

## WEB IT SOLUTIONS – COMPREHENSIVE TOOLS FOR MODERN QMS MANAGERS

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### SUMMARY

*Organizing and managing organization's business processes and performances requires a comprehensive approach to quality management especially by QMS managers. They must carefully and continually monitor, analyse and report on it regarding the QMS initiatives and activities to ensure that all the requirements of ISO standards are met. IT Web solutions offer tremendous potential for integrating and improving the work of QMS managers in the field of quality management.*

**Keywords:** Web technology, IT solution, QMS manager, information system (IS)

### 1. INTRODUCTION

The need for real-time visibility and control over quality management processes and their documents has been imposed by the business environment that calls for companies to constantly improve their performance in order to be successful on the global market. Thus, maintaining a paper-based quality management system in order to control different business processes in different parts of the organisation has proved to be a costly and inefficient practice. To overcome these problems, people involved into quality management are looking to deploy business information systems that integrate and connect processes regarding paper-based quality management into a well managed and transparent electronic quality management system. [1]

Web-based technologies enable that QMS managers manage and control quality system processes and documentations across multiple sites of the organizations. As a result, Web based quality management applications are both efficient and simple to use. In this sense, compliance with the requirements from quality system standards is possible by replacing paper and manual methods with a fully electronic, automated environment.

Different options of proprietary linking technology built into Web based applications make it easier for users to connect and synchronize electronic content with the relevant regulations, standards or guidelines and get visual presentations of important date or trends. At the same time, they enable QMS managers to maintain all relevant documents and information up-to-date. Document control, audit management, corrective and preventive actions (CAPA), non-conformance management, change management, equipment inventory, training management, customer complaints and other quality system processes are integrated under a central interface.

## 2. INFORMATION SYSTEMS AND WEB TECHNOLOGY

Over the past few years, information systems (IS) play an increasingly important role in improving the competitiveness of the organization's businesses. Not only just tools for operations of repetitive business tasks, they are used to guide and advance all of organization's daily business activities and processes. Today, a key source of significant competitive advantage can be achieved, very often, by integrated management software. In this way, the organization's departments, integrated around operating processes, can get response on their needs for responsiveness, reliability, and rapidly increasing expectations. It leads to increase efficiency amongst end users to have common understanding and timely information of all organizational business issues. [4]

Considering that information systems form a single integral part of modern organizations and businesses, it is clear that information technology does not fall more in the resources of it but it has become a business environment, involved into all aspects of organization's functions and activities. It's important to mention that the benefits of new technologies can be achieved only if they are directed towards organizational goals.

Today, in modern business environment, organizations demand a new type of QMS managers who combine managerial skills with the skills in the field of IT. Obviously, this type of QMS manager should possess, among other things, abilities to determine and define appropriate IS for the organization and their departments primarily as potential need in order to improve business performances and processes. After selecting and purchasing appropriate IS, QMS manager oversees implementation of such IS and effectiveness in providing quality information to and from its end-users. One of the definitions of information systems may be that they are *"regulated and integrated set of data, processes, interfaces, networks, technologies and people that are interrelated in order to support and improve everyday business operations and support top management in solving business problems, planning, managing, implementation, coordination and decision-making."* [2]

On the basis of the above-mentioned, it could be concluded that the efficiency and effectiveness of business information system can be seen in [7]:

- relevance of the information,
- adequate information distribution,
- timely information,
- proper shape information,
- adequate amount of information,
- *ad hoc* access to the necessary information.

### 2.1. Web technology

Web application is an application that is accessed by users over a network such as the Internet or an intranet. A computer software application that is coded in a browser-supported programming language (PHP, JavaScript, HTML, for example) that is reliant on a common web browser to render could be meant also by that.

Web developers often use client-side scripting to add functionality, especially to create an interactive experience that does not require page reloading. Recently, technologies have been developed to coordinate client-side scripting with server-side technologies such as PHP. Ajax, a web development technique using a combination of various technologies, is an example of technology which creates a more interactive experience.

In cloud computing model, web applications are software as a service (SaaS). There are business applications provided as SaaS for enterprises for fixed or usage dependent fee.

The most significant benefits of web applications are that they do not require any complex "roll out" procedures to deploy in large organizations if they have connection to the Internet or have developed own intranet network. Because of their size, Web applications typically require little or no disk space on the client side. All new features, implemented on the server are automatically delivered to the end users so there are no needs for upgrading client procedures. In that way, they provide cross-platform compatibility in most cases (i.e., Windows, Mac, Linux, etc.) because they operate within a web browser window. [8]

### 3. MODULES OF WEB QMS SOLUTIONS

Modules that could and need to be incorporated into one sophisticated Web QMS solutions in order to give QMS managers help to demonstrate the highest standards and improved quality to the auditors if they are to be certified or audited according to ISO standards, meet their requirements or customer demands, among others, are: [1,9]

- *Document control module* – it should enable that documents and records are clear, legible, unified and controlled by the business logic of the business processes, reduce risk of loss and degradation of documents because they do not depend on the environmental conditions, make it easier to search documents and records of quality management system, make it easier to administer rights, barring the rights of access to documents and records, make it easy to determine the associated documents, records and general hierarchy of documents included in the quality management system, that relevant versions of applied documents are available in locations where they are needed and used, prevent use of outdated documents.
- *Audit management module* – it could be very useful tool in organizing, performing and reporting quality audits. Through QMS Web application, it could be very easy to initiating and controlling audits from any location, especially for geographically dispersed organizations. With connection to *Document control module*, it can facilitate preparation and follow-up any type of audit.
- *Non-conformances/CAPA modules* - it is module that solves very challenging requirements that companies have to meet. Inadequate product quality, customer complaints or system's failure should promptly trigger investigations, solving the problem as fast as possible and preventing it from recurring. In most organizations, these documentations are paper based and the none-conformances/CAPA process is poorly integrated with the other quality processes. In this sense, it should efficiently manage corrective and preventive actions processes that are capture incidents and direct them through best practice workflows and accelerate collaboration and that each step of the investigation has been adequately documented. All authorized user can participate in the non-conformances/CAPA process using electronic forms. Quality managers are able to track the status of each non-conformance, have increased overview into the CAPA status and can rapidly generate data to demonstrate that investigations have been adequately performed and corrective and preventive actions taken. By connecting CAPA with other quality processes such as change control, audits, SOPs or validation, companies reduce the risk of non-compliance. Web based platform should allow users to create, control and track information and still work in a simple and flexible manner.

In addition to above mentioned modules, any organization manages many other processes as *customer complaints, change management, equipment inventory and calibration management, supplier quality management, risk management, training management process,*

as well, which are also very significant functions in domain of QMS system. For this reason, organizations need to make effort and strive to establish and implement a model of electronic QMS applications with these modules, as well. Only in that way, it can be one integrated and sophisticated electronic QMS solution for QMS managers.

#### 4. SOME MISUNDERSTANDING OF ELECTRONIC QMS SOLUTIONS

Many managers in organization could be unsure of how can electronic QMS solutions help them especially if they use a well-established paper-based system. [5]

Some of the most often questions or misconceptions are:

- *Electronic QMS solutions are only for big companies?* If it is considered that many requirements by ISO standards could be met, especially tracking and controlling documents and managing non conformances, whatever company's size, number of sites or employees they have, this can be wrong thinking. On the other side, it could be very significant means that ensures continuous improvement, critical information security, issue visibility, quick problem resolution, and fast regulatory approvals to market new products.
- *Deploying electronic QMS solutions can cost companies huge sums of money?* First of all, today there are plenty of commercial solutions, developed by dominant producers like SAP, ORACLE, MicroSoft which could be very expensive. But demands for quality management software have increased the competition amongst other smaller vendors. In that way, company that wants an electronic QMS can now buy it at an affordable price. Here must be mentioned offers of less-expensive, cost effective quality management software through services such as on demand or SaaS, where the software is hosted on the vendors' servers. This can reduce the cost of ownership by over 60% and makes the implementation possible in days rather than weeks - all for a small monthly fee.

Secondly, based on the available Web technologies and tools as well open-source solutions, organizations can build and develop their own QMS application taking into account their needs for QMS system. Participation of QMS managers in the development and implementation of such solutions is very important and significant.

- *Only technical personnel can use electronic QMS solutions?* It is a common case that technical staff that is, IT departments or technical personnel of companies can handle and use electronic QMS systems. It must be taken into consideration that The fact is that end users – employees, who are familiar with internet usage – could use it, because well-designed electronic QMS solutions are designed to be user-friendly and intuitive. In order to be easier to use than a paper-based system, the QMS software will typically include help manuals and technical support.
- *Poor / no return on investment on electronic QMS solutions?* When considering the use of a QMS, top management will usually question the QMS's potential return on investment. Various studies show that using software for quality management can save administrative time, reduce printing costs, improve production cycles, speed up change control processes, and improve speed of response - all of which adds up to a considerable return on investment. One of the biggest costs relates to risk, a good QMS will substantially reduce the risk of incorrect documentation like specifications or inspections being used and can thus provide a difficult to quantify yet significant saving. Depending on the scope of implementation, a QMS can offer return on investment in as little as 12 months.
- *Risk of losing data with electronic QMS solutions?* This is probably the most questionable issue associated with electronic QMS solutions. First of all, do QMS managers have copy of paper system off site? Probably not. So, if QMS managers

have systematic and organized approach to create a backup of all QMS related and relevant data in appropriate time it could be far safer than any other methods of documentation.

#### **4.1 Market insight of commercial and free Web QMS solutions**

Undoubtedly, there are many IT solutions regarding quality management that are found in the world market. In many cases, the existing ERP solutions have been extended with the functionality and requirements of the quality management of the business environment. This has led to a large number of commercial applications and we should mention here, definitely, Oracle, SAP and Microsoft with its comprehensive integrated solutions. However, these solutions may not be the most suitable for small and medium-sized businesses that have limited resources for such applications.

Therefore, the other commercial software solutions which are based on Web technologies can be noted as follows:

- *Mireaux's Web QMS* - a powerful Enterprise Management Software designed specifically to comply with the requirements set forth by the ISO international standards.
- *Accupoint's InterLink* - both cloud and Web based solutions designed to administer ISO Quality, Environmental and Safety compliance programs.
- *Kenesto* - a cloud-based Social Business Collaboration solution that delivers the full benefits of social interaction through its all-in-one service for group discussions, file and content sharing, team collaboration, project organization, task management, social workflow enablement, and more.
- *SOLABS QM* - Web electronic quality management system (e-QMS), supports quality operations within a highly regulated organization. SOLABS QM has capabilities in three main functional areas: quality processes management, controlled documents management, training records and profiles.
- *ISOsystemPlus* - a reliable, easy-to-use, affordable and efficient software that should help in developing, implementing and maintaining the Quality Management (Risk, Environment, Food Safety, Occupational Health And Safety, Informational Safety) Management System in accordance with requirements of various ISO standards (ISO 9001:2008, ISO 14001:2004, ISO 22000:2005, ISO 13485:2003, ISO 14971:2007, ISO 27001:2005, OHSAS BS 18001:2007)
- *Qsolve* - provides full document control capabilities, APQP, internal audits, and non-conformance reporting – a total quality solution. Qsolve's secure, web-based architecture gives instant online access to quality information via standard web browsers.
- *QT9™ ISO Management Software* - brings enterprise level quality management systems software for ISO 9001, AS9100, and ISO 13485 via local network or the World Wide Web. QT9™ is a high value, low cost ISO software package that will completely automate quality management system.
- *ISOTracker QMS* - A cloud-based quality management software system that offers a comprehensive set of quality management software applications. Includes document control, complaints management, audits, non-conformance reporting, CAPA and escalation.
- *PLMplus* - an affordable, SMB focused PLM and QMS solution delivered in a SaaS model. PLMplus allows managing change orders, documents, items and bills of materials, CAPA processes, NCMRs and more.
- *ISOXpres* – a Web database application for operating a paperless ISO 9001 quality management system.

- *MasterControl* – solutions that include quality management, document management, product lifecycle management, audit management, training management, document control, bill of materials, supplier management, submissions management.

Of course, these are just the examples of some of the many available commercial solutions.

On the other hand, regarding free web QMS application, the situation is completely different. Probably because of the great importance of the segment of quality management in today's business environment, as well as market value, free QMS web applications are not widely available.

## 5. CONCLUSION

In this turbulent and competitive time, any organization is looking for ways to save administrative costs, increase employee productivity, improve business performance, and speed up the customer response processes in order to get satisfied and long-terms loyal customers and to increase profit.

For these reasons, efficient and cost-effective modular electronic QMS applications incorporating modules such as audit management, document control, customer and supplier care, non-conformance and CAPA actions, supplier control could significantly help them.

Implementation of quality management (QMS) that is electronic, especially Web-based, so that important business processes and data can be controlled and analysed in regular time and when certain changes are required, maintains history from non-conformance/CAPA actions and is deployed electronically to the whole organization is a powerful management tool that certainly adds value to the organization on a long-term basis.

Web QMS solutions for quality management are dynamic, and capable of being analyzed and changed quickly. A real-time Web based QMS system, implemented and managed electronically provides speed and agility to any organization. The most significant characteristics of such solutions are that they permit top management and employees, doing their jobs, to communicate, analyse and monitor QMS information and issues, continually, and improve their performances with the final goal, the organization with TQM system.

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