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Building Information Modelling and Facility Management Service Delivery: A Critique

Aguome, Njideka Mary Clara[1]; Egolum, Charles C.[2], Ogbuefi, Joseph U.[3]
[1,2.] *(Department of Estate Management, Nnamdi Azikiwe University, Awka, Nigeria)*
[3.] *(Department of Estate Management, University of Nigeria, Nsukka)*
Corresponding Author: Aguome, Njideka MaryClara

Abstract: *The consensual foundation of extant BIM literature is that there is a preponderance of successful integrations of BIM in building construction while a nexus of BIM and Facility Management (FM) is also catching up. It is however pertinent to note that many of these studies have focused on buildings with very inadequate, if any, references made to other multidimensional facilities such as seaports; and current knowledge on the applicability of BIM to FM in buildings cannot be accurately extended in seaport FM due to differences in feature, size, purpose, dynamics, and construction. The justification of focusing on the seaport industry stems from its significant position as the gateway to global trade and logistics, with significant ramifications on the development, transformation and growth of the global economy. The aim of the study was to offer new research perspectives to fill knowledge gaps in the adoption of BIM in seaport facility management through a critical review of scholarly contributions to the BIM and FM literature (and the link to seaport FM where such even exists). The paper went beyond the identification of catchment areas facility management scholars can contribute to BIM research, but also indicated the crucial essence of BIM research to facility management practitioners. It thus concluded that a BIM strategy for seaport facility management offers an important new research domain for facility management and port transportation-based scholars. The position of the paper will awaken academics and facility managers, in particular seaport facility managers, on the fresh insights of adopting a BIM strategy in the discharge of FM functions in the global seaport industry.*

Keywords: *Building Information Modelling, Facility Management, Seaport Facility Management*

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I. Introduction

Effective management of large facility projects revolves around a cycle of planning formulation and implementation, operations and maintenance, and renewal or termination phases [1]. Facility management performance in such projects is dependent on an integration of processes across the project life cycle through a documentation strategy that supports ease of reference [2]. The poor espousal of this process integration and documentation is a precursor to time wasted in information retrieval, loss of resources, and low service delivery. Such development runs contrary to the principles of lean management within the facility management discourse, and [3] agrees, with the assertion that effective communication processes remain key to sustainable competitive advantage through efficient operations, management, and maintenance of a facility.

One way of achieving this in a typical large facility, like seaport, is through the application of Building Information Modeling (BIM). Building Information Modeling (BIM) is a collective database of information and knowledge resource on the functional and physical characteristics of a facility for the purpose of effective decision making over its life cycle [4]. BIM enhances information storage, communication facilitation, waste reduction, risk management, productivity, profit maximization and service delivery. By implication, it is the coordination of activities within a facility towards the attainment of corporate goals through effective management information system. Hence, the need for its integration in seaport Facility Management (FM).

Recently, BIM has increased in significance and essence globally. The consensual foundation of the BIM literature is that it stimulates facility management performance [5], and with the recent increase in global demand for its services, Allied Market Research forecasts indicate that the BIM market will generate over 11 billion dollars by 2022. So where does the Nigerian facility management industry feature in this global largesse? Evidence from indigenous research [6] shows that despite the glorious recommendations of the application of BIM in the FM industry, the use of BIM by seaport facility managers in Nigeria is still at the embryonic stage.

Worryingly, this scenario is not just restricted to seaport facility management but suggests that facility managers in Nigeria possess an insufficient grasp of BIM application. [6] aver that there is a low level of awareness (as indicated by 71% of the population) and adoption of BIM for FM in the Nigeria with only 2 of the 31 FM companies surveyed in Lagos using BIM for their FM services. Putting it into perspective, the Nigerian

Institution of Estate Surveyors and Valuers identify Lagos as the leading FM city in Nigeria. Thus, if the leading city in the country has a 6.5% application of BIM, the result from the rest of the country will definitely provide grim reading.

Contrarily, substantial quantum of research [7][8] provides evidence of the development and application of BIM frameworks for achieving sustainable performance in facility management by scholars and facility managers in more developed economies. As a result, facility managers focus on BIM frameworks such as Information Delivery Manual, Model View Definition, Industry Foundation Classes [7]; and modeling of floor plan, elevation, section, space utility on Excel formats [9][8]. With respect to Nigeria, there is huge paucity of empirical literature in this regard, with many facility management studies [10][3] either failing to highlight the need for a management information system or mentioning them in passing.

The same applies to current facility management practices in the country, and in consequence, facility management clients and facility users in the hospitality, transportation, banking and public sectors complain of low service delivery in energy efficiency, workplace functionality, and automated space management. These complaints have both short run and long run negative economic, social and environmental externalities. The seaport becomes a crucial specimen for evaluating the role of BIM in enhancing FM service delivery given its significant position as the gateway to global trade and logistics. Almost 80% of the total global trade volume is facilitated by ocean transportation. So the seaport facility manager already has work cut out for him.

[11] advance the running up a mountain metaphorical role of the seaport facility manager with the argument that ports are surrounded by highly complex environment characterized by disorganized activities, high costs, and sub-optimization of resources; and as such a new attitude must be adopted. Well, this study advocates the adoption of a BIM attitude to the shipment, cargo handling, storage, and offloading obligations of the facility manager. It is expected that in the attainment of seaport facility management goals of provision of maintaining port facilities and equipment, enhancing navigable channel safety, development and management of seaport properties, and effective procurements, a BIM strategy for seaport facility management in Nigeria cannot be overemphasized; especially in light of the substantial socio-political and economic challenges currently facing the nation. Thus, the study reviews literature on the application of Building Information Modeling in seaport facility management in a developing economy in a bid to establish the status quo and offer necessary directions for further enquiry.

II. Review of Related Literature

2.1 Building Information Modeling

While [12] traced the evolution of the BIM concept to the 1970s, [13] argues that it became evident in scholarly works in the 1980s, especially in the fields of automated construction and Architectural technology. Then, what was clear in literature was an identification of the concept as building model, construction construct, virtual building and building construct, and this was so until [13] coined the term Building Information Model. With progress in Information and Communication Technology over time, BIM evolved from being a prototype for recording building information to a building management information system. Concurring with this view, [14] introduced the name Building Information Modelling as a means of portraying the transformation of BIM from a building information repository to a communication system for effective construction management.

With this latest nomenclature and increase in its demand, BIM evolved into a digital representation of the construction and operation of facilities [12]. Despite the increasing interest in the BIM discourse in recent times, its extensive definition lends to the tougher task of presenting an all-encompassing view. The extensive application of BIM to several fields as engineering, building construction, real estate may have contributed to this. From an engineering perspective, [14] see BIM as technology that enables scenario planning, integrated project delivery; iterative and virtual design, and value engineering. This is a slightly different view from the perspective of [15] which puts BIM as a strategy for enhanced design, estimation, and coordination across all phases of the building lifecycle.

This difference in perspective was also observed by [16] who argue that the boundaries of BIM as a concept keeps undergoing several variations that make it difficult to pinpoint a common theme. This argument presents another angle to the reasons for the lack of a comprehensive view based on an evolution of scholarly thoughts on the subject. While agreeing with this latest reason preferred by [16] as the variations may be connected to the diverse array of disciplines that adopt and adapt the applicability of the concept; it is still pertinent to argue that in the extensive review of the BIM concept, a common theme does appear which summarizes BIM as an integration of information and processes to enable collaboration of project activities.

Lending credence, [4][17] argue that BIM is a digital representation of a facility's functional and physical features. The implication is that this digital representation provides information about the functional and physical characteristics of the facility to the manager. [6] provides greater insight on key information constructs within a facility. These are geometric information, space relationships data, geographic information, properties and quantities of building components [6]. There is need to stress however, that the [4] definition

lacks comprehensiveness as it does not indicate how to utilize the so-called digital representation. Filling in the gaps, [18] posit that BIM is a "value creating process that involves the generation, management and exchange of knowledge as a reliable basis for decision making throughout the lifecycle phases of a facility". It is easily clear that this view portrays the significance of BIM as not just a repository of information but a database for decision making within an organization.

[5] view of BIM brings it closer to the FM discourse, and since the definitions of BIM conform to the theoretical or practical background of the scholar, our view will also tend towards the facility management subject. In this vein, BIM is seen as a topical and graphical information repository with a technology that enhances accessibility and exchange of information necessary for FM functions within a project life cycle. "It makes explicit, the interdependency that exists between structure, architectural layout, mechanical, electrical and hydraulic services" through technological integration [6]. Simply put, it is an information management tool that supports facility management functions through maintenance and construction data support [7]. Offering a simpler narrative, it is clear that BIM is a digital representation of the characteristics of a facility utilized in decision making for sustainable service delivery.

Decision making here infers the maintenance, sanitation planning, procurement, space management, security, inventory management, property management, workplace design, and facilities management of the facility within the scope of the facility management contract. With the application of BIM, information about these phases of the facility management function are recorded and coordinated to ensure ease of accessibility and proper scheduling of activities. It is gleaned from the foregoing that BIM is a database that integrates and coordinates the physical and operational processes of a facility for the attainment of sustainable service delivery. This is the position of the study pertaining to building information modelling.

2.2 Facility Management

Facility management, like BIM, is a relatively recent phenomenon and since it is applicable to an array of professional disciplines such as Architecture and Engineering, it has also taken a lot of meanings. The dominant theme portrays the facility management function as an integration of organizational processes towards improved performance. The integration of organizational processes interpretation of FM is most visible in the definition by [19] who sees FM as a coordination of an organization's staff, environment and the business operations of the organization. In agreement, [20] contends that FM is the "provision of support services needed to deliver safe, secure and operational environment required for the effective production of an organization's core product (in this case adequate security)".

The two definitions see FM as a facilitator of safe and efficient business processes which are consistent with the goals of establishing the business. However, it is conspicuous that both views do not pay much adherence to technological processes such as Information and Communication Technology. [21] present a solution to this with their classification of FM which apart from the inclusion of the word technology, is largely the same as the previous offerings by the two schools of thought. The use of technology by [21] allows for the integration of ICT, and if so, then this definition has addressed the ICT problem and also integrated the BIM discourse.

Thus, FM is the integration of realty, human capital, environmental, business and technological processes towards the realization of the core business of the organization. This is adopted as the conceptual framework of FM for the study. at this point, we reiterate our conceptual framework of BIM which views BIM as a database for the integration and coordination of the physical and operational processes of a facility towards sustainable service delivery. It becomes clear therefore that such database is crucial given the facility management role of "integrating people, place, processes and technology" [21].

2.3 Seaport Facility Management

Globally, import and export statistics provide a very crucial index for appraising a nation's economic development and growth. [11] posits that over 70% of the import and export statistics which make up the total global trade volume is facilitated by ocean transportation through seaports. Seaports deliver an avenue for the delivery of cargo handling and shipment, warehouse storage, offloading services, safe and navigable channels, quarry management, port facilities and equipment maintenance, safety assurance, quality assurance to name a few. These services are crucial to the growth and development of not just a nation's economy but the global economy.

Putting it into perspective, seaports provide essential platform for these other elements to deliver their full potential, and any success here has significant influences on economic productivity and competitiveness. This complex role played by seaports has also affected the propounding of a stable definition for seaport. Lending credence, [22] argue that the structure and organization of seaports have been subjected to radical transformations due to similar changes in the international environment. To accommodate these transformations, they initially refer to the seaport as a geographical place for the exchange of commodities between sea and land

[22]. While this view can be accorded the accolades of offering a simple narrative to a complex concept, it is not all that inclusive from a technical point of view. As a result, issues such as storage, anchoring and safety are conspicuous in their absence.

This contention is shared by [23] who asserts that the modern port is one which can provide safe, cost effective and efficient pilotage, towing and cargo handling services to exporters and importers towards economic development. This view highlights the storage, anchoring safety capabilities of seaports. So from a place for exchange of goods, the seaport has evolved into a storage facility for the anchoring of ships and preservation of goods. This reference has been associated with the modern seaport facility as can be found in the revised view of [22] that the seaport is "a complex system composed of a set of material and immaterial elements, destined for the service of ships and goods".

A breakdown of this definition identifies service of ships and goods as the effective handling of cargo and vessels towards the actualization of the economic interest. This service is made possible by tangible and intangible elements that constitute the infrastructure, superstructure, equipment and tools for the docking of ships, loading and offloading of goods, and storage of goods within a seaport [22]. When the geographical perspective is brought to the fore of this latest assertion, the seaport can then be defined as a supply chain management and transportation hub for effective global integration. This definition exposes the seaport for what it truly is, a network system.

In line with this definition, it could be deduced that seaport is a crucially decisive system for an efficient trade structure with local, national, regional and global ramifications, hence it has a substantial bearing on a nation's economy and its development. This implies that poor management of the seaport facility may culminate in critical externalities for the global economy. Seaport operators in most developed countries such as United States and Canada, having foreseen these events, are already repositioning their container terminals through joint ventures, port terminals concessions, or to meet an increase in vessel size to compete globally rather than regionally [24]. The goal is aligned towards the attainment of quality in port service delivery, differentiation strategy implementation and specialized value-added transportation solutions.

This development has brought the seaports in these countries closer to our seaport analogy of a value-added activity hub for supply chain management and transportation efficiency, through an integration of supply chain activities and the seamless transportation systems using state-of-the-art technology. [11] observe that such a process amplifies service responsiveness and customer satisfaction in the port industry. Therefore, such an essential network system should possess a flexible, mechanized and automated operations management system if it would live up to its billing as an instigator of global economic development [23]. It is no small wonder that despite these attributions, research is yet to examine the application of BIM in seaport facility management in a developing economy such as Nigeria.

Nigeria is a contiguous Atlantic Ocean country and strategically located in the heart of Africa. This geopolitical position makes Nigeria a strategic port for dissemination of goods to other parts of Africa. Yet, this strategic position of the country is yet to be fully utilized going by the volume of foreign trade in recent years through Nigerian seaports to and from other African countries. The growing importance of seaport facility management should be considered *pari passu* with the global over reliance on ocean transportation which has accorded seaports the crucial responsibility of determining and enhancing the survival of nations; as no nation can survive without imports and exports. Facility management provides a standard for curbing seaport inefficiencies and promoting overall efficiency and flexibility in the exchange and management of cargo.

Put simply, seaport facility management is the integration of port facilities, real estate, human capital, business and technological processes for efficient management of the transportation and supply chain network towards the economic advancement of stakeholders. [11] posit that effective port organization requires flexibility in communication between port operations, human resources, marketing, information technology towards enhancing the relationship between the port and its environment. In all ramifications, it is evident that the application of BIM in seaport facility management is worthy of scholarly reflection if practitioners are to be continuously apprised of evolving best practices.

2.4 Application of BIM in Seaport Facility Management

BIM is a collective knowledge database that serves as a reliable basis for facility management decision making over a facility's life-cycle [17]. Studies have relied on this premise to investigate the application of BIM in facility management with a variety of outcomes. Despite the testimonials of a BIM strategy for facility management, certain antagonists of BIM strategy for facility management exist. [25] argue that the benefits of a BIM strategy are still not very clear. Sharing this view, [12] have argued that whatever benefits associated with the application of BIM in building processes have been felt more in the design and construction phase rather than supports the business proposition of the client [25].

It is an undisputed fact that Computer Aided BIM systems cut across the life cycle stages of the facility especially the aforementioned earlier stages of design and development, the United Kingdom Government

Strategy in [25] contends that the benefits accruable from the application is most felt in the operational stages. Where this is true, then it is practicable to the apply the strategy in the management of seaport facility, and [25] concurs that the benefit of such strategy is felt in the attainment of greater efficiency of facility management functions. Perhaps the argument for the relevance of BIM to the operational phase is reinforced by the stance of [26] which stresses that the operational phase of a building is the main contributor to the building lifecycle cost. This statistic is confirmed by [27] with the evidence that operational costs trump the initial investment costs by between 5 to 7 times, and 3 times the cost of construction [25].

Another propitious proposition that supports the application of BIM in the management of seaport facilities is the argument that data captured during the design and development stages would make facility management functions more efficient. For instance, relying on the reference of FM by [28] as a holistic act which covers everything from real estate and financial management to maintenance and cleaning, then the cost saving and information accessibility attributes of BIM make it a reliable system for efficient FM [26]. Indeed, this is a position shared by [8] who argue that public and private organizations globally have recommended and in some cases mandated the use of BIM as a strategy for addressing declining productivity. Interesting. No evidence exists to confirm that Nigeria is one of the countries mandating the BIM strategy for facility management, instead evidence exists otherwise.

While [6] confirm the absence of such directive in Nigeria, [8] presents the alternative with the submission that the United Kingdom Government has mandated the application of 3D and above BIM models on all public building projects. Of what benefit is such mandate on a BIM strategy for seaport facility management? The paper examines scholarly contributions to this effect.

Today's facility manager is in constant encounter with data based rudiments as inventory lists, procurement documents, contract papers, space dimensions, maintenance schedules, sanitation planning, workplace facilities life cycle to name a few. Timely, the manager makes reference to these data which are crucial to the smooth running of business within the facility. However, when the storage and retrieval of these data is not digital or smart, the propensity for loss, inaccuracy or delay rises. [29] opines that such scenario is critical to the organization as it leads to the loss of millions of dollars, and loss of thousands of man-hours through incessant delays. [27] presented a more detailed perspective of the anomaly of manual database management as is practiced by most facility managers in Nigeria with the statistic that of "$15.8 billion loss caused by interoperability inefficiencies, $10.6 billion are attributed to… the operations and maintenance phase of a building [8].

To arrest this anomaly, [30] aver that the main driver for the application of BIM in FM is efficient management of data. Database management in this regard refers to the accurate storage of data and the relative ease of retrieval for reference purposes. This outlines the significance of BIM in the facility manager's daily encounter with relevant data as stated earlier. [12] agrees, with the submission that BIM enables the digital capturing of space, physical and functional related data in such a manner that efficiency is achieved through low man-hours dedicated to FM system data re-creation. This is in consistence with BIM in FM studies [8][12][31] which promulgate the theory that the application of BIM as a data repository for FM operations using 3D, 4D and 5D systems guarantees data quality, reliability and accessibility, with significant cost saving potentials.

This theory is consistent with the Systems Theory developed in 1940 by Ludwig von Bertalanffy and which states that an organization, in this case a facility, is an integration of several environmental components of structure, people, functions and technology within a system. This idea suggests an agglomeration of different components within a facility in a strategic manner as to ensure smooth running of operations. This idea is consistent with the Chaos Theory which postulates that within the randomness of complex systems, such as seaports, performance relies heavily on programmed patterns, constant feedback loops and self-organization. The theory suggests the application of controlled environments to stem the butterfly effect which summarize activities within a facility where an event in one end may have significant externalities on another end. This is the essence of BIM.

What is the implication of these theories to the application of BIM in the Nigerian FM industry? [32] stress the potential essential role of BIM in enhancing knowledge transfer, streamlined operational mechanisms, and promoting transparency and standardization across the industry. Mark the key word there – potential. So, from a Nigerian and African perspective [6], how true is this proponent position on the application of BIM in FM as accessible and reliable data repository? The study suggests the need for further scholarly thought on this query. [33] emphasizes this call with the extrapolation that at present, there is a paucity of 3D data systems in the Nigerian construction industry with "virtually 0% utilization of 4D and 5D systems".

In any query of the need for a disbandment of 2D systems in favour of higher dimension systems, research offers a riposte. [34][28][8] posit that the application of 3D, 4D and 5D usually results in sustainable cognitive problem solving using accurate geometrical data. [28] add that with such BIM systems, the facility manager is able to simulate and benchmark performance outlook, and by this decision making is automated, smart and reliable [18]. This process works with the utilization of intelligent and smart algorithms in

troubleshooting broken equipment and scheduling necessary maintenance reactions to avert operational hitches in the client's business [35][18].

For seaports, as gleaned from the foregoing, it is argued that BIM possesses the potential of stemming loss of data and man-hours across the design, construction and operation phases of the facility life cycle, through a digitized system that enables storage, referencing and effective communication processes. While we believe that the benefits of this strategy to the seaport facility manager and client is already outlined in preceding paragraphs of this paper, more evidence of the benefits suffice. In carrying out the troubleshooting functions of the seaport facility manager, [36] assert that in place of unreliable manual investigations, BIM enables the manager, right in the comfort of his office, to instead refer to the seaport facility information model to expose the intricacies of the suspect location. Additional information within the model such as manufacturer, date of manufacture, design characteristics of the suspect component serve as guide for necessary decision making.

In addition to database management, literature [8][34] have examined other applications of BIM in FM functions as emergency and space management, energy monitoring, and human capital development. The energy issue is a fast rising global narrative in the wake of global warming and climate change. Therefore, the seaport facility manager bucks the trend with the application of BIM software such as Automated Computer Aided Design (AutoCAD) and BuildingSMART to control and manage energy distribution within the facility. [37] supports the narrative with the assertion that BIM has been successfully integrated in energy control through the management, replacement and scheduling of energy, utility and safety systems with sound functionality and cost saving results.

In the management of space, seaport facility managers can utilize BIM technology such as ArchiCAD Radar System, FreeCAD and Building Description System in capturing the dimensions of the seaport facility through laser scanning. [8][7] explain that laser scanning technologies enhance the capturing of existing building data for decision making that improves the delivery of facility management performance. Extant research has gone ahead to highlight other BIM in FM implementation outcomes as follows:

i. Technical support for workplace design and management [37]
ii. Guarantees positive Returns on Investment [6]
iii. Enhances interoperability [38].
iv. More efficient production management [39].
v. Guarantees sustainable FM performance [40]

Obviously, as with many other activities under the sun, certain challenges also encumber the application of BIM in Facility Management. These challenges are reviewed so as to present lessons available to the seaport facility manager in the application of BIM technologies. In a developing country like Nigeria, several constructions do not have available information models of any kind [38]. As a result, modelling a facility in Nigeria may require the use of manual and error prone assumptions of hidden data and even more visible data such as construction details, codes and standards may not be accurately deciphered as against the utilization of automated approaches such as 3D or more laser scanners, Facility Condition Index (FCI) and photogrammetry techniques.

Stressing the narrative, [41] investigated the application of BIM in FM processes using a case study approach. In the review of related literature, the study identified other challenges such as integration difficulties, interoperability issues, and ambiguous information model creation responsibilities. A cursory glance at the Nigerian situation [6][38][42] confirm the prevalence of these issues in Nigeria. Reality and practical case studies qualitatively analyzed in extant literature show diverse traits of BIM in FM integration challenges such as adaptation of design and construction stage BIM to suit present FM needs [41], BIM introduction to existing facility [43], and competence and cost issues in BIM integration [39].

[41] argues that most organizational case studies adhere to the following processes in overcoming the challenges encumbering BIM integration in FM:

i. Analysis of FM practices and identification of limitation therein.
ii. Using document analysis, inefficient management of data and poor data quality were the major limitations that warranted the adoption of BIM [41].

In addition to these is also ineffective communication processes. Pilot study is conducted to obtain facility data such as the project model and handover documents from the development team. [6] and [41] argue that mostly such data is not readily suited for BIM integration. Lending credence, [44] posit that successful BIM in FM utilization requires that the difference between the BIM and existing facility condition should be reduced. [41] avers that this is a precursor to the assessment of the handover documents and model to identify modeling gaps.

The third stage is the integration of BIM technologies such as google drive and other cloud technologies, Autodesk Navisworks, Microsoft Excel, Autodesk Revit, BIMlink, iConstruct, and Autodesk 360 [41]. [41] is also of the view that this stage has its distinct challenges usually associated with facility owner's

reception to the innovation, citing issues as stressing the need for employee training, procurement of relevant hardware and software, and recruitment of dedicated BIM experts.

In agreement with, and subsequent adoption of this approach identified by [41], it is pertinent to note that evidence of the BIM integration in FM outcomes is still not adequate to guide professionals of facility management in the seaport industry in Nigeria. This fact is already stressed by earlier reviewed literature, but it multiplies in significance with the anomalism of research paucity on BIM integration in seaport FM. There is indeed need for scholarly thought and action towards this concern. The study follows this premise and argues that since BIM allows facility information to be collected and modeled in a way that is universally recognized and prevents the information from getting lost during project handover, from design to construction to operations teams [28], a research bank on its application to FM for utilization by FM professionals, especially in the seaport industry in Nigeria, is indeed a no brainer.

2.5 Gap in Literature

From the review, most studies on BIM in FM have come from the more developed western countries that have recorded significant adoption of BIM and the few indigenous studies that have focused on BIM in FM have not considered its applicability in a facility as significant as seaport. Take for instance the assertion by [32] that the potential essential role of BIM in enhancing knowledge transfer, streamlined operational mechanisms, and promoting transparency and standardization across the industry. Mark the key word there – potential. This implies that from a Nigerian and African perspective [6], there is no evidence yet in extant literature on the truism of the proponent position on the application of BIM in FM. Again, what is the implication of such BIM theories to the application of BIM in the Nigerian FM industry? These expose the gap in the facility management literature and thus offers the need for a review of the efficiency of a BIM strategy for seaport FM.

III. Conclusion

This paper has reviewed a substantial number of literature on the application of Building Information Modelling in Facility Management. The study thus concluded that while BIM is a predictor of FM service delivery, regrettably, the application of BIM in seaport facility management is not yet propounded in indigenous literature in spite of the very complex nature and strategic seaport industry. If the present situation thrives, the outcome of this lapse may negatively impact the development, growth and transformation of the global economy. Consequently, the paper calls for a review on the adoption of a BIM strategy for seaport facility management in order to establish the sustainability of such approach.

Disclosure of Conflict Of Interest

The authors hereby declare that they have no conflict of interest with respect to this study. *Please find attached the Disclosure of Conflict of Interest document, thanks.*

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