Application of Value Chain Principles: A linchpin to successful completion of construction projects at institutions of higher learning. The Masvingo Regional Campus experience.

by

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Abstract

Every organisation has an operations system that creates value by transforming inputs into outputs (Robbins and Coulter, 2002). This study analysed how the application of value chain principles can influence the success of construction projects at institutions of higher learning. The study was based on the construction project at Masvingo Regional Campus of the Zimbabwe Open University (ZOU). A qualitative participatory approach was used to analyse data related to the requirements for value chain management that could be of competitive advantage to the successful completion of a construction project. A convenient sample of 8 members of staff at the region, headed by the Regional Director, and a workforce of 12 men doing various construction related activities, were used to augment qualitative data drawn from documented minutes and progress reports on the construction project. Results indicated that the successful completion of a construction project rests on three pillars of the value chain process. In addition, elements of best practices such as strong leadership, teamwork, strong financial support, and effective supply chain, among other elements of value chain management, are linchpins to successful completion of construction projects. The study concluded by recommending a model, similar to Porter’s value chain model (Porter, 1985) that can be used by other Regional Campuses of the ZOU in their future construction projects.

Keywords: value, value chain, value chain management, principles, construction project, institutions of higher learning.

Introduction

Since its inauguration in 1999, the Zimbabwe Open University (ZOU) has spread its tentacles in ten Regions (Provinces) of the country, with each region given the mandate to deliver educational services to the people living in surrounding areas. For this reason, the vision of ZOU has been to build (other than renting existing structures) ‘Homes for ZOU’, a term used to describe an infrastructural development that includes multi-purpose buildings to house and serve the educational needs of distance learners. However, since its conceptualisation, the idea of a ‘home for ZOU’ has not been fully implemented until ZOU gave Masvingo Regional Campus the mandate to embark on one of the first initiatives to construct such a structure of which the success would stand as a model for other regions to follow. Given this mammoth task and to avoid a trial and error approach that could have been very costly for the University, Masvingo Region chose to apply research based principles that would guide administration to ensure a successful completion of the project, hence, amongst an array of options brainstormed by Masvingo Region Administrators, the application of ‘value chain principles’ was chosen as the best option. This thinking was based on the fact that for every construction project to succeed, the organisation should have an operations system that creates value by transforming inputs into outputs (Robbins and Coulter, 2002). This study, therefore, is carried out to find the extent to which the application of value chain principles, exemplified in a model (Hansen 2007), can influence the success of a construction project at institutions of higher learning and at Masvingo Regional Campus of ZOU in particular.

The value chain is a concept borrowed from business management that was first described and popularised by Michael Porter in his 1985 best seller ‘Competitive Advantage: Creating and Sustaining Superior Performance’ (Porter, 1985, 1996; Hansen, 2007). In this book, Porter describes the value chain as a chain of activities the organisation arrays in order to add value to the product as it passes through the stages of production. This means, the chain of activities gives the product more added value for which customers are willing to pay a price. In this study ‘customers’ refer to all the stakeholders (including students) who have something to do with the construction project. Furthermore, Porter argues that the ability to perform particular activities and to manage the linkages between these activities is a source of competitive advantage and this depends on the step by step business processes that are used to serve the customer.

A brief review of literature offers us with further understanding of Porter’s ideas on value chain. According to Lynch (2006), Porter argues that the ability to perform particular activities and to manage the linkages between these activities is a source of competitive advantage and this depends on the step by step business processes that are used to serve the customer.

Robbins and Coulter (2002) clarify that value is the performance characteristics, features and attributes, and any
other aspects of goods and services for which customers are willing to give up resources (usually money). Thus, according to Robbins and Coulter (2002), the value chain is a series of organised work activities that add value at each step beginning with the processing of raw materials and ending with a finished product in the hands of the users. Lindfors (2000) concurs by pointing out that value chain is the manner of managing, controlling, handling and directing such sequence of activities an organisation carries out to create products and services that increase profit for the organisation and generate profit value for the customer. As for Kaplinsky and Morris (2000), the value chain process describes the full range of activities which are required to bring a product or service from conception, through the different phases of production, to the final delivery and handover to consumers after completion. It is in this light that this study was carried out as it intended to come up with a simpler value chain construction model in the context of Masvingo Regional Campus, and in the process generate generic value chain elements or factors that would apply to any construction project that the University would intend to embark on.

Theoretical Framework

As alluded to earlier on, the study drew its relevance from Porter’s Model of value chain management (Porter, 1985, Hansen, 2007, Lynch, 2006). Porter divided the range of activities in the value chain into two categories: the primary activities and support activities. Primary activities are grouped into five main areas and are directly concerned with the creation or delivery of a product or service. The five groups are: inbound logistics, operations, outbound logistics, marketing and sales and service. Each of these primary activities is linked to the second category of support activities which help to improve their effectiveness and efficiency. There are four main areas of support activities: procurement, technology development, human resources management and infrastructure (systems for planning, finance, quality information management etc). Thus, the present study based its construction project on Porter’s ideas and concepts on value chain, which simply means that in a construction project, an organisation requires inputs or resources that are worked upon to produce a product that should attract customers or clients to pay for the service rendered by the product. To achieve this, there should be support activities in the form of planning, financing, procurement, quality management and marketing of the product so that it is of use to the customers. These were the guidelines on which this study was based.

However, as Hansen (2007) argues, Porter’s value chain may not be applicable in every organisation or context. Nevertheless, his ideas form a formidable foundation for a location of a process model that fits a given context. In other words, the present study borrowed Porter’s value chain concept in order to come up with a value chain process model or strategy that would be reflected in a distinctive value chain. What it meant was that Masvingo region was expected to perform activities differently from its rivals; otherwise it started behaving more and more like its competitors and thereby losing its competitive advantage (Robbins and Coulter, 2002).
way of applying value chain methodology because the business of production is complex and heterogeneous. As such, each chain will have particular characteristics whose distinctiveness and wider relevance can only be effectively analysed in the context of where the activities are happening. To this effect, the study was carried out at Masvingo Regional Campus of the ZOU and adopted a qualitative participatory approach of which the researchers took an active role in the construction project. This method was chosen because of its practical orientation and predisposition to implement changes and its suitability to accommodate new initiatives (Errasti, Beach, Oduoza and Apaolaza, 2009).

As for the sample, Patton (1990) argues that in qualitative research, there are no strict criteria for sample size because qualitative studies typically employ multiple forms of evidence. For this reason, the study adopted a multi-stakeholder approach aiming to involve different stakeholders such as Senior Management of the ZOU, Masvingo Campus regional staff headed by the Regional Director, and a labour force of 12 men and one artisan.

A triangulation of methods was used to collect data. Firstly, data were collected using conversational interviews (Patton, 1990) that required information about best practices in a construction project, and interviews were conducted on the project sites or in the participants’ offices in order to get a complete picture of the information flows (Atkin, 1998). Secondly, data were gathered using observations for the purposes of describing settings, activities, people and the meanings of what was observed from the perspective of the participants. These observations were found critical because they led to deeper understandings than interviews alone since they provided knowledge of the context in which events occurred (Eisner, 1991). This enabled the researchers to see things that the participants, especially the contractor and his workmen, were not aware of, or that they were unwilling to discuss or redo.

Thirdly, data were captured through document analysis of minutes of the weekly meetings held by the construction committee, and also from official records of the PSIP funds, as well as from written reports of various officials involved in the construction project. In some cases, a ‘voice’ in the text, that is, particular quotes that illustrate the themes being described (Hoeffl, 2009), were also used.

Basically, data were analysed through inductive means that allowed critical themes to emerge (Patton, 1990) and these themes were examined and interpreted in a holistic fashion to really find what the participants intended to communicate.

Results

Findings of the study revealed that the management and successful completion of the construction project at Masvingo Region rested on three main value chain pillars, which were:

1. The management organisational structure
2. The value chain process
3. The value chain support elements.

The contribution made by each of the pillars in the successful completion of the construction project at Masvingo Region could be explained as outlined below.

1. The management organisational structure

Unlike Porter’s value chain theory (Porter, 1985) the study revealed that for a value chain management process to take place, particularly of a construction project, there should be a management structure in place that determines and provides a framework by which jobs, tasks, and activities are divided, grouped and coordinated (Robbins and Coulter, 2002). Thus, analysing the Masvingo Region construction project, such a structure was conceptualised and was put in place for purposes of directing activities of the construction project.

Conspicuous at the top of the hierarchy was the Senior Management of the ZOU comprised of the Vice Chancellor, the Registrar, the finance Director; with the Director Information and Communication Technologies (ICT) and Director Library and Information Services (LIS) on one side as consultants in their special areas, and the Director works, on the other side as a link between Senior management and the Region. The role of senior management was to direct the vision of the whole organisation and had the authority and responsibility for all decision making and for project definition in the organisation. Project definition is where the form of the project emerges (Atkin, 1998), hence, for this construction project, all approval rested within their jurisdiction.

The next stratum in the organisational hierarchy was the Regional team. For the construction project to be effective and efficient, the Masvingo Regional team found it necessary to form a committee better known as the ‘construction committee’ which was divided into some work teams. Talking about work teams Robbins and Coulter (2002) point out that these are formal groups made up of interdependent individuals who are responsible for the attainment of a goal. Thus, the construction committee at Masvingo region was composed of people of specialised skills, experience and expertise for the purpose of decision making and for purposes of driving all the value chain activities of the project. The construction committee was headed by the Director Operations, who in real terms was the Regional Campus Director. The Director Operations assumed the role of a ‘think tank’ and director of the whole organisation’s vision at regional level. The Director Operations also offered strong and effective leadership that united all members and units of the organisation so that the achievement of goals were realised. Under Director Operations, was the Operations manager (Deputy Regional Director) who assisted the Director Operations in the day-to-day supervision of the project. Next was the Procurement manager (Quality Assurance Coordinator) who was responsible for all the procurement of resource materials needed for the project. The Procurement manager ensured that all construction materials supplied adhered to quality standards as stipulated in the initial design and plan of the project. These together with the Regional administrator and the accounts clerk, three other senior members of staff, and the contractor, who was the project artisan, jointly constituted the construction committee. One key informant described the construction committee as the ‘foot soldiers’ of the project.
Again, commenting on the importance of the construction committee, one of the key participants remarked:

The idea of having a construction committee was our salvation, our ‘Moses’ and a short in the arm, otherwise each day’s work could have been a confusion, with people not knowing what to do and going in different directions.

Apart from just sharing ideas as being the biggest advantage of committees in organisations (Timothy, 2009), the construction committee jointly tasked itself with a special role of running the project on a day to day basis. Analysing the minutes of the committee meetings, results indicated that the members of the construction committee met once every week (usually on a Monday) to do the following:

1. Reflect and evaluate previous week’s value chain activities
2. Define the current week’s tasks and activities
3. Identify requirements for the immediate tasks
4. Discuss procurement procedures, that is, quotations, supplies and quality of goods
5. Discuss regional PSIP budget implications, that is, showing expenditures and balance
6. Examine contractor’s challenges and welfare of the workmen
7. Provide or suggest solutions and way forward
8. Set targets and deadlines for the remaining tasks and work activities.

At the end of it all, the minutes of such meetings were compiled and sent to the Registrar for advice, guidance and approval.

Considering the complexity of any construction project, it was apparent that such kind of a ‘swot’ analysis of the project value chain was critical and fundamental in the sense that it kept the project’s objectives in tandem with the goals, and everybody involved was kept informed about important decisions underpinning the project and consequently making the whole chain of activities move closer towards the successful completion of the project.

The third level in the organisational hierarchy was the labour force. Findings indicated that the labour force for the construction project under study operated in two different models, that could be referred to as Model ‘A’ and Model ‘B’.

In model ‘A’, labour force was contracted by the University. This means, the workmen (builders) were contract-full-time employees of the University and this model was used for the greater part of the first phase of the project. In model ‘B’, labour was wholly contracted, with one main contractor sub-contacting certain specialised jobs. When interviewed, the participants revealed that each of the models had its own advantages and disadvantages. The following were the advantages and disadvantages of model ‘A’ characterised by contract full-time employees at the university.

**Advantages of model ‘A’**
- Workmen, as employees of the University, were on the University’s payroll and received full benefits which included a monthly salary and approved allowances.
- Workmen did tasks as directed by the employer (Regional Director). This meant that there was more flexibility in task distribution, ensuring right task done at the right time.
- Could reduce costs because there was no hiring of extra labour.
- At least quality of work is ensured since supervision is wholly the responsibility of the employer.
- Better welfare of workers was ensured since every worker was assured of a pay at the end of the month.
- Generally, workers were motivated.

**Disadvantages of Model ‘A’**
- Caused congestion on the organisation’s staff establishment, leading to other departments being understaffed.
- Tasks could take a longer period to complete, that meant workers could not exert their maximum effort because they, at the end of the month, still received their full wages.

The following were said to be the advantages of Model ‘B’ (wholly contracted labour).

**Advantages of model ‘B’**
- Tasks could take a shorter period to complete since many people could be sub-contracted to do several tasks at the same time.
- Could be cheaper if all resources were available.

**Disadvantages of model ‘B’**
- Could be very costly in both time and money if supplies of materials were inconsistent.
- Contractor could not look after the welfare of workers well leading to workers getting demotivated and consequently affecting both quality of work and time taken to complete the tasks.
- Shifted responsibility of supervision from the project owner to the contractor who could not have effective administrative skills.

A closer look at the two models could reveal that model ‘A’ could have been of competitive advantage to the University in the sense that time wasting by workers was minimised because workers were fully tasked to do something about the project every time. Unlike in model ‘B’ where, in the delay of resource supplies, workers could temporarily be laid off, payment of workers could be irregular and could affect their motivation, and work could be done hurriedly leading to quality of work compromised, model ‘A’ ensured a smooth flow of all these activities leading to the achievement of intended goals.

Commenting on model ‘B’, one of the participants exclaimed: With this system (of contracted labour) we are using now, we are not assured of ‘a meal’ on our table everyday because money is not forthcoming. We spend a lot of time doing nothing except waiting for deliveries and the more time we spend doing nothing the more time we
This was when the actual tasks identified in the planning stage, for actual transactions to take place. Withdrawal of money from the PSIP account so as to give way authorized the procurement manager and the accounts clerk to in liaison with other members of the construction committee, the budget and time schedule. Link them up to tasks and labour, and align their implications to committee members to draw up the following activities:

- Defining work tasks.
- Estimating required resources and material supply.
- Setting work schedules and targets.
- Identifying labour force and expertise required.
- Discussing budget concerns and implications.
- Examining real and anticipated challenges.
- Suggesting way forward.

Generally, the value of this stage was to generate activities, link them up to tasks and labour, and align their implications to the budget and time schedule.

**ii) The tender procedure**

The next stage in the value chain process was the tender procedure. This stage involved the submission of quotations for each anticipated purchase, the selection of suppliers, and recommendation of approved suppliers in compliance with minimum legal requirements of purchasing and supplying. This meant that the materials were to be sourced from renowned registered suppliers and for every item to be bought, there was supposed to be three quotations out of which one with lower pricing but at the same time providing equally quality goods, was recommended as the supplier of those goods and hence, of competitive advantage to the organisation.

**iii) Procurement stage**

The next stage involved procurement of the recommended goods. In that stage, the Director Operations (Regional Director) in liaison with other members of the construction committee, authorised the procurement manager and the accounts clerk to make requisitions of the required purchases, leading to the withdrawal of money from the PSIP account so as to give way for actual transactions to take place.

**iv) The Operations stage**

The procurement stage was followed by the operations stage. This was when the actual tasks identified in the planning stage, were carried out. The contractor was expected to adhere to quality standards and to follow specifications as per agreed construction plan. Tasks could involve excavation, laying concrete slab, brick work, plumbing or painting; some or all which would be subject to inspection by City Council engineers and other standards control experts.

**v) The Supervision stage**

After the operations stage, followed the supervision and quality control phase. In that stage, the construction committee, both as a team or as individuals, visited the project site and supervised the work done. Lessons drawn from this phase were that even if the construction committee members were not qualified constructors or artisans, the observations they made were still of competitive advantage to the organisation. As argued by Sun Tzu (2011), competitive positions are defined by the subjective views of customers (not necessarily experts). It was therefore imperative that observations made by supervisors were communicated to the contractor in a constructive and positive manner. In many cases, things pointed out as errors by the supervisory team were those that even the contractor himself could not see or point out.

**vi) Change implementation and feedback stage**

Following the supervision stage was the change implementation and feedback stage. Implementing change in a construction project is critical because if not enforced, it faces resistance from actors thereby compromising quality. During implementing change, the constructors were facing challenges, for instance, receiving insufficient supply of materials or they were in need of appropriate technology that was required to add value to the activity. That information was then given as feedback during the following committee’s meeting, resulting in the recycling of the previous stages of planning, procurement, material supply and operations. As can be observed, these stages became routine or became cyclic value chain activities that characterised the whole construction process until the project reached the final stage of certification, handover and service. Some of the stages overlapped and others occurred simultaneously.

**vii) Certification, handover and service stage.**

The final stage of certification, handover and service guaranteed clients and project owners an assurance of the completion of the project so that it could be of service to the users. Certification of occupation, which is normally given by City Council Engineering and Health departments, ensured adherence to quality and safety issues of the building project. That meant that the project owners, who, in the case of this study, were the Vice Chancellor, the Registrar and The Regional Director, could not release the final payment of the labour costs to the contractor until they were convinced that safety and security of the occupants and the lifespan of the building were guaranteed. After certification had been done, the project could then be handed over to the project owners, who in turn, could pass it on to the users leading to the official opening of services to the clients.

**3. Elements of the Value Chain Process.**

Gleaning through all the findings above, there was evidence that showed that there were eleven elements of value chain or
factors that also acted as pillars to the successful completion of a construction project. Participants in the study identified and interpreted those factors as follows:

* Strong and effective leadership, that is, the ability to influence a group toward the achievement of goals.
* Teamwork, that is, a competitive spirit that drives members in a team to work as a group toward achievement of the intended goals.
* Strong financial support, that is, a steady and consistent supply of funds to support the purchase of materials, labour costs, transports costs etc.
* Effective supply chain, that is, ability to provide and supply quality goods that are in compliance with laid down construction standards, rules and regulations.
* Quality assurance, that is, ability to satisfy customers through compliance to laid down criteria and requirements.
* Communication, that is, ability to transfer ideas to others so that the message is understood and interpreted appropriately, leading to appropriate feedback given.
* Supervision, that is, ability to observe and identify errors and suggest corrective measures that influence change and improvement in the activity.
* Accountability, that is, ability to have responsibility of your actions and everything that is entrusted under you.
* Transparency, that is, ability to make others see and understand your actions before major decisions are passed.
* Flexibility, that is, ability to trade off what you think is your own with something different but equally valuable.
* Competencies, that is, the ability of the organisation to provide relevant skills, capabilities and resources, including appropriate technology, to support the value chain activities.

Conclusion

The research reflected in this study was an account of attempts to re-engineer the design and construction process along the line that had added value as its objective (Atkin, 1998). As such, this study showed that for any construction project to be successful, an organisation or institution should use a systematic approach that acts as a guide for all decisions made. In the study, Porter’s value chain principles were seen as a valuable guide for the construction project at Masvingo regional campus. However, in addition to Porter’s views that it was possible to successfully complete a construction project at Masvingo Regional Campus. This means that the ZOU can now apply the same model to any construction project intended to be accomplished in any of its regions. The model can also be generic to an extent that it can be applied to any construction project in institutions of higher learning across the globe, which is one of the biggest contributions, that this research has made in the field of research on construction projects.

Recommendations

The study therefore recommended the following:

1. The ZOU should use the value chain model as a guide toward successful completion of the construction projects; hence it achieves its goal of having a ‘Home for ZOU’ in each of its Regional campuses.
2. In considering between the two models of labour used in the study, findings have shown that it is of more competitive advantage to the institution to use contract full time employees than to use wholly contracted labour because the former type of labour is more economical in terms of time and financial costs.
3. That institutions embarking on construction projects should have a reliable supply of funds to support the project, a reliable supply of materials that meet certain quality standards, and a labour force with skills to execute the construction activities.
4. That the use of the three value chain pillars of i) organisational structure, ii) the value chain process and iii) the value chain elements, should be of necessity to any construction project because it ensures success and at the same time minimises errors.
5. That project owners should supervise their own construction work even if they are not qualified constructors because findings in the study have shown that quality is what clients say is it.
References