Challenges Facing the Construction Industry in Developing Countries

M DATTA
Department of Architecture and Building Services
Private Bag 0025, Gaborone, Botswana
mdatta@gov.bw

Abstract

A successful construction industry is essential to us all. Benefits from efficiently constructed buildings and infrastructures are well known and we all benefit from them.

If we are prepared to challenge the waste and poor performance arising from existing practices and focus efforts on delivering the value that our customers need we can attain and sustain continuos improvement in the industry.

Theme B is the topic of this presentation. It is not easy to sustain radical improvement in a diverse industry as construction, specially with the constraints of developing countries.

Five key areas of change are identified to set the agenda for the industry at large:

- Committed Leadership
- Focus on the customer
- Integrated process and teams
- Quality driven agenda
- Commitment to people

Ambitious targets and effective performance measurements are essential to deliver improvement. Proposals for a series of targets for annual improvements are made. Extensive use of performance data by the industry to inform the clients is to be seen.

To achieve these targets the industry will need to make radical changes to the process of project delivery. We must do so to secure our own future. It is a challenge to the industry to commit itself to change.

Keywords: *Commitment to change, Effective performance measurements, Poor performance, Radical improvement, Target, Waste*.

CONSTRUCTION INDUSTRY AND NATIONAL ECONOMY

National economic indices related to various industries reveal their corresponding economic role. Some of these are:- Gross domestic product (GDP), Gross output, Compensation of employees and Gross capital formation. Data from the SADC region (Ref:Economic Intelligent Report) is collected for GDP and data for Botswana (Ref: Central Statistics Office, Gaborone) is presented in detail for reference.

Gross domestic product is total market value of all goods and services produced within a country, less the cost of goods and services used during the production process. GDP data from some of the SADC countries relating to construction industry are submitted below for reference (these are percentages of total GDP):

Angola	4.8% in 1998	Mozambique	11.3% in 1997
Mauritius & Seychelles	7.2% between 1991-96	Zimbabwe	5 to 3% in 1996
Malawi	16% in 1996	Namibia	11.0% in 1997
Tanzania	4.9% in 1996	Botswana	10.0% in 1974/75
			6.4% in 1994/95

Gross output of a production is the value of all goods and services produced and sold by the sector (construction in this case) in an accounting period adjusted for changes in stock of work in progress and finished product. In Botswana gross output rose from P 54.1 million in 1974/75 to P 2,454.6 million in 1994/95 for the industry. (Ref: Central Statistics Office, Gaborone)

Compensation of employees consists of all payments in cash and in kind, by producers to employees and includes (a) wages and salaries and (b) employer's contribution. In Botswana this factor went up from P 14.3 million in 1974/75 to P 402.00million in 1994/95. (Ref; Central Statistics Office, Gaborone)

Gross fixed capital formation (GFCF)) of a production sector is the outlay of new durable goods to the stocks of fixed assets less net sales of similar second-hand and scrapped goods. Gross capital formation is the sum of GCFC and changes in inventories. In Botswana gross capital formation rose from P 7.5 million in 1974/75 to P66.8 million in 1994/95.(Ref: Central Statistics Office, Gaborone)

AN OVERVIEW AND IMPROVEMENT NEEDS

With reference to the above one can infer that construction industry in a developing country is a major stakeholder of the economy. It is also a source of employment at various levels of skills from manual labour to semiskilled, skilled and specialist workforce. Experience shows that it is one of the foremost industries in any developing country whose upward activity is related to the economy of the country. It is also perhaps the first industry whose slump is closely inter-linked with the fall of an economy.

It is therefore simply too important to be allowed to stagnate.

Constructions in developing countries have following important characteristics:

- Engineering integrity and design flares in response to constrained availability of materials.
- Flexible industry in response to funding constraints.
- Labour force is willing and adaptable to difficult working conditions.

Key areas requiring modernisation

Construction industry is aware and recognises the need to modernise in order to tackle the severe problems encountering it. Some of the key areas are:

Profitability: The industry has low and unreliable rate of profitability. Margins are too low to sustain healthy development. Companies who serve well must make better returns.

Research and Development: Little investment in research and development and in capital. It is damaging industry's capability to keep abreast of innovation in technology and process.

Training: Crisis in training. There exists an increasing concern about shortage of skills in the industry. Fewer people are being trained to replace the aging skilled workforce. Too few are acquiring the technical

and managerial skills required to get full value from developing techniques and technologies. The industry also lacks a proper career structure to develop and sustain supervisory and management skills.

Price and cost: Clients still equate price with cost and they are undiscriminating. Selection of designers and contractors are almost exclusively done on the basis of fee bidding and tendered price – one of the greatest barriers to improvement. Public sector interprets accountability in a rather narrow sense. The industry needs to educate and assist its clients and users to distinguish between best value and lowest price.

Dissatisfaction of clients: Construction in developing countries too often fails to meet the needs of modern competitive business in markets, and rarely provides best value for clients and taxpayers. Projects are generally seen as unpredictable in terms of delivery on time, within the agreed budget and to the standards of quality expected. To most of the clients the industry is viewed as a poor investment.

Fragmentation: Large number of companies, most employing very few people. It inhibits performance improvement. Such an approach has both positive and negative sides. On the positive side, it is likely that flexibility to deal with highly variable workloads is provided. It is therefore, forced to concentrate more on survival than on future investment. On the negative side, the extensive use of subcontracting prevents continuity of teams, essential to efficient working.

SCOPE OF IMPROVEMENT AND ROLE OF MAJOR CLIENT

Major clients working with construction companies can successfully integrate many of these developments to achieve appreciable improvement in the cost, time and quality of projects. These improvements must be spread across the industry and be offered to the vast majority of occasional and inexperienced clients.

Clients need better value from their projects. Construction companies need reasonable profits to assume long term future. Thus both have a powerful mutual interest and both recognise scope of improvement potentials.

This direction and the impetus for change must come from major / leading clients.

AMBITION AND TARGETS

References could be drawn in both service and manufacturing industries in an attempt to identify factors of change that helped in increasing efficiency and transformations of companies for better performance.

A series of fundamentals are identified to the above process which are just as applicable to construction industry as to any other industry.

Fundamentals are:

Committed leadership: Committed management in driving forward an agenda for improvement. There must be a believe within management in communicating the cultural requirement and operational changes throughout the entire organisation.

In construction, it affects contractors, suppliers and designers. There must be widespread evidence of the burning commitment to raise quality and efficiency amongst the managers.

Customer as a focus: The customer drives everything in best companies. Activities that do not add value from the customer's view are waste and are to be eliminated.

Today construction industry hardly think about the client or the consumer it is serving, rather invariably tend to think about the next employer in the contractual chain. There is no systematic research on what the end-user actually wants, neither dose the industry seeks to raise customers' aspirations and educate them to become more discerning. The industry has no objective process for auditing clients' satisfaction. Clients, both public and private sector should be much more demanding.

Integration of construction team and process around the product: Successful industries work backwards. It works from the customer's needs and focuses on the product and the value it delivers to the customer.

The current concept in the construction industry in developing countries is seen as typically dealing with a project process as a series of sequential and largely separate operations undertaken by individual designers (architects, engineers etc.), builders and suppliers. All of them interestingly have no stake in the long-term success of the product and have no commitment to it.

To increase efficiency and quality in construction this culture must change. It is a fundamental requirement.

Agenda with quality

It is not only zero defects but also

- Right at the first time
- Delivery on time and to budget
- Innovating for client's benefit
- Stripping out waste in design, materials and construction on site
- After sales care and cost effective maintenance.

'Quality' is the total package. It must attempt to exceed client's expectations.

It is difficult to provide 'quality' when clients select designers and contractors primarily on the basis of cost and not value for money. The challenge to the industry that it must understand what clients mean by quality and break the vicious circle of poor service and low client expectations by providing real quality.

Commitment to people

- Decent site conditions.
- Fair wages and care for health and safety of the workforce.
- Commitment to training and development of committed and capable workforce, managers, supervisors.
- Respect for all participants in the process of project delivery.
- Involve everyone in sustained improvement and learning.
- No blame culture based on mutual understanding and trust.

Construction industry in developing countries does not recognise its greatest asset – its people. Too much talent and potentials are simply wasted because we lack the commitment summarised above. The industry currently also fails to recognise the significance that suppliers can make significant contribution to innovation.

But the industry cannot afford such lack of commitment to continue and it cannot afford not to get the best from the people who create value for clients and profits for construction companies. The challenge is ours. In developed countries, this sense of commitment have been shown by some leading clients and construction companies and dramatic improvements in the efficiency and quality of performance in construction are recorded.

TARGETS AND IMPROVEMENTS

To achieve performance improvement, the construction industry is to set itself clear measurable objectives. Adopting targets (quantifiable) milestones and performance indicators focuses them. This is not happening at present. Targets must also be set for quality improvement in the efficiency in construction process – i.e. safety and labour productivity for example.

If the industry is to share in the benefits of improved performance the objectives and targets set must be directly related to client's performance perception i.e.; measures of improvement in terms of predictability, cost, time and quality. Thus clients will be able to recognise increased value.

If the targets are set in this way, corners are not cut and companies and their staff share in the benefits of success. It appears to be an effective way to sustain gains and deliver continuos improvements.

Suggested targets are illustrated in the table as the minimum scope for improvement in the performance of construction industry in developing countries. In addition to the targets it will be worthwhile to see

- The industry produce its own structure of objective performance measures (in agreement with clients).
- Construction companies prepare performance data, compare and share them with clients and each other.
- Instead of benchmarking, a system of independently monitored company 'performance cards' measuring their progress towards objectives and targets.

Such measurement methods must be put in place. The industry can start with a clean slate in this respect. It will thus create an industry wide performance measurement system. This will also enable clients to distinguish between the best and the rest, thus providing a rational basis for selection.

The suggested assessment is based on rationalising the waste in construction. Studies in the USA, Scandinavia and UK suggest that upto 30% of construction is rework, labour is used at only 40 to 60% of potential efficiency, accidents can account for 3 to 6% of total project costs, and at least 10% material waste. These are probably conservative estimates when compared to the amount of waste identified in manufacturing by best practice firms such as Toyota.

From my personal experience in developing countries (Tanzania, Zambia, Zimbabwe and Botswana) followings are estimated:

- 40% of construction is rework.
- 30 to 40% labour potential is used.
- 8% of total project costs account for accidents.
- 20 to 25% of materials are wasted.

Measures of improvement mentioned earlier are in terms of annual improvement. Greatest value is obtained through significant sustained improvement rather than one-off advances. It is expected that the leading companies in the industry will adopt the targets. They can also devise their own targets and monitor them regularly and report the progress publicly – and that includes companies in all sections of the industry.

If the industry is reluctant to do this, it is then proposed that the clients take the initiative. That is the challenge we face. It must be taken up.

Improvement in the process of project delivery

Can we learn from the success of manufacturing and service industry?

A U.K based task force visited Nissan U.K and wrote "we see that construction has two choices: ignore all this in belief that construction is so unique that there are no lessons to be learned; or seek improvement through re-engineering construction, learning as much as possible from those who have done it elsewhere". If the latter approach is adopted the industry has to rethink the process through which it delivers its projects to achieve and sustain improvement in its performance and products. (Ref: Department of Environment)

Repeat process – the process of construction is itself repeated in its essentials from project to project. Research suggests that up to 80% inputs into buildings be repeated. Repair and maintenance work also use a repeat process may be to a greater extent. Additionally, many building types such as houses, schools etc are essentially repeat products, which can be continually improved upon.

Significant inefficiencies exist in the construction process. There is potential for much more systematised and integrated project process, in which waste is reduced. This can be achieved by integrating the process and team around the project.

Integrated project process – it is a process (a) that utilises the full construction team, bringing the skills of all the participants to bear on delivering value to the client, (b) that is explicit and transparent, and therefore easily understood by the participants and their clients.

The rationale is that the efficiency of project deliveries presently constrained by separated process through which they are planned, designed and constructed. Fragmented structure of the industry exists in the process and it sustains a confrontational culture.

The conventional construction process does not protect the client and often becomes a barrier to using skills and knowledge of suppliers and contractors effectively in the design and planning of projects. It is a very sequential process.

The conventional process assumes that clients benefit from choosing a new team of designers, contractors etc. competitively for every project they do. A deeper thinking reveals that repeated selection of new teams inhibits learning, innovation and development of skilled and experienced teams. It prevents the industry form developing products and an identity – or brand – that can be understood by its clients.

End product – the above shortcomings can be tackled by focussing the construction process on delivering the needs of the end-user/consumer through the end product. Clients are interested in:

- the finished product
- its cost
- delivery on time
- its quality
- its functionality

An integrated process will be able to meet the above needs. The overall project can be subdivided into four elements as:

- product development
- project implementation
- partnering the supply chain
- production of components

These are complementary and interlinked elements. The key behind the integrated process is that teams of designers, contractors, and suppliers work together for series of projects, continuously developing the product, eliminating waste in the delivery process, innovating and learning from experience.

The challenge is to develop own integrated teams to deliver the same benefits to inexperienced clients. This is not only desirable but certainly possible.

Development of product

Activities listed below are parallel to the sort of research into the needs of customers undertaken by most other industries. These continuously develop a generic construction product - a house, a road, an office or maintenance of works and services.

- Listening and understanding of voice, requirements and aspirations of consumers.
- Products to exceed expectations of client.
- How specific engineering systems and components influence a construction product.
- To define projects that delivers the product in specific circumstances and setting clear targets for the project of delivery teams.
- Systematic and objective auditing of completed projects and customer satisfaction and feedback the knowledge gained into the product development process.
- Innovating with suppliers for product improvement without loss of reliability.

Implementation of project

Translating the generic product into a specific project on a specific site for a specific consumer. The implementation team incorporates all of the key suppliers, work together to design the architectural and engineering systems, select key component suppliers, pre-plan the manufacture, construction and commissioning.

Information technology (IT) is used extensively in developed countries and has become essential part of improving the efficiency of construction. Here if we could at least appreciate the need as below, we are certain of unlocking greater efficiency on site by using standardised components, and appropriate engineering technology:

- Leadership of an integrated team comprising of suppliers, contractors, and designers dedicated to designing and constructing the project.
- Process mapping, monitoring of performance and continuous improvement in quality and elimination of waste.
- Selection of components and development of design systems to achieve product performance targets.
- Pre-planning of manufacture, construction and commissioning.
- Component assembly, sub assemblies on site and commissioning of the completed projects.
- Development and training of all participants in support of improvement of performance.
- Feedback of the experience into the project delivery process.

These will certainly improve quality significantly. However the delivery of such an approach may reveal a cultural gap. Construction needs to be carried out by relatively small and dedicated team of multi – skilled operatives who develop their expertise over a series of projects.

The other two components of the integrated process are not discussed here.

Improvement and its sustainability

After putting the integrated process in place, the next step is to sustain the momentum of the increased efficiency and quality. The key is to implement a programme of sustained improvement of the construction process to eliminate waste and increase the value that it adds to the client. Other successful industries may guide us in this respect. One such concept could be “lean thinking”. It is powerful and coherent synthesis of the most effective techniques for waste elimination and delivering significant sustained improvements in efficiency and quality.

"Lean thinking" – recognises the fact that only fraction of the total time and effort actually adds value for the end user. Define clearly the value for a product/service from the end user's perception and removal of all the non-value activities step by step. Products and services are provided by one organisation only. Thus waste removal is pursued throughout the whole value stream (the entire set of activities across all firms jointly involved in delivering the product/service). New relationship must grow to remove inter-firm waste. Processes are re-organised so the product or design flows through all the value adding steps without interruption. Activities are synchronised by pulling the product from upstream steps when required in time to meet the demand from the end customer. (Ref: Department of Environment)

TO ENABLE IMPROVEMENT

Improvements and changes are required in working conditions, training and skills, design approaches, use of technology and company relationships. Such changes in culture and structure are essential to enable improvements in the project process to meet ambition of construction industry.

In order to bring cultural changes we must start by valuing our people. It is not only the quality of the workforce but also how they are treated. Today the workforce is undervalued, under -resourced, and generally treated as a commodity rather than the most important asset.

Working conditions

Whilst some changes may take time, others can be delivered almost immediately. Facilities for workers at site are generally poor and clients do not like such poor image of the industry. It is not a very big step to provide workers with uniform, proper ablution facilities and rest room areas. Work sites should become advertisements for the industry.

Health and safety record of construction is perhaps the second worst of any industry. Accidents seem to take place when either workers are not trained or working out of processes. The industry must reflect not only on the purely welfare consequences of a poor health and safety record but to consider its cost in relation to lost work days, potential prosecutions and even enforced closure of sites.

Training needs

There are significant gaps at various levels. Right skills are required to be improved to improve productivity.

- Top management level – lack of personnel with the commitment to being in class with the right balance of technical and leadership skills to manage the industry's business. Create career structure to develop such leaders of excellence.
- Project manager level – a need exist for training in integrating projects and leading performance improvement from its inception to commission. Training organisations and professional institutions to develop such training programme.
- Supervisor level – a key grade. In developing countries such a key grade person is virtually absent. Training needs to be identified as a matter of urgency to alleviate such acute shortage.
- Designers – high standards of professional competence available must be matched by a more practical understanding of the needs of clients and of the industry more generally. They are to develop greater understanding of how they can contribute value in the project process and supply chain of materials.
- Multi-skilling – lack exists. Building techniques in developing countries require more workers able to undertake a range of functions based around processes rather than trade skills.
- Upgrading, retraining and continuous learning – are not practiced currently in the industry. Frustration exists, as construction workers cannot cope with the new technologies that are being made available.

Quality and training are inseparable. Quality will not improve and costs will not go down until the industry educates its workforce in the skills and in the culture of teamwork. Training can be given deserved emphasis if all major clients, including public sector, insist to contractors who can demonstrate that they used trained workers. Valid training certificate must be produced of the workforce – could be a way forward.

Design construction and use

Too much time and effort is spent on construction sites, trying to make design work in practice. Fundamental malaise in the industry is the separation of design from the rest of the project process. We know of building performing poorly in terms of flexibility of use, operating and maintenance costs and sustainability. Design to be properly integrated with construction and performance in use. Time must not be wasted in reconnaissance.

Following are the practical consequences:

- Design team must fully involve subcontractors and suppliers.
- Experience gathered from completed projects must be fed into the next one.
- 'Right first time' must be the target.. Quality must become fundamental to the design process.
- The era of design fees based on a percentage of the costs of a project must be eliminated. This old concept offers little incentive to build efficiently. Designers should work together with all other participants in the process from the inception of the project.
- Whole life cost – costs of energy consumption and maintenance cost must be encompassed in the design.
- Clients must also accept their responsibilities for effective design. Clients are too impatient to start the project without appreciating the need for resources to be concentrated up-front on projects if greater efficiency and quality are expected.

Technology

On its own it cannot provide the answer to the need for greater efficiency and quality in construction. First, sort out the culture, followed by defining and improving processes and then applying technology as a tool to support these cultural and process changes.

Relationships

In other industries, creation of long-term relationships/alliances has become an essential element in the delivery of radical performance improvements. A team that does not stay together for long has no learning potential. Such relationship offers coperation and continuity to enable the team to learn and to take risk in improving the product. It is one of the fundamental requirements.

In view of the above the following are recommended:

- New criteria are needed in selection of partners. It is about best overall value for money and not the lowest price. Selection is on the basis of attitude to teamwork, ability to innovate and to offer efficient solutions.
- Success sharing. All teammates share success in line with the value they add for the clients. Clients also are to arrange for incentives to enable cost savings.
- Reliance on contracts. Effective partnering does not rest on contracts. Contracts add unnecessary and significant cost and of no value to the client. Client contractor relationship based on mutual interdependence and sound understanding shall make contracts obsolete. A relationship between British Airport Authority and Taylor Woodrow International is an example.
- Performance measurement and competition against clear improvement targets in terms of quality, timeliness and cost are the main elements of improving, sustaining and bringing discipline to the

relationships. Such relationships conducted properly are much more demanding and rewarding than those of competitive tender are. It requires mutual interdependence, continuity in workflow, stability and greater predictability. This kind of concept can be difficult for the industry and for many clients. That is the challenge.

- Alliances and partnering as described bring immediate savings. It may be shocking especially for the public sector, but it is vital that a way must be found to modify processes so that tendering is reduced. Comparison between suppliers and rigorous measurement of their performance with quantitative performance targets and open book accounting, together with demanding arrangements for selecting partners value for money can be achieved and properly audited.

CONCLUSION

Achieving an ambition lies in commitment.

Construction industry's commitment to work with major clients and deliver viable performance improvements. Clients' commitment to fulfill their role to lead the implementation agenda. Government's commitment to create and sustain the environment essential to enable dramatic improvements.

Public sector is the largest client in developing countries. It must become the best practice client. The process must begin with substantial improvements in the way public sector procures construction and this can be achieved while maintaining the need for public accountability.

A radical change is needed in the way we build. This may mean that there will be fewer but bigger winners. Companies with right culture deserve to thrive. No one benefits from cut- throat competition and inadequate profitability.

It is hoped that the construction industry will deliver to its customers in the same way as the best consumer-lead manufacturing and service industries.

It is a challenge to change for better.

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