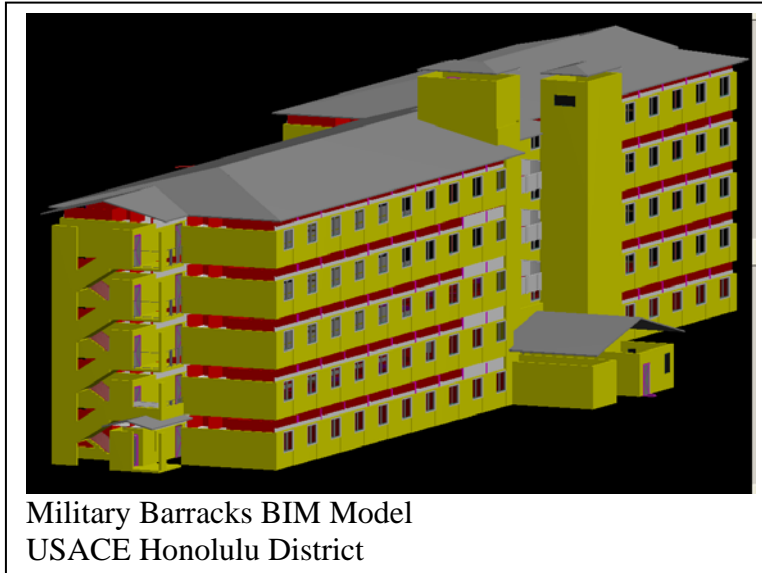


# Building Information Modeling: Collaboration, Integration, and Interoperability

By: Edward Huell  
U.S. Army Corps of Engineers  
The CAD/BIM Technology Center

The U.S. Army Corps of Engineers (USACE) has prepared for the MILCON Transformation process by instituting Building Information Modeling (BIM) as a new approach to its design process. In FY08, BIM will be required for all military construction projects. This new directive has led to many questions in the engineering community concerning the relevance of BIM to Civil Works projects of this nature within USACE. Answers to these questions will become evident as BIM matures within USACE.



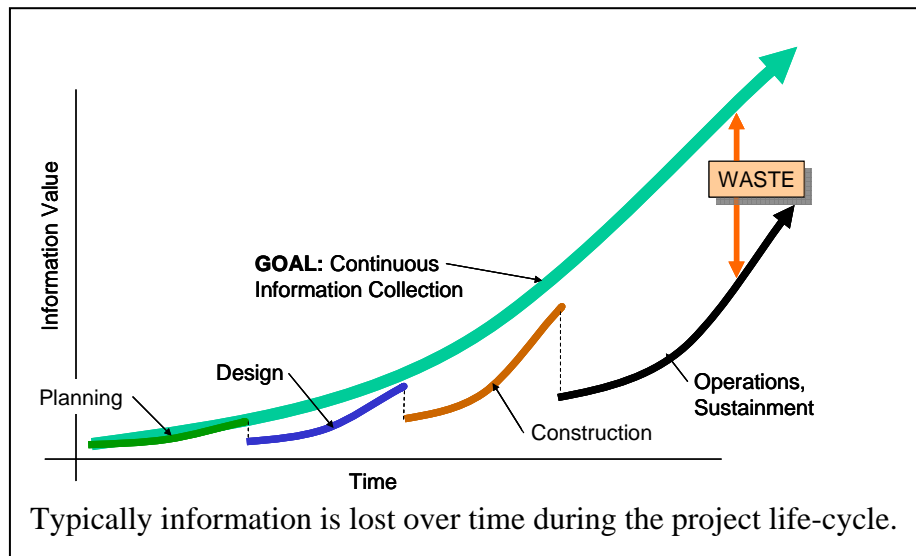
The primary focus of implementing BIM within USACE has been to aid the Centers of Standardization (COS) with meeting design requirements in support of MILCON Transformation. Districts identified as COS are responsible for the standardization of facility designs and processes. The vision of the Corps is that BIM will expedite design and construction activities to meet the critical deadlines of the MILCON Transformation process.

However, the benefits of BIM extend far beyond design and construction. The information contained in the BIM model has many potential uses in the life cycle of a facility. When all functions and activities related to the usage of a facility are viewed holistically, the true value of BIM to the life cycle of a facility becomes apparent. Once commissioned, a facility begins its next phase of existence. Information collected through BIM can aid in operating and maintaining the facility surrounding the infrastructure.

Typically thought of as merely a 3-dimensional modeling tool, BIM is a systematic process by which a multitude of individuals collaborate to simulate the construction of a facility in a virtual environment to identify potential problems before they arise during the construction phase of the project. The product (or component) of BIM is the 3-dimensional model. The model is a living entity containing information vital to the life cycle of the facility.

But how does this concept of using information from the BIM work? One must anticipate how information captured today can aid in efficiency tomorrow. This is where BIM becomes a valuable tool. The model must be created considering life cycle factors (occupancy usage, energy consumption, etc.) during development. When coupled with systems that support life cycle management, BIM offers the Corps new opportunities to better support its customers. An illustration of this is the utilization of data from the BIM process to aid in installation management and operations. Currently, the COS develops models with information pertaining to the rooms within a facility for the purpose of producing schedules for the construction drawings. Administrators of Installation Management Systems (IMS) typically field survey a facility after it has been constructed to determine the layout of the facility and gather other information. Information collected during the field survey by the administrator potentially has already been generated by the COS during the development of the model. The current disconnect with information exchange results in redundancy in effort, thereby wasting time and increasing costs. Information generated during the development of the BIM model could be used to support the IMS.

Lastly, the stakeholders (customer, owner, operator, etc.) should be partners in the BIM process. The involvement of these individuals ensures that valuable information is collected and



evaluated to determine its impact on the BIM model. When all entities interact during the development of the model, this synergy will enable information to be utilized in ways was not previously identified for the benefit of the life cycle process.