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Implementation of 5S Methodology in Public Libraries: Readiness Assessment

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Abstract

The main aim of this study is to investigate the readiness rate for implementing the 5S methodology in one of the greatest ancient public libraries in Iran and the Islamic world. The other objectives of this study are to determine the necessity and possibility of the 5S implementation in this library. The target population included all librarians, 110 people, working in the library departments who are in direct contact with users, out of whom 86 ones were selected randomly. After holding a training workshop on 5S, required data was collected by a self-made questionnaire. The research findings show that the librarians have a superb knowledge regarding the necessity of implementing the 5S in the library and according to them, implementing the 5S is relatively possible. Moreover, the library readiness, for implementing the 5S, has been discussed.

Keywords

5S methodology, TQM, librarians, public library, Iran

Introduction

5S methodology

The aim of total quality management (TQM) is to improve the quality of products and services and, in consequence, customer satisfaction (Dahlgaard & Dahlgaard-Park, 2006). According to Osada (1991), 5S is the key line for TQM. Sarkar (2006) points out before administering any other quality methodology, organizations need to implement and institutionalize the 5S. It is a Japanese management tool for making, developing and keeping a quality workplace by a series of activities. Japan has been using this practice for a long time. 5S methodology consists of five basic Japanese principles as Seiri, Seiton, Seiso, Seiketsu and Shitsuke meaning structurize, systematize, sanitize, standardize, and self-discipline in order (Liu, 2006). In Osada's idea (1991), the goal of 5S is organizing the workplace, holding it neat, cleaning, keeping standardized conditions, and maintaining the discipline that is required to perform a job perfectly. The 5S methodology is widely used in different manufacturing and business organizations however service organizations are employing its energy today (Sarkar, 2006).

The goals of the 5S implementation in an organization are as follow:

- optimizing use of space (Sarkar, 2006);
- organizing workplace (Osada, 1991; Warwood and Knowles, 2004; Sarkar, 2006)
- reducing waste, time and cost (Warwood and Knowles, 2004; Sarkar, 2006; Main et al., 2008);
- having better housekeeping (O'Eocha, 2000; Warwood and Knowles, 2004; Main et al., 2008)
- improving quality, efficiency and productivity (Ho and Cicmil, 1996; Sarkar, 2006; Sharrock, 2007)
- having better health and safety standards (Ho and Cicmil, 1996; O'Eocha, 2000; Warwood and Knowles, 2004);
- preventing pollution (O'Eocha, 2000; Becker, 2001)
- retrieving the items fast (O'Eocha, 2000; Sarkar, 2006; Sharrock, 2007)
- satisfying users (Xu, 2013; Nana, Drabo, Capo Chichi and Agueh, 2015)
- having staff's higher morale (Ho and Cicmil, 1996; Osada, 1991)
- increasing interaction between teams and create team spirit (Sarkar, 2006);

- creating a sense of belonging among staff (Sarkar, 2006).

Statement of the problem

In today's world, organizing work environment based on the scientific and systemic principles is one of the obvious and important characteristics of organizations and companies in developed countries, whereas in developing countries, the minimum attention has been spent on the systematic and scientific organization of the workplace and as an important principle does not enjoy a proper position (Masroor, 2009). As an example of workplaces, public libraries need to follow a certain pattern and practice in organizational and official affairs in order to discipline the office affairs and environmental neatness so that it can get more access to its own goals meaning attracting users' consent and to get the best and the most prominent information in the least time (Nooshin Fard and Mohammad Amini, 2012). It is while we are facing with a decrease in the number of public libraries's users in Iran (Keshvari and Abdollahi, 2012) and the other hand, some problems have been reported in Iranian public libraries (problems such as inadequate study space, lack of attention to making a necessary space for people with special needs, lack of necessary standards and so forth (Jalali, 2009) which make an incorrect services to the users, and bring about their dissatisfaction from the library services and a decline in using libraries. The Central Library of Astan Quds Razavi, also, is not excluded from this as an important public library of the country. This library is one of the greatest ancient Islamic libraries in Mashhad, Iran which Muslim nation of Iran has inherited as a precious heritage. Furthermore, it is considered to be one of the richest Islamic libraries throughout the world. According to its perspective document of 2025, this library tries to turn into the richest and the most active library center in the region and in the Islamic world. Therefore, applying a methodology like the 5S seems to be vital for removing environmental problems and efficient use of tools and also space of this library. However, in order to successfully implement and administer any methodology especially the 5S, identifying library readiness with respect to the influencing factors is prior to all actions, because the significance of this influence is to the extent that the implementation or non-implementation of the 5S depends on them (Abootalebi, 2002). On the other hand, identifying the necessity and possibility of applying the 5S on the view of main agents administering 5S, i.e. the librarians, can have a key role in achieving or failing of the 5S implementation. Therefore, the results of the present study can lead to

the library managers and authorities' awareness towards the library readiness for implementing the 5S. Thus, it would help recognize the strength points and weaknesses and contributes the managers and authorities in order to increase library readiness for implementing the 5S so that they can take effective steps in the further dynamism of this library. Thus, the main objective of this study is to identify the rate of the public library's readiness for implementing the 5S in terms of personal and intra-organizational influencing factors, in other words, factors related to organization and staff. The Other objectives of this study are to determine the necessity and possibility of 5S implementation in the library.

Literature review

So far, numerous studies have been conducted in manufacturing and service organizations, some of which engaged in investigating influential and inhibitive factors in implementing 5S. For example, through a survey using formal interviews and informal discussions, O'hEocha (2000) confirmed the influence of company culture, communications and employee attitudes on the use of 5S for environmental management at Cooke Brothers Ltd. In another survey conducted by Warwood and Knowles (2004), the major perceived benefits of implementing 5S in the UK manufacturing and service organizations were a clean and organized workplace, an improved work flow and the release of working space. Some of the reasons for not practicing 5S included the fact that it was too formal, there was no need for it, they have never heard of it, and it needed heavy investment. Ablanedo-Rosas et al., (2010) reported the following success factors in 5S implementation in 20 manufacturing and service organizations in Hidalgo State, Mexico: top management and personnel commitment to the 5S practice and investment in their training on 5S, including the 5S practice in the organizational strategic planning, the design of official communication channels to obtain personnel suggestions etc. Sua´rez-Barraza and Ramis-Pujol (2013) found a group of factors responsible for enhancing the successful implementation of the 5S in multinational organizations in Mexico. Factors such as strong commitment from management, the use of work teams, training and clear communication of the effort were identified as drivers.

However, few research projects have been done on 5S in libraries. Liu (2006) reported the experience of implementing the 5S in Baptist University Library, Hong Kong. The librarians showed a great interest in the 5S after learning the 5S

implementation. The success of the 5S program was attributed to the strong cooperation and active involvement of all library staff as well as top management's support. The author believes that the 5S provides guidelines for creating and maintaining an inviting, pleasant environment for library staff to work in, and for library users to study, learn, think, socialize, and to be inspired in. The implementation of 5S in order to create a good library work environment in Jiangnan University Library was studied by Xu (2013). The practice of the 5S enhanced the library service quality and increased users' satisfaction. A study on the feasibility of implementing the 5S was done by Tafreshi and Safavi (2014) in information department of National Library of Iran, consisting of special resources, closed resources, reference and public library, non-book sources, children and disabled, Iran and Islamic studies, and reception and membership units. The researchers concluded that implementing 5S in the information department of National Library of Iran was feasible. The results of a questionnaire-based survey at Kerman public libraries affiliated to Iran Public Libraries Foundation showed that based on 5S criteria, the librarians evaluated library spaces well regarding the 5S principles (Nooshin Fard and Mohammad Amini, 2012).

Reviewing the literature indicates that while implementing the 5S in the library, thus, like other organizations resulting in rising service quality and increasing users' satisfaction from library services, attention has less been paid to implementing 5S in libraries and in the libraries of Iran, still 5S has not been implemented. On the one hand, to implement any methodology, in the organization, first, the readiness rate of the organization should be investigated regarding the influencing terms and conditions so that ideal results would be obtained; however, no study has hitherto engaged in this expertise in libraries of Iran. Moreover, this study is of great importance because it is undertaken in a service sector that has been less explored, while previous studies on 5S were mainly conducted in industry and manufacturing sectors. Therefore, it can increase our knowledge on implementing 5S in one service sector especially public libraries.

Methodology

The target population of this survey involved all librarians working in two parts of the Central Library of Astan Quds Razavi, Mashhad, Iran that are in contact with users directly meaning public library department and department of documents and manuscripts (110 people), out of which 86 were selected randomly as the sample size

based on Krejcie and Morgan's sample size table. Data collection tool was a questionnaire which was developed by the investigator. The confirmed questionnaire was in two parts. The first part related to demographic characteristics and the second part included 62 statements in order to responding the four research objectives: 9 statements were for assessing the necessity rate of implementing the 5S in the library, 18 statements in order to investigate the implementing possibility of the 5S in the library, and 35 statements for surveying the readiness rate of personal influential factors and intra-organizational influencing factors. The statements of the questionnaire were designed and adapted on a five-point Likert scale ('very low'=1 to 'very much'=5). The primary questionnaire prepared by using reading related literature was given to the experts in 'Knowledge and Information Science', and 'Management' in order to survey the validity of the questionnaire, and their supplementary explanations and ideas were taken into account. The questionnaire reliability was confirmed through Cronbach's Alpha value (0.93). To collect the data, first, a workshop was held for librarians in order to get them acquainted with the 5S. Thus, some necessary explanations on the 5S were presented individually for those who did not take part in the workshop first, and then the finalized questionnaire was distributed to the intended sample. In the end, 81 questionnaires were collected out of 86 distributed questionnaires (response rate 94%) and were analyzed through the SPSS version 20 by using descriptive and inferential statistics. In the present study, the optimum level was considered to be 80% (Mean=4). Yet, the results of One-Sample Kolmogorov-Smirnov test indicated that the research variables were normal. So, the parametric tests were used in analyzing the data.

Findings and discussion

Profile of respondents

In terms of gender, most of the participants were females (60.26%) and at the age range of 36 to 45 years old (44.87%), and then the age range of 26 to 35 years old (39.78). About the academic degree, most participants (86.84%) had BA and MA degree.

Necessity of implementing the 5S in library

As it was understood from Table 1, the calculated mean score for the necessity of implementing the 5S was more than optimum level. As the sampling was conducted in this study, it could not be clear by observing the mean of the sample that how much the

necessity of 5S accorded with all librarians. Thus, in order to have a better comparison and a proper inference of results and its generalization to the research population, the one sample parametric t-test was used. Results of the test showed that there was a significant difference between the mean of the necessity of implementing 5S and the optimum extent. Furthermore, the researcher can claim with maximum certainty that according to librarians the necessity for implementing 5S was more than optimum, and the participants had a perfect understanding of the necessity for implementing the 5S in the library. O'Eocha (2000) names the staff's attitudes as one of the important factor for implementing the 5S. So, it can be said that, according to the librarians, the necessity of implementing the 5S can be a factor of success in implementing the 5S in the library. Review of the literature indicates that no research has been done with respect to the necessity of implementing the 5S in libraries, notwithstanding in various studies, the benefits of 5S in libraries like Liu (2006) and Xu (2013) and other service organizations have been reported.

Table 1. Necessity of implementing the 5S

Variable	Mean	t	df	p-value	Mean difference
The necessity of 5S implementation	4.13	2.10	80	0.03*	0.13

Note: df=degree of freedom, p-value*= $p < 0.05$, test value=4

Possibility of the 5S implementation in the Library

To find out the possibility of 5S implementation in the library, the mean for all five principles of 5S was calculated and compared with the optimum. The results showed that the possibility of implementing each of five principles and generally speaking, the possibility of implementing 5S had no significant difference with the optimum (Table 2). Therefore, it can be said that the implementation of the 5S was optimally possible in this library. In other words, the present conditions in this library for implementing 5S are optimal, so the possibility of implementing 5S exists. This result is in accordance with the findings of Tafreshi and Safavi (2014), who found that the possibility of implementing 5S existed in the National Library of Iran. Hence with respect to the issue that the 5S is a humanism system (Toliat Zovareh and Matboo Saleh, 2004), and its major agents, that is, librarians, knew its implementation in optimum, the library managers and authorities can act on implementing 5S by preparing, setting up and proper culture making.

Table 2. Possibility of implementing the 5S

5S principles	Mean	SD	One-Sample Test	
			t-value	Sig.
Structurise (S1)	3.83	0.98	1.46	0.14
Systematise (S2)	3.85	0.93	1.36	0.17
Santise (S3)	3.85	0.89	1.42	0.15
Standardise (S4)	3.87	0.92	1.25	0.21
Self-disciplinise (S5)	3.91	0.90	0.86	0.17
Total	3.86	0.87	1.38	0.17

Note: SD=standard deviation

The Readiness of intra-organizational influencing factors for implementing the 5S

Table 3 indicates that among intra-organizational influencing factors, “financial power” had the highest mean (4.17) and “applying right methods of praise and punishment”, had the lowest mean (2.87). In other words, the library is most capable in financial terms that indicates this library has an adequate budget to implement 5S. Perhaps, due to the fact that this library affiliates to the Organization of Libraries, Museums and Document Center of Astan Quds Razavi and that in terms of finance, it is a rich organization, the librarians evaluated the financial power of the library to a great extent. This is while many libraries are facing financial problems (Ajorloo and Ghafari Ghadir, 2012). Therefore, financial power of this library can be considered as a positive point, since Kimiaii and Khakzad (2008) mentioned that many cases in the 5S project require major repair and structural changes and need a separate budget. In Warwood’s and Knowles’ (2004) study, one the reasons for not implementing 5S was the library's need for heavy investment.

On the other hand, the participants believed that the right methods of praise and punishment were not desirably used in this library. Thus, this factor as an inhibitive factor reduces the library readiness for implementing the 5S, since librarians take actions for more efficient use of their organization whenever they are properly praised and punished. It is clear that librarians have this feeling if they would not receive praise and punishment deserving their positive and negative actions, hence, their motivation, to take steps for enhancing efficiency and the library’s efficiency would decrease.

Table 3. Mean and standard deviation of intra-organisational influencing factors

Factors	Mean	SD
Factors relating to organization		
Financial power of the organization	4.17	0.82
Existence and devotion of required facilities for Execution and continuation	3.86	0.83
Cultural flexibility	3.45	1.06
Background and results of administering similar practices	3.32	1.14
Changeable organizational culture	3.30	0.93
Organizational flexibility	3.27	1.14
Factors related to management		
Steady training of all staff for justifying the goals of the 5S	3.66	1.05
Doing suitable publicity for applying the 5S	3.45	0.68
Support and commitment from <i>board of directors</i> , top and middle management and authorities to the 5S	3.32	0.91
Proper human resource combination	3.14	1.03
Stability of management	3.32	1.16
Risk- taking spirit of library managers	3.10	1.19
Risk- taking spirit of top managers	3.05	1.11
Right application of praise and punishment	2.87	1.21

Note: SD=standard deviation

The intra-organizational influencing factors were divided into two groups, factors related to the organization and factors related to the management, and the mean of each group of factors was compared with the optimum level. With respect to the obtained results, we can point out that the library's readiness was less than optimum in total and both groups of the intra-organizational factors (Table 4). The undesirability of factors relating to management is an inhibitive factor in implementing and achieving the 5S, because several researchers believe that top management commitment is an essential factor in 5S (e.g., O'hEocha, 2000; Ablanedo-Rosas, et al., 2010; Sua'rez-Barraza and Ramis- Pujol, 2013). In relation to factors related to organization, librarians did not evaluate cultural and organizational flexibility, and changeable organizational culture optimum in this library. This result is in accordance with the results of Radad and Khosravi (2013) study. They found that the culture ruling on the Central Library of Astan Quds Razavi was hierarchy culture. The organization compatible with hierarchy culture type is characterized by a formalized and structured place to work; procedures govern the activities; and the emphasize is more on stability than flexibility (Cameron and Quinn, 2006). In O'hEocha's study, the organizational culture was known as one of the most

important factors in implementing the 5S. He believes that successful implementing of 5S depends, to a great extent, on organizational culture, since implementing the 5S leads to a wide and deep reforms in the organization and staff level. Culture and organizational atmosphere ruling on the organization should be in a way that, meanwhile accepting these revolutions, bears the required readiness for revolutions, too (Abootalebi, 2002). Therefore, the improper organizational and cultural flexibility and also, the improper organizational culture for accepting changes reduce the library's readiness for implementing the 5S.

Table 4. Comparison of readiness of intra-organizational influencing factors with an optimum level

Factors	Mean	SD	One-Sample Test	
			t-value	Sig.
Factors related to the organization	3.47	-6.96	-6.96	.000*
Factors relating to the management	3.35	-7.44	-7.44	.000*
Total	3.38	-7.15		

Note: SD=standard deviation, *p< 0.05, test value=4, df=80

The Readiness of personal influencing factors for implementing the 5S

As Table 5 indicated, among the personal influential factors, “work commitment” had the highest mean (4.46). However, “job security” had the lowest mean (3.43). In other words, the librarians evaluated their commitment and conscience of work to a high extent, but evaluated their job security to an undesirable extent. Asgarian and Javadpoor Shirvan (2012) believe that staff’s conscience of work is one of the influencing factors in organization productivity. So, it means that librarians with the high conscience of work would cooperate in order to reach efficiency in the organization via implementing the 5S. Regarding the obtained results about factors relating to job, it should be stated that the staff were not desirably satisfied with their job security and their job proportion with their interests and capabilities and also their job proportion with real needs of the library. In so far as these factors have a direct effect on staff’s cooperation for implementing 5S (Abootalebi, 2002; Arabian, 2007), the undesirability of these factors is an inhibitive factor for implementing 5S.

Table 5. Mean and standard deviation of readiness of personal influencing factors

	Mean	SD
Factors related to personal traits and characteristics		
Commitment and conscience of work	4.46	0.67
Personal discipline	4.43	0.59
Accountability	4.40	0.58
Mental health	4.31	0.73
Team spirit	4.23	0.79
Power of creativity and innovation	4.18	0.86
Personal motivation for continuous improvement in the organization	4.17	0.80
Personal flexibility	4.16	0.89
Family peace	4.15	0.91
Physical health	4.13	0.93
Lack of interest to stability	3.98	0.98
Risk-taking spirit	3.93	0.85
Lack of personal problems	3.74	1.07
Factors related to the 5S methodology		
Cooperation readiness for implementing 5S	4.07	0.93
Participation in implementing the 5S	4.02	0.89
Optimism to the 5S	3.77	1
Factors related to job		
Adequate practical experience	4.31	0.85
Job satisfaction	4.01	1.51
Job proportion of staff with library requirements	3.60	1.27
Job proportion of staff with interest and capabilities of the staff	3.56	1.28
Job security	3.43	1.39

Note: SD=standard deviation

With respect to the categorization of influential personal factors in three groups, and results coming from comparing each group with an optimum showed that the readiness of factors related to personal characteristics and traits was more than optimum. The readiness of factors related to 5S methodology was in optimum and the readiness of factors related to the job was less than optimum. In general, there was not a significant difference between the total mean of personal factors and the optimum and it can be said that the readiness of this library was in optimum in terms of personal factors (Table 6). It would be stated that as librarians have ideas about their own personal traits and characteristics in a self-expressing way, the readiness of this group of personal factors towards two other groups of personal factors, that is, factors related to the 5S and job,

was placed on a higher level. However, as a whole, the readiness of influential personal factors was optimal. This can be a very positive point for this library in order to implement 5S since in Goodarzi's idea (2011), staff are the fundamental bases in any organizational system. Further, Liu (2006) believes that due to deep collaboration and dynamic involvement of the entire library staff, the 5S program can reach achievements.

Table 6. Comparison of readiness of personal influencing factors with an optimum level

Factors	Mean	SD	One-sample test	
			t-value	Sig.
Factors related to personal characteristics and traits	4.18	0.57	2.87	0.00*
Factors relating to 5S	3.96	0.82	-0.42	0.66
Factors related to job	3.71	1.02	-2.55	0.01*
Total	4.05	0.63	0.77	0.44

Note: SD=standard deviation, * $p < 0.05$, test value=4, df=80

Conclusion and suggestions

To implement the 5S, the influencing factors in implementing should be identified and investigated because those factors in the beginning, middle and final stages influence the quality of implementing 5S (Mirzaii Daryani and Shareghi, 2012). Thus, this study investigated the readiness of central library of Astan Quds Razavi for implementing the 5S with respect to influential personal and intra-organizational factors. In fact, it can be said that the present study, for the first time, put the readiness of a public library under discussion based on influential factors in implementing the 5S. It was found that the main agents of the 5S, that is, the librarians, acknowledged the implementation of the program in their workplace vital and its possibility optimal.

Consequently, the library managers and authorities can take actions for implementing the 5S by infrastructure and proper culture making and boost the efficiency and productivity of the library. Further, librarians generally evaluated the readiness of the library in terms of intra-organizational factors in a lower level than optimum.

Therefore, the managers of this organization require to take indispensable actions to improve these factors, conditioning that they decide to implement 5S. On the other hand, with respect to the fact that librarians considered the readiness of library optimum in terms of personal factors, it can be concluded that if the library managers decide to

implement 5S in the library, the librarians are ready enough to implement the 5S. Considering the research findings, some suggestions are offered based on boosting intra-organizational factors and personal influencing factors and proper infrastructure for implementing the 5S in the library.

- The library managers and authorities are advised to find some techniques for enhancing librarians' job security.
- The library managers and authorities are suggested to revise, and use ways of praising and punishing staff on the basis of organizational structure.
- O'hEocha (2000) points out that the success or the failure of the 5S is in the hand of top managers, since they play a key role in setting up organizational culture. Though, change of organizational culture is time-consuming (Cameron and Quinn, 2006), it is suggested that the managers and authorities identify strategies that can lead to a change in organizational culture towards flexible and changeable organizational culture and therefor apply them.
- Since implementing the 5S is a long term project (Ho, 1999), and management time duration has an important role in the ends of work that guarantee the continuity of success and development (Sangtarash and Moghadar Doost, 2010), thus, management should have more stability and continuity in case of deciding to implement 5S in this library.
- It is advised that in case of trending to implement the 5S, managers did require investments and considered suitable human resources for the library.
- Management should identify the librarians' interests and capabilities through surveys and assign them duties that suit their interests and capabilities, as well as the library requirements.
- It is suggested that the managers of the library needed to enhance their risk-taking span.
- It is suggested that required surveys should be performed, so that once all other requirements are fulfilled, the managers and authorities can apply the 5S implementation in their agenda.
- It is suggested that with respect to the role of the 5S in promoting quality and satisfaction of users from the library services, managers and authorities should pave the way for approaching the efficiency of this important library more by

holding orientation sessions and providing required facilities for implementing 5S in their workplace.

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