CHAPTER 5

KNOWLEDGE MANAGED
ISO 9001:2000 BASED QUALITY SYSTEM

5.1 INTRODUCTION

The modern world is witnessing the emergence of numerous standards on quality systems. Some of them are ISO 9001:2000, QS 9000, TS 16949, TL 9000 (Besterfield 2004) and vda 6.1 (Kartha 2004). Apart from that, during the recent years, system standards for other strategies like environment and health have also emerged (Coleman and Douglas 2003; Simpson et al 2007).

The availability of many system standards to achieve various strategies leads to an impression that the choosing of any one among them would be a challenging task. However, the fact is not so because most of these standards have grown from ISO 9001:2000 standard. For examples, AS 9100 and TS 16949 standards have their foundations on ISO 9001:2000 standard (Kartha 2004). Hence, it can be inferred that any research on developing advanced quality system models should be based on ISO 9001:2000 standard. This emphasis can be further interpreted on seeing the articles like Tsim et al (2002) and Lewis et al (2006) in which the superior features of ISO 9001:2000 standard are pointed out. Hence, during the module of research being reported in this chapter, the KM system was developed by keeping ISO 9001:2000 standard as the foundation.
5.2 SUPERIOR FEATURES OF ISO 9001:2000 STANDARD

ISO 9001:2000 standard consists of five main clauses (Tan et al 2003, Tzelepis et al 2006, Magd 2006). The first three clauses are primitives and the remaining five clauses are the building blocks of the ISO 9001:2000 standard based quality system (Mc Adam and Fulton 2002). The titles of these main clauses are ‘quality management system’, ‘management responsibility’, ‘resource management’, ‘product realization’ and ‘measurement, analysis and improvement’. The working of the quality system model specified in this standard is depicted using a pictorial model called process - based quality management system. Thus this model clearly pinpoints the continual improvement process. At this juncture, it is to be examined whether KM principles should be mixed with ISO 9001:2000 standard or amended with it. In today’s ISO 9001:2000 standard dominated world, the organizations will be burdened if they are asked to install a new model which is interwoven with the principles of any other strategies. Presumably, due to this reason, the standards like AS 9100 and TS 16949 have been developed by amending ISO 9001:2000 standard. Hence the same approach was followed in this research to design Knowledge Managed ISO 9001:2000 based Quality System.

5.3 DESIGN OF KNOWLEDGE MANAGED ISO 9001:2000 BASED QUALITY SYSTEM

In order to design the Knowledge Managed ISO 9001: 2000 based Quality System, KM principles were amended with the five core clauses of ISO 9001:2000 standard. To illustrate this exercise, as a sample, the contents of section 4.1 of Knowledge Managed ISO 9001: 2000 based Quality System are presented in Table 5.1.
### An extract from Knowledge Managed ISO 9001:2000 based Quality System

<table>
<thead>
<tr>
<th>Clause Number</th>
<th>Title and requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Knowledge management based quality system</td>
</tr>
</tbody>
</table>
| 4.1 General requirements | The organization shall establish, document, implement and maintain a *knowledge management based* quality system and continually improve its effectiveness in accordance with the requirements of this international standard. The organization shall:  
  a) Identify the processes needed for the quality management system and their application throughout the organization as *knowledge management stipulations*.  
  b) Determine the sequence and interaction of these processes.  
  c) Determine criteria and methods needed to ensure that both the operation and control of these processes are effective.  
  d) Ensure the availability of resources and information necessary to support the operation and monitoring of these processes.  
  e) Monitor, measure and analyze these processes.  
  f) Implement actions necessary to achieve planned results and continual improvement of these processes.  
  g) *Identify key knowledge assets (tacit and explicit) of an organization.*  
  h) *With the help of CKO, find, select, organize, disseminate and transfer important knowledge and expertise necessary for various activities.* |
As shown in the table, in the introductory paragraph, the title KM has been amended. Further in the sub-clause ‘a’, the stipulations of KM principles are envisaged for adoption. The contents of sections from ‘b’ to ‘f’ have not been amended as these stipulations are equally applicable for knowledge and quality management practices. In order to amend the core KM principles with this clause, two new subsections ‘g’ and ‘h’ have been added. These subsections envisage the organization to identify key knowledge assets and manage them by assisting the services of CKO.

The same design principles described here were used to amend the KM principles with five remaining core clauses of ISO 9001:2000 standard and their sub-clauses. As described here, the contents of the existing ISO 9001:2000 standard have not been altered which implies that an organization that has already implemented the ISO 9001:2000 standard is not required to disturb any of the existing quality system elements. At the same time, the amendment of KM with ISO 9001:2000 standard enables the organization to acquire, organize and share the knowledge assets prevailing inside as well as outside the organization. The entire contents of Knowledge Managed ISO 9001:2000 based Quality System are given in Appendix 1 to 6 of this thesis.

5.4 IMPLEMENTATION STUDY

After designing the Knowledge Managed ISO 9001:2000 based Quality System, its implementation was examined in a Indian public sector company. Since the company is managed by the Government, it was not possible to make much inroad towards implementing Knowledge Managed ISO 9001: 2000 based Quality System. In fact, the study was restricted to the introduction of few elements of Knowledge Managed ISO 9001:2000 based Quality System into the quality manual. For example, the organization chart was appended with the designation CKO. This chart is shown in Figure 5.1.
D1 and D2 are the departments of the organization

**Figure 5.1 The organization chart appended with the CKO designation**

The designation of CKO is italised to mean that it is now newly added. Likewise, under the sub-clause 5.6.3, the review output of KM by Results Driven Incremental (RDI) methodology was included. Besides amending the quality manual, no other major activity leading to the implementation of Knowledge Managed ISO 9001:2000 based Quality System could be carried out.

### 5.5 PORTAL DEVELOPMENT

As portal development is the hallmark of any KM based project (Corbin et al 2007; Devedzic 2005), a portal pertaining to clause 4 of Knowledge Managed ISO 9001:2000 based Quality System was developed
during this research. This portal was developed using ASP and HTML. The functionality of this portal is described in this section.

Soon after the installation, the administrator who will be either the Chief Executive Officer or a senior executive of the company will nominate the CKO (Jones et al 2003; Tiwana 2005). The screen enabling this process is shown in Figure 5.2.

![Nomination of CKO by the Administrator](image)

**Figure 5.2 Nomination of CKO by the Administrator**

Similar screens will appear to carry out the following processes. After the nomination of CKO by the administrator, the CKO has to appoint team leaders. If team based approach is followed in the company, then the leaders of each team will be named by the CKO. If departmentalised system is followed, then CKO may name heads of the department as the team leaders.
Now the team leaders are assigned the passwords. The team leaders are required to choose the team members. All authorities associated with each level of this hierarchy are provided with the right to nominate or remove any of the subordinates. For example a CKO may nominate or remove a team leader (please see Figure 5.3).

**Figure 5.3 Nomination / Removal of Team Leader by CKO**

After the choosing of personnel, the portal is opened for operation. The contents page opened by the CKO is shown in Figure 5.4. Since so far only the portal of clause 4.1 of Knowledge Managed ISO 9001:2000 based Quality System has been developed, those links can alone be activated now.
On pressing the clause 4.1 of Knowledge Managed ISO 9001:2000 based Quality System in this portal, the summary table shown in Table 5.2 appears. As shown, this summary table is incorporated with sub-clauses of 4.1 of Knowledge Managed ISO 9001:2000 based Quality System. As clause 4 deals with Knowledge Managed ISO 9001:2000 based Quality System, circulars, meetings and minutes of the meetings dominate the functioning of this clause. This facility guides the CKO to monitor the circulars issued and the meetings conducted under this clause.

The working of the facility to develop a circular is illustrated here. On pressing the circular button against ISO 9001:2000 standard in summary Table 5.2, the screen shown in Figure 5.5 appears.
Table 5.2 Summary table of clause 4.1 of Knowledge Managed ISO 9001: 2000 based Quality System

Figure 5.5 Screen enabling the CKO to prepare circular
As shown, this screen enables the CKO to prepare circular regarding Knowledge Managed ISO 9001:2000 based Quality System. The clause number, date, code, team members and subject automatically appear in this screen. The CKO can choose the team leader/s, team member/s and other member/s to whom this circular is to be sent. In the case specified here as an example, the CKO desires to send this circular to a team leader, team member and other member. On pressing the send button, this circular is sent to these personnel. Now the portal allows the CKO to check whether this circular is read by those personnel. The screen enabling this process is shown in Figure 5.6.

Figure 5.6  Screen enabling the CKO to check whether the circular is read by the recipients

As shown the circular sent to the team leader is yet to be read by him/her. As a sample, this circular having been read by the team member is shown in Figure 5.7.
The portal allows both the CKO and team leaders to convene meetings in an electronic environment. The screen enabling this process is shown in Figure 5.8.

The meetings may be attended by the personnel even if they are residing outside the premises of the company. The portal provides the team members with the facility to share their knowledge. The screen enabling this process is shown in Figure 5.9.

The respective team leader consolidates them and develops the minutes of the meetings. The screen enabling the team leader to prepare the minutes of the meeting is shown in Figure 5.10.
Figure 5.8 Screen enabling the CKO to convene the meeting

Figure 5.9 Screen enabling a Team Member to share his/her knowledge in a meeting
Figure 5.10  Screen enabling the Team Leader to prepare the minutes of the meeting

When the meeting is conducted in virtual environment, the team members are encouraged to indicate the sources of knowledge available worldwide by furnishing the portal addresses. All the circulars and minutes of the meeting are provided with the index numbers for their easy retrieval. For example, the index number shown in Figure 5.11 indicates that it is pertaining to sub-clause 4.
Figure 5.11 Screen showing the meeting (M2) index number pertaining to sub-clause 4.1

The minutes of the meetings may be retrieved by entering the details in which meeting/s was/were conducted. For example, in the screen shown in Figure 5.12, CKO chooses the dates 29.10.2007 and 01.11.2007 to view the minutes of the meetings held between these dates. In response to this entry, the screen shown in Figure 5.13 appears. In this screen the list of the meetings conducted between these dates appears. CKO can view the minutes of the meeting by choosing them.

Since the procedure of conducting Knowledge Managed ISO 9001:2000 based Quality System is automated by the portal, the task of auditing this system is made easier through the electronic indexing system. For example, when an auditor desires to check whether a circular was issued on a particular date to a team member, he/she can do so by entering the appropriate inputs in the portal which would provide the necessary details.
Figure 5.12  Screen enabling the CKO to choose ‘from’ and ‘to’ dates to view the minutes of the meetings held between these dates

Figure 5.13  Screen enabling the CKO to view the list of minutes of the meeting held between the chosen dates
Besides the portal will enable only the specific activities pertaining to clause 4 to be carried out at different levels by the personnel. Those details are summarised in the Table 5.3.

### Table 5.3  Rights and privileges of personnel in Knowledge Managed ISO 9001:2000 based Quality System

<table>
<thead>
<tr>
<th>Administrator (Admin)</th>
<th>Chief Knowledge Officer (CKO)</th>
<th>Team Leader (TL)</th>
<th>Team Member (TM)</th>
<th>Other Member (OM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitoring of circulars</td>
<td>Sending Circulars</td>
<td>Monitoring the conduct of meetings – reading of current/old meeting details, preparation of minutes of meeting, viewing of old minutes of meeting</td>
<td>Reading of current/old meeting details, knowledge sharing during the meeting, viewing of old minutes of meeting</td>
<td>Viewing of current/old minutes of the meeting</td>
</tr>
<tr>
<td>Viewing of meeting files of Knowledge Managed ISO 9001:2000 based Quality System</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Knowledge Sharing- reading and writing
Thus the portal of Knowledge Managed Clause 4 of ISO 9001:2000 based Quality System not only automates the proceedings but also facilitates the management of knowledge through its virtual operation.

5.6 CONCLUSION

This chapter has reported a module of the research which was carried out in the context of the realization that, integration of KM with ISO 9000 certification practice would be a synergic proposition. This realization has been indicated in literature scanty (Lin and Wu 2005; Hellstrom and Husted 2004; Heng 2001). In spite of abundant literature on KM and ISO 9000 certification, only these three papers have mentioned the need of integrating KM with ISO 9000 series quality system standards. These papers also do not deal with the detailed methodology of infusing KM with an appropriate ISO 9000 series standard. The module of the research reported in this chapter fills this gap by amending the KM principles with ISO 9001:2000 quality system standard. After examining its working in a company, a portion of the portal of Knowledge Managed ISO 9001:2000 based Quality System model was developed.