meta-analysis of 87 empirical studies by Sheppard, Hartwick, and Warshaw (1988) showed that an average correlation of 0.53 was established between intention and behaviour. Sheeran (2002) conducted an empirical review on intention-behaviour relationship to investigate how big the gap between intention and real behaviour is. Intentions explained 28% on average of the variance of real behaviour. Another extensive meta-analytic review of 37 studies by Webb and Sheeran (2006), reported that a change in intention directly brings a significant change on the subsequent behaviour.

As Chau and Hu (2001) and Zhang and Ng (2013) reviewed, several researchers in the past have focussed on behavioural intention strongly linked to real targeted behaviour. It would be **theoretically sound and justified to focus on behavioural intention as the dependent variable**. Furthermore, in a cross-sectional survey-based study, it is sufficient to measure intention instead of real behaviour. This is because actual behaviour in a time period is largely based on beliefs and attitude in the previous time period (Agarwal & Prasad, 1999).

Commenting on meta-analysis studies done by Sheppard et al. (1988); Godin and Kok (1996); Albarracin, Johnson, Fishbein, and Muellerleile (2001); Armitage and Conner (2001); Hagger, Chatzisarantis, and Biddle (2002), the separate effects of mean correlations ( $r$ ) of attitude, subjective norm, perceived behavioural control with intention are observed to be 0.45 to 0.60 , 0.35 to 0.42, and 0.35 to 0.46. Meta-analysis on the TPB showed that attitude and subjective norm explained 33-50% of the variance in behavioural intentions (Ajzen, 1991;

Armitage & Conner, 2001), and perceived behavioural control contributed to an improvement of 5-12% in the variance of intentions (Armitage & Conner, 2001).

### **5.2.1 Development and Application of Theory of Planned Behaviour (TPB)**

The TPB has been robustly utilized in various fields and settings. It has been used and applied to predict and explain leisure choices (Ajzen, 1990); adolescent use and misuse of alcohol (Marcoux & Shope, 1997); pollution reduction preferences in firms (Cordano & Frieze, 2000); travel mode choices (Bamberg, Ajzen, & Schmidt, 2003); exercise intentions (Yap & Sabaruddin, 2008); academic dishonesty and students' cheating behaviour (Harding, Mayhew, Finelli, & Carpenter, 2007; Mayhew, Hubbard, Finelli, Harding, & Carpenter, 2009); explaining public transport information use (Farag & Lyons, 2010); the safety climate in aviation maintenance (Fogarty & Shaw, 2010); workplace dishonesty (Lin & Chen, 2010); drivers and inhibitors of students' university choice (Quintal, 2011); adolescent perpetration in cyberbullying (Heirman & Walrave, 2012); selection of internet banking (Nasri & Charfeddine, 2012); physical activities intentions (Supavittpatana, Phancharoenworakul, Yeo, Sinsuksai, & Vorapongsathorn, 2012); choices in visiting green hotels (Chen & Tung, 2014); and willingness to pay for the conservation of urban parks (López-Mosquera, García, & Barrena, 2014). The TPB has also been used to explain health behaviour, education, economics, physical activities, information usage, and transportation use.

More recently, the TPB has been widely applied in construction. It provides superior explanations in behavioural intention and has been tested in numerous studies (Armitage & Conner, 2001). For example, the TPB explains intentions to form project partnering (Cheng, 2016), cognitive factors influencing construction safety behaviour (Goh & Sa'adon, 2015) and knowledge sharing intentions in construction firms (Zhang & Ng, 2013). In addition, attitudinal forces that shape construction waste behaviour have been analysed under a TPB framework (Ara Begum, Siwar, Pereira, & Jaafar, 2009; Teo & Loosemore, 2010).

There are several assumptions concerning the TPB. Overall, the assumptions are:

- I) The TPB affords good prediction of intention from attitude, subjective norm, and perceived behavioural control, but nevertheless the prediction of behaviour from intentions is fraught with potential problems (Ajzen, 2014).

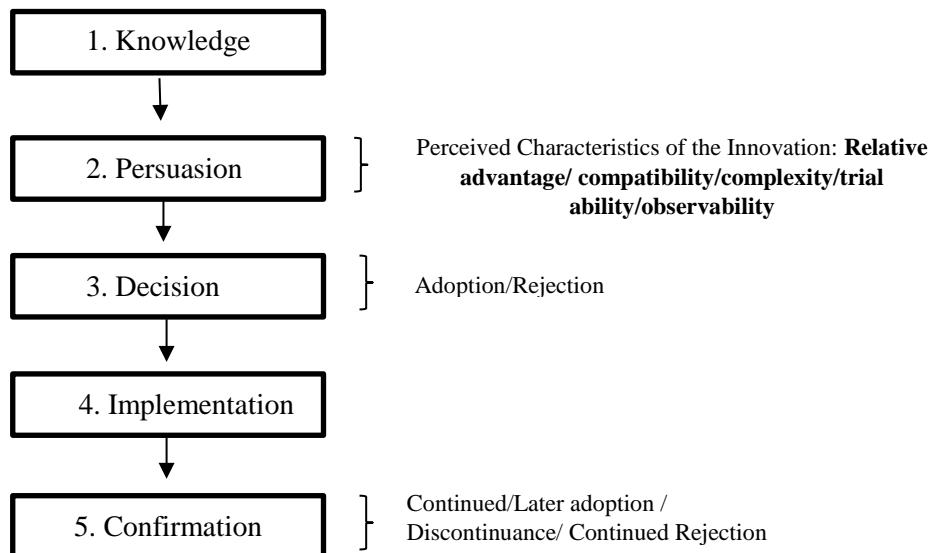
- II) The TPB assumes behaviour is predicted by a weighted linear function of attitude, subjective norm, and perceived behavioural control, and intention at a particular single point of time of assessment.
- III) The TPB constructs cannot be directly observed, but can only be inferred from observable responses (Ajzen, 2006b).
- IV) Any standard attitude scaling (such as Likert Scaling, or Thurston Scale) can be used for the purpose of solicitation (Ajzen, 2006b).
- V) TPB constructs are hypothetical and in the form of latent variables (Ajzen, 2006b).
- VI) The behaviour of interest is defined in terms of its **Target**, **Action**, **Context**, and **Time** (TACT) elements. For example, measurement of intention of performing behaviour in the questionnaire needs to be solicited in this format: “**I intent** to mediate (**action**) payment disputes (**target**) in this coming month (**time**) in Malaysia (**context**)”. However, TACT is somehow arbitrary and depends on the researcher’s discretion (Ajzen, 2006b).
- VII) Behaviour measurement obtained through self-report is not easily obtained.
- VIII) The TPB computes for additional amount of variance in predicting intentions beyond the original construct with **additional variables** and generalizations to the respective research context (Dumitrescu, Wagle, & Dogaru, 2011). The TPB welcomes for additional variables (Ajzen, 1991).
- ix) Events occurring between assessment of intentions and observations of behaviour can produce changes in intentions, and unanticipated obstacles can prevent people from carrying out their intentions (Ajzen, 2014).

### **5.3 Diffusion of Innovation Theory**

Innovation is defined by Rogers (2003) as an “idea, practice, or object that is perceived as new by an individual or other unit of adoption” (p. 12). The perceived newness of the idea for the individual determines his or her reaction to it. Similarly, ADR is an innovative legal practice that helps both disputing parties to reach settlement without litigation. ADR processes are highly regarded as the result of innovation that has taken place within the justice system (Sourdin, 2013).

The innovation decision process is the process through which an individual passes from first knowledge of an innovation, to forming an attitude toward the innovation (in the

persuasion stage), to a decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision (Rogers, 2003).



**Figure 5.1 Five Stages in the Innovation-Decision Process [Source: Rogers (2003)]**

**Stage 1—Knowledge Stage:** The decision to use an innovation starts with the knowledge stage. A decision maker needs to be exposed to and aware of the innovation in order to understand the functionality of that innovation.

**Stage 2—Persuasion Stage:** At the persuasion stage, a decision maker forms a favourable or unfavourable **attitude** toward the innovation. The mental activity at this stage is predominantly cognitive and affective (feeling). Attitude cannot be formed until the decision maker knows about that idea.

At this stage, a decision maker actively seeks information about the innovation and eventually develops general perceptions towards the innovation with the attributes of the innovation, such as **relative advantage**, **compatibility**, **complexity**, **trial ability**, **observability**.

**(a) Relative advantage:** It refers to the degree to which an innovation is perceived as better than the idea it supersedes. The degree of relative advantage may be measured in economic terms; social prestige factors, convenience, and satisfaction. Perceptions and measures of utilities of the idea in terms of advantages will normally decide its

rate of adoption. This implies the greater a person perceive the innovation as advantageous, the more rapid its rate of use.

- (b) **Compatibility** is the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters.
- (c) **Complexity** is the degree to which an innovation is perceived as difficult to understand and use.
- (d) **Trialability** is the degree to which an innovation may be experimented on a limited basis.
- (e) **Observability** is the degree to which the results of an innovation are visible to others.

Innovations that are perceived by decision makers as having greater relative advantage, compatibility, trialability, and observability and less complexity will be used more rapidly than other innovations.

**Stage 3-Decision Stage:** The decision stage is where the decision maker adopts or rejects the innovation. Adoption is a decision to make full use of an innovation as the best course of action available. Rejection is a decision not to adopt an innovation.

**Stage 4-The implementation Stage:** Implementation stage (behaviour) occurs when decision makers put the innovation into use.

**Stage 5-The Confirmation Stage:** At this final stage, the decision maker either reinforces his decision, or reverses his decision.

Overall, a decision maker forms favourable or unfavourable attitude towards an idea or an innovations based on the attributes of the innovation, such as relative advantage, compatibility, complexity, trialability, and observability (Rogers, 2003). Both relative advantage and complexity have been adopted to predict information technology use and proved to be strong determinants of attitude (Shih & Fang, 2004), and behavioural intention (Lee, Hsieh, & Hsu, 2011).

Both relative advantage and complexity had been operationalised as “perceived usefulness” and “perceived ease of use”, and found to influence behavioural intention to use information technology (Davis, 1989; Davis, Bagozzi, & Warshaw, 1989; Ventakesh & Bala, 2008; Ventakesh & Davis, 2000). Moreover, only perceived usefulness is found to be a significant determinant of attitude, while perceived ease of use was not considered in the study by Taylor and Todd (1995).

#### **5.4 Prospect Theory**

According to prospect theory, decision makers choose an option based on change of wealth, rather than total wealth *per se* (Kahneman & Tversky, 1979). Prospect theory suggests that individuals tend to perceive losses as more salient and work harder to prevent these than to capture gains, as losses looms larger than gains (Kahneman & Tversky, 1979).

According to Aldridge (2006), expectancy value models such as the TPB would intersect with Prospect Theory in the way that people evaluate risks to evaluate prospects. Intentions are actually conditioned by the assigned value to the prospects (Aldridge, 2006). Exhibition of risk avoidance behaviour would imply the considerations and evaluations of risks for actions in interest. Intentions to perform behaviours are conditioned by the expected value an individual assigns to the prospect.

Perceptions on risk have appeared in Bauer’s (1960) classical paper that explains risk-taking behaviour. Horton (1976) commented that the perception of risks is actually the perception of possibility of loss. This notion actually appeared in its earliest form in 1960 in Bauer’s work which initially suggested that people strategize to hedge risk in situations where information is inadequate and the repercussions of actions is innumerable.

Lee and Rao (2007) also consider that perception of risk is the perception of loss. It is the perception of uncertainty and adverse consequences of an outcome (Fu et al., 2006). Evaluation of loss implies that in the assessment of risk much attention is given to negative outcomes (Dholakia, 1997).

If perceived benefits of a decision outweigh the associated risks, positive attitude would be generated (Gewald, 2006). This cost and benefit analysis encompassed in the attitudinal beliefs of a decision is actually aligned with the Ajzen and Fishbein (1969)

equation of **attitude**. **Attitude** is notionally equivalent to Subjective Expected Utility (SEU) that posits people actually make decisions on choices that maximize gains, and minimize average loss. In the TPB, beliefs about risks and expected value are actually included in the concept of attitude (Aldridge, 2006).

A risk-averse orientation in resolving disputes would imply that disputants seek to reach settlement through negotiation (Neale & Bazerman, 1985). However, when negotiation reaches an impasse, disputants may generally demonstrate risk-avoidance behaviour and make less risky decisions. Aligned with prospect theory, risk avoidance is greater when threats to assets are salient (Sitkin & Pablo, 1992).

Therefore, it is postulated that, when disputes arise, disputants would try their best to protect, and avoid any further loss of pre-existing gains, such as business reputation, business profit, working relationships, and even time and cost vested in the project. Hence, choices that allows disputants to retain and avoid any further losses would encourage people to initiate a choice that is less risky (Cohen, 2007). Hence, disputing parties frequently seek settlement with negotiation as it offers fewer risks. However, when settlement cannot be reached with negotiation, would have implied the break-down of negotiation and reach an impasse (Chow et al., 2012b). This would necessitate the disputing parties to seek other means of resolution such as ADR. Disputant, for example the contractor in dispute, is in the position of facing two great losses: adverse consequences from the dispute itself, and the consequences of adopting a dispute resolution with risks for settlement. When a disputant perceives risks in a dispute to be high, it would imply the tendency to avoid further risks and exhibit risk avoidance behaviour. Sitkin and Weingart (1995) managed to show that higher levels of perceived situational risks would be negatively related to risky decisions, as risks resemble more negative outcomes (losses).

Disputants have to take risks in ADR use as it involves issues of trust in the third party. For example, in the case of mediation, issues of trust in the mediator is prominent (Yiu & Lai, 2009). Trust in the third party implies that the disputants must be willing to be open to, and take risks with the other party (Boulle, 2001). Therefore, disputants would re-evaluate available choices of resolution on whether any choices of ADR selection could bring settlement and prevent any further losses. Therefore, the continuum of risk aversion

behaviour will continue to be vested on ADR choice that generates higher perception of relative advantage and lower risks (perceived risks in ADR).

## **5.5 Motivation Theory (Intrinsic Motivations)**

Motivation theories stem from the assumptions about the underlying forces and factors that give impetus to action (Deci & Ryan, 1985). These assumptions can be viewed in two ways: mechanistic, or organismic.

Mechanistic theories assume that human organisms are passive and their behaviour is largely determined by the interactions and stimulus of the environment. Organismic theories view that organism is volitional and capable of initiating behaviours based on intrinsic needs and physiological drives. Standing on organismic theories, this “intrinsic motivation” is based on innate needs for competence and self-determination. The intrinsic needs for competence and self-determination motivate an ongoing process of seeking and attempting to conquer optimal challenges.

There is a close relationship between perceived competence and intrinsic motivation. The more competent a person perceives him or herself to be at some activity, the more intrinsically motivated he or she will be at that activity. This predicted relationship requires two conditions. Activities that are trivial or simple and therefore provide no challenge are not expected to be intrinsically interesting even if the person perceives him/herself to be extremely competent. Secondly, for perceived competence to affect intrinsic motivation, the perceived competence must exist within the context of some perceived self-determination (Deci & Ryan, 1985). Intrinsically, people act on something for their own sake (Deci, 1975).

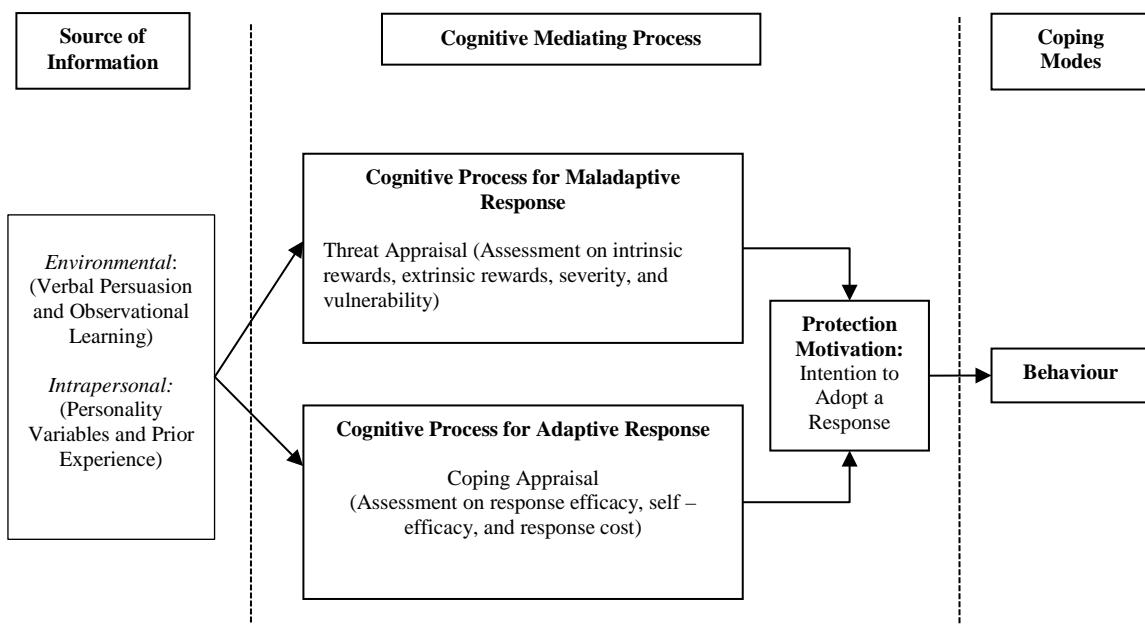
Competence can be defined in several ways. According to Bandura (1986) competence or self-efficacy is defined as the “judgements of individuals regarding their capabilities to organize and execute courses of action require achieving specific levels of performance” (p. 391).

Disputes are presumed to be challenging and adverse in all situations. The presupposition in this study posits that ADR knowledge, self-efficacy and perceived competencies in a particular ADR method will intrinsically motivate decision maker’s intention in using the method. Aligned with Deci and Ryan (1985) claim, the more a decision

maker perceives himself to be knowledgeable sufficient; and the higher perceived competence in a designated ADR method, the higher intrinsically motivated a person would be to instigate that choice.

## 5.6 Protection Motivation Theory

Both Protection Motivation Theory (PMT) and the TPB assume that a behaviour is predicted by a person's behavioural intention to perform that behaviour (Powell, Pattison, & Francis, 2015). Protection Motivation Theory consists of three main components, namely the source of information, cognitive mediation process, and coping modes (Rogers, 1983). PMT can be overall illustrated in Figure 5.2 below:



**Figure 5.2 Protection Motivation Theory [Adapted from Rogers (1983)]**

The source of information initiates two independent cognitive processes, such as threat appraisal and coping appraisal (Norman, Boer, & Seydel, 2005). The source of information could stem from environmental (such as verbal persuasion- fear appeals or observational learning-seeing what happens to others); or intrapersonal factors (such as personality factors or prior experiences with a similar threat) (Rogers, 1983).

Following that, a combination of both threat appraisal and coping appraisal would give rise to protection motivation, which can best be measured by behavioural intention (Boer & Seydel, 1996; Rogers, 1983). In short, intention to perform behaviour (protection motivation) is the result of a positive function of perception of severity, vulnerability, response efficacy, and self-efficacy, and a negative function of perceptions of the rewards associated with maladaptive responses and the response costs of the behaviour. For the protection motivation (intention) to be formed, according to Norman et al. (2005),

- (1) The perception of severity and vulnerability should outweigh the rewards associated with maladaptive response (Threat Appraisal).
- (2) Perceptions of response efficacy (effectiveness of the choice) and self-efficacy should outweigh the response cost of the adaptive behaviour (Coping Appraisal).

Protection motivation (intention) eventually leads to the performance of behaviour to cope with threat (coping mode).

### **5.6.1 Cognitive Mediating Process of ADR Use**

Maladaptive responses are behaviours that lead to negative consequences, or the absence of behaviours which may lead to negative consequences (Boer & Seydel, 1996). In this study, ‘not using the ADR method to settle dispute’ is conceptualised as maladaptive response. Unsettled disputes may pose serious threats to the disputing parties. Previous studies have shown that disputes may cause organizations to suffer from tensions (Cheung & Suen, 2002), damaged relationships (Al - Hammad, 1993; Cheung & Suen, 2002), escalation into unresolved problems and prolonged destructive conflicts (Kumaraswamy, 1998), and delays (Cheung & Suen, 2002; Sambasivan & Soon, 2007) . A decision in ADR methods is paramount, as inappropriate choice of dispute resolution mechanisms may result in unresolved disputes (Kumaraswamy, 1998). Absence of dispute settlement via ADR method would expose disputants to adverse threatening event –that is, escalation of disputes.

Coping appraisals involve the cognitive assessment and belief that performing an adaptive behaviour will reduce the threat (response efficacy), and the assessment over one’s capability in performing the recommended behaviour successfully (self-efficacy) (Boer &

Seydel, 1996). Response costs (such as availability of resources, inconvenience, expenses, unpleasantness, difficulty, complexity, side effects, disruptions of life and so on) may suggest predicaments to performing the adaptive behaviour (Rogers, 1983).

Perceptions of threats are conceptualised in terms of **perceived severity** (seriousness of a potential harmful situation) and **vulnerability** (probability of threatening events and susceptibility to harm). According to Rogers and Prentice-Dunn (1997), severity refers to “the degree of physical harm, psychological harm, social threats, economic harm, dangers to others rather than oneself, and even threat to other species” (p. 115), while vulnerability refers to the “the conditional probability that the threatening event will occur, provided that no adaptive behaviour is performed, or there is no modification of an existing behavioural disposition” (p. 115).

In the context of ADR use, ‘perceived vulnerability’ refers to the perceived probability that dispute would escalate provided that no adaptive behaviour (settlement with ADR) is performed, while ‘perceived severity’ refers to the perceived degree of harm to the organization when dispute escalates. This implies that the probability of maladaptive response (not instigating the ADR to settle dispute) will be decreased, and the intention to use the respective ADR for dispute settlement would increase if the perception of severity and vulnerability outweigh the rewards associated with maladaptive response. Nevertheless, decision makers who have high self-efficacies in ADR use, and perceive that using the particular ADR method would remove the dispute threat (response efficacy) would be likely to adopt the adaptive behaviour (using the particular ADR method), provided that the adaptive behaviour outweighs the repercussions of ADR use (response costs).

## 5.7 Institutional Theory

Institutional theory posits the critical influence of the institutional environment in driving organizations to make structural and behavioural changes with the aim of gaining social legitimacy (DiMaggio, 1983). Organizations have a tendency to behave according to socially accepted norms so that they can function congruently with the institutional environment.

This theory posits three pressures that influence organization behaviour, namely **coercive**, **mimetic**, and **normative pressures** (DiMaggio, 1983).

‘Coercive pressures’ refers to formal rules, mandates and regulations. In the counterpart of ADR adoption it would refer to contracts or legislations that mandate the usage of ADR. Coercive pressures on ADR use could stem from regulatory agencies, professional institutions, and industry associations. On the other hand, normative pressures could be derived from professionalization, where professional bodies within similar fields may form shared norms and diffusion of expectations through education, conferences, and professional consultations (Cao, Li, & Guangbin, 2014; Teo, Wei, & Benbasat, 2003). In Malaysia, the Malaysian Bar Council is known for its assertive roles and representation of legal professionals that advocates for the establishment of specialist construction courts (Ameer Ali, 2010). Two major construction associations in Malaysia are the Construction Industry Development Board (CDIB), and Master Builders Association Malaysia (MBAM). Other professional construction bodies in Malaysia include the Board of Quantity Surveyors, Board of Engineers, Board of Architects, and the Professional Services Development Centre (PSDC). Nevertheless, ADR methods such as mediation or arbitration stipulated in Malaysian construction standard form of contracts are subject to professional institutional rules. Mimetic pressures on the other hand refer to the motivation of an organization to imitate the success of other organizations. Due to uncertainty and lack of understanding in innovations, an organization tends to benchmark with the others that appear more legitimate and successful (Cao et al., 2014). Mimicry on peer projects with similar project characteristics and institutional backgrounds nevertheless grants decision makers legitimacy and sustains competitiveness in future projects (Cao et al., 2014). When facing disputes with uncertainties, imitating peer projects in ADR use can be seen as a way to hedge risk.

## **5.8 Development of ADR Decision-Making Behavioural Model: Theoretical Framework**

Drawing on the Theory of Planned Behaviour (TPB), Diffusion of Innovation Theory, Prospect Theory, Motivation Theory, Protection Motivation Theory, and Institutional Theory, and with reference to the reclassification concept of systematic review (Chapter 2) and preliminary study based on focus group (chapter 4), this section presents a conceptual and hypothesized ADR decision-making behavioural model.

The model consists of seven main constructs (Intention, Attitude, Subjective Norm, Descriptive Norm, Perceived Behavioural Control, Perceived Severity, and Perceived Vulnerability); two moderating variables (Voluntariness in ADR Use; and Voluntariness

from Mutual Consent), and 14 sub-variables. The dependant variable of this model is “Intention” (Figure 5.3).

## **5.9 Hypothesis Development**

### **5.9.1 Formation of Intention in the TPB**

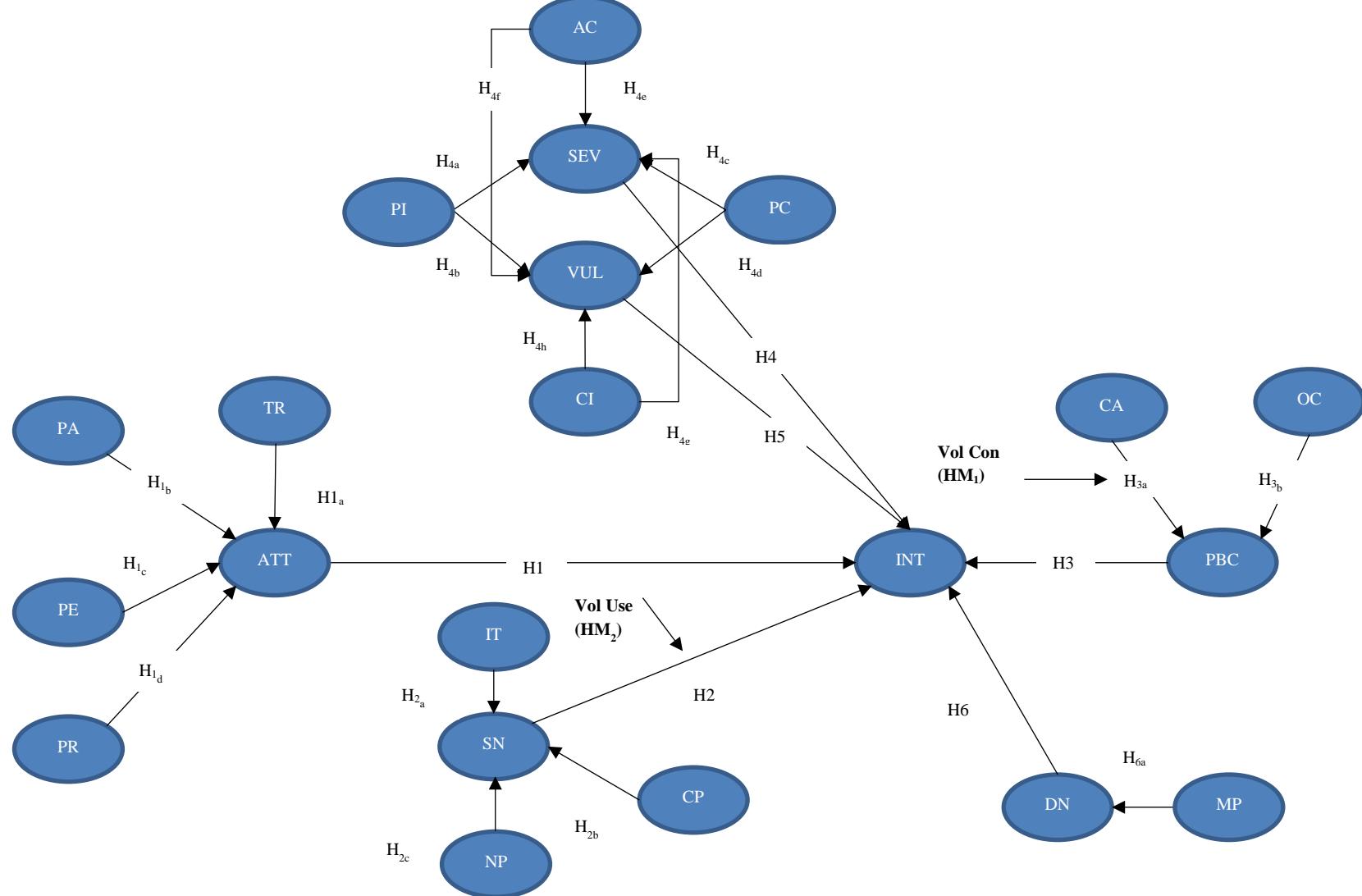
Drawing on the TPB, the decision to use ADR can be conceptualised as “intention to use ADR”, and the factors influencing “intention to use ADR” are attitude towards ADR use, subjective norm with regard to ADR use, and perceived behavioural control over ADR use.

Therefore, the following hypotheses are proposed, based on the TPB:

Hypothesis 1 ( $H_1$ ): Attitude (ATT) relates positively with Intention (INT)

Hypothesis 2 ( $H_2$ ): Subjective norm (SN) relates positively with Intention (INT).

Hypothesis 3 ( $H_3$ ): Perceived Behavioural Control (PBC) relates positively with Intention (INT).



**Figure 5.3 Conceptual ADR Decision-Making Behavioural Model**

### **5.9.2 Additional Variables to the Formation of Intention in the TPB Model**

Three additional constructs have been hypothesised as additional variables to the formation of intention. These variables are perceived severity, perceived vulnerability, and descriptive norm.

Drawing on Protection Motivation Theory, higher perceptions of harm to the organisation (perceived severity) when dispute escalates, (provided if no adaptive is performed) would enhance protection motivation. Similarly, higher perceptions on the exposure to this threat (perceived vulnerability) would increase intention to use ADR for dispute settlement. Both perceived severity and perceived vulnerability would serve as two additional endogenous constructs in predicting an intention to use ADR. Based on this,

***Hypothesis 4 (H<sub>4</sub>): Perceived Severity (SEV) relates positively with Intention (INT).***

***Hypothesis 5 (H<sub>5</sub>): Perceived Vulnerability (VUL) relates positively with Intention (INT).***

Rivis and Sheeran (2003) showed that descriptive norms are able to increase variance explain in intention by 5% after subjective norm, attitude, and perceived behavioural control have been taken into account. Descriptive Norm is a measure of an individual's beliefs about other people's behaviour. Unlike subjective norm which is a motivation to comply with what other people think that "I should do", descriptive norm is a perception of what others are actually doing (Gold, 2011). Descriptive norm is defined as something that has been done, rather than ought to be done (Forward, 2009). Descriptive norm refers to perceptions of significant other's own attitude towards a behaviour and actual behaviour (Rivis & Sheeran, 2003). Internalisation occurs when a referent's belief is incorporated into the decision maker's own belief (Ventakesh & Bala, 2008). Descriptive norm would affect intention to use ADR through the effect of internalisation. Thus,

***Hypothesis 6 (H<sub>6</sub>): Descriptive Norm (DN) relates positively with Intention (INT).***

### **5.9.3 Decomposition of Attitudinal/Behavioural Belief Structures**

Four variables (trust, perceived relative advantage, perceived ease of use, and perceived risk) are conceptualised as exogenous variables that decompose the attitudinal/behavioural belief structures.

### **5.9.3.1 Trust**

Trust can be defined as the “Willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party (p. 712)” (Mayer, Davis, & David Schoorman, 1995). Drawing on Bhattacherjee (2002)’s scales of trust, the dimensions of trust would encapsulate attributes of ability, integrity, and benevolence of the trustee.

Use of ADR methods involves the issues of trusts in the neutrals. The commencement of ADR highly depends on mutual communication between disputants and neutrals (Cheung et al., 2004b). Choice over the identity of neutrals depends on the agreement on both disputing parties (Cheung & Suen, 2002). Attributes of neutrals such as integrity, reliability and competence would affect the level of trust between disputing parties (Yiu & Lai, 2009). To deliver the ADR proceedings efficiently, neutrals need to gain a high level of trust of the disputing parties (Yiu & Lai, 2009).

Perceptions of trust have been found to have positive correlations with attitudes (Hung, Tsai, & Chuang, 2014; Lee, 2009; Liébana-Cabanillas, Sánchez-Fernández, & Muñoz-Leiva, 2014). Based on this,

*Hypothesis 1a (H<sub>1a</sub>): Trust (TR) relates positively with Attitude (ATT).*

### **5.9.3.2 Perceived Relative Advantage**

Drawing on the Diffusion of Innovation theory, perceived relative advantage has been considered to be important determinants influencing innovation adoption decisions (Tornatzky & Klein, 1982) . Similar and analogous to the notion of “perceived usefulness”, it was found to have a positive influence on attitude to using information technology (Davis, 1989; Taylor & Todd, 1995).

As diverse ADR methods offer different merits to the decision maker (Cheung, 1999), ADR that is perceived to be more superior would generate more favourable attitude on its use. Thus, it is postulated that:

**Hypothesis 1b ( $H_{1b}$ ): Perceived Relative Advantage (PA) relates positively with Attitude (ATT).**

#### **5.9.3.3 Perceived Ease of Use**

Based on Diffusion of Innovation Theory, complexity is analogous to “perceived ease of use” (Taylor & Todd, 1995). Both notions however carry the same definition, which often means the degree of difficulty of an innovation to be operated and executed (Abroud et al., 2013). ADR methods that offer flexibility in the processes, which can be tailored to suit the parties’ requirements, would enhance efficient communication, and achieve win-win outcomes for disputing parties (Cheung, 1999). Thus, it is postulated that ADR methods that offer easy adherence to the process would generate positive attitudes on its use. Therefore,

**Hypothesis 1c ( $H_{1c}$ ): Perceived Ease of Use (PE) relates positively with Attitude (ATT).**

#### **5.9.3.4 Perceived Risk**

Perceived Risk relates to the beliefs of negative outcomes (Yoon, 2011). It is postulated that disputing parties do not gain from the conflicting scenario, and they would work harder to prevent further losses. In accordance with Prospect Theory, losses loom larger than gains (Kahneman & Tversky, 1979), and disputing parties would tend to make less risky decisions with ADR methods. High-risk dispute resolution methods that would damage business relationships and bring adverse consequences to organisations, such as litigation, or arbitration, would be less favoured, as decision makers who exhibit characteristics of risk avoidance would weigh probability of loss more than gains. Perceived risk has been reported to have a negative influence on attitudes (Gewald, 2006; Lee, 2009; Liao, Lin, & Liu, 2010; Pi & Sangruang, 2011). Thus,

**Hypothesis 1d ( $H_{1d}$ ): Perceived Risk (PR) relates negatively with Attitude (ATT).**

#### **5.9.4 Decomposition of Subjective Normative Belief Structures**

Three variables (internal team influence, normative pressures, and coercive pressures) are conceptualised as variables that decompose normative belief structures.

##### **5.9.4.1 Internal Team Influence**

Most organisations in the construction sector use teams to meet customer expectations, and produce high-end project outcomes (Azmy, Shane, & Shelley, 2012). Parties in a

construction project mainly consist of consultants, architects, engineers for the design team; and contractors in charge for the construction processes. External stakeholders may impact the project but may not have direct engagement with the transactions of the project (Leung, Liu, & Ng, 2005). These additional parties include city planners, zoning authorities, union officials, safety specialists, health specialists, government engineers, vendors, users; special issue groups influencing construction project teams (Azmy, 2012). The parties influencing decision makers are complex. For theoretical consideration and ease of classification, a contractor's most influential referent groups can be specifically portioned into internal team influences. In view of that, the following hypothesis is formulated:

***Hypothesis 2a (H<sub>2a</sub>): Internal Team Influence (IT) relates positively with Subjective Norm (SN)***

#### **5.9.4.2 Normative Pressures and Coercive Pressures**

Normative pressures stem from professionalization. For an example, legal advisers could be a potential referent group for ADR users, especially when they are overwhelmed in legal issues (Brooker, 1999).

On the other hand, coercive pressures could stem from mandates put forth by political influence and issues of legitimacy (DiMaggio, 1983). Selection of ADR methods nevertheless was highly influenced by legal system and political issues (Chan et al., 2006), and the way in which ADR decision makers behave in an institutional system is highly shaped by cultural orientations (Tsai & Chi, 2009). Such orientations highly shape conflict management styles and the use of dispute resolution methods. Based on these notions, it is postulated that:

***Hypothesis 2b (H<sub>2b</sub>): Coercive Pressures (CP) relates positively with Subjective Norm (SN).***

***Hypothesis 2c (H<sub>2c</sub>): Normative Pressures (NP) relates positively with Subjective Norm (SN).***

#### **5.9.5 Decomposition of Control Belief Structures**

Five variables (consensus on appropriation, self-efficacy, facilitating conditions, controllability, organisational competency) are conceptualised as variables that decompose control belief structures.

### **5.9.5.1 Consensus on Appropriation & Voluntariness from Mutual Consent**

The use of ADR maybe depend on the type of behaviour (competing/cooperating), the relations (strained/good), and the involvement (short term/long term) between disputants (Marzouk et al., 2011). As one party may freely exercise his choice over the use of ADR, the widespread use of ADR nevertheless requires both disputing parties' agreement on ADR without suspicions (Brooker & Lavers, 1997).

This implies that consensus over the use of ADR is paramount if agreement between parties are mandatorily needed in its initiation. The presence of consensus may not *per se*, encourage and warrant use of ADR. However the absence of consensus between disputants on the use of ADR may suggest predicaments to perception of control over the use of ADR, and further affect the formation of intention and actual use behaviour. In the case where mutual consent is mandatorily needed for the initiation of ADR, consensus of appropriation on the use of ADR would have a stronger positive effect on perceived behavioural control.

This study adopts the term “Voluntariness from mutual consent” to conceptualise the level of mutual consent needed for ADR use. Moore and Benbasat (1991) defined voluntariness as “the degree to which use of the innovation is perceived to be voluntary or of free will” (p.195). High perceptions of voluntariness from mutual consent imply that the use of ADR is free from mutual consent, and does not require mutual consensus for its use. When mutual consensus is not needed, disputants may perceive themselves having more freedom to initiate a particular ADR method.

For an example, PAM 2006 Standard Form of Contract requires mutual written consent of both parties (e.g. Contractor and Employer) on the proceedings of mediation; while arbitration does not require mutual consent where the disputing party can issue his intention to arbitrate and his counterpart is obliged for the proceedings. Although this might seem to ease the use of a particular ADR method, disagreement on ADR technique with counterparts could possibly lead to more issues such as disagreement of arbitrators, and the proceeding process of ADR itself. Lack of consensus would lead to dissent and discourage intention formation.

Based on the arguments above, this section postulates that:

*Hypothesis 3a ( $H_{3a}$ ): Consensus on Appropriation (CA) relates positively with Perceived Behavioural Control (PBC).*

*Hypothesis Moderation 1 ( $HM_1$ ): Voluntariness from Mutual Consent (VolCon) negatively moderates the positive relationship between Consensus on Appropriation (CA) and Perceived Behavioural Control (PBC).*

#### **5.9.5.2 Organisational Competency**

Organisational competency overall refers to a particular set of skills, and resources a firm possesses as well as the way those resources are used to produce outcomes (Collins et al., 2007; Fiol, 2001). It consists of concepts of collective efficacy, organisational innovativeness and top management support (Lee, Yu, & Jeong, 2013). Collective efficacies emphasise beliefs about the conjoint capability of users. In the context of ADR use, this would refer to the belief and confidence in the organisation to possess adequate collective knowledge and familiarity in ADR use.

Organisational innovativeness refers to the willingness of an organisation to venture into an innovation (Lee et al., 2013). The organisation should have the technical capability of using the innovation without any resistance (Lee et al., 2013). Organisational financial status and strength of documents nevertheless are paramount in ADR use (Marzouk et al., 2011). These technical factors should help the organisation to initiate ADR methods easily.

Firm commitments from top management are helpful in circumventing the challenges of ADR use. Top management support usually exists in the form of resources, training and incentives (Lee et al., 2013). Absence of resources and opportunities would diminish perceived control over a behaviour (Ajzen, 1991; Ajzen & Driver, 1991). The operation of perceived behavioural control on intention is theorised to operate when a person perceives himself to possess more resources, opportunities, and capacities. According to Ajzen (2002), higher perception and belief of acquired resources and opportunities such as skills, time, money and cooperation by others; coupled with lesser obstacles encountered, could mean that people would have higher confidence and perceived control to exert the behaviour of interest.

Overall, higher organisational competency would lead to higher perceptions of control over ADR use. Thus, it would be reasonable to postulate that:

*Hypothesis 3b (H<sub>3b</sub>): Organisational Competency (OC) relates positively with Perceived Behavioural Control (PBC).*

### **5.9.6 Decomposition of Descriptive Normative Belief Structures**

Only one variable (mimetic pressures) is conceptualised as a variable that may decompose descriptive norm.

#### **5.9.6.1 Mimetic Pressures**

Descriptive norms are less likely to derive their influences from rewards, coercion, or legitimate power because the observations that others do or do not perform a behaviour does not necessarily imply that these others have the power to reward or punish the observer, or that they can legitimately expect the observer to behave as they do (Fishbein & Ajzen, 2010). It is likely that descriptive norms draw on the tendency of mimicry towards others. As mimetic pressures stem from the motivation to benchmark the success of others (Cao et al., 2014), it is likely that descriptive norms draw on a tendency of mimicry towards others. Thus, it is hypothesised that:

*Hypothesis 6a (H<sub>6a</sub>): Mimetic Pressures (MP) relates positively with Descriptive Norm (DN).*

### **5.9.7 Sources of Information-Cognitive Mediation Process of Protection Motivation**

The source of information initiates cognitive mediating processes and gives rise to both threats and coping appraisal processes under the framework of protection motivation (Rogers, 1983). The source of information could stem from environmental; or intrapersonal factors. According to Lee, Yiu, and Cheung (2016), the cognitive instrument of disputes' characteristics includes complexity of disputes, amount disputed and conflict intensities. This section draws on these characteristics and conceptualises them as "perceived complexities", "amount in controversy", and "conflict intensity" accordingly, and with an additional construct "perceived importance of dispute issues" as the possible source of information that initiates cognitive mediating process which leads to protection motivation.

According to Floyd, Prentice-Dunn, and Rogers (2000), components of appraisal of threat under PMT would involve a heuristic process. For example, the formation of perceived vulnerability would involve estimation of outcome probabilities. It has been shown that

people used mental heuristic processes to evaluate uncertainties (Tversky & Kahneman, 1973). Both “anchoring and adjustment” are purely mental heuristics in the process of evaluating risks (Tversky & Kahneman, 1974), which can be conceptualized into the research framework that explains how sources of information form perceptions of vulnerability and severity. To form and conceptualise probabilities and adverse consequences, disputants would go through stages of adjustment and anchoring phases where perceptions of risks would require collections of information and evidence experienced.

Accordingly, it is postulated that these variables (***Perceived Importance of Dispute Issues, Perceived Complexities, Amount in Controversy, and Conflict Intensity***) are anchoring and adjustment cues which positively influence the perceived vulnerability and the perceived severity of decision makers.

#### **5.9.7.1 Perceived Importance of Dispute Issues**

The perception of importance as defined by Robin, Eric Reidenbach, and Forrest (1996) is parallel to concepts of social “involvement”. Issues substantiated in dispute would resemble the significance value of a case to an organization. Although controversies can be objectively assessed in the form of claim value (amount claimed), perceived values differ from one another. The value of a suit may carry little weight of claimed value, but could carry significant repercussions (Hoogenboom & Dale, 2005). There would be several significant implications and issues associated with the claims. For example, a negligence suit against a company may seek minimal damages, however significant implications of costs such as reputation and insurance costs would remain high. This would force claimants to reject any compromise settlement (e.g. negotiation) (Hoogenboom & Dale, 2005; Marzouk & Moamen, 2009).

Arguably, different claim values would generate different perceptions of values or importance. Aside from contemplating the claim value (amount) of claims, some perceptions would have taken into account the significant implications and issues of claims to the company. For example, allegations of negligence, or issues of non-performance would have jeopardized one’s business reputation and would be considered significantly serious to the company, although the claim value is small. On the contrary, a high amount of claims might pose trivial and minimal concerns to the company to take strident resolutions if the claimant perceived the value of claim to be insignificant. This is because values are actually beliefs

and desirable goals that motivate action and behaviour. It is also ordered by importance relative to one another, which serves as the standards or criteria. Decision makers justify their actions based on their cherished perceived values (Schwartz, 1992, 2006, 2012).

Drawing on the arguments above, perception of importance is hypothesized to influence threat appraisal. The higher the perception of importance of the dispute issues, the higher perceived severity and vulnerability. Thus, this section postulates that:

***Hypothesis 4a (H<sub>4a</sub>): Perceived Importance (PI) relates positively with Perceived Severity (SEV).***

***Hypothesis 4b (H<sub>4b</sub>): Perceived Importance (PI) relates positively with Perceived Vulnerability (VUL).***

#### **5.9.7.2 Perceived Complexity**

Marzouk et al. (2011) posit “level of complexities” as one of the factors influencing dispute resolution strategy. It refers to the adversarial nature of disputes and mechanism of defences, and further influences the use of dispute resolution. The existing measurement of level of complexities of disputes is made ready in three perceived scales, namely “low, medium and high”. However to consolidate a refined scale for the quantification of dispute complexities, this study draws on the literature review for the development of a questionnaire particularly for the conceptualization of dispute complexities.

The concept of complexity of disputes is always linked to the idea of quantification, and issues of precision (Aibinu, 2009). Perceptions of dispute complexities can influence the use of ADR (Gebken & Gibson, 2006). The associated issues of disputes can be diverse, numerous and complex (Marzouk & Moamen, 2009). The complexities of dispute cases can be influenced by quantification of the number of disputed issues (Marzouk & Moamen, 2009; Mcmillian & Carolyn, 2009), the number of parties involved in the dispute, and the complexities of relationships between dispute parties (Mcmillian & Carolyn, 2009). This section further postulates that:

***Hypothesis 4c (H<sub>4c</sub>): Perceived Complexity (PC) relates positively with Perceived Severity (SEV).***

***Hypothesis 4d (H<sub>4d</sub>): Perceived Complexity (PC) relates positively with Perceived Vulnerability (VUL).***

### **5.9.7.3 Amount in Controversy**

One important factor influencing selection of dispute resolution strategy is the amount in controversy. The rejection or selection of a dispute strategy is highly influenced by the perceptions associated with the amount at stake. The reverse of cost (cost associated with expenses of resolution strategy to recover claims and suits) is the amount in controversy (Hoogenboom & Dale, 2005; Marzouk & Moamen, 2009). Disputants in the stage of selecting a resolution strategy will weigh and consider the costs of strategy against the value of claim. This implies that if the value of claims carries higher weight and value than the costs of that particular dispute resolution, it would foster and influence the action of selection of that dispute resolution.

Recovering a higher reward (in this case the amount at stake) would significantly influence different levels of decision making. High claims such as recovering money or defending against accusations will merit more strident and hard dispute resolution strategies than less valuable claims (Hoogenboom & Dale, 2005). This further implies that, if the “reward” (amount in controversy) is substantively high, and is expected to overwhelm the costs (expenses incurred from choosing the particular settlement strategy), the claimant would consider this settlement strategy.

Stages of dispute resolution vary according to the amount of controversy and adversaries (Chong & Mohamad Zin, 2012). It was suggested that the use of negotiation is suitable for an amount claimed which is less than 25% of the original contract, followed by the use of mediation for 25-60% of amount claimed of original contract, and lastly arbitration/litigation for amount of claim that is more than 60% of the original contract (Marzouk et al., 2011). Apparently, it is suggested that the use of dispute resolution strategy would be influenced by the increment of perceptions of amount claimed from the original contract. This section postulates that the amount in controversy would influence threat appraisal. Therefore,

***Hypothesis 4e (H<sub>4e</sub>): Amount in Controversy (AC) relates positively with Perceived Severity (SEV).***

**Hypothesis 4f ( $H_{4f}$ ): Amount in Controversy (AC) relates positively with Perceived Vulnerability (VUL).**

#### **5.9.7.4 Conflict Intensity**

According to Aibinu et al. (2011), levels of dispute can be conceptualized in the form of cooperative attitude. Cooperative attitude can be quantified by the extent to which people engage in conflict on a project, or can be termed “conflict intensity”. Aibinu (2007) conceptualises conflict intensity as a combination of frequency and severity of disagreements and the extent to which disagreements influence the working relationship between the parties. It would be reasonable to hypothesise that higher conflict intensities would lead to a higher perception of dispute severity and vulnerability. Thus,

***Hypothesis 4g ( $H_{4g}$ ): Conflict Intensity (CI) relates positively with Perceived Severity (SEV).***

***Hypothesis 4h ( $H_{4h}$ ): Conflict Intensity (CI) relates positively with Perceived Vulnerability (VUL).***

#### **5.9.8 Moderating Effect of Voluntariness**

Although participation in ADR methods largely remains voluntary, it was found that other forms of ADR that are adjudicatory have obtained statutory mandates (Cheung, 2006). ADR users would feel a degree of compulsion to use if the adoption or use is made mandatory. Actual mandatory or voluntariness does not influence behaviour, but rather the perception of voluntariness significantly influences actual behaviour (Moore & Benbasat, 1991).

According to Ventakesh and Bala (2008), three social mechanisms that function under social influence are compliance, internalisation, and identification. *Compliance* refers to adherence to social pressure to avoid punishment; *identification* refers to the belief of elevating one’s social status by performing what people believe to be important; while *internalisation* on the other hand is the incorporation of a referent’s belief into his or her own belief (previously discussed under the domain of descriptive norms). Previous study on technology use have shown that subjective norm had a significant effect on intention in mandatory settings (Ventakesh & Bala, 2008; Ventakesh & Davis, 2000). This section argues that subjective norm will have a significant effect on intention to use ADR under mandatory settings (lesser voluntariness) through the effect of compliance. Thus,

**Hypothesis HM<sub>2</sub>: Voluntariness in ADR Use (VolUse) negatively moderates positive relationship between Subjective Norm (SN) and Intention (INT).**

## 5.10 Operational Definition

Based on the hypothesised model, the overall operational definition for each construct is shown in Table 5.1 below:

**Table 5.1 Operational Definition**

Variable	Definition	Reference
Attitude	“Generated feelings of favourable/unfavourable towards a given behaviour”	Ajzen and Driver (1991); Taylor and Todd (1995)
Subjective Norm	“Social pressure felt by the person with regard to that particular intended act, or not performing that action”	Ajzen and Driver (1991); Taylor and Todd (1995)
Descriptive Norm	“Perceptions of significant other’s own attitude and behaviour in the domain”	Rivis and Sheeran (2003)
Perceived Behavioural Control	“Subjective degree of control (perceived control) over performance of the behaviour itself”.	Ajzen (2002)
Intention	“Indication of how hard people are willing to try, how much of an effort willing to put in performing a behaviour”	Ajzen (1991)
Voluntariness	“The degree to which use of the innovation is perceived as being voluntary or free will”.	Moore and Benbasat (1991)
Perceived Vulnerability	“The conditional probability that the threatening event will occur provided that no adaptive behaviour is performed, or there is no modification of an existing behavioural disposition”	Rogers and Prentice-Dunn (1997)
Perceived Severity	“The degree of physical harm, psychological harm, social threats, economic harm, dangers to others rather than oneself, and even threat to other species”	Rogers and Prentice-Dunn (1997)
Trust	“Willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party”	Bhattacherjee (2002) ; Mayer et al. (1995)
Perceived Relative Advantage	“Perception of an innovation/ idea as better than the innovation/idea it supersedes	Rogers (2003)
Perceived Ease of Use	“Degree to which the prospective user expects the target system to be free of effort”	Davis et al. (1989)
Perceived Risk	“Perception of uncertainty and adverse consequences of an outcome”	Fu et al. (2006); Lee (2009) ;Yoon (2011); Yuan, Liu, Yao, and Liu (2014)
Influences	“Expectations of referent group”	Taylor and Todd (1995)
Normative Pressure	“Pressures derived from professionalization”	DiMaggio (1983)
Coercive Pressure	“Formal and informal Pressures exerted on organizations by other organizations upon which they are dependant”	DiMaggio (1983)
Mimetic Pressure	“Pressures that encourages imitation on others”	DiMaggio (1983); Lee et al.

		(2013)
Consensus on appropriation	“The extent to which individuals agree on how to jointly use an advanced intervention”.	Lee et al. (2013)
Organisational Competency	“Particular set of skills and resources a firm possesses as well as the way those resources are used to produce outcomes”	Fiol (2001)
Amount in Controversy	“Perceptions associated with the amount at stake”	Hoogenboom and Dale (2005)
Perceived Importance	“The perception of importance parallel to social involvement”	Robin et al. (1996)
Perceived Complexity	“Perceptions that deal with ease or difficulty”	Rogers (2003)

The items for each construct were developed based on the preliminary focus group, the literature review, as well as the modification and adaptation based on previous scales. The response options for all items in the questionnaire were (“1-Strongly Disagree, 2- Moderately Disagree, 3- Somewhat Disagree, 4- Neutral (Neither Disagree nor Agree), 5- Somewhat Agree, 6- Moderately Agree, and 7- Strongly Agree”). Table 5.2 shows the source of the items:

**Table 5.2 Items of Model Constructs**

Model Construct	Item Code	Sample of Measurement Item	Source for Item Development
Attitude (3 Items)	ATT_1	Using this ADR method to settle the dispute would be a good idea	Adapted from Ajzen and Driver (1991); Taylor and Todd (1995)
	ATT_2	Using this ADR method to settle the dispute would be a wise idea	
	ATT_3	Using this ADR method to settle the dispute would be desirable	
Subjective Norm (3 Items)	SN_1	Most people who influence my behaviour would think that I should use this ADR method	Adapted from Ajzen and Driver (1991); Taylor and Todd (1995)
	SN_2	Most people who are important to me would think that I should use this ADR method	
	SN_3	Most people whose opinions I value would approve of me using this ADR method	
Descriptive Norm (3 Items)	DN_1	Most people like me have used this ADR method	Adapted from Fishbein and Ajzen (2010); Smith-McLallen and Fishbein (2008)
	DN_2	Most people who are similar to me have used this ADR method	
	DN_3	Most people I know have used this ADR method	
Perceived Behavioural Control (3 Items)	PBC_1	Using this ADR method would be entirely within my control.	Adapted from Taylor and Todd (1995)
	PBC_2	I would be able to use this ADR method	
	PBC_3	I have the resources and the knowledge and the ability to make use of this ADR method.	
Intention (4 Items)	INT_1	I intent to use this ADR method	Adapted from Fishbein and Ajzen (2010)

	INT_2	I plan to use this ADR method	
	INT_3	I will use this ADR method	
	INT_4	I am willing to use this ADR method	
Voluntariness (ADR Use) (3 Items) - Moderator	VOL_1	Using this ADR method would be voluntary	Adapted from Moore and Benbasat (1991); (Ventakesh & Bala, 2008; Ventakesh & Davis, 2000)
	VOL_2	It would not be contractually obliged to use this ADR method	
	VOL_3	Although it might be helpful, using this ADR method would certainly not be compulsory	
Voluntariness (Mutual Consent) (3 Items) - Moderator	VOL_4	Using this ADR method for the dispute would not require mutual consent	Adapted from Moore and Benbasat (1991); (Ventakesh & Bala, 2008; Ventakesh & Davis, 2000)
	VOL_5	The contract would not require mutual consensus for using this ADR method	
	VOL_6	Although it might be helpful, getting consensus from counterpart for using this ADR method would not be compulsory	
Perceived Vulnerability (5 Items)	VUL_1	Settlement of the dispute may be hindered if my organisation do not use this ADR method	Adapted from Taylor and May (1996)
	VUL_2	In order to prevent the dispute from escalating, using this ADR method would be essential	
	VUL_3	The way to prevent the dispute from worsening would be using this ADR method	
	VUL_4	A successful and lasting settlement of the dispute may not be possible if my organisation do not use this ADR method	
	VUL_5	My organisation would probably see this dispute intensifies by not using this ADR method.	
Perceived Severity (5 Items)	SEV_1	In case the dispute escalates, I see dispute like this as a serious threat to my organisation	Adapted from Taylor and May (1996)
	SEV_2	In case the dispute escalates, this dispute would have a long term adverse effect to my organisation	
	SEV_3	In case the dispute escalates, this dispute would be too serious to not settle it.	
	SEV_4	In case the dispute escalates, dispute like this would cause severe interruptions to my organisation	
	SEV_5	In case the dispute escalates, as disputes go, mine would be serious	
Trust (7 Items)	TR_1	Neutrals generally have the skills and expertise to perform this ADR method in an expected manner	Adapted from Taylor and May (1996); and Focus Group Discussion
	TR_2	Neutrals generally have access to the information needed to handle the process of this ADR method appropriately	
	TR_3	Neutrals are generally fair in their conduct of the proceedings of this ADR method	
	TR_4	Neutrals are generally fair in their service policies following proceedings of this ADR method	

	TR_5	Neutrals are generally open and receptive to disputant's needs	Adapted from Moore and Benbasat (1991); and Focus Group Discussion
	TR_6	Neutrals generally make good faith efforts to address most disputants' concerns	
	TR_7	Neutrals are generally trustworthy	
Perceived Relative Advantage (6 Items)	PA_1	Using this ADR method would settle the dispute more quickly	Adapted from Moore and Benbasat (1991); and Focus Group Discussion
	PA_2	Using this ADR method would improve the quality of dispute settlement between parties	
	PA_3	Using this ADR method would make it easier to settle the dispute	
	PA_4	Using this ADR method would enhance the effectiveness of settling the dispute	
	PA_5	Using this ADR method would give me greater control over the dispute	
	PA_6	Using this ADR method would be more economical in settling the dispute	
Perceived Ease of Use (3 items)	PE_1	Instructions of using this ADR method would be easy to follow	Based on Davis et al. (1989) and focus group discussions
	PE_2	It would be easy to learn how to use this ADR method	
	PE_3	It would be easy to adhere to the process of this ADR method	
Perceived Risk (4 Items)	PR_1	Using this ADR method to settle the dispute would be risky to my organisation	Adapted from Fu et al. (2006); Lee (2009) ;Yoon (2011); Yuan et al. (2014) and focus group discussions
	PR_2	Using this ADR method to settle the dispute would cause serious consequences to my organisation	
	PR_3	Using this ADR method to settle the dispute would cause damages to my organisation	
	PR_4	Using this ADR method to settle the dispute would cause more losses to my organisation	
Internal Team Influence (3 Items)	IT_1	To settle the dispute, my own project team would think that I should use this ADR method	Adapted from Taylor and Todd (1995), and focus group discussions
	IT_2	To settle the dispute, my own project team would support my use of this ADR method	
	IT_3	To settle the dispute, my own project team would want me to use this ADR method	
Normative Pressure (4 Items)	NP_1	Industry associations strongly propagate the value of this ADR method	Adapted from Cao et al. (2014); Teo et al. (2003); Liang, Saraf, Hu, and Xue (2007)
	NP_2	Industry professional bodies strongly propagate the value of this ADR method	
	NP_3	Universities strongly propagate the value of this ADR method	
	NP_4	Bar councils strongly propagate the value of this ADR method	
Coercive Pressure (3 Items)	CP_1	The government require the use of this ADR method	Adapted from DiMaggio and Powell (1983); Cao et al. (2014); Teo et al. (2003); Liang et al. (2007)
	CP_2	Industry professional bodies require the use of this ADR method	
	CP_3	Industry associations require the use of this ADR method	

Mimetic Pressure (3 Items)	MP_1	Peer projects that have used this ADR method have benefitted greatly	Adapted from DiMaggio and Powell (1983); Cao et al. (2014); Teo et al. (2003); Liang et al. (2007)
	MP_2	Peer projects that have used this ADR method have gained good reputations in the industry	
	MP_3	Peer projects that have used this ADR method are perceived favourably by others in the industry	
Consensus on Appropriation (2 items)	CA_1	To settle the dispute, there would be conformity on using this ADR method with my organisation's dispute counterpart	Adapted from Lee et al. (2013)
	CA_2	To settle the dispute, there would be conformity on how to use this ADR method (such as appointment / notice / resolution guidelines and rules) with my organisation's dispute counterpart	
Organisational Competency (4 Items)	OC_1	Regarding the use of this ADR method to settle the dispute, my organisation would have expertise for the use of this ADR method	Adapted and modified based on Lee et al. (2013)
	OC_2	Regarding the use of this ADR method to settle the dispute, my organisation would have strong documentation and facts for the use of this ADR method	
	OC_3	Regarding the use of this ADR method to settle the dispute, my organisation would support enough resources for the use of this ADR method	
	OC_4	Regarding the use of this ADR method to settle the dispute, my organisation would be familiar with the use of this ADR method	
Amount in Controversy (2 Items)	AC_1	Overall, the claim value pertaining to the dispute/negotiation is/was very substantial to my organisation	Self developed based on Hoogenboom and Dale (2005)
	AC_2	Overall, the claim value pertaining to the dispute /was considerably high	
Perceived Importance (4 Items)	PI_1	Overall, the dispute case is /was / extremely important to my organisation	Adapted from Robin et al. (1996)
	PI_2	Overall, the dispute case is /was / a considerable concern to my organisation	
	PI_3	Overall, the dispute case is /was / fundamental to my organisation	
	PI_4	Overall, the dispute case is /was / highly significant to my organisation	
Perceived Complexity (3 Items)	PC_1	Overall, I think that the associated issues of the dispute are/were very diverse	Self developed based on Marzouk and Moamen (2009)
	PC_2	Overall, I think that the associated issues of the dispute are/were very numerous	
	PC_3	Overall, I think that the associated issues of the dispute are/were very complex	
Conflict Intensity (3 Items)	CI_1	The disagreements with the handling of claim were very often	Adapted from Aibinu et al. (2011)
	CI_2	The disagreements with the handling of claim were very severe	

	CI_3	The disagreements with the handling of claim have caused a lot of negative effects on my organisation's working relationship among project parties	
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## 5.11 Pre-Test

As suggested by Sarstedt and Mooi (2014), before any survey takes place, the questionnaire should be pre-tested in order to enhance the clarity and improve respondents' acceptance of the survey. In the simplest forms, expert views can be consulted for this purpose, where they can answer and comment on the questionnaire. Experts have broad insights into a particular field and topic, and are well versed with the cultural perspectives of the survey (Chaudhary & Israel, 2014). Experts offer insights into revising the questionnaire and provide critiques from multiple perspectives (Czaja, 1998). Experts normally come in a small group. Sarstedt and Mooi (2014) suggested three to six experts; Chaudhary and Israel (2014) recommended three to four experts; while Czaja (1998) proposed three to eight experts.

Based on the items developed in Table 5.2 above, a set of questions for the main survey was proposed. The questionnaire consisted of three important sections, (1) dispute characteristics, (2) selection of ADR method, and (3) measurement items of the model. The questionnaire was pre-tested and validated by three experts who are decision makers in contractor firms. The expert's actual time to complete the questionnaire was recorded. Minor amendments to the questionnaire were further made based on their feedback. The backgrounds of the experts are illustrated in Table 5.3 below:

**Table 5.3 Experts' Background (Pre-Test)**

Contractor	Company Grade	Position	Experience in Construction	Major Comments to the Questionnaire
1	G2	Executive Director	11-15 Years	-Instructions need to be simplified -15 minutes was needed to complete the questionnaire
2	G4	Executive Director	More than 35 Years	-Items were comprehensive, and were all suitable for measuring the model construct. -Items measuring <b>Perceived Severity</b> and <b>Vulnerability</b> need to be carefully designed -20 minutes was needed to complete the questionnaire -Items need to be simplified.

3	G7	Director	6-10 Years	-Questionnaire was overall clear and concise -The items require further simplifications -Range of Standard Form of Contracts was comprehensive. -Items need to be simplified. -15 minutes was needed to complete the questionnaire
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The refined questionnaire (referred as “pre-tested questionnaire”) is a basis to the subsequent study –“Belief Elicitation Study” (to be discussed and presented in Chapter 6); and then further used for pilot study (to be discussed in Chapter 7). Belief Elicitation Study shared two similar sections with the post pre-tested questionnaire, which are: (1) dispute scenario & characteristics of dispute, and (2) selection of ADR methods for dispute settlement.

## 5.12 Chapter Summary

This chapter overall presents the development of a conceptual ADR decision-making behavioural model. The model draws on Theory of Planned Behaviour, Diffusion of Innovation Theory, Prospect Theory, Motivation Theory, Protection Motivation Theory and Institutional Theory.

The model overall consists of six major hypotheses, and 20 sub-hypotheses. Anchoring on intention, there are six major predictors of intention, namely attitude, subjective norm, descriptive norm, perceived behavioural control, perceived severity, and perceived vulnerability. Two moderators (voluntariness in ADR use, and voluntariness from mutual consent) were asserted in the model; four variables decompose attitude belief structures, three variables decompose subjective normative belief structures; one variable decomposes descriptive normative structures; two variables decompose control belief structures; and finally four variables were conceptualised as the sources of information that give rise to protection motivation.

The measurement items of the model constructs were developed based on the literature review, focus group discussion, and previous scales. Following this, a questionnaire consisting of three important sections was proposed. Three experts who have high decision-making authority in contractor firms reviewed the questionnaire design and validated the items. The feedback was mainly positive and the questionnaire was further refined and revised according to suggestions. Accordingly, the revised version of the questionnaire

(referred as “pre-tested questionnaire”) was a corner stone of the subsequent study –“Belief Elicitation Study” (to be discussed in Chapter 6), and of the pilot study (to be discussed in Chapter 7).

## **6. CHAPTER 6: BELIEF ELICITATION STUDY-REAFFIRMATION TO CONCEPTUAL ADR DECISION-MAKING BEHAVIOURAL MODEL**

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### **6.1 Introduction**

Belief in Alternative Dispute Resolution (ADR) use in the construction industry is an under-explored topic. A search from the literature failed to find any studies regarding to beliefs of ADR underpinned by the Theory of Planned Behaviour (TPB). This offers great opportunity for belief elicitation studies to be performed on ADR decision makers based on the TPB framework. This study aims to investigate salient beliefs that comprise *behavioural*, *normative*, and *control* beliefs, and to reaffirm the conceptual ADR decision-making behavioural model (in Chapter 5) is theoretically sound.

In expanding and developing the TPB questionnaires, the normal procedure requires the establishment of a focus group for eliciting beliefs, and then followed by a pilot study that leads to the finalization of questions for the main study (Francis et al., 2004). Pilot work is needed to identify accessible behavioural, normative, and control beliefs before a standard questionnaire is used in the main study (Ajzen, 2006b).

To achieve the aims above, a separate and independent belief elicitation study was conducted by using an online open-ended questionnaire. The belief elicitation questionnaire was designed and developed based on the pre-tested questionnaire (Chapter 5). The belief elicitation questionnaire consists of three major sections, which are: (I) dispute scenario & characteristics of dispute, (II) selection of ADR methods for dispute settlement, and (III) open-ended elicitations on behavioural, normative and control beliefs underpinning chosen ADR method.

The belief elicitation questionnaire was then distributed to a sample of contractors specialising in building and civil engineering works. Representatives of 25 contractors with high ADR decision-making authority in their organisations responded to the survey and

provided their salient beliefs on their choice of ADR methods towards settling hypothetical dispute scenarios in their actual projects. The sets of beliefs from the online survey were then qualitatively content analysed. Salient beliefs that were mentioned at least 10% of the time by the respondents were used as modal salient beliefs. Accordingly, the resulting sets of beliefs were then grouped, re-classified and proposed into nine theoretical constructs based on literature and practical empiricism. Four constructs such as *perceived relative advantage*, *perceived risk, trust, and perceived ease of use* were proposed as decompositions to the behavioural belief structure; three constructs such as *internal project team influence*, *normative pressures, and coercive pressures* were proposed as decompositions to the normative belief structure; while two constructs such as *organisational competency*, and *consensus on appropriation* were proposed as decompositions to the control belief structure. These constructs decomposed the original TPB framework's monolithic behavioural, normative, and control belief structures into stable sets of beliefs that can be used as a revised framework to systematically explore the underlying beliefs in ADR use. These proposed additional constructs aptly serve as possible revisions to the original TPB framework and suggest possible improvements to the prediction of ADR use.

Accordingly, the revised TPB model in this chapter was compared to the “conceptual extended TPB model based on focus group” (Chapter 4), and “conceptual ADR decision-making behavioural model” (Chapter 5). Further discussions were made at the end of this chapter.

## 6.2 Study Aims

This chapter aims to investigate salient beliefs that comprise ***behavioural, normative, and control*** beliefs underpinning ADR use, and reaffirm that the conceptual ADR decision-making behavioural model (in Chapter 5) is theoretically sound and comprehensive.

## 6.3 Methodology

To achieve the study aims above, the following research design was adopted. Salient beliefs can be elicited through focus groups or surveys (York, Brannon, Roberts, Shanklin, & Howells, 2009). Belief elicitation is one of the main pre-requisites and inputs for future TPB survey development (Ajzen, 1991; Ajzen & Nichols, 1995; Sutton et al., 2003), as knowledge of these salient beliefs can be used as the basis for quantitative measures of beliefs (Sutton et al., 2003). The derivations of the modal salient beliefs require data acquired from the

elicitations to be analysed (Ajzen, 2011). Elicitation of behavioural beliefs can generally take the form of free response where the respondents are asked to list the behavioural beliefs for the *advantages*, *disadvantages*; normative beliefs for the individuals or groups who would *approve of*, *disapprove of*, and also the control beliefs involving facilitators or barriers to the performance of the behaviour (Ajzen, 2006b; Fishbein & Ajzen, 2010).

To elicit beliefs effectively in this study, the respondents were required to respond to an online questionnaire survey. The questionnaire was designed in three main sections, while the targeted respondents were identified as below:

### **6.3.1 Anonymous Questionnaire Survey**

The design of the questionnaire survey followed Ajzen (2006b) suggestion of defining behaviour of interest in **Target, Action, Context, and Time (TACT)**. Behaviour is composed of four elements: the **Action** performed, the **Target** at which the action is directed, the **Context** in which it is performed, and the **Time** at which it is performed (Fishbein & Ajzen, 2010). The questionnaire consisted of three sections, which are:

#### **Section 1: Defining Context**

First, the respondents were asked to choose a scenario that best describes one of the on-going projects in their respective organisation. The respondents were asked to choose one scenario as shown in Table 6.1:

**Table 6.1 Choice of Scenario**

Scenario	Summarised Description
<b>A</b>	There is a major dispute in one of the projects; unable to reach settlement; still in the stage of deciding on which ADR method be used for settling the dispute.
<b>B</b>	Recently settled a major dispute in one of the projects with an ADR method.
<b>C</b>	There is a major dispute in one of the projects; Currently using an ADR method to settle the dispute. (Settlement in progress).
<b>D</b>	There is a major claim in one of the projects; in the stage of negotiating the claim.

Based on the chosen scenario, the respondents were then required to provide dispute or claim details. With reference to the claim and dispute taxonomies developed by Love, Davis, Ellis, and Cheung (2010), Kumaraswamy (1997), Charoenngam and Mahavarakorn

(2011), the respondents were asked to select one of the 15 major categories of disputes or claims, as depicted in Table 6.2 below:

**Table 6.2 Type of Dispute/Claim**

Category Number	Types of Dispute/Claim Encountered in Project
1	Change/Variation Order
2	Errors In Drawings, Specifications And Quantities
3	Differing Site Conditions
4	Payment (e.g.: Delayed Progress Payment/ Non-Payment Related Dispute, Etc.)
5	Delay (e.g.: Extension Of Time & Disruption Related Dispute, Etc.)
6	Ambiguity In Contract Terms / Contract Interpretation
7	Quality Related (e.g.: Defects, Workmanship, Etc.)
8	Performance Related (e.g.: Supply Of Goods, Materials, Execution Of Work, Suspension Issue, Issue Of "Regularly And Diligently" Etc.)
9	Information & Administrative Related Dispute
10	Awards & Decisions (e.g.: Dispute About Adjudication / Arbitration Awards, Etc.)
11	Professional Negligence
12	Personal Injuries
13	Property Damages
14	Nomination & Re-Nomination (e.g.: Appointment Of Replacement Person, Etc.)
15	Compliance With Instruction (e.g.: Compliance With Instruction By S.O/ Architect, Etc.)

**Contextually**, the occurrence of these disputes and claims were within their corresponding on-going construction projects in Malaysia.

### **Section 2: Defining Time, Action and Target**

For each chosen scenario, the respondents were further prompted by these hypothetical scenarios with guided instructions (Table 6.3):

**Table 6.3 Guided Instructions**

Previously Chosen Scenario	Hypothetical Scenario (Time)	ADR selection
A	Note: No further instruction given - This implies that the current on-going dispute requires settlement.	Select only one ADR method to settle the dispute.
B	"If you have previously selected Scenario B, <b>imagine</b> this similar dispute would reoccur in the <b>future</b> (when negotiation fails) in your project".	Select only one ADR method to settle this similar dispute
C	"Imagine if your current ADR method fails to settle the current dispute".	Select only one ADR method to settle the dispute
D	"Imagine if this negotiation breaks down and turns into a major dispute; and the Superintending Officer/ Engineer / Architect/ Officer/ Contract Administrator's decision fails to satisfy either party (If applicable)."	Select only one ADR method to settle the dispute

In order to settle the dispute, the respondents were offered seven major types of ADR method to select. The ADR method or “**Target**” includes Arbitration, Mediation,

Adjudication (Under Construction Industry Payment and Adjudication Act) CIPAA 2012, Adjudication (Contractual), Expert Determination, Dispute Review Board (DRB), and Dispute Adjudication Board (DAB).

**Time** refers to **currently on-going** dispute (Scenarios A and C), would **reoccur** in the future (Scenario B) or manifestation of dispute from claim **in the future** (Scenario D).

**Action** refers to “use” the selected ADR for settlement.

Overall, the behaviour of interest can be defined as: “Use the selected ADR method to settle the dispute”. In accordance with Fishbein and Ajzen (2010), the behaviour of interest in this study could be simplified as in Table 6.4:

**Table 6.4 Definition of Behaviour**

Action	Target	Context & Time
“Use”	“the selected ADR method”	to settle “the dispute”

### **Section 3: Eliciting Beliefs on Selected ADR.**

Based on selected ADR method, the respondents were then required to list their salient beliefs according to the questions elicited in Table 6.5.

**Table 6.5 Eliciting Salient Beliefs on ADR Use**

Types of Beliefs on ADR Use	Questions
<b>Behavioural Beliefs</b>	<ol style="list-style-type: none"> <li>1. What do you believe are the advantages of using the selected ADR method to settle the dispute?</li> <li>2. What do you believe are the disadvantages of using the selected ADR method to settle the dispute?</li> <li>3. Is there anything else you associate with using the selected ADR method to settle the dispute?</li> <li>4. Are there any individuals or groups who would approve of your using the selected ADR method to settle the dispute?</li> </ol>
<b>Normative Beliefs</b>	<ol style="list-style-type: none"> <li>5. Are there any individuals or groups who would disapprove of your using the selected ADR method to settle the dispute?</li> <li>6. Are there any individuals or groups who come to mind when you think about using the selected ADR method to settle the dispute?</li> <li>7. What factors or circumstances would enable you to use the selected ADR method to settle the dispute?</li> </ol>
<b>Control Beliefs</b>	<ol style="list-style-type: none"> <li>8. What factors or circumstances would make it difficult or impossible for you to use this selected ADR method to settle the dispute?</li> <li>9. Are there any issues that come to mind when you think about the difficulty of using the selected ADR method to settle this dispute?</li> </ol>

### 6.3.2 Target Respondents

The targeted respondents are the construction professionals working in contractor firms that specialise in building and civil engineering works. In Malaysia, the grades of the contractor range from G1 to G7, where G7 is the top. The characteristics of the contractors are portrayed in Table 6.6 below.

**Table 6.6 Contractors Classification**

Grade	Tendering Capacity (RM)-Currency in Ringgit Malaysia	Paid up Capital*/Net Capital Worth **(RM) Currency-in Ringgit Malaysia
G7	No Limit	750,000.00
G6	Not exceeding 10 million	500,000.00
G5	Not exceeding 5 million	250,000.00
G4	Not exceeding 3 million	150,000.00
G3	Not exceeding 1 million	50,000.00
G2	Not exceeding 500,000.00	25,000.00
G1	Not Exceeding 100,000.00	5,000.00

Source: CIDB (2016)

This study uses stratified sampling in combination with simple random sampling (without replacement) technique. In stratified sampling, a population is divided into mutually exclusive groups, followed by systematic samples or simple random samples from each group (Gideon, 2012). Stratified samples ensure representativeness of a population (Daniel, 2012). To participate in this online survey, 57,519 contractors (specialising in building and engineering works) registered with CIDB for the period from October 2015 until December 2015 were identified. These contractors were classified into seven categories (G1-G7) according to their qualification to tender. A total 1,000 contractors were randomly selected for this study. The size of the sample, according to probability formula (Abdul-Rahman, Kho, & Wang, 2014) was determined in Equation (1) below:  $n/N = 1,000/ 57519 = 0.0173$ , where  $n$  is the size of sample, and  $N$  is the size of population. Taking Grade 7 in the State of Johor for an example, the sample size required is determined by taking Total population (Johor), multiplied by the Equation (1), which would be  $386 \times 0.0173 \sim 7$ .

The distribution of the questionnaire stratified by contractors' grade and location is shown in Table 6.7.

**Table 6.7 BES Questionnaire Stratified by Contractor's Grade and Location**

Location (States)	G1		G2		G3		G4		G5		G6		G7	
	Total Pop	S.												
Johor	2623	46	976	17	765	13	285	5	300	5	111	2	386	7
Kedah	1959	34	432	7	214	4	103	2	108	2	54	1	181	3
Kelantan	1966	34	493	9	202	3	84	2	106	2	61	1	119	2
Labuan	137	2	21	0	15	0	2	0	1	0	0	0	1	0
Melaka	985	17	275	5	213	4	108	2	106	2	37	1	130	2
Negeri Sembilan	1756	31	522	9	258	4	107	2	132	2	41	1	95	2
Pahang	2089	36	561	10	317	6	176	3	152	3	60	1	122	2
Perak	2415	42	592	10	397	7	191	3	226	4	83	1	156	3
Perlis	864	15	105	2	46	1	15	0	27	1	6	0	31	0
Pulau Pinang	1118	20	232	4	329	6	139	2	176	3	81	1	328	5
Sabah	5302	92	1215	21	561	10	136	2	186	3	74	1	445	8
Sarawak	1971	34	777	14	358	6	132	2	169	3	78	1	436	8
Selangor	3493	61	1150	20	1359	24	609	11	916	16	262	5	1252	22
Terengganu	2257	39	570	10	248	4	152	3	196	3	85	2	186	3
Wilayah Persekutuan	1307	23	411	7	859	15	418	7	890	15	243	4	1312	23
<b>Total</b>	<b>526</b>		<b>145</b>		<b>107</b>		<b>46</b>		<b>64</b>		<b>22</b>		<b>90</b>	

Legend: Total Pop = Total Population, S. = Sample Size

## 6.4 Results

The demographic background of the respondents and the questionnaire were analysed and presented in the following sections:

### 6.4.1 Demographic Results

The online questionnaire was emailed to the extracted samples (contractors) in Table 6.7. From this, a total number of 25 contractors responded to the survey. The respondents for this study were ADR decision makers in either individual or organisational capacity. The scale of “1-Strongly Disagree, 2- Moderately Disagree, 3- Somewhat Disagree, 4- Neutral (Neither Disagree nor Agree), 5-Somewhat Agree, 6- Moderately Agree, 7- Strongly Agree” were used. Of these, 21 respondents marked “somewhat agree”, two respondents “moderately agree”, followed by two respondents “strongly agree” that they have decision-making authority in their organisation to select and use the best ADR method to settle any dispute in their respective projects. The responses adequately achieved the requirement for a belief elicitation study (Ajzen, 2016). The demographic background of the respondents for the study is detailed in Table 6.8 below:

**Table 6.8 Respondents' Profile**

<b>Demographic Details</b>	<b>Response Category</b>	<b>Frequency</b>	<b>% of Response</b>
<i>Experience in the Construction Industry</i>	21-25	2	8%
	26-30	7	28%
	31-35	3	12%
	36-40	4	16%
	41-45	4	16%
	46-50	1	4%
	51-55	2	8%
More than 55		2	8%
<i>Company Grade</i>	Grade 1	1	4%
	Grade 2	2	8%
	Grade 3	4	16%
	Grade 4	3	12%
	Grade 5	1	4%
	Grade 6	3	12%
	Grade 7	11	44%
<i>Designated Position in the Organisation</i>	Project Manager	4	16%
	Contract Manager	7	28%
	Assistant Contract Manager	1	4%
	Senior Contract Executive	2	8%
	Project Engineer	1	4%
	Project Executive	1	4%
	Project Coordinator	1	4%
	Manager	1	4%
	Director	3	12%
	Managing Director	1	4%
<i>Authorised to make decisions for ADR use in their respective projects</i>		3	12%
1. Strongly Disagree		-	-
2. Moderately Disagree		-	-
3. Somewhat Disagree		-	-
4. Neutral		-	-
5. Somewhat Agree		21	84%
6. Moderately Agree		2	8%
7. Strongly Agree		2	8%

#### **6.4.2 Results for Section 1 (Analysis of Questionnaire)**

All collected data were based on the four different scenarios that were designed and embedded within the questionnaire. Three respondents (12%) reported having one major dispute in one of their projects and were in the stage of deciding a resolution method (Scenario A); one respondent (4%) reported to have settled a major dispute in one of the projects with ADR method (Scenario B); three respondents (12%) were currently using an ADR method to settle a project dispute (Scenario C), followed by 18 (72%) respondents who were negotiating claims in their projects (Scenario D). Eleven respondents (44%) had change order/variation order-related issues, eight respondents (32%) had payment issues, two respondents (8%) were facing delay problems, followed by one respondent (4%) with

compliance-related, performance-related, and differing site conditions-related problems. The details for each scenario and issues are summarised in Table 6.9.

#### **6.4.3 Results for Section 2 (Analysis of Questionnaire)**

Based on the chosen scenario and encountered issues, 10 respondents (40%) selected arbitration as the most preferred ADR method. Six respondents (24%) selected adjudication under CIPAA 2012, followed by five respondents (20%) who selected expert determination, three respondents (12%) who selected mediation, and finally one respondent (4%) selecting contractual adjudication as the intended ADR method. Their choices are summarised in Table 6.9:

**Table 6.9 Selection of ADR Method Based on Simulated Scenario**

Scenario Description	Respondent (Code)	Contractor Grade	Project Contract Sum (RM)	Type of Project	Main Role of the Organisation	Type of Dispute/Claim	Standard Form of Contract used	Intended use of ADR method
<b>A: There is a major dispute in one of the projects; unable to reach settlement; still in the stage of deciding on which ADR method to settle the dispute.</b> <i>Instruction: "Select only one ADR method to settle the dispute."</i>	1	G2	Less than 10 Million	Residential	Sub-Contractor	Compliance with Instruction	CIDB Model Terms of Construction Contract for Subcontract Work PWD 203A (Rev 10/83)	Mediation
	2	G3	Less than 10 Million	Civil & Infrastructures	Main-Contractor	Payment	PWD 203A (Rev 10/83)	Adjudication Under CIPAA 2012
	3	G7	10 Million $\leq$ Contract sum < 50 Million	Institutional	Main-Contractor	Performance Related	PWD 203A (Rev 10/83)	Arbitration
<b>B: Recently settled a major dispute in one of the projects with an ADR method.</b> <i>Instruction: "Imagine this similar dispute would reoccur in the future (when negotiation fails) in your project". Select only one ADR method to settle the dispute.</i>	4	G4	Less than 10 Million	Civil & Infrastructures	Main Contractor	Payment	PWD DB Rev 2007 (Design & Build)	Adjudication Under CIPAA 2012
	5	G5	Less than 10 Million	Civil & Infrastructures	Sub-Contractor	Change/Variation Order	PWD 203A(Rev 1/2010)	Expert Determination
<b>C: There is a major dispute in one of the projects; Currently using an ADR method to settle the dispute. (Settlement in progress).</b> <i>Instruction: "Imagine if your current ADR method fails to settle the current dispute". Select only one ADR method to settle the dispute</i>	6	G7	Contract sum $\geq$ 250 Million	Mixed-Development	Main-Contractor	Payment	PAM Contract 2006 (Without Quantities)	Adjudication Under CIPAA 2012
	7	G7	Contract sum $\geq$ 250 Million	Mixed-Development	Main-Contractor	Payment	PAM Contract 2006 (Without Quantities)	Arbitration
	8	G1	Less than 10 Million	Residential	Sub-Contractor	Payment	In-House Model Terms	Arbitration
<b>D: There is a major claim in one of the projects; in the stage of negotiating the claim. "Imagine if this negotiation breaks down and turns into a major dispute; and the Superintending Officer/Engineer/Architect/Officer /Contract Administrator's decision fails to satisfy either party (If applicable)."</b>	9	G2	Less than 10 Million	Civil & Infrastructures	Main Contractor	Payment	PWD 203A(Rev 1/2010)	Expert Determination
	10	G3	Less than 10 Million	Residential	Sub-Contractor	Change/Variation Order	IEM.CES 1/90	Expert Determination
	11	G3	Less than 10 Million	Civil & Infrastructures	Main-Contractor	Payment	CIDB Standard Form of Contract for Building Works (2000 Edition)	Adjudication
	12	G3	Less than 10 million	Residential	Sub-Contractor	Change/Variation Order	PAM Sub-Contract 2006	Arbitration

13	G4	Less than 10 Million	Residential	Main-Contractor	Change/Variation Order	PAM Contract 2006 (With Quantities)	Mediation
14	G4	Less than 10 Million	Residential	Sub-Contractor	Differing Site Conditions	In-House	Expert Determination
15	G6	Less than 10 Million	Others	Main-Contractor	Change/Variation Order	CIDB Standard Form of Contract for Building Works (2000 Edition)	Arbitration
16	G6	Less than 10 Million	Commercial	Main-Contractor	Change/Variation Order	PAM Contract 2006 (Without Quantities)	Mediation
17	G6	Less than 10 Million	Residential	Main-Contractor	Delay related	PAM Contract 2006 (Without Quantities)	Arbitration
18	G7	Less than 10 Million	Residential	Main-Contractor	Change/Variation Order	PAM Contract 2006 (With Quantities)	Adjudication Under CIPAA 2012
19	G7	50 Million ≤ Contract sum < 100 Million	Industrial	Main-Contractor	Change/Variation Order	PWD DB Rev 2007 (Design & Build)	Adjudication Under CIPAA 2012
20	G7	50 Million ≤ Contract sum < 100 Million	Commercial	Main-Contractor	Delay related	PWD 203 (Rev 1/2010)	Adjudication Under CIPAA 2012
21	G7	Less than 10 Million	Commercial	Main-Contractor	Change/Variation Order	PWD 203A(Rev 1/2010)	Arbitration
22	G7	Less than 10 Million	Civil & Infrastructures	Sub-Contractor	Ambiguity In Contract Terms / Contract Interpretation	PAM Sub-Contract 2006	Arbitration
23	G7	Less than 10 Million	Civil & Infrastructures	Sub-Contractor	Change/Variation Order	PWD 203A(Rev 1/2010)	Expert Determination
24	G7	Less than 10 Million	Civil & Infrastructures	Prime Contractor	Change/Variation Order	PWD 203 (Rev 10/83)	Arbitration
25	G7	10 Million ≤ Contract sum < 50 Million	Residential	Main Contractor	Payment	PAM Contract 2006 (With Quantities)	Arbitration

Legend: PWD 203A (Rev 10/83) - Bills of Quantities form Part of the Contract

IEM.CES 1/90- IEM Standard Conditions of Sub-Contract for use in conjunction with the IEM Conditions of Contract for Civil Engineering Works

PWD 203A (Rev 1/2010) - Bills of Quantities Forms Part of Contract

PWD 203 (Rev 10/83) - Drawing and Specification Forms Part of Contract

PWD 203 (Rev 1/2010) -Drawing and Specification Forms Part of Contract

CIPAA 2012- Construction Industry Payment and Adjudication Act

#### **6.4.4 Results for Section 3 (Analysis of Questionnaire) –Investigation of salient beliefs that comprise behavioural, normative, and control beliefs underpinning ADR use:**

Not all beliefs elicited from each respondent were used in the study, only those most frequently elicited. Ajzen and Fishbein (1980) suggested that only beliefs mentioned by at least 10% or 20% of the sample should be used as modal salient beliefs. These elicited beliefs can then be content analysed, organized and grouped based on counting codes from text (Morgan, 1993). For example, pertaining to questions raised in the behavioural beliefs' dimension: “what do you believe are the advantages/disadvantages of using the selected ADR method to settle the dispute?”, and “ Is there anything else you associate with using the selected ADR method to settle the dispute?”, responses such as: “*save time*”, “*decision is faster*”, “*less time consuming*”, “*less time consuming compared to the other methods*”, “*more time needed*”, “*increase time in resolving the dispute*”, “*it will take too long to settle the matter*”, “*take a long time to settle*”, “*late of result*”, “*time*”, “*will take time*”, “*involves lots of meeting*”, were all themed as “**Speed**” (mentioned by 48% of the respondents, n=12).

Responses with similar outcomes would be grouped together, and the frequency with each outcome would be calculated. Ajzen and Fishbein (1980) mentioned that this requires common sense, as there are no clear guidelines. This study applied the 10% frequency cut-off recommended by Ajzen and Fishbein (1980).

Therefore, based on the intended behaviour (using the selected ADR method to settle dispute), the behavioural, normative, and control beliefs from the respondents were sorted and presented in Table 6.10 below:

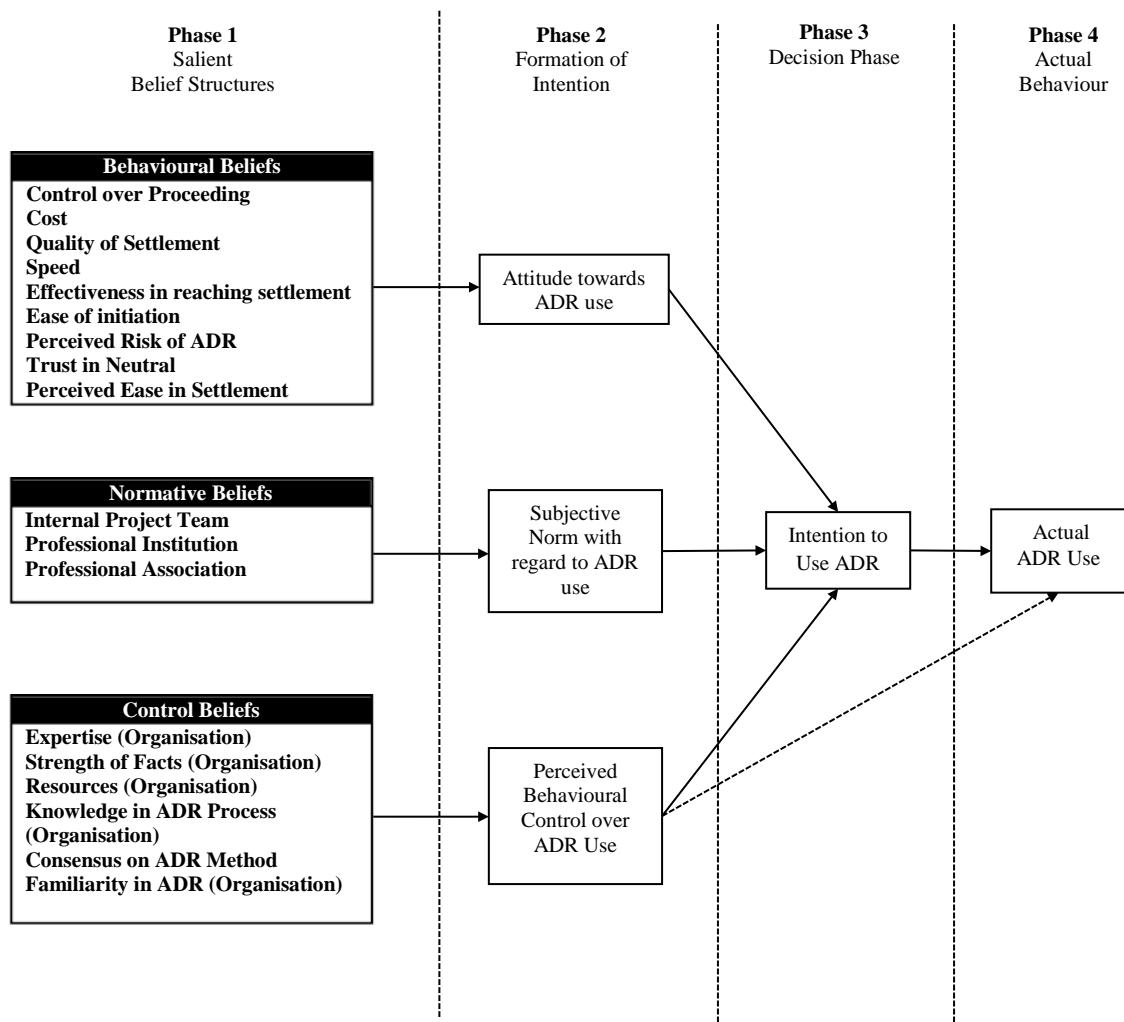
**Table 6.10 Frequency of Elicited Beliefs**

Behavioural Beliefs	Frequencies	Percentage %
<b>Speed</b>	12	48%
<b>Trust in Neutral</b>	11	44%
<b>Perceived Risk of ADR</b>	9	36%
<b>Control over the Proceeding</b>	7	28%
<b>Quality of Settlement</b>	6	24%
<b>Effectiveness in Reaching Settlement</b>	5	20%
<b>Ease of Use</b>	5	20%
<b>Cost</b>	3	12%
<b>Perceived Ease in Settlement</b>	3	12%
Normative Beliefs	Frequencies	Percentage
<b>Internal Project Team</b>	13	52%
<b>Professional Institute</b>	4	16%
<b>Professional Association</b>	4	16%

Control Beliefs	Frequencies	Percentage
<b>Resources (Organisation)</b>	14	56%
<b>Strength of Facts (Organisation)</b>	8	32%
<b>Familiarity in ADR (Organisation)</b>	7	28%
<b>Consensus on ADR method</b>	6	24%
<b>Expertise (Organisation)</b>	3	12%
<b>Collective Knowledge in ADR Process (Organisation)</b>	3	12%

#### 6.4.4.1 Extended TPB Model in Predicting ADR Selection and Use

Figure 6.1 below shows the conceptualised extended model based on classification and groupings of the resulting sets of beliefs.



**Figure 6.1 Extended TPB Model in Predicting ADR Selection and Use**

In phase 1, the salient behavioural, normative, and control beliefs about ADR use were first structured. Beliefs provide cognitive and affective foundations for attitude, subjective norm, and perceived behavioural control (Ajzen, 2006b). Salient behavioural beliefs consist of evaluations on the outcomes of ADR use, such as control over proceeding, cost of ADR, quality of settlement, speed, effectiveness in reaching settlement, ease of

initiation, perceived risk of ADR, trust in the neutral and perceived ease in settlement. On the other hand, salient normative beliefs consists of beliefs about the views of other important parties such as the internal project team, the dispute counterpart, the external project team, the professional institution, and the professional association towards ADR use. Lastly, salient control beliefs consist of beliefs about the factors that may facilitate or impede the use of ADR. These beliefs include the evaluations on the availability of expertise, strength of facts, resources, knowledge in ADR process, consensus on ADR method with counterpart, and self-efficacy.

The structured beliefs in phase 1 then lead to the formation of intention in phase 2. Salient behavioural beliefs are held to influence attitude, while salient normative beliefs determine subjective norm, and salient control beliefs determine perceived behavioural control. The combination of attitude toward ADR use, subjective norm with regard to ADR use, and perceived behavioural control over ADR use leads to the formation of intention to use ADR.

The more favourable the attitude towards ADR use and subjective norm, and the greater the perceived control over the use of ADR, the firmer the intention to use the ADR method in phase 3. In this phase, a decision maker would initiate and use an ADR method motivated by the strongest intention in the corresponding method. This phase is paramount, as a person's decision to act is equivalent to the intention to act (Fife-Schaw et al., 2007).

Given a sufficient degree and adequate control over the use of ADR, a decision maker would then realise and carry out his intention when an opportunity arises. Realisations of intention would finally lead to the actual initiation and use of ADR in phase 4.

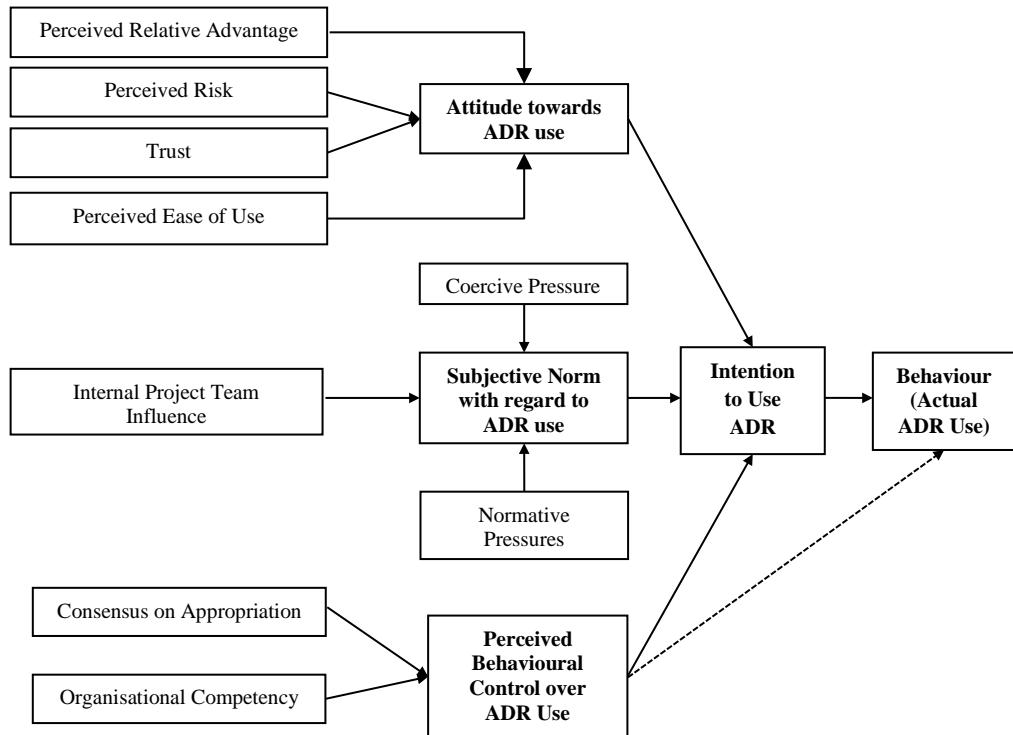
#### **6.4.4.2 Revised Model in Predicting ADR Selection and Use**

The resulting set of beliefs (*Figure 6.2 refers*) can be further reclassified based on theoretical, literature, and practical empirical validation grounds. Previous studies by Taylor and Todd (1995) had clearly shown that the original TPB model could be decomposed into multidimensional constructs, which further explained the behavioural intention. Therefore, this section further spans and reclassifies the resulting sets of beliefs underpinning behavioural, normative and control beliefs (*Figure 6.2 refers*) into nine theoretical constructs for future empirical exposition based on theoretical grounds from the literature.

Behavioural belief structures can be decomposed into perceived relative advantage, perceived ease of use, trust in neutrals and perceived risks of ADR. On the other hand, normative belief structures can be decomposed into internal team influences, normative pressure and coercive pressure. Control belief structures can be decomposed into organisation competencies, and consensus on appropriation. Overall, the reclassification of sets of beliefs into theoretical constructs is depicted in Table 6.11 below, and further displayed in Figure 6.2.

**Table 6.11 Proposed Theoretical Construct Based on Elicited Beliefs**

Elicited Beliefs	Proposed Theoretical Constructs
<b>Behavioural Beliefs</b>	
Control over Proceeding	
Cost	
Quality of Settlement	
Speed	Perceived Relative Advantage
Effectiveness in reaching settlement	
Perceived ease in settlement	
Perceived risk of ADR	Perceived Risk
Trust in neutral	Trust
Ease of initiation	Perceived Ease of Use
<b>Normative Beliefs</b>	
Internal Project Team	Internal Project Team Influence
Professional Institution, Professional Association	Normative / Coercive Pressures
<b>Control Beliefs</b>	
Expertise (Organisation)	
Strength of Facts (Organisation)	Organisational Competency
Resources (Organisation)	
Knowledge in ADR Process (Organisation)	
Familiarity in ADR (Organisation)	
Consensus on ADR Method	Consensus on Appropriation



**Figure 6.2 Revised TPB Model Based on Belief Elicitation Study**

#### 6.4.5 Reaffirmation with the Conceptual ADR Decision-Making Behavioural Model

To reaffirm that the conceptual ADR decision-making behavioural model (Chapter 5) is theoretically comprehensive, the results shown in Figure 6.2 (revised TPB model) were compared with the results of factors synthesized from the systematic review (Chapter 2), the conceptual extended TPB model based on the focus group (Chapter 4), and the conceptual ADR decision-making behavioural model (Chapter 5). The comparison shows that they all shared similar dimensions. This further confirms that the hypothesised conceptual ADR decision-making behavioural model is theoretically comprehensive and sound. No further amendments were needed on the items, or constructs of the conceptual ADR decision-making model. Table 6.12 shows the shared dimensions between the models:

**Table 6.12 Shared Dimensions between Conceptual ADR Decision-Making Behavioural Model, Synthesised Systematic Review Factors, Focus Group, and Belief Elicitation Study**

Main Constructs (Conceptual ADR Decision-Making Behavioural Model: Chapter 5)	Predictors of Main Construct	Shared Dimension with Factors Synthesized from Systematic Review (Chapter 2)	Shared Dimensions with Preliminary Focus Group (Chapter 4)	Shared Dimension with Revised TPB Model Based on Belief Elicitation Study (Chapter 6)
Attitude	Trust	Fairness, Expert Ruling, Confidence in ADR process, Neutrality	-	Trust in Neutral
	Perceived Relative Advantage	Benefits of ADR process, Bindingness, Cost, Confidentiality, Control over proceeding, Enforceability of decision, Flexibility of proceedings, Flexibility in issues, strategy and agreement, Outcomes of ADR, Preservation of relationship, Speed, Width of remedy.	Control Over Proceeding, Cost, Quality of Settlement, Speed, Effectiveness in reaching settlement	Control over proceeding, cost, quality of settlement, speed, effectiveness in reaching settlement, perceived ease in settlement
	Perceived Ease of Use	Informal method of proceedings, Control over proceeding, Traditional approach of proceedings	Ease of initiation	Ease of initiation
	Perceived Risk	Effect of proceedings, Perception of Risks	Perceived Risk of ADR	Perceived Risk of ADR
Subjective Norm	Internal Team Influence	-	Internal Project Team	Internal Project Team
	Normative Pressures	Lawyer's influence,	-	
	Coercive Pressures	Legal System, Cultural Orientations	-	Professional Institution, Professional Association
Descriptive Norm	Mimetic Pressures	-	-	-
Perceived Behavioural Control	Consensus on Appropriation	Agreement of Disputants , Parties' behaviour/relation/involvement		Consensus on ADR method
	Organisational Competency	Financial status, Strength of facts Knowledge of ADR process, Previous experience	Expertise, Strength of Facts, Resources (Organisation)	Expertise, Strength of Facts, Resources, Knowledge in ADR process, familiarity in ADR
Perceived Severity & Perceived Vulnerability	Amount of Controversy, Perceived Complexity, Conflict Intensity, Perceived Importance	Amount disputed, Complexity of disputes, Conflict intensities	-	-

## 6.5 Chapter Summary

The aims of this chapter are twofold. First, is to investigate the behavioural, normative and control beliefs underpinning ADR use; and secondly to reaffirm the hypothesised conceptual ADR decision-making model in Chapter 5 is theoretically comprehensive and sound.

To achieve these aims, a belief elicitation study was conducted with 25 contractors specializing in building and civil engineering works who responded to an online open-ended anonymous questionnaire. Their salient behavioural, normative and control beliefs on ADR use were collected. These were categorised into nine behavioural themes, three normative themes, and six control themes.

The resulting sets of beliefs from the elicitation were again reclassified and developed into nine sets of theoretical constructs based on a literature grounding and practical empiricism. Behavioural belief structures were decomposed into four dimensions: perceived relative advantage, perceived risk, trust, and perceived ease of use. Normative beliefs structures were decomposed into another three dimensions: internal project team influence, normative pressures, and coercive pressures. Control belief structures were decomposed into two dimensions: consensus on appropriation, and organizational competency. Based on the developed theoretical constructs, a revised TPB model in predicting ADR selection and use in the construction industry was presented.

Accordingly, the results were then compared across factors synthesized from the systematic review (Chapter 2), the conceptual extended TPB Model based on a focus group (Chapter 4), and the conceptual ADR decision-making behavioural model (Chapter 5). It was found that the conceptual ADR decision-making behavioural model shared similar dimensions with the others. This further reaffirms the comprehensiveness of the theoretical development of the conceptual model.

## **7. CHAPTER 7: MODEL EVALUATION-QUANTITATIVE RESULTS (POOLED RESULTS)**

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### **7.1 Introduction**

This chapter presents the evaluation of the conceptualised ADR decision-making behavioural model. The results include hypothesis testing, path analysis, and model analysis. The early part of this chapter first presents the discussion of the pilot test. Next, the background of the respondents and response rates (such as sample size and non-response bias assessments) are examined. Following that, the results of the preliminary data analysis such as normality and common method variance are discussed and reported accordingly. After establishing the trustworthiness of the data, the following section provides both measurement and structural model evaluations. The reliability and validity of the constructs are examined and presented (assessment of measurement model). The subsequent section then addresses collinearity issues and presents the assessment of the hypothesised paths for the conceptual model (assessment of structural model). All six major hypotheses and 20 sub-hypotheses of the conceptualised model were first tested and then presented for all pooled dispute scenarios [(Scenario A, n=37); (Scenario B, n=13) (Scenario C, n=14) and Scenario D, n=64)] with an overall total of 128 cases. The evaluation of the model aims to explain and understand the underlying decision-making process in ADR use. The result shows that attitude is the sole predictor that explains behavioural intention to use ADR.

To confirm the significance of attitude towards intention, and because there were both merits and constraints of the sample size obtained for each scenario in this study, the Theory of Planned Behaviour (TPB) model (without revision) was tested separately on both scenarios (Scenario A; n=37 and Scenario D; n=64). The role of these two scenarios was tested and presented subsequently in Chapter 8.

### **7.2 Study Aims**

This chapter aims to present the analysis of the conceptual ADR decision-making behavioural model using Partial Least Squares Structural Equation Modelling (PLS-SEM).

### **7.3 Pilot Test**

Following the results of the pre-test (discussed in **Chapter 5**), the questionnaire was revised and modified. According to Hill (1998), 10-30 participants are sufficient for a pilot

study in survey research. Hill (1998) further recommended that participants selected in the pilot study should originate from the same population as those in the proposed major study, even if the participants in the pilot study are not involved in the main study. Lackey and Wingate (1998) suggested that the pilot study sample should be around 10% of the project sample size.

The revised questionnaire was then randomly stratified to 1,000 contractor companies specialising in building and civil engineering. The distribution was carried out in the same way as was designed for the respondents in the main study. The survey was prepared in the form of anonymous online Google forms for the ease of responses. Each page of the survey included a small section for comments and feedback.

Twenty contractors with a high level of decision-making authority in the companies responded to the pilot study. The results of the pilot study were largely positive, and are presented in Appendix 1. All feedback from the respondents was taken into consideration, and the survey questionnaire was again revised, finalised and made ready for the main survey. Overall, the finalised main survey questionnaire consists of three important sections: (1) dispute characteristics, (2) selection of ADR method, and (3) measurement items of the model. The finalised questionnaire for main survey is shown in Appendix D. Major amendments made to the questionnaire include arrangement of sections, modification of structure, use of language and words. To avoid missing responses, The Google form was designed in a way that the questions were made mandatory to answer prior to submission.

#### **7.4 Main Survey**

The purpose of this phase was to conduct the main survey and collect responses from ADR users. A robust data collection of a cross-sectional survey was carried out on one single source (contractors specialising in building and civil engineering). Self-report measures in terms of the Likert scale were directly administered to the respondents. This allowed the researcher to collect responses regarding their beliefs (Manstead & Semin, 2001). For this study, the dependent variable was “intention”, and is deemed adequate if the occurrence of behaviour (Actual ADR Use) is perceived to be less instigated (Lee & Rao, 2007). As real behaviour requires real manifestation of disputes involving construction companies, this doctoral research mainly focuses on behavioural choices (intentions to use ADR). When

future behaviour cannot be measured, intentions (decisions to use ADR) are deemed sufficient to predict future behaviour and the cross-sectional study is deemed adequate.

This phase adopts stratified sampling techniques. According to Gideon (2012), stratified sampling is a sampling method in which a population is divided into mutually exclusive groups (called strata), followed by a selection of simple random samples or systematic samples from each of the groups (each stratum). According to Daniel (2012), stratified sampling is a probability sampling procedure of separating the target population into segments, followed by simple random sample selection from each segments. Stratified samples are more representative of a population because they ensure representation of each stratum into a single sample. One major sub-type of stratified sampling is proportionate stratified sampling, whereby the number of elements allocated to the various strata is proportional to the representation of the strata in the target population.

The total number of registered contractors specialising in building and civil engineering (as dated 7 October 2015) was 57,519. The total population of contractors can be further stratified into seven grades: Grade 1, 2, 3, 4, 5, 6, and 7.

These contractor grades are based on their tendering capacities. Referring to Abdul-Rahman et al. (2014) and CIDB (2016), the classification of Contractors according to firm size can be explained in Table 7.1 below:

**Table 7.1 Contractors' Classification [Adapted from Abdul-Rahman et al. (2014) and CIDB (2016)]**

Grade	Tendering Capacities Ringgit Malaysia (RM)	Paid up Capital/ net capital worth	Contractor categories (Size)
G7	No Limit	750,000.00	Large
G6	Not exceeding 10 million	500,000.00	Medium
G5	Not exceeding 5 million	250,000.00	Medium
G4	Not exceeding 3 million	150,000.00	Medium
G3	Not exceeding 1 million	50,000.00	Small
G2	Not exceeding 500,000	25,000.00	Small
G1	Not exceeding 100,000	5,000.00	Small

Studying a large population may be slow and tedious (Blaikie, 2003). In studies where large populations are involved, samples of between 1000 and 2000 may be deemed appropriate to provide adequate information about most populations (Blaikie, 2003).

The 2000 questionnaires were then stratified according to the seven grades. According to Daniel (2012), the size of the sample drawn from each grade should be proportional to the relative size of that grade in the target population. This gives an equal chance for each grade to be selected. The composition of each grade was distributed across 15 locations in Malaysia, and in a similar fashion, the surveys distributed to these locations followed the relative size of each location in a specific grade.

After collection of the responses, the data were analysed and the model was confirmed with Partial Least Squares-Structural Equation Modelling (PLS-SEM) due to various merits of this modelling technique. PLS-SEM has been credited with its efficiency to work with a wider range of sample size, increased model complexity, and less restrictive assumptions about research data (Hair, Ringle, & Sarstdet, 2011). If the primary goal of the study is exploratory or an extension of an existing structural theory, PLS-SEM should be selected (Hair et al., 2011). Model complexity is not an issue for PLS-SEM, as long as an appropriate data meet minimum sample size requirement, the complexity of the structural model is unrestricted (Hair, Hult, Ringle, & Sarstdet, 2014). The conceptualised ADR decision-making behavioural model anchored on the extension and decomposition of TPB model. Therefore, PLS-SEM was used as a quantitative technique to analyse latent variables and verify the hypothesis established in the research model.

A total of 2,000 contractors specialising in building and civil engineering were selected for the main survey. The size of the sample, according to the probability formula (Abdul-Rahman et al., 2014) was determined in Equation (1) below:  $n/N = 2,000/ 57519 = 0.0347$ , where  $n$  is the size of sample, and  $N$  is the size of population. Taking Grade 7 in the State of Johor for an example, the sample size required was determined by taking Total population (Johor); multiplied by the Equation (1), which would be  $386 \times 0.0347 \sim 13$ . The distribution of the questionnaire stratified by contractors' grade and location is depicted in Table 7.2 below:

**Table 7.2 Main Survey Questionnaire Stratified by Contractor's Grade and Location**

Location (States)	G1		G2		G3		G4		G5		G6		G7	
	Total Pop	S.	Total Pop	S.	Total Pop	S.								
<b>Johor</b>	2623	<b>91</b>	976	<b>34</b>	765	<b>27</b>	285	<b>10</b>	300	<b>10</b>	111	<b>4</b>	386	<b>13</b>
<b>Kedah</b>	1959	<b>68</b>	432	<b>15</b>	214	<b>7</b>	103	<b>3</b>	108	<b>4</b>	54	<b>2</b>	181	<b>6</b>
<b>Kelantan</b>	1966	<b>68</b>	493	<b>17</b>	202	<b>7</b>	84	<b>3</b>	106	<b>3</b>	61	<b>2</b>	119	<b>4</b>
<b>Labuan</b>	137	<b>4</b>	21	<b>1</b>	15	<b>1</b>	2	<b>1</b>	1	<b>0</b>	0	<b>0</b>	1	<b>0</b>

<b>Melaka</b>	985	<b>34</b>	275	<b>10</b>	213	<b>7</b>	108	<b>4</b>	106	<b>4</b>	37	<b>1</b>	130	<b>5</b>
<b>Negeri Sembilan</b>	1756	<b>61</b>	522	<b>18</b>	258	<b>9</b>	107	<b>4</b>	132	<b>4</b>	41	<b>1</b>	95	<b>3</b>
<b>Pahang</b>	2089	<b>73</b>	561	<b>19</b>	317	<b>11</b>	176	<b>6</b>	152	<b>5</b>	60	<b>2</b>	122	<b>4</b>
<b>Perak</b>	2415	<b>84</b>	592	<b>21</b>	397	<b>14</b>	191	<b>7</b>	226	<b>8</b>	83	<b>3</b>	156	<b>5</b>
<b>Perlis</b>	864	<b>30</b>	105	<b>4</b>	46	<b>2</b>	15	<b>0</b>	27	<b>1</b>	6	<b>0</b>	31	<b>1</b>
<b>Pulau Pinang</b>	1118	<b>39</b>	232	<b>8</b>	329	<b>11</b>	139	<b>5</b>	176	<b>6</b>	81	<b>3</b>	328	<b>11</b>
<b>Sabah</b>	5302	<b>184</b>	1215	<b>42</b>	561	<b>20</b>	136	<b>5</b>	186	<b>7</b>	74	<b>3</b>	445	<b>16</b>
<b>Sarawak</b>	1971	<b>69</b>	777	<b>27</b>	358	<b>12</b>	132	<b>5</b>	169	<b>6</b>	78	<b>3</b>	436	<b>15</b>
<b>Selangor</b>	3493	<b>122</b>	1150	<b>40</b>	1359	<b>47</b>	609	<b>21</b>	916	<b>32</b>	262	<b>9</b>	1252	<b>44</b>
<b>Terengganu</b>	2257	<b>79</b>	570	<b>20</b>	248	<b>9</b>	152	<b>5</b>	196	<b>7</b>	85	<b>3</b>	186	<b>7</b>
<b>Wilayah Persekutuan</b>	1307	<b>45</b>	411	<b>14</b>	859	<b>30</b>	418	<b>14</b>	890	<b>31</b>	243	<b>8</b>	1312	<b>46</b>
<b>Total</b>		<b>1051</b>		<b>290</b>		<b>214</b>		<b>93</b>		<b>128</b>		<b>44</b>		<b>180</b>

Legend: Total Pop = Total Population, S. = Sample Size

The survey was administered through email invitations. The contractors (owners of the email database) were invited to respond to the attached survey link. The survey was distributed in two waves. The contractors were first invited to respond to the survey (first wave), and the data collection period remained open for eight weeks. Following that, the same respondents were again reminded to respond to the survey, and the collection period opened for another eight weeks (second wave).

The main survey questionnaire (attached in Appendix D) consists 3 major sections as follows. In section 1, the respondents were asked to choose a scenario that best describes one of the on-going projects in their respective organisation, as shown in Table 7.3 below:

**Table 7.3 Section 1-Choice of Scenario (Main Survey)**

Scenario	Summarised Description
<b>A</b>	There is a major dispute in one of the projects; unable to reach settlement; still in the stage of deciding on which ADR method to be used for settling the dispute.
<b>B</b>	Recently settled a major dispute in one of the projects with an ADR method.
<b>C</b>	There is a major dispute in one of the projects; Currently using an ADR method to settle the dispute. (Settlement in progress).
<b>D</b>	There is a major claim in one of the projects; in the stage of negotiating the claim.

Then, based on the selected scenario, the respondents were required to provide dispute or claim details in section 2. With reference to claim and dispute taxonomies by Love et al. (2010), Kumaraswamy (1997), Charoenngam and Mahavarakorn (2011), the respondents were required to select one of the 15 types major categories of disputes or claims, as depicted in Table 7.4 below:

**Table 7.4 Section 2-Type of Dispute/Claim (Main Survey)**

<b>Category Number</b>	<b>Types of Dispute/Claim Encountered in Project</b>
<b>1</b>	Change/Variation Order
<b>2</b>	Errors In Drawings, Specifications And Quantities
<b>3</b>	Differing Site Conditions
<b>4</b>	Payment (e.g.: Delayed Progress Payment/ Non-Payment Related Dispute, Etc.)
<b>5</b>	Delay (e.g.: Extension Of Time & Disruption Related Dispute, Etc.)
<b>6</b>	Ambiguity In Contract Terms / Contract Interpretation
<b>7</b>	Quality Related (e.g.: Defects, Workmanship, Etc.)
<b>8</b>	Performance Related (E.G.: Supply Of Goods, Materials, Execution Of Work, Suspension Issue, Issue Of "Regularly And Diligently" Etc.)
<b>9</b>	Information & Administrative Related Dispute
<b>10</b>	Awards & Decisions (e.g.: Dispute About Adjudication / Arbitration Awards, Etc.)
<b>11</b>	Professional Negligence
<b>12</b>	Personal Injuries
<b>13</b>	Property Damages
<b>14</b>	Nomination & Re-Nomination (e.g.: Appointment Of Replacement Person, Etc.)
<b>15</b>	Compliance With Instruction (e.g.: Compliance With Instruction By S.O/ Architect, Etc.)

For each chosen scenario, the respondents were further prompted with these hypothetical scenarios with guided instructions in Section 2 (Table7.5):

**Table 7.5 Section 2-Selection of ADR Methods (Main Survey)**

<b>Previously Chosen Scenario</b>	<b>Hypothetical Scenario (Time)</b>	<b>ADR selection</b>
<b>A</b>	Note: No further instruction given - This implies that the current on-going dispute requires settlement.	Select only one ADR method to settle the dispute.
<b>B</b>	"If you have previously selected Scenario B, <b>imagine</b> this similar dispute would reoccur in the <b>future</b> (when negotiation fails) in your project".	Select only one ADR method to settle this similar dispute
<b>C</b>	"Imagine if your current ADR method fails to settle the current dispute".	Select only one ADR method to settle the dispute
<b>D</b>	"Imagine if this negotiation breaks down and turns into a major dispute; and the Superintending Officer/ Engineer / Architect/ Officer/ Contract Administrator's decision fails to satisfy either party (If applicable)."	Select only one ADR method to settle the dispute

In order to settle the dispute, the respondents were offered seven major types of ADR method to select. The ADR method or “**Target**” included Arbitration, Mediation, Adjudication (Under Construction Industry Payment and Adjudication Act) CIPAA 2012, Adjudication (Contractual), Expert Determination, Dispute Review Board (DRB), and Dispute Adjudication Board (DAB).

Finally, in Section 3 of the main survey questionnaire (Table 7.6), the respondents were required to respond to the instruments based on a seven-point Likert Scale, ranging from “1- Strongly Disagree, 2- Moderately Disagree, 3- Somewhat Disagree, 4- Neutral (Neither Disagree nor Agree), 5- Somewhat Agree, 6- Moderately Agree, and 7- Strongly Agree”

**Table 7.6 Section 3-Sample of Instruments (Main Survey)**

Construct	Items	Scale
<b>Intention</b>	<b>To settle the dispute,</b> I intend to use this ADR method I plan to use this ADR method I will use this ADR method I am willing to use this ADR method	(1-Strongly Disagree, 2- Moderately Disagree, 3- Somewhat Disagree, 4- Neutral (Neither Disagree nor Agree), 5- Somewhat Agree, 6- Moderately Agree, 7- Strongly Agree)
<b>Attitude</b>	Using this ADR method to settle the dispute would be a good idea Using this ADR method to settle the dispute would be a wise idea Using this ADR method to settle the dispute would be desirable	(1-Strongly Disagree, 2- Moderately Disagree, 3- Somewhat Disagree, 4- Neutral (Neither Disagree nor Agree), 5- Somewhat Agree, 6- Moderately Agree, 7- Strongly Agree)

## 7.5 Analysis of Samples Characteristics

This section presents an analysis of the characteristics of responses obtained from the main survey.

### 7.5.1 Response Rate and Non-Response Bias Assessment

In the first wave, 114 responses were received, while another 14 responses were received in the second wave. 128 surveys were completed online, representing a response rate of 6.4%. To ascertain the responses were free from non-response bias, this study adopted the recommendations of Rogelberg and Stanton (2007); and Armstrong and Overton (1977). Wave analysis was used, where the late respondents (Wave 2) were compared to early respondents (Wave 1). The two groups were compared in terms of respondents' demographic backgrounds such as years of experience in construction, contractor's grade, organisation positions, decision-making authority; and project details such as project locations, project characteristics, and responses for each measurement items. Two-sample independent sample T-Tests were employed to assess non-response bias. The assessments (Appendix 2) showed that there was no evidence to support a significant difference of demographic variables and key items between early respondents and late respondents at a 0.05 alpha level. This suggests a plausible conclusion that there was no indication of any non-response-bias.

The recommended minimum sample size for PLS path model estimation should at least be equal or larger than (1) 10 times the largest number of formative indicators used to measure one construct (Hair et al., 2014; Hair et al., 2011); or 10 times the largest number of structural paths directed at a particular construct in the model (Hair et al., 2014; Hair et al., 2011). The largest number of structural paths in the conceptual ADR decision-making behavioural model is six, which implies a minimum sample size of 60. The total cases obtained in this study was 128, thus exceeding the minimum requirement of sample size for the PLS path model.

Nevertheless, the total cases obtained also meet the sample size recommendation in PLS-SEM by Cohen (1992). As the maximum number of arrows pointing at a construct (Intention) is six, 75 observations are needed to achieve a statistical power of 80% for detecting  $R^2$  values of at least 0.25 (with a 5 % probability of error), while 62 observations are needed to achieve a statistical power of 80% for detecting  $R^2$  values of at least 0.25 (with a 10% probability of error).

### 7.5.2 Respondents' Background

This section presents an analysis of all 128 respondents' backgrounds. Table 7.7 below shows the profiles of the respondents.

**Table 7.7 Respondent's Background (N=128)**

Designation used in Organisation	Frequency	%
<b>President</b>	<b>4</b>	3.1
<b>Executive Director</b>	<b>11</b>	8.6
<b>Managing Director</b>	<b>29</b>	22.7
<b>Chief Executive Officer</b>	<b>7</b>	5.5
<b>Director</b>	<b>29</b>	22.7
<b>OTHERS</b>	<b>48</b>	37.5
<i>Assistant Vice President</i>	2	
<i>Project Manager</i>	6	
<i>Assistant Project Manager</i>	1	
<i>Project Coordinator</i>	1	
<i>Contract Manager</i>	2	
<i>Assistant Contract Manager</i>	1	
<i>General Manager</i>	4	
<i>Site Engineer</i>	1	
<i>Site Manager</i>	2	
<i>Project Engineer</i>	3	
<i>Project Executive</i>	1	
<i>Executive Manager</i>	2	
<i>Admin Manager</i>	1	
<i>Senior Executive</i>	1	
<i>Engineer</i>	1	

<i>Manager</i>	12	
<i>Assistant Manager</i>	2	
<i>Assistant Managing Director</i>	1	
<i>Contract Executive</i>	2	
<i>Quantity Surveyor</i>	2	
<b>Authorised to make decisions for ADR use in projects</b>		
1. Strongly Disagree	-	-
2. Moderately Disagree	-	-
3. Somewhat Disagree	-	-
4. Neutral	-	-
5. Somewhat Agree	91	71.1
6. Moderately Agree	21	16.4
7. Strongly Agree	16	12.5
<b>Contractor's Grade</b>		
Grade 1	6	4.7
Grade 2	34	26.6
Grade 3	23	18.0
Grade 4	18	14.1
Grade 5	11	8.6
Grade 6	4	3.1
Grade 7	32	25.0
<b>Years of Experience in the Construction Industry</b>		
1-5 Years	34	26.6
6-10 Years	27	21.1
11-15 Years	28	21.9
16-20 Years	12	9.4
21-25 Years	7	5.5
26-30 Years	9	7.0
31-35 Years	4	3.1
More than 35 Years	7	5.5
<b>Experience in ADR Use</b>		
Arbitration	16	12.5
Mediation	10	7.8
Adjudication (CIPAA 2012)	9	7.0
Adjudication (Contractual)	16	12.5
Expert Determination	5	3.9
Dispute Review Board	2	1.6

All respondents held prominent managerial positions in their organisations and had high decision-making authority in their organisation. 71.1% respondents somewhat agreed; 16.4% moderately agreed; while 12.5% strongly agreed that they were authorised to make decisions for ADR use in their respective projects. Regarding actual positions held, 3.1% (n=4) marked President; 8.6% (n=11) Executive Director; 22.7% Managing Director (n= 29); 5.5% (n= 7) Chief Executive Officer (CEO); 22.7% (n=29) Directors, and lastly 37.5% (n=48) marked other managerial designations such as “Assistant Vice President”, “Project Manager”, “Assistant Project Manager”, “Project Coordinator”, “Contract Manager”, “Assistant Contract Manager”, “General Manager”, “Site Engineer”, “Site Manager”, “Project Engineer”, “Project Executive”, “Executive Manager”, “Admin Manager”, “Senior

Executive”, “Engineer”, “Manager”, “Assistant Manager”, “Assistant Managing Director”, “Contract Executive”, “Quantity Surveyor”.

Of the respondents, 26.6% (n=34) were Grade 2 contractors, followed by Grade 7 (25.0%, n=32), Grade 3 (18.0%, n=23), Grade 4 (14.1%, n=18), Grade 5 (8.6%, n=11), and Grade 1 (4.7%, n=6).

Most of the respondents had between one to five years of experience in construction (26.6%, n=34), followed by 11-15 years (21.9%, n=28), and thirdly six to ten years (21.1%, n=27). Next most frequent was 16-20 years (9.4%, n=12), followed by 7.0 % (n=9) who reported having 26-30 years of experience, 5.5% (n=7) with 21-25 years and more than 35 years. Lastly, 3.1% (n=4) reported to have 31-35 years of experience in construction.

Of the respondents, 12.5% (n=16) reported experience in arbitration and adjudication (contractual), 7.8% (n=10) in mediation, followed by 7% (n=9) with experience in adjudication (CIPAA 2012), and 3.9% (n=5) in expert determination.

### **7.5.3 Project Details**

In answer to the question on scenarios, 37 respondents reported to have a major dispute in one of the projects, and were still in the stage of deciding which ADR method to be used (Scenario A), 13 respondents reported to have just recently settled a major dispute in one of the projects with an ADR method (Scenario B), 14 respondents reported to have settlement in progress (Scenario C), and finally 64 respondents were negotiating a major claim in one of the projects. Table 7.8 shows the type of scenarios faced by the respondents.

**Table 7.8 Overall Scenario (Main Survey)**

Scenario	Description	Frequency	Percentage %
A	There is a major dispute in one of the projects; unable to reach settlement; still in the stage of deciding on which ADR method be used for settling the dispute.	37	28.9
B	Recently settled a major dispute in one of the projects with an ADR method.	13	10.2
C	There is a major dispute in one of the projects; Currently using an ADR method to settle the dispute. (Settlement in progress).	14	10.9
D	There is a major claim in one of the projects; in the stage of negotiating the claim.	64	50

Table 7.9 below shows the overall project details in accordance with the selected scenario. Complete details of each case are attached in Appendix 3.

**Table 7.9 Overall Project Details**

Project Details	A (N=37)		B (N=13)		C (N=14)		D(N=64)		Total (N=128)	
	N	%	N	%	N	%	N	%	N	%
<b>Type of Project</b>										
1.Residential	<b>12</b>	32.4	<b>1</b>	7.7	<b>3</b>	21.4	<b>16</b>	25.0	<b>32</b>	25
2.Commercial	<b>10</b>	27.0	<b>1</b>	7.7	<b>1</b>	7.1	<b>13</b>	20.3	<b>25</b>	20
3.Cultural	-	-	-	-	-	-	<b>1</b>	1.6	<b>1</b>	1
4.Sporting	-	-	<b>2</b>	15.4	-	-	-	-	<b>2</b>	2
5.Healthcare	-	-	-	-	-	-	<b>2</b>	3.1	<b>2</b>	2
6.Civil & Infrastructure	<b>9</b>	24.3	<b>8</b>	61.5	<b>9</b>	64.3	<b>27</b>	42.2	<b>53</b>	41
7.Industrial	<b>6</b>	16.2	<b>1</b>	7.7	<b>1</b>	7.1	<b>5</b>	7.8	<b>13</b>	10
Other										
<b>Project Location</b>										
1.Johor	<b>5</b>	13.5	<b>1</b>	7.7	<b>2</b>	14.3	<b>7</b>	10.9	<b>15</b>	12
2.Kedah	<b>1</b>	2.7	<b>2</b>	15.4	<b>1</b>	7.1	<b>2</b>	3.1	<b>6</b>	5
3.Kelantan	<b>3</b>	8.1	<b>1</b>	7.7	<b>1</b>	7.1	<b>4</b>	6.3	<b>9</b>	7
4.Melaka	<b>1</b>	2.7	-	-	<b>1</b>	7.1	<b>2</b>	3.1	<b>4</b>	3
5.Negeri Sembilan	-	-	-	-	-	-	<b>3</b>	4.7	<b>3</b>	2
6.Pahang	<b>3</b>	8.1	<b>1</b>	7.7	<b>1</b>	7.1	<b>5</b>	7.8	<b>10</b>	8
7.Perak	<b>1</b>	2.7	-	-	<b>1</b>	7.1	<b>3</b>	4.7	<b>5</b>	4
8.Perlis	-	-	<b>1</b>	7.7	-	-	-	4.7	<b>1</b>	1
9.Penang	<b>4</b>	10.8	-	-	-	-	<b>3</b>	4.7	<b>7</b>	5
10.Sabah	<b>2</b>	5.4	<b>1</b>	7.7	-	-	<b>6</b>	9.4	<b>9</b>	7
11.Sarawak	<b>5</b>	13.5	<b>1</b>	7.7	<b>1</b>	7.1	<b>4</b>	6.3	<b>11</b>	9
12.Selangor	<b>5</b>	13.5	<b>2</b>	15.4	<b>4</b>	28.6	<b>17</b>	28.6	<b>28</b>	22
13.Terengganu	<b>1</b>	2.7	<b>2</b>	15.4	<b>2</b>	14.3	<b>3</b>	4.7	<b>8</b>	6
14.Kuala Lumpur	<b>6</b>	16.2	<b>1</b>	7.7	-	-	<b>5</b>	7.8	<b>12</b>	9
<b>Type of Project Dispute/Claim</b>										
Change/Variation Order	<b>8</b>	21.6	<b>5</b>	38.5	<b>2</b>	14	<b>15</b>	23	<b>30</b>	23
Errors In Drawings, Specifications And Quantities	<b>6</b>	16.2	<b>1</b>	7.69	<b>1</b>	7.1	<b>4</b>	6.3	<b>12</b>	9
Differing Site Conditions	<b>2</b>	5.4	-	-	<b>1</b>	7.1	<b>4</b>	6.3	<b>7</b>	5
Payment (e.g.: Delayed Progress Payment/ Non-Payment Related Dispute, Etc.)	<b>10</b>	27.0	<b>4</b>	30.8	<b>5</b>	36	<b>20</b>	31	<b>39</b>	30
Delay (e.g.: Extension Of Time & Disruption Related Dispute, Etc.)	<b>5</b>	13.5	-	-	-	-	<b>7</b>	11	<b>12</b>	9
Ambiguity In Contract Terms / Contract Interpretation	<b>1</b>	2.7	<b>1</b>	7.69	-	-	<b>1</b>	1.6	<b>3</b>	2
Quality Related (e.g.: Defects, Workmanship, Etc.)	<b>2</b>	5.4	-	-	<b>1</b>	7.1	<b>2</b>	3.1	<b>5</b>	4
Performance Related (e.g.: Supply Of Goods, Materials, Execution Of Work, Suspension Issue, Issue Of "Regularly And Diligently" Etc.)	<b>1</b>	2.7	-	-	<b>1</b>	7.1	-	-	<b>2</b>	2
Information & Administrative Related Dispute	-	-	-	-	<b>1</b>	7.1	<b>4</b>	6.3	<b>5</b>	4
Awards & Decisions (e.g.: Dispute About Adjudication / Arbitration Awards, Etc.)	-	-	<b>1</b>	7.69	<b>1</b>	7.1	-	-	<b>2</b>	2
Professional Negligence	<b>1</b>	2.7	<b>1</b>	7.69	-	-	-	-	<b>2</b>	2
Personal Injuries	-	-	-	-	-	-	<b>1</b>	1.6	<b>1</b>	1
Property Damages	-	-	-	-	-	-	-	-	-	-
Nomination & Re-Nomination (e.g.: Appointment Of Replacement Person, Etc.)	<b>1</b>	2.7	-	-	-	-	<b>1</b>	1.6	<b>2</b>	2
Compliance With Instruction (e.g.: Compliance With Instruction By S.O / Architect, Etc.)	-	-	-	-	<b>1</b>	7.1	<b>5</b>	7.8	<b>6</b>	5
<b>Contract Sum</b>										
Contract sum less than 10 Million	<b>25</b>	67.6	<b>9</b>	69.2	<b>12</b>	85.8	<b>59</b>	92.2	<b>105</b>	82
10 Million ≤ Contract sum < 50 Million	<b>6</b>	16.2	<b>1</b>	7.7	-	-	<b>4</b>	6.3	<b>11</b>	9
50 Million ≤ Contract sum < 100 Million	<b>2</b>	5.4	<b>3</b>	23.0	-	-	<b>1</b>	1.6	<b>6</b>	5
100 Million ≤ Contract sum < 150 Million	<b>2</b>	5.4	-	-	<b>1</b>	7.1	-	-	<b>3</b>	2
150 Million ≤ Contract sum < 200 Million	-	-	-	-	-	-	-	-	-	-
200 Million ≤ Contract sum < 250 Million	-	-	-	-	-	-	-	-	-	-
250 Million ≤ Contract sum	<b>2</b>	5.4	-	-	<b>1</b>	7.1	-	-	<b>3</b>	2
<b>Standard Form of Contract used</b>										

PWD 203 (Rev 1/2010)-Drawing and Specification Forms Part of Contract	<b>3</b>	8.1	<b>2</b>	15.4	<b>1</b>	7.1	<b>5</b>	7.8	<b>11</b>	9
PWD 203A(Rev 1./2010)-Bills of Quantities Forms Part of Contract	<b>5</b>	13.5	<b>1</b>	7.69	-	-	<b>15</b>	23	<b>21</b>	16
PWD 203 (Rev 10/83)- Drawing and Specification Forms Part of Contract	-	-	<b>1</b>	7.69	<b>1</b>	7.1	<b>2</b>	3.1	<b>4</b>	3
PWD 203A (Rev 10/83)- Bills of Quantities form Part of the Contract	<b>2</b>	5.4	<b>2</b>	15.4	-	-	<b>2</b>	3.1	<b>6</b>	5
PWD DB/T Rev 2002 (Turnkey)	-	-	-	-	-	-	-	-	-	-
PWD DB Rev 2007 (Design & Build)	<b>1</b>	2.7	-	-	<b>1</b>	7.1	<b>1</b>	1.6	<b>3</b>	2
PWD FORM DB (Rev.1/2010)	<b>1</b>	2.7	-	-	-	-	-	-	<b>1</b>	1
PWD 203N (Nominated Sub Contract)	<b>2</b>	5.41	<b>3</b>	23.1	<b>3</b>	21	<b>3</b>	4.7	<b>11</b>	9
FIDIC Conditions of Contract for Construction (Red Book)	-	-	-	-	-	-	<b>1</b>	1.6	<b>1</b>	1
FIDIC Conditions of Contract for Plant and Design/Build (Yellow)	-	-	-	-	-	-	-	-	-	-
FIDIC Conditions of Contract for EPC Turnkey Projects (Silver)	<b>1</b>	2.7	-	-	-	-	-	-	<b>1</b>	1
FIDIC Short Form of Contract (the Green Book)	-	-	-	-	-	-	-	-	-	-
PAM Contract 2006 (With Quantities)	<b>9</b>	24.3	<b>2</b>	15.4	-	-	<b>9</b>	14	<b>20</b>	16
PAM Contract 2006 (Without Quantities)	<b>1</b>	2.7	-	-	<b>1</b>	7.1	<b>3</b>	4.7	<b>5</b>	4
PAM Sub-Contract 2006	<b>3</b>	8.11	-	-	-	-	<b>1</b>	1.6	<b>4</b>	3
CIDB Standard Form of Contract for Building Works (2000 Edition)	<b>5</b>	13.5	<b>1</b>	7.69	<b>2</b>	14	<b>7</b>	11	<b>15</b>	12
CIDB Sub-Contract Form [CIDB.B(NSC)/2002]	<b>1</b>	2.7	<b>1</b>	7.69	<b>2</b>	14	<b>2</b>	3.1	<b>6</b>	5
CIDB Model Terms of Construction Contract for Subcontract Work	-	-	-	-	<b>1</b>	7.1	<b>2</b>	3.1	<b>3</b>	2
IEM.CE 2011: IEM Form of Contract for Civil Engineering Works	-	-	-	-	-	-	-	-	-	-
IEM.CES 1/90: IEM Standard Conditions of Sub-Contract for use in conjunction with the IEM Conditions of Contract for Civil Engineering Works	<b>1</b>	2.7	-	-	<b>1</b>	7.1	<b>5</b>	7.8	<b>7</b>	5
In House	<b>2</b>	5.4	-	-	<b>1</b>	7.1	<b>4</b>	6.3	<b>7</b>	5
PAM 1998	-	-	-	-	-	-	<b>2</b>	3.1	<b>2</b>	2
<b>Intended choice of ADR to settle Hypothetical Dispute/Claim Scenario</b>										
1.Arbitration	<b>15</b>	40.5	<b>10</b>	76.9	<b>4</b>	28.6	<b>30</b>	46.9	<b>59</b>	46.1
2.Mediation	<b>7</b>	18.9	<b>1</b>	7.7	<b>4</b>	28.6	<b>9</b>	14.1	<b>21</b>	16.4
3.Adjudication under CIPAA 2012	<b>8</b>	21.6	<b>1</b>	7.7	<b>3</b>	21.4	<b>15</b>	23.4	<b>27</b>	21.1
4.Adjudication (Contractual)	<b>3</b>	8.1	-	-	<b>1</b>	7.1	<b>3</b>	4.7	<b>7</b>	5.5
5.Expert Determination	<b>3</b>	8.1	<b>1</b>	7.7	<b>1</b>	7.1	<b>5</b>	7.8	<b>10</b>	7.8
6.Dispute Review Board	-	-	-	-	-	-	<b>1</b>	1.6	<b>1</b>	0.8
7.Dispute Adjudication Board	-	-	-	-	-	-	<b>1</b>	1.6	<b>1</b>	0.8
8.Other: (Facilitated Negotiation)	<b>1</b>	2.7	-	-	<b>1</b>	7.1	-	-	<b>2</b>	1.6

The type of projects reported in this study include civil & infrastructure projects (53 projects, 41%), followed by residential (32 projects, 25%), commercial (25 projects, 20%), industrial (13 projects, 10%), healthcare (2 projects, 2%), sporting (2 projects, 2%), and cultural (1 project, 1%). Most of the projects take place in Selangor (28 projects, 22%), while there is only one project in Perlis (1 project, 1%). On the other hand, 11 projects (9%) took place in Sarawak, and 9 projects (7%) in Sabah.

As for reported disputes/claim issues, most of the respondents had payment issues (39 cases, 30%), followed by change/variation order-related disputes (30 cases, 23%), errors in drawings issues (12 cases, 9%), delay issues (12 cases, 9%), differing site conditions (7 cases, 5%), compliance with instruction-related (6 cases, 5%), quality-related issues (5 cases, 4%), information & administrative-related dispute (5 cases, 4%), ambiguity in contract terms (3

cases, 2%), performance-related (2 cases, 2%), awards & decisions (2 cases, 2%), professional negligence (2 cases, 2%), nomination & re-nomination (2 cases, 2%), and personal injuries (1 case, 1%).

The majority of the projects (105 projects, 82%) had a contract sum value less than 10 million ringgit. 11 projects (9%) were reported to have value between 10 and 50 million, 6 projects (5%) between 50 million and 100 million, 3 projects (2%) between 100 million and 150 million, and another 3 ( 2%) projects more than 250 million ringgit.

PWD 203 A (Rev1/2010) was used in 21 projects (16%), followed by PAM Contract 2006 (With Quantities) in 20 projects (16%), CIDB 2000 in 15 projects (12%), PWD 203 (Rev 1/2010) and PWD 203N in 11 projects (9%). Both in-house contracts and IEM CES 1/90 Sub contract were each used in 7 projects (5%), both PWD 203A (Rev 10/83) and CIDB Sub-Contract Form in 6 projects (5%), PAM Contract 2006 (without Quantities) in 5 projects (4%), both PWD 203 (Rev10/83) and PAM Sub-Contract 2006 in 4 projects (3%), both PWD DB Rev 2007 (Design and Build) and CIDB Model Terms of Construction Contract for subcontract work in 3 projects (2%). PAM 1998 was used in 2 projects (2%), followed by PWD Form DB (Rev1/2010), FIDIC (Red Book), and FIDIC (Silver Book) each in 1 project (1%).

Overall, most respondents (n=59, 46.1%) selected arbitration as the intended choice of settling the hypothetical dispute issues, with in second place adjudication CIPAA 2012 (n=27, 21.1%), followed by mediation (n=21, 16.4%), expert determination (n=10, 7.8%), and contractual adjudication (n=7, 5.5%). Two respondents (1.6%) chose facilitated negotiation. The least preferred choices were the dispute review board (n=1, 1%), and dispute adjudication board (n=1, 1%).

## **7.6 Preliminary Data Assessment**

This section presents a preliminary analysis of data obtained from the respondents. The purpose of this exercise is to screen and clean any potential problems present in the data set used in the study. Overall, there is no missing data or missing response found in this study. The types of analysis discussed in this section include normality and common method variance tests. These tests were performed by using IBM SPSS Statistics 22.0.

### **7.6.1 Normality Test**

Lack of normality adversely affects results of multivariate analysis (Hair et al., 2014). As a general guideline, if either values for skewness and kurtosis greater than +1.0 or lower than -1.0 would indicate highly non-normal data. The results in the form of skewness and kurtosis assessments are attached in Appendix 4. Both skewness and kurtosis results are as attached in Appendix 4. In addition to that, Kolmogorov-Smirnov (KS) and Shapiro-Wilk test were conducted to confirm the results. The examination of the KS and Shapiro-Wilk tests suggests that the model variables vary from the normal distribution, (P value<0.05, Appendix 5). Although both KS and Shapiro Wilk results indicate non-normality of the data set, both kurtosis and skewness results suggest acceptable range of normality, as all model variables range between -1.0 and +1.0. Highly non-normal data was not found in the data set. Overall, non-normal data is not an issue with PLS-SEM. This further attributes to the justification of using PLS-SEM (Hair et al., 2011).

### **7.6.2 Common Method Variance**

Common method bias is attributed to a variance that is related to the measurement method. As one of the main sources of measurement error, the common method bias causes potential problems in behavioural research and threatens the validity of conclusions between measures (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). One way to examine the existence of the common method bias in the study is to use Harman's single factor score, in which all items (measuring latent variables) are loaded into a factor analysis to ascertain whether the majority of the variance can be accounted by one general factor (Podsakoff et al., 2003). If the total variance for a single factor is more than 50%, it suggests that the common method bias is found in the study (Mattila & Enz, 2002). The results are provided in Appendix 6. The overall result shows that one factor extracted accounts for not more than 50% (47.8%) of the variance in the data sample. This implies that the common method variance was not a problem in the data set.

## **7.7 PLS-SEM Model Evaluation: Assessment of Conceptual ADR Decision-Making Behavioural Model (Pooled Scenario A, B, C, D; N=128 Cases)**

This section presents the evaluation of the conceptual ADR decision-making behavioural model, taking into account of all pooled scenarios (A, B, C, and D). In evaluating and reporting the results, this study follows the guidelines given by Hair et al. (2011) and Hair et al. (2014). There are two types of model involved in PLS-SEM. The first is known as

the “measurement model” (Sarstedt, Ringle, Smith, Reams, & Hair Jr, 2014), which reflects the relationship between the latent variables and their measures (Chin, Choong, Alwi, & Mohammed, 2016). The second is known as “structural model” (Sarstedt et al., 2014), which assesses the relationship between the variables (Chin et al., 2016).

### **7.7.1 Measurement Model (N=128)**

Firstly, the model was assessed in terms of its reliability and validity. In this measurement model, all constructs of the conceptual ADR decision-making behavioural model were assessed reflectively. There are two types of reliability assessment: internal consistency reliability, and indicator reliability. Internal consistency reliability is assessed with composite reliability, where it should be higher than 0.70; while indicator reliability is assessed with indicator loadings, where they should be higher than 0.70 (Hair et al., 2014; Hair et al., 2011). On the other hand, there are two types of validity assessments: convergent validity and discriminant validity. Convergent validity is assessed with the average variance extracted (AVE), and the value should be higher than 0.50. Discriminant validity is assessed by comparing the square root of AVE of each latent construct with the construct’s correlation with any other latent construct (Fornell-Larcker Criterion), and by comparing the indicators’ loading with their respective cross loadings. To achieve discriminant validity, the square root of AVE of each construct should be higher than the construct’s correlation with any other latent construct; while the indicators’ loadings should be higher than all of their cross loadings (Hair et al., 2014; Hair et al., 2011). The validity and reliability results of the measurement model are presented in Table 7.10 below, while the results of cross loadings and Fornell-Larcker criterion are each shown in Table 7.11 and Table 7.12 below.

**Table 7.10 Validity and Reliability Results of Measurement Model**

Constructs	Items	Loadings	Composite Reliability	Average Variance Extracted (AVE)
Amount in Controversy (AC)	AC_1	0.9596	0.9661	0.9345
	AC_2	0.9738		
Attitude (ATT)	ATT_1	0.9646	0.9749	0.9284
	ATT_2	0.9759		
	ATT_3	0.9500		
Consensus on Appropriation (CA)	CA_1	0.9844	0.9841	0.9686
	CA_2	0.9840		
Conflict Intensity	CI_1	0.8599	0.9249	0.8043
	CI_2	0.8913		
	CI_3	0.9376		

Coercive Pressure (CP)	CP_1	0.9652	0.9851	0.9565
	CP_2	0.9837		
	CP_3	0.9849		
Descriptive Norms (DN)	DN_1	0.9632	0.9764	0.9323
	DN_2	0.9741		
	DN_3	0.9593		
Intention (INT)	INT_1	0.9743	0.9817	0.9306
	INT_2	0.9743		
	INT_3	0.9655		
	INT_4	0.9442		
Internal Team Influence (IT)	IT_1	0.9767	0.9844	0.9547
	IT_2	0.9754		
	IT_3	0.9791		
Mimetic Pressure (MP)	MP_1	0.972	0.9842	0.9542
	MP_2	0.9795		
	MP_3	0.9789		
Normative Pressure (NP)	NP_1	0.9318	0.9684	0.8847
	NP_2	0.9519		
	NP_3	0.9558		
	NP_4	0.9223		
Organisation Competency (OC)	OC_1	0.9146	0.9737	0.9024
	OC_2	0.9614		
	OC_3	0.9637		
	OC_4	0.9592		
Perceived Relative Advantage (PA)	PA_1	0.8521	0.9688	0.8385
	PA_2	0.9324		
	PA_3	0.9615		
	PA_4	0.9375		
	PA_5	0.9152		
	PA_6	0.8912		
Perceived Behavioural Control (PBC)	PBC_1	0.9198	0.9483	0.8595
	PBC_2	0.9542		
	PBC_3	0.9066		
Perceived Complexity(PC)	PC_1	0.9456	0.9667	0.9064
	PC_2	0.9478		
	PC_3	0.9627		
Perceived Ease of Use (PE)	PE_1	0.9838	0.9845	0.9549
	PE_2	0.978		
	PE_3	0.9696		
Perceived Importance (PI)	PI_1	0.9297	0.9706	0.8921
	PI_2	0.9434		
	PI_3	0.9535		
	PI_4	0.9513		
Perceived Risk (PR)	PR_1	0.9598	0.9829	0.9350
	PR_2	0.9756		
	PR_3	0.9671		
	PR_4	0.9653		
Perceived Severity (SEV)	SEV_1	0.8739	0.9552	0.8101
	SEV_2	0.9400		
	SEV_3	0.8761		
	SEV_4	0.9398		
	SEV_5	0.8674		
Subjective Norm (SN)	SN_1	0.9474	0.9657	0.9037
	SN_2	0.9663		
	SN_3	0.9380		
Trust (TR)	TR_1	0.9186	0.9844	0.9002
	TR_2	0.9505		
	TR_3	0.9606		

	TR_4	0.9724		
	TR_5	0.9694		
	TR_6	0.9546		
	TR_7	0.9137		
Perceived Vulnerability (VUL)	VUL_1	0.7713	0.9457	0.7778
	VUL_2	0.9192		
	VUL_3	0.9240		
	VUL_4	0.9169		
	VUL_5	0.8687		

**Table 7.11 Cross Loadings Assessments**

	AC	ATT	CA	CI	CP	DN	INT	IT	MP	NP	OC	PA	PBC	PC	PE	PI	PR	SEV	SN	TR	VUL
AC_1	<b>0.960</b>	0.475	0.417	0.618	0.338	0.38	0.51	0.422	0.306	0.385	0.348	0.469	0.431	0.666	0.386	0.707	0.044	0.333	0.429	0.417	0.251
AC_2	<b>0.974</b>	0.371	0.378	0.707	0.327	0.401	0.39	0.351	0.321	0.386	0.29	0.406	0.407	0.684	0.38	0.68	0.05	0.432	0.357	0.401	0.282
ATT_1	0.417	<b>0.965</b>	0.634	0.313	0.518	0.551	0.836	0.676	0.562	0.564	0.611	0.684	0.732	0.432	0.702	0.351	0.256	0.475	0.757	0.574	0.535
ATT_2	0.425	<b>0.976</b>	0.619	0.313	0.505	0.563	0.848	0.642	0.537	0.559	0.602	0.66	0.729	0.416	0.671	0.321	0.2	0.453	0.748	0.583	0.502
ATT_3	0.406	<b>0.95</b>	0.639	0.271	0.543	0.591	0.818	0.641	0.552	0.562	0.617	0.701	0.763	0.328	0.655	0.277	0.292	0.512	0.771	0.623	0.566
CA_1	0.401	0.655	<b>0.984</b>	0.29	0.788	0.684	0.629	0.713	0.744	0.717	0.738	0.782	0.701	0.235	0.695	0.279	0.336	0.569	0.654	0.828	0.656
CA_2	0.403	0.633	<b>0.984</b>	0.267	0.757	0.675	0.653	0.634	0.716	0.677	0.702	0.752	0.692	0.246	0.677	0.304	0.29	0.558	0.624	0.802	0.632
CL_1	0.561	0.32	0.245	<b>0.86</b>	0.249	0.175	0.293	0.251	0.224	0.288	0.246	0.26	0.212	0.685	0.249	0.52	0.339	0.271	0.223	0.273	0.178
CL_2	0.654	0.274	0.245	<b>0.891</b>	0.236	0.338	0.292	0.296	0.352	0.385	0.278	0.317	0.247	0.716	0.343	0.557	0.241	0.304	0.213	0.345	0.312
CL_3	0.635	0.262	0.271	<b>0.938</b>	0.302	0.296	0.271	0.322	0.332	0.36	0.251	0.309	0.249	0.683	0.308	0.572	0.379	0.443	0.227	0.33	0.333
CP_1	0.358	0.519	0.759	0.327	<b>0.965</b>	0.712	0.534	0.718	0.798	0.766	0.795	0.7	0.666	0.234	0.631	0.311	0.394	0.661	0.632	0.716	0.67
CP_2	0.33	0.551	0.774	0.285	<b>0.984</b>	0.706	0.576	0.766	0.846	0.788	0.812	0.723	0.673	0.214	0.626	0.258	0.378	0.606	0.652	0.765	0.693
CP_3	0.32	0.519	0.768	0.255	<b>0.985</b>	0.703	0.543	0.744	0.843	0.785	0.802	0.714	0.652	0.182	0.619	0.251	0.353	0.59	0.618	0.743	0.671
DN_1	0.361	0.564	0.657	0.26	0.694	<b>0.963</b>	0.587	0.719	0.701	0.698	0.72	0.762	0.735	0.254	0.72	0.324	0.35	0.662	0.708	0.685	0.779
DN_2	0.415	0.611	0.699	0.321	0.746	<b>0.974</b>	0.638	0.752	0.765	0.751	0.794	0.801	0.755	0.332	0.749	0.352	0.352	0.719	0.675	0.751	0.793
DN_3	0.394	0.529	0.642	0.317	0.648	<b>0.959</b>	0.547	0.659	0.7	0.681	0.748	0.786	0.685	0.305	0.768	0.352	0.385	0.723	0.636	0.715	0.79
INT_1	0.456	0.868	0.653	0.335	0.563	0.621	<b>0.974</b>	0.648	0.579	0.605	0.66	0.693	0.735	0.442	0.647	0.419	0.246	0.479	0.753	0.62	0.568
INT_2	0.438	0.811	0.628	0.284	0.534	0.603	<b>0.974</b>	0.63	0.533	0.602	0.638	0.681	0.728	0.417	0.607	0.386	0.223	0.473	0.739	0.591	0.565
INT_3	0.401	0.847	0.576	0.295	0.524	0.58	<b>0.966</b>	0.621	0.543	0.586	0.643	0.644	0.714	0.402	0.614	0.378	0.214	0.485	0.738	0.607	0.563
INT_4	0.476	0.812	0.657	0.296	0.553	0.562	<b>0.944</b>	0.617	0.524	0.581	0.626	0.711	0.698	0.39	0.632	0.395	0.216	0.546	0.715	0.616	0.541
IT_1	0.418	0.685	0.696	0.352	0.738	0.732	0.646	<b>0.977</b>	0.769	0.823	0.761	0.807	0.659	0.335	0.714	0.359	0.373	0.577	0.723	0.703	0.693
IT_2	0.367	0.654	0.675	0.29	0.759	0.706	0.63	<b>0.975</b>	0.737	0.79	0.762	0.766	0.674	0.232	0.652	0.295	0.348	0.584	0.707	0.718	0.71
IT_3	0.374	0.647	0.636	0.319	0.73	0.722	0.635	<b>0.979</b>	0.748	0.827	0.758	0.788	0.636	0.294	0.684	0.325	0.374	0.604	0.707	0.695	0.699
MP_1	0.347	0.564	0.739	0.357	0.816	0.724	0.563	0.749	<b>0.972</b>	0.875	0.813	0.747	0.634	0.351	0.689	0.38	0.463	0.602	0.648	0.748	0.696
MP_2	0.316	0.54	0.714	0.339	0.838	0.735	0.537	0.742	<b>0.98</b>	0.851	0.807	0.729	0.591	0.301	0.661	0.347	0.431	0.584	0.627	0.753	0.691
MP_3	0.289	0.57	0.72	0.318	0.831	0.734	0.555	0.762	<b>0.979</b>	0.847	0.804	0.736	0.612	0.277	0.669	0.297	0.443	0.598	0.645	0.761	0.699
NP_1	0.412	0.574	0.734	0.407	0.737	0.713	0.578	0.812	0.863	<b>0.932</b>	0.783	0.792	0.578	0.376	0.638	0.408	0.417	0.544	0.611	0.704	0.656

NP_2	0.358	0.555	0.678	0.349	0.752	0.721	0.587	0.79	0.886	<b>0.952</b>	0.803	0.761	0.598	0.324	0.621	0.371	0.429	0.563	0.638	0.695	0.684
NP_3	0.377	0.549	0.647	0.371	0.803	0.703	0.597	0.784	0.812	<b>0.956</b>	0.775	0.727	0.603	0.352	0.6	0.384	0.448	0.599	0.643	0.671	0.662
NP_4	0.354	0.516	0.608	0.334	0.705	0.635	0.554	0.747	0.741	<b>0.922</b>	0.692	0.65	0.561	0.329	0.543	0.366	0.38	0.554	0.619	0.596	0.616
OC_1	0.216	0.582	0.634	0.226	0.737	0.713	0.59	0.725	0.803	0.763	<b>0.915</b>	0.761	0.597	0.281	0.638	0.223	0.365	0.539	0.684	0.681	0.589
OC_2	0.372	0.613	0.741	0.295	0.805	0.774	0.662	0.76	0.795	0.798	<b>0.961</b>	0.796	0.711	0.332	0.616	0.323	0.387	0.649	0.725	0.788	0.726
OC_3	0.366	0.632	0.717	0.299	0.791	0.75	0.654	0.754	0.789	0.781	<b>0.964</b>	0.788	0.733	0.337	0.635	0.326	0.402	0.647	0.729	0.783	0.711
OC_4	0.269	0.576	0.679	0.262	0.784	0.733	0.617	0.718	0.762	0.741	<b>0.959</b>	0.744	0.653	0.281	0.599	0.238	0.31	0.561	0.684	0.747	0.622
PA_1	0.414	0.613	0.65	0.289	0.613	0.726	0.621	0.634	0.683	0.641	0.707	<b>0.852</b>	0.63	0.363	0.688	0.388	0.403	0.651	0.664	0.596	0.635
PA_2	0.444	0.669	0.771	0.286	0.749	0.756	0.652	0.795	0.749	0.76	0.806	<b>0.932</b>	0.75	0.285	0.725	0.363	0.413	0.692	0.713	0.759	0.76
PA_3	0.436	0.685	0.771	0.315	0.701	0.788	0.714	0.765	0.72	0.744	0.776	<b>0.962</b>	0.713	0.336	0.735	0.352	0.349	0.659	0.711	0.738	0.703
PA_4	0.453	0.686	0.753	0.32	0.695	0.758	0.702	0.769	0.689	0.732	0.765	<b>0.938</b>	0.733	0.326	0.745	0.36	0.365	0.618	0.677	0.75	0.738
PA_5	0.369	0.635	0.658	0.314	0.657	0.734	0.619	0.764	0.669	0.709	0.746	<b>0.915</b>	0.674	0.249	0.76	0.279	0.382	0.568	0.675	0.72	0.718
PA_6	0.34	0.59	0.667	0.3	0.574	0.689	0.562	0.689	0.631	0.683	0.657	<b>0.891</b>	0.575	0.282	0.692	0.288	0.357	0.531	0.593	0.622	0.644
PBC_1	0.344	0.735	0.638	0.2	0.616	0.661	0.703	0.641	0.554	0.58	0.671	0.717	<b>0.92</b>	0.215	0.619	0.215	0.435	0.594	0.819	0.637	0.677
PBC_2	0.417	0.733	0.653	0.269	0.636	0.713	0.732	0.624	0.597	0.586	0.648	0.686	<b>0.954</b>	0.328	0.724	0.343	0.294	0.574	0.763	0.664	0.739
PBC_3	0.441	0.67	0.678	0.268	0.637	0.718	0.635	0.604	0.594	0.563	0.663	0.668	<b>0.907</b>	0.277	0.699	0.338	0.235	0.607	0.72	0.709	0.641
PC_1	0.641	0.442	0.269	0.725	0.234	0.275	0.428	0.326	0.314	0.366	0.352	0.383	0.268	<b>0.946</b>	0.356	0.688	0.243	0.262	0.321	0.294	0.25
PC_2	0.659	0.346	0.231	0.717	0.208	0.28	0.401	0.244	0.283	0.324	0.274	0.27	0.295	<b>0.948</b>	0.298	0.716	0.123	0.268	0.275	0.263	0.237
PC_3	0.692	0.378	0.202	0.752	0.177	0.321	0.397	0.272	0.307	0.357	0.304	0.306	0.281	<b>0.963</b>	0.367	0.709	0.176	0.325	0.261	0.279	0.269
PE_1	0.385	0.699	0.684	0.335	0.62	0.749	0.635	0.7	0.68	0.614	0.642	0.781	0.698	0.366	<b>0.984</b>	0.38	0.375	0.633	0.638	0.671	0.712
PE_2	0.405	0.684	0.685	0.342	0.62	0.765	0.646	0.66	0.685	0.637	0.651	0.788	0.732	0.378	<b>0.978</b>	0.386	0.411	0.641	0.644	0.695	0.723
PE_3	0.37	0.674	0.673	0.312	0.635	0.749	0.618	0.69	0.655	0.621	0.624	0.749	0.722	0.307	<b>0.97</b>	0.356	0.361	0.615	0.612	0.667	0.749
PL_1	0.691	0.337	0.302	0.592	0.265	0.303	0.418	0.342	0.294	0.389	0.298	0.382	0.316	0.691	0.33	<b>0.93</b>	0.152	0.327	0.296	0.281	0.26
PL_2	0.683	0.262	0.273	0.535	0.22	0.284	0.344	0.268	0.292	0.34	0.219	0.329	0.271	0.668	0.341	<b>0.943</b>	0.043	0.341	0.226	0.247	0.264
PL_3	0.649	0.329	0.278	0.573	0.287	0.378	0.401	0.348	0.378	0.4	0.318	0.369	0.325	0.689	0.392	<b>0.954</b>	0.168	0.412	0.321	0.309	0.356
PL_4	0.687	0.311	0.269	0.619	0.278	0.361	0.382	0.3	0.34	0.4	0.274	0.318	0.3	0.745	0.374	<b>0.951</b>	0.137	0.387	0.277	0.25	0.284
PR_1	0.022	0.235	0.302	0.321	0.33	0.322	0.209	0.332	0.412	0.395	0.345	0.366	0.314	0.163	0.361	0.112	<b>0.960</b>	0.468	0.35	0.358	0.498
PR_2	0.076	0.275	0.359	0.364	0.412	0.384	0.263	0.388	0.471	0.465	0.409	0.432	0.369	0.2	0.396	0.157	<b>0.976</b>	0.482	0.378	0.404	0.521
PR_3	0.084	0.263	0.316	0.373	0.4	0.408	0.24	0.386	0.462	0.458	0.378	0.433	0.354	0.195	0.405	0.155	<b>0.967</b>	0.479	0.376	0.384	0.55
PR_4	-0.01	0.22	0.24	0.32	0.33	0.326	0.179	0.329	0.41	0.394	0.356	0.353	0.299	0.173	0.342	0.088	<b>0.965</b>	0.438	0.321	0.329	0.487

SEV_1	0.398	0.55	0.603	0.407	0.621	0.649	0.526	0.567	0.561	0.588	0.644	0.674	0.577	0.332	0.586	0.377	0.467	<b>0.874</b>	0.562	0.544	0.564
SEV_2	0.372	0.475	0.537	0.341	0.618	0.687	0.484	0.556	0.562	0.551	0.603	0.615	0.632	0.246	0.623	0.361	0.441	<b>0.94</b>	0.55	0.59	0.715
SEV_3	0.349	0.395	0.471	0.31	0.529	0.617	0.452	0.513	0.518	0.487	0.515	0.529	0.569	0.235	0.514	0.361	0.35	<b>0.876</b>	0.493	0.566	0.652
SEV_4	0.34	0.413	0.497	0.347	0.551	0.665	0.437	0.512	0.562	0.525	0.55	0.614	0.565	0.251	0.605	0.34	0.463	<b>0.94</b>	0.502	0.581	0.678
SEV_5	0.334	0.385	0.448	0.356	0.514	0.647	0.394	0.558	0.531	0.547	0.523	0.611	0.516	0.286	0.566	0.315	0.455	<b>0.867</b>	0.45	0.544	0.691
SN_1	0.353	0.741	0.57	0.188	0.573	0.612	0.708	0.685	0.572	0.582	0.63	0.631	0.739	0.229	0.598	0.253	0.338	0.481	<b>0.947</b>	0.568	0.553
SN_2	0.368	0.75	0.612	0.231	0.638	0.672	0.742	0.672	0.622	0.624	0.729	0.709	0.815	0.275	0.608	0.253	0.36	0.556	<b>0.966</b>	0.647	0.608
SN_3	0.425	0.753	0.667	0.278	0.638	0.702	0.726	0.72	0.671	0.695	0.758	0.754	0.805	0.346	0.637	0.343	0.356	0.591	<b>0.938</b>	0.699	0.641
TR_1	0.389	0.588	0.776	0.349	0.694	0.744	0.605	0.654	0.724	0.694	0.775	0.723	0.703	0.325	0.695	0.284	0.437	0.588	0.636	<b>0.919</b>	0.692
TR_2	0.4	0.58	0.751	0.365	0.711	0.703	0.597	0.679	0.729	0.689	0.767	0.717	0.677	0.29	0.643	0.305	0.418	0.673	0.635	<b>0.951</b>	0.705
TR_3	0.425	0.575	0.795	0.355	0.715	0.712	0.591	0.675	0.736	0.665	0.75	0.736	0.679	0.28	0.658	0.295	0.326	0.597	0.623	<b>0.961</b>	0.715
TR_4	0.399	0.598	0.811	0.34	0.751	0.718	0.61	0.702	0.762	0.678	0.754	0.746	0.691	0.271	0.672	0.246	0.343	0.577	0.655	<b>0.972</b>	0.704
TR_5	0.433	0.593	0.829	0.334	0.747	0.712	0.625	0.709	0.759	0.695	0.753	0.754	0.707	0.271	0.664	0.298	0.369	0.627	0.659	<b>0.969</b>	0.711
TR_6	0.375	0.6	0.8	0.33	0.732	0.692	0.6	0.708	0.745	0.671	0.755	0.721	0.691	0.267	0.656	0.24	0.329	0.586	0.655	<b>0.955</b>	0.679
TR_7	0.383	0.552	0.739	0.285	0.682	0.654	0.56	0.663	0.666	0.61	0.702	0.676	0.645	0.239	0.617	0.253	0.325	0.52	0.602	<b>0.914</b>	0.667
VUL_1	0.146	0.334	0.481	0.303	0.487	0.567	0.345	0.43	0.559	0.52	0.502	0.512	0.509	0.23	0.548	0.321	0.625	0.595	0.409	0.504	<b>0.771</b>
VUL_2	0.297	0.557	0.635	0.272	0.634	0.769	0.572	0.638	0.651	0.62	0.667	0.72	0.729	0.297	0.705	0.346	0.448	0.677	0.621	0.681	<b>0.919</b>
VUL_3	0.218	0.555	0.593	0.251	0.619	0.817	0.58	0.671	0.689	0.625	0.691	0.744	0.688	0.248	0.757	0.249	0.43	0.696	0.614	0.695	<b>0.924</b>
VUL_4	0.232	0.491	0.605	0.266	0.657	0.749	0.512	0.69	0.623	0.634	0.633	0.71	0.693	0.195	0.648	0.193	0.483	0.598	0.582	0.676	<b>0.917</b>
VUL_5	0.306	0.477	0.558	0.325	0.646	0.668	0.515	0.7	0.61	0.661	0.577	0.664	0.623	0.198	0.606	0.272	0.414	0.65	0.538	0.66	<b>0.869</b>

**Table 7.12 Fornell-Larcker's Criterion Assessment**

	AC	ATT	CA	CI	CP	DN	INT	IT	MP	NP	OC	PA	PBC	PC	PE	PI	PR	SEV	SN	TR	VUL
AC	<b>0.967</b>																				
ATT	0.432	<b>0.964</b>																			
CA	0.409	0.654	<b>0.984</b>																		
CI	0.69	0.31	0.283	<b>0.897</b>																	
CP	0.343	0.542	0.785	0.296	<b>0.978</b>																
DN	0.405	0.59	0.691	0.31	0.723	<b>0.966</b>															
INT	0.458	0.866	0.651	0.314	0.563	0.613	<b>0.965</b>														
IT	0.396	0.678	0.685	0.328	0.76	0.737	0.652	<b>0.977</b>													
MP	0.325	0.571	0.742	0.346	0.848	0.749	0.565	0.769	<b>0.977</b>												
NP	0.398	0.583	0.708	0.388	0.797	0.737	0.615	0.833	0.878	<b>0.941</b>											
OC	0.327	0.633	0.731	0.287	0.821	0.782	0.665	0.778	0.827	0.812	<b>0.95</b>										
PA	0.449	0.707	0.779	0.332	0.728	0.811	0.707	0.806	0.755	0.778	0.813	<b>0.916</b>									
PBC	0.432	0.769	0.708	0.265	0.679	0.752	0.745	0.672	0.627	0.622	0.712	0.745	<b>0.927</b>								
PC	0.698	0.407	0.244	0.769	0.215	0.308	0.428	0.294	0.317	0.367	0.325	0.335	0.295	<b>0.952</b>							
PE	0.396	0.702	0.697	0.338	0.639	0.772	0.648	0.7	0.689	0.638	0.654	0.791	0.734	0.359	<b>0.977</b>						
PI	0.715	0.329	0.296	0.614	0.28	0.355	0.409	0.334	0.349	0.406	0.295	0.37	0.322	0.739	0.383	<b>0.944</b>					
PR	0.049	0.258	0.318	0.358	0.384	0.375	0.233	0.373	0.456	0.445	0.386	0.413	0.348	0.19	0.391	0.135	<b>0.967</b>				
SEV	0.401	0.498	0.573	0.393	0.633	0.726	0.514	0.602	0.609	0.601	0.634	0.678	0.638	0.301	0.644	0.392	0.484	<b>0.9</b>			
SN	0.403	0.787	0.649	0.245	0.649	0.697	0.764	0.729	0.655	0.667	0.744	0.735	0.828	0.299	0.647	0.299	0.37	0.572	<b>0.951</b>		
TR	0.422	0.615	0.829	0.355	0.758	0.743	0.631	0.722	0.772	0.709	0.792	0.764	0.722	0.293	0.694	0.289	0.384	0.628	0.673	<b>0.949</b>	
VUL	0.277	0.555	0.654	0.319	0.694	0.815	0.58	0.717	0.712	0.696	0.7	0.766	0.741	0.266	0.744	0.312	0.533	0.731	0.633	0.734	<b>0.882</b>

The reliability and validity of the constructs were assessed accordingly. Table 7.10 shows that the loadings of all items and composite reliability (CR) of all constructs were above 0.7, implying significant results of reliability. All constructs exhibit AVE above the threshold of 0.5, which reflects a satisfactory degree value of convergent validity.

To assess discriminant validity of the constructs, cross loadings were first examined (Table 7.11). It was found that no indicator loadings were higher than the opposing constructs. Next, the square root of each construct's AVE was compared with the inter-correlations of the construct with the other latent construct. Table 7.12 reveals that the square root of each constructs' AVE was higher than the constructs' correlation with the other constructs in the model. These assessments further confirm that the discriminant validity of all constructs was satisfactorily met. The graphical illustration of the whole measurement model is shown in Appendix 8.

### **7.7.2 Structural Model Assessment (N=128)**

After the reliability and validity of the items and constructs have been ascertained and confirmed, the subsequent step is to evaluate the structural model's result. Before proceeding to other interpretations, collinearity issues should be first addressed (Hair et al., 2014). Absence of correlations between independent variables in regressions should be met as multicollinearity would cause difficulty to determine the separate effects of individual variables (Saunders, Lewis, & Thornhill, 2012a).

The level of collinearity can be measured by tolerance value and variance inflation factor (VIF). In the context of PLS-SEM, a tolerance value of 0.20 or lower, and a Variance Inflation Factor (VIF) of 5 or higher would indicate serious collinearity issues (Hair et al., 2011). To assess the presence of collinearity in this study, VIF values for all predictors (independent variables) were determined and further presented in Appendix 7.0. The results show that all VIF values are less than 5 and are within the acceptable range. Thus, collinearity is not an issue in the data sets. The results offer confidence that the structural model results would not be negatively affected by collinearity issues.

Both PLS Algorithm (path weighting scheme) with maximum iterations of 300 and a bootstrapping procedure of 128 cases and 5,000 samples were undertaken to perform the following:

- I. To evaluate the level of  $R^2$  value (Predictive accuracy of the model)
- II. To evaluate the significance and relevance of the structural model relationships (assessment of structural model path coefficients/hypothesis testing)
- III. To assess the effect sizes  $f^2$
- IV. To assess the predictive relevance  $Q^2$  and the  $q^2$  effect sizes.

#### **7.7.2.1 Assessment of $R^2$ values of the Endogenous Construct (N=128)**

To start with, the  $R^2$  values of the endogenous construct were examined. The rule of thumb dictates that  $R^2$  values of 0.75, 0.50, or 0.25 can be described as substantial, moderate, or weak respectively (Hair et al., 2011). Table 7.13 below shows the  $R^2$  values of each endogenous construct and their respective interpretations.

**Table 7.13  $R^2$  Values**

Construct	$R^2$ values	Interpretations
Attitude (ATT)	0.5632	Moderate
Descriptive Norms (DN)	0.5606	Moderate
Intention (INT)	0.774	<b>Substantial</b>
Perceived Behavioural Control (PBC)	0.5821	Moderate
Perceived Severity (SEV)	0.2174	Weak
Subjective Norm (SN)	0.555	Moderate
Perceived Vulnerability (VUL)	0.1266	Weak

The  $R^2$  values of intention (0.774) shows substantial amount of variance in selection behaviour. The  $R^2$  values for attitude (0.5632), descriptive norms (0.5606), perceived behavioural control (0.5821), and subjective norm (0.555) can be considered moderate; while both perceived severity (0.2174) and perceived vulnerability (0.1266) can be considered weak. The graphical representation of the  $R^2$  values of the model is shown in Appendix 9.

#### **7.7.2.2 Assessment of Structural Model Path Coefficients (N=128)**

After PLS-SEM algorithm was performed, the structural model relationships (path coefficient) can be obtained. The path coefficient represents the hypothesized relationships among the model constructs (Hair et al., 2014). Empirical  $t$  value is computed to determine the significance level of the path coefficient. For the two-tailed test, the critical  $t$ -values are

1.65 (significance level =10%), 1.96 (significance level =5%), and 2.58 (significance level =1%) (Hair et al., 2011). The structural model relationships are shown in Table 7.14 below, and the graphical representation of the model is shown in Appendix 10.

**Table 7.14 Path Significance Testing Results**

R <sup>2</sup> values (Endogenous Construct)	Hypothes is	Path	Hypothesis Test		
			Path Coefficient ( $\beta$ )	T-Statistics (t)	Interpretation
<b>Intention (R<sup>2</sup> =0.774)</b>	H <sub>1</sub>	<b>Attitude → Intention</b>	<b>0.6679</b>	<b>6.836***</b>	<b>Supported</b>
	H <sub>2</sub>	Subjective Norm → Intention	0.13	1.219	Not Supported
	H <sub>3</sub>	Perceived Behavioural Control → Intention	0.0477	0.447	Not Supported
	H <sub>4</sub>	Perceived Severity → Intention	0.0047	0.0504	Not Supported
	H <sub>5</sub>	Perceived Vulnerability → Intention	0.0462	0.5302	Not Supported
	H <sub>6</sub>	Descriptive Norm → Intention	0.0519	0.4654	Not Supported
<b>Attitude (R<sup>2</sup> =0.5632)</b>	H <sub>1a</sub>	Trust → Attitude	0.1144	0.9526	Not Supported
	H <sub>1b</sub>	<b>Perceived Relative Advantage → Attitude</b>	<b>0.3627</b>	<b>1.7623*</b>	<b>Supported</b>
	H <sub>1c</sub>	<b>Perceived Ease of Use → Attitude</b>	<b>0.366</b>	<b>2.1395**</b>	<b>Supported</b>
	H <sub>1d</sub>	Perceived Risk → Attitude	-0.0782	1.0841	Not Supported
<b>Subjective Norm (R<sup>2</sup> =0.555)</b>	H <sub>2a</sub>	<b>Internal Team Influence → Subjective Norm</b>	<b>0.5063</b>	<b>3.3553***</b>	<b>Supported</b>
	H <sub>2b</sub>	Coercive Pressure → Subjective Norm	0.1871	1.3457	Not Supported
	H <sub>2c</sub>	Normative Pressure → Subjective Norm	0.0967	0.7098	Not Supported
<b>Perceived Behavioural Control (PBC) (R<sup>2</sup> =0.5821)</b>	H <sub>3a</sub>	<b>Consensus on Appropriation → Perceived Behavioural Control</b>	<b>0.4013</b>	<b>3.844***</b>	<b>Supported</b>
	H <sub>3b</sub>	<b>Organisational Competency → Perceived Behavioural Control</b>	<b>0.4187</b>	<b>3.6286***</b>	<b>Supported</b>
<b>Perceived Severity (R<sup>2</sup> =0.2174)</b>	H <sub>4a</sub>	<b>Perceived Importance → Perceived Severity</b>	<b>0.2638</b>	<b>1.6893*</b>	<b>Supported</b>
	H <sub>4c</sub>	Perceived Complexity → Perceived Severity	-0.248	1.5138	Not Supported
	H <sub>4e</sub>	Amount in Controversy → Perceived Severity	0.18	0.9034	Not Supported
	H <sub>4g</sub>	<b>Conflict Intensity → Perceived Severity</b>	<b>0.2973</b>	<b>1.75*</b>	<b>Supported</b>
<b>Perceived Vulnerability (R<sup>2</sup> =0.2174)</b>	H <sub>4b</sub>	Perceived Importance → Perceived Vulnerability	0.2225	1.3821	Not Supported
	H <sub>4d</sub>	Perceived Complexity → Perceived Vulnerability	-0.1026	0.5342	Not Supported
	H <sub>4f</sub>	Amount in Controversy → Perceived Vulnerability	0.0173	0.0805	Not Supported
	H <sub>4h</sub>	<b>Conflict Intensity → Perceived Vulnerability</b>	<b>0.2495</b>	<b>1.8477*</b>	<b>Supported</b>
<b>Descriptive Norm (R<sup>2</sup> =0.561)</b>	H <sub>6a</sub>	<b>Mimetic Pressure → Descriptive Norm</b>	<b>0.7487</b>	<b>13.6659***</b>	<b>Supported</b>

\*\*\* Significant at  $p<0.01$ , 1%, \*\* Significant at  $p<0.05$ , 5%, \*Significant at  $p<0.1$ , 10%

The hypotheses were tested by examining the path coefficient and t-statistics. The result shows that the model is structurally good ( $R^2=0.774$ ) and sufficient in predicting behavioural intention to use ADR. All hypotheses were rejected except:  $H_1$  Attitude → Intention ( $\beta=0.6679$ ,  $t=6.836$ ,  $p<0.01$ );  $H_{1b}$  Perceived Relative Advantage → Attitude ( $\beta=0.3627$ ,  $t=1.7623$ ,  $p<0.1$ );  $H_{1c}$  Perceived Ease of Use → Attitude ( $\beta=0.366$ ,  $t=2.1395$ ,  $p<0.05$ );  $H_{2a}$  Internal Team Influence → Subjective Norm ( $\beta=0.5063$ ,  $t=3.3553$ ,  $p<0.01$ );  $H_{3a}$  Consensus on Appropriation → Perceived Behavioural Control ( $\beta=0.4013$ ,  $t=3.844$ ,  $p<0.01$ );  $H_{3b}$  Organisational Competency → Perceived Behavioural Control ( $\beta=0.4187$ ,  $t=3.6286$ ,  $p<0.01$ );  $H_{4a}$  Perceived Importance → Perceived Severity ( $\beta=0.2638$ ,  $t=1.6893$ ,  $p<0.1$ );  $H_{4g}$  Conflict Intensity → Perceived Severity ( $\beta=0.2973$ ,  $t=1.75$ ,  $p<0.1$ ),  $H_{4h}$  Conflict Intensity → Perceived Vulnerability ( $\beta=0.2495$ ,  $t=1.8477$ ,  $p<0.1$ );  $H_{6a}$  Mimetic Pressure → Descriptive Norm ( $\beta=0.7487$ ,  $t=13.6659$ ,  $p<0.01$ ).

### 7.7.2.3 Assessment of Effect Size (N=128)

Next, the effect sizes for confirmed hypotheses were computed according to the procedure provided by Hair et al. (2014). Effect size indicates the contributions and impact of the exogenous construct on the endogenous construct. Results of 0.02, 0.15 and 0.35 are interpreted as small, medium, and large  $f^2$  effect sizes respectively (Hair et al., 2011). The results of the effect sizes are presented in Table 7.15:

**Table 7.15 Effect Size Result for Confirmed Hypothesised Path**

Hypothesis	Path	Effect Sizes	
		$f^2$	Interpretation
$H_1$	Attitude → Intention	0.660	Large
$H_{1b}$	Perceived Relative Advantage → Attitude	0.085	Small
$H_{1c}$	Perceived Ease of Use → Attitude	0.108	Small
$H_{2a}$	Internal Team Influence → Subjective Norm	0.373	Large
$H_{3a}$	Consensus on Appropriation → Perceived Behavioural Control	0.179	Medium
$H_{3b}$	Organisational Competency → Perceived Behavioural Control	0.194	Medium
$H_{4a}$	Perceived Importance → Perceived Severity	0.032	Small
$H_{4g}$	Conflict Intensity → Perceived Severity	0.041	Small
$H_{4h}$	Conflict Intensity → Perceived Vulnerability	0.026	Small
$H_{6a}$	Mimetic Pressure → Descriptive Norm	-	-

#### 7.7.2.4 Assessment of Predictive Relevance $Q^2$ (N=128)

The measure of the model's predictive relevance can be examined with Stone-Geisser's  $Q^2$  value.  $Q^2$  value is examined by using blindfolding procedure. Notably, the procedure is only applicable for reflective or single item constructs (Hair et al., 2014). In this assessment, the omission distance (D) should be within the range of 5 to 10, where the number of valid observations divided by (D) is not an integer. In this study, the number of valid observations was 128, and the omission distance (D) was set to 7 so that the number of valid observations divided by (D) is not an integer. Cross validated redundancy was used as a measure of  $Q^2$  (Hair et al., 2011). As long as the measure value  $Q^2$  for a certain endogenous construct is larger than zero, its explanatory construct demonstrates predictive relevance (Hair et al., 2011).

With respect to Intention (INT),  $Q^2$  has a predictive relevance of 0.7173, reflecting a good predictive relevance for intention. In general, cross validated redundancy  $Q^2$  above 0.5 is indicative of a predictive model (Chin, 2010). Subsequently,  $Q^2$  for other endogenous constructs were computed and are overall presented in Table 7.16 below:

**Table 7.16 Predictive Relevance of Endogenous Construct**

Construct	R <sup>2</sup> Value	Q <sup>2</sup> Value
Attitude (ATT)	0.5632	0.5278
Descriptive Norms (DN)	0.5606	0.5154
Intention (INT)	0.774	0.7173
Perceived Behavioural Control (PBC)	0.5821	0.5024
Perceived Severity (SEV)	0.2174	0.1706
Subjective Norm (SN)	0.555	0.4939
Perceived Vulnerability (VUL)	0.1266	0.1052

All  $Q^2$  values are considerably above zero, providing support for the path model's predictive relevance related to the endogenous constructs. Next, the  $q^2$  values should be assessed to reflect the relevance of each construct to the endogenous construct in the structural model (Hair et al., 2014). Similarly, the interpretation of the  $q^2$  values uses the same critical values for assessment used for the evaluation of  $f^2$  effect size. 0.02, 0.15 and 0.35 are interpreted as small, medium, and large  $q^2$  effect sizes respectively (Hair et al., 2011).

The overall  $q^2$  values for the constructs in the confirmed paths are shown in **Table 7.17 below:**

**Table 7.17 Summary of Predictive Relevance**

Hypothesis	Path	Path Coefficient ( $\beta$ )	f2 Effect Size	q2 Effect Size
$H_1$	Attitude → Intention	0.6679	0.660 (large)	0.464 (large)
$H_{1b}$	Perceived Relative Advantage → Attitude	0.3627	0.085(small)	0.0712 (small)
$H_{1c}$	Perceived Ease of Use → Attitude	0.366	0.108(small)	0.099 (small)
$H_{2a}$	Internal Team Influence → Subjective Norm	0.5063	0.373(large)	0.113 (small)
$H_{3a}$	Consensus on Appropriation → Perceived Behavioural Control	0.4013	0.179(medium)	0.143 (small)
$H_{3b}$	Organisational Competency → Perceived Behavioural Control	0.4187	0.194(medium)	0.152 (medium)
$H_{4a}$	Perceived Importance → Perceived Severity	0.2638	0.032 (small)	0.0225 (small)
$H_{4g}$	Conflict Intensity → Perceived Severity	0.2973	0.041(small)	0.023(small)
$H_{4h}$	Conflict Intensity → Perceived Vulnerability	0.2495	0.026 (small)	0.0263 (small)
$H_{6a}$	Mimetic Pressure → Descriptive Norm	0.7487	-	-

### 7.7.2.5 Moderator Analysis

In many situations, the effect of an exogenous construct on another endogenous construct depends on another variable (Hair et al., 2014). This situation is referred to as the “moderator effect”, where the moderator changes or influences the strength of relationship between two constructs in the model. In this study, voluntariness from mutual consent and voluntariness in ADR use are two conceptual moderators. Voluntariness from mutual consent (VolCon) negatively moderates the positive relationship between consensus on appropriation and perceived behavioural control (Hypothesis Moderation 1: HM<sub>1</sub>); while voluntariness in ADR Use (VolUse) negatively moderates the positive relationship between subjective norm (SN) and intention (INT) (Hypothesis Moderation 2: HM<sub>2</sub>). Both moderators are treated as continuous moderating effects. To evaluate these moderating effects, the product indicator approach (PIA) was employed following guidelines provided by Hair et al. (2014).

To employ the product indicator approach, the original model needs to be extended by inserting both moderators VolCon and VolUse into the original conceptual model. The extended original model is now called the “main effects model”. The main effect model

comprises the original model and two variables: VolCon is linked to perceived behavioural control (PBC); while VolUse is linked to intention (INT).

Next, interaction terms need to be created in the model. Once the interactions are created for both VolCon\*Consensus on Appropriation (CA), and VolUse\*Subjective Norm (SN), further analysis can be done by running PLS-SEM algorithm by using the path weighting scheme.

The final moderating model now (Appendix 11) can be evaluated. First, the measurement model of the moderating model is examined. No indicators were removed since all loadings for VolCon and VolUse exceeded the minimum threshold (0.70). The outer loadings of the indicators for VolUse are VolUse\_1 (0.965), VolUse\_2 (0.977), VolUse\_3 (0.961); while the outer loadings for VolCon are VolCon\_1 (0.981), VolCon\_2 (0.984), and VolCon\_3 (0.986). The composite reliability for both VolCon and VolUse are 0.9890 and 0.9779. The results suggest high loadings for the interaction terms.

The moderating model shows a negative interaction term of VolCon\*CA (-0.029); and a negative interaction term of VolUSe\*SN (-0.083). Consequently, a bootstrapping procedure (128 Cases, 5000 sample) was performed to confirm the significance of the interaction term. It was found that only voluntariness in ADR Use (VolUse) negatively moderates positive relationship between subjective norm (SN) and intention (INT).The interaction term is significant ( $\beta=-0.0828, p<0.10$ ).

**Table 7.18 Moderating Results**

Hypothesis	Path	Hypothesis Test		
		Path Coefficient ( $\beta$ )	T-Statistics ( $t$ )	Interpretation
<b>HM<sub>1</sub></b>	Voluntariness from mutual consent (VolCon) negatively moderates the positive relationship between consensus on appropriation and perceived behavioural control	-0.029	0.445	Not Supported
<b>HM<sub>2</sub></b>	Voluntariness in ADR Use (VolUse) negatively moderates positive relationship between subjective norm (SN) and intention (INT)	-0.0828	1.958*	Supported

### 7.7.2.6 Overall Total Effects on Intention

The empirical result of the model (N=128) overall provides plausible evidence that attitude (ATT) is the sole and best predictor of intention (INT), while the significant predictors of attitude (ATT) are both perceived relative advantage (PA) and perceived ease of

use (PE). To reconfirm the findings, overall total effects of all latent variables on intention ( $N=128$ ) was examined and shown in Table 7.19 below:

**Table 7.19 Total Effects of All Latent Variables on Intention**

Path	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	Standard Error (STERR)	T Statistics ( O/STERR )
<b>AC → INT</b>	0.0016	0.0021	0.0307	0.0307	0.0535
<b>ATT → INT</b>	0.6679	0.6569	0.0981	0.0981	6.812***
<b>CA → INT</b>	0.0192	0.0256	0.0449	0.0449	0.4266
<b>CI → INT</b>	0.0129	0.0053	0.0379	0.0379	0.3411
<b>CP → INT</b>	0.0243	0.0187	0.0279	0.0279	0.8702
<b>DN → INT</b>	0.0519	0.0475	0.113	0.113	0.4592
<b>IT → INT</b>	0.0658	0.0699	0.0638	0.0638	1.032
<b>MP → INT</b>	0.0388	0.0357	0.0848	0.0848	0.4578
<b>NP → INT</b>	0.0126	0.0129	0.0243	0.0243	0.517
<b>OC → INT</b>	0.02	0.0287	0.049	0.049	0.4077
<b>PA → INT</b>	0.2423	0.2198	0.1395	0.1395	1.7366*
<b>PBC → INT</b>	0.0477	0.0644	0.1079	0.1079	0.4425
<b>PC → INT</b>	-0.0059	0.0032	0.0304	0.0304	0.1941
<b>PE → INT</b>	0.2445	0.2554	0.1153	0.1153	2.1207**
<b>PI → INT</b>	0.0115	0.0129	0.0356	0.0356	0.3235
<b>PR → INT</b>	-0.0522	-0.0553	0.0504	0.0504	1.0374
<b>SEV → INT</b>	0.0047	0.0037	0.0928	0.0928	0.0506
<b>SN → INT</b>	0.13	0.1283	0.1078	0.1078	1.2064
<b>TR → INT</b>	0.0764	0.0823	0.0834	0.0834	0.9157

Significant at  $p<0.01^{***}$ ;  $p<0.05^{**}$ ,  $p<0.10^*$

The empirical results from Table 7.19 above confirm that both constructs such as perceived relative advantage (PA) and perceive ease of use (PE) have considerable importance to intention (INT). Total effects of perceived relative advantage (PA) on intention (INT) is 0.2423, significant at  $t=1.7366$ ,  $p<0.10$ . Total effects of perceived ease of use (PE) on intention (INT) on the other hand is 0.2445, significant at  $t= 2.1207$ ,  $p<0.05$ .

### 7.7.2.7 Discussion

Overall, the path model (ADR decision-making behavioural model) exhibits good predictive relevance for selection behaviour (intention to use ADR), as the  $Q^2$  value is 0.7173, which exceeds 0 and more than 0.5. Intention is explained 77.4% by the latent variables, and attitude towards ADR use significantly influence intention ( $\beta=0.6679$ , significant at  $p<0.01$ ). Attitude has a large effect on intention ( $f^2=0.660$ ), and large predictive relevance for intention ( $q^2=0.464$ ).

Two other predictors were found to influence attitude significantly. Perceived relative advantage (PA) significantly influences attitude (ATT) ( $\beta=0.3627$ ,  $t=1.7623$ ,  $p<0.1$ ); and

similarly perceived ease of use significantly influences attitude (ATT) ( $\beta=0.366$ ,  $t=2.1395$ ,  $p <0.05$ ). Both perceived relative advantage (PA) and perceived ease of use (PE) have a small effect on attitude (ATT) ( $f^2=0.085$ , and 0.108), and each has small predictive relevance for attitude (ATT) as well ( $q^2=0.0712$ , and 0.099). This explains that both constructs have equal relevance to the prediction of attitude (ATT). These findings confirm that attitudinal dimensions prevail over other dimensions.

## 7.8 Chapter Summary

This chapter overall evaluates the conceptualised ADR decision-making behavioural model. The evaluation of the model aims to explain and understand the underlying decision-making process in ADR use. Preliminary analysis of the non-response bias test showed the data sets are free from non-response bias; normality was within acceptable range, and the data sets were free from the common method bias. The measurement model exhibited reliability and validity of the constructs; while the structural model confirmed the predictive relevance of the model. “Attitude” (ATT) was found to be the sole predictor of intention (INT) (selection behaviour); while both “perceived ease of use” (PE) and “perceived relative advantage” (PA) were found to be predictors of “attitude” (ATT). Overall, only one major hypothesis was accepted, while 10 sub-hypotheses were accepted. The relationships between important variables and behavioural intention (selection behaviour) were determined in this chapter. The overall graphical representation of the model is further illustrated in Figure 7.1 below.

To further complement the findings above, and because of both merits and constraints of sample size obtained for each scenario in this study, the TPB model (without revision) were tested separately and specifically on Scenario A; n=37 and Scenario D; n=64. The role of these scenarios were tested and presented subsequently in the next chapter (Chapter 8).

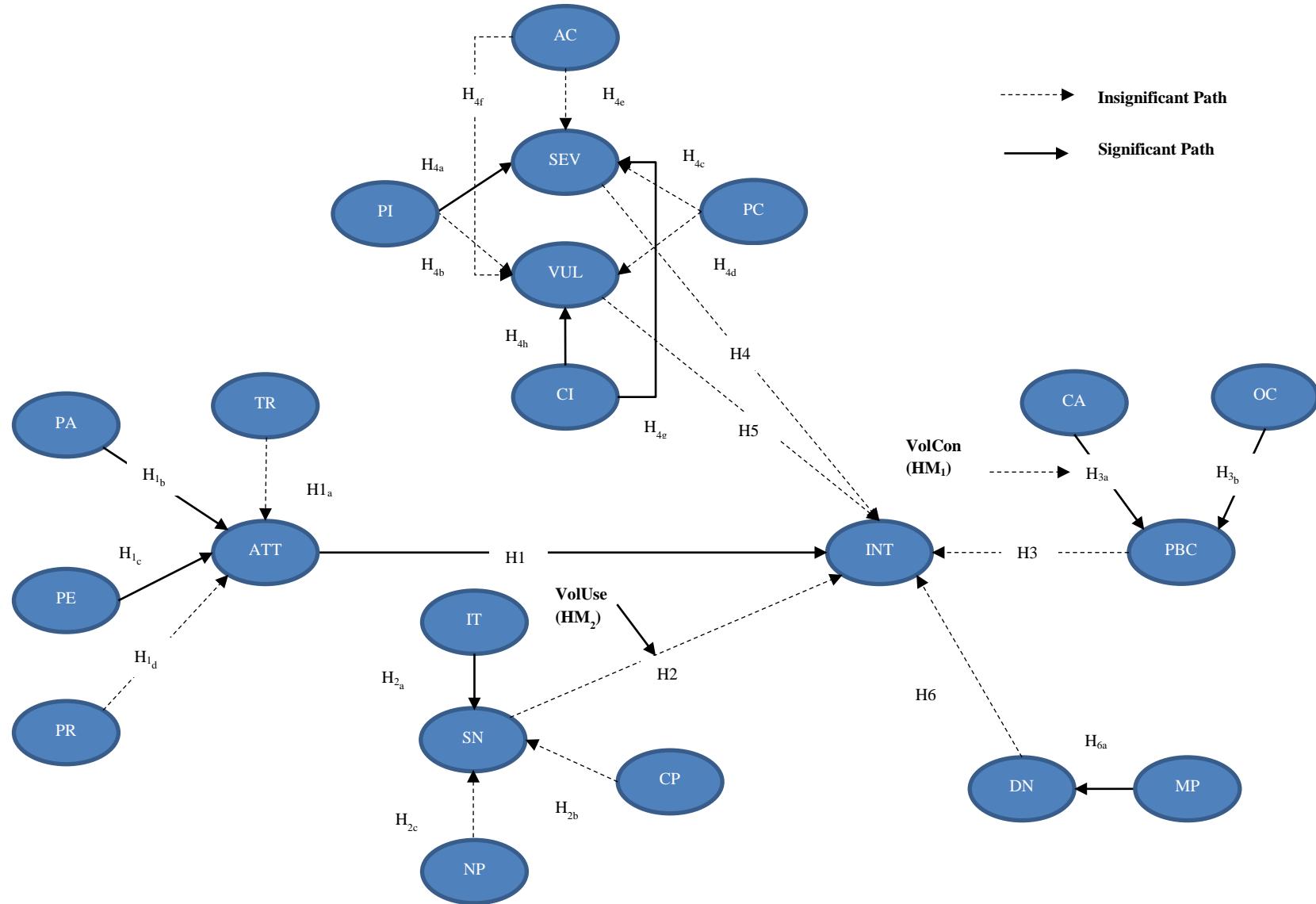


Figure 7.1 Confirmed Hypothesis

## **8. CHAPTER 8: A TEST OF THEORY OF THE PLANNED BEHAVIOUR-ROLE OF SCENARIOS IN ATTITUDINAL/BEHAVIOURAL DIMENSION**

(This chapter is extracted from the manuscript: “Predicting Intention to Use Alternative Dispute Resolution (ADR): An Empirical Test of Theory of Planned Behaviour (TPB) Model” *Journal of Management in Engineering*. Submitted for review)

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### **8.1 Introduction**

In the previous chapter, attitude (ATT) is the sole predictor of intention (INT) (selection behaviour). As previously mentioned, all data were obtained based on 4 scenarios (Scenario A, B, C, and D) that were embedded within the survey questionnaire. All pooled data (all scenarios) confirmed the predictive relevance of the conceptual ADR decision-making behavioural model, and significantly show the evidence of attitudinal dimensions as the most important factors that influence selection behaviour. Two significant predictors of attitude (ATT) are perceived relative advantage (PA) and perceived ease of use (PE).

Due to the complexity of the ADR decision-making model (6 main hypotheses and 20 sub-hypotheses), and coupled with the merits and limitations of data sets for each scenario, this chapter employs the original Theory Planned Behaviour (3 main hypotheses) in two different scenarios (Scenario A, n=37 cases; and Scenario D, N=64 cases) in order to examine the influence of attitude (ATT) towards intention (INT) to use ADR.

In the TPB model, there are three maximum arrows (attitude, subjective norm, and perceived behavioural control) pointing towards dependant variable (intention), and implies that the minimum sample sizes required for PLS modelling should at least meet 30 cases (10 times rule). Hence, this justifies the need to evaluate only two scenarios (Scenario A, N=37 cases; Scenario D, N=64 cases) with PLS-SEM. Scenario B (N=13 cases) and Scenario C (N=14 cases) were not part of the evaluation due to their limitation to meet the 10 times rule.

### **8.2 Study Aims**

This chapter aims to investigate and evaluate the predictive relevance of the Theory of Planned Behaviour (original TPB model without extension) in predicting intention to use

ADR in two scenarios (A and D), and accordingly evaluate the significant contributions of attitude (ATT) towards intention (INT) in these two scenarios.

### **8.3 Methodology**

To achieve the aims, both measurement and structural assessment of the TPB model were evaluated for Scenario A and D. All modelling procedures presented in Chapter 7 were adopted in this chapter. The TPB model posits that intention is predicted by attitude, subjective norm, and perceived behavioural control. Therefore, there are three hypotheses to be tested for Scenario A and D:

$H_0$ : Attitude (ATT) relates positively with Intention (INT)

$H_\beta$ : Subjective Norm (SN) relates positively with Intention (INT)

$H_\gamma$ : Perceived Behavioural Control (PBC) relates positively with Intention (INT)

### **8.4 Measurement Model (Scenario A & D)**

In scenario A, 37 respondents were facing disputes in their projects and were in the stage of deciding on which ADR method was to be used for dispute settlement; while in Scenario D, 64 respondents were in the stage of negotiating claims in their projects. Respondents in scenario A were required to select an ADR to settle their corresponding disputes; while respondents in Scenario D were instructed to select an ADR method to settle their dispute if negotiation failed.

To assess the reliability and validity of the data sets, the internal consistency reliability was assessed with composite reliability, while indicator reliability was assessed with indicator loadings. As for the validity assessments, convergent validity and discriminant validity were assessed with Average Variance Extracted (AVE). Overall, the validity and reliability results of measurement model for Scenarios A and D were presented in Table 8.1 below; while the results of cross loadings and Fornell-Larcker criterion are shown in Table 8.2 and 8.3 below.

**Table 8.1 Validity and Reliability Results of Measurement Model (Scenario A & D)**

Constructs	Items	Loadings (Scenario)		Composite Reliability (Scenario)		Average Variance Extracted (AVE) (Scenario)	
		A	D	A	D	A	D
Attitude (ATT)	ATT_1	0.9713	0.9731	0.9840	0.9801	0.9536	0.9427
	ATT_2	0.9740	0.9817				
	ATT_3	0.9843	0.9578				
Intention (INT)	INT_1	0.9797	0.9713	0.9793	0.9819	0.9221	0.9312
	INT_2	0.9681	0.9746				
	INT_3	0.9401	0.9667				
	INT_4	0.9528	0.9471				
Perceived Behavioural Control (PBC)	PBC_1	0.9584	0.9206	0.9725	0.9556	0.9218	0.8776
	PBC_2	0.9712	0.9642				
	PBC_3	0.9505	0.9251				
Subjective Norm (SN)	SN_1	0.9651	0.9611	0.9768	0.9714	0.9334	0.9189
	SN_2	0.9661	0.9732				
	SN_3	0.9671	0.9412				

**Table 8.2 Cross Loadings Assessments (Scenario A & D)**

Scenario A	ATT	INT	PBC	SN	Scenario D	ATT	INT	PBC	SN
ATT_1	<b>0.9713</b>	0.8801	0.7816	0.8399	ATT_1	<b>0.9731</b>	0.8516	0.8116	0.7826
ATT_2	<b>0.974</b>	0.8813	0.8279	0.8167	ATT_2	<b>0.9817</b>	0.8505	0.7863	0.774
ATT_3	<b>0.9843</b>	0.8994	0.799	0.8097	ATT_3	<b>0.9578</b>	0.82	0.7865	0.7559
INT_1	0.8918	<b>0.9797</b>	0.755	0.7592	INT_1	0.8762	<b>0.9713</b>	0.7573	0.7552
INT_2	0.8537	<b>0.9681</b>	0.7592	0.6779	INT_2	0.8016	<b>0.9746</b>	0.7647	0.7653
INT_3	0.8883	<b>0.9401</b>	0.749	0.7592	INT_3	0.8399	<b>0.9667</b>	0.724	0.7241
INT_4	0.8538	<b>0.9528</b>	0.7248	0.6722	INT_4	0.8228	<b>0.9471</b>	0.7417	0.7508
PBC_1	0.7999	0.7134	<b>0.9584</b>	0.8276	PBC_1	0.7884	0.7591	<b>0.9206</b>	0.8414
PBC_2	0.8284	0.7977	<b>0.9712</b>	0.8175	PBC_2	0.744	0.7244	<b>0.9642</b>	0.7551
PBC_3	0.7365	0.7252	<b>0.9505</b>	0.7413	PBC_3	0.7666	0.6878	<b>0.9251</b>	0.7554
SN_1	0.7862	0.6851	0.7416	<b>0.9651</b>	SN_1	0.7172	0.6989	0.7725	<b>0.9611</b>
SN_2	0.8118	0.7461	0.8232	<b>0.9661</b>	SN_2	0.7655	0.7571	0.8235	<b>0.9732</b>
SN_3	0.8401	0.7325	0.8333	<b>0.9671</b>	SN_3	0.7961	0.7711	0.8123	<b>0.9412</b>

**Table 8.3 Fornell-Larcker Criterion Assessment (Scenario A & D)**

Scenario A	ATT	INT	PBC	SN	Scenario D	ATT	INT	PBC	SN
ATT	0.9765				ATT	0.9709			
INT	0.9083	0.9603			INT	0.866	0.9650		
PBC	0.8221	0.7781	0.9601		PBC	0.8186	0.774	0.9368	
SN	0.8417	0.7475	0.8288	0.9661	SN	0.794	0.776	0.8386	0.9586

The results show that all loadings of all items and composite reliability (CR) for all constructs were above 0.7, which shows significant reliability (both scenarios). AVE of all constructs exceeds the threshold 0.5, and confirms a satisfactory degree of convergent validity.

Next, the discriminant validity of the constructs was examined. Table 8.2 shows that no indicator loadings were higher than the opposing constructs, and the square root of each construct's AVE was higher than the construct's correlation with the other constructs in the model (both scenarios). The overall results confirm that the discriminant validity of all constructs was satisfactorily met. The measurement model for both scenarios is shown in Appendix 12.

## 8.5 Structural Model Assessment (Scenario A & D)

After reliability and validity of the items and constructs for both scenarios were confirmed, the next step was to assess the structural model's result. Collinearity issues were first addressed and results presented in Appendix 13. These showed that all VIF values are less than 5.0 and within the acceptable range. Collinearity is not an issue in the data sets for either scenario. The results confirm that the structural model results for both scenario A and D would not be negatively affected by collinearity problems.

Both PLS Algorithm (path weighting scheme) with maximum 300 iterations and a bootstrapping procedure of 37 cases (for the case of scenario A) & 64 cases (for the case of scenario D) and 5000 samples were undertaken to perform the followings:

- I. Evaluation of  $R^2$  value
- II. Evaluation of significance and relevance of structural model relationships (assessment of structural model path coefficients/hypothesis testing).
- III. Assessment of Effect Sizes  $f^2$
- IV. Assessment of predictive relevance  $Q^2$  and  $q^2$  effect sizes.

### **8.5.1 Assessment of $R^2$ values of the Endogenous Construct (Scenario A & D)**

The  $R^2$  values of the endogenous construct for both scenarios were examined. Table 8.4 below shows the  $R^2$  values of the endogenous construct (intention) and their respective results.

**Table 8.4  $R^2$  values of the Endogenous Construct (Scenario A & D)**

Endogenous Construct	Scenario A (N=37)	Scenario D (N=64)
Intention (INT)	0.832 (Substantial)	0.773 (Substantial)

The  $R^2$  values of intention for Scenario A (0.832) show a substantial amount of variance in intention (selection behaviour). Similarly, the  $R^2$  value for intention for scenario D shows a substantial amount of variance in intention (INT) (selection behaviour). The graphical representation of the  $R^2$  values of the model is shown in Appendix 12.

### **8.5.2 Assessment of Structural Model Path Coefficients (Scenario A & D)**

Empirical  $t$  value was computed to determine the significance level of the path coefficient. The structural model relationships are shown in Table 8.5:

**Table 8.5 Path Significance Testing Results (Scenario A & D)**

$R^2$ values (Endogenous Construct)	Path	Hypothesis Test		
		Path Coefficient ( $\beta$ )	T-Statistics ( $t$ )	Interpretation
Intention ( $R^2 = 0.832$ ) Scenario A	Attitude → Intention	0.8930	7.1973***	Supported
	Subjective Norm → Intention	-0.1298	0.9802	NS.
	Perceived Behavioural Control → Intention	0.1515	1.0664	NS.
Intention ( $R^2 = 0.773$ ) Scenario D	Attitude → Intention	0.6407	3.9804***	Supported
	Subjective Norm → Intention	0.1955	1.3507	NS.
	Perceived Behavioural Control → Intention	0.0855	0.5880	NS.

\*\*\*  $p<0.01$ , \*\*  $p<0.05$ , \*  $p<0.1$

The hypotheses for both scenarios were examined by evaluating the path coefficient and t-statistics. The findings show that the TPB model is structurally good ( $R^2=0.832$  for Scenario A, and  $R^2=0.773$  for Scenario D) and sufficient in predicting behavioural intention to use ADR (selection behaviour). All hypotheses were rejected, except  $H_a$  Attitude → Intention ( $\beta=0.8930$ ,  $t=7.1973$ ,  $p<0.01$ ) for Scenario A; while  $\beta=0.6407$ ,  $t=3.9804$ ,  $p<0.01$  for scenario D).

### 8.5.3 Assessment of Effect Sizes (Scenario A & D)

Next, the effect sizes for confirmed path (Attitude → Intention) were computed, The result of effect size of attitude (exogenous variable) in both Scenario A & D were calculated and presented in Table 8.6 below. Apparently, the effect size of attitude on intention is substantially large ( $f^2>0.35$ ). This shows supporting evidence  $H_a$ , where attitude plays a prominent role in influencing intention in both scenarios.

**Table 8.6 Effect Size Result for Confirmed Path (Scenario A & D)**

Hypothesis	Path	Effect Sizes		Interpretation	
		$f^2$			
		A	D		
$H_a$	Attitude → Intention	1.142	0.524	Large	

### 8.5.4 Assessment of Predictive Relevance $Q^2$ (Scenario A & D)

Next, the model's predictive relevance for both scenarios was examined with Stone-Geisser's  $Q^2$  value, by using the blindfolding procedure. The omission distance (D) for both scenarios was set to 7. Cross-validated redundancy was used to assess  $Q^2$ . With respect to intention,  $Q^2$  for scenario A & D has predictive relevance value of 0.7604, and 0.7183. Both values exceed 0.5 which is indicative of a predictive model (Chin, 2010). The values are shown in Table 8.7 below. The  $Q^2$  values are considerably above zero, providing support for the model's predictive relevance related to the endogenous construct (intention).

**Table 8.7 Predictive Relevance of Endogenous Construct (Scenario A & D)**

Construct	$R^2$ Value		$Q^2$ Value	
	A	D	A	D
Intention (INT)	0.832	0.773	0.7604	0.7183

Meanwhile, the overall  $q^2$  values for the confirmed paths in both scenarios are shown in Table 8.8 below. The  $q^2$  effect sizes are interpreted as substantially large ( $>0.35$ ). This path confirms attitude (ATT) has significant predictive relevance for intention (INT) in both Scenario A and D.

**Table 8.8 Summary of Predictive Relevance (Scenario A & D)**

Hypothesis	Path	Path Coefficient		$f^2$ Effect Size		$q^2$ Effect Size	
		A	D	A	D	A	D
$H_a$	Attitude → Intention	0.8930	0.6407	1.142	0.524	0.8505	0.4178

### 8.5.5 Discussion

The TPB model is found to have good predictive relevance related to the endogenous construct (intention) in Scenario A ( $Q^2=0.7604$ ) and Scenario D ( $Q^2=0.7183$ ). Attitude (ATT) is found to have significant influence on intention (INT) in both scenarios ( $p<0.01$ ), and large effect size on intention (INT) in both scenarios ( $f^2$  effect size  $>0.35$ ), and has substantial predictive relevance for intention (INT).

### 8.6 Chapter Summary

This chapter aims to investigate the influence of attitude towards intention in two separate scenarios (A & D). It was found that attitude (ATT) significantly predicts intention (INT) to use ADR (selection behaviour) solely in the stage of dispute (scenario A), and when negotiation is expected to fail (scenario D). The path analysis gives strong evidence of effect size and high predictive relevance. The TPB model was found to have predictive relevance ( $Q^2$ ) for intention (INT) in both scenarios.

## **9. CHAPTER 9: DEVELOPMENT OF INTERVENTION FRAMEWORK**

Part of this chapter is extracted from the following manuscript: “Understanding Intention to Use Alternative Dispute Resolution (ADR): A Framework Based on Technology Acceptance Model (TAM)”. *Journal of Legal Affairs and Dispute Resolution in Engineering and Construction*. Submitted for Review.

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### **9.1 Introduction**

This chapter aims to test and propose an intervention framework which may influence intention (INT), attitude (ATT), perceived relative advantage (PA), and perceived ease of use (PE), based on both qualitative and quantitative grounds. Expert validations were first used to validate the importance of perceived relative advantage (PA), perceived ease of use (PE) and attitude (ATT) towards intention (INT) with reference to the research model (ADR decision-making behavioural model). Based on the decision-making behavioural model, construction experts continued to express their opinions and views on possible interventions that could be used to increase intentions to use ADR.

Based on both quantitative data and qualitative feedback, a parsimonious intervention framework was conceptualised and tested. It was found that the intervention framework offers plausible predictive accuracy and relevance in intention when there is an actual dispute (Scenario A, N=37), and prior to the occurrence of dispute (Scenario D, N=64). Overall results (N=128) confirm the relevance of the conceptual intervening framework. The functionality of the framework in both scenarios (A, and D) is further discussed at the end of this chapter.

### **9.2 Study Aims**

This chapter aims to:

- I. Validate the importance of attitude (ATT), perceived relative advantage (PA), and perceived ease of use (PE) to intention (INT).
- II. Develop and test a parsimonious intervention framework to intervene in ADR use.

### **9.3 Methodology**

Six construction experts agreed to participate in an interview validation session. The experts were briefed and given explanation on the ADR decision-making behavioural model. The interview sessions then aimed to seek further insights on two major issues:

- I. The most important factor/factors influencing intention to use ADR (selection behaviour)
- II. Possible interventions to enhance and promote ADR use in the Malaysian Construction Industry.

The overall background of the validation experts is presented in Table 9.1:

**Table 9.1 Experts' Background**

<b>Expert Code:</b>	<b>Experience in Construction</b>	<b>Designation in Organisation</b>	<b>Type of Organisation</b>	<b>Experience in the use of Alternative Dispute Resolution (ADR)</b>
<b>E1</b>	7 Years	Senior Project Executive	Consultant	Yes
<b>E2</b>	8 Years	Assistant Project Manager	Contractor	Yes
<b>E3</b>	7 years	Senior Surveyor	Contractor	Yes
<b>E4</b>	8 years	Senior Surveyor	Contractor	Yes
<b>E5</b>	7 years	Assistant Contract Manager	Contractor	Yes
<b>E6</b>	8 Years	Construction Site Manager	Contractor	Yes

All interviewees had more than 7 years of experience in ADR, as well as in construction.

### **9.4 Validation of Attitude, Perceived Relative Advantage, and Perceived Ease of Use to Intention to Use ADR.**

The significance of attitude towards intention (INT) was validated by **six experts**. The experts were required to address their views on the questions as follows:

**These are the important factors that influence intention to use ADR to settle dispute. What is your opinion? Based on the model, what is the most important factor influencing Intention to use ADR?"**

Both interviewee E1 and E2 claimed that attitude (ATT) is the most important factor that influenced intention to use ADR (selection behaviour), while E3 and E4 believed that attitude (ATT) comes after perceived vulnerability (VUL); E5 thought that attitude (ATT) comes after perceived severity (SEV), while E6 commented that attitude (ATT) comes after subjective norm (SN). The corresponding feedback comments were about the relevance of the constructs that influence intention (INT):

*“To me, the model is quite true. The majority important factors that affect intention would be attitude, subjective norm, and perceived behavioural control. **The most important is attitude**, followed by subjective norm and perceived behavioural control. I agree that they influence intention. Anyway, attitude is the most important one. When you have good attitude to use ADR, you would have higher intention to use ADR”....*

**Validation Expert 1 (E1)**

*“Yes, I would agree that attitude, subjective norm, descriptive norm, perceived behavioural control, perceived severity, and vulnerability influence intention. But still, in my opinion, the most **important factor is attitude**, seconded by subjective norm, and followed by perceived behavioural control.”*

**Validation Expert 2 (E2)**

*“Basically, I will take every factor (as shown) in the model into consideration as the influential factors towards intention to use ADR. Every factor has their own strength in influencing intention, because dispute would come with different facts and cases, so it is case-by-case basis. So based on your model, in my opinion, perceived vulnerability is the most important factor, **followed by attitude**”.*

**Validation Expert 3 (E3)**

*“I think that perceived vulnerability of the company is the most important factor. This is because ADR users would evaluate themselves and weighing the possibility against the consequences of dispute, and from there proceeds with any intention to use ADR. For example, let us say there is a dispute regarding the variation order (VO). The employer disagree with the all the VO submitted by the main contractor, thus dispute occurs. To*

*proceed with the use of ADR, contractor (ADR user) needs to first weigh potential loss and additional expenses and cash-flow issues affected by the dispute, while at the same time the contractor needs to collect the facts and documents involved associated with the use of ADR. That's why in this case perceived vulnerability comes first, while **attitude towards ADR method comes next**".*

**Validation Expert 4 (E4)**

*"My opinion is that this model is generally ok and logical. When disputes happen, first we will try to negotiate with the client. There will be conversations through letters. If this cannot solve the dispute, we will have our opinion, they would have their opinion, and then we have no choice but to take litigation. Yes, overall these factors will influence intention to take ADR. I think perceived severity is the most important. The threat to the company, the seriousness of the case if not settled is the most influential. We would try to protect the company. I think **attitude comes second**".*

**Validation Expert 5 (E5)**

*"Well, all these factors will influence on the intention to use the ADR. I do agree with the significance and relevance of all these factors, definitely they will influence on the intention...I think the four most important factor would be first subjective norm, if you follow the sequence, **attitude**, descriptive norm comes after that, and after that would be perceived behavioural control."*

**Validation Expert 6 (E6)**

Based on the most important factor in influencing ADR selection, the experts were further probed with this question:

**"Can you propose any interventions (such as programs/strategies/policies) that can make Attitude towards using ADR to settle dispute more favourable?"**

The feedback included:

*“Attitude towards ADR use can be enhanced if the ADR method itself is improved, or increase the **competencies of the neutrals**, that would lead to better disposition of perceived ease of use (**PE**) and relative advantage (**PA**)...”*

**Validation Expert 1 (E1)**

*“To make attitude better, ADR users can be convinced of the ease of use (**PE**), relative advantage (**PA**) through instillations of values and propagations of knowledge by the key players in the industry...”*

**Validation Expert 2 (E2)**

For both validation expert E3, and E4, the most important factor was perceived vulnerability (VUL), but neither one of them had any suggestion on intervening in perceptions of vulnerability (VUL). As for E6, the respondent felt that subjective norm (SN) could only be influenced by having team members that had experienced in ADR themselves. Both E5 and E6 were then asked to provide suggestions on intervening in attitude (ATT).

*“Most of the construction personnel do not **know and unaware** about the advantage or ease of use of ADR. I believe this falls under  $H_{1b}$  and  $H_{1c}$  in the model. Possible active interventions can begin by influencing these two factors: “perceived relative advantage”, and “perceived ease of use” in the model. Education and trainings to the construction workers may be helpful”.*

**Validation Expert 3 (E3)**

*“To foster better attitudes towards ADR use, most users need to be exposed to the characteristics and features of ADR first...”*

**Validation Expert 4 (E4)**

For expert E5, the most important factor was perceived severity (SEV), but no interventions could be made to influence perceptions of severity. However, when attitude towards the ADR methods became the next most important factor, expert E5 expressed the view as follows:

*“To make people like ADR, mostly everything is concerning with money. Mediation would be cheaper than arbitration. Very cheap, mostly more than hundred thousand if you go arbitration. The second one depends on the relationship between two parties. If very bad then arbitration, it depends, on the attitude in the ADR method. Make people more aware on ADR; make sure people think that ADR can protect their business relationship”.*

**Validation Expert 5 (E5)**

*“As for the attitude, it depends on the person himself whether or not the ADR is more favourable to settle the dispute. It is personal perception on the advantage of each dispute method. I think some of the factors from the normative sides can make attitude overall favourable. I think construction industry like CIDB, and NGOs like Master Builders should encourage people to use ADR to solve dispute related to any projects. The interventions can be done through construction and government agencies; they should educate contractors, consultants and developers on the understanding of all these ADR. Education is important. Even in the university, they can educate strategies to all future contractors that there is such a way to win any dispute cases by using ADR. This education, road shows, seminars might influence on the attitude more favourable.”*

**Validation Expert 6 (E6)**

To suggest possible interventions, with reference to the ADR decision-making behavioural model, the interviewees were further probed with these questions:

**“What are the issues that hinder the use of ADR in the Malaysian construction industry? How to deal with these issues by referring to this model? How can this model help to improve the level of ADR use in the Malaysian construction industry?”**

All validation experts substantiated the importance of propagating awareness towards improving attitude (ATT). Possible interventions could be made via road shows, industrial campaigns, educations, seminars and even training could enhance the perceived relative advantage (PA) and ease of use (PE) of ADR methods. The discussions below clearly show the importance of awareness towards influencing attitudinal dimensions of the research model:

*“The biggest issue in Malaysia is still the lack of awareness. Just go back to the awareness. Because people are not trained, most contractors, developers, or consultants, they are not aware and do not know how to use and the rights. They do not know how to use, and most important thing is **lack of positive attitude**. For example, the **arbitrators are not well trained**, they are lawyers, they are not from the construction, and they are not aware of the construction law and contract. To deal with this issue, we still have to **do more seminars**, let more personnel from construction to be involved in **more seminars**, not only for the arbitrators or for lawyer. Your model actually can show that what are the factors that affect intention to use ADR, and through the factors we can pinpoint which are the factors which we can do something like.....for example like focus on the factors, what we are lack of and which factor to improve.....mostly on attitude by cultivating more awareness.”*

**Validation Expert 1 (E1)**

*“So far the biggest issue in ADR use in the Malaysian construction industry is there is lack of protection by law. ADR does not guarantee outcomes in its use (perceived relative advantage issues)... People do not use ADR because they lack confidence, and bottleneck issues and lack of outcome of ADR. To settle this, find ways to increase perceptions of trusts on the methods and increase confidence... Interventions can be done based on **propagating success stories about other companies through conference, trainings, brochures**, that can create more awareness for potential users. Overall, this model is easy and detail in portraying the relationship towards intention (selection behaviour), where it creates more understanding for possible interventions on the important factors”*

**Validation Expert 2 (E2)**

*“Lack of awareness is the main culprit behind low ADR use. Awareness refers to dos and don’ts in ADR use. Well from this model, I know that all these six factors are important to look into, as you know every dispute is different, we can refer to this model and look at the problem and intervene in from **different perspectives**. Based on your explanation, I do believe that this model and your findings can be of help to the policy maker in the Malaysian Construction industry itself. The model needs to be exposed to the industry player as this model can show them the process of decision-making in using and choosing ADR”*

**Validation Expert 3 (E3)**

*“Some of the issues such as **awareness**, and **lack of expertise** as a whole affect the use of ADR. Lack of awareness is something related to attitude, it falls under category of attitude. They do not know about the **ease of use and relative advantage**. Besides that, an organisation would lack of expertise, which falls under organisational competency. Construction professionals should be trained since university level to be competent with the technique. An organisation that has this competency would have more control on it. Besides, trainings and **propagation of knowledge improve awareness**...I agree that the model could be insightful to the key players in understanding decision-making in ADR use”*

**Validation Expert 4 (E4)**

*In my opinion, the overall ADR use is greatly affected by seriousness of the case. For example, payment issue. If the client delays your payment 3 months, this is not an attitude issue; we have to look at the case. This is serious, your cash flow is tight, and you have no choice. You have to use ADR. However, depends on the status of the relationship, they will choose ADR, because some ADR has their **own advantage**, some will destroy mutual good relationship. Good relationship means they would have future project together. Sometimes depends on lawyer advice and **expert suggestion**, some ADR method may prove to be ease of use. Sometimes we have our intention to take litigation. However, when some expert says that “mediation is better, not that harsh, and you can get back what you want”, would actually affect our intention. Besides, most of us do not have the knowledge, expert and the team. Construction team needs the expert, they **do not know this right or know how to use**, and they would give up this right. To solve these issues, no knowledge, go to seminar, more aware, knowledge, and technical skill. Some of the issues can be solved by this model...Overall, at certain point, this model is easy to understand and at least can show the important factor, and if you want to influence people to use ADR, you can refer to this model. Why? Because some users **do not have the knowledge**, this is due to lack of awareness, so, by **promoting seminar** they will know. You focus on attitude right. For me attitude is a key role, you can convince user. How? You can use expert, because people has **trust on the expert**. If you go litigation, is not a play-game, it is a serious matter. You have to increase trust on the mediator (neutral).*

**Validation Expert 5 (E5)**

*“Education is one thing, probably is how the people around advise on the use of ADR. The second issue is lack of expertise, as they do not have expertise in this. They need to be educated, and made known that this ADR method will help them win any dispute. If the method itself has more advantage, it can help them. If they know how to use, it will also increase the use of ADR. The method itself, existence and awareness of the technicality aspects of the ADR use will help. The policy maker can learn from this model, as they know how to influence the contractor’s awareness in knowing that this ADR will help them in any dispute in the future. This model can help policy maker to intervene in the behaviour of ADR use.”*

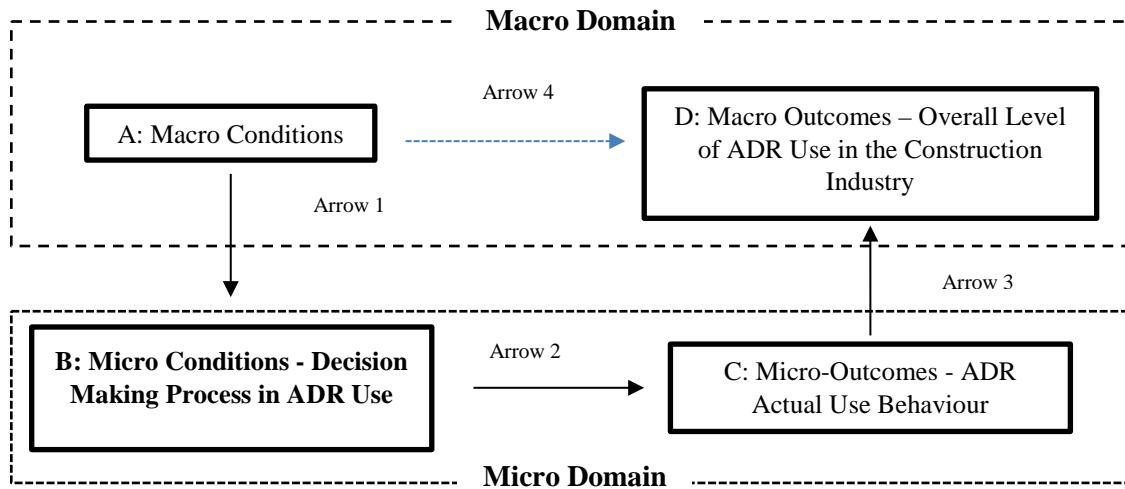
#### **Validation Expert 6 (E6)**

Drawing on the qualitative discussions, interventions through seminars and education resemble the effects of normative pressures (NP); while interventions through competencies of neutrals are operationalised as trust (TR). Trust (TR) captures attributes of ability, integrity, and benevolence of the neutrals in the context of ADR use. The qualitative results suggest that trust (TR) might not have a direct influence on attitude (ATT), but through effects on perceived ease of use (PE) and perceived relative advantage (PA).

Overall, institutional pressures (normative pressures) and favourable attributes of the neutrals are postulated to be effective in intervening behavioural intention of ADR use through cognitive instrument process.

### **9.5 Development of a Parsimonious Intervention Framework**

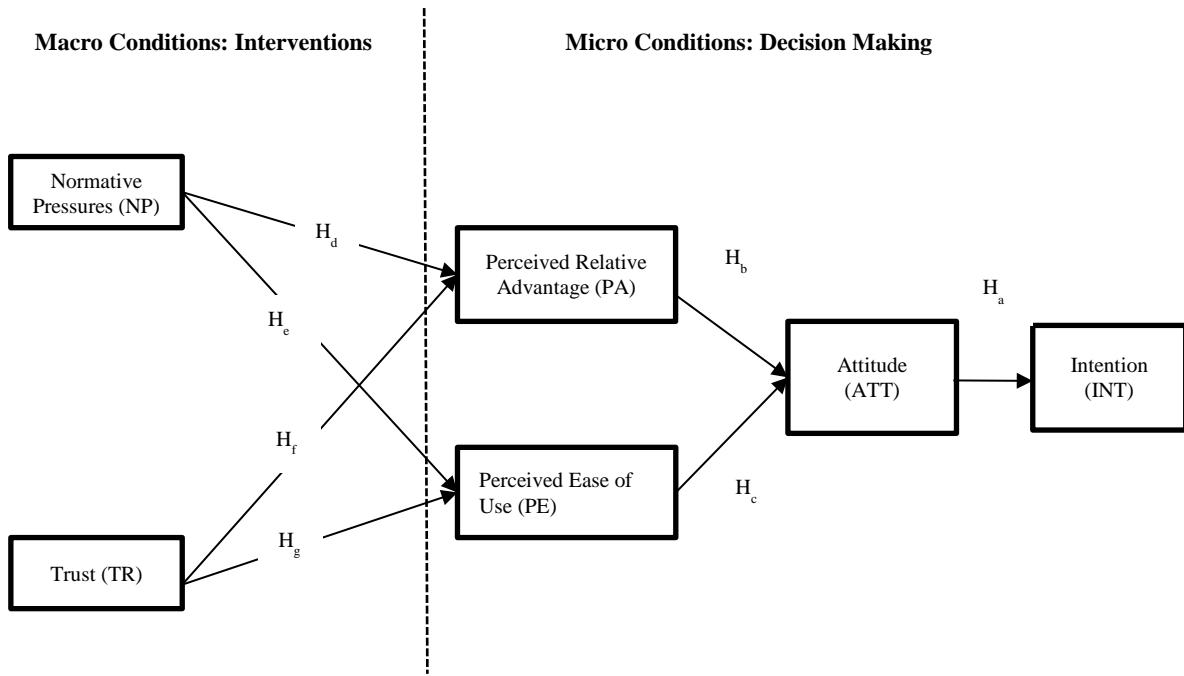
Complemented by qualitative interviews, a parsimonious intervention framework can be developed and tested. The dynamics of how macro-level configurations influence the overall level of ADR use can be better explained through a macro-micro Model of ADR use. The model of ADR use is depicted and explained in Figure 9.1 below. Modified based on Coleman’s micro-macro links (Coleman, 1987, 1990), the micro phenomena (such as frustration and lack of preference in using ADR), and macro phenomena (such as low rates of ADR use) are actually influenced by the user’s decision-making process. Figure 9.1 shows the application of Coleman’s scheme in ADR use.



**Figure 9.1 Macro-Micro Perspective of ADR Use [Modified based on Coleman's Scheme (1987, 1990)]**

As shown in Figure 9.1, Node A represents the propositions of macro conditions (such as institutional conditions) leading to macro outcomes (Level of ADR use in the construction industry). This macro to macro relationship is linked with dotted arrow 4, which represents assumptions about empirical regularity at macro level (Raub, Buskens, & Van Assen, 2011). However, this macro-level condition to macro outcomes is not a direct effect. The overall macro outcomes (Node D) is an aggregate result of individual's ADR actual use behaviour (Node C), which in turn is the result of decision maker's decision-making process in ADR (Node B). The micro conditions (Node B) are actually influenced by macro conditions (Node A). Macro forces are captured with two constructs: Normative Pressures (NP), and Trust (TR). Micro conditions that signify the decision-making process in ADR use are operationalised with the dynamics between perceived relative advantage (PA), perceived ease of use (PE), and intention (INT). According Ajzen (2006a), interventions that aim to change and influence behaviour can be directed at one of the determinants, such as attitudes, subjective norms, or perceived behavioural control.

Isomorphic pressures (normative pressures), and trust (TR) are posited to influence perceived relative advantage (PA) and perceived ease of use (PE). Overall, the intervention framework is portrayed in Figure 9.2 below:



**Figure 9.2 Conceptual Intervention Framework**

**The hypotheses postulated in the framework are as follows:**

$H_a$ : Attitude (ATT) relates positively with Intention (INT)

$H_b$ : Perceived Relative Advantage (PA) relates positively with Attitude (ATT)

$H_c$ : Perceived Ease of Use (PE) relates positively with Attitude (ATT)

$H_d$ : Normative Pressures (NP) relates positively with Perceived Relative Advantage (PA)

$H_e$ : Normative Pressures (NP) relates positively with Perceived Ease of Use (PE)

$H_f$ : Trust (TR) relates positively with Perceived Relative Advantage (PA)

$H_g$ : Trust (TR) relates positively with Perceived Ease of Use (PE)

### 9.5.1 Measurement Model of Intervention Framework (N=128)

The psychometric properties of the measurement scales were again examined to evaluate both internal consistency reliability and indicator reliability. Similarly, both convergent validity and discriminant validity were evaluated with Average Variance Extracted and the Fornell-Larcker criterion. The overall reliability and validity result for the

measurement model is shown in Table 9.2; while the results of cross loadings and the Fornell-Larcker assessment are shown in Table 9.3 and 9.4 respectively.

**Table 9.2 Validity and Reliability Results of Measurement Model (Intervention Framework, N=128)**

Constructs	Items	Loadings	Composite Reliability (Scenario)	Average Variance Extracted (AVE) (Scenario )
Attitude (ATT)	ATT_1	0.9646	0.9749	0.9284
	ATT_2	0.9758		
	ATT_3	0.9500		
Intention (INT)	INT_1	0.9744	0.9817	0.9306
	INT_2	0.9741		
	INT_3	0.9656		
	INT_4	0.9442		
Perceived Relative Advantage (PA)	PA_1	0.8498	0.9688	0.8385
	PA_2	0.9326		
	PA_3	0.9614		
	PA_4	0.9379		
	PA_5	0.9162		
	PA_6	0.8919		
Perceived Ease of Use (PE)	PE_1	0.9836	0.9845	0.9549
	PE_2	0.9782		
	PE_3	0.9696		
Normative Pressures (NP)	NP_1	0.9380	0.9684	0.8844
	NP_2	0.9549		
	NP_3	0.9528		
	NP_4	0.9156		
Trust (TR)	TR_1	0.9191	0.9844	0.9002
	TR_2	0.9505		
	TR_3	0.9610		
	TR_4	0.9725		
	TR_5	0.9695		
	TR_6	0.9540		
	TR_7	0.9132		

**Table 9.3 Cross Loadings Assessment (Intervention Framework, N=128)**

	ATT	INT	NP	PA	PE	TR
ATT_1	<b>0.9646</b>	0.8363	0.5653	0.6838	0.7018	0.5737
ATT_2	<b>0.9758</b>	0.8479	0.5597	0.66	0.6709	0.5825
ATT_3	<b>0.95</b>	0.8179	0.5634	0.7006	0.6549	0.6231
INT_1	0.8682	<b>0.9744</b>	0.6064	0.692	0.6465	0.6202
INT_2	0.8112	<b>0.9741</b>	0.602	0.6802	0.6066	0.5909
INT_3	0.8469	<b>0.9656</b>	0.5859	0.6436	0.6143	0.6071

INT_4	0.8116	<b>0.9442</b>	0.5808	0.7103	0.6318	0.6162
NP_1	0.5736	0.5777	<b>0.9379</b>	0.7918	0.6379	0.7045
NP_2	0.5552	0.5868	<b>0.9549</b>	0.761	0.6216	0.6948
NP_3	0.5487	0.5965	<b>0.9528</b>	0.7267	0.6003	0.6712
NP_4	0.5157	0.5535	<b>0.9156</b>	0.6499	0.5429	0.5956
PA_1	0.6133	0.6209	0.6438	<b>0.8498</b>	0.6877	0.596
PA_2	0.6693	0.6523	0.7623	<b>0.9326</b>	0.7247	0.759
PA_3	0.6848	0.7137	0.7472	<b>0.9614</b>	0.7348	0.7383
PA_4	0.6856	0.7022	0.7368	<b>0.9379</b>	0.7452	0.75
PA_5	0.6355	0.6188	0.7112	<b>0.9162</b>	0.7598	0.7197
PA_6	0.5898	0.5619	0.6873	<b>0.8919</b>	0.6922	0.6223
PE_1	0.6988	0.6348	0.6171	0.7812	<b>0.9836</b>	0.671
PE_2	0.6838	0.6462	0.6394	0.788	<b>0.9782</b>	0.6954
PE_3	0.674	0.6181	0.6221	0.749	<b>0.9696</b>	0.6675
TR_1	0.5875	0.6052	0.6971	0.7234	0.6953	<b>0.9191</b>
TR_2	0.5796	0.5969	0.6917	0.7176	0.643	<b>0.9505</b>
TR_3	0.5751	0.5908	0.6684	0.7367	0.6577	<b>0.961</b>
TR_4	0.598	0.6096	0.6808	0.7462	0.6715	<b>0.9725</b>
TR_5	0.5932	0.6251	0.6975	0.7542	0.6645	<b>0.9695</b>
TR_6	0.5997	0.6003	0.6721	0.7217	0.6559	<b>0.954</b>
TR_7	0.552	0.5602	0.6122	0.6769	0.6169	<b>0.9132</b>

**Table 9.4 Fornell-Larcker Criterion Assessment (Intervention Framework, N=128)**

	ATT	INT	NP	PA	PE	TR
ATT	<b>0.9635</b>					
INT	0.8657	<b>0.9647</b>				
NP	0.5841	0.6156	<b>0.9404</b>			
PA	0.7072	0.7062	0.782	<b>0.9157</b>		
PE	0.7016	0.6479	0.6409	0.7909	<b>0.9772</b>	
TR	0.6154	0.631	0.7113	0.765	0.6939	<b>0.9488</b>

The results show that all loadings and composite reliability (CR) for all constructs exceed value of 0.7. This confirms significant results of reliability. Nevertheless, the AVE for all constructs shows a satisfactory degree as all AVE values exceed the threshold value of 0.5.

As shown in Table 9.3 and 9.4, no indicator loadings were higher than the opposing constructs, while the square root of each construct's AVE was actually higher than the constructs' correlation with the other constructs. The overall results provide evidence that the

discriminant validity of all constructs was met. Finally, the measurement model for the framework is attached in Appendix 14.

### **9.5.2 Structural Model of Intervention Framework (N=128)**

After confirming the reliability and validity of the items and constructs, the subsequent step is to evaluate the structural model's result. Collinearity issues were first addressed. The result of collinearity assessment is presented in **Appendix 15**. The results show that all VIF values are less than the threshold value of 5.0. Collinearity is not an issue in the data sets.

PLS algorithm (path weighting scheme) with maximum 300 iterations and a bootstrapping procedure of 128 cases and 5000 samples were performed to achieve the following evaluations:

- I. Evaluation of  $R^2$  value
- II. Evaluation of significance and relevance of structural model relationships (assessment of structural model path coefficients/hypothesis testing).
- III. Assessment of Effect Sizes  $f^2$
- IV. Assessment of predictive relevance  $Q^2$  and  $q^2$  effect sizes.

#### **9.5.2.1 Assessment of $R^2$ Values (Intervention Framework, N=128)**

The  $R^2$  values of the constructs were examined and are shown in Table 9.5 below:

**Table 9.5  $R^2$  Values (Intervention Framework, N=128)**

Construct	$R^2$ value	Interpretation
Intention (INT)	0.749	Substantial (Marginal to 0.75)
Attitude (ATT)	0.554	Moderate
Perceived Relative Advantage (PA)	0.700	Moderate
Perceived Ease of Use (PE)	0.525	Moderate

The  $R^2$  value of intention shows a substantial amount of variance (selection behaviour).  $R^2$  values for attitude (ATT), perceived relative advantage (PA), and perceived ease of use (PE) show moderate, substantial, and moderate amount of variance explained by the predictors.

### 9.5.2.2 Assessment of Structural Model Path Coefficients (Intervention Framework, N=128)

Empirical  $t$  value was assessed to determine the significance level of the path coefficient. The structural model relationships are shown in Table 9.6 below:

**Table 9.6 Path Significance Testing Results (Intervention Framework, N=128)**

<b>R<sup>2</sup> values (Construct)</b>	<b>Path</b>	<b>Hypothesis Test</b>		
		<b>Path Coefficient (<math>\beta</math>)</b>	<b>T-Statistics (<math>t</math>)</b>	<b>Interpretation</b>
<b>Intention (R<sup>2</sup> =0.75)</b>	H <sub>a</sub> : Attitude → Intention	0.8657	29.4331 ***	Supported
<b>Attitude (R<sup>2</sup> =0.55)</b>	H <sub>b</sub> : Perceived Relative Advantage → Attitude	0.4067	2.4432**	Supported
	H <sub>c</sub> : Perceived Ease of Use → Attitude	0.3799	2.5514**	Supported
<b>Perceived Relative Advantage (R<sup>2</sup> =0.70)</b>	H <sub>d</sub> : Normative Pressures→ Perceived Relative Advantage	0.4815	4.6291***	Supported
	H <sub>f</sub> : Trust → Perceived Relative Advantage	0.4225	4.0305***	Supported
<b>Perceived Ease of Use (R<sup>2</sup> =0.525)</b>	H <sub>e</sub> : Normative Pressures→ Perceived Ease of Use	0.2982	2.0695**	Supported
	H <sub>g</sub> : Trust → Perceived Ease of Use	0.4818	3.7687***	Supported

\*\*\* Significant at  $p<0.01$ , \*\* Significant at  $p<0.05$ , \*Significant at  $p<0.1$ , 10%

The hypotheses of the framework were examined by assessing the path coefficient and  $t$ -statistics. The empirical result shows that the framework is structurally good ( $R^2=0.75$  in explaining intention). The framework explains 74.9% (almost 75.0%, substantial) of the variance of the dependent variable (selection behaviour) through attitude (ATT). Attitude (ATT) has a significant positive relationship to intention (INT) ( $\beta=0.8657$ ,  $t=29.4331$ ,  $p<0.01$ ).

The findings also confirm that 55.4% of the (moderate) of the variance of attitude (ATT) are explained through perceived relative advantage (PA) and perceived ease of use (PE). The path coefficient of perceived relative advantage (PA) → attitude (ATT) is significant ( $\beta=0.4067$ ,  $t=2.4432$ ,  $p<0.05$ ); and similarly the path coefficient of perceived ease of use (PE) → attitude (ATT) is significant ( $\beta=0.3799$ ,  $t=2.5514$ ,  $p<0.05$ ).

In addition to that, 70.0% (moderate) of the variance of perceived relative advantage (PA) are explained through normative pressures (NP), and trust (TR). Normative pressures (NP) significantly influences perceived relative advantage (PA) ( $\beta=0.4815$ ,  $t=4.6291$ ,  $p<0.01$ ); and trust (TR) is positively related to perceived relative advantage (PA) ( $\beta=0.4225$ ,  $t=4.0305$ ,  $p<0.01$ ).

Lastly, 52.5 % (moderate) of the variance of perceived ease of use (PE) is explained through normative pressures (NP) and trust (TR). The path coefficient of normative pressures (NP) → perceived ease of use (PE) is significant ( $\beta=0.2982$ ,  $t=2.0695$ ,  $p<0.05$ ), and similarly the path coefficient of trust (TR) → perceived ease of use (PE) is significant ( $\beta=0.4818$ ,  $t=3.7687$ ,  $p<0.01$ ).

All hypotheses referring to the path ( $H_a$ ,  $H_b$ ,  $H_c$ ,  $H_d$ ,  $H_e$ ,  $H_f$ ,  $H_g$ ,  $H_h$ ,  $H_i$ ) in the structural model of the framework are empirically supported.

#### **9.5.2.3 Assessment of Effect Size (Intervention Framework, N=128)**

The effect size ( $f^2$ ) for all confirmed paths was further assessed and presented in Table 9.7 below. The variance of intention (INT) can be solely influenced by attitude (ATT), where 75% of intention (INT) is contributed by attitude (ATT).

The impact of perceived relative advantage (PA) and perceived ease of use (PE) both contribute an almost equal amount of significance to attitude (ATT). Both constructs have a small effect on attitude (ATT) ( $f^2=0.139$ , and  $f^2=0.121$ ). The result suggests that both perceived relative advantage (PA) and perceived ease of use (PE) jointly contribute to the variance of attitude (ATT) with equal influence and importance.

Next, normative pressures (NP) were found to have the largest effect ( $f^2=0.38$ ) on perceived relative advantage (PA). This was followed by trust (TR) which has a moderate effect on perceived relative advantage (PA) ( $f^2=0.297$ ).

On the other hand, trust (TR) has a higher medium effect on perceived ease of use (PE) ( $f^2=0.240$ ), while normative pressures (NP) has only a small effect on perceived ease of use (PE) ( $f^2=0.093$ ).

**Table 9.7 Effect Sizes for Confirmed Path (Intervention Framework, N=128)**

Hypothesis	Path	Effect Sizes	
		$f^2$	Interpretation
H <sub>a</sub>	Attitude → Intention	-	-
H <sub>b</sub>	Perceived Relative Advantage → Attitude	0.139	Small
H <sub>c</sub>	Perceived Ease of Use → Attitude	0.121	Small
H <sub>d</sub>	Normative Pressures → Perceived Relative Advantage	0.38	Large
H <sub>e</sub>	Normative Pressures → Perceived Ease of Use	0.093	Small
H <sub>f</sub>	Trust → Perceived Relative Advantage	0.297	Medium
H <sub>g</sub>	Trust → Perceived Ease of Use	0.240	Medium

#### **9.5.2.4 Assessment of Predictive Relevance Q<sup>2</sup> (Intervention Framework, N=128)**

The framework's predictive relevance was further examined with Stone-Geisser's Q<sup>2</sup> value with blindfolding procedure. The omission distance was set to 7, and cross-validated redundancy was used to assess Q<sup>2</sup>. All values with respect to the other endogenous construct are exhibited in Table 9.8 below. The Q<sup>2</sup> values for all endogenous constructs exceed zero, providing further evidence for the framework's predictive relevance related to the endogenous construct. The intervention framework has a predictive relevance Q<sup>2</sup> of 0.6900, which indicates a good predictive model.

**Table 9.8 Predictive Relevance of Endogenous Construct (Intervention Framework, N=128)**

Endogenous Construct	R <sup>2</sup> Value	Q <sup>2</sup> Value
Intention (INT)	0.749	0.6900
Attitude (ATT)	0.554	0.5013
Perceived Relative Advantage (PA)	0.700	0.5814
Perceived Ease of Use (PE)	0.525	0.4983

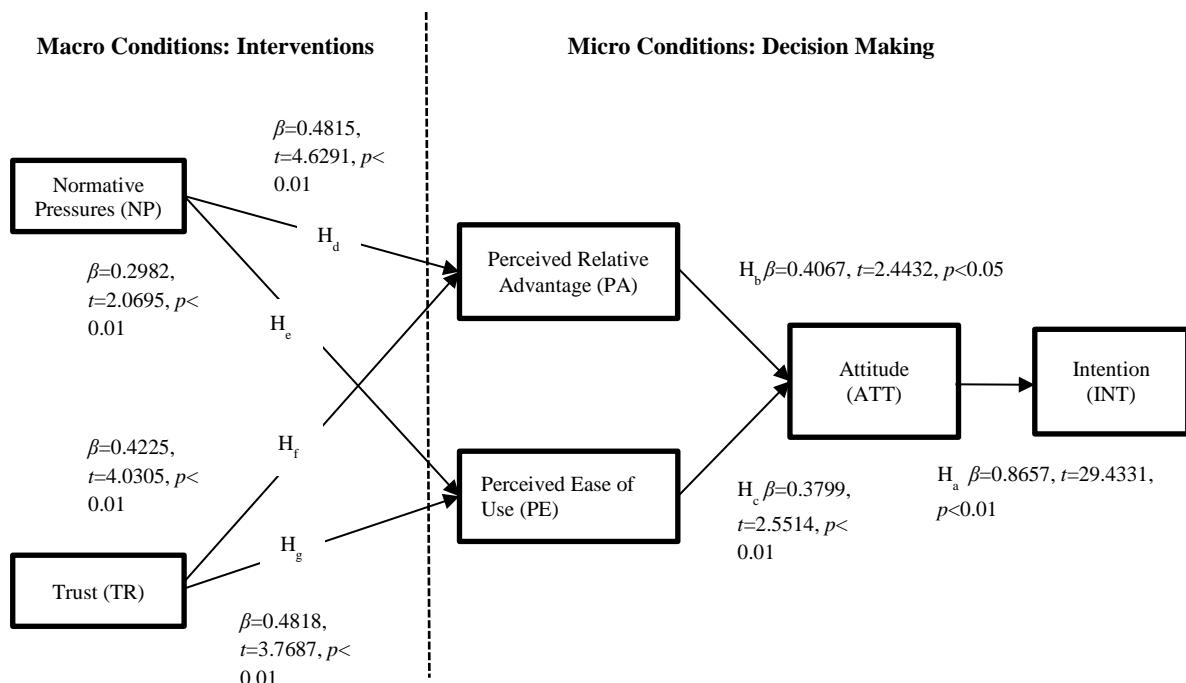
Meanwhile, the overall q<sup>2</sup> values for the confirmed paths are shown in Table 9.9 below. The q<sup>2</sup> effect size for the relationship of perceived relative advantage (PA) → attitude (ATT) is small ( $q^2=0.112$ ); relationship of perceived ease of use (PE) → attitude (ATT) is small

( $q^2=0.0844$ ), relationship of normative pressures (NP) → perceived relative advantage (PA) is medium ( $q^2=0.247$ ), relationship of trust (TR) → perceived relative advantage (PA) is medium ( $q^2=0.175$ ), relationship of normative pressures (NP) → perceived ease of use (PE) is small ( $q^2=0.0745$ ), and relationship of trust (TR) → perceived ease of use (PE) is medium ( $q^2=0.218$ ). For all confirmed paths, the predictive relevance  $q^2$  shares almost similar effect outcomes with its corresponding effect sizes  $f^2$ .

**Table 9.9 Summary of Predictive Relevance (Intervention Framework, N=128)**

Hypothesis	Path	Path Coefficient	$f^2$ Effect Size	$q^2$ Effect Size
$H_b$	Perceived Relative Advantage → Attitude	0.4067	0.139 (small)	0.112 (small)
$H_c$	Perceived Ease of Use → Attitude	0.3799	0.121 (small)	0.0844 (small)
$H_d$	Normative Pressures→ Perceived Relative Advantage	0.4815	0.38 (large)	0.247 (medium)
$H_f$	Trust → Perceived Relative Advantage	0.4225	0.297 (medium)	0.175 (medium)
$H_e$	Normative Pressures→ Perceived Ease of Use	0.2982	0.093 (small)	0.0745 (small)
$H_g$	Trust → Perceived Ease of Use	0.4818	0.240 (medium)	0.218 (medium)

The overall confirmed paths and hypotheses are further illustrated in Figure 9.3 below.



**Figure 9.3 Confirmed Paths (Intervention Framework, Pooled N=128)**

## **9.6 Role of Scenario [Dispute Phase (Scenario A), N=37 and Negotiation Phase (Scenario D), N=64]: Evaluation of Intervention Framework**

The intervention framework shows good predictive relevance based on pooled results (Scenarios A, B, C, and D). Two distinctive scenarios are further examined for Scenario A, and Scenario D. The intervention framework shows that there are two maximum arrows pointing towards a variable (Perceived Relative Advantage). The arrows stem from normative pressure (NP), and trust (TR). Therefore, 20 minimum datasets are required for PLS estimation according to the Ten Times Rule. Therefore for assessment of scenarios, this justifies the need to specify only both Scenario A, N=37 and Scenario D, N=64, since the data sets both Scenario A and D meet the minimum requirement of the Ten Times Rule (Hair et al., 2014). The procedures for assessing both measurement and structural model for these two scenarios followed the pooled (N=128) model and were presented and discussed in this section.

### **9.6.1 Measurement Model of Intervention Framework (Scenario A & D)**

As mentioned earlier, 37 respondents were facing disputes, in the stage of deciding ADR methods for dispute settlement; while 64 respondents were in the stage of negotiating claims. The observations made in these two distinctive scenarios can be enlightening as Scenario A portrays decision making during dispute in route, while Scenario D portrays decision making before dispute occurs.

The reliability and validity of measurement models for both scenarios were assessed with composite reliability, indicator loadings, convergent reliability and discriminant validity. To assess the reliability of the data sets, the internal consistency reliability was assessed with composite reliability, while indicator reliability was assessed with indicator loadings. To evaluate the validity of the data sets, convergent validity and discriminant validity were assessed with Average Variance Extracted (AVE). Overall, the validity and reliability results of Measurement Model for Scenario A and D are presented in Table 9.10 below, while the results of cross loadings and the Fornell-Larcker criterion are shown in Table 9.11 and 9.12 below.

**Table 9.10 Validity and Reliability Results of Measurement Model (Intervention Framework: Scenario A & D)**

Constructs	Items	Loadings (Scenario)		Composite Reliability (Scenario)		Average Variance Extracted (AVE) (Scenario )	
		A	D	A	D	A	D
Attitude (ATT)	ATT_1	0.9716	0.9732	0.984	0.9801	0.9536	0.9427
	ATT_2	0.9737	0.9814				
	ATT_3	0.9843	0.958				
Intention (INT)	INT_1	0.9797	0.9716	0.9793	0.9819	0.9221	0.9312
	INT_2	0.9679	0.9743				
	INT_3	0.9405	0.9671				
	INT_4	0.9526	0.9468				
Normative Pressures (NP)	NP_1	0.9244	0.9411	0.9444	0.969	0.81	0.8867
	NP_2	0.9423	0.943				
	NP_3	0.9193	0.9504				
	NP_4	0.8078	0.9321				
Perceived Relative Advantage (PA)	PA_1	0.9489	0.8612	0.983	0.9754	0.9061	0.8689
	PA_2	0.9463	0.9709				
	PA_3	0.9673	0.964				
	PA_4	0.9711	0.9547				
	PA_5	0.9264	0.9154				
	PA_6	0.9508	0.922				
Perceived Ease of Use (PE)	PE_1	0.9753	0.9933	0.9827	0.9934	0.9498	0.9804
	PE_2	0.9896	0.9892				
	PE_3	0.9586	0.988				
Trust (TR)	TR_1	0.8664	0.9381	0.9791	0.9884	0.8703	0.9243
	TR_2	0.9483	0.9638				
	TR_3	0.9395	0.9691				
	TR_4	0.9664	0.974				
	TR_5	0.9384	0.9868				
	TR_6	0.9431	0.9521				
	TR_7	0.9251	0.9452				

**Table 9.11 Cross Loadings Assessments (Intervention Framework: Scenario A & D)**

Scenario A							Scenario D						
	ATT	INT	NP	PA	PE	TR		ATT	INT	NP	PA	PE	TR
ATT_1	<b>0.9716</b>	0.8804	0.5806	0.6546	0.7656	0.7279		<b>0.9732</b>	0.8517	0.5851	0.7541	0.6808	0.6389
ATT_2	<b>0.9737</b>	0.8813	0.5923	0.6452	0.7318	0.6997		<b>0.9814</b>	0.8508	0.5531	0.7107	0.6311	0.6542
ATT_3	<b>0.9843</b>	0.8995	0.6122	0.6657	0.7676	0.7251		<b>0.958</b>	0.8204	0.5161	0.7224	0.6423	0.6011
INT_1	0.8919	<b>0.9797</b>	0.6835	0.7339	0.7639	0.7639		0.8761	<b>0.9716</b>	0.557	0.6587	0.5465	0.6185
INT_2	0.8536	<b>0.9679</b>	0.6816	0.6916	0.7547	0.727		0.8016	<b>0.9743</b>	0.573	0.6771	0.5058	0.6182
INT_3	0.8884	<b>0.9405</b>	0.6123	0.6544	0.7215	0.736		0.8398	<b>0.9671</b>	0.5462	0.6238	0.5125	0.6067
INT_4	0.8538	<b>0.9526</b>	0.6187	0.702	0.7124	0.7324		0.8229	<b>0.9468</b>	0.598	0.7459	0.5571	0.6337
NP_1	0.6053	<b>0.6546</b>	<b>0.9244</b>	0.8707	0.7883	0.8556		0.5636	<b>0.5467</b>	<b>0.9411</b>	0.7206	0.6003	0.6257
NP_2	0.5686	0.6439	<b>0.9423</b>	0.794	0.8008	0.8408		0.5375	0.561	<b>0.943</b>	0.7223	0.5948	0.6152
NP_3	0.5667	0.6209	<b>0.9193</b>	0.7852	0.8031	0.7525		0.513	0.5671	<b>0.9504</b>	0.6592	0.5362	0.6125
NP_4	0.4283	0.4921	<b>0.8078</b>	0.4984	0.6087	0.518		0.5238	0.5432	<b>0.9321</b>	0.6742	0.5266	0.5915
PA_1	0.6501	0.6591	0.8036	<b>0.9489</b>	0.8325	0.83		0.6819	0.6787	0.5701	<b>0.8612</b>	0.746	0.6127
PA_2	0.6407	0.6719	0.8075	<b>0.9463</b>	0.8471	0.8435		0.7392	0.6796	0.7113	<b>0.9709</b>	0.7728	0.6884
PA_3	0.6434	0.7323	0.801	<b>0.9673</b>	0.8166	0.8423		0.7135	0.6807	0.6867	<b>0.964</b>	0.7317	0.675
PA_4	0.6458	0.6919	0.801	<b>0.9711</b>	0.8318	0.8618		0.7257	0.6879	0.7392	<b>0.9547</b>	0.7523	0.6882
PA_5	0.5926	0.6569	0.7676	<b>0.9264</b>	0.8759	0.8472		0.7149	0.6286	0.7136	<b>0.9154</b>	0.7157	0.6603

<b>PA_6</b>	0.6584	0.7244	0.7966	<b>0.9508</b>	0.8221	0.8069		0.6186	0.5572	0.7	<b>0.922</b>	0.6336	0.5992
<b>PE_1</b>	0.7847	0.7545	0.8197	0.891	<b>0.9753</b>	0.8915		0.6696	0.5468	0.5931	0.7788	<b>0.9933</b>	0.7172
<b>PE_2</b>	0.7626	0.7575	0.8092	0.8845	<b>0.9896</b>	0.8611		0.6699	0.5598	0.6172	0.7637	<b>0.9892</b>	0.7075
<b>PE_3</b>	0.7115	0.7356	0.8313	0.7933	<b>0.9586</b>	0.8143		0.6541	0.527	0.5747	0.7715	<b>0.988</b>	0.695
<b>TR_1</b>	0.6648	0.6646	0.8074	0.8202	0.7988	<b>0.8664</b>		0.6444	0.6573	0.655	0.6666	0.7188	<b>0.9381</b>
<b>TR_2</b>	0.6591	0.7389	0.8275	0.8344	0.8431	<b>0.9483</b>		0.6653	0.6536	0.6358	0.6699	0.7066	<b>0.9638</b>
<b>TR_3</b>	0.7215	0.7452	0.7645	0.8081	0.8094	<b>0.9395</b>		0.5816	0.5833	0.6122	0.688	0.6729	<b>0.9691</b>
<b>TR_4</b>	0.6863	0.732	0.8039	0.8255	0.813	<b>0.9664</b>		0.6306	0.6078	0.5881	0.681	0.6801	<b>0.974</b>
<b>TR_5</b>	0.6843	0.7184	0.7859	0.8608	0.812	<b>0.9384</b>		0.6365	0.6408	0.6721	0.7015	0.6994	<b>0.9868</b>
<b>TR_6</b>	0.6947	0.731	0.7483	0.8037	0.7981	<b>0.9431</b>		0.6171	0.5836	0.6017	0.6588	0.6738	<b>0.9521</b>
<b>TR_7</b>	0.6881	0.7008	0.7455	0.7971	0.8605	<b>0.9251</b>		0.6003	0.5887	0.6034	0.6635	0.6484	<b>0.9452</b>

**Table 9.12 Fornell-Larker Criterion Assessment (Intervention Framework: Scenario A & D)**

	Scenario A						Scenario D					
	ATT	INT	NP	PA	PE	TR	ATT	INT	NP	PA	PE	TR
ATT	<b>0.9765</b>						<b>0.9709</b>					
INT	0.9085	<b>0.9603</b>					0.8663	<b>0.965</b>				
NP	0.6094	0.6759	<b>0.9000</b>				0.5684	0.5888	<b>0.9416</b>			
PA	0.671	0.7243	0.8366	<b>0.9519</b>			0.7511	0.7003	0.7385	<b>0.9321</b>		
PE	0.7733	0.7689	0.8411	0.8797	<b>0.9746</b>		0.6712	0.5501	0.6011	0.779	<b>0.9902</b>	
TR	0.735	0.7707	0.8402	0.881	0.8788	<b>0.9329</b>	0.6505	0.6417	0.6496	0.7029	0.7137	<b>0.9614</b>

The results show that all loadings for all items, and composite reliability (CR) for all constructs were above 0.7. This confirms the reliability of the datasets for both scenarios (A &D).

The AVE of all constructs exceeds the threshold value of 0.5, and the square roots of the AVE are greater than the constructs' correlation with other constructs respectively. No indicator loadings were higher than the opposing constructs. These results confirm the convergent and discriminant validity of the data sets (both Scenario A & D) were satisfactorily met.

### 9.6.2 Structural Model of Intervention Framework (Scenario A & D)

Following the assessment of reliability and validity of the datasets for both scenarios, the subsequent step was to evaluate the structural model of the framework. Collinearity issues were addressed and are presented in Appendix 16. Accordingly, the result showed that all VIF values are less than 5.0 and within the acceptable range. Collinearity is not an issue in the data sets for both scenarios. The results further confirm that the structural model results for both Scenario A and D would not be negatively influenced by collinearity problems.

Both PLS Algorithm (path weighting scheme) with maximum iterations of 300 and a bootstrapping procedure of 37 cases (for the case of scenario A) & 64 cases (for the case of scenario D) and 5000 samples were undertaken to perform the following:

- I. Evaluation of  $R^2$  value
- II. Evaluation of significance and relevance of structural model relationships (assessment of structural model path coefficients/hypothesis testing).
- III. Assessment of Effect Sizes  $f^2$
- IV. Assessment of predictive relevance  $Q^2$  and  $q^2$  effect sizes.

#### **9.6.2.1 Assessment of $R^2$ values of the Endogenous Construct (Intervention Framework: Scenario A & D)**

The  $R^2$  values of the endogenous construct for both scenarios were examined. Table 9.13 below shows the  $R^2$  values in both scenarios.

**Table 9.13  $R^2$  Values of the Endogenous Construct (Intervention Framework: Scenario A & D)**

Endogenous Construct ( $R^2$ )	Scenario A (N=37)	Scenario D (N=64)
Intention (INT)	0.825 (Substantial)	0.751 (Substantial)
Attitude (ATT)	0.598 (Moderate)	0.583 (Moderate)
Perceived Relative Advantage (PA)	0.808 (Substantial)	0.632 (Moderate)
Perceived Ease of Use (PE)	0.808 (Substantial)	0.542 (Moderate)

The intervention framework explains 82.5 % (substantial) of the variance of intention to use ADR (selection behaviour) when dispute occurs (Scenario A), and 75.1 % (substantial) of the variance of intention to use ADR (selection behaviour) in negotiation phase (Scenario D).

#### **9.6.2.2 Assessment of Structural Model Path Coefficients (Intervention Framework: Scenario A & D)**

Empirical  $t$  value was assessed to determine the significance level of the path coefficient. The structural model relationships are shown in Table 9.14 below:

**Table 9.14 Path Significance Testing Results (Intervention Framework: Scenario A & D)**

Scenario	Path	Hypothesis Test		
		Path Coefficient ( $\beta$ )	T-Statistics (t)	Interpretation
Intention ( $R^2=0.825$ ) Scenario A	H <sub>a</sub> Attitude → Intention	0.9085	25.7468***	Supported
	H <sub>b</sub> Perceived Relative Advantage → Attitude	-0.0414	0.0917	NS
	H <sub>c</sub> Perceived Ease of Use → Attitude	0.8098	2.2851**	Supported
	H <sub>d</sub> Normative Pressures → Perceived Relative Advantage	0.3277	1.8236*	Supported
	H <sub>e</sub> Normative Pressures → Perceived Ease of Use	0.3496	2.2540**	Supported
	H <sub>f</sub> Trust → Perceived Relative Advantage	0.6057	3.2053***	Supported
	H <sub>g</sub> Trust → Perceived Ease of Use	0.5850	4.1214***	Supported
Intention ( $R^2=0.751$ ) Scenario D	H <sub>a</sub> Attitude → Intention	0.8663	22.0394***	Supported
	H <sub>b</sub> Perceived Relative Advantage → Attitude	0.5806	3.2233***	Supported
	H <sub>c</sub> Perceived Ease of Use → Attitude	0.2190	1.2860	NS
	H <sub>d</sub> Normative Pressures → Perceived Relative Advantage	0.4876	3.2965***	Supported
	H <sub>e</sub> Normative Pressures → Perceived Ease of Use	0.2379	1.3246	NS
	H <sub>f</sub> Trust → Perceived Relative Advantage	0.3862	2.7414***	Supported
	H <sub>g</sub> Trust → Perceived Ease of Use	0.5591	4.1733***	Supported

\*\*\* Significant at  $p<0.01$ , 1%, \*\* Significant at  $p<0.05$ , 5%, \*Significant at  $p<0.1$ , 10%, 2 tailed test

With reference to the path coefficient and t-statistics, the hypotheses for both scenario A & D were assessed and examined. The findings showed that the intervention framework for both scenarios were structurally good ( $R^2=0.825$  for scenario A;  $R^2=0.751$  for scenario D) and sufficient in predicting behavioural intention to use ADR.

The results shown above are interesting. The findings showed that in a dispute situation when decision makers were in the stage of choosing ADR methods for settlement (Scenario A), the perceived ease of use (PE) of the method contributes to the decision-making process. It was found that perceived relative advantage (PA) is not significant for the cognitive process. Evidently, interventions through normative pressures (NP) and trust (TR) are possible as they positively influence perceived ease of use (PE). Accordingly, perceived ease of use (PE) positively influences attitude (ATT), and a favourable attitude (ATT) contributes to intention to use ADR. In Scenario A, all paths were significant, except H<sub>b</sub> Perceived Relative Advantage (PA) → Attitude (ATT).

On the contrary, prior to the occurrence of a dispute where decision makers were in the stage of negotiation claims (Scenario D), perceived ease of use (PE) does not influence attitude (ATT). Perceived relative advantage of ADR (PA) plays a significant role in forming attitudinal cognitive structures. It was found that the path from perceived relative advantage (PA) → attitude (ATT) is significant. Interventions through this path are possible, where normative pressures (NP) and trust (TR) strongly influence perceptions of utilities in ADR methods [perceived relative advantage (PA)]. In this scenario, all paths were significant, except H<sub>c</sub> Perceived Ease of Use (PE) → Attitude (ATT); and H<sub>e</sub> Normative Pressures (NP) → Perceived Ease of Use (PE).

#### **9.6.2.3 Assessment of Effect Sizes (Intervention Framework: Scenario A & D)**

Subsequently all effect sizes for confirmed paths were computed. The effect sizes for both scenarios are portrayed in Table 9.15 below:

**Table 9.15 Effect Size Result for Confirmed Path (Intervention Framework: Scenario A & D)**

Scenario	Path	Effect Sizes		
		$f^2$		Interpretation
		A	D	
Intention (R <sup>2</sup> =0.825) Scenario A	H <sub>a</sub> Attitude → Intention	-	-	-
	H <sub>c</sub> Perceived Ease of Use → Attitude	0.368	-	Large
	H <sub>d</sub> Normative Pressures→ Perceived Relative Advantage	0.167	-	Medium
	H <sub>e</sub> Normative Pressures→ Perceived Ease of Use	0.182	-	Medium
	H <sub>f</sub> Trust→ Perceived Relative Advantage	0.563	-	Large
	H <sub>g</sub> Trust → Perceived Ease of Use	0.521		Large
Intention (R <sup>2</sup> =0.751) Scenario D	H <sub>a</sub> Attitude → Intention	-	-	-
	H <sub>b</sub> Perceived Relative Advantage → Attitude	-	0.317	Medium
	H <sub>d</sub> Normative Pressures→ Perceived Relative Advantage	-	0.375	Large
	H <sub>f</sub> Trust→ Perceived Relative Advantage		0.234	Medium
	H <sub>g</sub> Trust → Perceived Ease of Use		0.395	Large

For Scenario A (dispute phase), perceived ease of use (PE) has a large effect ( $f^2=0.368$ ) on attitude (ATT). To intervene in perceived ease of use (PE) effectively, the competencies of the neutrals need to be carefully enhanced, as trust (TR) has a large effect ( $f^2$

=0.521) on perceived ease of use (PE). Meanwhile, isomorphic normative pressures (NP) have a medium effect on perceived ease of use (PE).

For Scenario D (Negotiation phase), perceived relative advantage (PA) has a medium effect on attitude (ATT) ( $f^2=0.317$ ). Perceived relative advantage (PA) can be influenced significantly by both normative pressures (NP) and trust (TR). Normative pressures (NP) have a larger effect on perceived relative advantage (PA), while trust (TR) has a medium effect on perceived relative advantage (PA).

#### **9.6.2.4 Assessment of Predictive Relevance $Q^2$ (Intervention Framework: Scenario A & D)**

The predictive relevance of the constructs on the confirm paths was examined with Stone-Geisser's  $Q^2$  by using the blindfolding procedure. The omission distance (D) for both scenarios was set to 7. Cross-validated redundancy was used to examine  $Q^2$ . Table 9.16 below shows the  $Q^2$  value for the endogenous construct. The  $Q^2$  values are considerably above zero, providing support for the model's predictive relevance related to the endogenous construct.

**Table 9.16 Predictive Relevance of Endogenous Construct (Intervention Framework: Scenario A & D)**

Endogenous Construct	$R^2$ Value		$Q^2$ Value	
	Scenario A	Scenario D	Scenario A	Scenario D
Intention (INT)	0.825 (Substantial)	0.751 (Substantial)	0.7536(Substantial)	0.6930(Moderate)
Attitude (ATT)	0.598 (Moderate)	0.583 (Moderate)	0.5333(Moderate)	0.5424(Moderate)
Perceived Relative Advantage (PA)	0.808 (Substantial)	0.632 (Moderate)	0.7320(Moderate)	0.5457(Moderate)
Perceived Ease of Use (PE)	0.808 (Substantial)	0.542 (Moderate)	0.7640(Substantial)	0.5418(Moderate)

The overall  $q^2$  values for the confirmed paths in both scenarios are shown in Table 9.17. For Scenario A, perceived ease of use (PE) has a medium predictive relevance

( $q^2=0.277$ ) for attitude (ATT); normative pressures (NP) has a medium predictive relevance ( $q^2=0.216$ ) for perceived relative advantage (PA); but a small predictive relevance ( $q^2=0.119$ ) for perceived ease of use (PE). Trust (TR) has both large predictive relevance for perceived relative advantage (PA) ( $q^2=0.374$ ), and perceived ease of use (PE) ( $q^2=0.385$ ).

For scenario D, perceived relative advantage (PA) has a medium predictive relevance ( $q^2=0.278$ ) for attitude (ATT). Normative pressures (NP) has a medium predictive relevance ( $q^2=0.276$ ) for perceived relative advantage (PA). Following that, trust (TR) has a medium predictive relevance ( $q^2=0.159$ ) for perceived relative advantage (PA), but relatively a larger predictive relevance ( $q^2=0.388$ ) for perceived ease of use (PE).

**Table 9.17 Summary of Predictive Relevance (Intervention Framework: Scenario A & D)**

Scenario	Path	Effect Sizes			
		$f^2$ Effect Size		$q^2$ Effect Size	
		A	D	A	D
Intention ( $R^2=0.825$ ) Scenario A	$H_a$ Attitude → Intention	-	-		
	$H_b$ Perceived Ease of Use → Attitude	0.368 (Large)	-	0.277 (Medium)	
	$H_d$ Normative Pressures→ Perceived Relative Advantage	0.167(Medium)	-	0.216 (Medium)	
	$H_e$ Normative Pressures → Perceived Ease of Use	0.182 (Medium)	-	0.119 (Small)	
	$H_f$ Trust→ Perceived Relative Advantage	0.563 (Large)	-	0.374 (Large)	
	$H_g$ Trust → Perceived Ease of Use	0.521 (Large)		0.385 (Large)	
Intention ( $R^2=0.751$ ) Scenario D	$H_a$ Attitude → Intention	-	-	-	-
	$H_b$ Perceived Relative Advantage → Attitude	-	0.317 (Medium)		0.278 (medium)
	$H_d$ Normative Pressures→ Perceived Relative Advantage	-	0.375 (Large)		0.276 (medium)
	$H_f$ Trust→ Perceived Relative Advantage		0.234 (Medium)		0.159 (medium)
	$H_g$ Trust → Perceived Ease of Use		0.395 (Large)		0.388 (large)

### 9.6.2.5 Discussion

In general, isomorphic normative pressures (NP) and trust (TR) were found to influence perceived relative advantage (PA), and perceived ease of use (PE) of ADR methods. These two macro forces are capable to influence decision-making process in ADR use. Both perceived relative advantage (PA) and perceived ease of use (PE) were found to influence attitude (ATT). Favourable attitude (ATT) would then encourage intention (INT) to use ADR. In general (pooled situations), perceived relative advantage (PA) has a stronger influence on

attitude (ATT). Normative pressures (NP) exhibit greater effect on perceived relative advantage (PA), while trust (TR) exhibits greater influence on perceived ease of use (PE).

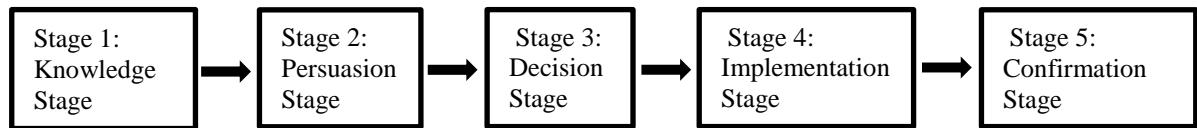
Consistent with Davis et al. (1989) assertions, perceived ease of use (PE) can influence attitude (ATT) through the basis of self-efficacy, where one would have more sense of control and sense of efficacy in using the system if it is perceived to be easier to interact with. When dispute occurs (Scenario A), perceived ease of use (PE) in ADR significantly influences attitude (ATT). One's affection and attitude towards ADR use may incorporate feelings towards the process of using the ADR method (ease of use). To circumvent further complications in dispute situations, the intrinsic motivation aspects of ease of use in ADR contributes to the favourable feelings in ADR use if the instructions in ADR are easy to follow, learn and adhere. However, the empirical result shows no evidence of perceived relative advantage (PA) to attitude (ATT) when dispute occurs. This implies overall that intention to use ADR must have been guided purely by the direct effects of feelings (positive or negative) towards ADR use, guided by a sense of efficacy in the methods through ease of use.

Up to the point before negotiation fails (Scenario D), the decision-making process in ADR use has been guided by instrumental cognitive evaluations. Attitudinal cognitive evaluations on the outcomes of using ADR strongly draw on the relative advantage of ADR methods. Although perceived ease of use (PE) had lost its influence on attitude (ATT), perceived relative advantage (PA) maintains its influence on attitude (ATT). Intention (INT) to use ADR strongly guided by affective feelings (attitudinal dimensions) drawing on the instrumental effects of ADR methods.

Overall, when a dispute occurs (Scenario A) that compels decision makers to select ADR methods, perceived ease of use (PE) is found to influence only attitude. Favourable attitudes (ATT) would then influence intention to use ADR. Perceived relative advantage (PA) is not significant in the decision-making process. Trust (TR) in the neutrals has a larger influence on perceived ease of use, while normative pressures (NP) have medium influence on perceived ease of use (PE).

In the phase of negotiation claims (Scenario D), only perceived relative advantage (PA) is found to influence attitude (ATT). Favourable attitudes (ATT) would then influence intention (INT) to use ADR. Perceived ease of use (PE) is not significant in the decision-making process. Normative pressures (NP) on the other hand have a larger influence on perceived relative advantage (PA), while trust (TR) has a medium effect on relative advantage (PA).

Drawing on Rogers (2003) diffusion of innovation's framework, five stages in the innovation decision process may be useful in explaining possible methodologies in intervening in the use of ADR in Malaysia (Figure 9.4). The framework is applied in the context of ADR selection and use behaviour.



**Figure 9.4 Rogers's 5 Stages in the Innovation Decision Process-Applied in ADR Selection and Use Behaviour**

In stage 1, the ADR users are made aware of and exposed to the presence of the ADR methods (innovation). The exposure to the ADR methods needs to be present to the ADR users' knowledge and awareness, and it requires their understanding of the functionality of the methods. According to Rogers (2003), there are typically three types of knowledge about an innovation. The whole innovation-decision process is essentially an information-seeking and information-processing activity in which an individual is motivated to reduce uncertainty about the advantages and disadvantages of an innovation. An innovation typically comes with such questions as "What is the innovation? How does it work?" and "Why does it work?" The first knowledge acquires information about the existence of an innovation. It is termed as "**awareness-knowledge**". This implies that the construction professionals need to be made aware of the merits offered by ADR methods. With sufficient motivation, it would foster the acquisition of "**how-to knowledge**" (second knowledge), which may occur at the expense of knowing how to use the ADR method properly. Alternatively, it could happen at the

persuasion and decision stages. The third knowledge (principles-knowledge) consists of information about the fundamental principles underlying the ADR methods. Interventions at this stage are possible as potential ADR users are made aware of the dos and don'ts of ADR methods, and their contractual legal rights of instigating them.

In stage 2 (persuasion stage), an ADR user is likely to form favourable or unfavourable attitude towards ADR methods. The mental activity at this stage is predominantly cognitive and affective (feeling). As the decision makers become more psychologically involved with the ADR methods, they will develop perceptions and attributes related to the ADR methods. Two important perceptions as determined in the study earlier are perceived relative advantage (PA) and perceived ease of use (PE). ADR methods that exhibit greater **relative advantage** and **ease of use** will yield favourable attitudes (ATT) towards ADR use. Interventions through isomorphic normative pressures (NP) and better portrayal of the competence of the neutrals that instil trust (TR) would effectively and positively influence these two cognitive instruments.

Normative pressures can be conveyed through the help of professionalization, where professional bodies within similar fields may form shared norms and diffusion of expectations through education, conferences, and professional consultations (Cao et al., 2014; Teo et al., 2003). Major construction associations in Malaysia (such as the Construction Industry Development Board (CDIB), and Master Builders Association Malaysia (MBAM) coupled with other professional construction bodies in Malaysia (such as the Board of Quantity Surveyors, the Board of Engineers, the Board of Architects, and the Professional Services Development Centre (PSDC) could play their role in propagating the virtues of ADR as the best methods of settling disputes. Knowledge about the features, process and procedures could influence users' perceptions of the relative advantage and ease of use of the ADR methods accordingly. As trust signifies users' perceptions of the competence, integrity and benevolence of the neutrals, their professional capacities and technical expertise could be improved with more professional training and more exposure to relevant construction law.

In stage 3, having made careful deliberative considerations on the ADR methods, the decision makers can decide to use or reject the ADR method. In stage 4, ADR methods can

be put into actual use when ADR users realise their intentions to use. Finally in stage 5, decision makers can reinforce their decisions for continued use of ADR methods.

## **9.7 Chapter Summary**

This chapter presents the development of an ADR intervention framework based on both qualitative and quantitative grounds. Six expert interviews were used to validate the ADR decision-making behavioural model. Accordingly, attitude (ATT), perceived ease of use (PE), and perceived relative advantage (PA) were found to influence intention (INT) to use ADR significantly. The importance of attitude (ATT) and the predictors were validated accordingly. Drawing on the validation interviews, normative pressures (NP) and trust (TR) were posited as macro forces that influence the attitudinal structure in the decision-making process. In general, the intervention framework was shown to be structurally sound and relevant, and in two distinctive scenarios: the phase when an actual dispute occurs and the phase of negotiating claims prior to the occurrence of a dispute.

## **10. CHAPTER 10: DISCUSSION & CONCLUSIONS**

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### **10.1 Introduction**

This chapter presents the achievement of the research objectives. The results explain decision-making behaviour in ADR use over the past three decades, providing further theoretical evidence on the dynamics underpinning selection behaviour which can be used as potential framework for practical interventions. The chapter reports the achievements of Objective 1, and Objective 2 and Objective 3 and Objective 4 as outlined in the doctoral study.

### **10.2 Objective 1 of Doctoral Research (Systematic Review)**

Objective 1 aimed to perform a systematic review on the factors influencing ADR selection and use in construction projects for the last 32 years. In total, 446 articles from 21 construction projects were identified and reviewed. Of these, only 13 articles focused on the factors influencing ADR selection and use. These 13 articles were then analysed, synthesized, and summarized in terms of the *research methods used, distribution across countries* and *citation influences*. It was found that previous studies on the selection and use of ADR were mainly based on utility grounds. Past studies also failed to show the relationships and dynamics between the factors towards ADR use. The results suggest the need for the future application of a theoretical model which explains and establishes relationships between the factors towards explaining ADR use.

### **10.3 Objective 2 of Doctoral Research (Develop and Test an ADR Decision-Making Behavioural Model)**

Objective 2 of the doctoral research aimed to develop an ADR decision-making behavioural model. The development of the model began with the reclassification of ADR selection and use factors into the Theory of Planned Behaviour (TPB) framework. Accordingly, the TPB framework was integrated with other behavioural theories and an ADR decision-making behavioural model was conceptualised. In between, the conceptualisation of the model involved the use of a focus group study, reaffirmed with a Belief Elicitation Study. A main questionnaire measuring the model constructs was developed. The questionnaire was pre-tested, pilot tested and finalised before being sent out as the main survey.

The model consisted of six major hypotheses and 20 sub-hypotheses. The participants consisted of 128 contractors who responded to the survey. The model was tested by using Partial Least Squares Structural Equation Modelling (PLS-SEM). The empirical examination of the model involved the following:

### **10.3.1 Determinants of Intention**

To confirm the major predictors of intention, the following six major hypotheses were proposed:

Hypothesis 1 ( $H_1$ ): Attitude (ATT) relates positively with Intention (INT).

Hypothesis 2 ( $H_2$ ): Subjective Norm (SN) relates positively with Intention (INT).

Hypothesis 3 ( $H_3$ ): Perceived Behavioural Control (PBC) relates positively with Intention (INT).

Hypothesis 4 ( $H_4$ ): Perceived Severity (SEV) relates positively with Intention (INT).

Hypothesis 5 ( $H_5$ ): Perceived Vulnerability (VUL) relates positively with Intention (INT).

Hypothesis 6 ( $H_6$ ): Descriptive Norm (DN) relates positively with Intention (INT).

The results from the bootstrapping routine (5000 samples, 128 cases) with PLS-SEM supported Hypothesis 1 ( $H_1$ ), as the path from attitude (ATT) to intention (INT) is significant ( $\beta=0.6679$ ,  $t=6.836$ ,  $p<0.01$ ). Attitude (ATT) has a large effect size on intention (INT) ( $f^2=0.660$ ). Nevertheless, attitude (ATT) has a large predictive relevance for intention (INT), with  $q^2$  value of 0.464. The remaining Hypotheses ( $H_2$ ,  $H_3$ ,  $H_4$ ,  $H_5$ , and  $H_6$ ) were all rejected as the paths were insignificant as their T-Statistics do not meet the minimum T-statistics of 1.65 (significant at 10%,  $p<0.10$ ). The finding shows that attitude (ATT) relates positively with intention (INT). The key determinant to intention (INT) is attitude (ATT).

According to Ajzen (1991), attitudes, subjective norms and perceived behavioural control may make independent contributions to the predictions of intentions. In some situations, only attitudes are significant for intentions, in others both attitudes and perceived behavioural control influence intentions. The relative contributions of attitudes, subjective norms and perceived behavioural control towards intentions are expected to differ across behaviours and situations (Ajzen, 1991). In this study, the research model clearly confirms

that **only attitude (ATT)** makes an independent contribution to intention (INT) (selection behaviour).

### 10.3.2 Determinants of Attitude

There were four sub-hypotheses formulated to investigate the determinants of attitude towards ADR use. The hypotheses were as follows:

Hypothesis 1a ( $H_{1a}$ ): Trust (TR) relates positively with Attitude (ATT).

Hypothesis 1b ( $H_{1b}$ ): Perceived Relative Advantage (PA) relates positively with Attitude (ATT).

Hypothesis 1c ( $H_{1c}$ ): Perceived Ease of Use (PE) relates positively with Attitude (ATT).

Hypothesis 1d ( $H_{1d}$ ): Perceived Risk (PR) relates negatively with Attitude (ATT).

The results show that only **both perceived relative advantage (PA) and perceived ease of use (PE)** make significant contributions to attitude (ATT). Hypothesis 1b and Hypothesis 1c were supported; while Hypothesis 1a and hypothesis 1d were rejected on the grounds of insignificance path. Trust (TR) and perceived risks (PR) are found to be insignificant to intention (INT).

The path of perceived relative advantage (PA) to attitude (ATT) is significant ( $\beta=0.3627$ ,  $t=1.7623$ ,  $p<0.1$ ), and has a small effect size on and predictive relevance for attitude (ATT) ( $f^2=0.085$ , and  $q^2=0.0712$ ). Similarly, perceived ease of use (PE) has a significant influence on attitude (ATT). Analysis shows that the path is significant ( $\beta=0.366$ ,  $t=2.1395$ ,  $p<0.05$ ), and has a small effect on and predictive relevance for attitude (ATT) ( $f^2=0.108$ , and  $q^2=0.099$ ).

Although both predictors show a relatively small effect and predictive relevance, this shows that the majority of variance of attitude can be explained by a combination of both perceived relative advantage and ease of use, rather than their independent contributions of one construct.

The results suggest that perceptions of utilities in ADR methods play the most important role in ADR selection. Decision makers eventually maximise the utilities

associated with each ADR method under uncertainty. The equation of attitude is essentially associated with Subjective Expected Utility (SEU), which posits that decision makers choose alternatives that maximize gains, and minimize average loss (Ajzen & Fishbein, 1969). Perceptions of relative advantage and ease of use nevertheless contribute to the expectancies in attitudinal dimensions and guide decision-making. ADR users will continue to prefer the ADR methods that supersede the others and provide benefits in terms of cost, value, and business relationships. The empirical evidence also supported that when users feel that the method is easy to use and can be initiated without effort, their attitude towards the ADR method becomes more favourable.

### **10.3.3 Determinants of Subjective Norm**

There were three sub-hypotheses formulated to determine the determinants of subjective norms as follows:

Hypothesis 2a ( $H_{2a}$ ): Internal Team Influence (IT) relates positively with Subjective Norm (SN)

Hypothesis 2b ( $H_{2b}$ ): Coercive Pressures (CP) relates positively with Subjective Norm (SN).

Hypothesis 2c ( $H_{2c}$ ): Normative Pressures (NP) relates positively with Subjective Norm (SN).

The results show that only internal team influence (IT) has a significant positive influence on subjective norm (SN). Hypothesis 2a was supported, and the path was found to be significant ( $\beta=0.5063$ ,  $t=3.3553$ ,  $p<0.01$ ). Hypothesis 2b and Hypothesis 2c were rejected as their paths were insignificant. Internal team influence (IT) has large effect size on and small predictive relevance for subjective norm ( $f^2=0.373$ ,  $q^2=0.113$ ).

The results suggest that two isomorphic pressures (normative and coercive pressure) do not affect perceptions of social pressure of the ADR decision makers. The most influential referent to the decision makers would be the internal project team members.

Although the moderator analysis shows that voluntariness in ADR Use (VolUse) negatively moderates positive relationship between subjective norm (SN) and intention (INT) ( $HM_2$  is significant), such compliance effect is not important to decision making since subjective norm (SN) do not influence intention (INT) (selection behaviour).

#### **10.3.4 Determinants of Perceived Behavioural Control**

There were total of two hypotheses formulated as follows:

Hypothesis 3a ( $H_{3a}$ ): Consensus on Appropriation (CA) relates positively with Perceived Behavioural Control (PBC).

Hypothesis 3b ( $H_{3b}$ ): Organisational Competency (OC) relates positively with Perceived Behavioural Control (PBC).

The results show that consensus on appropriation (CA) and organisational competency (OC) have a significant positive influence on perceived behavioural control (PBC). Both hypotheses were supported. The path from consensus on appropriation (CA) to perceived behavioural control (PBC) was significant ( $\beta=0.4013$ ,  $t=3.844$ ,  $p<0.01$ ). Meanwhile, the path from organisational competency (OC) to perceived behavioural control (PBC) is similarly significant ( $\beta=0.4187$ ,  $t=3.6286$ ,  $p<0.01$ ). Consensus on appropriation (CA) has a medium effect on and small predictive relevance for perceived behavioural control (PBC) ( $f^2=0.179$ ;  $q^2=0.143$ ). Organisational competency (OC) has a relatively larger effect on and predictive relevance for perceived behavioural control (PBC) ( $f^2=0.194$ ;  $q^2=0.152$ ).

Moderator analysis of  $HM_2$  however failed to find any support for the moderation effect of mutual consent on the relationship between consensus on appropriation (CA) and perceived behavioural control (PBC).

#### **10.3.5 Determinants of Descriptive Norm**

There was only one hypothesis formulated to identify the determinants of descriptive norm with regard to ADR use. The hypothesis was as follows:

Hypothesis 6a ( $H_{6a}$ ): Mimetic Pressure (MP) relates positively with Descriptive Norm (DN). The result show that mimetic pressure (MP) is strongly significant ( $\beta=0.7487$ ,  $t=13.6659$ ,  $p<0.01$ ). Mimetic pressure explains 56.1% of descriptive norm's (DN) variance. Imitation and mimicry effects strongly influence how people perceive the success of others.

#### **10.3.6 Determinants of Perceived Severity**

To identify the significant determinants of perceived severity, four hypotheses were formulated as follows:

Hypothesis 4a ( $H_{4a}$ ): Perceived Importance of Dispute Issues (PI) relates positively with Perceived Severity (SEV).

Hypothesis 4c ( $H_{4c}$ ): Perceived Complexity (PC) relates positively with Perceived Severity (SEV).

Hypothesis 4e ( $H_{4e}$ ): Amount in Controversy (AC) relates positively with Perceived Severity (SEV).

Hypothesis 4g ( $H_{4g}$ ): Conflict Intensity (CI) relates positively with Perceived Severity (SEV). The results show that both perceived importance (PI) and conflict intensity (CI) positively influence perceived severity (SEV). Hypothesis 4c and hypothesis 4e were rejected as they were found to be insignificant.

Overall, the path of perceived importance (PI) to perceive severity (SEV) was found to be significant ( $\beta=0.2638$ ,  $t=1.6893$ ,  $p<0.1$ ). Meanwhile, the path of conflict intensity (CI) to perceived severity (SEV) is also significant ( $\beta=0.2973$ ,  $t=1.75$ ,  $p<0.1$ ). Both perceived importance (PI) and conflict intensity (CI) have a small effect size ( $f^2=0.032$ ;  $f^2 =0.041$ ) and predictive relevance ( $q^2=0.0225$ ;  $q^2=0.023$ ) for perceived severity (SEV).

Both perceived importance of dispute issue (PI) and conflict intensity (CI) give rise to the perceptions of adverse consequences if a dispute escalates.

### **10.3.7 Determinants of Perceived Vulnerability**

To identify the significant determinants of perceived vulnerability (VUL), four hypotheses were formulated as follows:

Hypothesis 4b ( $H_{4b}$ ): Perceived Importance of Dispute Issue (PI) relates positively with Perceived Vulnerability (VUL).

Hypothesis 4d ( $H_{4d}$ ): Perceived Complexity (PC) relates positively with Perceived Vulnerability (VUL).

Hypothesis 4f ( $H_{4f}$ ): Amount in Controversy (AC) relates positively with Perceived Vulnerability (VUL).

Hypothesis 4h ( $H_{4h}$ ): Conflict Intensity (CI) relates positively with Perceived Vulnerability (VUL).

The results show that hypothesis 4h was supported, as conflict intensity (CI) was found to influence perceived vulnerability (VUL). The path was significant ( $\beta=0.2495$ ,  $t=1.8477$ ,  $p<0.05$ ). Conflict intensity (CI) has a relatively small effect size ( $f^2=0.026$ ) on and small predictive relevance ( $q^2=0.0263$ ) for perceived vulnerability (VUL).

The empirical results suggest that conflict intensity invokes perceived probability that the dispute would escalate if not settled with ADR.

#### **10.3.8 Overall Predictive Accuracy and Relevance of Model**

The overall predictive accuracy ( $R^2$ ), predictive relevance ( $Q^2$ ), and significance of the path model were examined and discussed. Furthermore, to compliment the overall findings, the total effects from all latent variables to intention (INT) were examined, and discussed accordingly. An examination of the total effects provides interesting results as it shows the influence of each latent variable to the targeted construct (Hair et al., 2014).

Empirical results show that the  $R^2$  value of Intention (selection behaviour) is substantial ( $R^2=0.774$ ). The model has predictive relevance as the Stone Geisser's  $Q^2$  for intention (selection behaviour) recorded a remarkable value of 0.7173. Notably, cross-validated redundancy of  $Q^2$  above 0.5 is indicative of a predictive model (Chin, 2010).

Attitude (ATT), subjective norm (SN), perceived behavioural control (PBC), descriptive norm (DN), perceived vulnerability (VUL), and perceived severity (SEV) jointly contribute 77.4% of variance to the explanation of ADR selection behaviour. However, only attitude (ATT) prevails in the prediction, as the path analysis confirms that it is strongly significant at  $p<0.01$ , with a path coefficient as high as 0.6679. Attitude (ATT) has a large effect size on ( $f^2=0.660$ ) and large predictive relevance ( $q^2=0.464$ ) for intention (INT).

To understand the influences of attitude (ATT) towards intention (INT), two separate scenarios were simulated and the influence of attitude was examined (Chapter 8). The original TPB model (without extension) which comprises attitude (ATT), subjective norm (SN), and perceived behavioural control (PBC) were put to test in two scenarios: Scenario A, and Scenario D. Scenario A (N=37) describes a dispute that was happening at the time of

survey, and selection of ADR methods were in consideration; while Scenario D ( $N=64$ ) depicts a negotiation of claim that was happening at the time of survey, and users were required to choose ADR methods to resolve the dispute if negotiation were to fail. Attitude was found to be the only and sole predictor of intention. Attitude (ATT) strongly influences intention positively at  $p<0.01$ ,  $\beta=0.8930$  in Scenario A, with  $p<0.01$ ,  $\beta=0.6407$  in Scenario D. Attitude was found to have large effect size on and predictive relevance for intention (INT) in Scenario A ( $f^2=1.142$ ,  $q^2=0.8505$ ), and in Scenario D ( $f^2=0.524$ ,  $q^2=0.4178$ ).

#### **10.4 Objective 3 of Doctoral Research (Determine the Predictors of Intention to Use ADR)**

Drawing from the hypothesis test and path analysis, the overall path analysis shows that the significant paths influencing intention are as follows:

Path 1: Perceived Relative Advantage (PA) influences attitude (ATT). Attitude (ATT) then positively influences Intention (INT).

Path 2: Perceived Ease of Use (PE) influences Attitude (ATT). Attitude (ATT) then positively influences Intention (INT).

#### **10.5 Objective 4 of Doctoral Research (Develop and Test an ADR Intervention Framework)**

Following the findings of the ADR decision-making behavioural model that discern the importance of attitude (ATT), perceived relative advantage (PA), and perceived ease of use (PE) towards intention (INT) to use ADR (selection behaviour), an intervention framework that aims to intervene in intention (INT), attitude (ATT), perceived relative advantage (PA), and perceived ease of use (PE) was developed based on both qualitative and quantitative grounds. Firstly, six expert validations were used to validate the importance of perceived relative advantage (PA), perceived ease of use (PE), and attitude (ATT) towards intention (INT) with reference to the research model (ADR decision-making behavioural model). Based on the research model, the six construction experts were asked to express their opinions and views on possible interventions that could be used to increase intention (INT) to use ADR. Based on their discussions, two constructs, namely normative pressures (NP) and trust in neutrals (TR), were conceptualised as macro conditions that influence attitudinal cognitive instruments of decision making.

Based on both quantitative data and qualitative feedback, a parsimonious intervention framework was conceptualised and tested with PLS-SEM. It was found that the intervention framework offers plausible predictive accuracy and relevance in intention (INT) generally ( $R^2=0.749$ ;  $Q^2=0.69$ ). Normative pressures (NP) has a stronger influence on perceived relative advantage (PA) ( $\beta=0.4815$ ,  $t=4.6291$ ,  $p<0.01$ ), while trust (TR) has a stronger influence on perceived ease of use (PE) ( $\beta=0.4818$ ,  $t=3.7687$ ,  $p<0.01$ ). Attitude (ATT) generally significantly predicts intention (INT) ( $\beta=0.8657$ ,  $t=29.4331$ ,  $p<0.01$ ).

When there was an actual dispute (Scenario A, N=37), attitude (ATT) significantly predicted intention (INT) ( $R^2=0.825$ ,  $Q^2=0.7536$ ). Perceived ease of use (PE) significantly influences attitude (ATT) ( $\beta=0.8098$ ,  $t=2.2851$ ,  $p<0.05$ ). Compared to normative pressures (NP) ( $\beta=0.3496$ ,  $t=2.2540$ ,  $p<0.05$ ,  $f^2=0.182$ ), trust (TR) has a larger significance in influencing perceived ease of use (PE) ( $\beta=0.5850$ ,  $t=4.1214$ ,  $p<0.01$ ,  $f^2=0.521$ ).

On the other hand, prior to the occurrence of a dispute (Scenario D), attitude (ATT) also predicts intention (INT) significantly ( $\beta=0.8663$ ,  $t=22.0394$ ,  $p<0.01$ ). Perceived relative advantage (PA) significantly influences attitude (ATT) ( $\beta=0.5806$ ,  $t=3.2233$ ,  $p<0.01$ ). In contrast to trust (TR) ( $\beta=0.3862$ ,  $t=2.7414$ ,  $p<0.01$ ), normative pressures (NP) ( $\beta=0.4876$ ,  $t=3.2965$ ,  $p<0.01$ ,  $f^2=0.375$ ) have a more significant influence on perceived relative advantage (PA).

## 10.6 Chapter Summary

This chapter presents and discusses the results obtained from the evaluation of the ADR decision-making behavioural model. The conceptualised ADR decision-making behavioural model managed to establish the relationship of all synthesized factors obtained from the 32-year systematic review, guided by the Theory of Planned Behaviour and integration of other behavioural theories. The quantitative results show that the conceptual ADR decision-making behavioural model has overall good predictive relevance. Variance in intention (INT) to use ADR is largely explained by attitude (ATT), while attitude (ATT) is jointly explained by perceived ease of use (PE) and perceived relative advantage (PA). Attitude (ATT) has a high predictive relevance and substantial effect size on intention (INT). The quantitative findings on attitude (ATT), perceived relative advantage (PA), and

perceived ease of use (PE) were further validated by six construction experts. In the context of the Malaysian construction industry, perceived relative advantage (PA), perceived ease of use (PE) and attitude (ATT) towards ADR remain the biggest influential factor towards selection behaviour in ADR. Total effect results from the PLS bootstrapping routine further confirmed that the remaining latent variables have no influence on selection behaviour (intention).

Accordingly, significant constructs from the model were extracted and developed into an intervention framework, complemented by findings from validation interviews. The framework was again tested by Partial Least Squares (PLS) Structural Equation Modelling (SEM). The framework shows promising and encouraging results that macro conditions such as normative pressures (NP) and trust (TR) influence cognitive instrumental of utilities, specifically on attitudinal dimensions. In turn, a favourable attitude yields better selection behaviour. The results overall unfold the dynamics of decision-making behaviour in ADR use over the past three decades, providing further theoretical evidence about the influence of macro forces that shape the dynamics underpinning selection behaviour. This can be used as a potential framework for practical interventions in the Malaysian construction industry. Through the plausible pathways established and tested in this study, ADR users could be made aware of and exposed to the innovations and presence of the ADR methods. Major construction associations in Malaysia could propagate and instil the virtues of ADR through normative pressures, while professional bodies could enhance the competencies of neutrals in both professional capacities and technical expertise. As both normative pressures and trust influence cognitive instrumental of utilities, interventions at the macro level would foster favourable attitudes and yield better ADR selection behaviour.

## **10.7 Research Limitations and Recommendations For Future Research**

Several limitations need to be addressed regarding this study. Firstly, the respondents involved in this study were contractors specialising in building and civil engineering registered under the Construction Industry Development Board (CIDB) Malaysia. The main study (Development of ADR decision-making behavioural model) could have involved other types of ADR users and respondents such as construction developers and consultants

Secondly, observations of the dynamics of decision-making in the ADR process were conceptualised in an ADR decision-making behavioural model with a cross sectional design. The relationship between intention to use ADR and actual use of ADR were not included in the study. The empirical observation between micro conditions and macro outcomes could be further examined. An extended longitudinal study should be attempted to provide empirical evidence that intention predicts actual ADR use behaviour. To achieve favourable outcomes, such longitudinal studies could involve larger compositions of surveyed populations.

Thirdly, the intervention framework could be further expanded with additional macro variables. In this study, macro conditions that affect both perceived relative advantage and perceived ease of use were based on qualitative and quantitative grounds. Although the intervention framework maintains its purest form of parsimony, there is possibility for future empirical investigations that could be performed to decompose the attitudinal dimensions of the framework. The effects of procurement systems, project sizes, organizational culture, and geographical concerns on ADR use could be further tested.

Fourthly, the evidence that the findings of this study would be found useful or actually applied in practice should be further investigated and observed in Malaysia. Practical intervention programmes can be further designed and tested by following the pathway shown in this study.

Lastly, the maturity of both the ADR decision-making behavioural model and the intervention framework could be tested in different countries, so as to provide several possible opportunities for data comparison in the future.

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## **Appendix A: Approval Letter and Participant Information Sheet (Research Protocol: 012980).**

**Office of the Vice-Chancellor**  
Finance, Ethics and Compliance



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### **UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE (UAHPEC)**

16-Sep-2014

#### **MEMORANDUM TO:**

Dr Tak Wing Yiu  
Civil & Environmental Engineer

#### **Re: Application for Ethics Approval (Our Ref. 012980): Approved**

The Committee considered your application for ethics approval for your project entitled **Predicting Contractors' Behavioural Intentions in Remedy Non-Payment: Understanding Decision Making Experience of Unpaid Contractors.**

We are pleased to inform you that ethics approval is granted for a period of three years.

The expiry date for this approval is 16-Sep-2017.

If the project changes significantly, you are required to submit a new application to UAHPEC for further consideration.

If you have obtained funding other than from UniServices, send a copy of this approval letter to the Research Office, at [ro-awards@auckland.ac.nz](mailto:ro-awards@auckland.ac.nz). For UniServices contracts, send a copy of the approval letter to the Contract Manager, UniServices.

In order that an up-to-date record can be maintained, you are requested to notify UAHPEC once your project is completed.

The Chair and the members of UAHPEC would be happy to discuss general matters relating to ethics approvals. If you wish to do so, please contact the UAHPEC Ethics Administrators at [ro-ethics@auckland.ac.nz](mailto:ro-ethics@auckland.ac.nz) in the first instance.

Please quote reference number: **012980** on all communication with the UAHPEC regarding this application.

**PARTICIPANT INFORMATION SHEET**  
(For Focus Group)

**Project title: Predicting Contractor's Behavioural Intention in Non-Payment: Understanding Decision-making Experience of Unpaid Contractors**

Name of Researcher: Chia Kuang LEE

**Researcher introduction**

I am a Doctoral candidate (PhD student) in The Department of Civil and Environmental Engineering, Faculty of Engineering, University of Auckland, New Zealand. My research is about developing a model that is capable of explaining contractors' behavioural choice and intention in remedying non-payment.

The discussion seeks from this Focus Group (Asynchronous Facebook Group) will mainly seek to explore the topic below:

- (1) The causes and effect of non-payment,
- (2) The influence of factors among and between the causes and effects,
- (3) Risks of non-payment (if not remedied, and when it happens)
- (4) What can a contractor do to recover payment if employer default payment,
- (5) The Factors and Determinants that influence the contractors decision in remedying non-payment,
- (6) The relationships between these determinants towards contractors' decision,
- (7) The risks and underlying problems of the available remedies in Malaysia against non-payment,
- (8) What prevents/discourage/motivate a contractor from exercising the remedies?
- (9) The underlying attitudinal, normative, and control beliefs that predicts contractor's intention and choice in remedying non-payment

This PhD study is funded by New Zealand Aid Programme (New Zealand ASEAN Scholars Award). As well as being considerable academic interests, the result of this study is expected to prove useful findings and implications for policy makers and key players in the construction industry, in

terms of understanding the acceptance of dispute resolution mechanism available in Malaysia and the effects of CIPA Act 2012, which is just recently enacted and enforced in Malaysia.

### **Project Rationale and Invitation**

The aim of this focus group is to obtain and harness participants' feedback as a result of discussion within the group. The participants have been selected and invited for this group on the basis of the diverse background of a consultant, developer, or contractor to avoid biasness and increase the richness of inputs for the research. The participants for this group are highly regarded to be expert in the respective field of construction payment and have more than 5 years of the industrial experience in construction industry.

### **Anonymity and Confidentiality**

The anonymity and identity of the participants within the focus group is not guaranteed. The participants are strongly advised to maximise their Facebook identity, and account privacies before accepting and joining the Focus group Invitation.

The extracts from the focus group maybe quoted in future academic publications and presentations, without revealing the identity of the participants of the focus group and source of such information.

There are possibilities that individuals could be identified in the final reports and publications. People's names or job titles will not be included in the final reports and publications, but participants should be aware that they may be identifiable through comments that they make.

Participants are required to not disclose anything with other people outside the focus group.

### **Project Procedures**

The nature of this Facebook Focus Group is asynchronous and the participants may discuss, and leave their comments and ideas anytime in the convenience of the participants up to **30 April 2015**. To avoid inconsistency with the other participants' comments, participants are advised not to withdraw and delete any text comments, threads, images, audio data and any data traceable to the researcher up from the focus group forum to the specified date of **30-04-2015**.

Participating in the group on the voluntary basis, and participants are free to decline to answer any question, or to leave the focus group at any time, without giving a reason.

### **Data Storage/Retention/Destruction/Future use**

Text comments, threads, images and audio data (if any) posted in the forum will be transcribed by the researcher. Only the researcher, and his main supervisor will hear, and witness the audio recording (if any) and full discussion posted in the forum in full.

The data from this research will be used for PhD thesis, academic research and papers and presentations.

All text comments, threads, images and audio data (if any) posted in the forum will be kept for six (6) years, after which they will be destroyed.

### **Right to Withdraw from Participation**

Participants have the right to withdraw from participation at any time. Participants are given the right to withdraw their participation from the research up to 30 April 2015. There are no consequences for the participants to do so.

### **Contact Details and Approval Wording**

#### **Contact Details of Researcher (Chia Kuang Lee) in Auckland, New Zealand**

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#### **Contact Details of Researcher (Chia Kuang Lee) in Malaysia**

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Email: chia@ump.edu.my/ chiakuang85@gmail.com  
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#### **Contact Details of Main Supervisor (Dr. Tak Wing Yiu)**

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Tel: 64 9 3737599 ext. 83851  
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#### **Contact Details of Head of Department (Professor Jason Maxwell Ingham)**

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For any queries regarding ethical concerns you may contact the Chair, The University of Auckland Human Participants Ethics Committee, The University of Auckland, Research Office, Private Bag

92019, Auckland 1142. Telephone 09 373-7599 extn. 87830/83761. Email:  
humanethics@auckland.ac.nz.

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS  
COMMITTEE ON 16 SEPTEMBER 2014 FOR (3) YEARS, REFERENCE NUMBER 012980

## **Appendix B: Approval Letter and Participant Information Sheet (Research Protocol: 015919).**

**Office of the Vice-Chancellor**  
Finance, Ethics and Compliance



The University of Auckland  
Private Bag 92019  
Auckland, New Zealand  
Level 10, 49 Symonds Street  
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### **UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE (UAHPEC)**

29-Sep-2015

#### **MEMORANDUM TO:**

Dr Tak Wing Yiu  
Civil & Environmental Engineer

#### **Re: Application for Ethics Approval (Our Ref. 015919): Approved with comment**

The Committee considered your application for ethics approval for your project entitled **Determinants of Alternative Dispute Resolution (ADR) Selection and Use in the Malaysian Construction Industry**.

Ethics approval was given for a period of three years with the following comment(s):

Please amend the following:

**1. Advertisement Emails**

a. Please add the UAHPEC approval wording to each email: Approved by the University of Auckland Human Participants Ethics Committee on ..... for three years, Reference Number .....

**2. CFs**

a. Please add space for a postal address for participants who require a transcript.

**3. Survey PISs**

a. Please include in the "Invitation to Participate" section a statement advising the potential participants that the submission of their survey will act as consent to participate in the survey portion of the research project.

**4. All documents**

a. Please proofread all public documents again for clarity and grammatical errors. It may be beneficial to have another person proofread them as well.

The expiry date for this approval is 29-Sep-2018.

If the project changes significantly you are required to resubmit a new application to UAHPEC for further consideration.

In order that an up-to-date record can be maintained, you are requested to notify UAHPEC once your project is completed.

The Chair and the members of UAHPEC would be happy to discuss general matters relating to ethics approvals if you wish to do so. Contact should be made through the UAHPEC Ethics Administrators at [ro-ethics@auckland.ac.nz](mailto:ro-ethics@auckland.ac.nz) in the first instance.



**Department of Civil Engineering and Environment**  
**Faculty of Engineering**  
**Phone: +64 93737513**

The University of Auckland  
Private Bag 92019  
Auckland, New Zealand

### **PARTICIPANT INFORMATION SHEET** (Pilot Study: Google Form Survey)

**Project title: Determinants of Alternative Dispute Resolution Selection and Use in the Malaysian Construction Industry**

Name of Researcher: Chia Kuang LEE  
Name of Main Supervisor: Dr. Tak Wing Yiu

#### **Researcher Introduction**

I am Chia Kuang LEE, and I am a Doctoral candidate (PhD student) in The Department of Civil and Environmental Engineering, Faculty of Engineering, University of Auckland, New Zealand. My main supervisor is Dr. Tak Wing Yiu.

#### **Project Information**

##### Rationale

My research is about developing a model that is capable of explaining and predicting Alternative Dispute Resolution (ADR) selection and use behaviour. This model is at the preliminary stage and requires a Pilot Study to further improve the psychometric properties of the measurement items of the constructs in the model, and effectiveness of the questionnaire to be used for future main survey.

##### Aims

This pilot study aims to obtain your comments about the clarity, language, wordings and relevance of the questionnaire.

##### Duration

This pilot study will continue up to a maximum date of 28 February 2018.

##### Benefits

I expect that the results of this pilot study would better improve the Behavioural Model. The model would be beneficial to the Malaysian Construction Industry as interventions to enhance and promote the use of Alternative Dispute Resolution (ADR).

### **Risks**

I have identified that some of the risks associated with this pilot study. As you go through answering the questionnaire, you would be required to provide dispute information and personal behavioural choice on ADR method based on scenario. For you, as a participant, this information may be considered sensitive and confidential.

To manage these risks, this survey guarantees your anonymity. You would not be required to provide your identity or company's name.

You have the right not to disclose any information you find uncomfortable. You also have the right not to answer any questions which you find sensitive and confidential.

### **Funding**

This PhD study is funded by New Zealand Aid Programme (New Zealand ASEAN Scholars Award).

### **Other people**

The result of this study is expected to prove useful findings and implications for both researchers and practitioners in the construction industry.

### **Invitation to Participate**

#### **Why**

You are invited to participate in this research because you are the owner and considered to have decision-making authority in the organization.

#### **How**

To find potential participants, like you, I have sent invitations via email to lists of construction companies registered under Construction Industry Development Board (CIDB), Real Estate and Housing Developer's Association (REDHA), and public records in Yellow Pages. The lists of companies are open for public access. In the email, requests would be made directly to the owner of the company. Interested participants would complete the questionnaire if interested.

#### **Voluntary participation**

Your participation is voluntary and you may decline this invitation to participate without penalty. If you choose to not participate, or you choose to withdraw, there are no consequences for you in doing so. If you agree to participate in this study, the submission of your survey will act as consent to participate in this Pilot Study.

### **Project Procedures**

This pilot study would be conducted in the form of web-based survey format. You will be asked to answer the questions by clicking on the link of Google Forms provided in the email. The expected time commitment from you for this survey is around 15 minutes.

### **Data Storage, Retention, Destruction and Future Use**

#### **How**

I will personally collect and analyse the data.

#### **Where**

All completed questionnaire in electronic format will be stored and encrypted as computer files in the Department of Civil and Environmental Engineering.

#### **How Long**

The data will be stored for a minimum of 6 Years.

#### **Destruction**

After the minimum storage time has elapsed, the data will be destroyed.

#### **Withdrawal of Data**

This questionnaire used is anonymous. There is no circumstance for the participants to be identifiable and linked to the comments and answers given. Therefore withdrawal of data from submitted Google Form is almost impossible.

#### **Anonymity and Confidentiality**

The preservation of anonymity and confidentiality is paramount. This survey guarantees anonymity and confidentiality. There is no circumstance for the participants to be identifiable and linked to the comments and answers given.

The information you share will only remain confidential to me, and my main supervisor. If any of the any of the data and results from the survey maybe quoted, published or reported in academic publications and presentations, it will be done in a way that does not identify you as the source.

#### **Contact Details and Approval**

##### **Contact Details of Researcher (Chia Kuang Lee)**

C/O Engineering Block 1,  
Level 11, Room 401- 1108  
20 Symonds Street  
Department of Civil and Environmental Engineering  
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##### **Contact Details of Main Supervisor (Dr. Tak Wing Yiu)**

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For any queries regarding ethical concerns you may contact the Chair, The University of Auckland Human Participants Ethics Committee, The University of Auckland, Research Office, Private Bag 92019, Auckland 1142. Telephone 09 373-7599 extn. 83711

Email: ro-ethics@auckland.ac.nz

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON **29 SEPTEMBER 2015** FOR (3) YEARS, REFERENCE NUMBER **015919**

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Faculty of Engineering  
Phone: +64 93737513

The University of Auckland  
Private Bag 92019  
Auckland, New Zealand

## PARTICIPANT INFORMATION SHEET

(Belief Elicitation Study: Google Form Survey for Contractors)

Project title: **Determinants of Alternative Dispute Resolution (ADR) Selection and Use in the Malaysian Construction Industry**

Name of Researcher: Chia Kuang LEE  
Name of Main Supervisor: Dr. Tak Wing Yiu

### Researcher Introduction

I am Chia Kuang LEE, and I am a Doctoral candidate (PhD student) in The Department of Civil and Environmental Engineering, Faculty of Engineering, University of Auckland, New Zealand. My main supervisor is Dr. Tak Wing Yiu.

### Project Information

#### Rationale

My research is about developing a model that is capable of predicting Alternative Dispute Resolution (ADR) selection and use behaviour. This model is at the preliminary stage and requires a Belief Elicitation Study to identify any possible themes as extension to the original model.

#### Aims

This Belief Elicitation Study aims to investigate your beliefs in using Alternative Dispute Resolution according to situational scenario.

#### Duration

This Belief Elicitation Study will continue up to a maximum date of 28 February 2018.

#### Benefits

I expect that the results of this Belief Elicitation Study would better improve the Behavioural Model. The model would be beneficial to the Malaysian Construction Industry as interventions to enhance and promote the use of Alternative Dispute Resolution (ADR).

#### Risks

I have identified that some of the risks associated with this Belief Elicitation Study. As you go through answering the questionnaire, you would be required to provide dispute information and

personal behavioural choice on ADR method based on scenario. For you, as a participant, this information may be considered sensitive and confidential.

To manage these risks, this survey guarantees your anonymity. You would not be required to provide your identity or company's name.

You have the right not to disclose any information you find uncomfortable. You also have the right not to answer any questions which you find sensitive and confidential.

#### Funding

This PhD study is funded by New Zealand Aid Programme (New Zealand ASEAN Scholars Award).

#### Other people

The result of this study is expected to prove useful findings and implications for both researchers and practitioners in the construction industry.

### **Invitation to Participate**

#### Why

You are invited to participate in this Belief Elicitation Study because you are a contractor who specialises in building & civil engineering works.

#### How

To find potential participants, like you, I have sent invitations via email to lists of construction companies registered under Construction Industry Development Board (CIDB), Real Estate and Housing Developer's Association (REDHA), and public records in Yellow Pages. The lists of companies are open for public access. In the email, requests would be made directly to the contractor. Interested participants would complete the questionnaire if interested.

#### Voluntary participation

Your participation is voluntary and you may decline this invitation to participate without penalty. If you choose to not participate there are no consequences for you in doing so. You can also withdraw from the study at any time without any consequences. If you agree to participate in this study, the submission of your survey will act as consent to participate in this Belief Elicitation Study.

### **Project Procedures**

This Belief Elicitation Study will be conducted in web-based survey format. You will be asked to answer the questionnaire by clicking on the link of Google Forms provided in the email. The expected time commitment from you for this survey is around 5-10 minutes.

### **Data storage, Retention, Destruction and Future Use**

#### How

I will personally collect and analyse the data.

#### Where

All completed questionnaire in electronic format will be stored and encrypted as computer files in the Department of Civil and Environmental Engineering.

#### How Long

The data will be stored for a minimum of 6 Years.

### **Destruction**

After the minimum storage time has elapsed, the data will be destroyed.

### **Withdrawal of Data**

This questionnaire used is anonymous. There is no circumstance for the participants to be identifiable and linked to the comments and answers given. Therefore, withdrawal of data from submitted Google Form is almost impossible once submitted.

### **Anonymity and Confidentiality**

The preservation of anonymity and confidentiality is paramount. This survey guarantees anonymity and confidentiality. There is no circumstance for the participants to be identifiable and linked to the comments and answers given.

The information you share will only remain confidential to me, and my main supervisor. If any of the any of the data and results from the survey maybe quoted, published or reported in academic publications and presentations, it will be done in a way that does not identify you as the source.

### **Contact Details and Approval**

#### **Contact Details of Researcher (Chia Kuang Lee)**

C/O Engineering Block 1,  
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Tel: +64 (0) 9 923 7920  
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For any queries regarding ethical concerns you may contact the Chair, The University of Auckland Human Participants Ethics Committee, The University of Auckland, Research Office, Private Bag 92019, Auckland 1142. Telephone 09 373-7599 extn. 83711  
Email: ro-ethics@auckland.ac.nz

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 29 SEPTEMBER 2015 FOR (3) YEARS, REFERENCE NUMBER 015919

## **Appendix C: Approval Letter and Participant Information Sheet (Research Protocol 016869)**

**Office of the Vice-Chancellor**  
Finance, Ethics and Compliance



The University of Auckland  
Private Bag 92019  
Auckland, New Zealand

Level 10, 49 Symonds Street  
Telephone: 64 9 373 7599  
Extension: 87830 / 83761  
Facsimile: 64 9 373 7432

### **UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE (UAHPEC)**

07-Mar-2016

#### **MEMORANDUM TO:**

Dr Tak Wing Yiu  
POST GRADUATE STUDENT

#### **Re: Application for Ethics Approval (Our Ref. 016869): Approved**

The Committee considered your application for ethics approval for your project entitled **Determinants of Alternative Dispute Resolution (ADR) Selection and Use in the Malaysian Construction Industry – (Main Study)**.

We are pleased to inform you that ethics approval is granted for a period of three years.

The expiry date for this approval is 07-Mar-2019.

If the project changes significantly, you are required to submit a new application to UAHPEC for further consideration.

If you have obtained funding other than from UniServices, send a copy of this approval letter to the Research Office, at [ro-awards@auckland.ac.nz](mailto:ro-awards@auckland.ac.nz). For UniServices contracts, send a copy of the approval letter to the Contract Manager, UniServices.

In order that an up-to-date record can be maintained, you are requested to notify UAHPEC once your project is completed.

The Chair and the members of UAHPEC would be happy to discuss general matters relating to ethics approvals. If you wish to do so, please contact the UAHPEC Ethics Administrators at [ro-ethics@auckland.ac.nz](mailto:ro-ethics@auckland.ac.nz) in the first instance.

Please quote reference number: **016869** on all communication with the UAHPEC regarding this application.

*(This is a computer generated letter. No signature required.)*

**PARTICIPANT INFORMATION SHEET**  
(Main Questionnaire Survey: Google Form)

**Project title: Determinants of Alternative Dispute Resolution (ADR) Selection and Use in the Malaysian Construction Industry – (Main Study).**

Name of Researcher: Chia Kuang LEE  
Name of Main Supervisor: Dr. Tak Wing Yiu

**Researcher Information**

I am Chia Kuang LEE, and I am a Doctoral candidate (PhD student) in The Department of Civil and Environmental Engineering, Faculty of Engineering, University of Auckland, New Zealand. My main supervisor is Dr. Tak Wing Yiu.

**Project Information**

Rationale

My research is about developing a model that is capable of explaining and predicting Alternative Dispute Resolution (ADR) selection and use behaviour. This model requires a **Main Questionnaire Survey** to examine the relationships between the variables in the model.

Aims

This **Main Questionnaire Survey** aims to investigate the hypothesis established in the model.

Duration

This **Main Questionnaire Survey** will continue up to a maximum date of 28 February 2018.

Benefits

I expect that the results of this **Main Questionnaire Survey** would be beneficial to the Malaysian Construction Industry as interventions to enhance and promote the use of Alternative Dispute Resolution (ADR).

Risks

I have identified that some of the risks associated with this **Main Questionnaire Survey**. As you go through answering this survey, you would be required to provide dispute information and personal behavioural choice on ADR method based on scenario. For you, as a participant, this information may be considered sensitive and confidential.

To manage these risks, this survey guarantees your anonymity. You would not be required to provide your identity or company's name.

You have the right not to disclose any information you find uncomfortable. You also have the right not to answer any questions which you find sensitive and confidential.

At the end section of this survey, you are invited to participate in two subsequent studies:

- (a) **Actual ADR Use Questionnaire Survey**
- (b) **Contractors' Model Validation Interview**

If you are interested to receive invitations to participate in **Actual ADR Use Questionnaire Survey**, you may be required to leave your email in the “**Correspondence Email Address**” section. In this case, your anonymity in this Main Survey is not guaranteed, as you may be identifiable through the responses which you have made.

Participation in these two future subsequent studies is on the voluntary basis, participants are **free to decline** to participate without any reason and consequences.

Your responses in this **Main Questionnaire Survey** will be only quoted and presented in future academic publications, researcher's thesis and presentations, without revealing the identity of the respondents.

#### Funding

This PhD study is funded by New Zealand Aid Programme (New Zealand ASEAN Scholars Award).

#### Other people

The result of this survey is expected to prove useful findings and implications for both researchers and practitioners in the construction industry.

#### **Invitation to Participate**

##### Why

You are invited to participate in this **Main Questionnaire Survey** because you are the owner and considered to have decision-making authority in the organisation.

##### How

To find potential participants, like you, I have sent invitations via email to lists of construction companies registered under Construction Industry Development Board (CIDB), Real Estate and Housing Developer's Association (REDHA), and public records in Yellow Pages. The lists of companies are open for public access. In the email, requests would be made directly to the owner of the company. Interested participants would complete the questionnaire if interested.

##### Voluntary participation

Your participation is voluntary and you may decline this invitation to participate without penalty. If you choose to not participate, or you choose to withdraw, there are no consequences, and you do not

have to give a reason for doing so. If you agree to participate in this study, the submission of your survey will act as consent to participate in this **Main Questionnaire Survey**.

### **Project Procedures**

This **Main Questionnaire Survey** would be conducted in the form of web-based survey format. You will be asked to answer the questions by clicking on the link of Google Forms provided in the email. The expected time commitment from you for this questionnaire survey is less than 15 minutes.

### **Data Storage, Retention, Destruction and Future Use**

#### How

I will personally collect and analyse the data.

#### Where

All completed questionnaire in electronic format will be stored and encrypted as computer files in the Department of Civil and Environmental Engineering. All physical data such as consent forms will be stored separately in a locked cabinet in the Department of Civil and Environmental Engineering.

#### How Long

The data will be stored for a minimum of 6 Years.

#### Destruction

After the minimum storage time has elapsed, the data will be destroyed. All forms of electronic data will be deleted from Department of Civil and Environmental Engineering computer data storage, while physical data will be shredded and destroyed.

### **Withdrawal of Data**

This questionnaire survey used is anonymous. There is no circumstance for the participants to be identifiable and linked to the comments and answers given. Therefore withdrawal of data from submitted Google Form is almost impossible.

However, if participants have stated their email in the “**Correspondence Email Address**” section, participants may personally contact the researcher to remove any data given **within 4 weeks** after submission of the Google Form.

### **Anonymity and Confidentiality**

The preservation of anonymity and confidentiality is paramount. This survey guarantees anonymity and confidentiality. There is no circumstance for the participants to be identifiable and linked to the comments and answers given.

However, if you have written your email in the “**Correspondence Email Address**” section as your consent to receive invitations about (a) **Actual ADR Use Questionnaire Survey**, you may be identifiable and linked to the comments and answers given. Thus, your anonymity is not preserved. In this case, please sign the **Consent Form** associated with this Main Questionnaire Survey, and return it to the researcher.

If you are interested in the **Contractors’ Model Validation Interview**, please contact the researcher directly and arrange for interview session.

Please note that as long as you do not state your email in the “**Correspondence Email Address**”, your anonymity is guaranteed and **you are not required** to sign the consent forms associated with this Main Questionnaire Survey.

The information you share will only remain confidential to me, and my main supervisor. If any of the any of the data and results from the questionnaire survey maybe quoted, published or reported in academic publications, researcher’s thesis and presentations, it will be done in a way that does not identify you as the source.

### **Contact Details and Approval**

#### **Contact Details of Researcher (Chia Kuang Lee)**

C/O Engineering Block 1,  
Level 11, Room 401- 1108  
20 Symonds Street  
Department of Civil and Environmental Engineering  
Faculty of Engineering,  
The University of Auckland  
Auckland 1010  
New Zealand  
Email: lchi554@aucklanduni.ac.nz

#### **Contact Details of Main Supervisor (Dr. Tak Wing Yiu)**

**Engineering Block 1**  
Level 11, Room 401- 1108  
20 Symonds Street  
Auckland 1010  
New Zealand  
Tel: +64 99233851  
E-mail: k.yiu@auckland.ac.nz

#### **Contact Details of Head of Department (Professor Pierre Joseph Henri Quenneville)**

Department of Civil and Environmental Engineering  
Faculty of Engineering  
The University of Auckland,  
Private Bag 92019, Auckland 1142,  
New Zealand  
Tel: +64 (0) 9 923 7920  
Email: p.quenneville@auckland.ac.nz

For any queries regarding ethical concerns you may contact the Chair, The University of Auckland Human Participants Ethics Committee, The University of Auckland, Research Office, Private Bag 92019, Auckland 1142. Telephone 09 373-7599 extn. 83711  
Email: ro-ethics@auckland.ac.nz

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 7 MARCH 2016 FOR (3) YEARS, REFERENCE NUMBER **016869**

Department of Civil Engineering and Environment  
Faculty of Engineering  
Phone: +64 93737513

The University of Auckland  
Private Bag 92019  
Auckland, New Zealand

### PARTICIPANT INFORMATION SHEET (Contractors' Model Validation Interview)

Project title: **Determinants of Alternative Dispute Resolution (ADR) Selection and Use in the Malaysian Construction Industry - (Main Study).**

Name of Researcher: Chia Kuang LEE  
Name of Main Supervisor: Dr. Tak Wing Yiu

#### **Researcher Introduction**

I am Chia Kuang LEE, and I am a Doctoral candidate (PhD student) in The Department of Civil and Environmental Engineering, Faculty of Engineering, University of Auckland, New Zealand. My main supervisor is Dr. Tak Wing Yiu.

#### **Project Information**

##### Rationale

My research is about developing a model that is capable of explaining and predicting Alternative Dispute Resolution (ADR) selection and use behaviour. This model requires interview sessions for validation.

##### Aims

The interview aims to obtain your opinion concerning the ADR selection and use behaviour model; and your suggestions to intervene and promote the use of ADR in Malaysian construction industry based on the model.

##### Duration

This study will continue up to a maximum date of 28 February 2018.

##### Benefits

I expect that the results of this interview would be beneficial to the Malaysian construction industry as interventions to enhance and promote the use of Alternative Dispute Resolution (ADR).

##### Risks

There is almost no risk in this interview. The questions of this interview mainly seek your general opinion about the ADR selection and use behaviour model, and ways to intervene and promote ADR

use based on the model. None of the interview questions require disclosures about your organisation, or employers.

For you, as a participant, if you find any question to be sensitive and confidential, you have the right not to disclose any information you find uncomfortable with. You also have the right not to answer the questions which you find them sensitive and confidential.

#### Funding

This PhD study is funded by New Zealand Aid Programme (New Zealand ASEAN Scholars Award).

#### Other people

The result of this study is expected to prove useful findings and implications for both researchers and practitioners in the construction industry.

### **Invitation to Participate**

#### Why

Following your participation in the previous **Main Questionnaire Survey**, you have contacted the researcher personally and expressed your interest to receive invitation for this **Contractors' Model Validation Interview**.

#### How

To find potential participants, like you, I have previously conducted a **Main Questionnaire Survey** to lists of construction companies registered under Construction Industry Development Board (CIDB), Real Estate and Housing Developer's Association (REDHA), and public records in Yellow Pages. The lists of companies are open for public access. In the **Main Questionnaire Survey**, the researcher would invite interested respondents to contact the researcher personally through researcher's email provided in the Main Questionnaire Survey. From there, respondents would receive this invitation, and further arrange for an interview session.

#### Voluntary participation

Your participation is voluntary and you may decline this invitation to participate without penalty. If you choose to not participate, or you choose to withdraw, there are no consequences, and you do not have to give a reason for doing so.

### **Project Procedures**

In this interview, you will be provided with an ADR selection and use model. Based on the model, you would be asked to comment appropriately according to the guidelines. The interview sessions would only be conducted between the participant, and the researcher (me).

The interview session can be conducted and arranged in either format: **face-to-face interview** or **online-video conferencing interview** (such as **Skype**, or **Facebook video call**), whichever is convenient for you.

If you prefer online-video conferencing interview, you are advised to maximise your personal online accounts before initiating any online-video conferencing interviews.

If you choose to participate, with your permission, I will need you to sign the consent form. No video recordings will be done, as I will only do audio recordings to record our discussions. Audio recorder will be used to record our discussions. The expected time commitment from you for this interview will be less than 45 minutes.

You can request the recorder to be turned off at any time without giving a reason. You can also request the video call to be turned off at any time without giving a reason. You can also choose to withdraw from participation, and withdraw from interview sessions at any time, without any consequences, and without giving a reason.

## **Data Storage, Retention, Destruction and Future Use**

### How

I will personally collect the data by transcribing all information, verbal discussions, text comments, and audio data discussed in this interview session.

### Where

As the interview sessions are digitally recorded, all sources of information in the form of digital format will be encrypted with security codes/passwords, and secured as computer files in the Department of Civil and Environmental Engineering. For physical data such as edited transcripts and consent forms will be stored separately in a locked cabinet in the Department of Civil and Environmental Engineering. All data would only be accessible to me, and my main supervisor.

### How Long

The data will be stored for a minimum of 6 Years.

### Destruction

After the minimum storage time has elapsed, the data will be destroyed. All forms of electronic data will be deleted from Department of Civil and Environmental Engineering computer data storage, while physical data will be shredded and destroyed.

## **Right to Withdraw from Participation**

You have the right to withdraw from the interview at any time without giving a reason. You can notify me to withdraw, and delete any specific comments, audio data and any interview data from future publication, transcription and analysis up until 8 weeks after the interview session.

## **Anonymity and Confidentiality**

The preservation of confidentiality is paramount. The information you share will only remain confidential to me, and my main supervisor. Participants, like you, are required to not disclose anything with other people outside the interview session.

This interview session is not anonymous as you would be linked and identifiable to the comments and result of the interview. However, if any of the data and results from the interview maybe quoted, published or reported in academic publications, researcher's thesis and presentations, it will be done in a way that does not identify you as the source.

A copy of the interview transcript and digital recordings would be made available to you, if you wish. Both digital recording and interview transcript would be given to you within 4 weeks after the interview session.

You have the right to review and edit the transcript, and return the revised transcript to the researcher within 2 weeks of receiving the transcript from the researcher.

A summary of finding would also be made available to you before 28 February 2018, if you wish.

## **Contact Details and Approval**

**Contact Details of Researcher (Chia Kuang Lee)**  
C/O Engineering Block 1,  
Level 11, Room 401- 1108  
20 Symonds Street  
Department of Civil and Environmental Engineering  
Faculty of Engineering,  
The University of Auckland  
Auckland 1010  
New Zealand  
Email: lchi554@aucklanduni.ac.nz

**Contact Details of Main Supervisor (Dr. Tak Wing Yiu)**  
**Engineering Block 1**  
Level 11, Room 401- 1108  
20 Symonds Street  
Auckland 1010  
New Zealand  
Tel: +64 99233851  
E-mail: k.yiu@auckland.ac.nz

**Contact Details of Head of Department (Professor Pierre Joseph Henri Quenneville)**  
Department of Civil and Environmental Engineering  
Faculty of Engineering  
The University of Auckland,  
Private Bag 92019, Auckland 1142,  
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Tel: +64 (0) 9 923 7920  
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Email: ro-ethics@auckland.ac.nz

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 7 MARCH 2016 FOR (3) YEARS, REFERENCE NUMBER **016869**

Department of Civil Engineering and Environment  
Faculty of Engineering  
Phone: +64 93737513

The University of Auckland  
Private Bag 92019  
Auckland, New Zealand

### PARTICIPANT INFORMATION SHEET (Project Experts' Model Validation Interview)

Project title: **Determinants of Alternative Dispute Resolution (ADR) Selection and Use in the Malaysian Construction Industry - (Main Study)**

Name of Researcher: Chia Kuang LEE  
Name of Main Supervisor: Dr. Tak Wing Yiu

#### **Researcher Introduction**

I am Chia Kuang LEE, and I am a Doctoral candidate (PhD student) in The Department of Civil and Environmental Engineering, Faculty of Engineering, University of Auckland, New Zealand. My main supervisor is Dr. Tak Wing Yiu.

#### **Project Information**

##### Rationale

My research is about developing a model that is capable of explaining and predicting Alternative Dispute Resolution (ADR) selection and use behaviour. This model requires interview sessions for validation.

##### Aims

The interview aims to obtain your opinion concerning the ADR selection and use behaviour model; and your suggestions to intervene and promote the use of ADR in Malaysian construction industry based on the model.

##### Duration

This study will continue up to a maximum date of 28 February 2018.

##### Benefits

I expect that the results of this interview would be beneficial to the Malaysian construction industry as interventions to enhance and promote the use of Alternative Dispute Resolution (ADR).

##### Risks

There is almost no risk in this interview. The questions of this interview mainly seek your general opinion about the ADR selection and use behaviour model, and ways to intervene and promote ADR

use based on the model. None of the interview questions require disclosures about your organisation, or employers.

For you, as a participant, if you find any question to be sensitive and confidential, you have the right not to disclose any information you find uncomfortable with. You also have the right not to answer the questions which you find them sensitive and confidential.

#### Funding

This PhD study is funded by New Zealand Aid Programme (New Zealand ASEAN Scholars Award).

#### Other people

The result of this study is expected to prove useful findings and implications for both researchers and practitioners in the construction industry.

### **Invitation to Participate**

#### Why

Project experts who are invited to participate in this interview session are on the basis of diverse background as consultants, or developers, or contractors. Therefore, participant like you is highly regarded to be an expert project practitioner in the construction industry.

#### How

To recruit potential participants, like you, I have sent invitations via email to lists of construction companies registered under Construction Industry Development Board (CIDB), Real Estate and Housing Developer's Association (REDHA), and public records in Yellow Pages. The lists of companies are open for public access. In the **email, requests would be made to the company to circulate this invitation among project experts in the organisation.** From there, interested respondents would further contact the researcher personally and arrange for an interview session.

#### Voluntary participation

Your participation is voluntary and you may decline this invitation to participate without penalty. If you choose to not participate, or you choose to withdraw, there are no consequences, and you do not have to give a reason for doing so.

### **Project Procedures**

In this interview, you will be provided with an ADR selection and use model. Based on the model, you would be asked to comment appropriately according to the guidelines. The interview sessions would only be conducted between the participant, and the researcher (me).

The interview session can be conducted and arranged in either format: **face-to-face interview or online-video conferencing interview** (such as **Skype, or Facebook video call**), whichever is convenient for you.

If you prefer online-video conferencing interview, you are advised to maximise your personal online accounts before initiating any online-video conferencing interviews.

If you choose to participate, with your permission, I will need you to sign the consent form. No video recordings will be done, as I will only do audio recordings to record our discussions. Audio recorder will be used to record our discussions. The expected time commitment from you for this interview will be less than 45 minutes.

You can request the recorder to be turned off at any time, without giving a reason. You can also request the video call to be turned off at any time, without giving a reason. You can also choose to withdraw from participation, and withdraw from interview sessions at any time, without any consequences, and without giving a reason.

## **Data Storage, Retention, Destruction and Future Use**

### How

I will personally collect the data by transcribing all information, verbal discussions, text comments, and audio data discussed in this interview session.

### Where

As the interview sessions are digitally recorded, all sources of information in the form of digital format will be encrypted with security codes/passwords, and secured as computer files in the Department of Civil and Environmental Engineering. For physical data such as edited transcripts and consent forms will be stored separately in a locked cabinet in the Department of Civil and Environmental Engineering. All data would only be accessible to me, and my main supervisor.

### How Long

The data will be stored for a minimum of 6 Years.

### Destruction

After the minimum storage time has elapsed, the data will be destroyed. All forms of electronic data will be deleted from Department of Civil and Environmental Engineering computer data storage, while physical data will be shredded and destroyed.

## **Right to Withdraw from Participation**

You have the right to withdraw from the interview at any time without giving a reason. You can notify me to withdraw, and delete any specific comments, audio data and any interview data from future publication, transcription and analysis up until 8 weeks after the interview session.

## **Anonymity and Confidentiality**

The preservation of confidentiality is paramount. The information you share will only remain confidential to me, and my main supervisor. Participants, like you, are required to not disclose anything with other people outside the interview session.

This interview session is not anonymous as you would be linked and identifiable to the comments and result of the interview. However, if any of the data and results from the interview maybe quoted, published or reported in academic publications, researcher's thesis and presentations, it will be done in a way that does not identify you as the source.

A copy of the interview transcript and digital recordings would be made available to you, if you wish. Both digital recording and interview transcript would be given to you within 4 weeks after the interview session.

You have the right to review and edit the transcript, and return the revised transcript to the researcher within 2 weeks of receiving the transcript from the researcher.

A summary of finding would also be made available to you before 28 February 2018, if you wish.

## **Contact Details and Approval**

**Contact Details of Researcher (Chia Kuang Lee)**  
C/O Engineering Block 1,  
Level 11, Room 401- 1108  
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Department of Civil and Environmental Engineering  
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**Contact Details of Main Supervisor (Dr. Tak Wing Yiu)**  
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20 Symonds Street  
Auckland 1010  
New Zealand  
Tel: +64 99233851  
E-mail: k.yiu@auckland.ac.nz

**Contact Details of Head of Department (Professor Pierre Joseph Henri Quenneville)**  
Department of Civil and Environmental Engineering  
Faculty of Engineering  
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Private Bag 92019, Auckland 1142,  
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Email: ro-ethics@auckland.ac.nz

**APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 7 MARCH 2016 FOR (3) YEARS, REFERENCE NUMBER 016869**

## Appendix D: Main Survey Study Questionnaire (Research Protocol 016869)

Please answer all questions to the best of your knowledge.

Guidelines: Please answer the questions by putting a tick ✓ in the box.

Example: My gender is Male

✓	Male
	Female

Age

21-25
26-30
31-35
36-40
41-45
46-50
51-55
More than 55

Gender

Male
Female

Years of experience in the construction industry

1-5
6-10
11-15
16-20
21-25
26-30
31-35
More than 35 years

Please specify the CIDB Grade of your organisation (For contractor)

Grade 1 (G1)
Grade 2 (G2)
Grade 3 (G3)
Grade 4 (G4)
Grade 5 (G5)
Grade 6 (G6)
Grade 7 (G7)

What is the best description that suits your current position in the organisation?

President
Executive Director
Managing Director
Chief Executive Officer (CEO)
Director
Other:

Do you have personal experience in any project involving the use of Alternative Dispute Resolution (ADR) Method? If yes, what are they?

(You can select more than one)

Arbitration
Mediation
Adjudication (Under Construction Industry Payment and Adjudication Act) CIPAA 2012
Adjudication (Contractual)
Expert Determination
Dispute Review Board (DRB)
Dispute Adjudication Board (DAB)
NONE, NO Experience at all.
Other:

**Dispute Scenario**

- Dispute happens when negotiation and discussion fail to reach agreement
- This study does not consider “Negotiation and Litigation” As ADR method
- Alternative Dispute Resolution (ADR)” in this study are methods other than Negotiation and Litigation.

**Which SCENARIO best describes your current situation?** Select only ONE Scenario (**Put a tick ✓ in ONE box**)

Based on the on-going construction projects which my organisation has...

	<p>SCENARIO A:</p> <ul style="list-style-type: none"> <li>➢ There is a major dispute in one of the projects;</li> <li>➢ Unable to reach settlement</li> <li>➢ Still in the stage of deciding on which ADR method to settle the dispute.</li> </ul> <p style="text-align: center;">(If you select this, please proceed to page 3)</p>
	<p>SCENARIO B:</p> <ul style="list-style-type: none"> <li>➢ Recently settled a major dispute in one of the projects with an ADR method.</li> </ul> <p style="text-align: center;">(If you select this, please proceed to page 4)</p>
	<p>SCENARIO C:</p> <ul style="list-style-type: none"> <li>➢ There is a major dispute in one of the projects;</li> <li>➢ Currently using an ADR method to settle the dispute. (Settlement in progress)</li> </ul> <p style="text-align: center;">(If you select this, please proceed to page 5)</p>
	<p>SCENARIO D:</p> <ul style="list-style-type: none"> <li>➢ There is a major claim in one of the projects; in the stage of negotiating the claim</li> </ul> <p style="text-align: center;">(If you select this, please proceed to page 9)</p>

**You have Selected Scenario A:**

**What best describes your current scenario? (Only for Scenario A) (Put a tick ✓ in ONE box)**

	My organisation has used (one or several) Alternative Dispute Resolution method to settle this dispute, but failed to reach settlement. Therefore my organisation is in the process of selecting ANOTHER Alternative Dispute Resolution (ADR) Method.
	Besides negotiating with the counterpart and referring to the Superintending Officer/ Engineer/Architect for decision (if applicable), my organisation has not used any other dispute resolution method to settle this dispute yet. This is my organisation's INITIAL attempt of selecting an Alternative Dispute Resolution (ADR) method to settle the dispute.

**What were the types of Alternative Dispute Resolution (ADR) method your organisation has used, but failed to reach settlement? (Only for Scenario A)**

(You can select more than one)

Arbitration
Mediation
Adjudication (Under Construction Industry Payment and Adjudication Act) CIPAA 2012
Adjudication (Contractual)
Expert Determination
Dispute Review Board (DRB)
Dispute Adjudication Board (DAB)
Besides Negotiation, my organisation has not used any other dispute resolution method to settle this dispute yet. This is my organisation's INITIAL attempt of selecting an Alternative Dispute Resolution (ADR) method to settle this dispute
Other:

**Did your dispute counterpart formally make request to use any of the following Alternative Dispute Resolution (ADR) method to settle the dispute?**

If Yes, which one? (You can select more than one)

Arbitration
Mediation
Adjudication (Under Construction Industry Payment and Adjudication Act) CIPAA 2012

	Adjudication (Contractual)
	Expert Determination
	Dispute Review Board (DRB)
	Dispute Adjudication Board (DAB)
	NO, my dispute counterpart has not issued or requested to use anything yet
	Other:

(After answering all questions on page 3, please proceed to page 6-8)

You have selected Scenario B:

What were the types of Alternative Dispute Resolution (ADR) method your organisation has used for this dispute? (Only for Scenario B) \*

You can select more than one

	Arbitration
	Mediation
	Adjudication (Under Construction Industry Payment and Adjudication Act ) CIPAA 2012
	Adjudication (Contractual)
	Expert Determination
	Dispute Review Board (DRB)
	Dispute Adjudication Board (DAB)
	Other:

Which Alternative Dispute Resolution (ADR) method was the ONLY ONE that has successfully settled the dispute? (Only for Scenario B) \*

You can select ONLY ONE

	Arbitration
	Mediation
	Adjudication (Under Construction Industry Payment and Adjudication Act ) CIPAA 2012
	Adjudication (Contractual)
	Expert Determination
	Dispute Review Board (DRB)
	Dispute Adjudication Board (DAB)
	Other:

(After answering all questions on page 4, please proceed to page 6-8)

You have Selected Scenario C:

Which of the following Alternative Dispute Resolution (ADR) method currently in use? (Only for Scenario C)

Select only one:

	Arbitration
	Mediation
	Adjudication (Under Construction Industry Payment and Adjudication Act ) CIPAA 2012
	Adjudication (Contractual)
	Expert Determination
	Dispute Review Board (DRB)
	Dispute Adjudication Board (DAB)
	Other:

Which ADR or Dispute Resolution method have been used by your organisation, but failed to reach settlement? (Only for Scenario C)

You can select more than one

	Arbitration
	Mediation
	Adjudication (Under Construction Industry Payment and Adjudication Act) CIPAA 2012
	Adjudication (Contractual)
	Expert Determination
	Dispute Review Board (DRB)
	Dispute Adjudication Board (DAB)

	None. This is a primary attempt
	Other:

**(After answering all questions on page 5, please proceed to page 6-8)**

**Dispute characteristics (For Scenario A or B or C)**

Based on the selected scenario, fill in the related project and dispute details (**Put a tick✓ in ONE box only**).

**Type of dispute**

Change/Variation Order
Errors In Drawings, Specifications And Quantities
Differing Site Conditions
Payment (e.g.: Delayed Progress Payment/ Non-Payment Related Dispute, Etc.)
Delay (e.g.: Extension Of Time & Disruption Related Dispute, Etc.)
Ambiguity In Contract Terms / Contract Interpretation
Quality Related (e.g.: Defects, Workmanship, Etc.)
Performance Related (e.g.: Supply Of Goods, Materials, Execution Of Work, Suspension Issue, Issue Of "Regularly And Diligently" Etc.)
Information & Administrative Related Dispute
Awards & Decisions (e.g.: Dispute About Adjudication / Arbitration Awards, Etc.)
Professional Negligence
Personal Injuries
Property Damages
Nomination & Re-Nomination (e.g.: Appointment Of Replacement Person, Etc.)
Compliance With Instruction (e.g.: Compliance With Instruction By S.O/ Architect, Etc.)
Other:

**Briefly describe the dispute and your dispute counterpart**

Against who? (Sub-contractor? Contractor? Developer?) Elaborate more on the dispute

--

**Project contract sum (Ringgit Malaysia)**

Contract sum less than 10 Million
10 Million ≤ Contract sum < 50 Million
50 Million ≤ Contract sum < 100 Million
100 Million ≤ Contract sum < 150 Million
150 Million ≤ Contract sum < 200 Million
200 Million ≤ Contract sum < 250 Million
250 Million ≤ Contract sum

**Type of project**

Residential
Commercial
Cultural
Sporting
Health-care
Civil & infrastructures
Industrial
Other:

**Project funding**

Government funded
Private funded
Both government and private funded
Other:

**Year for the commencement of construction activities**

2010
2011
2012
2013
2014
2015
Other:

**For this project, which standard form of contract is being used by your organisation?**

PWD 203 (Rev 1./2010)-Drawing and Specification Forms Part of Contract
PWD 203A(Rev 1./2010)-Bills of Quantities Forms Part of Contract
PWD 203 (Rev 10/83)- Drawing and Specification Forms Part of Contract
PWD 203A (Rev 10/83)- Bills of Quantities form Part of the Contract
PWD DB/T Rev 2002 (Turnkey)
PWD DB Rev 2007 (Design & Build)
PWD FORM DB (Rev.1/2010)
PWD 203N (Nominated Sub Contract)
FIDIC Conditions of Contract for Construction (Red Book)
FIDIC Conditions of Contract for Plant and Design/Build (Yellow)
FIDIC Conditions of Contract for EPC Turnkey Projects (Silver)
FIDIC Short Form of Contract (the Green Book)
PAM Contract 2006 (With Quantities)
PAM Contract 2006 (Without Quantities)
PAM Sub-Contract 2006
CIDB Standard Form of Contract for Building Works (2000 Edition)
CIDB Sub-Contract Form [CIDB.B(NSC)/2002]
CIDB Model Terms of Construction Contract for Subcontract Work
IEM.CE 2011: IEM Form of Contract for Civil Engineering Works
IEM.CES 1/90: IEM Standard Conditions of Sub-Contract for use in conjunction with the IEM Conditions of Contract for Civil Engineering Works
Other:

**Your organisation's main role for the project**

As Prime/Main contractor
As Sub-contractor

**What is the best description for your position in this project?**

Construction Site Engineer
Construction Site Manager
Project Manager
Other:

**This project commences in which part of Malaysia**

Johor
Kedah
Kelantan
Melaka
Negeri Sembilan
Pahang
Perak
Perlis
Penang
Sabah
Sarawak
Selangor
Terengganu
Kuala Lumpur
Putrajaya
Labuan
Other

**How would you quantify the claim value pertaining to the dispute? (Monetary)**

The amount claimed:

More than 0%, and up to 14.29% of the original contract amount
14.30% up to 28.59% of the original contract amount
28.60% up to 42.89% of the original contract amount
42.90% up to 57.19% of the original contract amount
57.20% up to 71.49% of the original contract amount
71.50% up to 85.79% of the original contract amount
85.80% up to 100 % of the original contract amount
Not Applicable

**How would you quantify the claim value pertaining to the dispute? (Duration Claim)**

The duration (extension of time) claimed:

More than 0%, and up to 14.29% of the original contract duration
14.30% up to 28.59% of the original contract duration
28.60% up to 42.89% of the original contract duration
42.90% up to 57.19% of the original contract duration
57.20% up to 71.49% of the original contract duration
71.50% up to 85.79% of the original contract duration
85.80% up to 100% of the original contract duration
Not Applicable

**Overall, the claim value pertaining to the dispute is/was**

(1-Strongly Disagree, 2- Moderately Disagree, 3- Somewhat Disagree, 4- Neutral (Neither Disagree nor Agree), 5-Somewhat Agree, 6- Moderately Agree, 7- Strongly Agree)

	1	2	3	4	5	6	7
very substantial to my organisation							
considerably high							

**Overall, the dispute case is/was**

(1-Strongly Disagree, 2- Moderately Disagree, 3- Somewhat Disagree, 4- Neutral (Neither Disagree nor Agree), 5-Somewhat Agree, 6- Moderately Agree, 7- Strongly Agree)

	1	2	3	4	5	6	7
extremely important to my organisation							
a considerable concern to my organisation							
fundamental to my organisation							
highly significant to my organisation							

**The disagreements with the handling of claim (claim pertaining to the dispute)**

(1-Strongly Disagree, 2- Moderately Disagree, 3- Somewhat Disagree, 4- Neutral (Neither Disagree nor Agree), 5-Somewhat Agree, 6- Moderately Agree, 7- Strongly Agree)

	1	2	3	4	5	6	7
were very often							
were very severe							
have caused a lot of negative effects on my organisation's working relationship among project parties							

**Overall, I think that the associated issues of the dispute are/were very**

(1-Strongly Disagree, 2- Moderately Disagree, 3- Somewhat Disagree, 4- Neutral (Neither Disagree nor Agree), 5-Somewhat Agree, 6- Moderately Agree, 7- Strongly Agree)

	1	2	3	4	5	6	7
diverse							
numerous							
complex							

**After Answering all the questions from page 6-8, please skip page 9- 11, and proceed to page 12-15 \*\*\***

**Negotiation Characteristics (For Scenario D)**

Based on the selected scenario, fill in the related project and negotiation details (**Put a tick✓ in ONE box only**).

**Category of claim in the negotiation process**

Change/Variation Order
Errors In Drawings, Specifications And Quantities
Differing Site Conditions
Payment (e.g.: Delayed Progress Payment/ Non-Payment Related Dispute, Etc.)
Delay (e.g.: Extension Of Time & Disruption Related Dispute, Etc.)
Ambiguity In Contract Terms / Contract Interpretation
Quality Related (e.g.: Defects, Workmanship, Etc.)
Performance Related (e.g.: Supply Of Goods, Materials, Execution Of Work, Suspension Issue, Issue Of "Regularly And Diligently" Etc.)
Information & Administrative Related Dispute
Awards & Decisions (e.g.: Dispute About Adjudication / Arbitration Awards, Etc.)
Professional Negligence
Personal Injuries
Property Damages
Nomination & Re-Nomination (e.g.: Appointment Of Replacement Person, Etc.)
Compliance With Instruction (e.g.: Compliance With Instruction By S.O/ Architect, Etc.)
Other:

**Briefly describe the claim discussed in the negotiation and your counterpart in the negotiation**

Against who? (Sub-contractor? Contractor? Developer?) Elaborate more on the nature of the claim in the negotiation process

--

**Project contract sum (Ringgit Malaysia)**

Contract sum less than 10 Million
10 Million ≤ Contract sum < 50 Million
50 Million ≤ Contract sum < 100 Million
100 Million ≤ Contract sum < 150 Million
150 Million ≤ Contract sum < 200 Million
200 Million ≤ Contract sum < 250 Million
250 Million ≤ Contract sum

**Type of project**

Residential
Commercial
Cultural
Sporting
Health-Care
Civil & Infrastructures
Industrial
Other:

**Project Funding**

Government funded
Private funded
Both government and private funded
Other:

**Year for the commencement of Construction Activities**

2010
2011
2012
2013
2014
2015
Other:

**For this project, which standard form of contract is being used by your organisation?**

PWD 203 (Rev 1./2010)-Drawing and Specification Forms Part of Contract
PWD 203A(Rev 1./2010)- Bills of Quantities Forms Part of Contract
PWD 203 (Rev 10/83)- Drawing and Specification Forms Part of Contract
PWD 203A (Rev 10/83)- Bills of Quantities form Part of the Contract
PWD DB/T Rev 2002 (Turnkey)
PWD DB Rev 2007 (Design & Build)
PWD 203N (Nominated Sub Contract)
FIDIC Conditions of Contract for Construction (Red Book)
FIDIC Conditions of Contract for Plant and Design/Build (Yellow)
FIDIC Conditions of Contract for EPC Turnkey Projects (Silver)
FIDIC Short Form of Contract (the Green Book)
PAM Contract 2006 (With Quantities)
PAM Contract 2006 ( Without Quantities)
PAM Sub-Contract 2006
CIDB Standard Form of Contract for Building Works (2000 Edition)
CIDB Sub-Contract Form [CIDB.B(NSC)/2002]
CIDB Model Terms of Construction Contract for Subcontract Work
IEM.CE 2011: IEM Form of Contract for Civil Engineering Works
IEM.CES 1/90: IEM Standard Conditions of Sub-Contract for use in conjunction with the IEM Conditions of Contract for Civil Engineering Works
Other:

**Your organisation's main role for the project**

As Prime/Main contractor
As Sub-contractor

**What is the best description for your position in this project?**

Construction Site Engineer
----------------------------

	Construction Site Manager
	Project Manager
	Other:

**This project commences in which part of Malaysia**

Johor
Kedah
Kelantan
Melaka
Negeri Sembilan
Pahang
Perak
Perlis
Penang
Sabah
Sarawak
Selangor
Terengganu
Kuala Lumpur
Putrajaya
Labuan
Other

**How would you quantify the claim value discussed in the negotiation process? (Monetary)**

The amount claimed:

More than 0%, and up to 14.29% of the original contract amount
14.30% up to 28.59% of the original contract amount
28.60% up to 42.89% of the original contract amount
42.90% up to 57.19% of the original contract amount
57.20% up to 71.49% of the original contract amount
71.50% up to 85.79% of the original contract amount
85.80% up to 100% of the original contract amount
Not Applicable

**How would you quantify the claim value discussed in the negotiation process? (Duration Claim)**

The duration (extension of time) claimed:

More than 0%, and up to 14.29% of the original contract duration
14.30% up to 28.59% of the original contract duration
28.60% up to 42.89% of the original contract duration
42.90% up to 57.19% of the original contract duration
57.20% up to 71.49% of the original contract duration
71.50% up to 85.79% of the original contract duration
85.80% up to 100% of the original contract duration
Not Applicable

**The claim value discussed in the negotiation process is**

(1-Strongly Disagree, 2- Moderately Disagree, 3- Somewhat Disagree, 4- Neutral (Neither Disagree nor Agree), 5-Somewhat Agree, 6- Moderately Agree, 7- Strongly Agree)

	1	2	3	4	5	6	7
very substantial to my organisation							
considerably high							

**If negotiation of claim fails and turns into dispute, the dispute case would be**

(1-Strongly Disagree, 2- Moderately Disagree, 3- Somewhat Disagree, 4- Neutral (Neither Disagree nor Agree), 5-Somewhat Agree, 6- Moderately Agree, 7- Strongly Agree)

	1	2	3	4	5	6	7
extremely important to my organisation							
a considerable concern to my organisation							
fundamental to my organisation							
highly significant to my organisation							

**The disagreements with the handling of claim (claim pursuant to the negotiation)**

(1-Strongly Disagree, 2- Moderately Disagree, 3- Somewhat Disagree, 4- Neutral (Neither Disagree nor Agree), 5-Somewhat Agree, 6- Moderately Agree, 7- Strongly Agree)

	1	2	3	4	5	6	7
were very often							

were very severe							
have caused a lot of negative effects on my organisation's working relationship among project parties							

If negotiation of claim fails and turns into dispute, I think that the associated issues of the dispute would be very  
 (1-Strongly Disagree, 2- Moderately Disagree, 3- Somewhat Disagree, 4- Neutral (Neither Disagree nor Agree), 5-Somewhat Agree, 6-  
 Moderately Agree, 7- Strongly Agree)

	1	2	3	4	5	6	7
diverse							
numerous							
complex							

**After Answering all the questions from page 9-11, please proceed to page 12-15 \*\*\***

#### INSTRUCTIONS (READ THIS BEFORE YOU PROCEED)

If you have previously selected Scenario A ----> SELECT Only One ADR method to settle this dispute.

If you have previously selected Scenario B ----> IMAGINE this similar dispute would reoccur in the future (when negotiation fails) in your same project. SELECT Only One ADR method to settle this similar dispute.

If you have previously selected Scenario C ----> IMAGINE if your current ADR method FAILS to settle the current dispute. SELECT Only One ADR method to settle this dispute.

If you have previously selected Scenario D ----> IMAGINE if this negotiation breaks down and turns into a major dispute; and the Superintending Officer/Engineer/Architect's decision fails to satisfy either party (If applicable). SELECT Only ONE ADR method to settle the dispute.

#### Based on Scenario A, B, C, or D you have selected

**SELECT Only One Alternative Dispute Resolution (ADR) method to settle the dispute (Tick✓ only one).**

Arbitration							
Mediation							
Adjudication (Under Construction Industry Payment and Adjudication Act) CIPAA 2012							
Adjudication (Contractual)							
Expert Determination							
Dispute Review Board (DRB)							
Dispute Adjudication Board (DAB)							
Other (Please specify this "Other" ADR Method) :							

#### ADR Selection and Use Behaviour

**Indicator:** (1-Strongly Disagree, 2- Moderately Disagree, 3- Somewhat Disagree, 4- Neutral (Neither Disagree nor Agree), 5- Somewhat Agree, 6- Moderately Agree, 7- Strongly Agree)

**Referring to the selected ADR method to settle the dispute,**

#### Intention

To settle the dispute,

	1	2	3	4	5	6	7
I intent to use this ADR method							
I plan to use this ADR method							
I will use this ADR method							

#### Attitude

	1	2	3	4	5	6	7
Using this ADR method to settle the dispute would be a good idea							
Using this ADR method to settle the dispute would be a wise idea							
Using this ADR method to settle the dispute would be desirable							
I like the idea of using this ADR method to settle the dispute							

**Your intended use of this ADR method originates from which of the following? (Put a tick ✓ in ONE box)**

PWD 203 (Rev 1/2010)-Drawing and Specification Forms Part of Contract
PWD 203A(Rev 1/2010)-Bills of Quantities Forms Part of Contract
PWD 203 (Rev 10/83)- Drawing and Specification Forms Part of Contract
PWD 203A (Rev 10/83)- Bills of Quantities form Part of the Contract

PWD DB/T Rev 2002 (Turnkey)
PWD DB Rev 2007 (Design & Build)
PWD 203N (Nominated Sub Contract)
FIDIC Conditions of Contract for Construction (Red Book)
FIDIC Conditions of Contract for Plant and Design/Build (Yellow)
FIDIC Conditions of Contract for EPC Turnkey Projects (Silver)
FIDIC Short Form of Contract (the Green Book)
PAM Contract 2006 (With Quantities)
PAM Contract 2006 (Without Quantities)
PAM Sub-Contract 2006
CIDB Standard Form of Contract for Building Works (2000 Edition)
CIDB Sub-Contract Form [CIDB.B(NSC)/2002]
CIDB Model Terms of Construction Contract for Subcontract Work
Construction Industry Payment and Adjudication Act (CIPAA 2012)
IEM.CE 2011: IEM Form of Contract for Civil Engineering Works
IEM.CES 1/90: IEM Standard Conditions of Sub-Contract for use in conjunction with the IEM Conditions of Contract for Civil Engineering Works
Other:

**"I am authorised by my organisation to select and use the best ADR method to settle any dispute (if any) in this project"**

Please rate the extent to which you agree/disagree with the statement above

[1-Strongly Disagree, 2- Moderately Disagree, 3- Somewhat Disagree, 4- Neutral/ (Neither Disagree nor Agree), 5- Somewhat Agree, 6- Moderately Agree, 7- Strongly Agree]

Degree of Agreement	1	2	3	4	5	6	7

**Subjective Norm**

To settle the dispute,

Most people who influence my behaviour would think that I should use this ADR method	1	2	3	4	5	6	7
Most people who are important to me would think that I should use this ADR method							
Most people whose opinions I value would approve of me using this ADR method							

**Perceived Behavioural Control**

To settle the dispute,

using this ADR method would be entirely within my control.	1	2	3	4	5	6	7
I would be able to use this ADR method							
I have the resources and the knowledge and the ability to make use of this ADR method.							

**Perceived Severity**

In case the dispute escalates,

I see dispute like this as a serious threat to my organisation	1	2	3	4	5	6	7
this dispute would have a long term adverse effect to my organisation							
this dispute would be too serious to not settle it.							
dispute like this would cause severe interruptions to my organisation							
as disputes go, mine would be serious							

**Perceived Vulnerability**

Settlement of the dispute may be hindered if my organisation do not use this ADR method	1	2	3	4	5	6	7
In order to prevent the dispute from escalating, using this ADR method would be essential							
The way to prevent the dispute from worsening would be using this ADR method							
A successful and lasting settlement of the dispute may not be possible if my organisation do not use this ADR method							
My organisation would probably see this dispute intensifies by not using this ADR method.							

**Descriptive Norm**

To settle this type of dispute,

Most people like me have used this ADR method	1	2	3	4	5	6	7
Most people who are similar to me have used this ADR method							
Most people I know have used this ADR method							

**Perceived Relative Advantage**

Using this ADR method would.

	1	2	3	4	5	6	7
settle the dispute more quickly							
improve the quality of dispute settlement between parties							
make it easier to settle the dispute							
enhance the effectiveness of settling the dispute							
give me greater control over the proceeding							
be more economical in settling the dispute							

#### Perceived Risk

Using this ADR method to settle the dispute would

	1	2	3	4	5	6	7
be risky to my organisation							
cause serious consequences to my organisation							
cause damages to my organisation							
cause more losses to my organisation							

#### Perceived Ease of Use

Regarding the use of this ADR method to settle the dispute,

	1	2	3	4	5	6	7
instructions of using this ADR method would be easy to follow							
it would be easy to learn how to use this ADR method							
it would be easy to adhere to the process of this ADR method							

#### Internal Team Influence

To settle the dispute, my own project team would

	1	2	3	4	5	6	7
think that I should use this ADR method							
support my use of this ADR method							
want me to use this ADR method							

#### Normative Pressures

For this type of dispute,

	1	2	3	4	5	6	7
Industry associations strongly propagate the value of this ADR method							
Industry professional bodies strongly propagate the value of this ADR method							
Universities strongly propagate the value of this ADR method							
Bar councils strongly propagate the value of this ADR method							

#### Coercive Pressures

For this type of dispute,

	1	2	3	4	5	6	7
The government require the use of this ADR method							
Industry professional bodies require the use of this ADR method							
Industry associations require the use of this ADR method							

#### Mimetic Pressures

Peer projects that have used this ADR method

	1	2	3	4	5	6	7
have benefitted greatly							
have gained good reputations in the industry							
are perceived favourably by others in the industry							

#### Organisational Competency

Regarding the use of this ADR method to settle the dispute, my organisation would

	1	2	3	4	5	6	7
have expertise for the use of this ADR method							
have strong documentation and facts for the use of this ADR method							
support enough resources for the use of this ADR method							
be familiar with the use of this ADR method							

#### Consensus on Appropriation

To settle the dispute, there would be conformity

	1	2	3	4	5	6	7
on using this ADR method with my organisation's dispute counterpart							
on how to use this ADR method (such as appointment / notice / resolution guidelines and rules) with my organisation's dispute counterpart							

**Trust**

Regarding the use of this ADR method to settle the dispute, NEUTRALS...

	1	2	3	4	5	6	7
generally have the skills and expertise to perform this ADR method in an expected manner							
generally have access to the information needed to handle the process of this ADR method appropriately							
are generally fair in their conduct of the proceedings of this ADR method							
are generally fair in their service policies following proceedings of this ADR method							
are generally open and receptive to disputants' needs							
generally make good faith efforts to address most disputants' concerns							
are generally trustworthy							

**Voluntariness (ADR Use)**

To settle the dispute in this scenario,

	1	2	3	4	5	6	7
using this ADR method would be voluntary							
it would not be contractually obliged to use this ADR method							
although it might be helpful, using this ADR method would certainly not be compulsory							

**Voluntariness (Mutual Consent)**

To settle the dispute in this scenario,

	1	2	3	4	5	6	7
using this ADR method for the dispute would not require mutual consent							
the contract would not require mutual consensus for using this ADR method							
although it might be helpful, getting consensus from counterpart for using this ADR method would not be compulsory							

You are invited to participate in these two subsequent studies (optional): **Contractors' Model Validation Interview**

If you are interested to participate in the **Contractors' Model Validation Interview (optional)**, please email the researcher personally.

**THANK YOU FOR YOUR TIME.**

## Appendix 1: Pilot Study Questionnaire Stratified by Contractor's Grade and Location

Location (States)	G1		G2		G3		G4		G5		G6		G7	
	Total Pop	S.	Total Pop	S.	Total Pop	S.	Total Pop	S.	Total Pop	S.	Total Pop	S.	Total Pop	S.
<b>Johor</b>	2623	<b>46</b>	976	<b>17</b>	765	<b>13</b>	285	<b>5</b>	300	<b>5</b>	111	<b>2</b>	386	<b>7</b>
<b>Kedah</b>	1959	<b>34</b>	432	<b>7</b>	214	<b>4</b>	103	<b>2</b>	108	<b>2</b>	54	<b>1</b>	181	<b>3</b>
<b>Kelantan</b>	1966	<b>34</b>	493	<b>9</b>	202	<b>3</b>	84	<b>2</b>	106	<b>2</b>	61	<b>1</b>	119	<b>2</b>
<b>Labuan</b>	137	<b>2</b>	21	<b>0</b>	15	<b>0</b>	2	<b>0</b>	1	<b>0</b>	0	<b>0</b>	1	<b>0</b>
<b>Melaka</b>	985	<b>17</b>	275	<b>5</b>	213	<b>4</b>	108	<b>2</b>	106	<b>2</b>	37	<b>1</b>	130	<b>2</b>
<b>Negeri Sembilan</b>	1756	<b>31</b>	522	<b>9</b>	258	<b>4</b>	107	<b>2</b>	132	<b>2</b>	41	<b>1</b>	95	<b>2</b>
<b>Pahang</b>	2089	<b>36</b>	561	<b>10</b>	317	<b>6</b>	176	<b>3</b>	152	<b>3</b>	60	<b>1</b>	122	<b>2</b>
<b>Perak</b>	2415	<b>42</b>	592	<b>10</b>	397	<b>7</b>	191	<b>3</b>	226	<b>4</b>	83	<b>1</b>	156	<b>3</b>
<b>Perlis</b>	864	<b>15</b>	105	<b>2</b>	46	<b>1</b>	15	<b>0</b>	27	<b>1</b>	6	<b>0</b>	31	<b>0</b>
<b>Pulau Pinang</b>	1118	<b>20</b>	232	<b>4</b>	329	<b>6</b>	139	<b>2</b>	176	<b>3</b>	81	<b>1</b>	328	<b>5</b>
<b>Sabah</b>	5302	<b>92</b>	1215	<b>21</b>	561	<b>10</b>	136	<b>2</b>	186	<b>3</b>	74	<b>1</b>	445	<b>8</b>
<b>Sarawak</b>	1971	<b>34</b>	777	<b>14</b>	358	<b>6</b>	132	<b>2</b>	169	<b>3</b>	78	<b>1</b>	436	<b>8</b>
<b>Selangor</b>	3493	<b>61</b>	1150	<b>20</b>	1359	<b>24</b>	609	<b>11</b>	916	<b>16</b>	262	<b>5</b>	1252	<b>22</b>
<b>Terengganu</b>	2257	<b>39</b>	570	<b>10</b>	248	<b>4</b>	152	<b>3</b>	196	<b>3</b>	85	<b>2</b>	186	<b>3</b>
<b>Wilayah Persekutuan</b>	1307	<b>23</b>	411	<b>7</b>	859	<b>15</b>	418	<b>7</b>	890	<b>15</b>	243	<b>4</b>	1312	<b>23</b>
<b>Total</b>		<b>526</b>		<b>145</b>		<b>107</b>		<b>46</b>		<b>64</b>		<b>22</b>		<b>90</b>

Legend: Total Pop = Total Population, S. = Sample Size

## Pilot Study: Respondents Background

Years of Experience in Construction	Gender	Position in Organisation	Overall Comments
6-10	Male	Director	Overall Clear
11-15	Male	Executive Director	Clear
More than 35 Years	Male	Executive Director	Understandable
6-10	Male	Senior Executive	Questions were relevant
11-15	Male	Managing Director	All relevant
1-5	Male	Managing Director	Simplifications needed in items
6-10	Male	Structural Engineer	Easy to understand
11-15	Male	President	Clear
1-5	Female	Executive Officer	Very detail
31-35	Male	Managing Director	Try reducing questions. Some are ambiguous and repetitive.
6-10	Male	President	Some terms need to be plainer. Avoid technical jargons
1-5	Male	Project executive	Try prepare a supplementary translation copy of the questionnaire
6-10	Female	President	I agree with the relevance of the items
31-35	Male	Director	Easy to answer
11-15	Male	Chief Executive Officer (CEO)	Easy to understand
11-15	Male	Director	Overall no further comments
6-10	Male	Contract Manager	Clear
1-5	Female	Admin Manager	Improve arrangement of sections
11-15	Male	Executive Director	Improve Clarity of Items. Reduce elaborations.
1-5	Male	Managing Director	Clear

\*\* No missing responses were found in this pilot study.

## Appendix 2: Non-Response Bias Assessments of Data Set

	Mean Ranks	Mann-Whitney U	Wilcoxon W	Z	Asymp.Sig (2-Tailed)
<b>Respondents Grade</b>					
Early Respondents (1 <sup>st</sup> Wave) N=114	64.42	788.500	7343.500	-0.074	0.941
Late Respondents (2 <sup>nd</sup> Wave) N=14	65.18				
<b>Years of Experience in Construction</b>					
Early Respondents (1 <sup>st</sup> Wave) N=114	62.34	551.500	7106.500	-1.921	0.055
Late Respondents (2 <sup>nd</sup> Wave) N=14	82.11				
<b>Position in Organisation</b>					
Early Respondents (1 <sup>st</sup> Wave) N=114	64.04	746.00	7301.000	-0.413	0.679
Late Respondents (2 <sup>nd</sup> Wave) N=14	68.21				
<b>Project Location</b>					
Early Respondents (1 <sup>st</sup> Wave) N=114	64.86	757.000	862.00	-0.315	0.752
Late Respondents (2 <sup>nd</sup> Wave) N=14	61.57				
<b>Project Characteristics</b>					
Early Respondents (1 <sup>st</sup> Wave) N=114	65.29	708.000	813.000	-0.722	0.470
Late Respondents (2 <sup>nd</sup> Wave) N=14	58.07				
<b>Decision-making Authority</b>					
Early Respondents (1 <sup>st</sup> Wave) N=114	63.82	721.000	7276.000	-0.738	0.460
Late Respondents (2 <sup>nd</sup> Wave) N=14	70.00				
AC_1		610.000	7165.000	-1.458	0.145
AC_2		576.500	7131.500	-1.718	0.086
PI_1		590.500	7145.500	-1.615	0.106
PI_2		590.000	7145.000	-1.619	0.106
PI_3		608.500	7163.500	-1.469	0.142
PI_4		641.500	7196.500	-1.215	0.224
CL_1		643.000	7198.000	-1.206	0.228
CL_2		652.500	7207.500	-1.149	0.251
CL_3		579.000	7134.000	-1.705	0.088
PC_1		667.500	7222.500	-1.017	0.309
PC_2		742.500	7297.500	-0.435	0.664
PC_3		668.500	7223.500	-1.012	0.311
ADR Choice/Selection		701.000	7256.000	-0.786	0.432
Int_1		786.500	7341.500	-0.090	0.928
Int_2		746.500	851.500	-0.090	0.928
Int_3		740.500	845.500	-0.451	0.928
Int_4		704.500	7259.500	-0.735	0.928
Att_1		769.500	874.500	-0.223	0.824
Att_2		784.000	7339.000	-0.110	0.913
Att_3		691.000	7246.000	-0.844	0.398
SN_1		740.000	7295.000	-0.456	0.649
SN_2		710.000	7265.000	-0.694	0.488
SN_3		589.500	7144.500	-1.633	0.102
PBC_1		664.500	7219.500	-1.052	0.293
PBC_2		736.000	7291.000	-0.490	0.624
PBC_3		605.500	7160.500	-1.514	0.130
PSev_1		697.000	7252.000	-0.798	0.425
PSev_2		657.500	7212.500	-1.105	0.269
PSev_3		659.500	7214.500	-1.088	0.277
PSev_4		582.500	7137.500	-1.704	0.088
PSev_5		622.000	7177.000	-1.384	0.166
PVul_1		666.500	7221.500	-1.041	0.298
PVul_2		649.000	7204.000	-1.177	0.239
PVul_3		660.000	7215.000	-1.106	0.269
PVul_4		769.000	7324.000	-0.230	0.818
PVul_5		658.500	7213.500	-1.120	0.263
DN_1		705.500	7260.500	-0.728	0.467
DN_2		645.000	7200.000	-1.214	0.225
DN_3		656.000	7211.000	-1.117	0.264
PRA_1		585.5000	7140.500	-1.666	0.096
PRA_2		669.000	7224.000	-1.025	0.306
PRA_3		571.000	7126.000	-1.787	0.074
PRA_4		681.000	7236.000	-0.924	0.356
PRA_5		556.500	7111.500	-1.916	0.055
PRA_6		569.500	7124.500	-1.791	0.073

PRisk_1		612.500	7167.500	-1.469	0.142
PRisk_2		655.500	7210.500	-1.125	0.261
PRisk_3		620.000	7175.000	-1.403	0.161
PRisk_4		625.500	7180.500	-1.364	0.173
PEase_1		719.500	7274.500	-0.624	0.532
PEase_2		664.500	7219.500	-1.058	0.290
PEase_3		720.500	7275.500	-0.618	0.537
IT_1		587.000	7142.000	-1.669	0.095
IT_2		614.000	7169.000	-1.456	0.145
IT_3		637.500	7192.500	-1.276	0.202
NP_1		657.500	7212.500	-1.122	0.262
NP_2		640.000	7195.000	-1.255	0.210
NP_3		561.500	7116.500	-1.914	0.056
NP_4		598.000	7153.000	-1.609	0.108
CP_1		625.000	7180.000	-1.398	0.162
CP_2		613.500	7168.500	-1.480	0.139
CP_3		593.000	7148.000	-1.646	0.100
MP_1		563.500	7118.500	-1.877	0.060
MP_2		621.000	7176.000	-1.428	0.153
MP_3		584.500	7139.500	-1.700	0.089
OC_1		672.500	7227.500	-0.986	0.324
OC_2		670.000	7225.000	-1.006	0.314
OC_3		714.500	7269.500	-0.657	0.511
OC_4		634.000	7189.000	-1.292	0.196
CA_1		694.000	7249.000	-0.834	0.404
CA_2		669.000	7224.000	-1.028	0.304
TR_1		657.000	7212.000	-1.125	0.261
TR_2		685.000	7240.000	-0.896	0.370
TR_3		664.500	7219.500	-1.081	0.280
TR_4		632.000	7187.000	-1.333	0.182
TR_5		620.500	7175.500	-1.415	0.157
TR_6		608.500	7163.500	-1.502	0.133
TR_7		563.500	7118.500	-1.865	0.062
Vol_1		652.500	7207.500	-1.146	0.252
Vol_2		627.000	7182.000	-1.350	0.177
Vol_3		644.000	7199.000	-1.213	0.225
Vol_4		732.000	7287.000	-0.526	0.599
Vol_5		713.500	7268.500	-0.671	0.502
Vol_6		786.000	7341.000	-0.096	0.924
Scenario		726.500	7281.500	-0.593	0.553

There is no evidence to support a difference between early respondents and late respondents at a 0.05 significance value (two-tailed).

**Appendix 3: Respondents' Detail**  
**Respondents' Detail (Scenario A)**

Scenario	Code	Year of Experience	Grade	Position	Experience in ADR	Type of Dispute/Claim	Contract Sum	Type of Project	Form of Contract	Project Location	Intended use of ADR method
A	A6	11-15	Grade 7 (G7)	Executive Director	Arbitration, Adjudication CIPAA 2012	Errors In Drawings, Specifications And Quantities	50 Million ≤ Contract sum < 100 Million	Civil & infrastructures	PAM Contract 2006 ( With Quantities)	Kuala Lumpur	Adjudication CIPAA 2012
	A6	31-35	Grade 7 (G7)	Director	-	Change/Variation Order	Contract sum less than 10 Million	Commercial	PAM Contract 2006 (Without Quantities)	Kuala Lumpur	Mediation
	A8	16-20	Grade 7 (G7)	Project Manager	Arbitration, Adjudication CIPAA 2012	Payment	50 Million ≤ Contract sum < 100 Million	Commercial	PAM Contract 2006 ( With Quantities)	Selangor	Adjudication CIPAA 2012
	A11	16-20	Grade 7 (G7)	Contract Manager	Adjudication (Contractual)	Differing Site Conditions	250 Million ≤ Contract sum	Commercial	PAM Contract 2006 ( With Quantities)	Kuala Lumpur	Adjudication (Contractual)
	A12	1-5	Grade 7 (G7)	Chief Executive Officer (CEO)	-	Quality Related	10 Million ≤ Contract sum < 50 Million	Residential	PAM Contract 2006 ( With Quantities)	Selangor	Adjudication CIPAA 2012
	A14	11-15	Grade 6 (G6)	President	Arbitration, Adjudication (Contractual)	Professional Negligence	Contract sum less than 10 Million	Civil & infrastructures	PWD 203A (Rev 10/83)	Kelantan	Arbitration
	A16	11-15	Grade 7 (G7)	Project Manager	-	Change/Variation Order	10 Million ≤ Contract sum < 50 Million	Commercial	PAM Sub-Contract 2006	Selangor	Adjudication (Contractual)
	A18	6-10	Grade 5 (G5)	Director	Adjudication CIPAA 2012, Adjudication	Change/Variation Order	Contract sum less than 10	Commercial	PWD 203A (Rev 10/83)	Pahang	Arbitration

				(Contractual)		Million				
A20	11-15	Grade 5 (G5)	General Manager	Mediation	Payment	Contract sum less than 10 Million	Industrial	FIDIC Conditions of Contract for EPC Turnkey Projects (Silver)	Johor	Mediation
A40	16-20	Grade 3 (G3)	Site Engineer	-	Payment	Contract sum less than 10 Million	Residential	CIDB Standard Form of Contract for Building Works (2000 Edition)	Melaka	Mediation
A45	26-30	Grade 7 (G7)	Managing Director	Mediation	Errors In Drawings, Specifications And Quantities	10 Million ≤ Contract sum < 50 Million	Residential	PAM Contract 2006 ( With Quantities)	Penang	Mediation
A46	26-30	Grade 3 (G3)	Chief Executive Officer (CEO)	-	Payment	Contract sum less than 10 Million	waste water treatment plant	In House	Selangor	Arbitration
A51	26-30	Grade 7 (G7)	Project Manager	Arbitration, Mediation	Payment	Contract sum less than 10 Million	Residential	Standard Form of Design & Build Contract Form PWD DB (Rev.1/2010)	Pahang	Adjudication CIPAA 2012
A59	16-20	Grade 3 (G3)	Managing Director	-	Errors In Drawings, Specifications And Quantities	Contract sum less than 10 Million	Civil & infrastructures	PWD 203A(Rev 1./2010)	Sabah	Adjudication CIPAA 2012
A60	16-20	Grade 7 (G7)	Managing Director	Arbitration	Nomination & Re-Nomination	10 Million ≤ Contract sum < 50 Million	Civil & infrastructures	CIDB Sub-Contract Form [CIDB.B(NSC)/2002]	Sabah	Expert Determination
A68	6-10	Grade 2 (G2)	Director	-	Delay	Contract sum less than 10 Million	Residential	CIDB Standard Form of Contract for Building Works (2000 Edition)	Johor	Mediation
A71	1-5	Grade 2 (G2)	Executive Manager	-	Payment	Contract sum less than 10 Million	Industrial	CIDB Standard Form of Contract for Building Works (2000 Edition)	Selangor	Adjudication CIPAA 2012
A73	1-5	Grade 4 (G4)	Project Engineer	-	Errors In Drawings, Specifications And Quantities	Contract sum less than 10	Industrial	PWD 203N (Nominated Sub Contract)	Penang	Arbitration

						Million				
A76	1-5	Grade 3 (G3)	Managing Director	-	Differing Site Conditions	Contract sum less than 10 Million	Commercial	PWD DB Rev 2007 (Design & Build)	Sarawak	Arbitration
A77	1-5	Grade 2 (G2)	Managing Director	-	Delay	Contract sum less than 10 Million	Residential	PWD 203 (Rev 1./2010)-Drawing and Specification Forms Part of Contract	Kedah	Arbitration
A80	1-5	Grade 2 (G2)	Director	Arbitration	Payment	Contract sum less than 10 Million	Civil & infrastructures	CIDB Standard Form of Contract for Building Works (2000 Edition)	Perak	Expert Determination
A84	1-5	Grade 3 (G3)	Director	-	Change/Variation Order	Contract sum less than 10 Million	Civil & infrastructures	PWD 203 (Rev 1./2010)-Drawing and Specification Forms Part of Contract	Sarawak	Arbitration
A87	31-35	Grade 2 (G2)	Site Manager	-	Payment	Contract sum less than 10 Million	Civil & infrastructures	PWD 203A(Rev 1./2010)-Bills of Quantities Forms Part of Contract	Terengganu	Adjudication CIPAA 2012
A89	1-5	Grade 2 (G2)	Managing Director	Adjudication (Contractual)	Payment	Contract sum less than 10 Million	Residential	CIDB Standard Form of Contract for Building Works (2000 Edition)	Kelantan	Mediation
A92	11-15	Grade 2 (G2)	Managing Director	-	Errors In Drawings, Specifications And Quantities	Contract sum less than 10 Million	Civil & infrastructures	PWD 203A(Rev 1./2010)-Bills of Quantities Forms Part of Contract	Sarawak	Arbitration
A98	26-30	Grade 2 (G2)	Manager	Mediation, Adjudication CIPAA 2012	Payment	10 Million ≤ Contract sum < 50 Million	Commercial	PAM Contract 2006 ( With Quantities)	Penang	Mediation
A106	1-5	Grade 2 (G2)	Managing Director	Adjudication (Contractual)	Errors In Drawings, Specifications And Quantities	Contract sum less than 10 Million	Industrial	PWD 203N (Nominated Sub Contract)	Sarawak	Arbitration
A107	26-30	Grade 5 (G5)	Managing Director	-	Performance Related	Contract sum less than 10 Million	Commercial	PAM Sub-Contract 2006	Johor	Arbitration

	PA3	6-10	Grade 7 (G7)	Contract Manager	Arbitration	Ambiguity In Contract Terms / Contract Interpretation	100 Million $\leq$ Contract sum < 150 Million	Commercial	PAM Contract 2006 ( With Quantities)	Johor	Arbitration
	PA4	1-5	Grade 7 (G7)	Administration Manager	-	Delay	100 Million $\leq$ Contract sum < 150 Million	Industrial	PWD 203 (Rev 1./2010)-Drawing and Specification Forms Part of Contract	Johor	Arbitration
	PA5	11-15	Grade 7 (G7)	Executive Director	Court	Change/Variation Order	Contract sum less than 10 Million	Residential	PAM Sub-Contract 2006	Penang	Arbitration
	RA2	6-10	Grade 7 (G7)	Director	Arbitration	Change/Variation Order	10 Million $\leq$ Contract sum < 50 Million	Residential	PAM Contract 2006 ( With Quantities)	Kuala Lumpur	Arbitration
	RA5	6-10	Grade 2 (G2)	Senior Executive	-	Change/Variation Order	Contract sum less than 10 Million	Commercial	In House	Sarawak	Expert Determination
	RA6	11-15	Grade 4 (G4)	Managing Director	Adjudication (Contractual)	Delay	Contract sum less than 10 Million	Residential	PWD 203A(Rev 1./2010)-Bills of Quantities Forms Part of Contract	Pahang	Adjudication (Under Construction Industry Payment and Adjudication Act) CIPAA 2012
	RA8	6-10	Grade 2 (G2)	Engineer	-	Delay	Contract sum less than 10 Million	Civil & infrastructures	IEM.CES 1/90: IEM Standard Conditions of Sub-Contract for use in conjunction with the IEM Conditions of Contract for Civil Engineering Works	Kuala Lumpur	Engineer's Decision
	RA10	1-5	Grade 7 (G7)	Executive Manager	Adjudication (Contractual)	Quality Related	250 Million $\leq$ Contract sum	Residential	PAM Contract 2006 ( With Quantities)	Kuala Lumpur	Adjudication (Contractual)
	RA12	6-10	Grade 2 (G2)	President	-	Change/Variation Order	Contract sum less than 10 Million	Residential	PWD 203A(Rev 1./2010)-Bills of Quantities Forms Part of Contract	Kelantan	Arbitration

## Respondents' Detail (Scenario B)

Scenario	Code	Year of Experience	Grade	Position	Experience in ADR	Type of Dispute/Claim	Contract Sum	Type of Project	Form of Contract	Project Location	Intended use of ADR method
B	B3	11-15	Grade 7 (G7)	Managing Director	Adjudication (Contractual)	Change/Variation Order	50 Million ≤ Contract sum < 100 Million	Civil & infrastructures	PWD 203 (Rev 1./2010)	Kuala Lumpur	Arbitration
	B26	11-15	Grade 7 (G7)	Managing Director	Arbitration, Adjudication CIPAA 2012, Adjudication (Contractual)	Payment	50 Million ≤ Contract sum < 100 Million	Civil & infrastructures	PWD 203 (Rev 1./2010)	Perlis	Arbitration
	B30	More than 35 Years	Grade 5 (G5)	Manager	Arbitration	Payment	Contract sum less than 10 Million	Sporting	PAM Contract 2006 (With Quantities)	Johor	Arbitration
	B39	16-20	Grade 4 (G4)	President	Mediation, Adjudication CIPAA 2012, Adjudication (Contractual), Expert Determination, Dispute Review Board (DRB), Dispute Adjudication Board (DAB)	Ambiguity In Contract Terms / Contract Interpretation	Contract sum less than 10 Million	Civil & infrastructures	PWD 203 (Rev 10/83)	Terengganu	Arbitration
	B47	6-10	Grade 3 (G3)	Director	-	Professional Negligence	Contract sum less than 10 Million	Sporting	PWD 203N (Nominated Sub Contract)	Sarawak	Arbitration
	B52	1-5	Grade 3 (G3)	Managing Director	Mediation	Payment	Contract sum less than 10 Million	Commercial	PWD 203A (Rev 10/83)	Terengganu	Arbitration
	B69	21-25	Grade 2 (G2)	Director	-	Errors In Drawings, Specifications And Quantities	Contract sum less than 10 Million	Civil & infrastructures	PWD 203A(Rev 1./2010)	Kedah	Arbitration
	B72	6-10	Grade 7 (G7)	Manager	Mediation	Payment	Contract sum less than 10 Million	Residential	PAM Contract 2006 (With Quantities)	Selangor	Mediation

	B95	1-5	Grade 1 (G1)	Manager	-	Change/Variation Order	Contract sum less than 10 Million	Civil & infrastructures	PWD 203N (Nominated Sub Contract)	Selangor	Arbitration
	B104	More than 35 Years	Grade 4 (G4)	Director	-	Change/Variation Order	Contract sum less than 10 Million	Civil & infrastructures	CIDB Standard Form of Contract for Building Works (2000 Edition)	Kelantan	Arbitration
	B108	6-10	Grade 2 (G2)	Manager	-	Change/Variation Order	Contract sum less than 10 Million	Civil & infrastructures	CIDB Sub-Contract Form [CIDB.B(NSC)/2002]	Pahang	Expert Determination
	RB11	31-35	Grade 7 (G7)	Managing Director	Arbitration	Awards & Decisions	50 Million ≤ Contract sum < 100 Million	Civil & infrastructures	PWD 203A (Rev 10/83)	Kedah	Arbitration
	RB15	31-35	Grade 1 (G1)	Director	Expert Determination	Change/Variation Order	10 Million ≤ Contract sum < 50 Million	Industrial	PWD 203N (Nominated Sub Contract)	Sabah	Adjudication CIPAA 2012

### Respondents' Detail (Scenario C)

Scenario	Code	Year of Experience	Grade	Position	Experience in ADR	Type of Dispute/Claim	Contract Sum	Type of Project	Form of Contract	Project Location	Intended use of ADR method
C	C7	11-15	Grade 7 (G7)	Project Manager	-	Change/Variation Order	100 Million ≤ Contract sum < 150 Million	Civil & infrastructures	PWD 203 (Rev 1./2010)	Selangor	Arbitration
	C15	6-10	Grade 6 (G6)	General Manager	-	Differing Site Conditions	Contract sum less than 10 Million	Commercial	PAM Contract 2006 (Without Quantities)	Pahang	Adjudication (Contractual)
	C19	1-5	Grade 5 (G5)	Site Manager	Arbitration, Mediation, Adjudication CIPAA 2012	Errors In Drawings, Specifications And Quantities	Contract sum less than 10 Million	Residential	PWD 203N (Nominated Sub Contract)	Kedah	Arbitration
	C24	26-30	Grade 4 (G4)	Chief Executive Officer (CEO)	Arbitration	Payment	Contract sum less than 10 Million	Oil and Gas plant	In House	Terengganu	Expert Determination
	C35	11-15	Grade 7 (G7)	Director	Dispute Review Board (DRB)	Information & Administrative Related Dispute	250 Million ≤ Contract sum	Residential	CIDB Sub-Contract Form [CIDB.B(NSC)/2002]	Melaka	Mediation
	C62	1-5	Grade 2 (G2)	Executive Manager	-	Quality Related	Contract sum less than 10 Million	Civil & infrastructures	CIDB Standard Form of Contract for Building Works (2000 Edition)	Johor	Mediation
	C78	6-10	Grade 2 (G2)	Director	-	Performance Related	Contract sum less than 10 Million	Civil & infrastructures	CIDB Model Terms of Construction Contract for Subcontract Work	Selangor	Mediation
	C81	16-20	Grade 2 (G2)	Director	-	Payment	Contract sum less than 10 Million	Residential	PWD 203N (Nominated Sub Contract)	Selangor	Adjudication CIPAA 2012
	C85	1-5	Grade 2 (G2)	Managing Director	-	Payment	Contract sum less than 10 Million	Civil & infrastructures	PWD 203N (Nominated Sub Contract)	Selangor	Adjudication CIPAA 2012
	C90	6-10	Grade 2 (G2)	Director	-	Payment	Contract sum less than 10 Million	Civil & infrastructures	PWD 203 (Rev 10/83)	Kelantan	Adjudication CIPAA 2012
	C94	11-15	Grade 3 (G3)	Director	-	Payment	Contract sum less than 10 Million	Civil & infrastructures	IEM.CES 1/90	Terengganu	Arbitration

	C109	11-15	Grade 2 (G2)	Manager	-	Compliance With Instruction	Contract sum less than 10 Million	Civil & infrastructures	CIDB Standard Form of Contract for Building Works (2000 Edition)	Sarawak	SO Decision
	RC7	1-5	Grade 2 (G2)	Assistant Managing Director	Adjudication (Contractual), Expert Determination	Awards & Decisions	Contract sum less than 10 Million	Civil & infrastructures	PWD DB Rev 2007 (Design & Build)	Perak	Arbitration
	RC14	6-10	Grade 1 (G1)	Vice President	-.	Change/Variation Order	Contract sum less than 10 Million	Civil & infrastructures	CIDB Sub-Contract Form [CIDB.B(NSC)/2002]	Johor	Mediation

### Respondents' Detail (Scenario D)

Scenario	Code	Year of Experience	Grade	Position	Experience in ADR	Type of Dispute/Claim	Contract Sum	Type of Project	Form of Contract	Project Location	Intended use of ADR method
D	D2	6-10	Grade 7 (G7)	Assistant Manager	-	Errors in Drawings, Specifications and Quantities	10 Million ≤ Contract sum < 50 Million	Civil & Infrastructures	PWD 203A(Rev 1./2010)	Johor	Adjudication CIPAA 2012
	D5	1-5	Grade 7 (G7)	Project Engineer	-	Personal Injuries	Contract sum less than 10 Million	Residential	PWD 203 (Rev 1./2010)	Pahang	Expert Determination
	D9	26-30	Grade 7 (G7)	Managing Director	-	Change/Variation Order	10 Million ≤ Contract sum < 50 Million	Civil & Infrastructures	PWD 203A(Rev 1./2010)	Kelantan	Arbitration
	D10	11-15	Grade 7 (G7)	Executive Director	-	Delay	50 Million ≤ Contract sum < 100 Million	Industrial	PAM Contract 1998 (With Quantities)	Selangor	Arbitration
	D13	1-5	Grade 7 (G7)	Contract Executive	-	Compliance with Instruction	Contract sum less than 10 Million	Residential	PAM Contract 2006 (With Quantities)	Selangor	Mediation
	D17	11-15	Grade 5 (G5)	Project Manager / Coordinator	-	Change/Variation Order	Contract sum less than 10 Million	Civil & Infrastructures	PWD 203A(Rev 1./2010)	Kedah	Arbitration
	D21	More than 35 Years	Grade 5 (G5)	Managing Director	-	Change/Variation Order	Contract sum less than 10 Million	Residential	PAM Contract 2006 (Without Quantities)	Kuala Lumpur	Arbitration
	D22	11-15	Grade 6 (G6)	Manager	-	Change/Variation Order	Contract sum less than 10 Million	Civil & Infrastructures	PWD 203 (Rev 1./2010)	Negeri Sembilan	Arbitration
	D23	11-15	Grade 5 (G5)	Managing Director	-	Change/Variation Order	Contract sum less than 10 Million	Residential	PAM Contract 2006 (With Quantities)	Sabah	Arbitration

	D25	21-25	Grade 4 (G4)	General Manager	-	Payment	Contract sum less than 10 Million	Civil & Infrastructures	PWD 203 (Rev 1./2010)	Kelantan	Arbitration
	D27	6-10	Grade 4 (G4)	Director	-	Payment	Contract sum less than 10 Million	telecommunication structure	CIDB Standard Form of Contract for Building Works (2000 Edition)	Selangor	Mediation
	D28	6-10	Grade 6 (G6)	Managing Director	-	Errors in Drawings, Specifications and Quantities	Contract sum less than 10 Million	Industrial	PWD 203 (Rev 10/83)	Selangor	Arbitration
	D29	6-10	Grade 4 (G4)	Executive Director	-	Delay	Contract sum less than 10 Million	banking	PWD 203A (Rev 10/83)	Johor	Arbitration
	D31	1-5	Grade 7 (G7)	Quantity surveyor	-	Payment	Contract sum less than 10 Million	Commercial	PAM Contract 2006 (With Quantities)	Selangor	Mediation
	D32	6-10	Grade 7 (G7)	Assistance contract manager	-	Payment	10 Million $\leq$ Contract sum < 50 Million	Residential	PAM Contract 2006 (With Quantities)	Penang	Adjudication CIPAA 2012
	D33	6-10	Grade 4 (G4)	Director	-	Differing Site Conditions	Contract sum less than 10 Million	Residential	PWD 203A(Rev 1./2010)	Selangor	Arbitration
	D34	21-25	Grade 3 (G3)	Director	-	Differing Site Conditions	Contract sum less than 10 Million	Civil & Infrastructures	PWD 203 (Rev 1./2010)	Johor	Arbitration
	D36	21-25	Grade 4 (G4)	Managing Director	Expert Determination	Errors in Drawings, Specifications and Quantities	Contract sum less than 10 Million	Industrial	PWD 203A (Rev 10/83)	Johor	Arbitration
	D37	1-5	Grade 7 (G7)	Assistant project manager	Arbitration	Payment	Contract sum less than 10 Million	Health-Care	PAM Contract 2006 (With Quantities)	Negeri Sembilan	Adjudication CIPAA 2012
	D38	21-25	Grade 3 (G3)	Managing Director	-	Delay	Contract sum less than 10	Hotel	PWD 203N (Nominated Sub Contract)	Melaka	Arbitration

						Million				
D41	6-10	Grade 3 (G3)	Assistant Vice President	-	Payment	Contract sum less than 10 Million	Civil & Infrastructures	CIDB Model Terms of Construction Contract for Subcontract Work	Johor	Arbitration
D42	11-15	Grade 3 (G3)	Director	-	Information & Administrative Related Dispute	Contract sum less than 10 Million	Commercial	PWD 203N (Nominated Sub Contract)	Melaka	Arbitration
D43	1-5	Grade 5 (G5)	Manager	-	Payment	Contract sum less than 10 Million	Health-Care	CIDB Model Terms of Construction Contract for Subcontract Work	Kelantan	Mediation
D44	26-30	Grade 3 (G3)	Director	-	Payment	Contract sum less than 10 Million	Other	PWD DB Rev 2007 (Design & Build)	Selangor	Adjudication CIPAA 2012
D48	1-5	Grade 3 (G3)	Manager	-	Nomination & Re-nomination	Contract sum less than 10 Million	Cultural	IEM.CES 1/90	Pahang	Dispute Review Board (DRB)
D49	More than 35 Years	Grade 4 (G4)	Chief Executive Officer (CEO)	-	Delay	Contract sum less than 10 Million	Residential	PAM Contract 2006 (Without Quantities)	Selangor	Adjudication (Contractual)
D50	11-15	Grade 3 (G3)	Director	-	Compliance with Instruction	Contract sum less than 10 Million	Commercial	FIDIC Conditions of Contract for Construction (Red Book)	Johor	Dispute Adjudication Board (DAB)
D53	1-5	Grade 2 (G2)	Executive Director	-	Payment	Contract sum less than 10 Million	Civil & Infrastructures	CIDB Standard Form of Contract for Building Works (2000 Edition)	Selangor	Adjudication CIPAA 2012
D54	1-5	Grade 2 (G2)	Executive Director	-	Payment	Contract sum less than 10 Million	Civil & Infrastructures	CIDB Standard Form of Contract for Building Works (2000 Edition)	Selangor	Adjudication CIPAA 2012
D55	26-30	Grade 2 (G2)	Managing Director	Arbitration, Mediation, Adjudication CIPAA 2012, Adjudication	Performance Related	Contract sum less than 10 Million	Civil & Infrastructures	IEM.CES 1/90	Selangor	Arbitration

				(Contractual)						
D56	16-20	Grade 4 (G4)	Director	-	Change/Variation Order	Contract sum less than 10 Million	Civil & Infrastructures	In House	Perak	Adjudication (Contractual)
D57	11-15	Grade 2 (G2)	Director	-	Information & Administrative Related Dispute	Contract sum less than 10 Million	Commercial	CIDB Standard Form of Contract for Building Works (2000 Edition)	Kuala Lumpur	Mediation
D58	6-10	Grade 2 (G2)	Managing Director	-	Compliance with Instruction	Contract sum less than 10 Million	Residential	CIDB Sub-Contract Form [CIDB.B(NSC)/2002]	Selangor	Arbitration
D61	6-10	Grade 3 (G3)	Manager	-	Change/Variation Order	Contract sum less than 10 Million	Residential	In House	Selangor	Expert Determination
D63	6-10	Grade 5 (G5)	Managing Director	-	Change/Variation Order	Contract sum less than 10 Million	Industrial	IEM.CES 1/90	Sarawak	Adjudication CIPAA 2012
D64	1-5	Grade 3 (G3)	Executive Director	-	Delay	Contract sum less than 10 Million	Civil & Infrastructures	PWD 203A(Rev 1./2010)	Terengganu	Arbitration
D65	6-10	Grade 7 (G7)	Contract executive	-	Change/Variation Order	10 Million ≤ Contract sum < 50 Million	Commercial	PAM Contract 2006 (With Quantities)	Selangor	Adjudication CIPAA 2012
D66	1-5	Grade 2 (G2)	Executive Director	-	Payment	Contract sum less than 10 Million	Commercial	PWD 203A(Rev 1./2010)	Perak	Adjudication CIPAA 2012
D67	16-20	Grade 3 (G3)	QS	-	Change/Variation Order	Contract sum less than 10 Million	Residential	PAM Sub-Contract 2006	Sarawak	Arbitration
D70	1-5	Grade 5 (G5)	Assistant Manager	-	Differing Site Conditions	Contract sum less than 10 Million	Civil & Infrastructures	PWD 203A(Rev 1./2010)	Kedah	Arbitration

	D74	21-25	Grade 2 (G2)	Chief Executive Officer (CEO)	Adjudication CIPAA 2012, Adjudication (Contractual)	Performance Related	Contract sum less than 10 Million	Civil & Infrastructures	CIDB Standard Form of Contract for Building Works (2000 Edition)	Negeri Sembilan	Mediation
	D75	1-5	Grade 3 (G3)	Manager	-	Change/Variation Order	Contract sum less than 10 Million	School project	PWD 203A(Rev 1./2010)	Sabah	Arbitration
	D79	21-25	Grade 2 (G2)	Director	-	Errors in Drawings, Specifications and Quantities	Contract sum less than 10 Million	Civil & Infrastructures	PWD 203 (Rev 1./2010)	Perak	Arbitration
	D82	11-15	Grade 3 (G3)	Manager	-	Change/Variation Order	Contract sum less than 10 Million	Civil & Infrastructures	CIDB Standard Form of Contract for Building Works (2000 Edition)	Sabah	Mediation
	D83	11-15	Grade 2 (G2)	Director	-	Payment	Contract sum less than 10 Million	Civil & Infrastructures	PWD 203A(Rev 1./2010)	Kuala Lumpur	Arbitration
	D86	16-20	Grade 4 (G4)	Chief Executive Officer (CEO)	-	Change/Variation Order	Contract sum less than 10 Million	Civil & Infrastructures	PWD 203 (Rev 10/83)	Sarawak	Arbitration
	D88	6-10	Grade 2 (G2)	Managing Director	Adjudication (Contractual)	Payment	Contract sum less than 10 Million	Civil & Infrastructures	PWD 203A(Rev 1./2010)	Terengganu	Adjudication CIPAA 2012
	D91	1-5	Grade 3 (G3)	Managing Director	-	Payment	Contract sum less than 10 Million	Civil & Infrastructures	CIDB Standard Form of Contract for Building Works (2000 Edition)	Kelantan	Adjudication CIPAA 2012
	D93	1-5	Grade 2 (G2)	Director	-	Payment	Contract sum less than 10 Million	Civil & Infrastructures	PWD 203A(Rev 1./2010)	Sabah	Adjudication CIPAA 2012
	D96	6-10	Grade 3 (G3)	Managing Director	-	Payment	Contract sum less than 10 Million	Commercial	PAM Contract 2006 (With Quantities)	Sabah	Adjudication (Contractual)
	D97	11-15	Grade 7 (G7)	Executive Director	Adjudication (Contractual)	Payment	Contract sum less than 10	Residential	PWD 203A(Rev 1./2010)	Penang	Adjudication CIPAA 2012

D99	16-20	Grade 4 (G4)	Director	Adjudication (Contractual)	Information & Administrative Related Dispute	Contract sum less than 10 Million	Residential	PAM Contract 2006 (With Quantities)	Selangor	Arbitration
D100	More than 35 Years	Grade 2 (G2)	General Manager	-	Delay	Contract sum less than 10 Million	Residential	PAM Contract 2006 (Without Quantities)	Selangor	Mediation
D101	11-15	Grade 4 (G4)	Managing Director	Arbitration	Change/Variation Order	Contract sum less than 10 Million	Residential	PWD 203A(Rev 1./2010)	Pahang	Arbitration
D102	1-5	Grade 4 (G4)	Project Manager	-	Payment	Contract sum less than 10 Million	Commercial	CIDB Sub-Contract Form [CIDB.B(NSC)/2002]	Kuala Lumpur	Adjudication CIPAA 2012
D103	16-20	Grade 3 (G3)	Director	Litigation	Delay	Contract sum less than 10 Million	Mixed	PAM Contract 2006 (With Quantities)	Selangor	Mediation
D105	More than 35 Years	Grade 7 (G7)	Project Coordinator	-	Payment	Contract sum less than 10 Million	Civil & Infrastructures	In House	Johor	Adjudication CIPAA 2012
PD6	1-5	Grade 1 (G1)	Managing Director	Expert Determination	Information & Administrative Related Dispute	Contract sum less than 10 Million	Commercial	IEM.CES 1/90	Sabah	Expert Determination
RD3	11-15	Grade 2 (G2)	Executive Director	-	Payment	Contract sum less than 10 Million	Civil & Infrastructures	PWD 203A(Rev 1./2010)	Pahang	Expert Determination
RD4	More than 35 Years	Grade 4 (G4)	Executive Director	-	Differing Site Conditions	Contract sum less than 10 Million	Residential	In House	Penang	Expert Determination
RD9	11-15	Grade 2 (G2)	President	Mediation	Ambiguity in Contract Terms / Contract interpretation	Contract sum less than 10 Million	Civil & Infrastructures	PWD 203A(Rev 1./2010)	Pahang	Arbitration

	RD13	1-5	Grade 1 (G1)	Project executive	-	Change/Variation Order	Contract sum less than 10 Million	Commercial	PAM 1998	Kuala Lumpur	Arbitration
	RD16	11-15	Grade 1 (G1)	Chief Executive Officer (CEO)	-	Compliance with Instruction	Contract sum less than 10 Million	Civil & Infrastructures	PWD 203N (Nominated Sub Contract)	Sarawak	Arbitration
	RD17	11-15	Grade 4 (G4)	Director	-	Compliance with Instruction	Contract sum less than 10 Million	Commercial	IEM.CES 1/90	Terengganu	Arbitration

Legend: PWD 203A (Rev 10/83) - Bills of Quantities form Part of the Contract

IEM.CES 1/90- IEM Standard Conditions of Sub-Contract for use in conjunction with the IEM Conditions of Contract for Civil Engineering Works

PWD 203A (Rev 1/2010) - Bills of Quantities Forms Part of Contract

PWD 203 (Rev 10/83) - Drawing and Specification Forms Part of Contract

PWD 203 (Rev 1/2010) -Drawing and Specification Forms Part of Contract

CIPAA 2012- Construction Industry Payment and Adjudication Act

## Appendix 4: Normality Test

### Descriptive Statistics

	N	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Group	128	.31334	.098	2.533	.214	4.485	.425
Years	128	2.02808	4.113	.990	.214	.108	.425
Grade	128	2.03845	4.155	.355	.214	-1.331	.425
Position	128	1.53687	2.362	-.578	.214	-.993	.425
Project_Location	128	4.45226	19.823	-.448	.214	-1.291	.425
Project_Characteristics	128	2.38103	5.669	-.171	.214	-1.815	.425
Decision_Making	128	.70462	.496	1.408	.214	.490	.425
AC_1	128	1.81176	3.282	-.318	.214	-.793	.425
AC_2	128	1.76468	3.114	-.341	.214	-.796	.425
PI_1	128	1.74535	3.046	-.388	.214	-.553	.425
PI_2	128	1.72506	2.976	-.372	.214	-.583	.425
PI_3	128	1.79237	3.213	-.289	.214	-.754	.425
PI_4	128	1.73425	3.008	-.245	.214	-.765	.425
CI_1	128	1.68187	2.829	-.105	.214	-.792	.425
CI_2	128	1.46313	2.141	-.317	.214	-.617	.425
CI_3	128	1.73629	3.015	-.104	.214	-.849	.425
PC_1	128	1.63018	2.657	-.290	.214	-.663	.425
PC_2	128	1.55533	2.419	-.540	.214	-.476	.425
PC_3	128	1.61925	2.622	-.329	.214	-.649	.425
ADR_Choice	128	1.55855	2.429	1.425	.214	2.051	.425
Int_1	128	1.36839	1.872	-.392	.214	.065	.425

Int_2	128	1.36165	1.854	-.311	.214	-.080	.425
Int_3	128	1.40284	1.968	-.214	.214	-.346	.425
Int_4	128	1.37878	1.901	-.465	.214	.079	.425
Att_1	128	1.56815	2.459	-.542	.214	-.064	.425
Att_2	128	1.50295	2.259	-.412	.214	-.082	.425
Att_3	128	1.44587	2.091	-.341	.214	.046	.425
Att_4	128	1.66643	2.777	-.403	.214	-.377	.425
SN_1	128	1.51548	2.297	-.271	.214	-.257	.425
SN_2	128	1.39380	1.943	-.193	.214	-.176	.425
SN_3	128	1.43372	2.056	-.272	.214	-.195	.425
PBC_1	128	1.43554	2.061	-.286	.214	-.025	.425
PBC_2	128	1.33967	1.795	-.350	.214	.073	.425
PBC_3	128	1.38610	1.921	-.252	.214	-.151	.425
PSev_1	128	1.43005	2.045	-.408	.214	.296	.425
PSev_2	128	1.44619	2.091	-.373	.214	.018	.425
PSev_3	128	1.40863	1.984	-.206	.214	-.242	.425
PSev_4	128	1.41108	1.991	-.310	.214	.086	.425
PSev_5	128	1.39168	1.937	-.350	.214	-.046	.425
PVul_1	128	1.42038	2.017	-.343	.214	.114	.425
PVul_2	128	1.32176	1.747	-.233	.214	-.104	.425
PVul_3	128	1.27106	1.616	-.245	.214	.418	.425
PVul_4	128	1.29560	1.679	-.218	.214	.293	.425
PVul_5	128	1.28511	1.652	-.039	.214	.336	.425
DN_1	128	1.46462	2.145	-.081	.214	-.325	.425
DN_2	128	1.36081	1.852	-.034	.214	-.228	.425

DN_3	128	1.45890	2.128	-.084	.214	-.204	.425
PRA_1	128	1.51103	2.283	-.408	.214	.034	.425
PRA_2	128	1.35465	1.835	-.387	.214	.379	.425
PRA_3	128	1.39369	1.942	-.284	.214	.069	.425
PRA_4	128	1.33399	1.780	-.273	.214	.153	.425
PRA_5	128	1.36318	1.858	-.284	.214	.174	.425
PRA_6	128	1.46212	2.138	-.371	.214	.031	.425
PRisk_1	128	1.49340	2.230	-.200	.214	-.074	.425
PRisk_2	128	1.43631	2.063	-.113	.214	-.074	.425
PRisk_3	128	1.47385	2.172	-.080	.214	-.185	.425
PRisk_4	128	1.51207	2.286	-.129	.214	-.112	.425
PEase_1	128	1.38459	1.917	-.381	.214	.349	.425
PEase_2	128	1.38678	1.923	-.464	.214	.290	.425
PEase_3	128	1.28504	1.651	-.290	.214	.354	.425
IT_1	128	1.44908	2.100	-.536	.214	.378	.425
IT_2	128	1.41419	2.000	-.417	.214	.309	.425
IT_3	128	1.33168	1.773	-.307	.214	.457	.425
NP_1	128	1.38884	1.929	-.471	.214	.533	.425
NP_2	128	1.28963	1.663	-.205	.214	.369	.425
NP_3	128	1.20520	1.453	-.246	.214	.575	.425
NP_4	128	1.26815	1.608	-.332	.214	.536	.425
CP_1	128	1.37325	1.886	-.248	.214	.593	.425
CP_2	128	1.34499	1.809	-.363	.214	.543	.425
CP_3	128	1.32473	1.755	-.141	.214	.344	.425
MP_1	128	1.34132	1.799	-.444	.214	.711	.425

MP_2	128	1.32601	1.758	-.314	.214	.662	.425
MP_3	128	1.33951	1.794	-.249	.214	.358	.425
OC_1	128	1.47544	2.177	-.358	.214	-.041	.425
OC_2	128	1.52118	2.314	-.463	.214	.059	.425
OC_3	128	1.49439	2.233	-.410	.214	.059	.425
OC_4	128	1.40196	1.965	-.522	.214	.170	.425
CA_1	128	1.32176	1.747	-.378	.214	.855	.425
CA_2	128	1.31427	1.727	-.346	.214	.500	.425
TR_1	128	1.34187	1.801	-.326	.214	.454	.425
TR_2	128	1.38020	1.905	-.369	.214	.348	.425
TR_3	128	1.25491	1.575	-.073	.214	.669	.425
TR_4	128	1.26584	1.602	-.166	.214	.669	.425
TR_5	128	1.29693	1.682	-.375	.214	.644	.425
TR_6	128	1.34389	1.806	-.380	.214	.331	.425
TR_7	128	1.29192	1.669	-.302	.214	.362	.425
Vol_1	128	1.37000	1.877	-.077	.214	-.155	.425
Vol_2	128	1.27377	1.622	-.185	.214	-.434	.425
Vol_3	128	1.33046	1.770	-.111	.214	-.380	.425
Vol_4	128	1.29648	1.681	-.411	.214	.561	.425
Vol_5	128	1.25638	1.578	-.293	.214	.277	.425
Vol_6	128	1.24445	1.549	-.325	.214	.380	.425
Scenario	128	1.31875	1.739	-.437	.214	-1.609	.425
Valid N (listwise)	128						

## Appendix 5: Kolmogorov-Smirnov & Shapiro-Wilk Test

Tests of Normality

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Group	.527	128	.000	.360	128	.000
Years	.209	128	.000	.859	128	.000
Grade	.188	128	.000	.859	128	.000
Position	.233	128	.000	.837	128	.000
Project_Location	.184	128	.000	.878	128	.000
Project_Characteristics	.315	128	.000	.771	128	.000
Decision_Making	.433	128	.000	.609	128	.000
AC_1	.153	128	.000	.925	128	.000
AC_2	.156	128	.000	.928	128	.000
PI_1	.143	128	.000	.919	128	.000
PI_2	.162	128	.000	.924	128	.000
PI_3	.144	128	.000	.930	128	.000
PI_4	.140	128	.000	.932	128	.000
CI_1	.176	128	.000	.936	128	.000
CI_2	.239	128	.000	.917	128	.000
CI_3	.190	128	.000	.929	128	.000
PC_1	.180	128	.000	.934	128	.000
PC_2	.214	128	.000	.909	128	.000
PC_3	.201	128	.000	.924	128	.000
ADR_Choice	.251	128	.000	.786	128	.000
INT_1	.171	128	.000	.935	128	.000

INT_2	.171	128	.000	.925	128	.000
INT_3	.167	128	.000	.933	128	.000
INT_4	.166	128	.000	.924	128	.000
ATT_1	.177	128	.000	.917	128	.000
ATT_2	.183	128	.000	.923	128	.000
ATT_3	.200	128	.000	.923	128	.000
SN_1	.208	128	.000	.935	128	.000
SN_2	.200	128	.000	.938	128	.000
SN_3	.168	128	.000	.943	128	.000
PBC_1	.196	128	.000	.931	128	.000
PBC_2	.178	128	.000	.929	128	.000
PBC_3	.179	128	.000	.935	128	.000
SEV_1	.195	128	.000	.919	128	.000
SEV_2	.192	128	.000	.932	128	.000
SEV_3	.174	128	.000	.937	128	.000
SEV_4	.207	128	.000	.925	128	.000
SEV_5	.176	128	.000	.935	128	.000
VUL_1	.225	128	.000	.922	128	.000
VUL_2	.190	128	.000	.928	128	.000
VUL_3	.227	128	.000	.918	128	.000
VUL_4	.206	128	.000	.930	128	.000
VUL_5	.223	128	.000	.915	128	.000
DN_1	.189	128	.000	.940	128	.000
DN_2	.203	128	.000	.925	128	.000
DN_3	.187	128	.000	.938	128	.000

PA_1		.179	128	.000	.930	128	.000
PA_2		.185	128	.000	.917	128	.000
PA_3		.177	128	.000	.932	128	.000
PA_4		.171	128	.000	.931	128	.000
PA_5		.208	128	.000	.922	128	.000
PA_6		.171	128	.000	.934	128	.000
PR_1		.234	128	.000	.918	128	.000
PR_2		.211	128	.000	.934	128	.000
PR_3		.204	128	.000	.938	128	.000
PR_4		.222	128	.000	.926	128	.000
PE_1		.226	128	.000	.912	128	.000
PE_2		.212	128	.000	.916	128	.000
PE_3		.214	128	.000	.916	128	.000
IT_1		.220	128	.000	.910	128	.000
IT_2		.208	128	.000	.918	128	.000
IT_3		.212	128	.000	.920	128	.000
NP_1		.244	128	.000	.904	128	.000
NP_2		.200	128	.000	.929	128	.000
NP_3		.240	128	.000	.902	128	.000
NP_4		.241	128	.000	.905	128	.000
CP_1		.254	128	.000	.895	128	.000
CP_2		.244	128	.000	.904	128	.000
CP_3		.234	128	.000	.912	128	.000
MP_1		.244	128	.000	.901	128	.000
MP_2		.257	128	.000	.899	128	.000

MP_3	.224	128	.000	.923	128	.000
OC_1	.192	128	.000	.933	128	.000
OC_2	.199	128	.000	.921	128	.000
OC_3	.203	128	.000	.925	128	.000
OC_4	.196	128	.000	.923	128	.000
CA_1	.236	128	.000	.896	128	.000
CA_2	.215	128	.000	.911	128	.000
TR_1	.227	128	.000	.912	128	.000
TR_2	.212	128	.000	.916	128	.000
TR_3	.236	128	.000	.891	128	.000
TR_4	.219	128	.000	.897	128	.000
TR_5	.209	128	.000	.909	128	.000
TR_6	.203	128	.000	.919	128	.000
TR_7	.204	128	.000	.918	128	.000
Vol_1	.200	128	.000	.937	128	.000
Vol_2	.207	128	.000	.933	128	.000
Vol_3	.199	128	.000	.937	128	.000
Vol_4	.211	128	.000	.914	128	.000
Vol_5	.198	128	.000	.927	128	.000
Vol_6	.203	128	.000	.922	128	.000
Scenario	.314	128	.000	.733	128	.000

a. Lilliefors Significance Correction

## Appendix 6: Common Method Bias

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	45.405	47.795	47.795	45.405	47.795	47.795

## Appendix 7: Collinearity Assessment (N=128)

Model	Collinearity Statistics		
	Tolerance	VIF	
1 (Constant)			
ATT	.335		2.987
PBC	.206		4.863
SN	.247		4.052
DN	.254		3.930
SEV	.411		2.432
VUL	.268		3.727

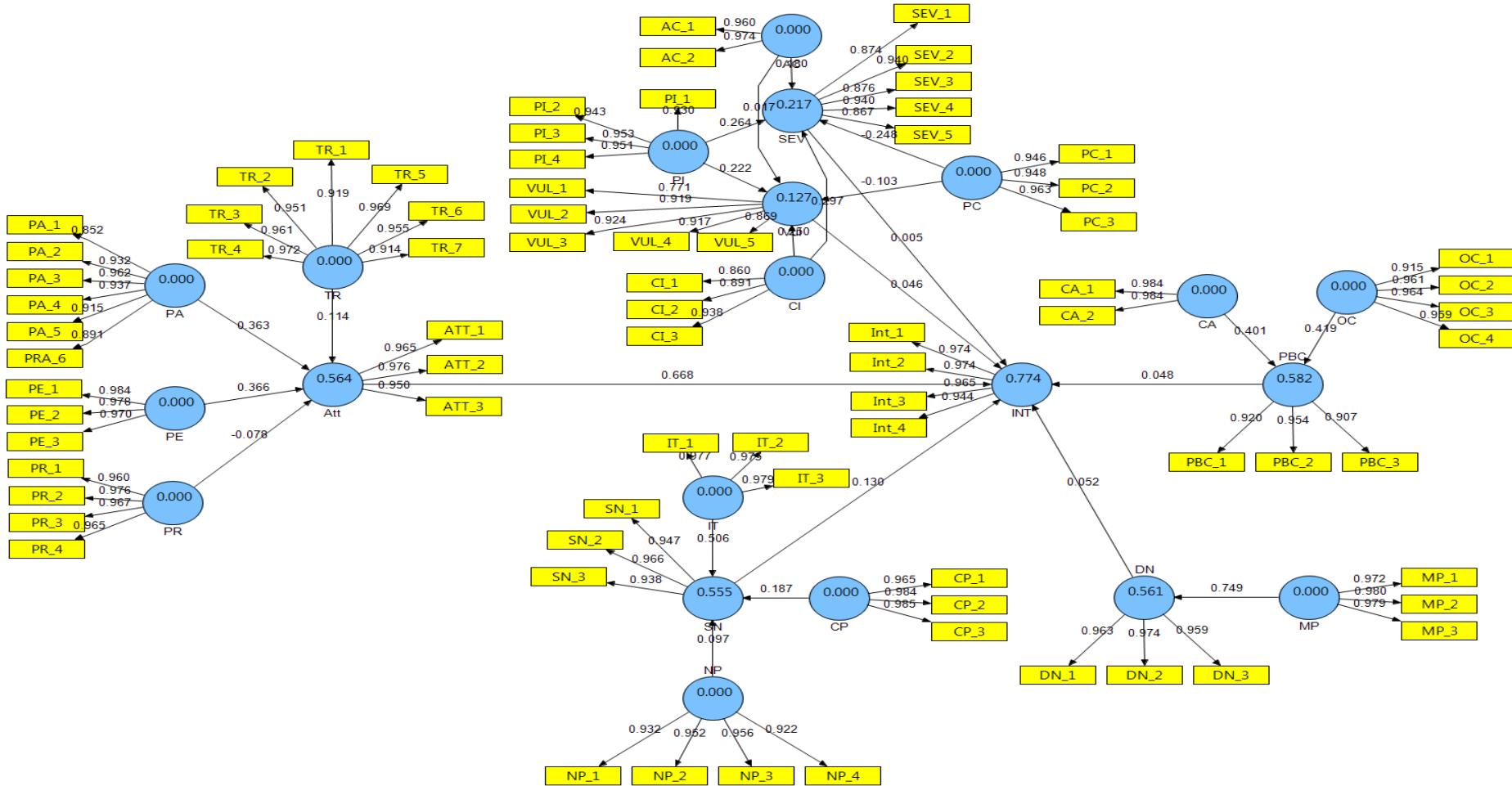
Model	Collinearity Statistics		
	Tolerance	VIF	
2 (Constant)			
AC	.381		2.622
PI	.376		2.662
PC	.289		3.454
CI	.363		2.753

Model	Collinearity Statistics		
	Tolerance	VIF	
3 (Constant)			
TR	.391		2.556
PA	.281		3.560
PE	.352		2.839
PR	.812		1.232

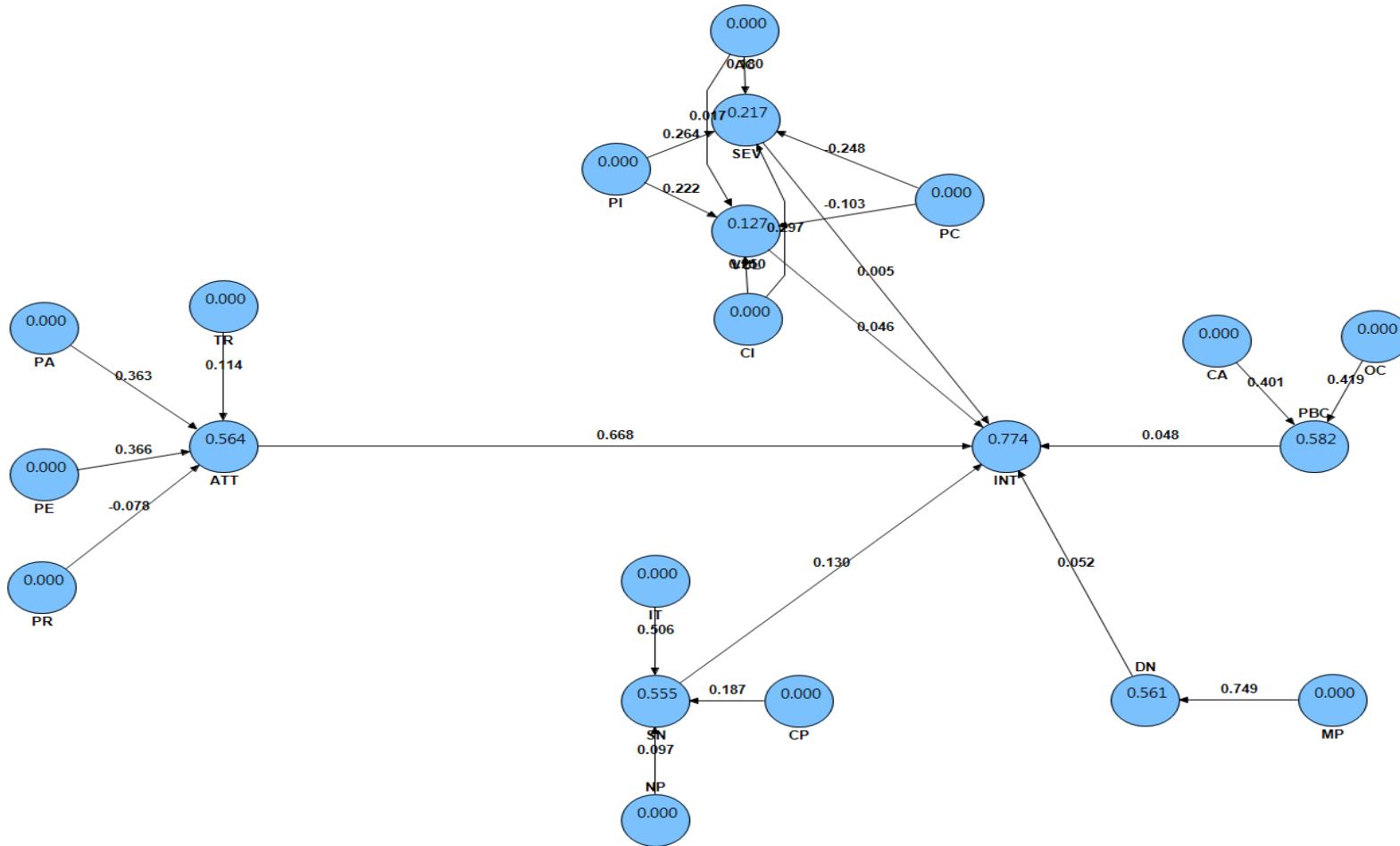
Model	Collinearity Statistics		
	Tolerance	VIF	
4 (Constant)			
IT	.282		3.550
CP	.335		2.989
NP	.243		4.119

Model	Collinearity Statistics		
	Tolerance	VIF	
5 (Constant)			
CA	.465		2.150
OC	.465		2.150

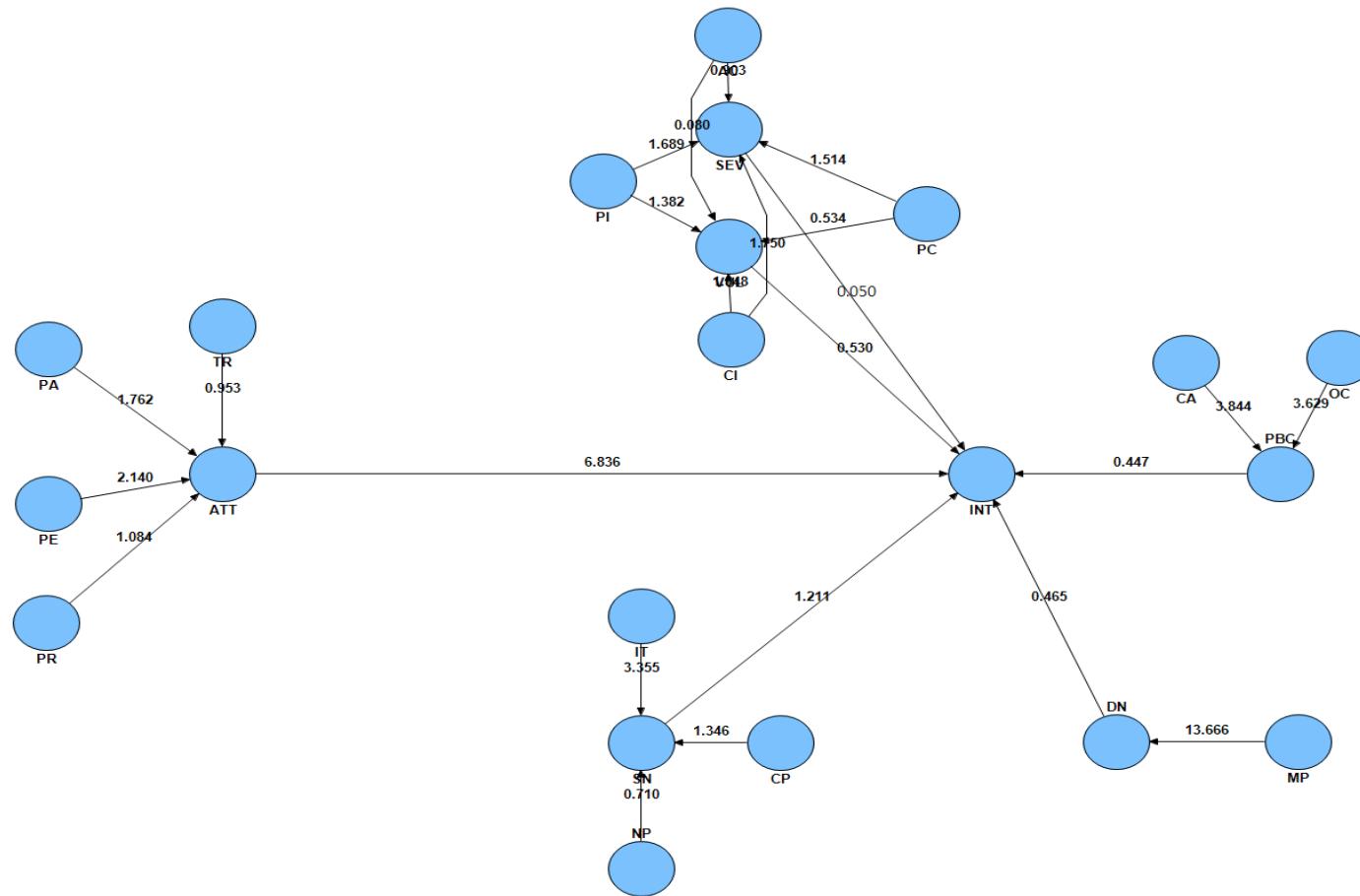
**Appendix 8: Measurement Model Illustration (PLS-SEM, N=128)**



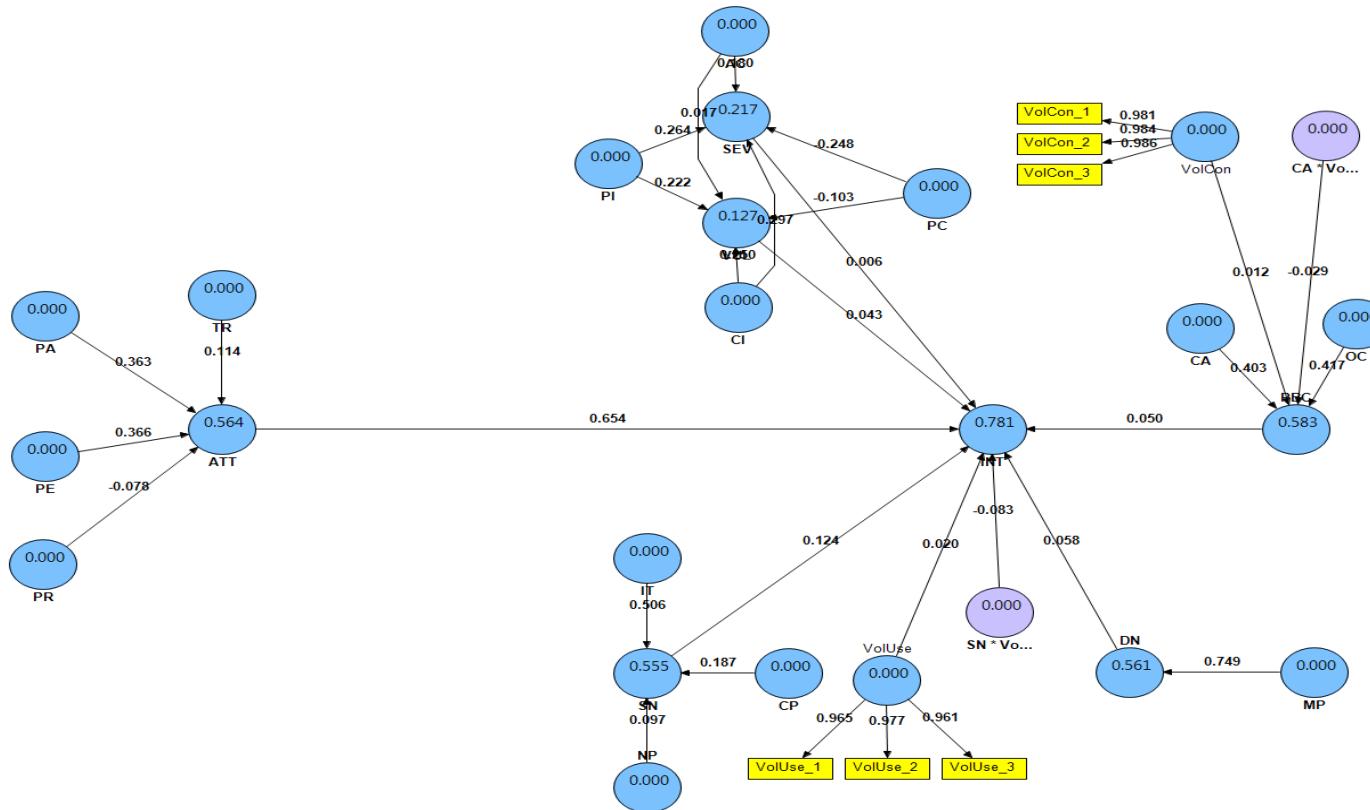
**Appendix 9: Assessment of R<sup>2</sup> values of the Endogenous Construct (Model with N=128)**



## Appendix 10: Bootstrapping Results (ADR Decision-Making Behavioural Model)

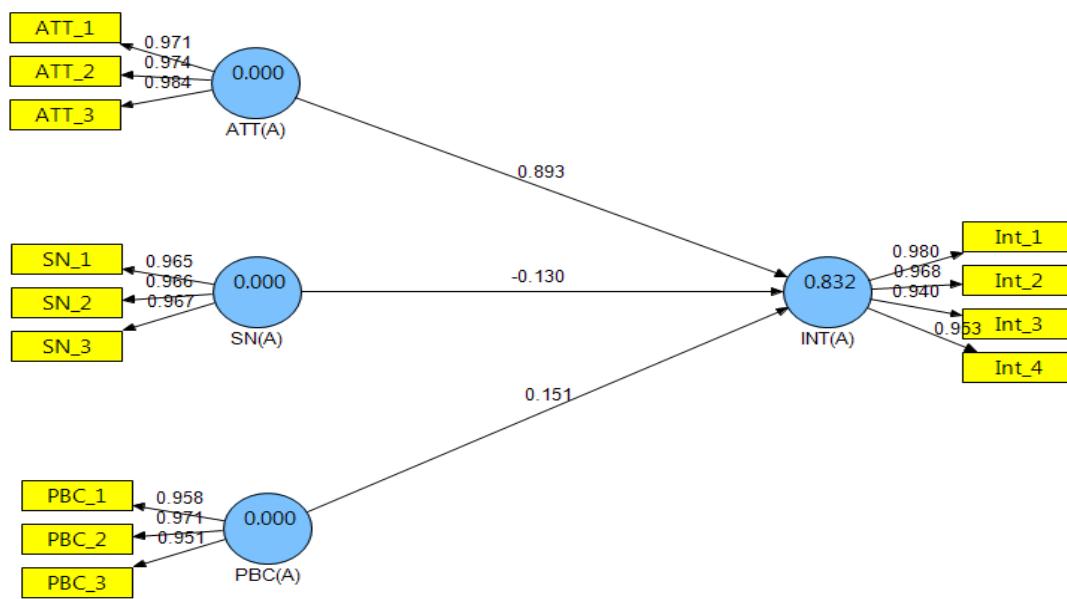


### Appendix 11: Moderating Model (ADR Decision-Making Behavioural Model)

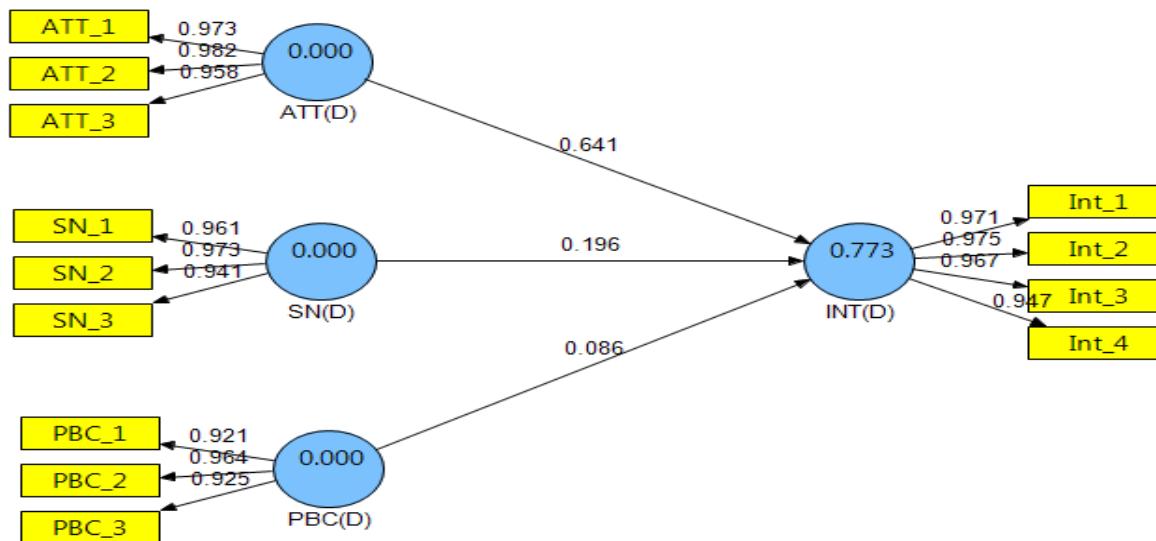


## Appendix 12: Measurement Model of the TPB Model (Scenario A and D)

### Scenario A



### Scenario D



### Appendix 13: Collinearity Assessment (Scenario A and D)

**Coefficients<sup>a</sup>**

Model (Scenario A)	Coefficients <sup>a</sup>						
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	1.135E-5	.071		.000	1.000		
ATT	.893	.145	.893	6.158	.000	.242	4.132
PBC	.152	.140	.152	1.083	.287	.260	3.847
SN	-.130	.148	-.130	-879	.386	.234	4.279

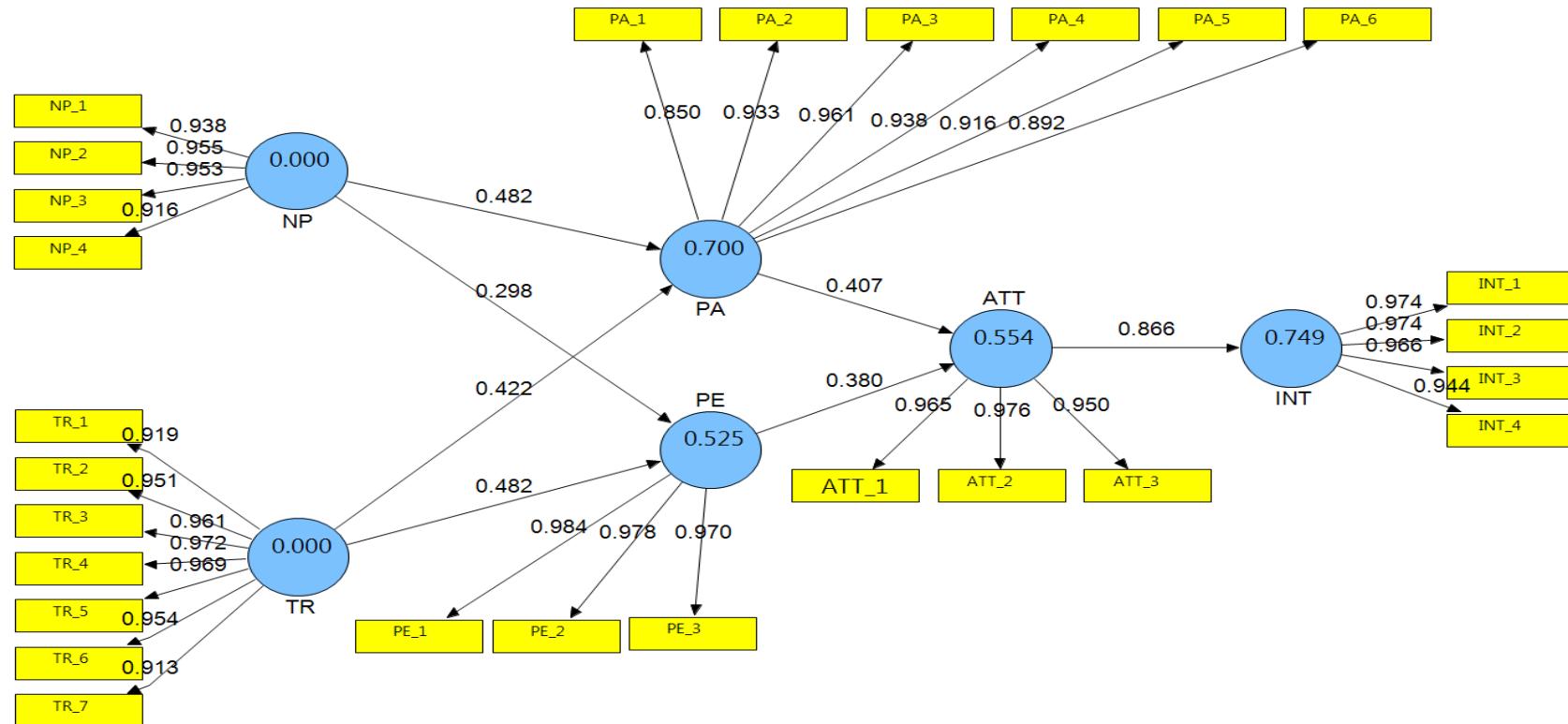
a. Dependent Variable: INT

**Coefficients<sup>a</sup>**

Model (Scenario D)	Coefficients <sup>a</sup>						
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
2 (Constant)	-4.954E-6	.062		.000	1.000		
ATT	.641	.114	.641	5.616	.000	.291	3.438
PBC	.086	.127	.086	.672	.504	.234	4.280
SN	.196	.120	.196	1.626	.109	.262	3.820

a. Dependent Variable: INTENTION

**Appendix 14: Measurement Model Illustration (Intervention Framework, N=128)**



### Appendix 15: Collinearity Assessment (Intervention Framework, N=128)

**Coefficients<sup>a</sup>**

Model			Standardized Coefficients	t	Sig.	Collinearity Statistics			
	Unstandardized Coefficients					Tolerance	VIF		
	B	Std. Error	Beta						
1	(Constant)	-1.047E-5	.060		.000	1.000			
	PA	.407	.098	.407	4.171	.000	.374		
	PE	.380	.098	.380	3.891	.000	.374		
							2.671		

a. Dependent Variable: ATT

**Coefficients<sup>a</sup>**

Model			Standardized Coefficients	t	Sig.	Collinearity Statistics			
	Unstandardized Coefficients					Tolerance	VIF		
	B	Std. Error	Beta						
1	(Constant)	-1.999E-5	.049		.000	1.000			
	NP	.482	.070	.482	6.906	.000	.494		
	TR	.422	.070	.422	6.059	.000	.494		
							2.024		

a. Dependent Variable: PA

**Coefficients<sup>a</sup>**

Model			Standardized Coefficients	t	Sig.	Collinearity Statistics			
	Unstandardized Coefficients					Tolerance	VIF		
	B	Std. Error	Beta						
1	(Constant)	-5.085E-6	.062		.000	1.000			
	NP	.298	.088	.298	3.401	.001	.494		
	TR	.482	.088	.482	5.496	.000	.494		
							2.024		

a. Dependent Variable: PE

## Appendix 16: Collinearity Assessment: Intervention Framework (Scenario A and D)

### Scenario A: N=37

Model	Coefficients <sup>a</sup>						
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	2.725E-5	.109		.000	1.000		
PA	-.041	.229	-.041	-.181	.857	.226	4.423
PE	.810	.229	.810	3.543	.001	.226	4.423

a. Dependent Variable: ATT

Model	Coefficients <sup>a</sup>						
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-1.365E-5	.075		.000	1.000		
NP	.328	.139	.328	2.363	.024	.294	3.400
TR	.606	.139	.606	4.369	.000	.294	3.400

a. Dependent Variable: PA

Model	Coefficients <sup>a</sup>						
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-2.463E-5	.075		.000	1.000		
NP	.350	.138	.350	2.525	.016	.294	3.400
TR	.585	.138	.585	4.224	.000	.294	3.400

a. Dependent Variable: PE

### Scenario D: N=64

Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error				Beta	Tolerance
							VIF
1 (Constant)	4.551E-6	.083			.000	1.000	
PA	.581	.132	.581		4.404	.000	.393
PE	.219	.132	.219		1.661	.102	.393
							2.543

a. Dependent Variable: ATT

Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error				Beta	Tolerance
							VIF
(Constant)	-7.441E-6	.078			.000	1.000	
NP	.488	.102	.488		4.770	.000	.578
TR	.386	.102	.386		3.778	.000	.578
							1.730

a. Dependent Variable: PA

Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error				Beta	Tolerance
							VIF
(Constant)	-9.973E-6	.087			.000	1.000	
NP	.238	.114	.238		2.088	.041	.578
TR	.559	.114	.559		4.906	.000	.578
							1.730

a. Dependent Variable: PE