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## BIM Outsourcing Services in Cameroon

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### Abstract

Building Information Modelling (BIM) is a process which simulates a construction project in a digital model allowing for more effective method of designing creating and maintaining assets during projects lifecycle. Its importance in performance improvement has led to many countries especially in the global North massively investing in it to solve the long-study performance issues that has plagued the construction industry for generations. However, a major barrier has been a lack of BIM experts to implement BIM on projects in the global North. The Architecture Engineering and Construction (AEC) businesses are now looking outwards to other countries to provide BIM services through what is commonly known as BIM outsourcing. Yet, while other countries such as India and China have always been key players in the BIM outsourcing market, it is not yet clear how this is playing out in Africa especially Cameroon. This study explored the potential of outsourcing of BIM services from Cameroon, a central African country to the global North. A questionnaire was distributed to a target population of 110 and 37 provided complete response, representing a response rate of 33.6%. The findings revealed that lack of knowledge about where to find BIM outsourcing jobs, lack of major BIM agents to link them with major global construction companies out of Cameroon, lack of knowledge where to find BIM outsourcing jobs were major barriers hindering BIM outsourcing services in Cameroon. In addition, the study revealed that strategies such as the provision of BIM training to youths, development of policies to regulate BIM outsourcing activities, embedding BIM into degree programmes and set-up vocational BIM training centres will need to be implemented in order to promote the uptake of BIM outsourcing services in Cameroon.

### Background

Globally, the construction industry has been underperforming for generations. Many have hailed Building Information Modelling (BIM) as the solution to overcome the long-standing challenges that have hindered progress in the construction industry. BIM is an innovative and collaborative way of working underpinned by digital technologies, which support more efficient methods of designing, creating and maintaining the built environment. The benefits of BIM are cost reduction, timely delivery of projects, greater clients' satisfaction, etc. Translating a US \$4.3tn, or US \$174bn per year for infrastructure investment for Africa by 2040, projected by Global Infrastructure Outlook Report 2017, requires adopting innovative approaches including BIM to project delivery. However, the acute shortage of BIM skills has hindered its uptake in the developed countries. But with many developed countries imposing mandatory BIM adoption policies, the need to outsource BIM services to fill the skill gaps in the global North is becoming imperative. Unlike in other areas, e.g., telecommunication, whereby Western countries have sought or services offshore especially from emerging economies, such as India and China, these countries and South East Asian regions, are also becoming huge consumers of BIM [1] and are in need of BIM experts too. Thus, although still in its infancy, BIM outsourcing services have started to grow in Africa. Despite recent activities of BIM discussions and uptake in other African countries, BIM outsourcing is yet to receive any significant interest. There is no research about BIM outsourcing for Sub-Saharan Africa. The key players, enabling policies, and above all, the skills required for such a market to flourish in Sub-Saharan Africa is still very sketchy. Overcoming the afore-mentioned challenges will open new opportunities to youths including women who represent a significant group of the population, yet the highest group of those unemployed.

This study aims to investigate the role Sub-Saharan Africa can play in the global BIM outsourcing market. To achieve this aim, the following objectives need to be attained, which are to investigate and identify the:

- benefits of offshore BIM outsourcing services
- barriers of offshore BIM outsourcing services
- strategies that facilitate the uptake of BIM outsourcing services

This study will focus on Cameroon, a country that has recently been embracing BIM. However, the findings drawn from here will be relevant to other Sub-Saharan African countries especially the Francophone countries.

### BIM Outsourcing

Outsourcing is the concept of contracting out one or more activities to other companies, which used to be performed by the company itself [2, 3]. Since World War II industrial production activities has been transferred between nations or regions, but it is only since the mid-nineties that outsourcing has surged in services [4]. Outsourcing is a decision taken by an organisation to contract or sell the organisation assets, people, process and/or activities to a third party supplier, which in exchange provides and manages assets and services for monetary returns over an agreed period of time [3].

Information and Communication Technology (ICT) has become very important in today's business environment. Fierce global competition, higher expectation from the customers and continuously expanding supply-chains drive companies to outsource to specialised third parties [5]. There is hardly any organization that can cope in today's global competitive environment

without the help of ICTs. Offshore outsourcing or offshoring is understood as when a company chooses to outsource processes or activities to a service-provider located in a different country. One of the main drivers behind decisions to outsource work to service providers in low cost nations is reducing direct labour costs [2]. The digital outsourcing of BIM services is a developmental field with very limited literature about the topic [4, 6]. *Mulder and Heintz* [4] investigated the offshore outsourcing of design services among Dutch architects and the possible benefits. *Fountain and Langar* [6] developed the only up to date BIM related outsourcing study. The study focuses on the outsourcing patterns among general contractors within the United States. Despite the limited literature, it is evident that digital outsourcing of BIM related services is happening within the construction industry [4,6]. *Fountain and Langar* [6] characterised BIM outsourcing as: “the contracting out creation and/or use of a BIM model by an organization for a project to a third-party that specializes in the BIM process.” As a result, of the standardisation and wide acceptance of Computer-aided Design (CAD) software, digitalisation is now a vital aspect in construction industry. The use of BIM allows for remote collaboration and therefore it is possible for companies to outsource time-consuming and repetitive tasks to third parties and focus on core objectives that are more valued. This is enhanced by the use of cloud based Common Data Environment (CDE), which further allows for decentralised collaboration [7]. The digitalization of AEC industry has made a large pool of offshore labour easily available, because geographical location and distance between participants does not hinder BIM outsourcing functions. This provides the industry with the ability to lower costs, increase staff flexibility and enhance their competitive position [4]. However, to exploit these opportunities, professionals will have to make a deliberate decision to divide and transfer design work for strategic business reasons. *Fountain and Langar* [6] argued that BIM outsourcing is on the rise, as 45% of the respondents to their study confirmed having outsourced some aspects of BIM to specialised IT services. Out of the 45% of respondents, majority outsourced locally (95%) within the US. Other countries reported contributed only marginally except for India [8]. The respondents disclosed that 22% outsourced to India, 3.5% outsourced China and Philippines. Other countries were mentioned as well, such as Brazil, Mexico, Romania, Malaysia and Poland, but with less than 3% of outsourcing contribution. Additionally, the survey discussed that contractors that have previously used BIM, in 41% choose to outsource even though they possessed in-house capabilities and 54% respondents disclosed that they have outsourced either completely or partially the tasks in which they are not fully proficient.

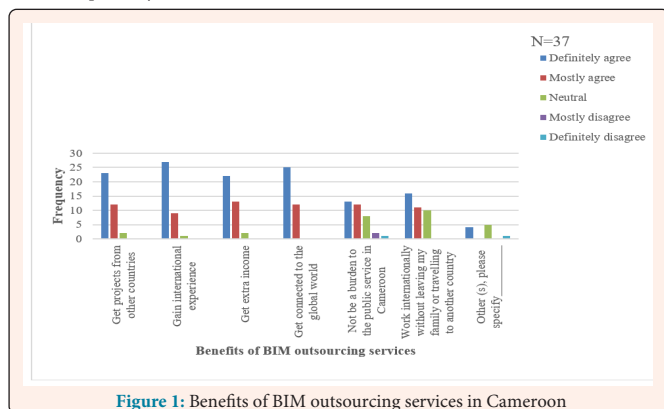
**Method**

A descriptive study, a questionnaire was adopted as the research design for this study. The target population included newly qualified Construction and Civil Engineering graduates with between zero and two years’ experience in construction, civil engineering and very few with BIM expertise. In total, a population of 110 was purposively targeted and 37 provided complete response, representing a response rate of 33.6%. The participants were required to rate the responses on the following scale:

- a) Strongly Disagree
- b) Disagree
- c) Neutral
- d) Agree
- e) Strongly Agree

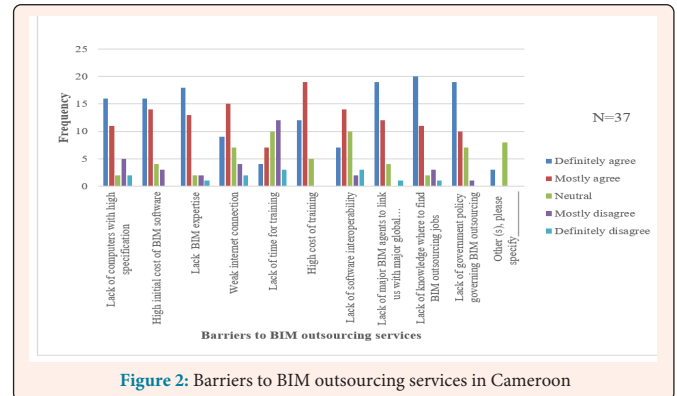
**Data Analysis**

This study sought to investigate the benefits, barriers and strategies of promoting the uptake of BIM outsourcing services in Cameroon the results presented in Figures 1, 2 and 3 respectively.



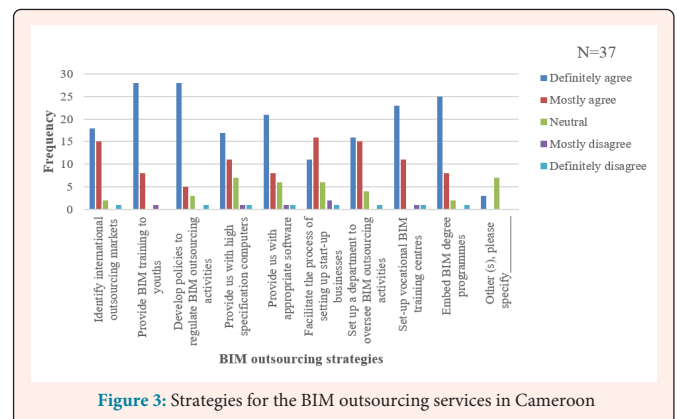
**Figure 1:** Benefits of BIM outsourcing services in Cameroon

Based on Figure 1, most of the respondents “definitely agreed” that there were immense benefits in outsourcing the services to BIM companies offshore. The results for digits above 20 are: Get projects from other countries (23), Gain international experience (27), Get extra income (22) and Get connected to the global world (25)



**Figure 2:** Barriers to BIM outsourcing services in Cameroon

Based on Figure 2, more than half of respondents “definitely agreed” on: Lack of knowledge about where to find BIM outsourcing jobs (20), Lack of major BIM agents to link us with major global construction companies out of Cameroon (19), and Lack of knowledge where to find BIM outsourcing jobs (19). However, only 9, 7 and 4 respondents “definitely agreed that Weak internet connection, Lack of software interoperability, Lack of time for training were barriers to BIM outsourcing services. While the low response for the Lack of software interoperability and Lack of time for training requires further investigation, that of Weak internet not being a major barrier can be due to recent high internet penetration rate in Africa.



**Figure 3:** Strategies for the BIM outsourcing services in Cameroon

Figure 3 reveals that the top four strategies to promote the uptake of BIM outsourcing services in Cameroon are Provide BIM training to youths (28), Develop policies to regulate BIM outsourcing activities (28), Embed BIM into degree programmes (25), Set-up vocational BIM training centres (23)

**Conclusion**

This study discussed the benefits, barriers and strategies to improve the uptake of BIM outsourcing services in Cameroon. The main take-away is that a lot with respect to the provision of BIM training to youths, development of policies to regulate BIM outsourcing activities, embedding BIM into degree programmes and set-up vocational BIM training centres still has to be done in order to better place Cameroonian youths in the market of BIM outsourcing services for them to compete with Chinese, Indians, Latin Americans and others in delivering BIM services to the global North remotely. Given the small sample size, it is recommended that a wider study on a larger population should be conducted using both quantitative and qualitative techniques to further gain an in-depth understanding of the results discussed. Although this study was focused on Cameroon, the results can also inform policies in other African countries.

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