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Framework for Creating a Building Information Modelling Environment in Architectural, Engineering and Construction Firms and Projects

Oluseye Olugboyega
Obafemi Awolowo University, Ile- Ife, Nigeria
Oolugboyega@yahoo.com, oolugboyega@oauife.edu.ng,

SUMMARY

The processes of BIM call for a collaborative environment with tools with which a project team can develop, share, and exchange project data digitally throughout the project lifecycle. An environment for BIM processes is a technology hosting services that provide the atmosphere for interoperability, information model development, communication, integration and collaboration as required in BIM. This study aims to develop a framework for creating a BIM environment for projects and in an organization. A theoretical framework was developed to guide the review of literature for the process of creating a BIM environment. To frame the research, five concepts relating to both soft and hard BIM infrastructure were outlined to describe the process of creating a BIM environment in an organization and for a project. The findings in the theoretical framework were summarized and used to develop a conceptual framework for creating a BIM environment. It was found that a BIM environment can only be created when BIM has been adopted or implemented and that the framework to create a BIM environment include: acquiring BIM authoring software technologies and BIM hardware, developing BIM contents library, adapting or developing a BIM standard, and setting up a BIM platform. The study concluded that the types of BIM authoring software technologies to be acquired should be based on the goals of a project or firm and the types of BIM hardware to be procured; and also that BIM platform should be set up based on the types of BIM authoring software technologies and BIM hardware selected for the project or for the organization's work processes.

KEYWORDS: BIM Environment, BIM authoring software technologies, BIM platform

1. INTRODUCTION

An environment within an organization or for a project that incorporates software tools and platforms to provide building information modelling (BIM) services is referred to as a BIM environment (Eastman et al., 2011). It includes the creation, storage and management of building information models and the standards for enforcing the protocols, processes and practices of BIM. Building and Construction Authority of Singapore (2013) describes BIM environment as the hardware, software, protocol, and coordination workspace required within an organization or on a project in order to deliver a BIM-based project.

The processes of BIM call for a collaborative environment with tools with which a project team can develop, share, and exchange project data digitally throughout the project lifecycle. An environment for BIM processes is a technology hosting services that provide the atmosphere for

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interoperability, information model development, communication, integration and collaboration as required in BIM. Knowing how to put together a BIM environment will prepare firms and professionals in the architectural, engineering and construction (AEC) industries for a trouble-free BIM adoption. Information on creating a BIM environment will enable AEC firms and professionals to effortlessly plan and develop BIM in their organizations and for projects. Even so, many AEC firms and professionals are using BIM or are involve in BIM-based projects without realising it. This is mostly due to the lack of understanding of BIM terminologies, processes and protocols; and it is hampering the widespread adoption of BIM.

A large number of studies have been done on the framework for BIM implementation in an organization and for projects (Jung and Jo, 2011; Mom et al., 2011; CICRP, 2012; Ahmad, 2013); nevertheless, the framework for creating a BIM environment in an organization and for projects has not been well investigated. For this reason, this study aims to develop a framework for creating a BIM environment for projects and in an organization with a view to supporting the identification of BIM-specific requirements and preparations of a BIM implementation plan by a project team or organization that has adopted BIM.

2. THEORETICAL FRAMEWORK FOR CREATING A BIM ENVIRONMENT

A theoretical framework was developed to guide the review of literature for the process of creating a BIM environment. To frame the research, five concepts relating to both soft and hard BIM infrastructure were outlined to describe the process of creating a BIM environment in an organization and for a project. The structure of the theoretical framework include: BIM authoring software technologies, BIM hardware, BIM contents library, BIM standards, and BIM platform.

2.1 BIM AUTHORING SOFTWARE TECHNOLOGIES

BIM authoring software technologies are software technologies that support BIM. They are task-specific software application for creating and manipulating 2D or 3D building information models required for a defined purpose (Eastman et al., 2011). They are intelligent 2D or 3D design software technologies capable of simulating the construction and operation of a facility and useful for generating informative building information models during conceptual design and construction of buildings. According to the Association of General Contractors of America (2015), a BIM software technology should be able to develop a parametric and object-oriented building information models and should enable the adding of time, quantities, cost and other useful information to a 3D model of a facility. BIM software technologies are different from ordinary Computer Aided Design software technologies for the reason that they have data attributes to make a building information model intelligent and also have a built-in library of categorized objects and attributes that are needed to produce a digital prototype of a building. Although, BIM objects/contents libraries can be used to supplement the built-in library of BIM authoring software technologies (ARCADIS, 2010; Smith, 2014; Mordue, 2013; RIBA, 2012; East, 2014).

2.2 BIM HARDWARE

Arayici (2011) and McGraw-Hill (2007) describe BIM hardware as the computer hardware and networking hardware required for processing, documentation, and smooth running of BIM authoring software technologies and other BIM processes. McGraw-Hill (2007) maintained that

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BIM hardware requirements depends on the selected BIM authoring software technologies, project conditions or need, and size of the organization. Dell Precision (2010) argued that the best sources of information for BIM hardware information are the BIM authoring software technologies vendors. The University of West Florida (2005) stated that networking hardware is required in the creation of a BIM environment so as to allow sharing of resources, and that this can be done either by a Local Area Network (LAN) or by a Wide Area Network (WAN). Dell Precision (2010) considered a gigabit-speed LAN, Pentium ® 4-3.4GHz processors, a hard disk of up to 320 GB and a RAM of to 20GB, motherboards with a Level 2 Cache of 2MB, 64-bit operating system and at least 1280 X 1024 pixels monitor capable of 24-bit or 32-bit Truecolour capable of providing for 512MB of its own as the minimum requirements for BIM hardware selection.

2.3 BIM OBJECTS/CONTENTS LIBRARY

Eastman et al. (2011) defined BIM objects as digital representation of doors, windows, equipment, plant, furniture, electrical fixtures, mechanical fixtures, walls or floors, and site. When a database or an online catalogue is created to documents building objects models, a BIM contents or objects library is formed. A BIM object library is a web portals where digital objects or models can be searched and downloaded. The objects in a BIM objects library are classified as generic objects and proprietary objects. Generic objects are objects that are used at the conceptual stage of building design and bear no manufacturer specific data. While, proprietary objects are detailed or BIM-ready objects provided by building product manufacturers or fabricators. In BIM, proprietary objects are used to replace generic objects as the building design progresses or near the costing or construction stage (Mordue, 2012; Afsari and Eastman, 2014). The websites of building product manufacturers and fabricators are the sources for BIM objects library (Autodesk, 2011). However, Hamil (2013) noted that these websites have file formats and BIM authoring software technologies that they support. For example, Arcat supported DGN file format and AECOSim, Bentley Architecture, AutoCAD, and Autodesk Revit as BIM authoring software technologies; the UK NBS BIM library supported IFC file format and REVIT, Vectorworks, ArchiCAD and AECOSim as BIM authoring software technologies. According to Afsari and Eastman (2014), the organization of BIM object library can be carried out by categorizing those objects using criteria such as object classes in the target population, customized categorization system, and references to the classification system.

2.4 BIM STANDARDS

BIM processes require guidelines, these guidelines are referred to as BIM standards. BIM standards serve as guides for the process of creating building information model and meeting BIM objectives. They specify the content of building information model, BIM deliverables, BIM rules and protocols, BIM requirements, BIM information management such as file format, folder structures, file naming convention, and colour scheme (Building and Construction Authority of Singapore, 2013).

2.5 BIM PLATFORM

A system or platform is required for combining building information models produced in different BIM authoring software technology packages into one file so that they can be viewed as one composite model. BIM platform can be formed by assembling tools such as integration,

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collaboration, communication, interoperability, and clash detection tool. Integration tools are required for putting various discipline-specific information models together. These are object-based file format that are relevant to the AEC industries (Association of School Business Officials, 2013; Adobe Systems Incorporated, 2008). Collaboration is an essential requirement in BIM. The project team members are required to work together and share files containing the discipline-specific information models developed by each members of the team. The exchange and sharing of files are carried with collaboration tools such as disk space, file servers, web-based file storage, dropbox or DSpace. Communication tools provide medium of interaction among the project team members or between the office and the job site. Voice or video conferencing tools could be selected as communication tools; however, DSL connection speeds of at least 256Kbps is required for communication in a BIM environment (University of California Berkeley, 2009). Interoperability tools are required for interchanging document formats or converting document format. They allow the importation, manipulation, conversion, and creation of a variety of different types of 2D or 3D building information models regardless of format. Interoperability is of paramount importance in BIM because it allows information models to be read in many more applications (Association General Contractors of America, 2015). Clash detection tools allow the tracking of changes or detection of clashes in building information models or reviewing of building information models in real time for comments, viewpoints, measurements, interference detection, 4D simulation, photorealistic rendering, and PDF-like publishing (Association of School Business Officials, 2013; Association General Contractors of America, 2015).

3. CONCEPTUAL FRAMEWORK FOR CREATING A BIM ENVIRONMENT

The steps involved in creating a BIM environment have been identified from literature. These steps are explained in Table 1. The findings in the theoretical framework were summarized and used to develop a conceptual framework for creating a BIM environment as shown in Figure 1. The validation for the framework was done by cross-referencing the conceptual framework with the theoretical framework and justifying the steps by the findings of previous similar studies.

Table 1: Framework for Creating a BIM Environment

BIM ENVIRONMENT			EXAMPLES	SOURCES
1.	**BIM AUTHORING SOFTWARE TECHNOLOGIES**			ARCADIS (2010), Enigneering News Record (2014), Computer Integrated Construction Research Program (2011), RIBA (2012), Smith (2014), Mordue (2013), Construction Products Association (2013), East (2014).
A.	**Architectural model**		Architectural Desktop, Bentley Architecture, V8, Vectorworks, Revit Architecture.	
B.	**Structural model**		X Steel, SDS/2, QuickPen, CADPIPE, SOFTEK, Revit Structure, CSC, Tekla Structure, ETABS, RISA, SoFiSTiK, Bentley Structure, Orion	
C.	**Mechanical, Electrical and Plumbing (MEP) model**		Revit MEP, Bentley Mechanical, Hevacomp Mechanical designer, 3D pipedesigner, AutoCAD MEP, CADPIPE electrical, HVAC System design, CAD-MECH, CAMduct, Multi-pipe, Bentley Electrical, Autopipe	
D.	**Schedule and time model**		MS Project, Primavera, Bentley Schedule Simulator, Jet-Stream timeliner, E-builder, Newforma	
E.	**Resources and cost model**		MS Project, IES, Autodesk QTO, Cost X, Ideate BIM link, Sefaira, Planswift, Timberline, Vico Cost Planner, Innovaya Visual Estimating	
F.	**Construction and site utilization model**		Unity 3D game engine, AutoCAD Civil 3D, Power Civil, InRoads Site, Hevacomp Simulator, Bentley Simulator	
G.	**Operation and maintenance model**		CMMS, IBM Maximo, Bentley facilities, Autodesk FMdesktop, One Tool, Geospatial and facilities	
H.	**Sustainability model**		IESVE, Autodesk Green Building Studio	
2.	**BIM HARDWARE**			Microsoft (2016), UWF (2005), Arayici (2011), Dell Precision (2010), McGraw Hill (2007)
	A.	**Computer hardware**		
	i. Storage device		Hard disk drives, CD-ROM drives, tape drives, diskdrive, floppy drive, Zip drive, CD-RW drive, DVD-ROM drive, DVD-RW drive	
	ii. Output device		Printers, monitor, speakers	
	iii.		Mouse, window, keyboard, microphone, scanner, digital camera, PC camera	

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	Input device		
	iv. Motherboard/ processing device	Controllers, ports, system memory, cache memory, processor, windows operating system, port connector	
B.	Networking hardware	Network adapter, satellites, internet, Ethernet cables, fiber optics, modems, routers	
3.	BIM CONTENTS LIBRARY	Autodesk seek, Arcat, Smart BIM, BIM components, NBS BIM library	Hamil (2013), Afsari and Eastman (2014), Mordue (2012)
4.	BIM STANDARDS	USF CAD guidelines and standards, USF layer guidelines, NBS BIM object standard v.1.1, ISO 16739, PAS 1192-2 and 3, US National CAD Standard, US National BIM Standard v.1.0, MIT CAD and BIM guidelines v.3.2, CP 83, Singapore Essential BIM Guide, BS 1192:2007, USF BIM guidelines and standards for Architects, Engineers and Contractors, BS 8541-1 and 2, CIC BIM Protocol 2013, BIM e-Submission guidelines, UK CAD Standard Basic layer code 2001 and 2002, CIM Steel Integration Standards (CIS/2), National Guidelines for Digital Modelling	MIT (2012), RIBA (2014), BCAS (2013), ARCADIS (2014), National BIM Standard (2007), University of South Florida (2015).
5.	BIM PLATFORM		ASBO (2013), ASI (2008), UCB (2009), OMT (2016), Microsoft (2016), Lucido (2015), AutoDWG (2016), IFC Wiki (2016), Solidworks (2016), VicoSoftware (2015)
A.	Integration tools	PDF, IFC, DWG, DWF, RVT, DGN, SKP, CoBie, gbXML, DXF, BCF, CIS2, AEX, GML, ODF, 3DS, IGS, SVG, JPEG, PNG	
B.	Collaboration tools	Disk space, storage drives, file servers, Dropbox, DSpace, Box, Pogoplug, GoFlexNet	
C.	Interoperability tools	AVS document Converter, Cobynsoft's review, PDF converter, OCR kit 2, OmniPage professional 17, Readiris 12, ExactScan pro 2, Typereader, Fire Reader, MicroSoft Office Compatibility Pack, Office 2003 Service Pack 2 (SP2), MicroSoft Office System Open XML format converters Administrative template (ADM) v.2.0, Autodesk DWG Trueview, GIS Convert, DWG Converter, ZAmzar, PDF-DWg Converter, DWg-DXF Converter, DGN-DWG Converter, DWG-DWf Converter, IFC file analyser, Open Source BIM Server, BIM Surfer, IFC C2SKP, FZK Viewer, IFC QuickBrowser, OpenIFC tools, Solidworks 3D CAD Solutions	
D.	Coordination/ clash detection tool	3D Model Converter, SimpleBIM, BIM Vision, Bentley Navigator, Autodesk naviswork, Solibri Model Checker, GraphiSoft, VICO, Field 360 BIM, Tekla BIM Sight, Nemestchek Viewer, Constructivity Model Viewer, Areddo.	
E.	Communication tools	Avatar (3D ICC Terf), whiteboard, Skype, Email, WebEX, MicroSoft Live Meeting, Adobe Acrobat Connect, GoTo Meeting, TeamSpot, MediaWiki, PBWiki, Adobe Buzzard, GoogleDocs, 37 Signals writeboard, Cloud Sharing	

BIM implementation is a strategic planning issue; but the creation of BIM environment is a tactical and practical affair. The creation of a BIM environment is a readiness criterion for BIM implementation and it is essential to the success of BIM implementation (Ahmed, 2013). A BIM environment can only be created when BIM has been adopted or implemented. Autodesk (2011) asserted that the implementation of BIM in an organization requires a corporate will and the determination of the technology infrastructure requirements such as hardware, software platforms, software licences, network, and modelling content, because BIM implementation will alter the staffing needs, operational processes and technology requirements. For the implementation of BIM, a BIM implementation programme is required; and among the plans usually contained in a BIM implementation programme is the creation of a BIM environment. The decision to implement BIM has to do with the objectives of an organization or a project.

These objectives will also determine the choice of tools for the BIM environment. These tools serve as the soft and hard infrastructures for the BIM processes. The choice of tools for BIM environment depends on the level of BIM implementation. Over time, as an organization advances in its level of BIM implementation, the tools in the BIM environment will be reviewed and changes will be made as appropriate. BIM Planning Guide for Facility Managers (2012) and East et al. (2011) observed that organizations and governments have to develop guidelines for BIM on projects to identify goals for BIM use, scope and use of BIM across phases of project,

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scope of standards or formats related to BIM and the exchange of BIM, roles of participants in the BIM process, and develop internal knowledge about BIM software technologies.

Figure 1 summarizes the steps required in the creation of a BIM environment. These steps were further detailed and the tools required in each step were identified in Table 1. The framework as illustrated in Figure 1 and Table 1 helps out with the determination of the BIM-specific requirements. The framework also outlines 5-steps which consist of 18 categories. Each of those categories describes the tools required in order to create a BIM environment. The decisions to implement BIM can only be supported by taking steps to create a BIM environment. As identified in Table 1, the steps involve acquiring BIM authoring software technologies and BIM hardware, developing BIM contents library, adapting or developing a BIM standard, and setting up a BIM platform. The availability of the tools identified in Table 1 in an environment will enable a BIM competent staff members or a BIM competent project team members to undertake BIM processes. The types of BIM authoring software technology to be acquired depends on the types of discipline-specific models that the organization or the project team creating a BIM environment desires to develop.
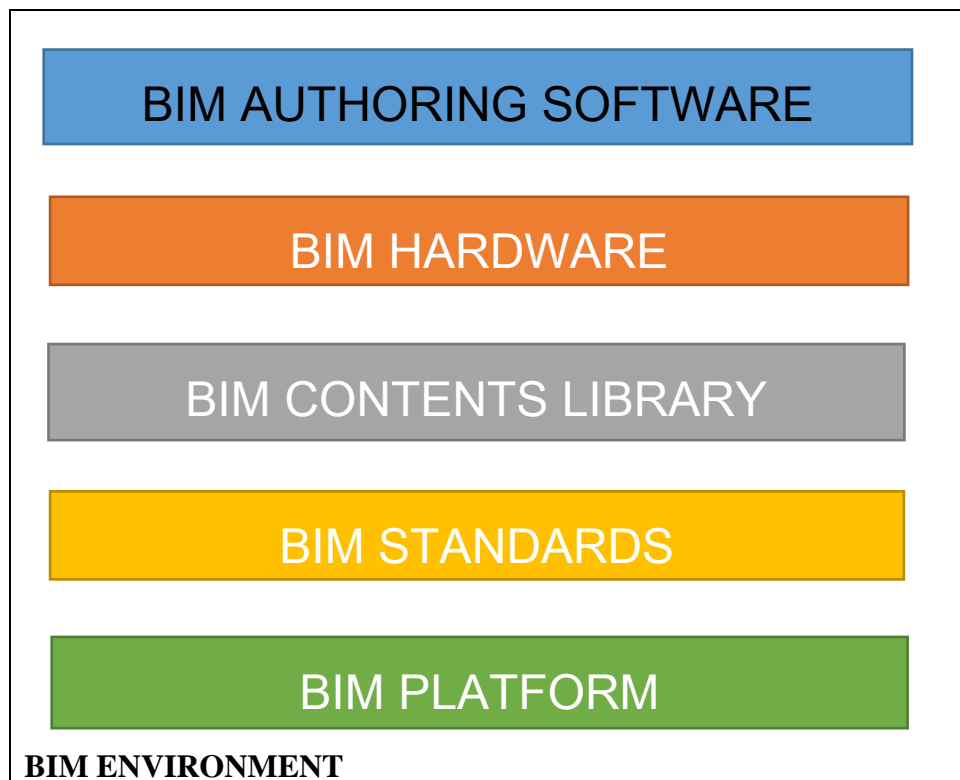

Figure 1: Conceptual framework for creating BIM environment

As shown in Table 1, the BIM authoring software technologies were categorized based on various discipline-specific information models viz. software technologies for authoring architectural model, structural model, MEP model, Schedule and time model, resources and cost model, construction and site utilization model, operation and maintenance model, and sustainability model. As observed by Eastman et al. (2011), BIM implementation requires far more than acquiring software and upgrading hardware. It requires the understanding of BIM software technologies and related processes. The acquisition of BIM authoring software technologies should be followed by the acquisition of BIM hardware or rather done together.

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McGraw-Hill (2007) noted that the type of BIM hardware to be acquired depends on the type of BIM authoring software technology required and the objectives of the project or the firm. CICRP (2012) noted that the software platforms and versions that are interoperable should be selected and that the understanding of the hardware specifications is also a valuable information to be considered as it is important to ensure that the downstream hardware is not less powerful than the hardware used to create the information.

Some of the countries, universities and various organizations that had adopted BIM, have developed their own BIM standards. However, developing a BIM standard is not important as a suitable BIM standard can be adopted and adapted from any of the existing BIM standards.

The choice of BIM authoring software technology and the BIM implementation programme will determine the selection of BIM platform. BIM platform is the stage where the whole concept of BIM can be carried out. The interoperability and integration of the discipline-specific information models, the collaboration and communication among the participating firms or project team members, and the coordination of the discipline-specific information models in order to detect information clashes and avoid errors and omissions. CICRP (2011) noted that an organization adopting BIM should identify collaboration tools and procedures and considers the infrastructure required for BIM processes.

4. CONCLUSION

The study investigated the framework for creating a BIM environment in an organization and for project. A BIM environment features software technologies, tools, and platforms to provide the environment for BIM services. The specific requirements in the creation of a BIM environment for BIM processes are BIM authoring software technologies, BIM hardware, BIM contents library, BIM standard, and BIM platform. These 5-steps to creating a BIM environment will enable AEC firms and professionals to undertake BIM processes.

The types of BIM authoring software technologies acquired and the goals of a project or firm should inform the types of BIM hardware to be procured. To set guidelines for BIM processes, an existing BIM standards could be modified to suit the peculiarities and goals of a project or firm; otherwise, a Custom-made BIM standard may be developed altogether. BIM platform is to be set up based on the types of BIM authoring software technologies and BIM hardware selected for the project or for the organization's work processes.

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REFERENCES

Adobe Systems Incorporated (2008). Document management-Portable Document Format-Part 1: PDF 1.7, 1st Edition 2008-7-1.

Afsari K. and Eastman C. (2014). Categorization of building product models in BIM content library portals. Blucher design proceedings, 1:8, SIGRADI 2014.

ARCADIS (2010). BIM Recommendations. [Online] Available: www.arcadis-us-pmcm.com [2015. December 19].

Association of Social Business Officials (2013). BIM resources Guide: A guide for implementing BIM in state of Maryland and Washington DC public school construction projects. 1st draft.

Associated General Contractors of America (2015). Contractor's guide to BIM. 1st edition.

Autodesk (2011). Autodesk Seek. Autodesk. [Online] Available: www.Seek.autodesk.com [2015. December 19].

AutoDWG (2016). DWF-DWG Converter. [Online] Available: www.autodwg.com/dwf-dwg conveter. [2015. December 19].

Building and Construction Authority of Singapore (2013). BIM essential guide for BIM adoption in an organization. Building and construction authority. [Online] Available: www.bimsg.wordpress.com [2015. December 19].

Computer Integrated Construction Research Program [CICRP] (2012). BIM planning guide for facility owners. Version 1.0, University Park, P.A, the Pennsylvania State University.

DellPrecision (2010). Future-Proofing BIM. [Online] Available: www.dell.com [2015. December 19].

Eastman C., Teicholz P., Sacks R., and Liston K. (2011). BIM Handbook: A guide to Building Information Modelling for Owners, Managers, Designers, Engineers, and Contractors. 2nd Edition, John Wiley and Sons, Inc.

Engineering News Record (2014). Show Me the Money: 5D-cost estimating tools taking off. [Online] Available: www.enr-com [2015. December 19].

Hamil S. (2013). The benefits of using a structured approach to data. [Online] Available: www.thenbs.com/topics/designspecificationandarticles/ [2015. December 19].

IFCWiKi (2016). Freeware IFCtools for visualizing, checking and translating IFC files. [Online] Available: www.ifcwiki.org/index.php/freeware [2015. December 19].

Jung, Y. & Joo, M. (2011). BIM framework for practical implementation. Automation in construction, 20(2): 126-133.

Lucido S. (2015). Using Autodesk DWG True view to convert dwg files version. Autodesk Knowledge network. [Online] Available: www.knowledge.autodesk.com/support/dwg-trueview/learn-explore [2015. December 19].

Massachusetts Institute of Technology (2012). MIT CAD & BIM Guidelines v.3.2. MIT Department of facilities. Facility Information systems. [Online] Available: www.fis.mit.edu [2015. December 19].

Microsoft (2016). Computer System Hardware Classes. [Online] Available: www.msdn.microsoft.com/en-us/library/aa389273(v=vs.85).aspx [2016. May 10].

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Online Media Technologies (2016). AVS Document Converter 3.0. [Online] Available: www.avs4you.com/avs-document-converter.aspx [2016. January 11].

Microsoft (2016). Windows 10 free upgrade: Popular Converting files downloads. [Online] Available: www.microsoft.com/en-us/download/converting-files.aspx [2016. June 1].

Mordue S. (2012). National BIM library generic content release 2. [Online] Available: www.thenbs.com/topics/bim/articles [2015. December 19].

Mom, M., Tsai,M.H. and Hsieh, H.H. (2011). Decision-Making and Technology- Implementing Factors For BIM Adoption. International Conference on Construction Applications of Virtual Reality.

RIBA (2014). NBS BIM Object Standard v.1.1. RIBA Enterprises Limited.

Solidworks (2016). 3D CAD. [Online] Available: www.solidworks.com/sw/products/3d-cad/cad-file conversion. [2016. June 1].

Strategic Code (2016). GIS file format Conversions. [Online] Available: www.gisconvert.com [2016. June 1].

University of West Florida (2005). Discovering computers. [Online] Available: www.uwf.edu/clemley/cgs1570w/notes/concepts-1.htm [2015. December 19].

University of California Berkeley (2009). Collaborative Tools Strategy. [Online] Available: www.gartner.com/displaydocument?ref=g_search [2015. December 19].

University of South Florida (2015). BIM Guidelines and Standards for architects, Engineers and Contractors. [Online] Available: www.usf.edu/fpc [2015. December 19].

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About the Author

Oluseye OLUGBOYEGA

Ile-Ife, Nigeria

Mr. Oluseye Olugboyega is a first class graduate of the Department of Building at Obafemi Awolowo University, Ile-ife, Nigeria. He obtained a Bachelor of Science degree in Building and Master of Science degree in Construction Management. He is currently a lecturer in the Department of Building, Obafemi Awolowo University and a member of the Nigerian Institute of Building. He can be contacted at oolugboyega@yahoo.com or oolugboyega@oauife.edu.ng