

Implementation of Building Information Modelling Workflow

Brief description

For the past ten years, a paradigm shift has been taking place in the worldwide construction industry, moving from the existing practices and standards towards a more intuitive approach. This approach is called building information modeling (BIM).

In contrast to BIM, the existing workflows majorly adopted in the construction life cycles are considered rudimentary due to the lack of digitization. Building information modeling achieves digitization of projects through the use of emerging technological advancements, this allows industry professionals to reduce inefficiencies and eliminate previously inherent flaws in the planning, design, construction & maintenance of the built environment.

Building Information Modeling (BIM) workflow in the Construction Projects Directorate (CPD) implementation entails replacing the existing procedures, standards and workflows involved in the design, management, and execution of projects from conception to hand-over.

As such, the scope of BIM is broad and has benefits and ramifications across the entire supply chain for both infrastructure and building sectors. However, the focus of this BIM is on two distinct phases of implementations serving as a reliable basis for future adoption across the construction industry.

Phase 1 (Construction Projects Directorate):

In accordance with the Project Management System (PMS) methodology, the supply chain for in-house construction products and services provided by the Ministry Of Works (MOW) originates at the CPD, and as such the implementation of the workflow begins with this directorate.

The objectives of implementing the BIM workflow in the CPD are:

1. Increase the collaboration between all units within the CPD by through centralization of design and construction data.
2. Reducing & removing productivity gaps inherent in traditional workflows by introducing automation mechanisms.
3. Increase accuracy by eliminating information discrepancy in all construction documentation.
4. Expanding the design and construction prospects, through BIM interoperability and expandability.
5. Improve future reconciliation of completed projects by creating dynamic high-fidelity models that can be used for data extraction and analysis.

Phase 2 (Supplementary Technical & Engineering Services):

As mentioned in the previous section, the benefits to be achieved through BIM implementation apply to supplementary technical and engineering services beyond the CPD.

The nature of the benefits will vary based upon the type of service provided and as such will depend entirely on the extent and type of implementation within each directorate.

However, there are immediate benefits that are partially realized due to the initial phase that can be garnered with negligible effort.

This phase will focus on the implementation of BIM in directorates offering services that are:

- Essential services significantly impacting the project supply chain.
- Directly affected by or benefit from the BIM workflow.
- Exhibit the highest return potential from the BIM workflow.

A few examples to illustrate the potential return on investment achievable for the supplementary technical and engineering services:

- The data provided by the BIM project team can be used to reduce the amount of time needed to prepare tender documents and cost estimates by a factor of 80% or more.
- The centralization of information by the BIM project team can reduce and/or eliminate the need for ITD to create third party document sharing systems such as EDMS and can integrate real-time data into their databases, effectively removing the need for manual input of project documentation.
- The as built models prepared by the BIM project team can later be used by the Building Maintenance Directorate to conduct high-level analytics and diagnostics previously impossible.
- Additionally, maintenance work requiring manipulation of as-built drawings or extraction of data will now effectively be instantaneous, whereas previous efforts would take days, or in the case of outsourcing work to the CPD, months.

These examples illustrate the magnitude of what is achievable, provided that BIM is implemented in a manner that integrates all directorates in a single system. The ambition is to eventually utilize its capabilities in other ministries in a nation-wide network of information sharing and collaboration, such that all stakeholders, regulatory authorities, media outlets etc. Can reap the benefits and achieve a higher level of productivity previously impossible.

Ultimately, BIM implementation will achieve the following major objectives:

Quantitative objectives:

1. Increased output of projects per year.
2. Reduced cost of construction projects.
3. Faster return of investment from projects.
4. Reduction of manpower needed to complete projects.

Qualitative objectives:

1. Automation of project management reporting.
2. Reduction of time needed to complete a project.
3. Increased innovation in project design due to advanced modelling and prototyping.
4. Increased energy efficiency in designs due to compatibility of BIM models with all major environmental analysis tools.