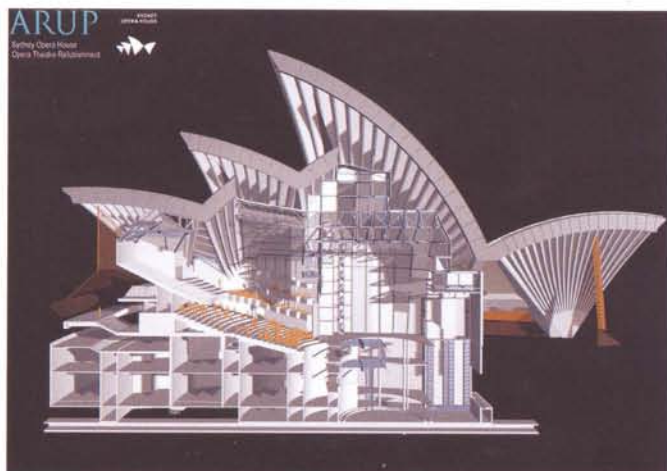


## STRATEGIES IN FM

# SYDNEY OPERA HOUSE GOES DIGITAL



Courtesy: ARUP & Johnson Pilton Walker JPW  
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**R**esearch from the CRC for Construction Innovation Sydney Opera House Facilities Management Exemplar Project provides evidence that a three-dimensional digital model of Sydney Opera House will save time while improving the operation of the facility through consistent, accurate and current data that enables faster and more effective management.

In a digital age when nearly every architect, engineer and consultant is using computer aided drafting (CAD) to document the design and construction of buildings it might be surprising to know that such an innovative building as Sydney Opera House was completed without the assistance of even the most basic two-dimensional digital drawings.

Like the great cathedrals of medieval Europe where design issues were often resolved on site, and with the continued evolution of the facility's technical needs over the past 35 years, Sydney Opera House is a different building than that portrayed in Utzon's original drawings. Consequently, there is no definitive set of plans for Sydney Opera House, nor is there integrated documentation incorporating the many services changes that have been made over the years.

The lack of consistent data in a single source has become an ongoing issue to the management of the facility, one that the

Sydney Opera House Facilities Management Exemplar Project (SOH FM Exemplar Project) aims to resolve.

Since launching this promising two-year research project in April 2005, the SOH FM Exemplar Project researchers have been developing strategies that will best respond to the direct needs of SOH while gaining knowledge about some of the most up-to-date FM systems available today.

The three main research areas of the project are:

- building information modelling;
- benchmarking; and
- procurement.

The building information modelling (BIM) section of the project is well underway, with the first stage of the research now complete. This research has already brought to light a number of significant opportunities for SOH and has highlighted the possibilities that BIM holds for the broader construction and FM industries.

Building information modelling (BIM) can be defined as a three-dimensional database designed specifically for built facilities. BIM integrates a digital description of a building with all the elements

that contribute to its ongoing function such as air-conditioning, maintenance, cleaning or refurbishment and describes the relationship between each element.

Generic benefits of the modelling system include:

- a single repository for all facility management functions that ensures consistent, accurate and easily accessible data;
- 'whole-of-life cycle' documentation that can include design and construction information as well as information required for the building to function efficiently; and
- objects and elements of the model hold more information than purely physical representation – e.g. a building component such as a lift – can include, location, vertical transport route, as well as manufacturer's code, last date of service and maintenance history

The key benefit of BIM is that it is an accurate geometrical representation of all parts of a building into a single integrated data environment.

### **WHY DOES SYDNEY OPERA HOUSE NEED A BUILDING INFORMATION MODEL?**

Sydney Opera House currently has seven different and incompatible digital information systems that manage functions as diverse as building maintenance, accounting, building presentation and asset value management. In addition, the services are separated into four main technical groups: electrical, mechanical, building and CAVS (communications and audiovisual services). The four areas are serviced by different contractors, each with independent digital systems. Sydney Opera House must manually transfer information from all of these to their own systems.

Specific benefits of BIM to Sydney Opera House include:

- faster and more effective facilities management where information can easily be shared and reused by the variety of contractor and staff employed;
- design proposals for upgrades and refurbishments can be rigorously analysed and simulations performed easily;
- production of building documentation is of high quality and highly flexible;
- controlled whole-of-life costs and environmental data leads to predictable building performance and tighter budget planning; and
- government, industry and manufacturers all have a single common language to describe elements of the building (common protocol).

A BIM of SOH will do more than simply record the physical structure of the facility; it will also incorporate huge amounts of servicing, maintenance and costing information. This type of digital modelling is called a 'rich' model as it includes all information about objects within a building, such as lifts, ventilation and fire systems and, importantly, the relationship between them in a single repository ensuring consistency, accuracy and access.

A multimillion dollar annual budget for maintenance, a maintenance department of 40 to 50 people, additional external contractors and around 200 jobs a week all demand an excellent management system. A BIM system that shares information, saves time and makes cost planning a reality is one Sydney Opera House is enthusiastic to implement. **FM**

*For more information go to <[www.construction-innovation.info](http://www.construction-innovation.info)> and follow the links to the Project pages.*