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Interface Management

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Executive Summary

As capital projects have become more complex and increasingly global, project leaders have felt a greater need for interface management (IM). Defined as the appropriate management of communications, relationships, and deliverables among two or more interface stakeholders, effective IM is integral to project success. Yet, because it is an emerging discipline, project teams have, to date, had little guidance on its implementation. As a result, IM implementation has varied widely across the industry, and no common definitions and practices have evolved. To address the need for a coherent industry approach to IM, CII chartered Research Team (RT) 302, Interface Management. The team's mission was to identify the current state of IM and establish its definitions and effective practices for owners and contractors who face serious interface issues on global mega-projects. To accomplish this, RT 302 developed a rigorous survey to structure its interviews with personnel on 46 projects.

This research summary focuses on the research key findings from the team's interviews, i.e., the established IM definitions, practices and recommendations. It also introduces Implementation Resource (IR) 302-2, *The Interface Management Implementation Guide* (IMIGe), and IR 302-3, *The Interface Complexity Assessment Tool* (ICAT), which together help users match IM implementation levels to project complexity. From the interviews, the team found that the projects with a low level of IM implementation tended to have higher and more dispersed cost growth—as well as more outliers (e.g., excessive cost growth)—than did the projects with high IM implementation. Though more validation efforts (e.g., more sample projects) will clarify the results, this finding shows the potential benefit of having formal IM implementation for global mega-projects.

The research team's analysis further indicates that implementing the appropriate level of IM enables project teams to be proactive in identifying and managing interface points. Because effective IM creates open communication channels between interface stakeholders and

facilitates their engagement in resolving conflicts and issues, it eventually leads to a lower project risk profile and higher project performance. Finally, in this summary, the team puts forward a path for the wider adoption of IM, identifying the areas where more research efforts are needed.

Introduction

CII chartered RT 302 with the primary objectives of identifying the current state of IM and establishing its definitions and effective practices. As the scale and complexity of capital projects has increased, and as the need for effective management of multiple stakeholders has intensified throughout the project life cycle, IM has become more important for project success. However, current IM practices vary across different organizations. In the absence of a consistent understanding of and common approach to IM, the industry has developed false expectations of the ability of IM to improve project performance and stakeholder communication.

This research summary presents the following findings and products: 1) the definitions and elements of IM, 2) the current state of IM practices, 3) Implementation Resource (IR) 302-2, *The Interface Management Implementation Guide* (IMIGe), and IR 302-3, *The Interface Complexity Assessment Tool* (ICAT), and 4) an analysis of the relationships between the level of IM implementation and project performance.

What Is Interface Management?

Interface management (IM) first emerged in 1967 on an aerospace and electric power pool project, as a way of analyzing the contact points between interacting project parties and identifying the corresponding inter-organizational issues. In spite of these early roots, the lack of the necessary technological infrastructure required to organize, communicate, and control sufficient amounts of interface information and data have prevented its full use by the construction industry. However, recent advances in information and communication technologies have enabled the construction industry to adopt IM gradually. IM has also increased as a result of the following factors:

- complex and geographically scattered projects
- globalization of design and manufacturing processes

- compressed schedules with parallel design and construction processes
- need for collaboration and timely exchange of information
- increased use of modular construction methods through multiple contracts
- increased demands from external stakeholders.

These challenges demand a structured approach to managing both internal and external interfaces, and aligning stakeholder interests to achieve a successful project outcome.

IM practice currently varies significantly among industries and corporations, especially within the oil and gas sector, and particularly in the offshore projects arena. Because the lack of a consistent understanding and common approach to IM can create false expectations of improvement in project performance or communication between parties, RT 302 adopted a research approach that would enable standardization.

Research Approach

RT 302 investigated 46 projects to identify the current state of IM and its most effective practices. Specifically, the team chose to use a structured interview as its principal data collection instrument, taking into account the characteristics of the research projects investigated. In other words, because IM had not been standardized (e.g., with common definitions), the research team determined that relying on a paper-based questionnaire (e.g., asking a respondent to fill out a questionnaire without any help) would create confusion. The team interviewed key personnel (e.g., interface managers) on the 46 projects, each of which were from different sectors of the industry, with various sizes and geographic distributions. The interview questionnaire consisted of three principal parts: 1) general project information, 2) IM practices, and 3) IM performance factors. The overall study protocol received approval from the institutional review board at each participating university (i.e., University of Waterloo and University of Michigan).

The team analyzed all the transcripts gathered from these interviews in order to synthesize universal definitions, common practices, and IM's relationship with project performance. Statistical analyses were performed as needed (e.g., correlation and principal component analysis). In addition, several projects were selected for in-depth case studies.

Readers of this research summary should be aware of related CII research efforts, since they may provide added context. Those efforts include the following:

- IR 244-2, *Global Project Controls and Management Systems: Adapting Your PCMS Program for Success*
- IR 258-2, *Information Integration to Improve Capital Project Performance*.

Products of RT 302

As discussed above, in addition to this research summary, RT 302 produced the following CII publications:

- IR 302-2, *Interface Management Implementation Guide (IMIGe)*
- IR 302-3, *Interface Complexity Assessment Tool (ICAT)*
- Research Report (RR) 302-11, *Interface Management*.

RT 302 also presented its research findings at international conferences, and produced academic papers, including conference proceedings and journal papers.

How to Use the Interface Management Implementation Guide (IMIGe)

Drawing on its research findings (e.g., the current state of IM and effective IM practices), RT 302 developed the Interface Management Implementation Guide (IMIGe). The IMIGe gives owners and contractors guidance on assessing the current state of IM on their projects. It also helps them determine the appropriate level of IM implementation for their respective organizations. The IMIGe also assists in the development of short- and long-term IM implementation strategies and plans.