

THE IMPACT OF ORGANISATION CULTURE ON EFFECTIVE EXPLOITATION OF BUILDING INFORMATION MODELLING, BIG DATA ANALYTICS AND INTERNET OF THINGS (BBI) FOR COMPETITIVE ADVANTAGE IN CONSTRUCTION ORGANISATIONS

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ABSTRACT

The purpose of this paper is to analyse the impact of organisational culture on the exploitation of three technological innovations: Building Information Modelling, Big Data Analytics and Internet of Things (BBI) considering the role of organisational culture as a determinant of organisational competitive advantage. After reviewing the literature on organisational culture and its relationship with competitiveness, this paper further analyses the critical culture constructs that impact specifically on exploitation of Building Information Modelling, Big Data Analytics and Internet of Things which leads to maximise organisational competitive advantage. Findings reveal that organisational culture can be both positively and negatively associated with aforementioned technological innovations depending on its key attributes for exploitation. Hence, culture of an organisation has the potential of fostering innovative technologies, but can also act as a barrier depending on how they are operationalised. The findings additionally show that in order to enhance innovation, neither a flexibility focus (which is rooted in collaboration and shared commonalities) nor an external focus (built upon the dynamics of competition and achieving concrete results) alone would suffice- both are equally critical in characterising organisational culture. The paper focuses on a context, where there is a lack of studies on the impact of cultural constructs that are specifically relevant to BBI, which lays the basis for the originality of this paper. Findings can guide managers' efforts in organisational culture developments which foster exploitation of these technologies towards maximising the competitive edge.

Keywords: building information modelling, big data analytics, competitive advantage, exploitation, internet of things, organisational culture.

INTRODUCTION

During the past several years, the information and communication technology (ICT) advances relating to the construction sector have been expeditious, offering the potential for efficiency gains and advances in business effectiveness (Construct IT 1998; Duyshart et al. 2003), and yet there has been, and continues to be a pervasive resistance to the changes that these technological advances offer (Davis and Songer 2008). The use of building information modelling (BIM) has long been argued to create an overall better product and is also very advantageous in regard to overall success of construction firms (Arayici and Egbu 2012) while Big Data Analytics (BDA) and Internet of Things (IOT) yet to improve greatly, but still the related work flows have proven to be advantageous for the construction organisations (Ming and Huaying 2007). However, despite their widespread advantage, it is increasingly accepted that the failure of construction firms in embracing these highly collaborative and integrated technologies is more than simply an issue of technology (Wainright and Waring 2004). Thus, arguably, the issue extends to the domain of “organisational culture” as a key aspect of the organisational environment within which ICT-enabled integration is supposed to occur. While the importance of culture has been widely accepted, to date the linkages between organisational culture and exploitation in particular for technological innovations have scarcely been examined in the literature. The concept of ‘competitive advantage’ is solely used to identify the cultural factors as to which factors highly influence the competitive advantage of construction firms. This paper makes an effort to assess the cultural attributes’ impact on the exploitation of such integrated and collaborative ICT solutions. In particular it allows recognise the shared nature of the situationally contextualised “beliefs” of an organisation and its “values”, providing the basis upon which to identify the impact of culture that lead to organisational competitive advantage

The methodology used is three fold: the study first identifies “culture” as a critical impact factor for competitive advantage generally and explores the constructs/ constituents that influence competitive advantage. Second, the study evaluates the exploitation of BIM, BDA and IOT to identify the constructs/ constituents of BBI exploitation. Finally, with the use of thorough review of literature, the study explores the impact of culture on the exploitation of BIM, BDA and IOT. In doing so, the findings reveal that organisational culture may positively and/or negatively impact on the exploitation of BBI for organisational competitive advantage. It concludes by generating hypotheses about the mechanisms by which organisational culture can enhance organisational competitive advantage when BBI are used.

LITERATURE REVIEW

Organisational Culture

Organisations are human created 'living mechanisms' or 'functional systems' that interrelates with the internal and external environment. They behave indifferently from individuals whom it is made of (Mintzberg 1979). Beijerse (2000) explicates this ideology through his well-known organisational design model that distinguishes the organisation in to elements of strategy, structure and culture. Among the three main elements, culture is the focus of this paper to investigate the impact for effective exploitation of Building Information Modelling, Big Data Analytics and Internet of Things. Culture, as defined by Mobley et al. (2005) is a set of assumptions, beliefs and values that are widely shared and strongly held by the members of an organisation. Culture has once defined to be the 'core' that directs an organisation for its way (Zairi and Al-Mashari 2005). Hofstede's (1984) view on culture in terms of organisations is "the collective programming of the mind which distinguishes one group from another". The most commonly known and the simplest definition for culture is "the way we do things around here" (Lundy 1994) which leads to many different dimensions. Schein (2004) defines culture as:

[...] a pattern of shared basic assumptions (beliefs) that was learned by a group as it solved its problems of external adoption and internal integration, that has worked well enough to be considered valid and, therefore, to be thought to new members as the correct way to perceive, think, and feel in relating to those problems (Schein, 2004, p. 17)

The Importance of Organisational Culture for the Exploitation of Innovative Technologies

Cultures that develop within an organisation can be either productive or destructive for innovation. Organisations that successfully lead innovations have a strong positive productive culture. According to Hofstede (1980) such cultures are believed to be the major influence for employees' motivation and commitment with following key attributes;

- Shared positive values
- Heroes
- Rites and rituals
- Cultural communication networks

Hofstede (1980) divided culture into four distinctive elements: symbols, heroes, rituals and values. Symbols are said to be the most apparent element of culture that gives a meaning and resembles with gestures, objects, words or acts that signify something unique among other aspects of organisational cultures. Values form the core of the culture in the deepest level and are directly connected with moral and ethical codes. Values on the other hand are reflections of what people think, do, 'likes' and 'dislikes'. Rituals are collective tasks which represents social norms. Heroes are considered to be persons who possess characteristics which are highly prized and are often labelled as 'winners'. A hero is also a great motivator

and a role model (Deal and Kennedy 1983). Hofstede (1980) further discusses about the 'right' type of culture that promotes innovations are always flexible in nature and emphasised towards the attitude of 'winning'. Schein (2004) offers a different perspective to organisational culture as a "the pattern of shared basic assumptions" that a group learn as it solves its problems of external adaptation and internal integration which works well enough to be considered valid and therefore taught to new members as the 'corrected'/ 'lessons-learned' way to understand, think and feel in relation to those problems.

Cameron and Quinn (2006) explain culture in four categories: adhocracy, clan, market and hierarchy- using two dimensions. The two dimensions exhibit flexibility and discretion versus stability and control, and external focus versus internal focus and integration. The four categories are also explained along with six aspects of a typical organisation- dominant characteristics, organisational leadership, and management of employees, organisational glue, strategic emphases and criteria of success.

Organisational success often emerges with competitive advantage; increasingly arise from the continuous acquisition of knowledge. In order to develop continuous and sustained value creation, a firm must formulate and implement an innovation-supportive culture which enhances the capabilities required to successfully implement and maintain both now and in the future (Voelpel et al. 2005). Leonard (1995) interprets this outlook as 'unlocking' the ability to innovate, perform and improve throughout a long term period. The study conducted by Kivrak et al. (2009) revealed that benchmarking and learning have possible effects on organisational success. It is strongly perceived that effective knowledge sharing and setting a benchmark out-turn with uplifted efficiency and thereby productivity. Interacting with individuals endorsed with different cultural backgrounds and different expertise helps an organisation to embrace innovation much easier since knowledge sharing is undemanding in such environment. Moreover, it is identified that trust is a key factor in effective knowledge sharing between team members.

A synergistic approach which promotes the flexibility of respecting other's ways is considered to be the best way of successful implementation of innovations (Kivrak, et al. 2009). Admittedly, strategy development need to be drew forward. Nevertheless, there are two opposing views on changing of values within cultures in the research literature. One view sees culture as very rigid and stable within an industry and at a time when cultures change, the change occurs independently of each other (Barkema and Vermeulen 1997). The other view sees that, when different cultures contexts frequent interacts, the cultures will become more similar over time which is also known as Cultural Convergence Theory (Axelrod 1997). Therefore synergetic approach will either make couple or more cultures to be similar or smoothly change independently. Hence the ontology behind the theory is that a culture is bound to affect by outside influences and external changes. This ideology is also considered to be a driver for competitive advantage.

Competitive Advantage and Organisational Culture

Competitiveness is a concept which acts as a core to normatively oriented strategic thinking, and allows sense making to different dimensions, different levels and to different firms at different times (Barney 1986). Firm (organisation or company) is one of such levels discussed in this paper. Considering a firm's competitiveness based on economic dimension alone would be incomplete. It is essential that a firm's competitiveness need to be viewed in social dimension, achieving business success, and future growth and development (Flanagan et al. 2007). A culture is a competitive advantage for an organisation as it cannot be replicated by its competitors, for its historical legacies are embedded in cultures. Nevertheless, a culture also acts as a significant barrier for change with its anchored historical beliefs that are sunk in (Johnson et al. 2014). The mainstream construction management literature has long been recognized with organisational culture (Handy 1985; Johnson et al. 2014). Within the construction research domain, the impact of culture on organisational performance is becoming an increasingly important topic for organisations in their winning strategies. Although construction industry is predominantly identified as a loosely coupled, project based set of systems, the industry as a whole has now being investigating the possible trustworthy collaborations which also trigger the urgency of a cultural change.

With all different organisational culture types, it is well perceivable that the organisational culture is not something tangible, nor easily captured or defined. It is a complex topic that needs to be viewed in different lenses. Further, it needs to be observed with people's beliefs, values, behaviours, symbols as it plays a significant part in the day-to-day functioning of an organisation. Hence, for this study, culture is viewed through the lens in which it influence competitiveness in firms, Among Several different world views on culture that have been identified in organisational culture studies, this paper deploys the culture model coined by Cameron and Quinn (2006) the Organisational Culture Assessment Instrument OCAI. Cameron and Quinn (2006) suggested four types of culture which has predominantly considered the competing nature of employees as well as project teams/ enterprises. The OCAI include: 1) The Hierarchical culture: considered to be well coordinated, characterized by formal rules and policies. 2) The Market culture: generally perceived to be highly competitive, while winning is the motivation/passion that holds the employees and the organisation together. 3) The Clan culture: mainly refers to a friendly working environment, where the employees are treated as an extended family and the superiors are considered as mentors; the working force is characterised by high job and organisation commitment and develop friendly relations. 4) The Adhocracy culture: aims innovating and risk taking, assured by a highly creative and agile working environment. OCAI makes an ideal suit for this study in such a way that it incorporates flexibility and discretion versus stability and control, and external focus versus internal focus and integration. The authors further claim that adhocracy culture to be the most appropriate culture that fosters

innovations as it emphasizes flexibility and change and is externally orientated. An adhocracy culture promotes creativity, entrepreneurship and risk taking.

METHODOLOGY

This paper is presented as a part of an on-going PhD research that investigates the strategic approach of implementing and exploiting BBI as strategic tools for competitive advantage in construction organisations. As a part of the original research, the study develops a preliminary conceptual framework with the aid of comprehensive review of literature. Within this conceptual framework, the study investigates the impact of culture on BBI exploitation for competitive advantage. This paper covers the latter to develop a preliminary conceptual framework. The study is primarily based on a thorough review of relevant literature in the areas of organisational culture, exploitation prospects of Building Information Modelling, Big Data Analytics and Internet of Things and competitive advantage for construction firms from strategic perspectives. The factors presented in this paper were derived through extensive review of literature. The reviewed sources were published journal articles, conference articles, conference proceedings, monographs, report chapters, report reviews, editorial material, theses and working papers.

In the review of literature, the study first selects a cultural model to understand organizational culture in the context of which culture influence 'competitive advantage'. Among many of the well-established models, Quinn and Cameron (2006) developed the Organisational Culture Assessment Instrument (OCAI), a validated survey method to assess current and preferred organizational cultures. The OCAI is based on Quinn and Cameron's Competing Values Framework Model which was selected as the culture model for this study. The reason for the selection of this model is that the model explains how the four organisational cultures dynamically behave in four parameters includes internal focus and integration vs. external focus and differentiation, and stability and control vs. flexibility and discretion. As postulated by Porter (1985), an organisation can achieve competitive advantage over its rivals by cost advantage and differentiation advantage not only internally but also externally focused. Since the competing values framework addresses this external and internal dimensions as well as for its fit-for-purpose in related to dynamics of competition and achieving concrete results while leaders are seen as innovators or entrepreneurs, the study considered this model to be acceptable to investigate the research question 'the impact of culture on the exploitation of BBI for competitive advantage'.

Second, the academic interest around BBI in relation to its 'exploitation' is thoroughly reviewed in the literature. A systematic review was carried out to obtain a set of constructs to define 'exploitation' of the aforesaid technologies. The research question was to 'identify the exploitation constructs for BIM, BDA and IOT'. However, as a result of the thorough review of literature, the study obtained a set of common exploitation constructs in the context of ICT technological advances in general mainly because of the number of similarities observed within the domains; BIM, BDA and IOT. It was also noticed that the

studies do not have a consensus in the agreement of establishing a clear boundary line between the terms 'implementation', 'exploitation' and 'diffusion'. As such, the keyword search strings did not limited to 'exploitation', instead the search strings were extended to represent 'exploitation' 'implementation' and 'diffusion' in addition to 'Building Information Modelling', 'Big Data Analytics' and 'Internet of Things'. The review took in to account all available published (journal articles, conference articles, conference proceedings, monographs, report chapters, report reviews, editorial material, theses and working papers) studies as evidences based on best quality contributions in major AEC research databases in all fields (subject, title, abstract, keywords, full text etc.), from 2007-2017. The search also expanded in to grey literature in google scholar and basic google because of the scarcity of the word 'exploitation' appearing specifically in related to BBI. The review initially retrieved a set of studies that looked in to exploitation and they were categorized separately for BIM, BDA and IOT. Some of the identified constructs include readiness to adopt, capability, maturity, value creation, continuous improvement, etc. However, many of these constructs overlap with the terms 'adoption' and 'implementation'. Therefore, the authors then further sorted these constructs with two successive steps: elimination of duplicates/ irrelevant constructs and verification. The filtered list was then subjected to classification into four distinct categories (A-primary subject, B-secondary subject, C-anecdotal, D-others) to obtain the mostly cited constructs as primary subject. The final sample was of help to capture the mostly cited constructs for 'exploitation' of BBI- the four constructs of exploitation which are described in the analysis section.

As the third step, the identified constructs for culture and exploitation were mapped against to examine the impact of culture on the exploitation of BBI using a thorough review of literature. A set of hypotheses are established based upon literature that studied similar cultural attributes in the context of ICT technologies. In line to the selected cultural model, attributes of each culture construct were unfolded. For example, the attributes of clan culture- mentorship, teamwork, collaboration, extended family nature was explored in terms of how they generally impact on the exploitation constructs- creating new uses, extending existing capabilities etc. The findings reveal both positive and negative impacts towards exploitation of ICT technologies.

ANALYSIS

Culture that influences Competitive Advantage

Having defined the Cameron and Quinn (2006) four types of culture values viewed in the lens of competitive advantage the relationship between organisational culture and the exploitation of Building Information Modelling (BIM), Big Data Analytics (BDA) and Internet of Things (IoT) is examined.

Among many models that have been used to measure organisational culture as suggested by literature, Cameron and Quinn (2006) created Organisational Culture Assessment

Instrument (OCAI), based on Competing Values Framework Model (See Figure-1). The evaluation of a culture is conducted using four core values in an array of 2 x 2 competing values where each value is consisting of 4 sub values as follows:

- Clan culture- personal place, nature of an extended family, mentoring, participation
- Adhocracy culture- Dynamic, risk taking, valuing innovation, entrepreneurship
- Market Culture- result oriented, values competition, values achievement, getting the job done
- Hierarchy Culture- Favours structure and the control power, coordination, efficiency, stability

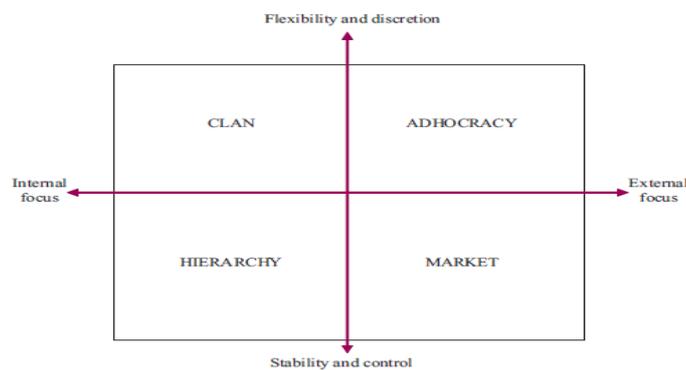


Figure-1 Quinn and Cameron's Competing Values Framework Model

Source: Cameron and Quinn (1999)

The model is a true emphasis of internal and external focus that clearly illustrates the difference between the focus for organisational improvements driven by internal factors (business processes and people caring) and external focus driven by stakeholder engagement. Stability versus flexibility distinguishes the two perspectives of organisations that are more stable and organisations that promote innovation, personal growth, continuous organisation improvement and change. These dimensions are evaluated through six dimensions: Dominant characteristics, Organisational leadership, Management of employees, Organisational glue, Strategic emphasis and Criteria of success. The six dimensions can be interpreted through four types of cultures. These main factors were used to evaluate against competitive advantage and exploitation of BBI in this paper.

Exploitation factors for BBI

Exploitation as defined by Egbu (2001) is the act of using resources and processes in order to benefit from their efforts. Technological exploitation can be viewed in different perspectives: commercial, social, environmental and political (Russom 2013). In the attempt of extracting the maximum value from the technological resources, firms increasingly combine their internal exploitation through the ultimate value that it offers to the economy. Extracting economic value from these three resources by maximizing the benefits for

shareholders is an extremely challenging task because BBI by its own terms are intangible, idiosyncratic, uncertain, predominantly tacit, and with poorly defined property rights. As postulated by Zahra and George (2002), exploitation is applying new external knowledge commercially to achieve organisational objectives, and to create new ones by incorporating acquired and transformed knowledge into its operations. Taking this operational definition as the basis of 'exploitation' speculated in this study followed by a thorough review of literature, four key constructs for exploitation were identified (see table-1).

Table 1- Constructs for exploitation of BBI

Constructs for exploitation of BBI
Refinement of existing systems
Efficiency and effectiveness of daily tasks
Extending and leveraging existing capacities of individuals who engage
Persistent creation of new products, uses, systems, processes, knowledge or organisational forms

In the era of increasingly severe commercial competition, an investment on IT related technologies is not only a short-term competitive advantage, but also for keeping the competitive advantage, and obtaining sustainable competitive advantage. Further this advantage can be obtained by improving efficiency and effectiveness of IT technologies (Cao Ming and Shu Huaying 2007). *(H1. BBI exploitation positively impact on organisational competitive advantage)*

Having reached to a set of constructs for organisational culture and exploitation in common, the next step is to review the literature to generate a set of hypotheses that explores the impact of these cultural constructs on the constructs of exploitation.

The Impact of Culture on BBI Exploitation for Competitive Advantage

There is an agreement in the literature about the need for a culture which emphasises caring for employees in such a way that they feel wanted and admired is a key to learn, improve and increase efficiency of work. Trustworthiness, openness, empowerment are also considered to be important when it comes change management (of a new technology adoption and survival for exploitation). Kitchell (1995) found that organisations with flexible and open culture and emphasize long-term orientation have a greater propensity to adopt advanced manufacturing technology. Although the innovation investigated in these studies were on an outcome perspective (e.g., adoption of new technology), these empirical results lay ground for the associations between certain dimensions of organisational culture and innovation adoption. All these describe the characteristics of a clan culture which can be

concluded to have a positive correlation with BBI exploitation. On the other hand no agreement has been made for clan culture to have an adverse impact on creating new uses or extending and leveraging existing capacities of individuals which are the constructs of exploitation. Although the above-mentioned studies focus on different aspects of the relationship between clan culture and innovation exploitation in general, most find a positive relationship between them. Therefore, the following hypothesis can be formulated:

H2a. Clan culture positively impact on the exploitation of BBI

The adhocracy culture which promotes risk-taking orientation, creativity, teamwork, collaborative working, and ambiguity tolerance, entrepreneurship, openness and change orientation is considered to be the most appropriate culture for both innovative technology exploitation as well as achieving organisational competitive advantage. Henry Mintzberg's (1979) explains adhocracy culture as basically control by the support staff. There is little formality so, direct supervision and defined processes are less important than in other organisation structures. Research and development can be a primary driver of adhocracies as typified by new technology industries. Uzkuurt et al (2013), who conducted an empirical study in the bank sector in Turkey, proved that an innovation culture in an organisation facilitates the introduction, adoption and diffusion of innovations which, in turn, results in superior firm performance. Ruppel and Harrington (2001), drawing the competing values framework, concluded that a value system which emphasize flexibility and innovation is essential in development success for technological innovations. Another empirical study conducted by Brewer and Gajendran (2012) has observed that the dynamic and risk taking culture of a construction firm influences its level and quality of ICT uptake and integration to produce improvements. Moreover, some of the patterns identified in the studies are clearly associated with the success of technology adoption within firms, whilst others are specific in nature (i.e. BIM implementation in particular). However, it is appearing that the terms used in these studies; 'adoption', 'implementation' implies to a series of activities at a given covers the exploitation constructs (i.e. refinement of existing systems to make more benefits). This is majorly because of the diversified definitions used by the authors to describe the aforementioned terms as well as the inability to establish a clear line in between the terms; adoption, implementation and exploitation. Amabile et al. (1996) critically evaluate the innovative and risk taking type of culture by disaggregating in to two types; high creativity and low creativity. Both these type of cultures challenges factors inter alia; organisational encouragement, supervisory encouragement, work group supports, freedom, sufficient resources in different levels. Even though few studies challenge the view that clan culture positively impact innovation exploitation, there is a consensus among authors for its positive impact; which leads to formulate the following hypothesis:

H2b. Adhocracy culture has neither a uni-polar impact on the exploitation of BBI nor significant impact on the exploitation of BBI

The external knowledge acquisition encouraged by the market culture appears to be positively impact on both BBI exploitation and competitive advantage (Brewer and Gajendran 2012). Its emphasis on goals accomplishment stimulates the long-term orientation associated to competitive advantage. The market culture also focuses on stability and control instead of on the flexibility which a necessity for compete in a highly agile environment. A positive effect of this culture on exploitation and competitive advantage can therefore be expected.

H2c. Market culture positively impact on the exploitation of BBI

The views reported in the literature on hierarchy culture contain both positive and negative impacts towards BBI exploitation. Kanter (1988) states that innovation is most likely to occur in organisations that have integrative structures, emphasize diversity, have multiple structural linkages inside and outside the organisation, have intersecting territories, have collective pride and faith in people's talents, and emphasize collaboration and teamwork (p. 383). This perception describes the degree of 'complexity' and stratification' of organisational structures (Mintzberg, 1979). On the other hand, some of the authors claim that the hierarchical nature of an organisational structure has highly negative effect on innovation uptake as well as its diffusion, as a result of the power barrier between individuals. This can be attributed to achievements of norms and formal procedures and control, which are considered to be the main barriers for innovative technologies adoption and survival. High-structures are said to inhibit continuous change orientation, communication and dialogue, empowerment and risk-taking. However there's no agreement on the negative impact of hierarchy culture on BBI exploitation. Because the constructs identified for exploitation in this study require a set of robust (predominantly quantitative) as well as highly structured measures to understand the dynamics of.

H2d. Hierarchy culture bi-polar impact on the exploitation of BBI and has no significant impact on the exploitation of BBI

FINDINGS AND DISCUSSION

The conceptual framework

According to the review of literature carried out, evaluating the positive and negative impacts, the above-mentioned studies focus on different aspects of the relationship between organisational culture and exploitation of innovative technologies, under

complexly different conditions. In summary, following hypotheses were concluded and a theoretical model was developed (see Figure 1).

H1. BBI exploitation positively impact on organisational competitive advantage

H2. Organisational culture will affect Exploitation of BBI. In particular:

H2a. Clan culture positively impact on the exploitation of BBI

H2b. Adhocracy culture has a bi-polar impact on the exploitation of BBI and has no significant impact on the exploitation of BBI

H2c. Market culture positively impact on the exploitation of BBI

H2d. Hierarchy culture has a bi-polar impact on the exploitation of BBI and has no significant impact on the exploitation of BBI

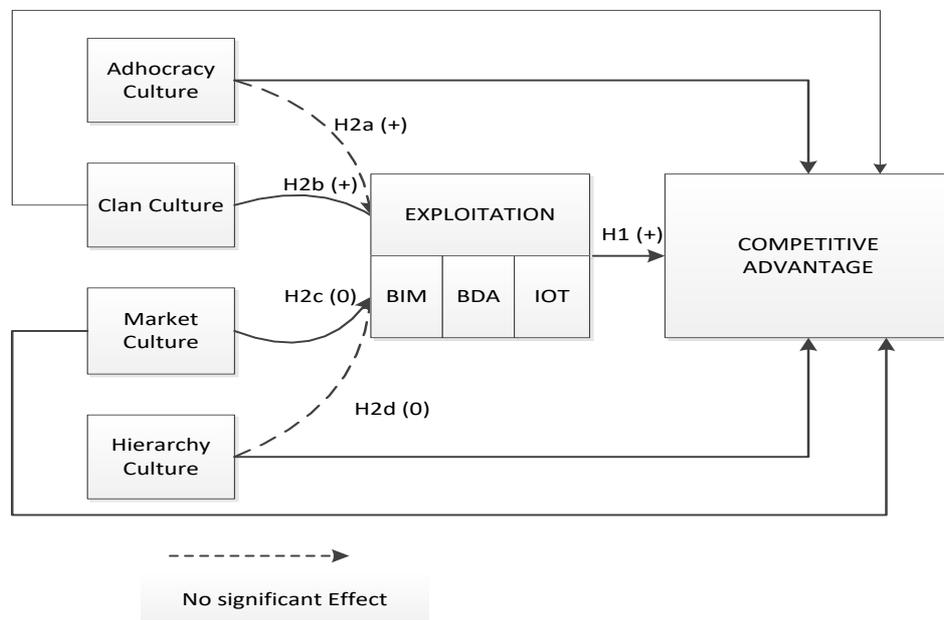


Figure 1- Conceptual Framework for the relationship between culture, exploitation and competitive advantage

Amongst the four culture dimensions, clan and market cultures found to be the two cultural dimensions, that create comparatively high influences creating new uses, extending and leveraging existing competencies, promoting efficiency gains as well as effectiveness gained by the use of BIM, BDA and IOT. To facilitate BBI exploitation within construction sector, the stakeholders are suggested to span over their departmental or organisational boundaries, so as to encourage communicate and exchange their BIM/BDA/IOT knowledge and experience with working colleagues, business partners and encourage the firms' culture to reflect an extended family with more engagement and participation by its employees.

Further, encouraging the result orientedness (goal achievement) and the ability to recognise the value of competition helps firms to enhance their competitive edge. Disaggregating each domain, the performance efficiency expected through BIM is likely more affected by the risk taking dynamism of adhocracy while the predictability for business insights expected in BDA is majorly influenced by 'Clan Culture' for its flexibility in creative thinking. Smart achievements expected through IOT is mostly a matter of the level of internal and external integration where both 'Hierarchy' and 'Adhocracy' cultures.

CONCLUSION AND RECOMMENDATION

This paper focused on the relationship between organisational culture and the exploitation of BBI for organisational competitive advantage. The study design was built on appropriate theoretical modelling work, particularly in the development of appropriate interventions with 'competitive advantage'. Cameron and Quinn's (2006) Competing Values Framework Model was deployed to explore the aforesaid impact. However, 'competitive advantage' is not in-depth evaluated in this study. The study proposes both positive and negative correlations between constructs of culture and exploitation of BBI. The study provides evidence for the positive link between two organisational cultures (clan and market) and BBI exploitation while highlighting both negative and positive impact of hierarchy and adhocracy cultures. The implications of these results may help practitioners (within an organisation) who are intending to adopt, implement and exploit technological innovation to compete in the market. The paper highlights the fact that, organisational culture is a key enabler for exploiting BBI and thereby for achieving competitive advantage. Lastly, since the present study is based on literature review, further empirical studies (for quantitative studies and cross-validation) are required to validate the hypotheses proposed in this paper.

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