

**TENTATIVE TITLE**

A Research Concept Paper Proposal

Presented

by

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**INTRODUCTION**

## 1.1 Introduction

Every construction project is unique and has its own operating environment and sets of technical requirements. As a result, the execution of a construction project is subject to numerous constraints that limit the commencement or progression of field operations, which invariably have significant negative impact on overall project performance. By definition, constraints refer to any condition, such as temporal/spatial limitations and safety/quality concerns, which may prevent a project to achieve its goals. Successful execution and control of a construction project relies on effective identification and management of constraints through master planning and short-term look-ahead scheduling. While the master schedule provides a global view of a project and the overall execution strategy, a look-ahead schedule offers a detail account of operational constraints and a detailed plan showing work to be done within a relatively short time window. Ideally, these detailed schedules should reflect actual field conditions and provide field personnel with operation instructions free of constraints and conflicts (Hinze 2008). This look-ahead scheduling and constraint analysis procedure is also a critical component of the last-planner methodology proposed by Ballard (2000). This research project will provide an overview of state-of-art schedule constraint analysis practice during look-ahead scheduling. In addition, it will propose a conceptual framework for managing constraints.



**PRELIMINARY LITERATURE REVIEW**

## 2.1 Preliminary Literature Review Objectives

A preliminary literature review shows that past studies are primarily focused on understanding and modeling a particular type of constraint, such as technological, contractual, resource, spatial, and information constraints. Limited progress has been made on classifying various constraints according to their characteristics in a comprehensive manner. In terms of modeling and resolving constraints, various approaches have been recommended. For example, many CPM-based methods are applied to deal with time-related constraints; knowledge-based systems were used to automate work plan generation; network-based optimization algorithms were developed to resolve constraints; and databases and visualization techniques, such as 3D, 4D, and Virtual Reality (VR), are used to communicate and visualize constraints. What is missing from the past studies is a comprehensive and structured approach in managing constraints What is missing from the past studies is a comprehensive and structured approach in managing constraints



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**DISCUSSION AND CONCLUSION**

## 3.1 Discussion

The primary research method for this study is literature review and conceptual modeling. Constraint identification and classification through a structured approach is the very first step toward a “zero-constraint” environment. This study will first review various types of constraints in construction and their characteristics. Based on this understanding, a classification method will be developed to categorize constraint factors for the purpose of constraint identification and modeling. In the second stage of this study, existing constraint modeling methods will be identified based on a comprehensive review of current industry practices and academic researches. Finally, once the constraint classification and modeling techniques are identified, a conceptual framework for total constraint management will be outlined. This study will be conducted between September 2020 and May 2021.

## 3.2 Conclusion

With this research we intend to demonstrate that xxx…



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