

## Investigating the Role of Supplier Involvement in the Design Process as an Approach for Enhancing Building Maintainability

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**Abstract :** The post-construction phase represents a critical milestone in the project lifecycle. This is because design errors and omissions, as well as construction defects, are examined during this phase. The traditional procurement approaches that are commonly adopted in construction projects separate design from construction, which ultimately inhibits contractors, suppliers and other parties from providing the design team with constructive comments and feedback to improve the project design. As a result, a lack of considering maintainability aspects during the design process results in increasing maintenance and operation costs as well as reducing building performance. This research aims to investigate the role of Early Supplier Involvement (ESI) in the design process as an approach to enhancing building maintainability. In order to achieve this aim, a research methodology consisting of a literature review, case studies and a survey questionnaire was designed to accomplish four objectives. Firstly, a literature review was used to examine the concepts of building maintenance, maintainability, the design process and ESI. Secondly, three case studies were presented and analyzed to investigate the role of ESI in enhancing building maintainability during the design process. Thirdly, a survey questionnaire was conducted with a representative sample of Architectural Design Firms (ADFs) in Egypt to investigate their perception and application of ESI towards enhancing building maintainability during the design process. Finally, the research developed a framework to facilitate ESI in the design process in ADFs in Egypt. Data analysis showed that the 'Difficulty of trusting external parties and sharing information with transparency' was ranked the highest challenge of ESI in ADFs in Egypt, followed by 'Legal competitive advantage restrictions'. Moreover, 'Better estimation for operation and maintenance costs' was ranked the highest contribution of ESI towards enhancing building maintainability, followed by 'Reduce the number of operation and maintenance problems or reworks'. Finally, 'Innovation, technical expertise, and competence' was ranked the highest supplier's selection criteria, while 'paying consultation fees for offering advice and recommendations to the design team' was ranked the highest form of supplier's remuneration. The proposed framework represents a synthesis that is creative in thought and adds value to the knowledge in a manner that has not previously occurred.

**Keywords :** maintenance, building maintainability, building life cycle cost (ICC), material supplier

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