How BIM-lean integration enhances the information management process in the construction design


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HOW BIM-LEAN INTEGRATION ENHANCES THE INFORMATION MANAGEMENT PROCESS IN THE CONSTRUCTION DESIGN

The IM challenges and their relation to the construction design problems

- Lack of communication and coordination
  • Poor or missing input information
  • Unbalanced sharing of resources
  • Unreliable decision making

- Insufficient documentation
  • Inadequate support of information management by senior management
  • Limited resources for deploying
  • Managing or improving information systems
  • Difficulties in changing working practices and processes of staff
  • Internal policies impacting on the ability to coordinate activities enterprise-wide
  • Information completeness and accuracy
  • Information duplication

- Unreliable decision making
  • No clear strategic direction for the overall technology environment
  • Lack of clarity around broader organisational strategies and directions
  • Difficulties in changing working practices and processes of staff
  • Information exchange

- Systems or tools
  • Lack of integration or coordination between information systems
  • Limited resources for deploying
  • Managing or improving information systems
  • Insufficient input information

- Information
  • Lack of clarity around broader organisational strategies and directions
  • Difficulties in changing working practices and processes of staff
  • Unreliable decision making

- Policy and strategy
  • Lack of clarity around broader organisational strategies and directions
  • Difficulties in changing working practices and processes of staff
  • Unreliable decision making

- People
  • Poor or missing input information
  • Unbalanced sharing of resources
  • Unreliable decision making

The IM challenges and their relation to the construction design problems

- Effective design management is critically important to overcome construction problems that are associated with the design process due to poor design information management.
- Many construction problems can be traced back to the design process due to many decision making processes and major amount of information exchange in the design process.
- In terms of methodology, the underlying research is conceptual by nature, and is underpinned by literature review.

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Some of the key challenges within the construction design have been highlighted in this paper such as lack of communication and coordination, poor or missing input information, design changes.

This paper identified some of the key IM challenges within the design process which have been summarised into four main categories of systems or tools, information, people, and policy and strategy.

These challenges have been linked to the construction design problems and it is believed by the authors that by improving those, the IM will be accordingly improved.

BIM and Lean would enhance IM. It is believed that the integration of BIM functionalities (i.e. visualisation) with Lean principles (i.e. reduce variability) enable better IM improvement during the design process.

BIM and Lean interaction would benefit IM in terms of reducing construction design problems and associated with the IM problems.

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Conclusion

The IM challenges and their relation to the construction design problems

- Clash detection enables identifying clashes between systems and objects.
- These improved systems and strategies allow people to take more reliable decision making.
- Clash detection improves richness of the information exchange.
- It avoids future design changes and unreliable decision making.
- Human errors could also be identified through clash detection.

- All the shared information can be visualised by project participants in a collaborative environment.
- Design problems can be directly improved through identified design error or issues in the design stage.
- Visual management is linked closely to standardisation.
- Design problems due to lack of standardised systems would be improved directly and indirectly.
- As BIM and Lean provide effective work strategies the construction design problems will be resolved by improving information management.

- Effective collaboration and communication among project participants enables creating accurate information.
- Integrated tools and systems improves the reliable decision making process.
- Collaboration enables project participants to share information at the same time and adjust any changes.
- Clear understanding of the project strategy and requirements through better communication and improve coordination.
- Effective information exchange among all the project team collaboratively enhances preparing sufficient documentation in the design process.