Organizational Change and its Effects on Throughput: A Case Study of Lonmin Mine Shafts

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Abstract. Several factors contribute to the effectiveness of an organization after an organization restructuring. Some of these factors are easily measurable while some are not. This study investigated the effect of employee attitude and perception towards organizational change (Theory of Constraints (TOC)) implementation using two Lonmin mine shafts as case studies. Sustainability of TOC was also considered. A quantitative research method was used for collecting data from two shafts in Lonmin Mine as a case study. The data was analysed using the IBM SPSS statistics 26 software. Descriptive and inferential statistical methods were performed on the data to test for statistical significance of the results. Findings from the study revealed that employees show remarkably positive attitude and perception towards organizational change. However, there is no correlation between the attitude and perception of employees and the organizational throughput.

Keywords: Employee Attitude; Employee Perception; Organizational Change; Theory of Constraints

1. Introduction

The theory of constraints (TOC) is one of the modern operations management strategies that have evolved in the past few decades. Krajewski [1] and McNeese [2] stated that constraints restrain a business from attaining its system’s goal by restricting its performance and confining its throughput. TOC is thus a continuous improvement process that is aimed at ensuring that the organization functions at its optimum capacity given its available resources. TOC aims to achieve this by resolving the issues that stand at the bottleneck of the organization as they arise. TOC focuses primarily on the weakest linkage(s) in the chain, on the basis that the performance of a system is determined by its constraints— in order to
advance the efficiency of the systems [3,4]. This theory is an agile method developed to help
people and organisations to thoughtfully consider their problems, develop innovative
solutions and successfully implement those solutions [5].
Change is an integral part of modern organizations due to its ability to aid in keeping up with
the dynamic and evolving demands posed by the market and to maintain competitiveness [6,-
8]. According to Klarner [9] and Jones [10], there are two change scenarios in defining
change and emotions as continuous processes— sequential and simultaneous changes.
Organizational changes come in various types which would then deploy a variety of methods
such as merger and acquisition, laying-off employees, and others. As an example,
organizational change in an organization will also bring redundancy, delayering and
downsizing [11], this can result in discontentment among employees. For the employees who
escape the retrenchments, the downsizing may perhaps create economic problems [12]. This
is due to the difficult situations that the layoff survivors are confronted with after downsizing,
[13] which include dissatisfaction as a result of exhaustion because of the work overload.
The results of change are influenced by many variables i.e. the process of the change in
question; the actual content of the change; the business context and the employees that are
involved with the change [14]. Meanwhile, people have been identified to be an important
variable for the success of change by many researchers, no matter how good the change
program was developed, it is necessary to have the support of the employees to successfully
achieve the change program [15]. The attitude of employees towards organizational change is
critical to the change process, and the failure of planned organizational change could lead to
resistance [16]. The implementation of strategic change is a double-edged sword, it
simultaneously produces expected performance improvement and unexpected performance
deterioration [7-8,17-18].
This study examines the consistency and sustainability of TOC, with special attention being
focused on the effect of attitude and perception of the employees towards organizational
change in the mining industry, with a case study of Lonmin mine. The throughput or
performance of two shafts in this organization, where TOC has been implemented were
studied before implementation, during and after implementation. This study therefore
examines the reception of TOC (as the organizational change) by the employees of the
organization using questionnaire survey

2. Theories of Organizational Change
Organizational change is defined as the introduction of new patterns of principles, activities,
schedules, and attitudes among significant sections of a population due to complications and
opportunities that may arise from the environment both internally and the externally [19]. The
primary objectives of organizational change are to improve cooperation between the
departments and to also ensure improvement of customer-friendly services [20].
Organizational change is very dynamic in its nature, the type of the organization has an effect
on how the organizational change will be conceived [21], as a result, organizational change
has become essential to ensuring that organizational strategies continue to be viable [8].
Organizational change has also become a continuous process rather than an interruption to the
daily running of the business equilibrium [19]. Organizational changes provide a substantial
occasion around which meanings, beliefs and values, that are modified, constructed and
destructed are shared [19].
Lam et al. [8] says that change also includes making alterations within the organization such
as retraining employees, acquisition, continual equipment update, and mergers. The most
prominent prerequisite of perceived organizational change is communication, and perceived
organizational changes significantly influences the attitudes toward the actual organizational changes as well as organizational commitment [22]. Klarner [9] states that to achieve redefined goals based on traditional understanding, employees are obliged to adapt to organizational change and learn new approaches while being resistant to setbacks during change. According to Schein [23] frequent changes will result in resistance or absolute failure will be noticeable in the organization’s inability to effectively unfreeze and create readiness for change before attempting a change induction (Liu, 2010). In addition, failure to manage change effectively could reduce the chances of organizational effectiveness and employee well-being, and damage manager’s careers [24,25].

2.1. Attitude and Perception
Attitude comprises of three components: feeling, belief, and action [26]. In studying the concept of attitude, [27] states that if said that a person has a certain attitude towards a particular situation, then it is interpreted that the person has some sort of opinion about it and some predisposition for action or at least for feeling with regard to it. Borkowski [26] also states that perception is closely associated with attitude, this author describes perception as a fact that a person deliberates or how they interpret a situation they meet in person. According to Özbas [28] perception also comprises of three components: selection, organization, as well as interpretation. Cognizance and reception towards incentives play a key role during perception [26,28].

Attitude and perception are crucial tools in the determination of employee reception to organizational change. Pava [29] advocates that alienation and ignorance will undermine even the most sophisticated technology in the absence of strong employee commitment that can sustain high performance. The organizational change process has been indicated by numerous studies to be a very stressful experience for the individuals involved [30], as a result management scholar acknowledge that there is a rate of change that may negatively affect employee attitudes, perceptions, morale, emotions, and/or feelings [31,32].

3. Research Methodology
A case study of two shafts was conducted to analyze and compare the opinions of the respondents working in both shafts. This was to determine what improvements were recognized by the shafts after the TOC was implemented and if indeed TOC implementation is effective. One hundred and sixty (160) questionnaires were distributed (eighty questionnaires per shaft) but one hundred and fifty-seven (157) were completed. A set of questions were compiled from existing literature to gather information on the attitude and perception of the employees. Descriptive survey was used in this study due to its ability to provide accurate portrayal of characteristics such as opinions, beliefs, behaviour and knowledge of a particular group, situation or individual. This descriptive survey was applied to determine the how employee attitude and perception affect the reception of the new strategies introduced. Random sampling method was applied in administering the questionnaires for this study. This was to award every member of the population an equal chance of being selected to answer the set of questions asked which were the same for the entire population size [33]. The data gathered from the questionnaire was sorted to ensure completeness, consistency and accuracy of each one. The data was analysed using Statistical Package for Social Sciences (SPSS) software. In analysing the data, Cronbach’ Alpha measure of 0.7 being the minimum limit of acceptance was used for the reliability. The results obtained from the reliability analysis for both the attitude and perception show that the
questions used to measure the attitude and perception are reliable, both resulting in a Cronbach’ Alpha above 0.7 (0.821 and 0.746 for attitude and perception respectively). The chi-square test of association, which is also known as the chi-square test for independence, was used to discover if there exists a relationship between the two categorical variables. A lesser chi square test statistic means that the observed data fits the expected data extremely well, therefore, there is a relationship between the two variables. The independent T-test was also used to determine whether there is a statistically significant difference between the means of the two categorical variables. Furthermore, the retrieved data was analysed using descriptive statistics and presented in the following section.

4. Results
Perception and attitude were used as the key indicators to assess reception of the organizational change by employees. Figure 1 shows the results obtained from the reception of TOC in 4B shaft and Saffy shaft respectively. There is a large variation between the population of employees that have received training and those that have not. The chart displays that a significant 92 percent of employees agree to having received TOC training as opposed to the 8 percent that have not in 4B shaft. This is a positive indication that the majority of the people working in this shaft are aware of the organizational change taking place. Figure 1 also shows that a great majority of 95.2 percent of employees in Saffy shaft have acknowledged receiving TOC training, while on the contrary only 4.8 percent of the employees have denied receiving the training. This is an insignificant minority that could learn the basics on the job. It is thus safe to conclude that this shaft is also aware that there is an organizational change taking place.

![Figure 1. Responses to TOC training in 4B shaft and Saffy shaft respectively](image)

Test of association between the response ratings of attitude in the different shafts is presented in Table 1. The table shows that only the variable ‘does TOC promote team work’ was significant with a p-value of 0.032.

| Variable                        | P-Value |
|---------------------------------|---------|
| How efficient is TOC?           | .112    |
| Is TOC easy to work with?       | .100    |
| Does TOC promote team work?     | .032    |
| Does TOC empower the people?    | .217    |
Has TOC improved staff moral on duty? \( .547 \)

Test of association was also conducted between the response ratings of perception and the different shafts as shown in Table 2. The table shows that significant results were found for the variable ‘has TOC improved performance’ (p-value<0.001) and the variable ‘has TOC increased accountability’ (p-value=0.043).

| Variable                           | P-Value |
|------------------------------------|---------|
| Has TOC improved production?       | <0.001  |
| Has TOC reduced process time?      | .113    |
| Has TOC improved the flow of delegation of duties? | .235    |
| Has TOC improved communication?    | .156    |
| Has TOC increased accountability?  | .043    |

Table 2. Pearson Chi-Square Tests between Saffy and 4B (Perception)

The mean item score from Saffy shaft respondents were greater than the mean item score of the respondents from 4B shaft as presented in Table 3. This translates that the respondents in Saffy shaft has better perception of TOC when compared to the respondents in 4B shaft. The standard deviation based on Table 3 also presents that the deviation in the opinion of respondents from Saffy shaft was generally lower than the deviation in the opinion of respondents from 4B. However, the variables ‘how efficient is TOC’, ‘is TOC easy to work with’ and ‘does TOC promote team work’ were statistically significant with p-values 0.014, 0.021 and 0.003 respectively.

| Variable                           | Saffy  | 4B   | P-Value |
|------------------------------------|--------|------|---------|
| Mean Std deviation                 | Mean Std deviation |         |
| How efficient is TOC?             | 4.36 .641 | 4.05 .902 | .014 |
| Is TOC easy to work with?         | 4.41 .589 | 4.17 .715 | .021 |
| Does TOC promote team work?       | 3.46 .841 | 3.05 .972 | .003 |
| Does TOC empower the people?      | 4.23 .811 | 4.03 .888 | .144 |
| Has TOC improved staff moral on duty? | 3.73 .693 | 3.55 .804 | .135 |

Table 3. Attitude towards TOC

The results shown on Table 4 demonstrated that the average response ratings for Saffy shaft are greater than those of the 4B shaft. However, significant differences were only realised for the variable ‘Has TOC improved the flow of delegation of duties’ and the variable ‘has TOC reduced process time’ with p-values <0.001 and 0.009 respectively.

| Variables                           | Saffy Mean Std deviation | 4B Mean Std deviation | P-Value |
|-------------------------------------|-------------------------|-----------------------|---------|
| Has TOC improved staff moral on duty? |                        |                       |         |
Has TOC improved production? 4.95 .219 4.47 .64 <.001
Has TOC reduced process time? 4.64 .579 4.32 .88 .009
Has TOC improved the flow of delegation of duties? 3.45 .727 3.25 .746 .086
Has TOC improved communication? 3.45 .745 3.21 .864 .061
Has TOC increased accountability? 3.94 .832 3.88 .628 .645

Independent T-test was conducted for equality of means of perception and attitude among the two shafts and the results are shown in Table 5. The mean for perception was 3.6125 and 3.4459 for Saffy and 4B shafts respectively. Assuming equality of variances, the difference between the two means was not statistically significant at 5 percent level of significance with a p-value of 0.102. On the other hand, the mean for attitude Saffy and 4B was 4.0375 and 3.7688 respectively. Also, assuming equality of variances, the difference between the means was statistically significant at 5 percent level of significance with a p-value of 0.005, demonstrating that there is a significant difference in the means drawn from the attitudes of the samples of the two shafts.

Table 5. Independent T-Test of Attitude and Perception of TOC

| Variable   | Name of Shaft | Mean   | Std deviation | P-Value Equality of variances | P-Value Equality of means |
|------------|---------------|--------|---------------|------------------------------|----------------------------|
| Perception | Saffy         | 3.6125 | .65698        | .243                         | .102                       |
|            | 4B            | 3.4459 | .61084        |                              |                            |
| Attitude   | Saffy         | 4.0375 | .59115        | .454                         | .005                       |
|            | 4B            | 3.7688 | .59033        |                              |                            |

The results illustrated in Figure 2 shows a 5.5 percent drop in the 4B shaft of the number of employees that received training but still don’t understand how to translate it to their working environment. Based on Figure 2, a total of 12.5 percent of employees in this shaft including the 8 percent that did not receive training do not have a complete picture of what this system is aimed at achieving with respect to their various portfolios. Saffy shaft however, only have 4.8 percent employees that did not have a thorough understanding of TOC inclusive of the 3.75 percent that did not receive training.
Figure 2. Training vs. Understanding Both Shafts

5. Discussion of findings
Research studies show a wide variation of employees’ responses to organizational change ranging from strong optimistic attitudes (i.e. “this change is very important for the organization to succeed”) to strong pessimistic attitudes (i.e. “this change could ruin the company”) [34]. While both ends of the spectrum do exist, to successfully achieve organizational goals and change the programmes thereof, positive attitudes are very essential [31]. Although organizational change may vary in form (e.g. reengineering, restructuring, downsizing, virtual organizing, mergers, etc.), it has been established the absolute success of change is dependent on the employees [10]. Eby [31] stated that an organizational change initiative can either be enabled or constrained by employee perceptions of the organizational readiness to change. The fate of change lies in employee perceptions who could either resist or accept change [31,35,36]. Any organizational change process has been indicated by numerous studies to be a very stressful experience for the individuals involved [30]. According to Vakola [34] there is no correlation between occupational stressors and attitudes to change, which reveals that stressed individuals exhibit increased hesitancy and reduced commitment to accept organizational change involvements. Change in its nature requires a positive onlook, the results obtained in Tables 3 and 4 in relation to the Figure 2 also demonstrate the degree of accuracy in this statement, Saffy shaft had a slightly more positive approach in attitude and perception as opposed to 4B shaft and the production output results are evident. Vakola [34] study indicated that the significant impact on attitudes to change resulted from bad work relationships (leading to lack of trust) as one of the occupational stressor on employees’ attitudes towards change.

Training is an important aspect of the success of any work-system, however understanding is principal to the ultimate sustainable accomplishment. Training can also present itself as part of the organizational stressors as employees often feel the pressure to perform and deliver within a short space of time. Grouws [37] emphasizes the need to learn with understanding and describes it as an issue across all fields of learning. The most fundamental characteristic of learning is understanding, and it is paramount that issues that surround understanding are addressed in models of learning and training [38] in order to encourage sustainability. Many organizational change programs have been perceived as being successful in their early stages, however, according to Kotter [39] it is claimed that ultimately close to 70 percent of all change initiatives fail and as a result, long-term success is not guaranteed [40]. The study by Kotter [39], put forward by specifically observing the behaviour of the 4B shaft trend after TOC implementation. There are other studies however, that suggest factors associated with attitude and perception that could influence this statement. These factors are, that if employees perceive support from the management during the change initiative, organizational change may be more successful [41]. Weber [42] stated that previous studies have also indicated that trust in management plays a significant role in reducing negative feelings triggered by change, uncertainty and ambiguity. In order to craft a significant basis for accomplishing organizational change goals, honest and fair business practices, trustful communication and teamwork may be very key elements to consider [43].

6. Conclusion and recommendation
This study investigated the effect of employee attitude and perception towards organizational change (Theory of Constraints implementation (TOC)) using two Lonmin mine shafts as case studies by using quantitative research methods for collecting data. The general attitude and perception of the employees in these shafts towards change was remarkably positive contrary
to the general notion that ‘people are hostile to change’, which is indicative that TOC was well received in both shafts. However, the results obtained in 4B shaft raise a concern around whether there was sufficient preparation made for the organizational change, or whether or not the shaft was ready for the organizational change. Based on the results obtained from the questionnaire it is conclusive that the success of TOC or any organizational change is not completely a function of employee attitude and perception. The results show that the adaptation struggle in 4B shaft is not a result of the employee attitude and perception, therefore management needs to go back to the drawing board and come up with a training strategy that will adequately prepare the employees and make it easier for them to practice TOC. The results obtained from Saffy shaft and from the questionnaire, show TOC as a sustainable and efficient system, however the results in 4B display otherwise. This, therefore, means that based on the work done for this research it is not conclusive whether the TOC is truly sustainable, or how long it takes to fully implement the system. This study also revealed that the positive employee attitude and perception in organizational change is not the final determinant of whether the organizational change will produce the expected results.

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