Identification of the Causes of Non-Value-Adding Activities during the client briefing process

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ABSTRACT AND KEYWORDS

Purpose of this study

This study endeavours to identify the causes of non value-adding activities during the construction client briefing process in order to minimise the occurrence of them in design process.

Methodology

A literature review focusing on the identification of the causes of non-value adding activities during the client briefing phase was conducted. Close-ended questionnaires were distributed and interviews were conducted with purposively sampled registered architects, structural designers, project managers, contractors and quantity surveyors in the Central Business District of the City of Cape Town.

Findings

The study reports that the construction client briefing process fails to identify and minimise the causes which give rise to activities that do not add value to the design process. It was revealed that an inadequate design
brief resulted from the failure on accurate interpretation of building services, inadequate scope of work resulted to changes in drawing specifications, unnecessary redesign drawings arose due to failure in accurate interpretation of the building services and design briefs that did not take complete consideration of client’s requirements resulted in changes in design drawings, hence the existence of non-value adding activities.

Practical implications

The study increases the knowledge and understanding of the causes of non-value adding activities during client briefing process. This potentially will reduce the occurrence of non-value adding activities during the design process which will subsequently reduce waste during construction stage.

Originality/value

The identification of the causes of non-value adding activities during the construction client briefing process provides a step forward towards the reduction of the non-value adding activities in design process.

Keywords

Causes, client briefing process, non-value adding activities, design process

1. INTRODUCTION

The client’s briefing process of construction initiation phase consists of identification and understanding of needs, wants and expectations of the clients’ development objectives. Kamara and Anumba (1999) stated that the process of collecting information from a client under the premises of interviews and workshops during the early stages of construction projects seeks to identify the client’s development objectives. A briefing process permits clients to communicate their intentions about the project and together with the project team outline project objectives (Yu, Shen, Kelly and Hunter, 2005). One of the aims of this process is to provide a project team an opportunity to translate client’s requirements into architectural concepts that other designers can use to develop their own design activities (Gray and Hughes, 2003). Unfortunately, clients communicate their needs and requirements in non-design terms which necessitate the project team to capture and translate into design terms (Kamara Anumba, and Evbuomwan, 2000). Smith et al., (2000) asserted that the pre-design stage of construction projects is the source of problems such as rework and change orders. This is because the inadequacy in understanding and
translating accurately the clients' requirements by the members of the project team is likely to occur. Thus, the lack of identification of client requirements and the lack of a complete framework to capture the client requirements are still considered major problem factors in the client briefing process (Yu et al., 2005). Consequently, poor understanding of the client's requirements leads to project delays and high variation costs (Ree and Meel, 2007). Tzortzopoulos et al., (2005) argue that project delays arise as a consequence of non-value adding interactions due to poor definition of requirements.

Non-value adding activities are referred to as activities which absorb resources without adding value to the customer (Saukkorippi, 2005). Koskela (1992), Alarcon (1994) and Love et al., (1997) defined non-value-adding activities as all those activities that absorb time and resources and generate direct or indirect costs but do not contribute value to the product. Moreover, in construction terms non-value adding is synonymously to waste (Buzby et al., 2002). Saukkorippi (2005) argued that in order to be capable to define what non-value adding is the term value has to be described. In other words, value-adding and non-value adding activities can best be realized if the term value can be interpreted and expressed in what it actually means to those to whom value is to be delivered.. Knuf (2000) described value as everything a customer is willing and satisfied to pay for. Evans (2002) observed value as the relative amount of the customer's perceived benefit to perceived cost. Alwi (2002) opined that the moment the client first decides to invest in the construction project, prevention of non-value adding activities should be considered. This study aims at identifying the causes of non-value adding activities during the construction client briefing process in order to minimise the occurrence of non-value adding activities in design process.

2. BACKGROUND

For many years, waste in construction has been known as the loss of productivity due to labours, inefficient use of materials, repairs and reworks that result in projects running over budget and over time. According to Alwi et al. (2002) activities which do not add value (waste) to construction work such as repairs, reworks and time delays etc. contribute to the reduction of construction work productivity. However, waste goes beyond the loss of productivity due to inefficient use of labour and materials on site.. For example, Lam et al. (2001) argue that the construction industry is associated with collective efforts spent on producing unusable or impractical project information which collectively creates waste. According Burke (2003) a misleading scopedefinition (scope of work) resulted from the failure to accurately interpret the clients' needs and problems. Arguably, a misleading scope definition is deficient project information which leads to erratic decision making. Furthermore Burke (2003) argued that if this
misleading definition causes rework and additional effort, both the cost and time implications of the project are affected. The reworks and additional effort stated here does not only apply to construction process on site, but also to the building design process in the form of redesigns and design changes. Both the redesigns and design changes absorb time and resources of the project.

3. LEAN CONSTRUCTION PRINCIPLES

According to Abdelhamid (2004), lean is a strategic method-process concerned with shortening time period between the client order and the product delivery by eradicating waste and maximizing value of the paying client. This argument is supported by Garcia and Drogosz (2007) in their study on lean engineering principles when illustrating the product development lead-time. As shown in the figure below the “lead time of a process is directly related to the part of waste which slows down the development process and absorbs the main engineering resources”. The longer the non-value adding time the more waste is accommodated during the process.

![Figure 1: Product Development Lead Time](image)

Source: Lean engineering principles (Garcia and Drogosz, 2007)

Lean thinking approach attempts at identifying and eliminating waste. The development of a product includes not only value added time such as for
example defining and designing a product but also non-value added times such as for example design changes and modifications.

Typically, non-value adding activities arise following alterations demanded by the clients to design drawings. However, Koskela (1998) listed the principles of lean production as having to do with:

- reducing the non-value adding activities, leading to simplification, reduction of variability and increase of flexibility;
- increasing the efficiency of value adding activities associated with improvement of production technology and production skills;
- ensuring the product specifications thus improving customer value;
- improving a comprehensive and integrated way and balancing actions oriented to implement lean production principles in design, control and production system.

Above all, the lean design management principles aim at reducing or eliminating the non-value adding activities, thus increasing awareness of project participants about activities that add value to the project. Arguably, any effort aiming to reduce non-value adding activities (e.g. redesigns, change requests) can be achieved first by clear identification of the causes of non-value activities.

4. **CAUSES OF NON-VALUE ADDING ACTIVITIES ON CLIENT BRIEFING STAGE**

4.1 Poor definition and translation of client requirements

The construction industry has been struggling to identify causes which give rise to non-value adding activities within the activities performed during the client briefing process. These activities lead to project budget overruns, over time overwhelmed with rework, variations and disputes (Love and Li 2000; Tilley, et al., 2002; Andi and Minato 2003; Tilley and McFallan 2000a, b & c; Gallo et al., 2002). Because clients do not communicate their requirements in design terms compelling the project team to capture, interpret and translate into design terms (Kamara, et al., 2000), inadequacy in understanding and translating precisely the client’s requirements by members of the project team is likely to occur. Cooper and Kleinenschmidt (1996) pointed out that the failure to clearly define building characteristics and services before design begins might be a major cause of poor design quality and project process delays. Tzortzopoulos et al., (2005) argued that the long project delays arise as a consequence of non-value adding interactions due to poor definition of requirements. Tzortzopoulos et al.,
(2005) further opined that poor requirements definition is a value related issue that leads to inadequate project brief resulting in design proposals which fail to sufficiently consider requirements. The poor considerations of the client’s requirements result in failure of accurate interpretation of the building functions and services. Ultimately, this failure results in construction designs which are confronted by redesigns and modifications.

4.2 Poor consideration of client requirements

From the construction perspective, briefing is a process inclusive of the client informing the project team about the requirements that can satisfy the specific project stated need (Yu et al., 2005). In order for client satisfaction to be achieved, the client’s needs have to be translated into construction designs which specify technical characteristics, performance criteria and quality standards (Seymour and Low, 1990). If client requirements are inadequately considered concerning the function, the anticipated quality standards, the use of space and the whole working environment of the proposed building, non-value adding activities occur in the form of changes in design drawings and specifications. Thus, poor consideration of requirements results in unnecessary redesigns (Tzortzopoulos et al., 2005). The construction activities are inter-reliant, for an example; “changes made during the pre-design phase, proportional could have an impact of $1 to the project, and if not identified early enough the cost could increase to $ 10 during the design phase and up to $ 100, if left until construction had begun” (Tilley, 2005).

Moreover, the uncertainties provided by project initiation or conception stages due to insufficient information at hand and making of major design decisions too early in the project development process contributes to the failure to maximize overall project value (Othman et al., 2004). Nevertheless, Gray and Hughes (2003) opined that the start-up meeting during the briefing stage is intended to generate ideas through discussions in order to give understanding of the client’s objectives. Ultimately, a briefing process product is used to evaluate options and to articulate clearly the project requirements (Blyth and Worthington, 2001). However, construction clients believe that to ensure that the final product (building) meets and fulfils their requirements, an extended version of the briefing process that almost lasts until the final stages of construction could better do the job (Rezgui et al., 2001). This is because during the early stages of the construction project clients cannot always state their requirements clearly (Gray and Hughes, 2002). However, construction consultants view the briefing process as a well-defined process with a start and end, to ensure records of changes in order to be able to claim fees for any extra work activity (Rezgui et al., 2001). Arguably, non-value adding activities occur due to traditional focus by the briefing and design teams on converting client’s requirements into design solutions. This traditional transformation of clients needs (input) into design drawings and
specification (output) is undertaken without an accurate consideration of the client’s position concerning the function, the anticipated quality standards, the use of space and the whole working environment of the proposed building. Nonetheless, the consecutive analysis of the management of client’s requirements behind the spectacles of marketing discipline has presented the distinction between the focuses of selling and marketing as follows: “Selling is preoccupied with the seller’s needs to convert his service or product into cash, marketing with the idea of satisfying the needs of the customer by means of the service or product and the whole cluster of things associated with creating, delivering, and finally consuming it” (Levitt, 1991:10).

Traditionally, the client briefing and construction design teams stand over the counter as sellers of construction “service-activities” with the sellers needs in converting their services or product (drawings & specification) into cash. Arguably, poor consideration of the client’s requirements leads to failure in the accurate interpretation of the product (building) functions and services. The client, “as the purchaser of services from the construction industry” (Kamara et al., 2000) is served on the other side of the counter without a proper analysis of the end-user of the facility when the project is completed.

4.3 The construction clients and the building end-users

Change requests originate from a lack of clear definition and mutual in-depth understanding between the client’s development objectives and the building end-users services. The table below presents a “Change Request” format utilized by construction project managers during the design and construction phase, if and when changes are requested by clients.

| Source: Project management (Burke, 2003) |

**Table: 1 Change request**

<table>
<thead>
<tr>
<th>Change Request</th>
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<tbody>
<tr>
<td>Number:</td>
<td>Date Raised:</td>
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<tr>
<td>Initiated by:</td>
<td></td>
</tr>
<tr>
<td>Change requested (related drawings/work package)</td>
<td></td>
</tr>
<tr>
<td>Reason for change:</td>
<td></td>
</tr>
<tr>
<td>Approval:</td>
<td></td>
</tr>
<tr>
<td>Name:</td>
<td>Position:</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Project management (Burke, 2003)
The existing gap between the end-user clients and the paying clients in determining accurately the requirements of the client “body” has been identified by Ziesel (1981) as one of the major problem factors in the briefing process. Unfortunately, this problem still hunts, hinders and obstructs the success of the construction performance in recent times. Thus, Ryd (2001) argues that in the early stages of construction projects the co-operation between the consultants, clients (owners) and end-users (customer) are not accurately documented. Believing that the clients normally have a tendency to change their thoughts on various aspects of the project proposal during the project brief, CIOB1 (2002) advocate that identification and control of needs and objectives of the client and those of the project through careful examination to minimize future changes to the project brief is essential.

Ryd (2001) opined that construction clients do not only represent his own needs, but also the needs of those who are going to rent or let out the building premises. Thus, during the development of the functional brief the “business objectives” of the project and the “statement of needs” have to be translated into a researched and comprehensive brief document which precisely defines the client's requirements (Gray and Hughes, 2003). Arguably, accurate understanding of the client’s needs should be translated to solve the identified business opportunity which later the end-user will carry out in a form of rendering their own services. This suggests that clients' requirements should not be confused with end user’s needs. Hence, Ryd (2001) argued that the construction client has a responsibility to ensure that all desires and preferences of the end-user are met. In addition, interviewees during a study to identify the incidence of non-value adding activities within the Indonesian and Australian constructing companies confirmed that changes in designs arise due to owners or clients requesting changes to designs in pursuit to meet new preferences and needs (Alwi et al., 2002). These new preferences by clients are initiated through desire to meet end-users needs in relation to the building services. The pre-design stage has an influence on the design stage. The design stage has an influence on construction stage. The construction activities are interdependent.

5. METHODOLOGY

A purposive approach was adopted in the selection of participant companies in the Central Business District of the City of Cape Town. Questionnaire survey was used to identify the causes of non-value adding activities and to substantiate the theoretical framework. A questionnaire consisting three sections was drafted. The first section collected the
biographical profile of the respondents. The second section collected the views and opinions of respondents concerning the causes of the non-value adding activities during the client briefing phase. The third section collected the views and opinions of respondents concerning the possible link factors which influence the prevalence of non-value adding activities. According to Walliman (2005), a questionnaire enables a researcher to organize the questions and receives replies without actually having to talk to every respondent. Most of the questionnaires were hand-delivered to the selected respondents who were instructed to read and answer the questions. Other questionnaires were mailed. The hand-delivered questionnaire yielded high response rate than the mailed questionnaire. Out of the 100% of the questionnaires which were completed and returned, the hand delivered questionnaires amounted to 70% and the mail questionnaires amounted to 30%.

Closed-ended questions were sent out to purposive sampled registered quantity surveyors, architects, structural engineers, project manager and contractors to obtain opinions on the causes of non-value adding activities during the design phase. A purposive sampling is a useful method consisting of getting information from a sample of the population that one thinks knows most about the subject matter (Walliman, 2005). According to Creswell et al., (2007) purposive sampling refers to the chosen respondents whose experience and knowledge are relevant and required for the study. Due to time constrains the population was stratified and divided into characteristics of importance of research, for an example positions of participants, experience and the selection of the traditional project team organisations. Accordingly, the sampling design adopted was a stratified purposive sampling. The answers of the closed-ended questions from the respondents were captured and analyzed using the Statistical Package for Social Scientific (SPSS). A quantitative approach deals with data that is mostly statistical (Welman and Kruger, 2004). Internal consistency reliability for the scale questions was determined. Cronbach’s alpha coefficient of reliability was determined for scaled questions. The coefficient of 0.7 is acceptable as a rule of thumb. The construction companies selected are conducting their business in the Central Business District of the City of Cape Town.

6. FINDINGS

6.1 Research participation

Due to time constrain the targeted sample size was twenty (20) construction companies. However, out of twenty (20) companies 18 (90%) completed and returned the questionnaire. Participant companies included cost consultants (17%), project managers (22%), contractors (17%), structural designers (22%) and architects (22%). Positions of respondents
within their organizations included general managers (22%), assistance managers (16.7%), senior project managers (11.1%), structural engineers (16.7%), directors (11.1%), mechanical engineers (11.1%), candidate architects (5.6%) and senior architect assistants (5.6%). The experience of the respondents in the construction industry ranged from 1 - 10 years (33.6%), 10 – 20 years (27.9%), 20 – 30 years (27.9%) and 30 - 40 years (11.2%). The median length of experience in construction industry was 15 years. While respondents had been in their present companies for a period ranging from six months to 29 years, the median length of time they had worked there was 3 years and six months. All respondents had been involved in the building client briefing and design process of the construction projects.

6.2 Discussion of findings

6.2.1 Identification of the causes of non-value adding activities during client briefing process

A 5 point Likert scale established to what extent respondents agreed with given statements, namely Strongly disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, and Strongly disagree = 5. The findings are presented in Table 1. All respondents (100%) agreed that the lack of understanding precisely the client’s needs and requirements was the major problem during the client briefing process. Majority of (72.2) agreed that the poor definition of client requirements during client process resulted to construction designs which were confronted by redesigns. More than a half of respondents (66.6 %) agreed that the poor identification of client requirements during the client briefing process resulted long project delays. More than a half of respondents (65.2%) agreed that a lack of proper framework to capture and translate the client needs and expectations resulted in project delays.

Table 2: Causes of non-value adding: poor definition and translation of client requirements (N=18)

<table>
<thead>
<tr>
<th>Statements</th>
<th>SD %</th>
<th>D %</th>
<th>N %</th>
<th>A %</th>
<th>SA %</th>
<th>Mean</th>
<th>Std</th>
</tr>
</thead>
<tbody>
<tr>
<td>The lack of understanding precisely the client’s needs and requirements is</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>61.1</td>
<td>38.9</td>
<td>4.0</td>
<td>0.5</td>
</tr>
<tr>
<td>the major problem during the client briefing process</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor identification of client requirements during the client briefing</td>
<td>0</td>
<td>11.1</td>
<td>22.2</td>
<td>44.4</td>
<td>22.2</td>
<td>3.8</td>
<td>0.9</td>
</tr>
<tr>
<td>process causes long project delays</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
A lack of proper framework to capture and translate the client needs and expectations result to a misleading definition of scope of work

<table>
<thead>
<tr>
<th>Statements</th>
<th>SD %</th>
<th>D %</th>
<th>N %</th>
<th>A %</th>
<th>SA %</th>
<th>Mean</th>
<th>Std</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor definition of client requirements during client briefing process result to construction designs which are confronted by redesigns</td>
<td>0</td>
<td>22.2</td>
<td>5.6</td>
<td>50.0</td>
<td>22.2</td>
<td>3.7</td>
<td>1.1</td>
</tr>
<tr>
<td>Poor definition of client requirements result to poor design quality</td>
<td>5.6</td>
<td>16.7</td>
<td>33.3</td>
<td>27.8</td>
<td>16.7</td>
<td>0.5</td>
<td>1.1</td>
</tr>
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</table>

Less than half respondents believed that the poor definition of client requirements result to poor design quality. However, the survey also reports that more than a half respondents agreed that poor definition of client requirements during client briefing process resulted in construction designs which were subjected to redesign. Proper definition of client requirements by the project team members requires proper understanding of them. Poor definition of the client requirements originate from the lack of precise understanding of client requirements. Arguably, failure to interpret precisely the client’s requirements results in construction designs which attract the clients to request revisions and modifications. These revisions and modifications will lead to redesigns which consume time and resources. Changes in designs arise due to clients requesting changes to designs in pursuit to establish what was lost from the interpretation by the project team members. Potentially, failure in the accurate interpretation of the building functions and services, poor consideration of the client’s requirements and a misleading definition of scope of work result to non-value adding activity in a form of redesigns. Accordingly, a survey reports that lack of understanding precisely the client’s needs and requirements is the major problem during the client briefing process. Given that clients don’t communicate their requirements in design terms, capturing and translating their requirements is the major problem. If clients’ requirements are not captured and translated properly they produce a misleading definition. Thus, it was found that a lack of proper framework to capture and translate the client needs and expectations result to a misleading definition of scope of work. Project long processes arise due to poor identification of client requirements and lack of proper framework to capture the client needs and expectations. The poor definitions of requirements originate from inadequacy in understanding and translating precisely the client’s requirements by the members of the project team.
6.2.2 Identification of the causes of non-value adding activities during client briefing process

A 5 point Likert scale established to what extent respondents agreed with given statements, namely Strongly disagree = 1, Disagree = 2, Neutral = 3, Agree = 4 and Strongly disagree = 5. As shown in Table 3, majority of the respondents (88.8%) agreed that changes in project briefs originated from a lack of clear definition and mutual in-depth understanding between the client’s development objectives and the building end-users services. A large number (83.3%) of the respondents agreed that the basics in satisfying the needs of the client’s had a lot to do with understanding the project priorities and the business case of the end-user’s services. Most of the respondents (77.8%) agreed that the gap between construction client’s needs and the building end-users services was very important in relation to a clear understanding of the project requirements.

Table 3: Causes of non-value adding: Construction clients and the building end-users

<table>
<thead>
<tr>
<th>Statements</th>
<th>N</th>
<th>SD %</th>
<th>D %</th>
<th>N %</th>
<th>A %</th>
<th>SA %</th>
<th>Mean</th>
<th>Std</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change requests in project briefs originated from a lack of clear definition and mutual in-depth understanding between the client's development objectives and the building end-users services</td>
<td>18</td>
<td>0</td>
<td>11.1</td>
<td>0</td>
<td>44.4</td>
<td>44.4</td>
<td>4.2</td>
<td>0.6</td>
</tr>
<tr>
<td>The gap between the client's needs and the end-user services regarding a complete understanding of the project requirements is very important.</td>
<td>18</td>
<td>0</td>
<td>0</td>
<td>22.2</td>
<td>38.9</td>
<td>38.9</td>
<td>4.2</td>
<td>0.8</td>
</tr>
<tr>
<td>The basics to satisfy the needs of the client's have so much or a lot to do with understanding the project priorities and the business case of the end-user's services</td>
<td>18</td>
<td>0</td>
<td>11.1</td>
<td>5.6</td>
<td>55.6</td>
<td>27.7</td>
<td>4.0</td>
<td>1.2</td>
</tr>
</tbody>
</table>

It was reported that the lack of understanding the client requirements and the end-user services lead to change in project briefs. This is because understanding clients’ requirements does not necessary indicates the understanding of the building end-user’s services. The clients’ requirements should not be confused with end user’s services. If there is a poor distinction in understanding between the client’s development objectives and the end-users services in relation to the function, the
anticipated quality standards, the use of space and the whole working environment of the proposed building, non-value adding activity will occur in the form of changes in project briefs. Hence, non-value adding activity in a form change orders originate from a lack of clear definition and mutual in-depth understanding between the client development objectives and the end-user services. Furthermore, a large number of respondents agreed that the basics in satisfying the needs of the client have a lot to do with understanding the project priorities, and the business case of the end-user services. This is due to a fact that accurate understanding of the client needs has to be identified and translated to solve the identified business opportunity, which later the end-user will carry out in the form of rendering their own services. The accurate identification and classification of the client requirements and the end user services is imperative for the accomplishment of the project objectives.

6.2.3 Identification of the causes that influenced existence of non-value adding activities

A 5 point Likert scale established to what extent respondents agreed with given statements, namely Strongly disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, and Strongly disagree = 5. The findings are presented in Table 1. A large number of respondents (77.8%) agreed that inadequate design brief resulted in poor design drawings. Majority of the respondents (72.2%) agreed that failure in accurate interpretation of the product characteristics or services lead to inadequate design brief. Majority of the respondents (72.2%) agreed that inadequate working drawing details arise due to poor design management. Most respondents (66.7%) agreed that unnecessary redesign drawings arose due to failure to accurately interprete the products (building) characteristics and services.

<table>
<thead>
<tr>
<th>Statements</th>
<th>SD%</th>
<th>D%</th>
<th>N%</th>
<th>A%</th>
<th>SA%</th>
<th>Mean</th>
<th>Std</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inadequate scope of work result to changes in drawing specification</td>
<td>0.0</td>
<td>11.1</td>
<td>22.2</td>
<td>44.4</td>
<td>22.2</td>
<td>3.8</td>
<td>0.9</td>
<td>1</td>
</tr>
<tr>
<td>Unnecessary redesign drawings arise due to failure on interpretation of the building services</td>
<td>0.0</td>
<td>5.6</td>
<td>27.8</td>
<td>38.0</td>
<td>27.2</td>
<td>3.8</td>
<td>0.9</td>
<td>2</td>
</tr>
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</table>
The inadequate design briefs were reported to be responsible for poor design drawings. When designs are poor, contractors are supplied with impractical working drawings that demand future revisions during the construction process. The interdependence of design activities requires a chain production of value adding activities during the design development. Inadequate design briefs were reported to occur due to failure on accurate interpretation of building characteristics and services. The failure in accurate interpretation of building services originated from poor project requirements definition. In construction projects there are three requirements that need to be outlined. First, the clients requirements, second the end user’s services and third the project requirements. Failure in accurately identifying and categorizing these requirements leads to poor definition of requirements. Poor definition of requirements results to unnecessary work.

It was reported that inadequate working drawing details emanated from poor design management. Given that there are a large number of activities undertaken and many stakeholders (project team members) that need to be coordinated during the development of design, a failure to effectively plan, coordinate and control the design progress to ensure
information of an appropriate quality is delivered to meet the practical construction result to the obstruction of the project performance with redesign, rework, delays and disputation. Coordinating the design development for production rather than for excellence needs to be the major role of the design manager. Failure in above-mentioned issues will result to inadequate working drawings due to poor design management.

7. CONCLUSIONS

The paper presented that some of the non-value adding activities arising during the design process emanated from the pre-design stage. These non-value adding activities include redesigns and changes in designs. These activities absorb time and resources hence, non-value adding costs. The causes which influenced the prevalence of these non-value adding activities included inadequate design briefs. The inadequate design briefs emanated from the incomplete consideration of requirements. The incomplete consideration of requirements originated from a failure to accurately interpret the client product (building) services. The pre-design stage has an influence on the design stage. The design stage has an influence on construction stage. The identification of the causes of non-value adding activities will lead to the potential reduction of waste and promotion of activities that add value in construction productivity.

8. RECOMMENDATIONS

Construction clients are seeking for a “one-stop shop” service that offers certainty of cost and time in the project delivery process. A clear identification of the causes which influence existence of non-value adding activities is required. The identification of the causes of non-value adding activities at an early stage would provide useful information that would allow project members to reduce their occurrence. Workshops for project team members on lean design management approach needs to be conducted. By adopting effective implementation of appropriate methodology of lean construction principles when preparing the design brief, non-value adding activities can be minimized. By understanding the penalties of non-value adding activities all participants will be able to execute their roles as facilitators of a concise, clear and comprehensive brief process, thus ensuring the elimination of non-value adding activities. The overall result will lead to improve a chain production of value adding activities during a design phase.
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