Implementing 5S within a Japanese context: an integrated management system

Rod Gapp, Ron Fisher and Kaoru Kobayashi
Griffith Business School, Griffith University, Bundall, Australia

Abstract

Purpose – Building on previous studies of the managerial application and development of the 5S concept (5S), this research aims to identify and present key concepts of 5S from a Japanese management perspective. These findings link 5S to aspects of Japanese management approach, which are aligned to an integrated management system rather than a simple management tool or technique.

Design/methodology/approach – Data were collected from Japanese companies that use 5S as a core management approach and use their organisational web sites to disseminate information in regard to this practise. The data were examined by the use of computer-aided lexical analysis (Leximancer), which provided an insight into the nature of 5S within the original Japanese context.

Findings – The research found several key concepts behind the Japanese approach to 5S management. These findings demonstrate the importance of both the technical (visible) and philosophical (invisible) approaches required for each of the 5S components and are discussed in a managerial rather than cultural framework.

Practical implications – The findings are important both theoretically and practically as they provide insight into the meaning and logic, applied to the application of the 5S management approach within its original environmental context.

Originality/value – The originality and value of the paper is derived from the holistic understanding of the application of 5S and its use as a problem-solving intervention at the system or process level; a necessary initiating point within lean management philosophies. 5S within the context identified is the strategic platform for the managerial decisions required for the development of an integrated management system.

Keywords Japan, Management philosophy, Business improvement, Quality assurance

Paper type Research paper

Introduction

5S initially based on the Japanese acronyms of seiri (organisation), seiton (neatness), seisō (cleaning), seiketsu (standardisation) and shitsuke (discipline), is used as a platform for developing an integrated management system by the parallel use of total productive maintenance (TPM) (Bamber et al., 2000). In the West both 5S and TPM are sometimes disregarded or at least underutilised (Douglas, 2002). A common definition of 5S in the West is “housekeeping” (Becker, 2001; Chin and Pun, 2002; Cooney, 2002; da Silveira, 2006; Eckhardt, 2001). A framework of applying 5S within a business (as apposed to a personal philosophy of way of life) was first formalised in the early 1980s by Takashi Osada (Ho et al., 1995). The practice of 5S aims to embed the values of organisation, neatness, cleaning, standardisation and discipline into the workplace (Osada, 1991). In Japan the 5S practice was initiated in the manufacturing sector and then extended to other industries and services sector. The Toyota Production System provides a well-known example of 5S principles in practice, the early versions were
based on 3S this, became 4S (Ohno, 1988). Boeing in the USA pursues 5S as a world-class strategy (Ansari and Modarress, 1997). Even with these prestigious and complex examples it appears that many researchers and practitioners have difficulty going beyond the simplest 5S concept (or meaning) of “housekeeping”. This is suggested by Hyland and others where they believe that Australian manufacturing firms have only a basic perception of the importance and the potentiality of 5S (Hyland et al., 2000). These authors found of ten continuous improvement tools they investigated the usage and perceived importance of 5S was lowly ranked. It would appear at the abstract level, 5S is “easy to understand” (Becker, 2001; Eckhardt, 2001; Zelinski, 2005). It seems far more difficult to fully understand what lies behind 5S when developed as a value driven business model as seen in both the Toyota and Boeing situations. In addition it is also believed that some definitions applied to 5S in the west may confuse practitioners (Hubbard, 1999; Shih and Gurnani, 1997), compounding the difficulty the West has in fully appreciating the benefits of 5S as an organisational wide strategy for improving organisation decision making and performance.

This paper is aimed at optimising an understanding of 5S and its full potential. This can be enhanced through the understanding of the organisational and management perceptions of 5S in its country of origin (Japan). Based on the previous study (Kobayashi et al., 2006) texts from Japanese organisational web sites were re-examined in depth using computer-aided lexical analysis (Kobayashi et al., 2006). The result revealed important factors in the understanding of the managerial and organisational nature of 5S. The authors suggest that these factors could be crucial for the successful implementation of 5S in non-Japanese contexts.

A review of the literature

Background to the concept of 5S

The understanding 5S is detailed and engrained in Japan, as it stems from an approach that sees it as life wisdom, practiced everyday (Osada, 1989). Because of this foundation 5S is easily included in management practice and contributes to cost-effectiveness by maximising both efficiency and effectiveness. When understood and developed within the context regardless of the organisations size or type, 5S can be used to engage improvement activities within many environments including: homes, schools, communities and workplaces (De Mente, 1994). The implementation of 5S can also uncover hidden problems that may have otherwise remained unnoticed. Some of the important benefits of implementing 5S are summarised as:

- **Orderliness (seiri and seiton)** – to maximise efficiency and effectiveness by reducing people’s workload and human errors through simplifying processes;
- **Cleanliness (seiso and seiketsu)** – to maximise effectiveness by contributing to a healthier life, safety and wellbeing as well as enhancing transparency; and
- **Discipline (shitsuke)** – through training and education to enhance the level of morale which leads to increased quality of work/life and work standards (Osada, 1991).

Within Japan it is endeavoured that the practice of 5S be integrated with another Japanese life wisdom *kaizen* (change for the better) and *me-de-miru* (visual) methods (Kodama, 1959). This integrated system of thinking and managing becomes *me-de-miru kanri*, which is a visual control system. When initially introduced as a
management system in Japan the first 3S (seiri, seiton and seiso) of the 5S concept received greater emphasis. Given that this occurred with little description of detailed discussion of the concepts involved (Suehiro, 1981) 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 formalised by Takashi Osada in the early 1980s. During this same timeframe the Japanese approach to quality, just-in-time (JIT) and TPM were being developed concurrently. The kaizen (continuous improvement) principle was also formalised by Imai (1986) as a management method.

As a response to these industrial developments, periodicals started compiling articles and case studies of 5S from both practitioner and industrial research perspectives (Kojyo Kanri Editorial Dept, 1985). In the 1990s this led to the visual control method and 5S being jointly compiled and translated into English (Nikkan Kogyo Shinbun, 1995). A primary objective of practising 5S is to maximise the level of workplace health and safety in conjunction with increased productivity. A longitudinal survey by the Japan Industrial Safety and Health Association JISHA, 1999 showed the development and evolvement 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 S “safety” has evolved and is sometimes added 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), shown in Table I.

While the traditional Japanese understanding of 5S follows the five-step model there is some difference within some Japanese organisations in the elements used for 5S. Some Japanese organisations adopt 3S (Nakamura, 1992) whereas others implement 6S (Sprague, 2002; Zelinski, 2005). These variations appear to depend on the level of maturity of the 5S practice within an organisation or the emphasis on corporate objectives of the organisation along with its industrial characteristics (Miki, 1995). There has also been a change in the organisational objectives of 5S. Originally elimination of waste was emphasised as in the Toyota production system (TPS) or “lean production” (Womack et al., 1990). However quality has become the primary purpose of the 5S practice for most Japanese manufacturers.

<table>
<thead>
<tr>
<th>Period (Years)</th>
<th>Activity</th>
<th>Work Injuries</th>
<th>Productivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (1950-1955)</td>
<td>2S</td>
<td>44.08</td>
<td>(1950) 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24.49</td>
<td>(1955)</td>
</tr>
<tr>
<td>2 (1956-1972)</td>
<td>4S</td>
<td>22.99</td>
<td>(1956) 3.6 times up from the previous period</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.25</td>
<td>(1972)</td>
</tr>
<tr>
<td>3 (1973-1980)</td>
<td>5S</td>
<td>7.25</td>
<td>(1972) 1.4 times up from the previous period</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.59</td>
<td>(1980)</td>
</tr>
<tr>
<td>4 (1981-1998)</td>
<td>6S</td>
<td>3.23</td>
<td>(1981) 1.5 times up from the previous period</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.75</td>
<td>(1998)</td>
</tr>
</tbody>
</table>

**Source:** JISHA, 1999
This quality focus has become globally accepted in conjunction with other Japanese approaches to quality (Shih and Gurnani, 1997). Recently, because of the applicability of its overall approach to decision making, 5S has expanded its application onto environmental management systems (EMS) to assist in achieving sustainability (Bicheno, 2004; Tice et al., 2005).

What the Japanese 5S entails

The original concept of 5S has both socio-historical and philosophical roots (Kobayashi, 2005). Many of the practices in Japan are often denoted by do (way: philosophy) and jyutsu (techniques), such as kendo (philosophical)/kenjyutsu (technique) (Japanese fencing) or similarly judo/jujyutsu (in Japanese unarmed combat), which are intended to train the body and mind through discipline (Sugiura and Gillespie, 2002). This creed is also applicable to Japanese management which encompasses both “management philosophy” and “management techniques”. An example of the former can be seen in private supplemental schools, such as The Matsushita Institute of Government and Management (MIGM) founded by Konosuke Matsushita in Matsushita Electronic Industry. They provide lectures to CEOs, politicians and economists, including management philosophy, visions, economics, policies and ethics (see www.mskj.or.jp). The 5S concept is also included with its “way of life” and management context (MIGM graduates, personal communication, July 2006). This view is consistent with Osada’s framework (1989) but has not been accurately reflected in the English edition (1991) of his work. The management techniques can be obtained at an individual basis from publications, workshops and seminars provided by management consultancy services. For example, Hiroyuki Hirano successfully promotes 5S using manga (cartoon comics) and audio-visual materials (e.g. The Productivity Press Development Team, 1996). This view emphasises more on the use of the first 2S (seiri and seiton) and its importance for corporate survival (Hirano, 1995) but by adopting this approach of emphasising the techniques, the importance of the underpinning philosophical thought can be lost on the novice or beginner.

The current recognition of 5S Japanese management thought in Western literature

While much of Western literature still acknowledges 5S as “housekeeping” (Becker, 2001; Chin and Pun, 2002; Cooney, 2002; da Silveira, 2006; Eckhardt, 2001) or a “lean tool” (Hines et al., 2004; Pavnaskar et al., 2003), others perceive 5S as having a more strategic focus. For example, Hyland et al. (2000) refer to 5S to a “problem-solving tool”. Bamber et al. (2000) suggest that 5S and TPM can be practised not only simultaneously but also in conjunction with other process improvement methods used in total quality management (TQM), kaizen and just in time (JIT) methods so that organisations can take an integrated approach, which incorporates EMS. This view is empirically supported by Zutshi and Sohal (2005) who identified that there are benchmarking standards available for the EMS which can be used to achieve optimum levels of operations or “best practice” in Australia, as shown in Figure 1.

In practice, enormous effort may be required to achieve this integrated management system. Therefore small-to-medium organisations may resist taking this view due to economy of scale. Researchers recommend considering 5S in a more philosophical or at least strategic way. When 5S becomes a way of doing business, operations will need to be approached differently due to the behavioural changes required as a basis for 5S to
succeed. Once all members within an organisation can fully understand and implement 5S, organisational readiness towards best practice becomes more realistic, since one of the outcomes of successful 5S practice is increased morale and organisational resilience (Osada, 1991). The literature (Bamber et al., 2000; Tice et al., 2005) suggest that 5S contributes to the following important strategic priorities: productivity, quality, costs, delivery, safety and morale, as shown in Figure 1. In present Western writing (Tice et al., 2005; Vais et al., 2006) there has been recognition of the potential of 5S in line with environmental management, an approach, which is well established and exercised in Japan (Bicheno, 2004)

Prior to and including these findings, Western literature has had a predominate focus on the more visible and describable *jyutsu* (techniques) of 5S and placed little emphasis on the “Do or way”, the philosophical foundation of the approach within a Japanese management context. This separation of the technical from the philosophical aspect of managing and developing 5S has weakened both the understanding and application of 5S in Western management settings.

**Methodology**

The literature (Douglas, 2002; Ho et al., 1995) has suggested that 5S is underutilised by Western organisations. Others have implied that 5S has received a focus on specific applications rather than on its holistic meaning (Kobayashi et al., 2006). The aim of this research was to understand the message from these organisations in terms of the managerial principles and practises of 5S in a Japanese organisational or management context. This research looked at existing established secondary data in relation to the managerial and organisational application of 5S within Japanese businesses; organisational web sites were selected as the research frame. This is possible as messages in organisational web sites are becoming dialogues which represent the organisations’ strategic intentions making them more than just a marketing device (Flanagin, 2000; Jones et al., 2004; Kee, 2002). Corporate web sites are now important primary sources of information in relation to that organisation’s (Anderson and
Kanuka, 2003; O'Dochartaigh, 2002). This study also sought for keywords commonly used by organisations. Therefore the approach reflects that of a case study investigation of messages from Japanese 5S practicing organisations.

A total of 84 Japanese organisations, which publicly described 5S on their organisational web sites, were purposive sampled. Based on previous research in this area (Kobayashi et al., 2006), both accessibility checking was conducted followed by a test-retest reliability checking before analysis. Computer-aided lexical analysis (Kobayashi et al., 2006) was used for this study. This enabled triangulation of the data set. Leximancer Version 2.2, was used as a data analysis tool, its learning capability generated and put similar words into groups automatically as synonyms, then represented them as a “concept” (Smith, 2003).

In computer-aided lexical analysis, each word forms the unit of analysis (Krippendoff, 1980). The initial execution of Leximancer identified 21 concepts by generating a number of words. The number of concepts to be considered by Leximancer was increased incrementally and the program again executed. This was continued up to a setting of 40 concepts. After these iterations it was observed that no new concepts above 31 were evident, therefore, the concepts identified in the analysis, were deemed to be saturated, as proposed by Strauss and Corbin (1998). All 84 web pages were used for the analysis. A feature of Leximancer is its ability to display concepts and the relationships between them, in a conceptual map. The type of mapping selected was “linear” which emphasises co-occurrence between concepts (Smith, 2003).

Content validity, the accuracy of translation was checked using Brislin’s (1980) back translation method. In the previous study (Kobayashi et al., 2006), all the pages were independently translated into English and content validity was conducted by the use of both a Web translation service with a verification sample of these translations assessed by an independent translator. Data, which contained industry-specific terminologies was confirmed by independent translators to assure accuracy. As a consequence, of these validity checks, some modifications in assigning words were made. The term organisation was replaced to either company or arrangement to avoid confusion in its meaning (e.g. the organisation component of 5S rather than the business form). As most Japanese put the first S seiri and the second S seiton together in use as an idiom, this was identified as significant in the previous studies by Kobayashi et.al. (2006). The concept arrangement was manually assigned to represent these two elements altogether. The third S seiso and fourth S seiketsu were assigned as cleaning for the same reason.

Findings
The 5S as a means of management
The most frequently occurring concepts were: cleaning (seiso and seiketsu), improvement (kaizen) and arrangement (seiri and seiton); all three concepts were strongly linked to each other. These concepts were followed by place, management and activity, place and activity were closely linked and management existed in its own right. The fifth S shitsuke was emphasised as training, which was linked to the concepts of method and workplace. Table II shows all the 31 concepts extracted by Leximancer.

The proximity of concepts in the cluster map was derived from a combination of the direct and indirect relationships between those concepts listed in Table I achieved through a series of 2,000 iterations of Leximancer. The 31 concepts were clustered by the
lexical software to produce groups of related themes. The cluster map displays the higher-level concepts. It can be readily seen that the clusters produced can be grouped as:

- standard-cleaning-activity;
- machine-improvement-management; and
- plan, as shown in Figure 2.

<table>
<thead>
<tr>
<th>Concept</th>
<th>AC</th>
<th>RC (%)</th>
<th>Concept</th>
<th>AC</th>
<th>RC (%)</th>
<th>Concept</th>
<th>AC</th>
<th>RC (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleaning</td>
<td>176</td>
<td>100.0</td>
<td>Order</td>
<td>87</td>
<td>49.4</td>
<td>Profit</td>
<td>50</td>
<td>26.0</td>
</tr>
<tr>
<td>Improvement</td>
<td>170</td>
<td>96.5</td>
<td>Business</td>
<td>84</td>
<td>43.7</td>
<td>Standard</td>
<td>48</td>
<td>25.0</td>
</tr>
<tr>
<td>Arrangement</td>
<td>156</td>
<td>88.6</td>
<td>Enterprise</td>
<td>74</td>
<td>38.5</td>
<td>Fixed</td>
<td>44</td>
<td>22.9</td>
</tr>
<tr>
<td>Place</td>
<td>154</td>
<td>87.5</td>
<td>Company</td>
<td>73</td>
<td>38.0</td>
<td>Small</td>
<td>40</td>
<td>20.8</td>
</tr>
<tr>
<td>Management</td>
<td>132</td>
<td>75.0</td>
<td>Person</td>
<td>72</td>
<td>37.5</td>
<td>Machine</td>
<td>39</td>
<td>20.3</td>
</tr>
<tr>
<td>Activity</td>
<td>118</td>
<td>67.0</td>
<td>Fact</td>
<td>68</td>
<td>35.4</td>
<td>Customer</td>
<td>37</td>
<td>19.2</td>
</tr>
<tr>
<td>Time</td>
<td>100</td>
<td>56.8</td>
<td>Work</td>
<td>59</td>
<td>30.7</td>
<td>Equipment</td>
<td>36</td>
<td>18.7</td>
</tr>
<tr>
<td>Method</td>
<td>98</td>
<td>55.6</td>
<td>Factory</td>
<td>57</td>
<td>29.6</td>
<td>Information</td>
<td>36</td>
<td>18.7</td>
</tr>
<tr>
<td>Training</td>
<td>93</td>
<td>52.8</td>
<td>Addition</td>
<td>57</td>
<td>29.6</td>
<td>Plan</td>
<td>33</td>
<td>17.1</td>
</tr>
<tr>
<td>Workplace</td>
<td>91</td>
<td>51.7</td>
<td>Production</td>
<td>50</td>
<td>26.0</td>
<td>Participation</td>
<td>31</td>
<td>16.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Maintenance</td>
<td>30</td>
<td>15.6</td>
</tr>
</tbody>
</table>

Notes: AC: absolute count; RC: relative count

Table II. The list of concepts regarding 5S appeared in the Japanese context

Figure 2.
The conceptual map of 5S in the Japanese context
When looking at co-occurrence, the following were identified: the concepts of cleaning, arrangement and training were linked to each other. The frequently occurring concept of improvement was linked to place, cleaning, and activity and followed by arrangement, training and management. The concept of place mostly included the word of genba (shopfloor), organisations investigated often expressed this as an “(immediate/actual) place of management”. The concept of improvement included both the words “efficiency” and “effectiveness”. The word “efficiency” was generally related to the concept of production whereas the word “effectiveness” was linked to the concept of management. Here discussions of material from the sources investigated included statements indicating that “improvement can only be achieved when management develops processes that increase effective ways of day to day operation . . . This is best achieved when inefficiency is identified in the workplace by individuals or workgroups and discussed in terms of improving performance in both the short and long term.” It would seem from this information that Japanese organisations clearly perceived 5S as a holistic, stand-alone management method for workplace improvement, while machine, equipment, and maintenance were related to the TPM practice. These results support the literature (Bamber et al., 2000) that 5S can be a platform for the integrated management system (IMS). The concept of standard included expressions such as “5S is the foundation for constructing international standards into management systems” and “continues this standard with actions”. This evidence supports 5S fit within both ISO or OHS (AS 4801 in Australia) standards (Zutshi and Sohal, 2005).

Further defining 5S as a high level management method that enhances both management decisions and strategy is the relationship between the groups identified in Figure 2 and Deming’s (1994) Plan, Do, Study, Act cycle (PDSA). Here the important application of planning is identified in isolation to the right and incorporates the key activity of participation. The doing relates to the groupings of Standards, cleaning and activity within the terms of the organisational plan. Study and act fit across the groupings of machine, improvement and management which see the study being the understanding of the amount and reason for improvements and the act being the management of the organisational activities to increase the value of both the existing processes involved and to review and further develop the plan.

Within these groups there is also relevant information in terms of the focus placed by Japanese management when applying 5S. First, the three grouping of planning, standards and machine sit on the outside of the core grouping of improvement, managing, training and activity, indicating that they are seen as normal developed processes. The sources researched identified that the application of the first 3S’s assisted in a number of ways; “in using 5S one becomes to understand the value of systems and processes,” “in applying the organising aspects of 5S improvement issues become clearly identified” and “to manage improvement one needs to understand ones work, how activities relate to this work and what skills are best for this work, 5S removes the clutter making this an easier process for all involved.” This is clarified with planning including participation, machine linked to maintenance and standard of sufficient importance to be its own category. The management grouping has a focus on business and business related issues giving it a clear strategic direction on organisational performance, while the grouping of improvement includes a mix of external and internal management objectives and includes quality related fuci such as
customers, enterprise and profit. The training grouping includes the operational aspects of 5S such as training, workplace, arrangement and equipment an interesting link between the improvement and training grouping is concept of fact this suggests a role in enhancing performance. The last grouping of activity provides insight into the individual at a personal level, while all other groups look from the team or sectional level up and out to the organisational level in an integrated fashion.

The current intentions on 5S from the Japanese cases
A breakdown of organisations that described 5S on their web sites is shown by industry sector in Table III. Here manufacturing organisations included automotive-parts, food, and chemical producers. Service organisations consisted of employment agencies, management consultancies and training providers. A third category was separated out and included schools, management associations, management communities, and city councils, which has a non-profit or government focus.

When looking within these categories at individual cases, the manufacturing sector seemed to be major 5S practitioners whereas service organisations tended mainly to act as 5S trainers and providers. The other organisational sectors were a combination of both 5S trainers and practitioners. Technical colleges provided both the educational aspects and implementation methods of 5S; they implemented 5S and informed their 5S teaching through their experiences. Non-profit organisations (management associations and communities) provided places where 5S practitioners could conduct meetings and use other mechanism to exchange information regarding their workplace management and current 5S practices. Their main emphasis was “5S is primary for improvement”. City councils were aligned with training providers to offer 5S workshops mainly for small sized organisations at affordable prices and some free. Councils also discussed 5S in terms of management, decision-making and planning and highlighted the benefits of 5S to government, business and the broader community.

In terms of training, these organisations explained the meaning and importance of 5S and provided examples of the advantage of 5S implementation. Practitioners’ provided descriptions of their current practice and included photos pictures and diagrams inline with the me-de-miru (visual methods) philosophy. This study did not extract the details of those additional visual materials. Some organisations used their web sites as newsletters to communicate with their customers. Others provided company audits as a method of informing current levels of their 5S implementation within that particular organisation. Education/non-profit/city councils provided mixed information. Numazu City Council (case 68) incorporated 5S into their policies and informed the reader of their current 5S practice and explained how the council can provide better services to their citizens using the 5S principle. This organisation also provided a dialogue-style checklist, which linked to workplace health and environmental management.

<table>
<thead>
<tr>
<th>Cases</th>
<th>Count</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td>25</td>
<td>29.8</td>
</tr>
<tr>
<td>Service</td>
<td>37</td>
<td>44.0</td>
</tr>
<tr>
<td>Education/non-profit/city council</td>
<td>22</td>
<td>26.2</td>
</tr>
<tr>
<td>Total</td>
<td>84</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table III. The list of concepts regarding 5S appeared in the Japanese context.
Discussion

Research outcomes

The study identified a major emphasis for Japanese 5S organisations, that being “to create a better workplace.” An implication in this finding is that the implementation and management of 5S in the Japanese organisations studied, is based on the holistic perspective of the 5S concept in both organisational and management decision making. In this context, 5S focused both internally within the companies themselves and outwardly toward customers and suppliers. These findings are supported by Osada (1991) where the ability to improve the workplace in conjunction with internal and external company relationship are assisted by the enhanced transparency that this holistic management approach to 5S provides. The research also indicated that this transparency is associated with the visual methods used (me-de-miru) and the direct relationship 5S was seen as having on improvement, management and overall organisational performance. Through the use of general and easy to understand terms on their web sites the Japanese organisations investigated also indicated that it is important to promote 5S practice to a wide audience as this communication is aimed at their customers as well as their employees.

Whilst manufacturers seem to have very advanced 5S practices, the findings from service organisations implied that service firms are in an earlier phase of the developmental cycle with a slightly low level of maturity in their 5S practice. Historically a similar progression was also observed in the early stages of 5S development in their manufacturing counterparts, indicating a later uptake of 5S in the service sector. Commonly used terms in the Western 5S literature such as “housekeeping” (Becker, 2001; Chin and Pun, 2002; Cooney, 2002; da Silveira, 2006; Eckhardt, 2001) or “lean tool” (Hines et al., 2004; Pavnaskar et al., 2003) did not appear in this study of Japanese organisations. This supports the use of a different focus in the managerial and organisational approaches taken to decision making and strategy when Japanese management implement 5S. Reinforcement for this finding is also obtained in the data as abbreviations such as TQM, JIT and TPM were included and integrated into 5S by the organisations investigated again, emphasising the holistic management perspective adopted.

This study could not find terms such as “employee involvement” or “employee empowerment” terms, which are regularly included in the Western literature. More importantly, the study identified a higher level of overall organisational involvement, total participation to the concept of 5S occurred at the planning rather than implementation level. Planning was a significant grouping in its own right; the two components of the grouping were planning and participation. This suggests a total participation emphasis by Japanese management in terms of 5S and its implementation. Thus, reducing the need to develop what could be seen as a lower level intervention, such as involvement and empowerment as these stand-alone concepts would become givens within the total participation approach identified in the study. The research also suggests that total participation in Japan is seen in terms of “autonomy”, such an important emphasis has little mention in the “lean” literature but does occur in TPM literature. Suzuki (1992) claims that autonomy has a complex relationship with 5S, in that 5S implementation can enhance autonomy and inversely the existing presence of a high level of autonomy enhanced the practice of 5S. Thus, within the Japanese context, autonomy and 5S can be both a means and an outcome;
whichever way it occurs it provides an understanding to why 5S is a strong platform for the development of an integrated management system.

This study provides a theoretical link in terms of 5S and its role in developing managerial and organisational capability. It also has identified a number of further studies which include the analysis of material other than text, such as the many visual materials identified (me-de-miru) as important in the Japanese presentation of 5S – photos, diagrams, models, charts, etc.

Practical outcomes
Gaining an understanding of the complexity and deeper requirements of 5S from a Japanese management perspective is a valuable source of information in terms of its application within other managerial settings. 5S, within a Japanese management contextual setting, is intended to provide a mechanism for improving the workplace with minimal costs and disruption. There is strong evidence that this is achieved through both high levels of managerial and organisational decision making while maintaining an environment of total participation. This is achieved by integrating the concepts of outcomes, planning and participation. The research identified that Japanese managers placed a strong emphasis on the involvement of individuals and workgroups, not only in the operational aspects of the development of 5S but also in the strategic and long-term organisational benefits of the application of this system. This involvement of management and the linking of the identified concepts of management-improvement-activity and training and effective planning systems is driven by participation, establishing logical and applicable standards for day to day operations. A direct consequence of this approach is the provision of a platform that creates a direct understanding and application of Deming’s (1994) PDSA cycle, which is important as this type of thinking has translated into action improving 5S in terms of practical application. The level at which this platform is applied is of importance as it is clear that in the initial phase of the 5S system that all possible benefits are presented as a well articulated strategy. The participation focus of such an approach means that all are informed and involved, including all organisational members, customers and suppliers. It is this higher level of understanding that translates to the improvements required to meet the identified emphasis of “to create a better workplace.” Within this organisational context a better workplace has complex meanings, which include:

* improving overall organisational performance and productivity by understanding the implications and relationships between the individual, the work group (section) and the organisation in terms of output and requirements;
* enhancing relationships with customers and including their requirements when thinking about and designing the work environment required to create the product or service;
* the identification of a clear plan that includes 5S within the organisation’s overall strategic direction and linking this to the PDSA cycle thereby making such a plan organic within the organisation; and
* understanding the needs across the complete spectrum for individual to group (section), to the complete organisation. This extensive level of knowledge enhances every individual’s ability to co-contribute to the concept of enterprise and the facts, activities and organisation required to achieve these outcomes.
Management, while facilitating this process, is released from operational roles to develop higher-level activities that drive the direction of the overall performance of the organisation.

It is clear that the adoption of 5S is well suited to applications within production firms as it provides a platform that, with little effort, allows the organisation to satisfy various international standards with minimal costs. This appears to have a historical dimension with manufacture having a longer leadtime. There is strong evidence that 5S is applicable and beneficial for service industries, and that this sector is in the earlier stages of 5S development and implementation but progressing toward the level as seen in manufacture.

Although this study did not focus on the aspect of “how to” implement 5S, the use of me-de-miru (visual) methods could be a success factor for the 5S implementation. This highlights an area that will have practical applications when better understood.

**Conclusion**

It is clear that Japanese organisations see 5S as having two components, the first being a high level management and organisational system that has a complex and philosophical meaning (do: the way). This translates to overall organisational performance through participation. The second is the provision of a management portfolio of tools (jyutsu: techniques) that provides the means to achieve the high level “do” requirements of the organisation. This was demonstrated in the conceptual map with the four key areas being; management, activity, training and improvement. These four areas provide the organisation with a defined platform for managerial decision-making within a total participative environment of the development and implementation of the 5S management approach. The concept map places the concepts of machine (including maintenance) to one side the concept of standards to another and separates out the leading process of planning. It is the core activities of management, activity, training and improvement that allow for an understanding of the appropriate standards and maintenance of machine outcome of the planning and core processes, the do or way. This deeper understanding of 5S and its associated intent builds a culture that develops a management strategy, which sees its application presented in the form of an Integrated Management Systems. An important point for consideration for the successful uptake of 5S occurs when the benefits of 5S are fully appreciated within this holistic management perceptive, and a high level of autonomy is provided to all involved within a well-planned environment. As 5S stems from life wisdom and the deeper understanding of 5S at an abstract level its application is difficult as it requires the actual development of the wisdom rather than an abbreviated summary of some of the concepts in the terms of management tools. It is this deeper wisdom that will allow the West to develop the 5S to the levels of managerial application seen within this study, rather than the simple tool for ordering the workspace, where the focus seems to be on the two techniques of maintenance and standards (jyutsu) as identified in the findings and presented in Figure 2.

**References**


**Corresponding author**

Rod Gapp can be contacted at: r.gapp@griffith.edu.au

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