

Chapter 6

The US National Building Information Modeling Standard

Patrick C. Suermann
University of Florida, USA

Raja R.A. Issa
University of Florida, USA

ABSTRACT

The publication of the National BIM Standard (NBIMS) at the end of 2007 after two years of work by the most highly diverse team ever assembled by the National Institute of Building Sciences brought a symbolic shift in the architecture, engineering, construction, and facility ownership (AECO) community. However, what impact did it have on the industry? This chapter looks at the strengths, weaknesses, opportunities, and impact of the NBIMS into 2009 and beyond. Specifically, this chapter will delve into some of the strengths of the NBIMS, such as promulgating a standardized approach for documenting information exchanges between stakeholders, and applying the NBIMS Interactive Capability Maturity Model (I-CMM) to evaluate a project or portfolio for BIM maturity. Opportunities exist in the areas of sustainability, modularity, and fabrication, as demonstrated in several industry projects to date. Weaknesses of the NBIMS are that it is not directly applicable yet at the technical level such as the National CAD Standard (NCS). Along with the NCS, the NBIMS and their umbrella parent organization, the Facility Information Council of the National Institute of Building Sciences are gradually being absorbed into the buildingSMART™ Alliance. Lastly, the primary impact of the NBIMS will be felt in terms of current and future projects promoting interoperable information exchange for specific stakeholders. These include multiple applications of interoperable-IFC-based approaches.

1 INTRODUCTION

In 2004, the National Institute of Standards and Technology (NIST) published a report stating that

poor interoperability and data management costs the construction industry approximately \$15.8 billion a year, or approximately 3-4% of the total industry (Gallaher, et al. 2004). Additionally, the buildingSMART™ Alliance is calling for a \$600B reduction in construction costs through productivity

DOI: 10.4018/978-1-60566-928-1.ch006

improvements by 2020, and they feel it is conservative. Since the NIST report, many have dubbed Building Information Modeling (BIM), as the answer to this problem. From the National BIM Standard (NBIMS) published December 27, 2007, a BIM (i.e. a single Building Information Model) is defined as “a digital representation of physical and functional characteristics of a facility” (Kennett 2006 and NBIMS 2007). Several reports have sought to assess the level of BIM diffusion in the industry. For instance, the Construction Management Association of America (CMAA) Survey of Owners (D’Agostino et al. 2007) reported on the state of Building Information Modeling in the American construction industry at the same time as the NBIMS publication at the end of 2007. In the joint publication of their eighth annual survey of owners, FMI, a construction-specific research, consulting, and investment banking firm partnered with the CMAA to determine the current state and future trends in the construction industry surrounding BIM. The subtitle, “The Perfect Storm – Construction Style” alludes to the current market forces that are driving technological adoption at a greater rate than in the previous seven years of the survey. Specifically, the authors state, “A fresh tool – Building Information Modeling (BIM) is enabling and supporting this change in philosophy, process, and approach, which will allow owner organizations, in turn, to weather the coming storm of construction industry challenges” (D’Agostino et al. 2007).

After NBIMS publication in December, 2007, many in the industry were disappointed that the standard did not provide a detailed “road map” for how to apply BIM to specific existing processes. However, as this chapter will discuss, the NBIMS represents a strategic departure from existing, traditional AECO business processes, and instead focuses on what information should flow from stakeholder to stakeholder in the future of the BIM-based facility industry. Instead of a technical how-to document, the NBIMS represents what could or should be accomplished, and leaves the

role of establishing best management practices (BMPs) to research entities like NIST or Universities, or industry entities like the American Institute of Architects, the Construction User’s Roundtable (CURT), the AGC BIMforum and others. The specific objectives of this chapter are to discuss the NBIMS in 2009 and beyond. This will be accomplished by discussing its existing and future strengths, weaknesses, opportunities, and impacts.

2 BACKGROUND

The NBIMS was published December 27, 2007 after approximately two years of effort starting in August of 2005 (See Fig. 1). The leader of the NBIMS Committee effort was Mr. Dana K. “Deke” Smith, FAIA of the National Institute of Building Sciences Facility Information Council (NIBS-FIC), the same entity responsible for producing the National CAD Standard (NCS) since the 1990s.

In retrospect, this association with the NCS could be considered a blessing as well as a curse. The blessing came in the form of an organization of diverse and respected professionals, proven processes, and technical knowledge. The curse came in the form of an industry that expected another NCS, *version 4.0* in NBIMS *version 1.0*. In other words, the NBIMS is much less technical than the NCS. Whereas the NCS discusses specifics like line weights and layering targeted for paper production of architectural drawings, the NBIMS is all-encompassing of the facility lifecycle and addresses how to view communication between all participants of the facility lifecycle. In all, this left the NBIMS – much like other standards or standards organizations, with strengths, weaknesses, opportunities, and possible challenges to overcome before accomplishing the greatest impact possible. This chapter will discuss specific facets of all of these.

14 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

www.igi-global.com/chapter/national-building-information-modeling-standard/39470

Related Content

Missing Value Imputation Using ANN Optimized by Genetic Algorithm

Anjana Mishra, Bighnaraj Naik and Suresh Kumar Srichandan (2018). *International Journal of Applied Industrial Engineering* (pp. 41-57).

www.irma-international.org/article/missing-value-imputation-using-ann-optimized-by-genetic-algorithm/209380

Role of AI in Revolutionizing Clinical Care

Oindrilla Ghosh, Binod Kumar and Parimal Kumar Roy (2025). *Emerging Multisector Applications of AI and IoT* (pp. 69-102).

www.irma-international.org/chapter/role-of-ai-in-revolutionizing-clinical-care/379057

An Empirical Study on Adoption of ERP on IT and Non-IT Companies in Odisha

Monalisha Patel (2018). *International Journal of Applied Industrial Engineering* (pp. 58-67).

www.irma-international.org/article/an-empirical-study-on-adoption-of-erp-on-it-and-non-it-companies-in-odisha/209381

Knowledge Management in SMEs: A Mixture of Innovation, Marketing and ICT: Analysis of Two Case Studies

Saïda Habhab-Rave (2013). *Industrial Engineering: Concepts, Methodologies, Tools, and Applications* (pp. 1350-1361).

www.irma-international.org/chapter/knowledge-management-smes/69343

Introduction

(2013). *Technology and Energy Sources Monitoring: Control, Efficiency, and Optimization* (pp. 1-8).

www.irma-international.org/chapter/introduction/72810