



# **Profitability of Continuous Improvement Process in Developing Human Resource Plan for Construction Companies in Malaysia**

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## **ABSTRACT**

The need for continuous improvement (CI) for the productivity of construction professionals and operatives in the Malaysian construction industry cannot be overemphasized. Companies today seek competitive edge in terms of profitability. For any organization or company to excel, it must consider its personnel as the most valuable resource. Nations and organizations must take the aspect of their human resources in a dynamic concept, otherwise they risk losing their competitiveness and being overtaken by their competitors. This paper is aimed at assessing the profitability of integrating a CI process in the human resource development plan of Malaysian construction companies. The main objectives set out includes, to determine the implementation strategies of CI in companies; identify the benefits of human resource development in Malaysian construction industry; examine critical success factors to promote CI in Malaysian construction industry; identify the barriers and challenges to CI in Malaysian construction companies. The method used is review paper by drawing inferences from the findings of selected journals. The findings revealed that CI in form of training and performance appraisal, are positively related to the competitiveness and profit of a company. Among the benefits of implementing CI are that employees working under healthy environment, customer's satisfaction are guaranteed and increased company financial returns. CI can increase profitability, various diagrams and analysis are tools used in CI. The study established that Malaysian construction industry is rated low in the aspect of CI of its workforce.

**Keywords:** Continuous Improvement Process, Profitability, Human Resources, Construction Industry, Companies

**JEL Classifications:** M1, E24, L7, M11

## **1. INTRODUCTION**

According to Revans (1983), for an organization to prosper in today's ever evolving environment, its ability to change must surpass the rate at which the change forced on it. This can be best achieved through assessing the procedures and process by which its members learn, develops a model to facilitate continuous improvement (CI) and innovation in business processes. Many organizations are as of now adapting to present circumstances, recognizing that change is required is developing and the willingness to start the change procedure is expanding. For organization be able to sustained incremental innovation must integrate behavioral routines into its process (Biazzo and Bernandi,

2003). Economic uncertainty and intensive competition are the main forces known to be pushing and pulling organizations in the present economic ground. In this context, improvement of project performance and incorporation of change techniques is very important to be maintained persistently (Takim and Akintoye, 2002).

Construction sector is the backbone sector among economy driving sectors of any nation, through its activities, the construction industry enables the growth of other industries as a larger user of the products of other industries, its responsibilities ranges from provision of residential housing, real estate, commercial and necessary infrastructural development to increase the living

standard of general populace, the need of its services is always increasing due to the increase in population, migration and surging demands of middle class citizens for better accommodation and related services (Porter, 2011). For the industry to deliver its responsibilities as expected and maintain its reputation in the eyes of the public, the industry's most evolve with the evolution of its internal and external environment. The personnel's level intellectuality and expertise must be cherished particularly in this age of information and communications technologies (ICT) application, globalization, dynamic environment, high cost of human resources.

Construction industry is exceptionally fragmented in nature and comprises different professionals and specialist undertaking diversity of activities in single project. The image associated with the industry is that of lack of recognition to productivity improvement either technologically, through people or process improvement. The criticism is related to poor workmanship, construction process and methodology, materials waste on site, safety issues, product quality etc., (Hamid, 2015).

In Malaysian context, the construction industry like other construction industries, contributes to the economic development of the country. The industry consists of contractors of different licenses grades, specialist, architectural and engineering consultancy firms. The types of construction projects which are obviously under taken by the industry and required by the people includes provision of residential and commercial buildings, infrastructural development and other related development within the built environment. Despite its development and contribution to the gross domestic product (GDP), the industry is under consistent pressure to be more efficient in handling projects by upgrading its performance.

It is generally accepted that, can only be successfully implemented when members of the organization are involved at all levels of its activities, from planning to the last point of implementations.

This research seeks to confirm the following objectives: (1) Determine the implementation strategies of CI in companies; (2) identify the benefits of human resource development in Malaysian construction industry; (3) examine critical success factors to promote CI in Malaysian construction industry; (4) determine how profitable the use of CI process in developing human resource plan can be; (5) identify the barriers and challenges to CI in Malaysian construction companies.

The aim of this study is to assess the profitability of integrating a CI process in the human resource development plan of Malaysian construction companies.

## 2. CI IN CONSTRUCTION INDUSTRY

In simple term, CI can be defined as an organizational process of focused and engaged constant incremental innovations on process. The result of a survey carried out by Jose et al.(2000) which cover an organization that have adequate capacities for carrying out and managing projects, yet are not oriented towards improvement and

learning. Struggling with these ideas, do not use available tool or techniques, and consequently are denying themselves of potential outcomes to enhance their performance. CI is the fundamental principle around which CI process is focused. It supplements and invigorates the standards of process orientation and customer centered and involvement with the specific acknowledgment that no procedure, product, or service ever achieves perfection and that neither the customer's expectation nor the quality remains static. To retain customer loyalty and stay ahead of competitors required deliberate positive changes (Stone et al., 2000). Dedication to CI is an exhibition of consistent, deliberate commitment to quality. Its base is incremental development of small step with high frequency, short cycles of progress with little impact but cumulatively can make a significant contribution to performance. Although the changes occur as individual will dependently attempt to make minor improvements, the effect is rarely felt unless the pattern of changes remain constant over certain period.

CI is a prominent concept in management and practice, usually associated with the organizations where the activities are of repetitive nature. However, there are a considerable number of organizations where the primary activities are achieved by means of projects; among such organizations is construction industry.

### 2.1. Role of the Malaysian Construction Industry

The industry is considered to be a major productive sector in Malaysia, with the output for the construction sector up to RM 7248 million, RM 7168 million, and RM 7350 million in year 2004, 2005, and the estimate for 2006, respectively (Malaysian Budget Report, 2006). The sector is considered to be an essential factor for development of the nation. One of the top three major economic sector. The other two sector being manufacturing and agriculture, which contribute to the national output. However, the construction industry's output is relatively small when compared to the other sectors in Malaysia. For instance, it is found that the construction sector contribution accounts 1.8% in first quarter 2006 and 2.9% in 2004 to GDP. Ibrahim et al. (2010) affirmed that its contribution to the GDP is <15 times smaller than that of the services sector and less than eight times smaller than that of the manufacturing sector (Malaysian Economic Report 1999-2004). Even though, they further explained that it accounted for <3.3% of GDP from 1999 to 2004, the industry is a strong growth push because of its extensive backward and forward linkages with the rest of the economy (Ofori, 1990).

### 2.2. CI Process

CI process is unique to every organization; the application should be in accordance with the nature of its activities. Presently, the application of theories or principles or combination of such is known to be the best practice. CI process is one of these principles, it comprises of implementation of practices that bring about incremental activities for enhancing efficiency and effectiveness of organizational process.

### 2.3. Need of CI in Malaysian Companies

According to the construction industry development board (CIDB, 2009) of Malaysia, the general view in respect of Malaysian construction industry is that, the industry is ineffective and

inefficient with many problems such as delays in project delivery, cost overrun, disputes etc. Currently, the construction sector is highly reliant on the services of unskilled foreign workers which constitute 40-45% of the total industry's work force; this additional confounds the attempts to improve the image of the industry (Hamid, 2015). Aziz and Hafez (2013) held the view that construction management techniques and necessary technology needed for advancement are the two key factors influencing the development of the construction industry. They emphasize that over the past 40 years, even with the fact that several new and advanced technologies have been frequently applied to construction projects, the efficiency of the industry has remained quite low. It is an acceptable fact that although the computer aided design technology has significantly improved the efficiency of drawings, but it can also be seen that it cannot reduce design errors and these, in turn, can cause the need for rework of construction work making it quite difficult for construction managers to optimize the construction process to reduce cost (Aziz and Hafez, 2013). This is a critical aspect of design/build (D/B) projects, where, in the actual sense the aim was to reduce cost and increase quality by an improved constructability of the building design. Obviously, it can generally be deduced that the technology cannot effectively support the implementation of D/B projects. Therefore, in this light, the researcher postulated that the application of both appropriate new technology and contemporary management concepts is undoubtedly, likely to be the two effective approaches to improved construction industry efficiency.

#### **2.4. Human Resource Management (HRM) Practice**

According to Tan and Nasurdin (2011) several organizations are left with the option to actively seek for new ways, ideas, experimentation, and creative solutions in improving their current product, process, system and technology, this ever-emerging rapid development of high technology, ICT gave no alternative. This is commonly referred to as organizational innovation. Malaysia, which happened to be one of the post-industrial societies has severely undergone a fierce competition within its rivalries. In an effort to ensure it survived the battle, Malaysia launched its new economy model which aims at transforming the manufacturing firms from the product based towards the knowledge based.

This step taken in the manufacturing sector is worthy of emulation in the construction sector. This is because companies generally face similar challenges and uses human resources that demands good management and improvements alike. It was believed that HRM practices can lead to usable increased knowledge, motivation, synergy, and commitment of a firm's employees, which would result in a sustained competitive advantage for the firm (Harter, et al., 2002), (Tan and Nasrudin, 2011). Tan and Nasrudin, (2011) in their study offer several suggestions to manufacturing firms, in particular, in Malaysia to focus on training program; this can actually be required in all industries. Their logical argument is that employees who undertake the training programs are naturally expected to apply the knowledge acquired on the task and job assigned to them.

Most likely to deliver it with higher expertise and professionalism. This was further put that, the higher level of implementation

of training, the more the transfer and flow of information and knowledge and adoption of new ideas and more innovation.

#### **2.5. Main Aspect of CI**

The main aspect of CI was achieving sustained development earmarked on waste elimination in all setups and procedures of a company. In addition it requires concerted effort of all parties in achieving improvement with less capital investment involved (Bhuiyan and Baghel, 2005).

Several procedures are involved in achieving CI such as mechanism of productivity improvement, employee idea system and lean, total quality management (TQM), quality control circles. Achieving sustainability in buildings is one of the first principles in the practice of CI (Garvin, 1987 Cited in [Nguyen, 2015]). More so quality service improvement and product improvement (Nair, 2006; Naveh and Erez, 2004; Rungtusanatham, 2001; Schroeder et al., 2005; cited in Nguyen, 2015) as well as improving performance of operatives are all part of the application of CI (Anderson et al., 1995; Choi and Eboch, 1998; Dow et al., 1999; Samson and Terziovski, 1999; cited in Nguyen, 2015). According to Juergensen (2000) the main strategy behind CI was to reduce failures and increase successes in project management.

#### **2.6. Benefit of Application of CI**

The benefits of CI cannot be over emphasis, this is as a result of investment required to finance is very cheap, also employee ideas effectively utilize, Bessant et al. (1994). Woods (1997) stated that employees benefit immensely through CI by working under healthy environment, customer's satisfaction and increased company financial returns. Martichenko (2004), postulated that for executives to feel they are doing the right thing then the organization has to incorporate CI. Cole (2001) stated in his research that CI is all about the process of organization formation and organization renewal in both public and private sector.

##### **2.6.1. Case study**

Landwójtowicz (2015) in his study related the result of a case study of a research concerning the element considered to be the determinants of development of the CI concept carried out in a company that is into the production of electronic devices. In its years of operating, the company's strategically priorities have always been to deliver quality and efficiency, which it considers to be vital in building of the competitive advantage. Not until 2008, when the company's management finally decided a formal introduction of the principle of CI to the set of organization's objectives. This was its management concept. It started with implementing an improvement activities program at the team and management level. The company after a year, reorganizes its organizational structure were it introduced an independent new organizational unit, the head, whose task was to manage the company's operational activities in the process improvement. The business management principles used here concerned the introduction of a new leadership, it is a concept of the CI based on the culture and management principles. This was basically designed to develop the employee's own responsibility and the continuous learning throughout up skilling and mentoring, what

was meant to be measured is discovering and developing the potential of the staff employed in the company.

**2.6.2. CI at the management level**

At management levels, using the concept of the CI, the actions of individuals or heads of organization is usually deemed to fulfill two functions: Maintenance and standards improvement. Pre-determined standards are the main approach, in making any amendments, this is to say, standardization is one of the natural elements of the concept. When the research was conducted, it was established that the standardization has been ensured only through the use of tools such as manuals and procedures, describing the way of acting in the processes and workplaces (Landwójtowicz, 2015).

**2.6.3. CI at the level of an individual employee**

According to Landwójtowicz (2015), Kaizen oriented on a unit appears as a form of a suggestion system (Landwójtowicz, 2015), which enables the possibility of rationalization of the operations performed by a single person and has a positive effect on the level of their work commitment. The management does not expect immediate economic effects but also pays attention to the employees' morale. The suggestion system, however, must be properly organized. In the analyzed company, it was divided into two parts: Individual suggestions and group recommendations. The suggestion system enables the opportunity of a direct conversation between the employee and their superiors, improves bilateral communication and gives employees the opportunity to help employees in problem solving. The number of the suggestions reported by employees is an important criterion for assessing

the work quality of direct supervisors. Senior supervisors should support the staff directly supervising employees, so that they may support them creating more suggestions. The aim is to allow the presentation of many suggestions, and information about that number is placed in an assigned, clearly visible spot of the production facility, to encourage employees to compete (both between employees and between the teams). Standard invented by the employee themselves is also for them easier to accept. Operation of the company's suggestion system is effective, as evidenced by the results listed in Table 1.

Because of increase in numbers of reported and accepted approaches suitable for the accomplishment, the analysis of the minimum time required to achieve them was set up. In the period between January and September 2014 it was found to be 30 days, this, simply implies an introduction of actions enabling a quicker response, confirming the need of the analysis of the reasons for such a situation and from the staff responsible for implementing the changes (Landwójtowicz, 2015).

**2.6.4 Benefit of CI**

Cole (2001) also summarizes the benefits of CI are as follows:

- Large number of employees is mobilized and as a result improves employee's commitment and innovation.
- Result magnification is achieved through a small number of small wins that occurs simultaneously.
- Tremendous possible changes can be achieved through small wins.
- Sequences of small wins can be based on revolutions.

**Table 1: The results of the suggestion system**

Year	2009	2010	2011	2012	2013	2014
Number of completed applications	24	153	393	641	1195	1254
Number of applied proposals	307	284	402	1335	1645	1626
Percentage of completed applications	8	54	98	48	73	77

(Adapted from: Landwójtowicz, 2015)

**Table 2: Matrix diagram of the selected methods and tools suitability in the individual phases of continual improvement**

PHASE TOOL	Reason for improvement	Current situation	Analysis	Identification of possible solutions	Evaluation of effects	Implementation and standardization	Evaluation of the effectiveness
Affinity\diagram	AA		A	AA			A
Interrelationship diagram	AA		A	A			A
Systematic diagram	AA		A	A			A
Matrix diagram	A	A	A	A		AA	A
Matrix data analysis	A	A		A	A		A
PDPC diagram	AA			AA		A	A
Arrow diagram	A			A			A
Quality function deployment	A	A	A	A			A
Failure mode and effect analysis	A		AA	AA	A		A
Fault tree analysis	A		AA	A	A		A
Design of experiments			AA	AA	A		A
Process capability evaluation	A	AA	A	A	A	A	A
Machine capability evaluation	A	AA	A	A	A		A
Gage capability evaluation	A	AA	A		A		A
Flow chart	AA	A		A		AA	A
Cause and effect diagram			AA		A		A
Data collection form		AA	AA	A	A	A	A
Pareto Diagram	AA	A	AA		A		A
Histogram	A	AA	A		A	A	A
Scatter diagram			AA		A		A

Adopted from (Plura, 2000), "A": Tool is suitable for use in a given phase, "AA": Tool is especially suitable for use in a given phase

- Learning is encouraged through small wins that is base in practice and accepted after implementation by the same group of people who suggested the changes.
- Useful knowledge on a whole system can be promoted through learning using small wins spread throughout the organization.
- Difficult for other organizations to copy because small win processes are often based on tacit knowledge.

The above benefits are applied mostly to public sector than the private sector, particularly the last one. Tacit knowledge is adopted into use by CI.

According to Temponi (2005) listed the benefits of CI to academic institution in USA and UK as follows:

- Capital investment are achieved with low cost improvements are achieved gradually, dramatic changes (Jha et al., 1996).
- No monopoly of ideas, suggestion and ideas from directly from does executing the job. (Jha et al., 1996; Goh, 2000; Taylor and Hirst, 2001).
- Employee commitment has increased (Temponi, 2005).
- Quality/performance improvement (Chassin, 1997; Goh, 2000).
- Waste reduction (Gallagher et al., 1997).
- Costs reduction (Gallagher et al., 1997); and,
- Customer satisfaction improvement (Gallagher et al., 1997; Taylor and Hirst, 2001).

**2.7. Tool of CI**

According to Plura (2000) suitable tools and methods need to be selected in order to achieve effective and successful CI. In addition, matrix diagram was used in selecting appropriate tools or method for different stages of CI (Table 2).

**2.8. Key Success Factor of the CI Concept**

The conducted analysis allowed to confirm the efficacy of the CI program accomplished in the company as well as to identify the key factors for the program success. They were determined on the basis of nine areas, in area of which the requirements of the CI concept are accomplished (Landwójtowicz, 2015) (Table 3).

*2.8.1. Critical success factor of CI*

A thorough literature review was carried out using combinations of CSFs and CI, six sigma’s, kaizen, TQM, and manufacturing, private sector, public sector, health, National Health Service, education, police, and fire service. Most papers discussed projects carried out in the manufacturing sector. As Huq (2005) says, there are very few empirical papers on quality management in the service sector. In the cause of literature search it was found that only very few papers discussed on CSFs on project implementation. According to Youssef and Zairi (1995) they examine generic critical factors on 22 different types of organizations throughout the world and benchmarked it (Table 4).

**2.9. Status of Implementation**

The concept of HRM is associated with recruiting, employing and maintaining employees with required knowledge and skills to fill in positions in an organizational structure to accomplish tasks associated with their respective positions. It deductively shows that HRM is also a great part of CI. Currently there are little or no evidence that organizations recognized the vital contributions of HRM to continuous performance improvement (Jørgensen and Hyland, 2007). In the Malaysian construction industry, the level of implementation was seen to be far low, in the opinion of Hamid (2015). Where he believed, the industry is still highly reliant on

**Table 3: Key success factors of the CI concept**

Area/requirements	Key success factors
Program formalization and the determination of the action structure	Determination of the action structure The formal program of CI. The formal structure of the action. A specific action plan for the development and improvement projects
Determination of the continuity principles and control of their turnaround times	Stable CI program based on the accomplishment of clearly defined development objectives. Monitoring of the objectives accomplishment. Analysis of the execution time
The distribution and the activity range Training	To reach all levels of the organization with the upswing procedures. System approach Special training in the area of: Methods and tools to analyze and solve problems The principles of teamwork Methods and techniques for process perfecting
Management commitment	Providing required resources. Integration of CI with the strategic objectives. Setting up of the policy, system and procedures of actions. Building a culture of the CI
Coordination of the program	An appointment of the internal coordinators to support the CI activities, facilitating the access to resources and to the methodological advisory for the improvement teams’ members and other employees
Methods and tools	The application of scientific methods and tools to identify problems and to analyze their reasons and to accomplish the projects included in the elaborated improvement plans
Results measurement Communication of the results, a form of motivation	Defining of measurable goals. Monitoring results in the area of specific parameters Application of selected communication forms: Information boards, staff meetings. Identification and the application of the incentive system (recognition and encouragement)

CI: Continuous improvement, (Adapted from: Landwójtowicz, 2015)

**Table 4: Benchmarked critical success factors across the world and different sectors**

Critical success factor	USA	importance of factor in each sector/location			
		Ranked NHS (GP practice) in UK	Mixed sector in middle east	Mixed sectors in Malaysia and Singapore	Overall ranking for all the organizations
Management commitment	1	1	1	2	1
Customer satisfaction	2	3	6	3	3
Clear mission statement	3	7	2	1	2
Cultural change	4	11	10	5	6
Education	5	19	3	8	7
Participative management	6	18	8	7	10
Strategic quality plan	7	14	7	16	9
Goal clarity	8	12	5	4	4
Error prevention	9	6	17	17	12
Top management steering					
Committee	10	10	9	13	8
Problem solving	11	17	14	12	14
Measurement	12	16	11	18	16
Problem identification	13	13	13	11	13
Goal setting	14	9	4	6	5
Recognition programme	15	15	12	9	15
Quality circles/improvement	16	2	16	15	11
Vendor partnership	17	4	22	20	17
Project improvement					
Procedures	18	5	21	21	18
Publicized success	19	8	18	22	19
SPC	20	20	20	19	21
Cost of quality	21	21	15	14	20
Zero defect attitude	22	22	19	10	22

(Adapted from: Youssef and Zairi, 1995)

the services of unskilled foreign workers. This certainly poses an image for low implementation in Malaysia which requires improvement.

### 2.10. Challenges and Barriers in Implementing CI

The major challenges and barriers in CI implementation is difficulty of sustainability over a long period of time and success is hardly achieved. Furthermore, innovation can be inducing through CI under a favorable atmosphere in an institution Bessant et al. (1994) cited by (Fryer et al. 2007).

According to the studies conducted by the Gallagher et al. (1997) shows that the improvements expected to achieve through the use of CI initiatives often fail, but no any outline for the causes neither for any solution to counter it.

Structure, background and company culture are major factors that hinders successful execution of CI initiatives, Gallagher et al. (1997). Unsuccessful implementations are as a result of ineffective use of mechanism for measurement as well as not considering the behavior that need change. To achieve a high level successful implementation CI initiative, we need good structure, sound background and effective company culture.

## 3. METHODOLOGY

The literature reviewed provided the facts for developing basis for this research work. A review article type of research is adopted. Relevant literature on CI and HRM is reviewed to have a better understanding of the benefits and tools for successful implementation of CI initiatives and strategies currently adopted

in Malaysian construction industry. This is simply by summarizing the findings of already concluded researches in this area to provide an overview of the selected ones. Various articles on CI, Human Resources Management, Malaysian Construction Industry, Company Management and Improvements were studied and the result of selected articles formed the basis of the finding arrived at.

## 4. DISCUSSION

The previous works shows clearly that CI is a systematic approach in itself to measure and review the progress and outcome of the work done against the targeted strategic objectives and goals to ensure improvement in process and procedure is being continually pursued. The human resource aspect of the companies is fundamental to its performance and survival. Therefore, is expedient to know that in a country like Malaysia where there is a challenge of economic potentials in the construction industry, local manpower continuous development is needed in the various companies. This is to ensure the industry's improvement and individual companies' survival and better service delivery. Manpower planning demands strategic processes, where all necessary input is determined and all expected output are evaluated. This is meant to be a continuous process through review to ensure there is an effective improvement and implementation.

Documentation and adequate planning on the elements like the time taken would lead to benchmarking performance levels, identify what are actually the improvement opportunities and consider them as part of CI initiatives, preventing potential performance gap in all situations. In a null shell, aiming to achieve a higher level successful implementation CI initiative, the nation will need

good structure, sound background and effective company culture. There are tremendous benefits of implementing CI process in the human resource plan development of companies, among which include employees working under healthy environment, customer's satisfaction is guaranteed and increased company financial returns.

## 5. CONCLUSION

The general concept of CI is the same to most production related industry. Fundamentally, the issue of better management of workforces or human resources applies to every area of competition, resources management, higher productivity and most importantly profitability. Malaysian construction industry has made several milestone achievements in virtually all aspects of human wants, but to lounge further, in order to keep with the tides of changes in this new world of revolutionary technological and efficiency advancement, set to ensure better service provision to consumers at very competitive cost, quality and satisfaction, it must as a matter of urgency, develop further its human resources capabilities, through the concept of CI process.

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