

Assessing Owners' Role in Improving Constructability of Construction Projects in Indonesia

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Presentation Outline

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- Constructability
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Research Background

Many construction projects are awarded on a competitive basis using the traditional approach

separation of design from production in the construction process

lack of constructability of the construction projects

a reason for projects exceeding budgets and schedule deadlines

ignoring opportunities of significant savings in project cost and completion time resulting from the careful interaction of planning, design, and engineering with construction

Constructability

- evolved from studies into how improvement can be achieved to increase cost efficiency and quality in the construction industry
- an approach that links the design and construction processes
- defined as:
 - *'the optimum use of construction knowledge and experience in planning, design, procurement, and field operations to achieve the overall project objectives'*
(Construction Industry Institute 1986)
- It emphasizes the ability to construct and the importance of construction input to all project phases

Constructability

- Improving constructability of construction projects is the responsibility of all project stakeholders, ie owners, designers and contractors.
- the owners have the most authority in enforcing the implementation of constructability,
- the owners' awareness of the benefit of improved constructability is the most important.
- owners must be aware that the decisions which are made in the initial stages of planning and design are difficult and costly to change once construction begins.

Constructability

- awareness of the project owners were measured in terms of their responsibilities for constructability improvement, which include:
 - Setting the project objectives and priorities;
 - Building and leading the project team based on the contractual approach selected, and leading the team effectively by fostering a team approach on a project;
 - Making constructability a project concern by emphasising early cost influence, using constructability to meet project objectives, insisting on early construction involvement in major decisions, and resolving conflicts based on project objectives.

Constructability Survey

• PROJECT PLANNING

- Most of the respondents claimed that they had clearly stated their project objectives, especially the traditional project objectives of cost, time, quality and safety.
- All owners claimed that they had also clearly stated their project priorities and had used the project objectives as criteria in making major decisions.
- public sector owners gave a higher rating to consideration of project quality objectives than the private sector owners did.
- industrial project owners are more likely to clearly state the 'other' project objectives, while the infrastructure and residential project owners are more likely to consider new design approaches and construction methods.

Constructability Survey

• SELECTING AN APPROACH TO PROJECT DELIVERY

- public-sector owners were more likely to deliver their project using the traditional approach, whereas delivery methods selected by private-sector owners vary from the traditional approach to the design-construct approach.
- heavy engineering construction projects and residential construction projects tend to be delivered using the traditional approach.
- owners who develop industrial projects prefer the design-construct approach.
- types of project delivery approach in building construction projects vary from the traditional approach to the construction management approach. However, the traditional approach is still the preferred delivery method.

Constructability Survey

• Stage in integrating construction input:

- conceptual planning stage (35%).
- design stage (42%).
- procurement stage (5%).
- construction stage (18%)

• Method of incorporating construction inputs

- involving construction personnel through design consultant (58%).
- Owners' own construction personnel (30%).
- engaged contractors' personnel to provide construction inputs (5%)
- services of construction management firms (7%)

Constructability Survey

• Method of incorporating construction inputs

- The private-sector owners are more likely to incorporate the construction input as early as the conceptual planning phase, whereas the public-sector owners tend to delay this input to the design phase.
- In heavy engineering construction projects, it is more likely that construction personnel are involved only in the construction phase.
- In industrial construction projects, the owners tend to incorporate the construction input as early as the conceptual planning phase.
- In building projects, the construction input is also incorporated early in the project life cycle. However, most of the inputs are provided by the construction personnel of the design consultant, as the traditional approach is still the preferred method of project delivery.
- In the residential construction projects the construction inputs are most likely to be incorporated in the design phase, and they are mostly provided by the owners' construction personnel

Constructability Survey

• Method of incorporating construction inputs

- most owners stated that they had assigned key individuals who had appropriate experience to the project team.
- being receptive to construction input was one of the important criteria in selecting a project designer and had established a pre-construction plan in developing their project.
- did not feel strongly about provision of early involvement of construction personnel in selecting their contractual approach.
- private-sector owners are more likely to give a higher consideration to the provision of early involvement of construction personnel when selecting the project delivery method

Constructability Survey

• Constructability as Project Concern

- made or at least tried to make constructability a project concern.
- used the project objectives to solve project conflicts and insisted on construction involvement in making major decisions.
- maintained lessons-learned files of completed projects.
- emphasised the importance of early construction input and tried to use constructability to meet project objectives.
- private sector owners put more emphasis on early cost influence and inclusion of construction involvement in major decision than the public sector owners.
- the public-sector owners are more likely to maintain the lessons-learned file from their projects

Constructability Survey

• Project Performances

- When project quality objectives are clearly stated, this may lead to improved project performance related to project cost and project safety, and to a lesser extent on project quality
- Project cost performance is also improved when the objective statement includes a commitment to finding the most cost effective means to achieve project objectives
- Project safety is improved when project objectives and their priorities are clearly stated, and project conflicts are resolved based on project objectives
- Project quality performance is improved when the project objectives regarding safety, and to a lesser extent the project quality objectives are clearly stated.

CONCLUSIONS

- Project owners in Indonesia do have some understanding of the importance of constructability.
- However, the traditional approach to project delivery, which is the preferred method by most of them, limits their option for involving construction personnel in the pre-construction phases.
- The most common methods of integrating construction input were through construction personnel of the project owners or the project designers.
- There were few significant differences between public sector owners and private sector owners, and among owners who developed different types of project, in their approach to constructability.
- Early contractor involvement reduced constructability problems, which led to an improved project performance.