

# Value Creation for Kenyan Construction Industry Firms to Ensure that they Remain Highly Competitive with the Threat of New Entrants in the Local Market

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**Abstract**—In the wake of many infrastructure construction projects, a booming real estate industry, a shift towards global market driven concepts and increased competition with other skilled actors in the value chain, Kenyan Construction industry firms have to adapt quickly to stay competitive.

With the country's progress and economic growth, construction projects have become international affairs with multi-national construction firms taking positions as lead consultants and contractors for major projects in Kenya. The historically monolithic Kenyan construction industry is slowly being diffused by foreign competition and there is pressure on the local actors to increase productivity and reduce costs.

Value innovation for both consultants and contractors with fundamental changes in the way the firms create and appropriate value is crucial for their survival. Analysis of the possibilities and restrictions of the activity system in relation to the individual firms and the supply chain for the construction industry firms has also been explored in this study.

Identification of an emergent system: International collaboration in the supply chain has also been explored. Insights into business model design for the construction industry firms have also been given, this is since most firms in the Kenyan construction industry tend to focus on the design quality of the service they offer, largely neglecting the entrepreneurial side of the business which requires managerial attention. The study consequently leads to the demonstration of the application of the activity system in the Kenyan construction industry.

**Keywords**—Construction Industry; Value Creation; Consultants; Contractors; New Entrants; BIM; Business model design; PoR

## I. INTRODUCTION

With the fast-growing international trade and development, the construction industry has been provided new opportunities by the World Trade Organization (WTO) agreements (WTO, 2013). Emerging economies entry into the WTO has sped up the process of liberalization, privatization and institutional reforms, thus pushing many firms from the developing world to internationalize in order to counter the intense competition at the domestic and regional markets (Gammeltoft, 2010). In the wake of globalization, firms are

now exposed to newer challenges as they have to compete within ever changing and expanding marketplaces (Murphy, 2007).

Fuelled by Kenya's fast changing society and increasingly unpredictable economy, organizations ability to adapt has become more important to survive. Firms need to develop new business models or alter their existing ones to create and capture value when markets, technologies and legal structures are changing (Teece, 2010). Thus, constant innovation of the business model is essential to maintain a healthy business.

For example, procurement of construction services by Kenyan authorities does not favor the local Construction industry player. Contractors have been complaining that they have been left out as Chinese firms take the largest percentage of local projects (Omondi, 2015). Kenya National Highway Authority (KeNHA) has in the last five years awarded seven of eleven major road construction contracts to Chinese contractors. The remaining four are taken by three European contractors and one Indian contractor. Kenyan contractors do the maintenance and even this not guaranteed.

As China's and other International firms presence is felt in the country, Kenyan presence in the Construction industry is being swept to the periphery. Kenyan Authorities claim that Kenyan contractors do not have financial and human resource capacity (Omondi, 2015), ironically, the same authorities are tasked with the development and promotion of the local industry.

Therefore, even with increased pace and broadened scope of construction projects, vibrancy in architectural and engineering consultancy services and the evolving construction technology, Kenyan Construction industry firms are facing stiff competition from foreign players. For example, the main obstacle for local contractors involvement in donor funded projects is the special pre-condition that the contractor be on the approved contractor list of funding agencies (Omondi, 2015).

The study seeks to identify activity systems that can be used within the construction industry in Kenya to create and capture value. The activity systems also involve the

exploration of international collaboration and thus highlight the importance of business model design.

This paper addresses value creation in the Kenyan Construction industry by using a systematic approach from business model literature. The research aims to identify and analyze current trends in value creation of the global Construction industry firms in order to recognize implications for future business model innovation.

#### A. Value Creation and The Business Model

The overall objective of a focal firm's business model is to exploit a business opportunity by creating value for the parties involved, i.e. to fulfill customers needs and create customer surplus while generating a profit for the focal firm and its partners (Amit, 2010). That objective could also be called "the value creating insight on which the firm turns," and it is reflected in the customer value proposition (Magretta, 2002). Sometimes value is just defined monetarily, but nowadays, a broader definition is more popular which also includes non-monetary revenues, such as competitive advantage, competence, market position, and social rewards (Walter A, 2001; Torronen, 2003; Ahola T, 2008; Barima, 2009).

Walter et al (2001) argue that value creation must be a win-win situation and the supplier needs to offer value to the customer but also needs to gain benefits from the customer at the same time. The value chains of current construction projects are complex and include multiple different stakeholders, and thus the concept of value plays a central role in construction project deliveries (Barima, 2009). However, creating value demands that the project stakeholders processes are compatible in order to exploit and benefit from the expertise and resources of all the stakeholders (Ahola T, 2008). Ramaswamy and Guillard (2010) have called this situation value co-creation. Basically, value co-creation adds the perspective of project stakeholder collaboration and involvement into the concept of value creation, and at the same time, shifts the mindset from a traditional 'subsystem delivery' to 'system ensemble and experience co-creation'.

While there is no sure way for business success, a properly developed business model based on sound business practices substantially increases the chances of success. The success is not just surviving but thriving in a business that rewards the company, employees and clients commensurate with the efforts and risks involved. The problem is that the Kenyan construction industry has not kept up with the changing times. The result is that clients need better value and consultants and contractors need reasonable profits. Ted Garrison (2005) argues that when consultants and contractors are selected based on the value they deliver and not solely on price, the total project costs can be reduced despite the higher fees. A similar relationship occurs with the workers. Higher wages attract higher-performing workers who produce at higher levels. That helps offset the wage increases.

Without a well developed business model, firms will either fail to deliver or capture value (Teece, 2010). Kenyan Construction industry need to consider not only how to address changing market demands, but also how to capture value from providing new innovative products or services. Hence, an understanding of business model design may help firms to establish competitive advantage (Teece, 2010). Robert Tucker (1995) points out that the client is demanding

more value today. He claims that today's client is better informed, more demanding and has more choices. Ted Garrison (2005), confirms that today's client is more demanding and has more choices. He states that most people think that they are better informed, but most of the "information" available is actually misinformation. This is especially true when issues are complex, as in construction. His point is that today's consultant must educate the client. If the Construction industry player doesn't do this, the client may make poor decisions and blame the consultant.

#### B. The Activity System

The paper aims to identify activity systems that are used within the AEC industry to create and capture value. An activity in a firm's business model can be viewed as the engagement of human, physical, and/or capital resources of any part to the business model (the business, clients, employees, suppliers etc) to serve a specific purpose towards the fulfillment of the overall objective. An activity system is a set of interdependent organizational activities centered on a focal firm, and encompasses activities that are either conducted by the focal firm or by partners, customers or vendors (Zott, 2010).

The activity system perspective encourages systematic and holistic thinking when designing a business model for the future, instead of concentrating on isolated, individual choices (such as the "design or build for consultants and contractors respectively" decision about a particular project, or the outsourcing of a particular activity). The message to construction industry players is clear: look at the forest, not the trees - and get the overall design right, rather than optimizing the details (Amit, 2010).

Casadesus et al (2013) argue that with the emergent need for new business models, business model innovation is increasingly attracting the attention of scholars and practitioners. Massa & Tucci (2013) further define business model innovation as the search for new logics of the firm and new ways to create and capture value for its stakeholders; it focuses primarily on finding new ways to generate revenues and define value propositions for customers, suppliers, and partners.

In the global construction industry context, four emergent activity systems were identified: Lean Construction, BIM Services, International Collaboration and Programming Services. Each activity system is introduced briefly and a further study on each system is carried out within the Kenyan construction industry context.

##### 1) Lean Construction

The lean process was pioneered by the Toyota Production System in the automotive industry, and is fast becoming a popular project delivery method in the construction management industry internationally. However, for Kenyan construction industry players it has been a hard sell especially for trades accustomed to working on the same schedule for years.

Lean construction consists of many methods and principles, but the last planner principle is the most commonly used on most international projects (Roel, 2013). There's more value captured by using the principle. The last planner system is best defined as (sub-) contractors performing work at the last appropriate moment on a project so that the site is prepared for the next sub-contractor to immediately start work as part of an efficient parade of tasks.

The contractors plan and work around shorter modules and schedules allowing them to think about projects on a day-to-day basis and consider how their work impacts the other contractors in the project (Aziz, 2013).

#### 2) *BIM Services*

BIM services largely consists of consulting activities. The reliance on digital design models has been a common practice in the manufacturing industry for decades. Project teams at companies such as Boeing and Toyota have placed digital models at the core of their collaborative, concurrent engineering processes for years, using them to support the entire project lifecycle—from design and documentation to manufacturing and field support.

In the last couple of years, Building Information Modeling (BIM) has become a new paradigm within the global construction industry. The representation of all the information needed to describe buildings throughout the whole design, construction and management process has been an objective for those applying information technology in buildings for years (Eastman, 1999). BIM services involve the construction and use of an accurate virtual model to visualize the design, identify possible issues and encourage integration of design and construction (Azhar, 2011).

Unlike CAD, which uses software tools to generate digital 2D and/or 3D drawings, BIM facilitates a new way of working: creating designs with intelligent objects. Regardless of how many times the design changes—or who changes it—the data remains consistent, coordinated, and more accurate across all stakeholders. Stanford University Center for Integrated Facilities Engineering (CIFE) figures based on 32 major projects using BIM indicates benefits such as (CIFE, 2007):

1. Up to 40% elimination of unbudgeted change.
2. Cost estimation accuracy within 3%.
3. Up to 80% reduction in time taken to generate a cost estimate.
4. A saving of up to 10% of the contract value through clash detections.
5. Up to 7% reduction in project time.

#### 3) *International Collaboration*

According to the Kenya National Bureau of Statistics Economic Survey for 2015 (KNBS, 2015), the Kenyan construction industry registered an accelerated growth of 13.1% compared to a revised growth of 5.8% in 2013. The KPMG Global Construction Survey 2013 (KPMG, 2013) also states that though Kenya has seen continuous growth in its construction industry, Africa as a continent is the most popular prospect amongst 165 senior leaders in the global construction and engineering industry and almost half are interested in Africa.

A study conducted by Marina et al. (2014) focusing on international collaboration and partnering for architectural firms states that when applying the concept on several sectors of the industry, new sustainable models for collaboration within the supply chain could emerge. Hence when customized to the characteristics of the industry, the activity system perspective on business model design could present a framework to address strategic issues on different industry levels.

#### 4) *Programming Services*

Programming services can be defined as the thorough and systematic evaluation of the interrelated values, goals, facts, and needs of a client's organization, facility users, and the surrounding community (Hershberger, 2000). A well conceived program leads to a high quality design. The Program of Requirements (PoR) contains functional and technical aspects and is directly linked to the clients ambitions and budget.

Programming services largely consist of consulting services and would fall under the Project Managers or the Architects domain. A PoR can also be made prior to the hiring of an architectural firm. Programming services are vital to projects success in that as buildings and building systems become increasingly complex, clients have become much more sophisticated and thus more interested in understanding and managing their physical resources. Managing the myriad of interests is crucial in creating consensus among user groups and communicating critical decisions and project priorities.

Without the clarity presented in a complete and robust program, confusion and mistakes can arise during the design phase that are both costly and time consuming to remedy. In many cases, the financial goals of the project will require compromise and creativity among the participants. However, when projects are carefully programmed, subsequent design phases can proceed more efficiently, saving time and money for the client. Architectural programming establishes a clear understanding of project constraints as well as the quality of the desired solution (Architecture, 2013).

## II. METHODS

This research strives to provide a general overview of activity systems that can be used within the Construction industry in Kenya to capture and create value with an ultimate aim of providing Construction companies a few insights on how they can enhance assignment effectiveness.

A qualitative approach was used to identify the design elements, the core ingredients and architecture of the activity system. Exploratory Interviews were conducted at first to collect data from the perspectives of different Construction industry players (Architects, Engineers, Quantity Surveyors and contractors) in Nairobi, Kenya. 25 semi-structured face to face interviews were conducted. Materials from previous desk studies were used to prepare for the interviews, all interviews were approximately 1 hour in length for each. The respondents had at least 20 years experience and their suggestions were not only based on specific projects but also on their working experience on local and international construction projects in different countries.

The sample consisted of firms with different characteristics. With regards to firm sizes, three sizes were distinguished: Micro-sized firms that employ less than 10 persons, small sized firms with less than 50 persons and medium sized firms with fewer than 250 persons (Commission, 2005). In the study, all the three sizes were included.

The data was then analyzed by the authors and three research assistants using the technique of context mapping. At the heart of the data analysis was the task of discovering themes. Different key themes were identified as activity systems for value creation.

### III. RESULTS & DISCUSSION

During the interviews, the participants were asked for their opinions about the relationship between value creation in construction projects, a firm's competitive nature, emergent activity systems and business model design. All the interviewees acknowledged that the Kenyan Construction industry has a typically conservative construction climate, however, according to the participants, four emergent activity systems that have an effect on value creation and a firm's competitive nature in different ways and levels were identified: Lean construction, BIM, International collaborations and programming services. Each activity system is introduced briefly, and then an analysis is done from a firm perspective using the content, structure and governance design elements (Zott, 2010). However, the data stresses the fact that each specialized project participant is very important in the overall construction project delivery process and therefore, the activity system is discussed from a more holistic point of view.

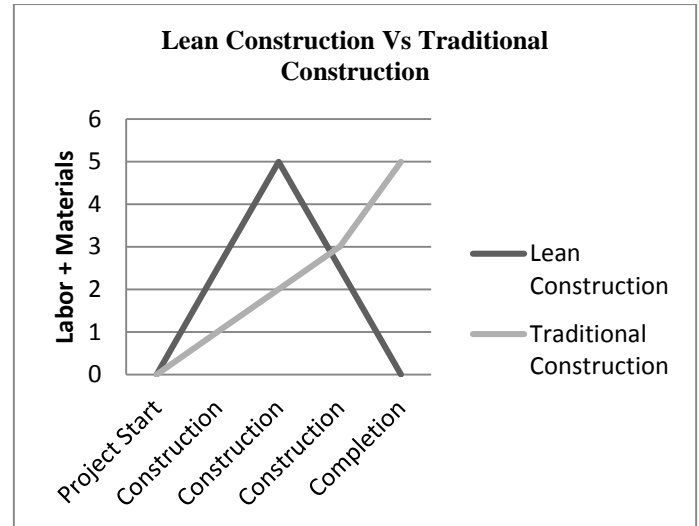
#### A. Lean Construction

Lean construction methods can have major impacts on the outcomes and success of construction projects. While some respondents, especially contractor X and Z believe that lean construction provides opportunities for increased collaboration, maximum efficiency and optimized performance, others deliberately have not been interested in implementing any lean principles. Large contractors like contractor X, have been open to trying the lean process, since it focuses on the efficient use of human and material resources, while traditional construction processes focus on each subcontractor reducing the cost and increasing the speed of its individual work activities.

As attested to by client P, Chinese and other International firms are chosen because of their fast delivery of projects. Clients P and Q both confirm that the response time for foreign firms working as consultants in Kenya is substantially short compared to their local counterparts. This combined with working with a contractor applying the Lean Principles, has seen them report on projects having "smoother rides" throughout the construction process, and the avoidance of the mad rush at the end of a project that can often lead to extra labor requirements and costly overtime. In most cases, teams implementing lean principles have shaved months off their schedule.

Implementing lean construction principles in the Kenyan Construction industry involves new productivity-focused processes that are slightly different from the traditional construction process (Architect F). The productivity-focused process decentralizes decision making and manages flow and consistency of work holistically rather than focusing on the speed of any single aspect of a job (Contractor Y).

The contractors plan and work around shorter modules and schedules allowing them to think about projects on a day-to-day basis and consider how their work impacts the other contractors in the project. Basically, when analyzing the structure of the activity system, it stands out that activities of lean construction are mainly linked on the basis of trust, accountability, a network of commitments and reliable hand-offs between all the contractors (Engineer M).



#### B. BIM Services

BIM services are provided by none of the 25 consultancy firms involved in the study (project management, architecture, engineering). This suggests that firms lack a certain type of integral project or expertise to work with BIM. This also illustrates why the firms are facing stiff competition from their foreign counterparts. Project manager A reported on several attempts to use BIM in a project but they had been futile because the consultants in his team were not responsive. Architect F reported on a certain request by a client to use BIM, however, he didn't meet the request since he didn't have any prior exposure to BIM. Client R stated that "I would like to use BIM in my projects in order to reduce costs or complexity". However, Engineer M stated that "There are implications of BIM, generating a virtual model of a preliminary and still changing design can require an enormous amount of time and corresponding costs especially when you don't have prior experience."

#### C. International Collaboration

While some respondents believe that the larger African International market provides opportunities to create and appropriate value, others have never worked outside Kenya. Six of the twenty five firms involved in the study currently have at least two projects they are working on abroad. The other firms that do not work abroad are either micro or small sized firms and this shows that size does matter when it comes to International expansion.

Engineer J stated that the main reason for small firms to work exclusively in Kenya is the lack of resources or international aspirations. However, Architect F, whose firm is in more than five countries in Africa stated that the main reasons for international expansion are increased competition in the domestic market, spreading the risk through diversification into new markets, competitive use of resources and taking advantage of the opportunities offered by the larger African economy. He stated that some of the firm's international clients request for their services because of their specific knowledge in Architecture which is less evolved in the country in question.

The firm of Contractor K is not working abroad since it has a lot of workload in Kenya, specifically Nairobi metropolitan region. However, the contractor states that "we have a lot of workload in Nairobi right now, nevertheless, we are strategizing on increasing efficiency, importing more construction equipment and we are continuously evaluating the potential future construction markets in other countries in the region." However, Project Manager B states that most international activities mainly consist of design or consultancy services in the first stages of the Construction process. The implementation stages are executed by a local partner, because of their knowledge in local legislation and building methods.

Although the linkage of activities is highly project specific and varies per country, the case given by Project manager B illustrates that regarding the structure of the activity system, contacts with local authorities or institutions is beneficial to the acquiring of activities such as fast tracking of acquiring all the necessary approvals and thus having time savings in a project. This is because the project team consults the authorities from the early design stages and usually the final design is accepted with no major changes.

#### D. Programming Services

Most of the interviewees, especially the architects stated that the client's requirements and their financial implications are not always clear in the beginning of the project and evolve during the process. However, project manager A stated that there is a substantial value addition and benefit to the client when there's a PoR some of which are: the project reflects the clients values, project goals and design issues are clear from the start, and the client is provided a rational basis for design decision making.

All the firms interviewed stated that they didn't have a well developed PoR system, however, project manager A stated that his firm provided value to the client by assembling a programming team and integrating different disciplines, financial analysis, risks, cost-benefit and maintenance aspects in the PoR. Architect D stated that he has received a PoR assignment before from a client developing a hotel, he stated that the client needed a careful up-front analysis of the design issues to get a clear view of the possibilities of ambition and budget. The firm was able to deliver added value to the client by visualizing and summarizing the PoR and was paid for this service.

#### IV. CONCLUSION & RECOMMENDATION

The main aim of this research paper was to identify activity systems that can be used within the construction industry in Kenya to capture and create value. Empirical results from 25 explorative interviews with different players in the construction industry show four emergent activity systems that can be used to capture and create value; Lean Construction, BIM Services, International Collaboration and Programming Services. Since these activity systems involve new activities, new linkages, and new governance mechanisms, they point that business model design of Kenyan Construction industry players should change concurrently.

Studies have shown that when companies are perceived to provide quality and capture value in the top 20 percent, they make more than double the profits of those in the bottom 40 percent. The study was mainly about the local players taking control of their companies, the local

construction industry and focusing on building client loyalty by continuously adding more value to their projects. A re-design of current business models is necessary to A) Successfully create and capture value on the firm level and B) Optimize collaboration with all key players on the supply chain level. The linkage of activities is highly project related.

However, from the discussion, several topics emerged. For lean construction, it's slightly different from the traditional method of construction and consultants are tasked with facilitation while contractors implement, the main benefit is increased reliability. On the other hand, for an international market approach, the involvement of high level parties can help to generate a stable basis for settlement. BIM and programming services are highly managerial but they have linkages with the innovation and efficiency design themes.

For the Kenyan authorities, they should impose a pre-condition for any foreign contractors and consultants working in Kenya. A joint venture approach should be mandatory, all foreign firms should have local partners and this would go a long way in aiding technology transfer and capacity building of the local construction industry firms.

The conclusion is that all the activities listed above could be connected to new revenue models for the construction industry players and might have substantial value for future service delivery. The activity systems are already quite common in the global construction industry but contradiction and conflict between design and integral firms could increase due to the growing importance of managerial services. Nevertheless, the client is set to receive better value with reduced project costs and the construction industry player is set to create more value and receive higher fees.

#### V. FURTHER RESEARCH

As attested to by the respondents, the majority of the firms in the Kenyan construction industry are not concerned with their business model. To understand the reasons behind this and how it can be improved requires further research.

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