Factors Contributing to the Sustainability of 5S in Sri Lankan Organizations

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Abstract

This study attempted to determine the factors contributing to the sustainability of 5S in Sri Lankan organizations. Four hundred and sixty seven (467) employees including both managers as well as subordinates, among nineteen (19) Sri Lankan companies across nine different industries were subjected to the research. Findings suggest that leadership and employee commitment are two important factors. Further, shared leadership as a style (high level of both people and task orientation) should be developed, while commitment is being established among all levels of the organization before implementation. The implication of the study for managers is that they need to pay attention to in developing certain factors before the implementation of 5S in their organizations, as well as another set of factors needs to be emphasized to sustain the implemented 5S, or even any other quality concept for a longer period of time.

1. Introduction

The determination to organize the work place by keeping it neat and clean, thus standardizing conditions and maintaining the discipline that is needed to perform better has been named 5S. The name 5S comes from the first letters of five Japanese terms and has been the stepping stone for many other quality techniques and process improvements such as Kaizen, Just-in-time (JIT), Six Sigma and Total Quality Management (TQM).

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The National Productivity Policy for Sri Lanka was formulated in 2003 to promote productivity at enterprise level. The policy includes an enterprise-approach to productivity improvement, and creation of a harmonious environment in the workplace with employee involvement in productivity programmes and good labour management relations. This is a timely action taken by the Government of Sri Lanka in addressing the efficient and effective use of resources in organizations both in the private and public sectors (National Productivity Awards 2005, 2006).

Along with productivity, emphasis on quality has also gained popularity among Sri Lankan business organizations. These quality concepts have been refined by the Quality Circle Association of Sri Lanka whose motto was “Prosperity through Quality”. With this emphasis on productivity and quality, concepts such as 5S and Kaizen became hot topics among Sri Lankan managers from the late 1980’s.

2. Research Problem

Unlike other countries, the prevailing political economic and labour environment in Sri Lanka has not been conducive for achieving high productivity and excellent quality standards. Many local companies have failed in their attempts to implement and sustain 5S while only very few Sri Lankan companies had sustained the implementation of 5S.

The organizations where 5S was properly implemented and sustained experience a significant impact in terms of quality and productivity in contrast with the companies where 5S could not be implemented properly. They would lag behind their competitors who have efficiently implemented 5S. Is this because the causative factors are not present in such organizations to facilitate the sustainability of 5S? Perhaps, such companies may not have had all success factors in place, and a few failed to implement and sustain 5S.

3. Significance of the Study

The study was aimed at determining whether 5S is truly practised in Sri Lankan organizations in the manufacturing, services, public and private sectors, and whether such organizations are attuned to changes from within for such quality systems for the improvement of their products and services. The findings of this research would reveal the possibilities of Sri Lankan organizations implementing and sustaining changes such as 5S successfully in the future. The research highlights the vulnerable areas, which should be dealt with when implementing 5S.

From the practical point of view, based on the findings of this research, any techniques organization which attempts to implement 5S or other Total Productivity Maintenance techniques (TPM) or even bring in simple changes, would be conscious of the contributing factors based on the significance of the particular factor in terms of contribution.
4. Literature Review

De Mente (1994) refers to 5S when included in management practice as contributing to cost-effectiveness by maximizing both efficiency and effectiveness. When understood and developed regardless of the organization’s size or type, 5S can be used to engage improvement activities within many environments including homes, schools, communities and workplaces.

Some of the important benefits of implementing 5S are summarized by Takashi Osada (1991):

- **Orderliness (seiri and seiton)** – to maximize efficiency and effectiveness by reducing people’s workload and human errors through simplifying processes;
- **Cleanliness (seiso and seiketsu)** – to maximize effectiveness by contributing to a healthier life, safety and wellbeing as well as enhancing transparency; and
- **Discipline (shitsuke)** – to enhance the level of morale which leads to increased quality of work/life and work standards through training and education.

Suehiro (1981) explains that when 5S was initially introduced as a management system in Japan, it was the first 3S (seiri, seiton and seiso) of the 5S concept that received greater emphasis. Given that this occurred with little detailed discussion of the concepts involved, this may have led to the simplistic English translation of “housekeeping.” The development of 5S from this initial starting point to the current comprehensive framework was first formalized by Takashi Osada in the early 1980s. During this same period the Japanese approach to quality, just-in-time (JIT) and total productivity maintenance (TPM) were being developed concurrently.

The kaizen (continuous improvement) principle was also formalized by Imai (1986) as a management method. Consequent to these industrial developments, periodicals started compiling articles and case studies of 5S from both practitioner and industrial research perspectives, which are found in Kojyo Kanri Editorial Dept, (1985). Nikkan Kogyo Shinbun (1995) wrote in the 1990s that this led to the visual control method, and 5S was jointly compiled and translated into English. The primary objective of practising 5S was to maximize the level of workplace health and safety along with increased productivity.

A longitudinal survey by the Japan Industrial Safety and Health Association JISHA, 1999, showed that the development and evolution of 5S between 1945 and 1998 led to a reduction in the frequency of work incidents. The numbers, 2S, 4S and 5S, indicate the order of elements in 5S respectively (for example, 2S stands for seiri and seiton). An additional sixth 5 “safety” evolved and added sometimes to promote the reduction of work injuries. The significance of implementing 5S goes beyond direct productivity as it is aligned with noticeably decreasing industrial accidents during the survey period (JISHA, 1999).

Nakamura (1992) said that while the traditional Japanese understanding of 5S follows the five-step model there is a difference within some Japanese organizations in the elements used for 5S. Some Japanese organizations adopt 3S, and Sprague, 2002; Zelinski, (2005) said that others implement 6S. According to Miki, (1995) these variations appear to depend on the level of maturity of the 5S practice within an organization or the emphasis on corporate
objectives of the organization along with its industrial characteristics. There has also been a change in the organizational objectives of 5S.

As per Womack et al. (1990), originally the elimination of waste was emphasized as in the Toyota Production System (TPS) or “lean production” (Womack et al., 1990).

Bamber et al. (2000) and Tice et al. (2005) suggest that 5S contributes to the following important strategic priorities: productivity, quality, costs, delivery, safety and morale, as shown in the diagram below. (Figure I). All the depicted process improvement programmes such as Occupational Health and Safety Management System (ISO 4801:2000), Environmental Management System (ISO 14001) and ISO 9000 series (Quality Management System) revolve around 5S.

**Figure 1 – All Process Improvements Revolve Around 5S**

Sources: Bamber et al. (2000); Zutshi & Sohal (2005)
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Figure 2: J.P. Ayilu and J.S. Khomba, (2008) explains that Total Process Management is none other than 5S.
Employee commitment has emerged as one of the most important variables in management and organizational behaviour. The reason has been the growing evidence that there is a relationship between commitment and certain outcome variables. The definitions given by various researchers indicate that employee commitment is an attitudinal phenomenon. This is the loyalty that the employees show towards the organization to achieve the goals and vision of the company and to remain in the organization. Several empirical studies reveal that there is a strong relationship between the demographic variables and employee commitment, such as age, sex, pay, job tenure and education, which are negatively related. The researcher also shows that the work rewards, values, motivation, culture, and organizational climate, etc. are the principal determinants of employee commitment. Further research shows that turnover, absenteeism, job satisfaction, job involvement, job tension, job role autonomy, personality factors, worker characteristics and role conflicts are certain outcomes of employee commitment (Girihagama, 2008).

Commitment in terms of 5S is not confined to a particular level of employees in the organizational hierarchy. However, commitment should come from across the organization (all levels of employees), i.e., from top management to the bottom/minor staff including cleaning staff.

Of the factors contributing to the success of 5S, the commitment of leadership comes first. Leadership plays a critical role in bringing about any change in the existing organizational systems and the culture. In fact, the implementation of 5S is somewhat of an organizational cultural change. Hence, 5S would not be successful by just trying to get it done through the others, unlike any other organizational task, which is directed to the subordinates. Implementation and sustainability of 5S requires a 100% genuine involvement of top management.

The less successful companies did not have autonomy (Self Governance - Collins) within the organization. Management has to be 100% behind the 5S campaign. (Osada, 1993). Step 1: Get top management commitment and be prepared (Samuel & Cicmil, 1996).

Having considered the major factors, which contribute to the sustainability of 5S, we can concentrate on two overarching factors as per the literature.

Organizational cultures are created by leaders and one of the most decisive functions of leadership may well be the creation, management, and if and when necessary, the destruction of culture. Culture and leadership, when examined closely, are two sides of the same coin and neither can really be understood by itself (Schein, 1991).

Hence, when leadership is selected as an area of study, the same would cover the area of a conducive culture in the organization.

Similarly, change is also managed by the leader of the organization. The need for change does not require extra attention, as it could be covered under the different aspects of leadership.
No matter how the vision has been formed, the leadership must take responsibility for charting the direction and change process of the organization. *Strong, visionary leadership is a must* (Fuller, 2001).

There is no substitute for the role that leadership and supervision play in accomplishing successful organizational change. Thus, it is extremely important that leaders and supervisors in the organization have a strong understanding of the basic principles of successful change (Carter, 1997).

In the management context different styles of leadership have been identified in the literature. Blake and Mouton’s classic managerial grid shows “concern for people” and “concern for task”. There is particular empirical evidence that their interactive notion of leadership style (that is concern for people interacting with concern for task) has more predictive validity than additive situational approaches (Luthens, 2001).

Similarly, a balance in task orientation and people orientation is required in the leadership style for successful implementation of 5S and its sustainability.

According to the literature, employee commitment leads to commitment towards the success of the organization. However, 5S should be introduced as a tool instrumental in achieving organizational success. Due to the sheer commitment in achieving organizational success employees embrace 5S. The implementation and sustainability of 5S become successful as a result of the said commitment of organizational staff.

Leadership and commitment are two important factors in sustaining the 5S within an organization.

5. Study Frame

*Figure 3 – Major Factors Contributing to the Sustainability of 5S*

<table>
<thead>
<tr>
<th>Resource availability</th>
<th>Leadership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conducive culture</td>
<td>Commitment</td>
</tr>
<tr>
<td>Need for improvement / change</td>
<td>Sustainability of 5S</td>
</tr>
</tbody>
</table>

Although the above five were short listed as the key factors, the literature survey was helpful in reducing these to two, leadership and commitment. Resources are made available only by management or the leadership. Organizational cultures are created by leaders (Schein, 1991). Hence the researchers decided to study leadership and commitment, which would also cover culture, resources and the need for change respectively.
6. Hypotheses

Table 1. Hypotheses and Associated Concepts

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Associated Concepts</th>
</tr>
</thead>
</table>
| H₁         | Task-oriented Leadership (C₁)  
Sustainability of 5S (C₂) |
| H₂         | People-oriented Leadership (C₃)  
Sustainability of 5S (C₂) |
| H₃         | Higher Commitment of Sub-ordinates (C₄)  
Sustainability of 5S (C₂) |
| H₄         | Higher Commitment of Leaders (C₅)  
Sustainability of 5S (C₂) |

H1. Task oriented leadership, contributes positively to the sustainability of 5S.
SH2. People oriented leadership, contributes positively to the sustainability of 5S.
H3. Greater the commitment of subordinates, higher the sustainability of 5S.
H4. Greater the commitment of the Leader, higher the sustainability of 5S.

7. Operationalization

Sustainability was considered from the date of implementation up to the date of this research. The organizations included in the sample had implemented 5S during the year 2007 or before.

Leadership of an organization was tested from two dimensions, the leader’s evaluation of himself and the evaluation by subordinates. This gave an unbiased evaluation of the leadership.
The questionnaire on commitment distributed among both groups was the same because it had to reflect the total commitment of the organization.

**Table 2 - Summary of Operationalization**

<table>
<thead>
<tr>
<th>Concept</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainability of 5S</td>
<td>Taiki Akimoto 5S audit &amp; the interviews</td>
</tr>
<tr>
<td>Leadership</td>
<td>Questionnaire from Fred Luthans</td>
</tr>
<tr>
<td>Employee Commitment</td>
<td>Questionnaire from Fred Luthans</td>
</tr>
</tbody>
</table>

**8. Sample and Methodology**

**Table 3 - Summary of the Actual Sample**

<table>
<thead>
<tr>
<th>Number of organizations selected</th>
<th>19 (Across nine industries)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of respondents</td>
<td>467 (Average of 25 per company)</td>
</tr>
<tr>
<td>Time allocated per company</td>
<td>3 - 4 hours</td>
</tr>
</tbody>
</table>

**9. Data Analysis and Findings**

**Table 4. Summary of Hypotheses Testing (Correlations)**

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Subordinate’s point of view</th>
<th>Leader’s point of view</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>0.818 (0.01)</td>
<td>0.442</td>
</tr>
<tr>
<td>H2</td>
<td>0.7 (0.01)</td>
<td>0.568 (0.05)</td>
</tr>
<tr>
<td>H3</td>
<td>0.785 (0.01)</td>
<td></td>
</tr>
<tr>
<td>H4</td>
<td>0.148</td>
<td></td>
</tr>
</tbody>
</table>

The researchers critically analysed the data obtained through the questionnaire to identify the relationships that were conceptualised in the study. It was observed that most hypotheses were proved.

**Hypothesis 1 (H₁):** Task-oriented leadership contributes positively to the sustainability of 5S.

Since, this hypothesis was proved in the study, it is recommended that the practitioner should develop a high level of task orientation. This is evident in the strong correlation seen between task oriented leadership and sustainability of 5S.
Hypothesis 2 (H2): People-oriented leadership contributes positively to the sustainability of 5S.

Since this hypothesis is supported in the study, it is recommended that practitioners should develop a high level of people orientation. This is evident from the strong correlation seen between people-oriented leadership and sustainability of 5S.

Hypothesis 3 (H3): Greater the commitment of subordinates, higher the sustainability of 5S.

Since this hypothesis is proved, with a correlation of 0.785 (at 0.01 significant level), it is recommended that the practitioner should emphasize building a high level of commitment among the staff.

Hypothesis 4 (H4): Greater the commitment of leaders, higher the sustainability of 5S.

Since this hypothesis is supported in the study it is recommended that practitioners should inculcate a high level of commitment among the leaders at different levels of management.

For sustainability of 5S, leadership and commitment are two important factors. Leadership comprises both task and people orientation. From this study, it is evident that task and people orientation should be maintained at high levels. Hence, shared leadership is the most appropriate style of leadership in this endeavour.

Commitment, which was studied as the second independent variable, needs to be developed and maintained at all levels of the organization.

5S principles should be innovative and more practical. Certain concepts need to be modified as suited to the organizational purpose. A bottom-up approach is most appropriate in creative idea generation.

Motivation through internal competitions, rewards and recognition given to the winners (individually or department wise) is required to maintain the momentum.

5S related objectives in their annual corporate objectives ensure the attainment of the same. Hence, ensure the sustainability of 5S.

Steering committees and patrol teams are required to ensure active participation and contribution of every employee. These committees should represent a total cross section of the organization which covers all levels of employees.

Company training schedules should include training on 5S. Every employee needs to be provided with a basic training in 5S and they should know how it could help in enhancing the quality, efficiency and effectiveness of their work. 5S training should be integrated to the induction training for new recruits to assure that they are not missed out.

Initially, a 5S manual should be developed and it should be made mandatory for everyone to abide by it. Later, include the same guidelines in the Standard Operating Procedures (SOP) of
the organization. Hence, these guidelines will have minimum dependence on any other factor, and sustainability of 5S will be taken over by the organizational systems.

10. Conclusions

The top management of the organization should build a high level of task orientation as well as a people orientation in their leadership style. Hence it is shared leadership, which is the most appropriate style for sustaining 5S.

Commitment needs to be built at all levels of the organization.

All employees should be provided with 5S training. Essentially they should know the benefits of 5S, which would help them in uplifting the quality of their work as well as their personal lives. Hence, get them to willingly embrace the concepts of 5S and transfer them into their blood stream.

In order to be successful in sustaining 5S, managers should establish the said style of leadership and employee commitment, while providing the employees with the required 5S training by the time of implementing 5S.

Once these are in place the organization is ready for a long lasting 5S. However to ensure its sustainability the managers need to include the 5S guidelines into company systems and make them mandatory. Employees who show a special interest need to be recognized and rewarded in order to encourage others too. 5S concepts need to be modified to be more practical.

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