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Leadership Strategy Selection in Construction Industry

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Abstract

When facing a strategic leadership problem, a decision maker must choose an appropriate reasoning strategy for a given situation. Complex strategic choices sets focus upon providing deliberate and methodical support for decision-makers engaged in strategic decision making. The increasing interest in the subject of leadership reflects the considerable importance of this phenomenon. This study in short presents methods of strategic leadership selection in construction. There could to be separated five levels of a decision maker: novice, advanced beginner, competent, proficient and expert. Each of them acts in different way. While working in complex environments, the human decision makers can always face situations where time constraints, high stakes, multiple players, ill-structured problems and situations are presenting strategic decision making the information is used to make high-risk decisions. There exists wide range of methods, which could to be applied to the leadership strategy selection. Based on literature overview, a LEVI 3.0 program based strategy selection model is presented.

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Keywords: leadership; strategy, construction; multi-criteria decision making.

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1. Introduction

When facing a strategic leadership problem, a decision maker must choose an appropriate reasoning strategy for a given situation. Complex Strategic Choices sets focus upon providing deliberate and methodical support for decision-makers engaged in strategic decision making. The increasing interest in the subject of leadership reflects the considerable importance of this phenomenon. The part in conventional construction project management costs (about 13 percent) and reworks (about 12 percent) in construction seeks about ¼ of construction costs. Leadership is one of the most widely researched topics in the civil engineering and management literatures. There are rarely introduced various formal mathematical descriptive models of leader and/or follower behaviour. Strategic thinking is grounded on a strong understanding of the complex relationship between the organization and its environment.

2. The model of leadership in civil engineering and management

Civil engineering broadly concerns about five main aspects:

- urban planning,
- architectural solutions,
- building design,
- construction processes, and
- facility management.

Each building is built once. In other words, there not exist exactly the same situation in construction of building.

So, the decision-making problems in construction are unique.

By considering the role and importance, civil engineering and management (CE&M) processes the leadership strategy is faced with many challenges and problems. The leaders may implement specific types of leadership to enhance the intended ethical climate. A decision making model for CE&M issues, however, a review of theoretical issues in this field, indicates that personal skills of the members, building life cycle conditions and enterprise and management relations matters of interest to researchers in this field.

A competitive leader is responsible for project success.

Typically, leaders have responsibilities encompassing authority and leadership, which lays within contexts that could be characterized (at the minimum) by the existence of three conditions:

1) There is a leader;
2) The leader has at least one follower;
3) The project has a shared goal.

Ahlquist and Levi [1] presented five necessary conditions for leadership:

- Interpersonal relations (at least one follower must exist);
- Asymmetry (potential non-reciprocity of attention, obedience, etc.);
- Salience (subordinates pay attention);
- Domain specificity (the leadership occurs in some contexts, but not necessarily others (although leaders with high salience may transcend contexts);
- Instrumentality (there is a motivating purpose or a goal communicated by the leader).

In analysis of the criteria affecting construction labour productivity are classified under the following four primary groups:

1) Management;
2) Technological;
3) Human/labour;
4) External.

3. Research process, methodology & assumptions

The main concept of game theory is originated by mathematical researchers. Then, this mixed field of science found its applications in economy and industry and also other practical sciences [2]. In terms of strategic tasks, the most suitable calculation method is the game theory [3, 4]. The game theory usually analyses decision-making processes in various fields [5, 6]. The game theory in construction was used for different problem solution: for Construction Processes [7-15]; for sustainable assessment of construction site [16]. The analysis of the quality of the results obtained the game theory [17]. The review of game theory applications in construction engineering and management presented Kapliński and Tamošaitienė [5]. The use of option games as a tool to evaluate trade-offs between flexibility and strategic commitment in industrial water infrastructure projects. Option games meet the challenge of balancing competitive pressure to commit to big-budget projects against a more flexible approach that keeps investment options open [18]. The management of groundwater resources is complex, especially when decisions about the ecological environment and the social environment are considered. In addition to this, economic efficiency should be considered. Conflicts and Cooperation in Projects: Application of Conjoint Analysis and Game Theory to Model Strategic Decision Making [19]. Decision support systems using made the decision-making faster. Is this research, our main consideration is the use and application of game theory and LEVI 3.0 program [20].

The principles of leadership strategy selection:

- Decisions are processes, not events
- Tendency to view the decision as OK/not OK
- Probably more helpful to think about HOW we go about making decisions rather than WHAT decision should we make/has been made;
- What is system 1 telling me, do I need to work it out with system 2, am I at risk of a cognitive or affective bias in system 1, am I missing something (calibration)?
- The processes of leadership selection problem are presented in Fig. 1.

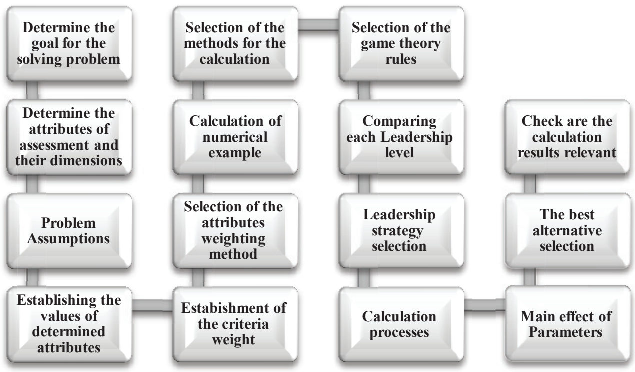

Fig. 1. *The model for the leadership selection problem*

Satisficing is a decision-making strategy that entails searching through the evidence and available alternatives until an acceptability threshold is met (the level of uncertainty has been reduced to a level at which the individual feels comfortable to make a decision). This is contrasted with optimal decision making, an approach that specifically attempts to find the best alternative available.

4. Case study

The main aim of the research is the use and application of game theory in CE&M processes. The model of leadership selection in CE&M processes is described by eighteen discrete criteria values. For the numerical example was selected one of the most risky CE&M processes – construction. The subject of investigation is a project member team. Each member is described by eighteen attributes. The attributes of member selection are as follows: x_1 - ethical issues, x_2 - problem-solving skills, x_3 - interpersonal skills, x_4 - creative, x_5 - adaptability, x_6 - collaborative skills, x_7 - safety issues, x_8 - interdisciplinary application, x_9 - theoretical issues, x_{10} - practical awareness, x_{11} - technical skills, x_{12} - information systems and computer skills, x_{13} - estimating/scheduling skills, x_{14} - communication, x_{15} - marketing, x_{16} - financial management, x_{17} - enterprise and project management relations, x_{18} -

environmental awareness. The optimisation direction of the selected attributes $x_{1–14}$ is minimisation and of the $x_{15–18}$ attributes is maximisation. Attributes performance measurement is presented in points. LEVI 3.0 program was used to select leadership strategy selection. LEVI 3.0 is a program was developed for multiple criteria decision making problems solution. The research considers coordination in CE&M processes. LEVI 3.0 program was applied to find the leader among the team members.

The initial decision making results for problems solution are entered to the LEVI 3.0 program (Fig. 2).

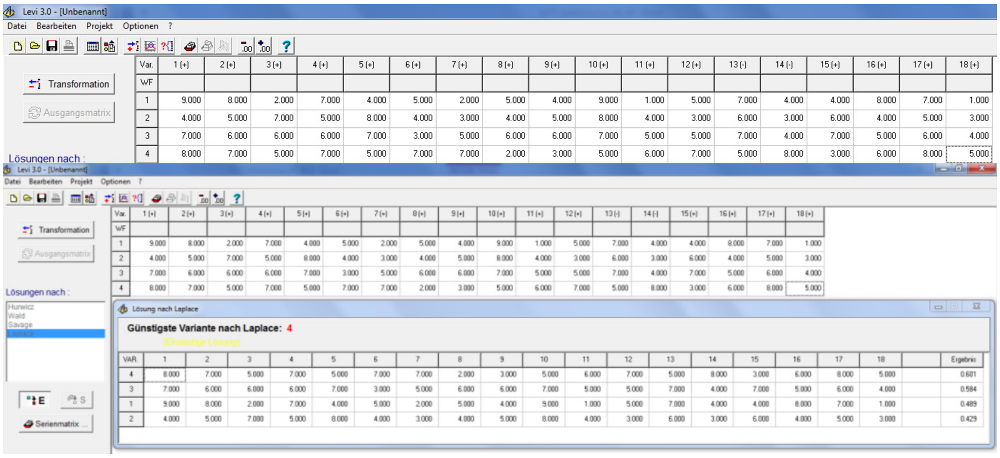

Fig. 2. *The initial date and calculation results be applying LEVI 3.0 program*

Conclusion

The research considers coordination in CE&M processes, in which is assumed that non cooperative game theory approach could be used as a suitable tool for coordinating pricing, inventory and marketing expenditure policies in different levels the strategy the leadership changed depending the negotiating power. The situation and assumption used in the paper is the key for the future researches. Considering more levels in CE&M processes lead the researchers to a comprehensive model for CE&M processes coordination in future. In addition, as the competency of information and complete information sharing in different levels of the strategy is impossible, as well as using LEVI 3.0 program approaches such as Laplace rule will help solve this problem. The developed model for the leadership strategy selection based on LEVI 3.0 program show that model can be applied in praxis.

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