



OVERCOMING RESISTANCE TO CHANGE IN ENGINEERING AND CONSTRUCTION: CHANGE MANAGEMENT FACTORS FOR OWNER ORGANIZATIONS.

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Abstract

For owner organizations in the architecture, engineering, and construction industry, successful implementation of new processes for procuring, contracting, and managing requires a concerted change management effort. The objective of this study was to empirically measure the impact of individual change management factors on minimizing resistance from organizational members during implementation, which is often cited as a major reason for organizational change failure. Project team resistance to the implementation of a new project delivery system was tracked across sixteen owner organizations. Findings include identification of six change management factors that contribute to minimizing resistance to change, including certain aspects of project scope, size and duration, organizational expectations of change implementation speed, the establishment of formal change agents, and the level of change agent involvement with implementation activities. Implications for change leaders and practitioners are discussed to recommend strategies for reducing resistance to change. Elsevier Ltd. APM and IPMA.

Keywords – Engineering and construction; Change management; Alternative procurement methods; Project management;

1. INTRODUCTION

Owner organizations that frequently purchase services from the architecture, engineering, and construction (AEC) industry have continually sought to improve project performance by enhancing their standard sourcing and project management practices [1]. Typical owner goals are to improve internal process efficiency in the face of increasing resource constraints as well as to improve performance and consistency in their management of hired external AEC firms [2]. These goals are often accomplished by implementing changes in major areas of AEC project delivery. one major area is alternative procurement methods, which include different evaluation practices aimed at minimizing the owner's risk of procuring low-performing AEC firms [3]. Innovative approaches to risk transfer are another major area, where unconventional contracting methods are intended to improve the identification, mitigation, and transfer of potential project risk factors [4]. Third, new project management processes are intended to enhance project control such that owner organizations are better able to measure project performance and increase accountability of hired AEC firms to deliver expected levels of quality [5].

Implementation of new practices in the procurement, contracting, and management of AEC projects requires a disengaging from traditional practices, which often have been built up over decades of operation [6]. The change management literature emphasizes the difficult and complex nature of change implementation and often cites high failure rates [7]. one major cause of change effort failure is resistance from organizational members, where resistance to change is defined as any dissenting actions that slow, oppose, or obstruct a change management effort [8]. Previous research has noted resistance from organizational members as a barrier to change implementation [9], yet little empirical data has been recorded for the AEC industry specifically.

2. LITERATURE REVIEW

2.1. Resistance to Change

The concept of resistance to change is rooted in unfreezing, moving, and freezing model of organizational change, which stated that there are driving forces that seek to either bring about or resist change. Research in the areas of resistance to change often describes it on the individual level as three dimensions: cognitive, affective, and behavioral [10]. The cognitive dimension refers to how employees think about the change, including their perceived capability to be effective in new work roles [11]. The affective dimension is defined as the emotional and psychological reactions employees experience in how they feel about the change [12]. The behavioral dimension examines resistance in terms of employee action responses, and whereas the first two dimensions are often accepted as the sources or reasons causing resistance, the behavioral dimension is the actual manifestation of resistance in the form of observable conduct, deeds, and events [13]. This study focuses exclusively on behavioral resistance to change due to the fact that it is the only directly observable dimension. Twelve specific types of resistive behaviors, were observed in this study based upon definitions from the literature [14].

2.2. Change management factors

The AEC industry presents unique challenges for change practitioners; for example, its project-based nature necessitates that change be implemented on the level of individual projects. Since individual projects can be viewed as “temporary organizations” [15], specific factors within the project and associated project team are important to consider from a change management perspective [16]. Critical factors include the project scope, size, and duration [17], as well as personnel hierarchical position and experience levels [18].

Type of resistive behavior	Definition of the resistive behavior
Reluctant compliance	Doing the minimum required, lack of enthusiasm, guarded and doubtful
Delaying	Agreeing verbally but not following through, stalling, procrastinating
Lack of transparency	Hiding or withholding useful information during

	implementation
Restricting education	Avoiding or restricting the spread of the change message
Arguing & open criticism	Verbally opposing and/or finding fault with the change implementation
obstructing & subverting	openly sabotaging, blocking, undermining the change implementation
Spreading the negative word	Spreading negative opinions and rumors, appealing to fear in resistance

Table 1: Change management factors

Unrealistic expectations that underestimate the amount of time and effort required to accomplish the change may lead to resistance [19]. Previous research has also reported a directly proportional relationship with change message delivery (in the form of change-related education and training received by organizational members) and change management success [20]. The formal designation and involvement of change agents to lead change implementation is another critical factor, and many organizational change researchers have specifically called for the establishment of a “transition team” to guide the change [21].

3. METHODOLOGY:

3.1. Data Sample & Research Context

Across the Pakistan from twelve sector data are collected. Eight were public sector organizations, including state, city, and county governments as well as school districts and post-secondary educational institutions. Two were private owners representing a defense contractor and a private educational institution. Among these twelve owners, 52 individual AEC projects were observed to document the amount of resistance encountered. on each project, two key individuals from the owner's project team participated: the lead contracting officer and lead project manager (N = 104). of the participating individuals, 69 were

frontline personnel, 27 were supervisor-level, and 8 were which consisted of three processes that were new to each organization. First, an alternative procurement approach was used to evaluate and select AEC firms on each of the 36 projects in the data sample. The procurement approach consisted of a best value approach where contractor evaluations were based on both price and performance criteria (e.g. firm capability, project risk assessment, references, and project team interviews). Second, an innovative contracting method was implemented that required the procured AEC firm to complete three deliverables to be added to the owner's traditional contract documentation: a project milestone schedule, a formal and project-specific risk management plan, and detailed list of action items requested of the owner's project team during project execution. Third, a new project management process was incorporated to track, communicate, and measure the impacts of risks encountered during project execution.

3.2. Change Implementation Context

Each of the twelve participating owner organizations independently implemented the same organizational change, formally documented on a weekly basis for the contract duration along with quantitative impacts on project cost, schedule, and owner satisfaction. Each of these processes was completely new to the participating owner organizations.

3.3. Action Research Method

An action research methodology was utilized, which is defined as a collaboration between researchers and practitioners on a selected project to collect data about what is happening within the organizational system while simultaneously addressing the practical concerns of the organization. Action research is characterized as being change-oriented with a focus on addressing a particular problem by changing the organization system. It is process-oriented and commonly follows a cyclical process of planning, acting, observing, and evaluating that is aimed at increasing the understanding of change processes and social systems. The action research method was selected for this study due to its emphasis on three research elements: first, the research is based on actual conditions rather than theoretical models; second, the direct collaboration between researchers and organizational members presents a rich data

collection opportunity; and third, the data collection occurred in “real time” during change implementation rather than relying upon post-change survey instruments.

4. RESULT OF STUDY:

Results for resistive behavior frequency hypothesis tests and Tukey post-hoc analysis are described below. A summary of ANOVA results for each of the six hypotheses is provided. Levene's test was used to determine homogeneity of variances. Tukey post-hoc testing identified significant relationships between individual change management factors and results are summarized is

4.1. Scope of Project

When considering the relationship between project scope and resistance to change, construction projects were found to have a statistically significant lower mean frequency of resistive behavior. It is important to note that although construction projects were found to have the least amount of resistance, practitioners should still expect to encounter resistance (in some capacity) no matter what the project scope they are implementing a change within.

4.2. Size of Project

Two significant relationships were found for project size, leading to an acceptance of Hypothesis 2. Smaller projects (less than one million dollars) encounter less frequent resistance than medium- and large-sized projects.

4.3. Duration of Project

Projects with shorter project durations (less than one year) encountered less resistive behaviors than either medium duration projects of one to three years in length and long-term projects with durations of more than three years.

4.4. Personnel position level

Personnel position level (frontline, supervisor, executive) within the owner organization was not found to be significant at the 95% confidence level. This result confirms previous research by Smollan (2011), who studied resistance within the three personnel hierarchical levels of executives (senior management), supervisors (managers), and frontline personnel (first-level employees) and found empirical evidence that it is not just “workers” or frontline personnel who resist change, but organizational personnel at all different hierarchical levels.

4.5. Personnel career stage

The difference in resistive behaviors encountered for each of the personnel career stages tracked were not significant at the 95% confidence level, leading to the rejection of hypothesis 5 and acceptance of the null hypothesis. However, it should be noted that the difference between early career stage resistance and middle career as well as late career was significant at the 93% and 88% confidence levels, respectively.

4.6. Formal change agents

Results revealed that organizations who did not formally designate change agents to lead the implementation effort encountered significantly more resistance than those organizations that did, leading to the acceptance of Hypothesis.

5. CONCLUSION

Conclusion of the study are:

- The objective of this research was to measure the frequency of behavioral resistance encountered among AEC owner project teams tasked with implementing new procurement, contracting, and project management processes.
- The major contribution was identification of certain change management factors that were associated with minimizing the amount of resistance encountered during change implementation. Project scope, size, and duration had significant

relationships with resistance to change, with projects of construction scoping, small size, and short duration encountering the least resistance.

- organizational expectations of the speed of implementation also impacted resistance, with expectations of accelerated implementation speed later manifesting high levels of resistance. organizations that held long-term, multi-year, strategic expectations of the change effort experienced the least amount of resistance during implementation. Formal establishment of change agents to lead the implementation effort significantly reduced resistance, and high levels of day-to-day project involvement by change agents resulted in the lowest levels of resistance overall.
- A contribution to practitioners is the empirical data that helps guide change management approaches within AEC owner organizations. First, change practitioners must be cognizant of project scope, size, and duration when choosing between multiple upcoming project opportunities that are candidates for change implementation. Second, practitioners may consider piloting the change on a smaller scale before expanding it to broader implementation, while keeping in mind the benefits of achieving “short term wins.” Third, setting realistic and sobering expectations regarding the strategic and difficult nature of change implementation may actually foster greater levels of readiness among the AEC project teams who will be asked to implement the change.

6. RECOMMENDATION

Future research is recommended to

- expand the scope to include the impact of planned change within owner organizations on the AEC companies they partner with, such as contractors, design firms, architectural firms, and operations companies.

- The fact that any change in process not only impacts the owner team, but also how they interact with their hired AEC firms, may have a significant impact on resistance to change. The magnitude or strength of the resistance behaviors, in addition to frequency, should be accounted for by future researchers.
- Finally, future research is recommended to include a more nuanced investigation of the establishment, definition, and involvement of formal change agents. This study did not identify implications related to the number of change agents, their hierarchical level within the organization, or their level of experience, leadership capability, and personal readiness for change.
- Since change agent leadership is seen to be a highly important element of change management, understanding the specific factors that contribute to change agent success bears further investigation.

7. REFERENCES

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