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ABOUT THE CHAIR

Established in January 2012 under the leadership of Dr. Aminah Robinson Fayek, the Industrial Research Chair in Strategic Construction Modeling and Delivery operates within the Department of Civil and Environmental Engineering at the University of Alberta.

The Chair brings together construction industry owners, contractors, and labour groups working in Alberta and across Canada to develop comprehensive research-based solutions to key industry problems. Giving particular attention to Canada's oil and gas, utilities, industrial, and commercial construction sectors, the Chair focuses on strategic concerns related to construction management—such as construction industry productivity, project delivery, and performance. Research undertaken includes improvements to labour productivity, structuring projects and teams, assessing owner and contractor competencies, and reducing project execution risk.

The Chair's research program takes advantage of fuzzy logic's ability to capture and quantify the many subjective uncertainties that challenge construction projects. Researchers combine fuzzy logic with other forms of uncertainty modeling, artificial intelligence, and simulation techniques to develop advanced decision-support tools and approaches.



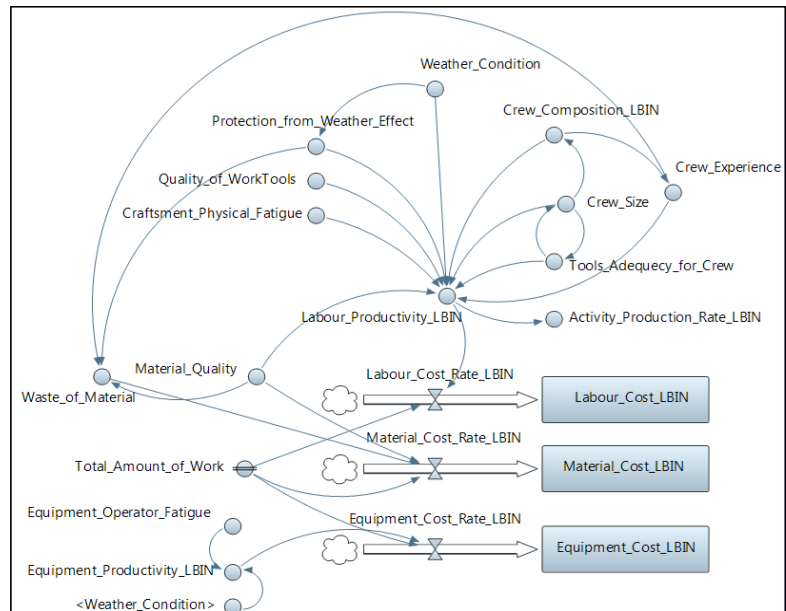
BACKGROUND

- Existing predictive models for construction productivity face the following limitations:
 - Predicts a constant construction productivity value for the whole project.
 - Cannot capture the subjectivity of construction variables.
 - Labour is the only resource considered by the model.
- Fuzzy system dynamics (FSD) is an appropriate modeling technique to address these limitations.

OBJECTIVES

- Identify critical factors influencing construction productivity at the activity and project levels.
- Quantify the effect of influencing factors on activity-level and project-level productivity.
- Include material, equipment, and labour as project resources.
- Develop a predictive model for construction productivity using fuzzy system dynamics techniques

METHODOLOGY



Sample of project-level construction productivity model

PROJECT PARTNERS



INDUSTRY APPLICATIONS AND BENEFITS

- Track construction productivity:** Allows manager to track changes in productivity over time and throughout the project lifecycle (i.e., planning to execution).
- Improve resource consumption:** Allows construction planners to predict the resource consumption and productivity of construction projects for different execution plans.
- Improve construction productivity:** Allows managers to test potential productivity improvement strategies during project execution.