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Effective Collaborative Documentation System for ISO 9000

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Abstract: ***Companies that work according to ISO 9000 standards have to maintain a set of documents describing the quality system that include policies, procedures and instructions to assure the final product's conformance with ISO 9001 requirements, the aim of this research is to develop and design the QMSISO system by referring to clause 4 Quality management system of ISO 9001-2008, ISO TR 10013 -2001, and ISO/TC 176/SC 2/N 525R2 Guidance on the documentation requirements of ISO 9001-2008 to effectively implement the ISO 9000 in a real environment, the QMSISO overall effectiveness assessment results found to reach an effectiveness ratio is 76.5 %, The documentation process improvement achieved through reducing the time required to finding a particular document is 97 %, the percentage of improvement in procedure document approval time to reach 89 % and the paper consuming improvement percentage is 100 %.The results showed the feasibility of using QMSISO by companies to get certified to ISO 9001.***

Index Terms: Quality Management System, ISO 9001, Content Management System, Drupal, Document Management System.

I. INTRODUCTION

In new world trade, success of organization is measured by concepts like:-, market share between competitors, time to develop and produce new products and employees ability to drive customers for it but the organization capability to produce high-quality products still forms the essential concepts leading organizations to success.

The competitive world markets and quality assurance has become even more relevant. To meet this requirement, manufacturers and suppliers have had to recognize the importance of quality and the fact that it can only be achieved through efficient organization and a determination by management to meet the increased quality requirements of their potential customers. There has to be an increasing reliance on quality and the recommendations of ISO 9000 in order to meet customers' requirements. In fact, for anyone wanting to sell their product in a multi-national European or American markets, the ISO 9000 standards are essential publications. Together they provide a comprehensive set of rules and regulations, specifications and recommendations that enable a manufacturer or supplier, large or small, to set up workable quality processes and procedures and to operate within their constraints [1].

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II. QUALITY MANAGEMENT SYSTEM (QMS)

An organization must organize itself in such a way that the human, administrative and technical factors affecting quality will be under control. This leads to the requirement for the development and implementation of a quality management system that enables the objectives set out in the quality policy to be accomplished. Clearly, for maximum effectiveness and to meet individual customer requirements, the management system in use must be appropriate to the type of activity and product or service being offered [2].

Quality management system it is a philosophy that underlines the organizational transformation that enables manufacturing organizations to reap real benefits from improvement in quality performance and competitiveness. Under competitive pressures, organizations need to learn faster and lead in best practice for business excellence [3].

III. ISO 9001

ISO 9001 is the definitive requirements standard which specifies the requirements for a QMS which can be used when an organization's capability to provide products that meet customer and applicable regulatory requirements needs to be demonstrated [4,5].

IV. EFFECTIVE AND EFFICIENT QUALITY MANAGEMENT SYSTEM QMS BASED ON ISO 9000

Schlickman emphasized that QMS based on ISO 9000 developed should be effective. It means that QMS developed should be able to achieve targets, goals and objectives that have been determined previously, It will be a useless QMS if the QMS developed fails to achieve and realize all the targets and objectives of the QMS itself. A good QMS is defined as the ability to achieve and realize the targets, objectives, and goals of the QMS that have been determined before [8].

Secondly, he suggested when developing an efficient QMS based on ISO 9000, it should be enough to document only what is required. There should not be over documentation because it will produce a lot of paperwork and not something that is really needed and required. Thus, an efficient QMS is not developed.

V. QMSISO SYSTEM DEVELOPMENT

QMSISO system is developed as an approach to documentation management of ISO 9001 documentation for collaborative control and link of all interested parties of the documentation. This helps the employees to reduce time of documents approval loops, reduce paperwork, searching of a particular document and centralized storage of all ISO 9001 documents.

An open source Web content management system solution plays an important role in this work. There are many ways to develop Web-based system, from the simple Web log (blog) engine system that allows limited content publishing to a full content management system framework to application frameworks, on which it can build a custom content management system for collaborative management of ISO 9001 documentations.

A. Integration of QMSISO with Clause 4.2.3 Control of Documents in the ISO 9001:2008

This section illustrate the integration of all the Functional requirement in clause 4.2.3 Control of Documents and ensure implementing it in the QMSISO system through the analysis stage

1- Documents must be approved before they are distributed; this is done by configuring workflow, rules, email modules and setting permeations to specific roles for each type of contents.

2- Documents must be reviewed/updated/re-approved on a periodic basis; this is done by configuring rules, email, date, notifications modules and setting E-mails and internal messages for certain type of contents.

3- The correct version of document(s) must be made available at point of use; this is done by configuring view module to publish correct version of document for each type of contents.

4- The current revision status of documents is identified; this is done by configuring revisioning module for each type of contents.

5- Identify, control and monitor documents from external sources; this is done by creating and configuring a new content type for each document from external sources

6- Prevent the accidental/unintended use of obsolete documents; this is done by configuring view module and publishing correct version of document for each type of contents Preserve the usability of documents; a search function is enabled with the core Search module. The contents are seamlessly integrated with content earlier, now allows search results to reflect users need for any certain document.

The system should be accessible to any of the authorized users anywhere without requiring excessive effort. QMSISO is designed to be a web-based system that can be accessed through a web browser with an Internet connection as shown in Figure 1. To login the system, the user should supply a valid username with the corresponding password. After the authentication of the user's access rights, the user is signed on.

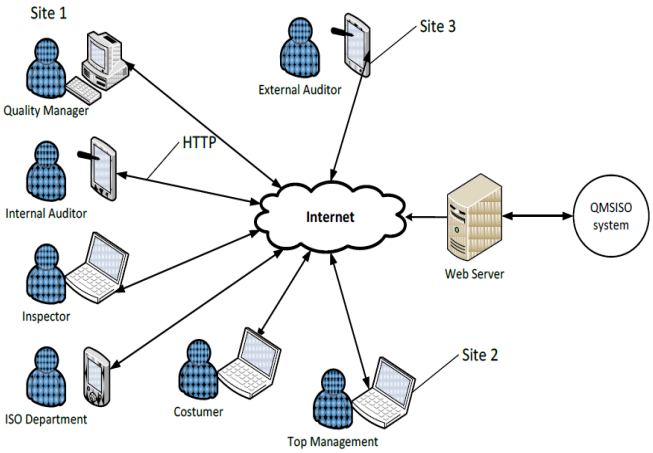

Figure 1 Accessibility of QMSISO

B. QMSISO System Architecture

The architecture of the developed system is shown in figure (2) The capabilities of the developed system are carried out through collaborative Web capabilities to control ISO 9001 documentation as example of application and testing of QMSISO system the first screen in the QMSISO System is the login screen's, as shown in after entering QMSISO username and password the user is redirected to the home page of QMSISO system.

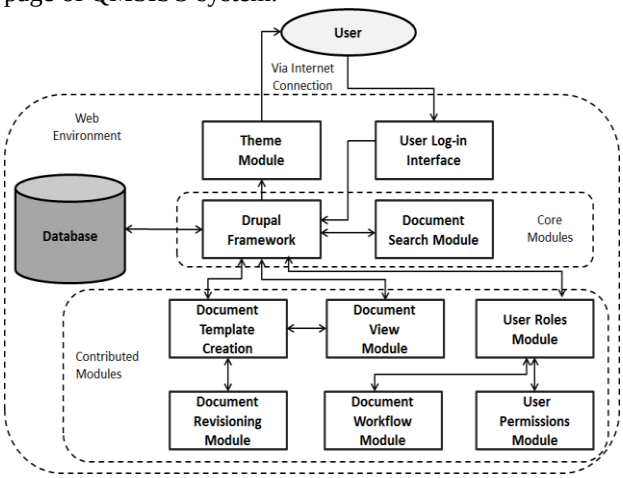

Figure 2 Architecture of QMSISO system

VI. THE RESULTS OF QMSISO IMPLEMENTATION IN REAL ENVIRONMENT APPLICATION

A. Results of QMSISO System Effectiveness

The Results of effective implementation of QMSISO were evaluated by department of ISO in The State Company for Leather Industries (SCLI) who reviewed and tested the QMSISO system then approached with a survey uestionnaire to determine the system effectiveness in comparison with the traditional system, the questions asked and the responses in a Likert's scale were range from 1 to 5 by ISO department staff (five members) using the equations below:-

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$$Rq = \sum_{i=1}^{n} Rs_i$$

Where Rq = reaction per question.
Rs = reaction per member.
N = number of members.

$$Pe = \frac{Rs}{n} * 100$$

Where Pe = percentage of effective
Rs = reaction per member
n = number of members

$$Oe = \frac{\sum_{i=1}^{n} Rs_i}{nq}$$

Where Oe = percentage of overall effective
Rs = reaction per member
nq = number of questions

The final results of the survey given in table 1 in appendix

B. Results of Improvement

The results of improvement by QMSISO implementation using the equation:-

$$C^t = \frac{QMSISO\ gain}{Traditional\ gain} * 100$$

The conclusion from the result of applying QMSISO system in SCLI it is appear that the percentage improvement of time required for finding a particular document is 97 %. And the percentage of improvement in procedure document approval time is 89 %; last the paper consuming improvement percentage is 100 % due to QMSISO is a paperless documentation system.

VII. CONCLUSION

The main contribution of this research is to build an effective collaborative Web-based Quality Management System develop for the documents according to the requirements of ISO 9000 standards and the way that ISO 9000 users to control and preview documents, it links all interested parties of the documentation. This helps the employees to reduce time of documents approval loops, reduce paperwork, searching of a particular document and centralized storage of all ISO 9001 documents, the proposed QMSISO system is a Web-Based application for QMS Documentation System it can be applied to different companies for other purposes which need to using document management system, The QMSISO system was successful in achieving collaboration between all ISO 9001 members in the company to increase the effectiveness of the quality management system and The results showed that the QMSISO system play vital role in improving documentation performance.

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Appendix

Table: 1. Effectiveness of QMSISO System

No	Question	Reactions in a Likert's scale of range 1-5.	Percentage of effective for each characteristic after implementation
1	Is QMSISO system is easy to use?	3.8	76 %
2	Is QMSISO system meets the requirements of the QMS standard?	4.2	84 %
3	Is QMSISO performance is meeting the general documentation requirements of QMS?	4.2	84 %
4	Is QMSISO performance is meeting the objectives of developing quality manual in QMS?	4	80 %
5	Is QMSISO performance is meeting the objectives of controlling documents in QMS?	3.8	76 %
6	Is QMSISO performance is meeting the objectives of controlling records in QMS?	3.4	68 %
7	Is QMSISO system decrees document errors due to information mistakes?	3.8	76 %
8	Is Users regarding usability of QMSISO documentation system?	3.4	68 %
The Overall Effectiveness		**76.5 %**	

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