Facility and Asset management of hospital building using BIM

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Abstract: The aim of the study was to establish the Facility Management knowledge categories within the life cycle of a building context. The level of non-compliance appeared to identify a lack of knowledge, and appropriately qualified and experienced personnel involved within the management. The issues identified prompted the question on how facility management knowledge categories evolve and develops throughout the life cycle of a building. Core knowledge categories included Finance as a central theme within the Facility Management domain with Building Services and Business providing an indication as to the broad nature of Facility Management knowledge construct. Also identified within the research was the lack of legislative harmonization between different states and territories within the Facility Management domain and the disparity between Facility Management practitioners with regards to knowledge context and application

Index Terms **- Facility, Asset, Building Information Modelling (BIM).**

I. INTRODUCTION

Facility management (or facilities management or FM) is an interdisciplinary field devoted to the coordination of space, infrastructure, people and organization, often associated with the administration of office blocks, arenas, schools, sporting complexes, convention centers, shopping complexes, hospitals, hotels, manufacturing, shipping, etc. FM represents a wider range of activities than just business services and these are referred to as non-core functions. Facility management (or facilities management or FM) is an interdisciplinary field devoted to the coordination of space, infrastructure, people and organization, often associated with the administration of office blocks, arenas, schools, sporting complexes, convention centers, shopping complexes, hospitals, hotels, manufacturing, shipping, etc. FM represents a wider range of activities than just business services and these are referred to as non-core functions. They vary from one business sector to another. In a 2009 Global Job Task Analysis the International Facility Management Association (IFMA) identified eleven core competencies of facility management. These are: communication; emergency preparedness and business continuity; environmental stewardship and sustainability; finance and business; human factors; leadership and strategy; operations and maintenance; project management; quality; real estate and property management; and technology.

1.1 Role of the facilities manager

The role of Facility Management and their involvement within the lifecycle of a building was also identified within the research as being little or none during the design and construction phases of the building. The handover and management of the buildings to Facility Managers occurs within the occupancy phase of the building's life cycle meaning that the building was inherited without due consideration of continued operational efficiencies or functionality affecting the overall cost effectiveness of the building.

1.2 Building Information Modelling (BIM)

Building Information Modelling is currently being used, discouraged, encouraged, mandated and delivered globally within the construction industry. BIM historically is partially used successfully in the construction industry for design clash detection; the process allows the project team to collaboratively integrate their design to ensure that there is a "no surprise design" throughout the construction phase. BIM helps to provide success in boosting delivery and operational efficiency, reduce costs and improve value. BIM maturity levels were developed in 4 stages as a way of becoming the accepted definition for the criteria in being deemed BIM-compliant.

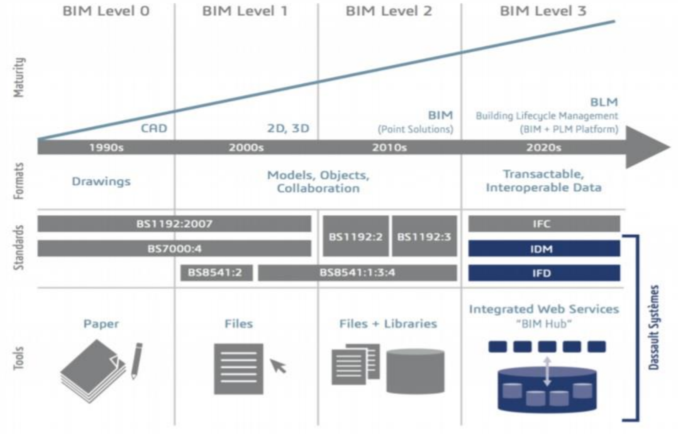

Fig-1 BIM Maturity Levels

1.3 Building Energy Analysis (BIM Energy Analysis)

Building performance simulation (BPS); formerly known as building energy simulation or building energy modeling is the use of software to predict performance aspects of a building. The objective is to create a virtual model that is sufficiently accurate to form a useful representation of the actual building BPS forecasts the various energy and mass flows within a building, in order to evaluate one or several performance aspects using computer simulation. Energy analysis in building design has to meet both the cost and schedule requirements of practical projects.

1.4 Energy Simulation

With the expanding interest in energy-efficient building design, whole building energy simulation programs are increasingly employed in the design process to help architects and engineers determine which design strategies save energy and are cost-effective. It is crucial to understand the limitations of different tools in order to successfully integrate building performance analysis in early stages of the design process, as well as capabilities of different software programs for modeling different energy-efficiency design strategies. Simulation models are flexible tools that can be used effectively for analyzing the behavior of systems.

II. RESULTS AND DISCUSSON

2.1 Building performance factors

Location:	20.0383625030518,73.8033676147461
Weather Station:	709248
Outdoor Temperature:	Max: 40°C/Min: 7°C
Floor Area:	419 m²
Exterior Wall Area:	298 m²
Average Lighting Power:	13.02 W / m²
People:	37 people
Exterior Window Ratio:	1.23
Electrical Cost:	$0.08 / kWh
Fuel Cost:	$0.78 / Therm

2.2 Annual Energy Use/Cost

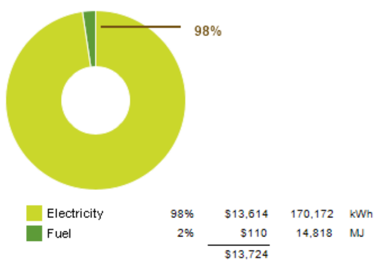

Fig-2 Annual Energy Use/Cost

2.3 Energy Use: Fuel

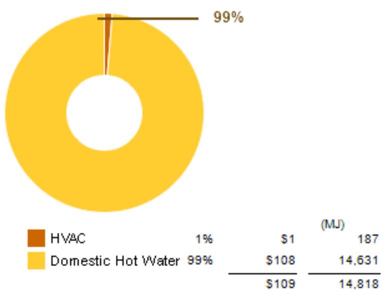

Fig-3 Energy Use: Fuel

Table-1: Energy Consumption Utility

Name of Facility	Actual Utilization in %	Actual Cost in Rs. per Kwh	Remark
Serve and Cashless Unit	29	475.75	
HVAC System	58	98.92	
Sprinkler Irrigation System	23	177.62	Assumes an overall efficiency 75% for Pump and Drive

III. CONCLUSION

Energy required for a building is needs to be optimized. In most of the Public building factors like Daylight, Thermal Comfort, Building's orientation as per solar shading point of view are not considered; which ultimately affects the energy use pattern and cost for that building. Hence for better utilization of natural energy sources and optimization of energy use, Analysis is required to be done for existing Energy

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