

Title: The influences and challenges of interface management in project management.

What the research is about:

The scale of construction projects is on the way to become more and more complicated due to the progress of technology and operations. At the same time, contractors are faced huge pressure in a highly competitive market with respect to factors such as budget, time to market and quality (Tomiyama and Meijer, 2005).

Consequently, the Engineering-Procurement-Construction (EPC) methods are globally recognized (Hale et al., 2009). Typically, an EPC contract covers project management, site management and supervision, engineering, materials and equipment, civil works, foundation and site infrastructure works, transport and installation, and commissioning, as well as scheduling and performance guarantees for the entire solution (Jan Pícha et al., 2015). With a fast-track lifecycle, the EPC method can achieve lower costs and a reduced project duration by integrating the design, procurement, and construction processes (Back and Moreau, 2000). However, the adoption of concurrent engineering design, procurement, and construction increases the uncertainties and complexities of EPC projects, which makes it harder to control and manage interfaces when in project execution (Lee et al., 2006).

In civil construction, (Wideman, 2002) provides two definitions for interface management. "The first is the management of communication, coordination, and responsibility across a common boundary between two organizations, phases, or physical entities which are interdependent". "The second is managing the problems that often occur among people, departments, and disciplines rather than within the project team itself" (Wideman, 2002). "In the EPC construction industry, the experts defined the interface management as the management of common boundaries between people, systems, equipment, or concepts" (Nooteboom Uri, 2004). "Such EPC projects are not without their difficulties, for example, the time pressures frequently brought by overlapping design, procurement, and construction increase uncertainty and complexity in managing the multiple interfaces between different interacting stakeholders" (Wenxin et al., 2017).

Apparently, for successful of implementing, monitoring and controlling an EPC project are depended on a useful framework for the description and identification of all interfaces through an interface management that able to resolve the gaps and overlaps in the project scope packages, moreover, to establish effective communication and collaboration between project team members and contractors.

This research will provide an overview of interface management in project management whereby the interface issues like design miscalculations, variation order in a commercial contract, miscommunication between internal and external stakeholders, and construction conflicts of the project can be moderated by increasing clarity and visibility of project battery limits, scopes, responsibilities, and roles of each project stakeholders. It is of great theoretical and practical significance to study the

influencing factors of interface management and its mechanism, which is of great significance to improve the interface management level of EPC project.

Problem Description and Why it is important?

The uniqueness of building construction - poorly controlled building environment, the complexity of construction, temporary multi-organization, and subcontracting and interdisciplinary nature - increase the number and types of interfaces in a project, and cause various interface issues (Qian Chen et al., 2008).

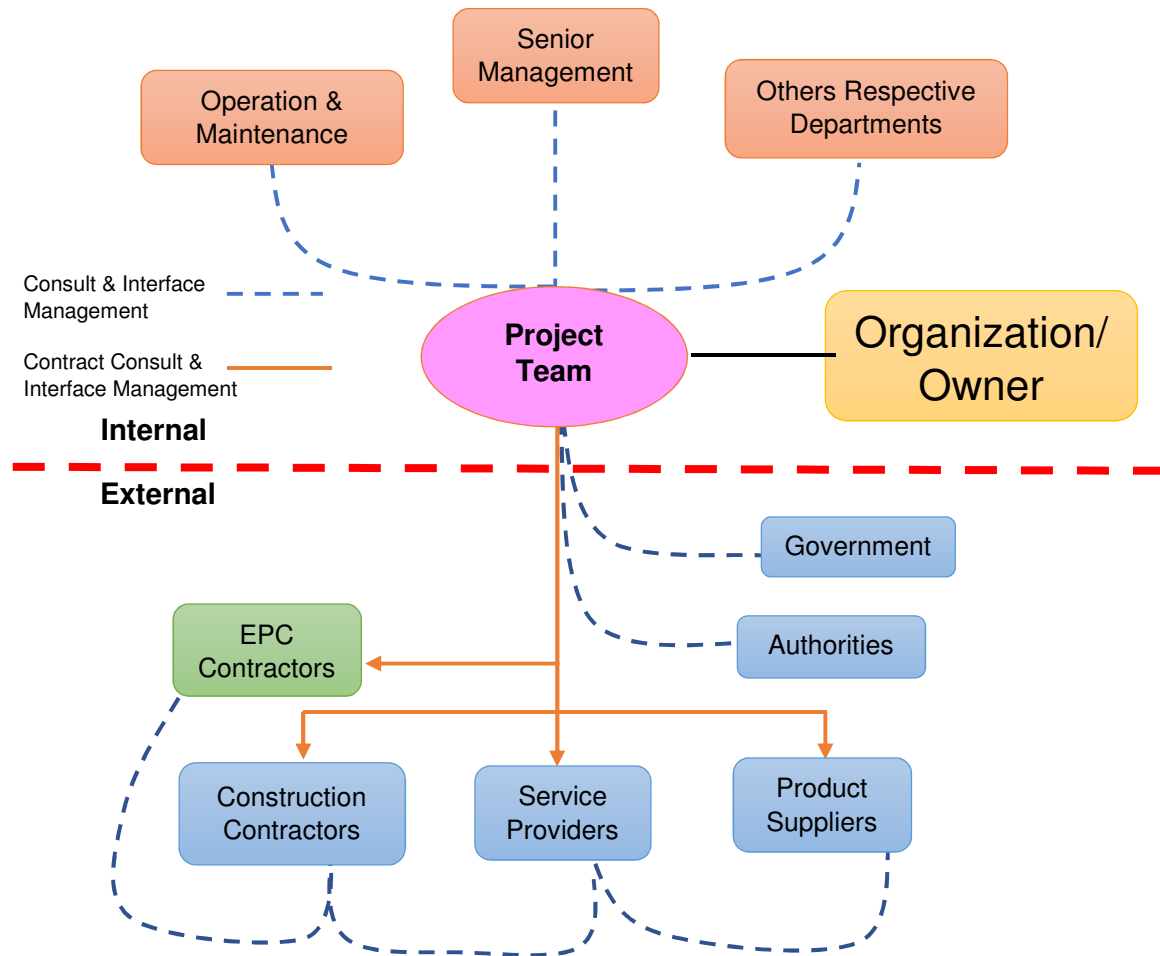
Interfaces are defined as the contact point between relatively autonomous organizations which are interdependent and interacting to achieve some larger system objectives (Wren, 1967).

Construction interface could be defined as mismatched parts, systems performance failures, coordination difficulties, assembly conflicts between trades, etc. (Qian Chen et al., 2008). In addition, the construction interface usually occurs when many project participants are joined to a construction project, which is always divided into several sub-activities. Thus, these interface problems result in many negative impacts to the project including low productivity, poor quality, waste, delays, claims, and cost overruns (Qian Chen et al., 2008). Besides, (S. Shokri et al., 2016) also mentioned that implement interface management at the initial stage of the project cycle is crucial, it would be able to enhance of project performance in respect of scope, time, cost, quality, risk, and safety. Apparently, the project scopes, times, costs and risks are significantly increased, but how does interface management to facilitate in this matters and why does it matter? The importance and benefits of implementing interface management are:

- a. Mitigate the potential risk related to project interface:
 - to promote and increase of cooperation, awareness, coordination and exchanging of information between contractors, projects and existing facilities;
 - to ensure EPC contractors understand interface issues, and their responsibility to manage them and;
 - to reduce cost overruns with well-defined scopes of work related to interfaces;
- b. Improve project execution
 - to enhance project performance by understanding project objectives, requirements, constraints, complex information and project milestone;
 - to increase the quality of the project by providing an outline that appropriately understands relevant requirements and;
 - to suggest a framework whereby challenges can be identified and ironed out in a systematic manner and through effective methods to eliminate possible impacts on the project;
- c. Real-time visibility and oversight and support to projects
 - to eliminate ambiguity on roles and responsibilities related to project interfaces and;
 - to provide a real-time framework that able to traces the progress of the determination of interfaces.

Who the beneficiaries will be:

The useful lessons of this study will be valuable to the organization and appointed project team as well as internal and external stakeholders in executing better practices and platforms for the interface management and project management. Looking at the EPC project in my organization, the beneficiary stakeholders would be distributed into two distinct groups – internal and external. The following Figure 1 illustrates the basic contractual structure of a typical project by using an EPC contract, while, on the other hand, a detailed structure can vary from project to project.



Aim and Research Objectives:

The aim of the research conducts representative challenges of interface management study to explore their applicability as well as strategies of project interface related analysis in the existing EPC industry practices. Fundamentally, the study has the following objectives:

- to investigate a more holistic conception strategies of interface management in reviewing EPC contractor's overall performance and its associated with the principles of EPC project;
- to identify the challenges and impacts on project interfaces by analysing interface management theories and project management principles;

- to explore and evaluate the close relationship of the existing interface connected issues that found in EPC projects;
- to propose constructive recommendations for difficulties encountered and;
- to outline a conclusion from the study of literature, case studies, and evaluation of research.

Methodology and sources of data

The methodology of this study illustrates a mixed method research in order to achieve the research aim and objectives. The key methods will be accomplished by looking at the examples throughout research interview approach and case study approach. Hence, two parallel strategies will be applied in this research study, and are summarized in Table 1 as follows:

- Qualitative semi-structured interview approach:- Interviews with different engineering background of project team members and project managers can understand the major differences in these areas in order to focus on the type of interface management and the actual influences and challenges of interface management in EPC projects.
- A practical case study approach:- A real-life context case study is performed to investigate the current interface management practices in my organization. At this point, the entire interface management practices will be observed and explored, including the real-world functioning of the organization, project lifecycle, and project tools. By assessing the interface management methods the present drawbacks and achievements are exposed.

STRATEGY	AIM	SAMPLE	TYPE OF QUESTIONS	METHOD OF ANALYSIS
1. Qualitative semi-structured interview	To figure out and determine the challenges and impacts on project interfaces through the appointed projects carried out by the project person in charge.	To interview (XX) members of the project team within my organization, SDC, who has been with the company for more than five (5) years and as well in charged more than five (5) projects	Semi-structured questionnaires. Open questions	To perform the content analysis.
2. A practical project case study	To investigate the entire interface and project management practices in my organization including the organization, project lifecycle, and project tools.	To conduct an in-depth case study on (XX) EPC projects within my organization which involved from the initial project stage to the completion.	Structured questionnaires. Open questions	To provide opinion and compile a case study report based on the collated raw data and info from contract documents, interviews and observations.

Table 1: Research Strategy

Based on the sources of data collection, a set of the scheme will be developed to sort out those project interface factors for interface modeling which affected between interface management implementation and project performance. Lastly, once the interface modeling methods are defined, a conceptual framework for comprehensive interface management will be outlined to enhance the existing interface management.

Plan for the research:

Week	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
1. Finalise preparation for a research project.															
2. Complete revisions for research design															
3. Data collection methods															
4. Literature review															
5. Qualitative semi-structured interviews															
a. Establish contacts in data collection sites															
b. Finalise sampling and data gathering procedures															
c. Interview with five project managers															
6. A practical project case study															
7. Data analysis & interpretation															
8. Review of project and write up															
9. Finalizing the project															
10. Submission of project															

Table 2: Propose research project timeline

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