



The Usefulness of ISO 9001 Standard to Enhance Information Technology Service Management in Organization

Irwan Munandar
Balai Pendidikan dan Pelatihan
Tambang Bawah Tanah
irwan@esdm.go.id

Wahyu Indra Satria
Faculty of Computer Science
University of Indonesia
wahyu.indra51@ui.ac.id

Abstract— Organization life is depends on how it capture, protect, retain, and maintain their information technology. According to that description, now we know that information technology (IT) is very important in organization, and if we want establish information technology correctly and maintainability, need a good management of that information technology itself. One of activity that can be used to manage information technology (IT) in organization is information technology service management (ITSM). Information technology service management (ITSM) delivers IT based services to organizations. ITSM supports the attainment of business goals by aligning IT activities with business processes requirements. There are several standards that correlated with implement a good ITSM. These several standards can be a benchmark of organization to improve their ITSM. One of interesting standard to be discussed is ISO 9001. This paper will briefly explore and elaborate about how ISO 9001 standard enhance information technology service management (ITSM) in organization.

Index Terms — Organization life, information technology, information technology service management, business process, standard, ISO 9001.

I. INTRODUCTION

In this era, most of organization life is correlated and depend on information technology (IT). This is because the use of information technology (IT), can provide all of business lifecycle of organization, and help organization in competitiveness with others also. Information technology (IT) can be used to support organization commissioner/CEO in decision making (decision support system), managers to monitoring and maintain their organization condition

(monitoring and maintain system), and for employee in their operational activity (operational system).

Organization life is depends on how it capture, protect, retain, and maintain their information technology. According to that description, now we know that information technology (IT) is very important in organization, and if we want establish information technology correctly and maintainability, need a good management of that information technology itself.

One of activity that can be used to manage information technology (IT) in organization is information technology service management (ITSM). Information technology service management (ITSM) delivers IT based services to organizations. ITSM supports the attainment of business goals by aligning IT activities with business processes requirements. ITSM is of increasing importance to IT organizations around the world, while information systems play a crucial function in private and public sector organizations. ITSM is the paradigm shift from a traditional IT department to a customer and service orientation. The need to align the IT strategy with the business strategy, increasing the transparency of IT process, and quality while reducing the cost of IT services [1] [2].

There are several benefits in implement a good ITSM in organization, such as increase efficiency and effectiveness in use of information technology (IT), monitor and maintain of IT cost, increase business productivity, and many more. Because there are a lot of benefits in conduct ITSM, international organizations agree to make several standards that correlated with implement a good ITSM. Of course this several standards are not really directly improved the implement of a good ITSM.

Even though this several standards cannot directly help organization improve their ITSM implementation in their business lifecycle, this several standards can be used as organization benchmark, so organization can know about what domain in their organization to be improved, to get a good information technology service management (ITSM).



One of interesting standard to be discussed is ISO 9001. ISO 9001 is a quality management system standard that is recognized internationally. Management system refers to what the organization does to manage the process, or activity, so that the products or services meet organization goals [3].

ISO 9000 series of standards first emerged in 1987 as the torch-bearer of the standards for doing business in Europe. Immediately after the emergence, it has got fast acceptance all over the world. According to the International Organization for Standardization (ISO), up to December 2010 more than 1064785 ISO 9001 certificates had been issued in 178 countries and economies [4].

According to that description, raises interesting question: Can organization enhance their information technology service management (ITSM) by implementing ISO 9001 standard? The answers of that question will briefly explore further. This paper divided into four sections. Section one is introduction, section two will briefly explain about issues, usefulness, frameworks, and models that have been developed conformed to the existing research about ISO 9001 standard. Section three is finding and evaluation, and section four is conclusion.

II. STUDY OF LITERATURES

In exploring and elaborate about how ISO 9001 standard enhance information technology service management (ITSM) in organization, as the focus topic of discussion, there are many issues, usefulness, frameworks, and models that have been developed and researched. The authors make description and investigation of the problem based on the existing research and literatures as follows.

A software application to improve human rights watching activities and to prepare police stations to face the ISO 9001:2008 certification procedures is implemented. This research is about the conceptual design of the IT support for human rights watching, police transparency and police performance evaluation. From a software engineering point of view, reports a very specific and innovative software development project oriented both to support human right watching activities, to evaluate police performance and to prepare police stations for ISO 9001 certification [3]. Based on that research, we know that ISO 9001 can be “trigger” to enhance the usefulness of software application.

An expert advisory system for ISO 9001 based quality management system (QMS) of manufacturing environment is researched. The purpose of this research is to integrated ISO 9001 quality system guidelines and domain experience into a knowledge-based expert system. By identifying the critical ISO elements and comparing the company’s current quality performance with ISO standards, this advisory system provides assessment results and implementation suggestions in terms of corrective and preventive action reports to the

organization [4]. ISO 9001 is “inputted” into organization expert system.

An integrated model of ISO 9001:2000 and CMMI for ISO registered organizations is implemented. This research proposed an integrated model by inserting CMMI practices into ISO 9001:2000 requirements. Researcher expect that this model will be helpful to ISO registered organizations as it will allow existing ISO assets to be re-used without redundant efforts. In addition, the model will help organizations to perform gap analysis and maintain their quality manual without any difficulty when adopting CMMI [5].

BPM Model of GQIMP for ISO 9001:2008 supported by CASE tools implemented, to make integration of quality management system (QMS) in an integrated way into a ISO 9001:2008 real case. The results through the selection of this strategy presents is lean and concise, for obtaining ISO certification. ISO 9001 uses as benchmark and guidelines to develop all of aspect service in organization [6].

Preliminary investigation from Taiwan’s certified companies is implemented to investigate what personality traits should the ISO 9001 QMS auditor possess and improve, from audited company’s viewpoint. By application of ISO19011 (Guidelines for quality management systems auditing and environmental management systems auditing) and ISO9000 standard, questionnaires were used to collect data from ISO 9001 certificated companies in Taiwan. Quality management system auditor will be proposed, and those will be provided for certification organizations on their qualification identification and training planning for new auditors. ISO 9001 is used to determine about the all of aspect service in organization well establishing [7].

Research to find about impact of ISO 9001 in software development maturity is implemented. It finds that ISO 9001 lead to software process improvement. The answer is based on 2.5 BOOTSTRAP maturity assessments carried out in Danish companies; twelve of these for ISO 9001 certified companies. It is not only the quality system and software quality management that is influenced by an ISO 9001 certification, but other software processes such as project management, testing, and resource management are also influenced [8].

Exploratory study to investigate the correlation and contrast between ISO 9001 and CMMI framework in context of software quality management implemented. All of the quality related activities demanded by the ISO 9001 version 2000 or 2008 can only be met by only one KPA of CMMI, known as Configuration Management. CMMI is much more detailed and comprehend model to adopt. ISO is surely not a replacement of CMMI, but if organization is afraid of CMMI complexity, it’s better to start with an ISO standard and then making transition to CMMI [9].



Modeling of the design process MEM's products based on the process approach by ISO 9001 is researched. The design process of complicated technical means as one of the phase of total product life cycle (LCP) has been analyzed. According to the recommendations to ISO 9001 standards design process is considered as a set of interrelated processes. The process divided into stages. There are defined objective, criteria and specifications for each stage, formalized model of the design process and the scheme of algorithm analysis and control process parameters has developed [10].

Applying ISO 9001:2000, MPS.BR and CMMI to Achieve Software Process Maturity: BL Informatica's Pathway implemented to describes BL Infomática's software processes improvement plan, lessons learned, difficulties and benefits that where collected during the execution of the improvement plan. Quantitative results of applying presented approach in BL Infomática are significant: it has obtained ISO 9001:2000 certifications, it has been evaluated as MPS.BR Level F and CMMI Level 3 adherent. Moreover, classic project problems as schedule delays, budget overrun, poor requirements definition, scope control, risks and configuration management were minimized and predictable more often [11].

Integrating lean Six Sigma with ISO 9001:2015 is research that integrated six sigma and ISO 9001 in organization. The finding is Six Sigma commonly uses as popular approach that promotes the improvement of systems, processes, or any other type of entity. On the other hand, quality management systems based on the ISO 9001 standard encourage organizations to adopt various forms of improvement to consistently enhance its overall performance, to better be able to meet customer and other stakeholder requirements, as well as to address their future needs and expectations [12].

Integration of Six Sigma with a QMS based on the ISO 9001 requirements: a Portuguese SME case study is a research that integrated six sigma and ISO 9001 also. It find that ISO 9001 quality management systems are based upon a process-model, according to all of activities that impact customer, legal and regulatory requirements, should be identified, documented, controlled and continuously improved. Six Sigma is a process-focused approach aimed at improving business results by enhancing performance of a specific core process [13].

Research about ISO 9001 and agile development is implemented. This research describes how Primavera Systems, a developer of enterprise project management software, established a quality management system that was aligned with ISO 9001 while still maintaining all of the benefits of its Scrum/XP agile practices. It found that ISO 9001 helps ensure agile practices are being followed [14].

Investigation of the capability of XP to support the requirements of ISO 9001 software process certification is

researched. This research presents an analysis of extreme programming (XP) from the ISO 9001 and ISO 90003 perspectives. The focus is to extract the requirements related to the ISO product realization process and to determine the strengths and weaknesses of XP in handling those requirements [15].

A case study of managing a new computer device development in a creative ISO 9001 is a research about how organization developing a new computer device based on ISO 9001. The findings of a case study that explores the micro level factors, surrounding the processes of creativity and process management in a creative organization. The paper adopts an interpretive approach, which involves the collection and analysis of qualitative data [16].

OffshoreQA, a framework for supporting the efforts of offshore software development outsourcing vendors to comply with ISO 9001:2008 and in particular clause 7, which relates to product realization. The solution consists of an integrated requirements management, configuration management and test management system that define the main roles during each software development phase for every site [17].

Process improvement towards ISO 9001 certification in a small software organization is a research about software process improvement in small organizations that become a challenging task where the "smallness" brings a number of unique problems. It also report the status of work on creating ISO 9001 compliant quality system in a small software organization [18].

There is a research about national project to develop checklist to support audits and assessments of ISO 9001, compliant quality management systems in the field of software implemented. This national project is reviewed in terms of project requirements, process and product quality objectives and quality management practices; participation by industry locally and internationally; the use of the Internet for communication and document distribution; the product development and review process; and the trial (or validation) of the product [19].

A web application to prepare police stations to face an ISO 9001:2008 certification process and to improve watching activities of human rights is researched. The joint of web application, ISO 9001:2008 standard requisites and software engineering concept of process, has proven to have, at a prototype level, an important and positive synergic [20].

Based on the study of literatures in exploring and elaborate about how ISO 9001 standard enhance information technology service management (ITSM) in organization that became the topic of discussion, description and investigation of the issues problem, raised an interesting finding and evaluation. In next section, will briefly explore and elaborate about that finding



and evaluation based on section 2 (study of literature), so that can answer research question in section one.

III. FINDING AND EVALUATION

At this section, explain the finding and evaluation of the study, based on the study literatures in previous section (section two). The aim is to answer the research question in section one, that how can organization enhance their information technology service management (ITSM) by implementing ISO 9001 standard. The result and evaluation are divided into a several point.

- a. There are several usefulness about ISO 9001 for software system development such as [3] [4] [11] [14] [15] [17] [18] [20]. Correlated for enhance the ITSM in organization, of course the software system development have a strong contribution. Because if organization want establish a good ITSM, which a part of all lifecycle aspect in organization, software development process is an important things to be done well. Since software is embedded in all of activity of organization, ISO 9001 help on its benchmark about how make good software system, so that can give organization a best software development system to enhance their ITSM (software system that match with organization vision, mission, objective, and all of requirements) This is match with ITSM goal to aligning IT services with business process.
- b. Integrated model of ISO 9001 is also implemented for many reasons, such as gap analysis [5], benchmark and guidelines [6], cover system lifecycle [10], and improvement of system process [12] [13]. Correlated for enhance ITSM in organization, all of this activity can increase the effectiveness and efficiency of ITSM in organization. When organization can have a good gap analysis of their system, benchmark and guidelines of their IT, good system lifecycle, and improve their system process, it means organization can have the best usefulness about their information technology. Thanks to ISO 9001 standard that make this activity happen,
- c. ISO 9001 for investigation such as in [7] [8] [9] [19], help organization to find what domain/aspect they must improve according to ISO 9001. Of course ISO 9001 standard not only covers the IT aspect in organization, but also their business process. The benefit for organization is they can know how to improve and align their IT services with business process. Once again, ISO 9001 meet with ITSM goal.
- d. ISO 9001 standard can use for managing new computer device also [16]. In ITSM, it is important to make sure about your computer device, is that confirm with

business environment and standard of organization, then how align its computer device with organization needs.

IV. CONCLUSION

Now we know about how the ISO 9001 standard, that is implement in organization, can improve or enhance the usefulness of information technology service management. There is a lot of things that ISO 9001 cover as benchmark, so organization can used that all of benchmark point, to improve their ITSM in all of organization lifecycle process.

ACKNOWLEDGEMENT

The author would like to give a big thanks to Muhammad Baharudin Jusuf, S.Kom., M.I.S, as Lecturer of Information Technology Service Management subject, all of University of Indonesia academicians, and all of the anonymous Reviewers for their insightful review comments on this paper.

REFERENCES

- [1] Deutscher, Jan, "Concept for Implementation of Cost Effective Information Technology Service Management (ITSM) in Organizations"; IEEE Network Operations and Management Symposium Workshops, 2010.
- [2] Proehl, Throsten, "Topic and Applied Theories in IT Service Management"; Erek, Koray; Limbach; Felix; Zarnekow, Ruediger, Technical University of Berlin, Germany, 2013.
- [3] Debnath, Narayan, "A software application to improve human rights watching activities and to prepare police stations to face the ISO 9001:2008 certification procedure", Winona University, USA; Uzal, Roberto, Universidad Nacional de San Luis, Argentina, 2011.
- [4] Bewoor, Anand, "An expert advisory system for ISO 9001 based QMS of manufacturing environment"; Bewoor, Laxmi, University of Pune, India, 2012.
- [5] Yoo, Chanwoo, "An integrated model of ISO 9001:2000 and CMMI for ISO registered organizations", Seoul National University; Yoon, Junho; Lee, Byungjeong; Lee, Chongwon; Lee, Jinyoung; Hyun, Seunghun; Wu, Chisu, University of Seoul, 2004.
- [6] Montini, Denis, "BPM Model of GQIMP for ISO 9001:2008 supported by CASE tools"; Matuck, Gustavo; Cunha, Adilson; Diaz, Luis, Brazilian Aeronautics Institute of Technology, Brazil, 2014.
- [7] Liao, Ren, "Customer's perspective on ISO 9001 QMS Auditors Personality Traits – A Preliminary Investigation from Taiwan's Certified Companies", Chienkuo Technology University, Taiwan, 2014.



- [8] Hass, Anne, "Does ISO 9001 Increase Software Development Maturity?"; Johansen, Jorn; Heje, Jan, DELTA, Denmark, 1998.
- [9] Ijas, Qaiser, "Exploratory Study to Investigate the Correlation and Contrast between ISO 9001 and CMMI Framework Context of Software Quality Management"; Asghar, Hira, Islamia University of Bahawalpur; Ahsan, Ali, CASE Islamabad, Pakistan, 2016.
- [10] Tkachenko, Nataliya, "Modeling of the Design Process MEM's Products Based on the Process Approach by ISO 9001"; Yurchak, Irina, Lviv Polytechnic National University, Ukraine, 2015.
- [11] Ferreira, Analia, "Applying ISO 9001:2000, MPS.BR and CMMI to Achieve Software Process Maturity: BL Informatica's Pathway"; Santos, Gleison; Cerqueira, Roberta; Montoni, Mariano; Barreto, Ahilton; Barreto, Andrea; Rocha, Ana, Federal University of Rio de Janeiro, Brazil, 2007.
- [12] Marques, P, "Integrating Lean Six Sigma with ISO 9001:2015"; Meyrelles; Saraiva; Guerreiro, Institute for Technology and Quality, Portugal, 2016.
- [13] Marques, P, "Integration of Six Sigma with a QMS based on the ISO 9001 requirements: a Portuguese SME case study"; Guerreiro, Welding and Quality Institute; Saraiva University of Coimbra; Requeijo, Universidade Nova de Lisboa, Portugal, 2011.
- [14] McMichael, Bill, "ISO 9001 and Agile Development", Primavera Inc.; Lombardi, Marc, RCG Information Technology, USA, 2007.
- [15] Qasaimeh, Malik, "Investigation of the Capability of XP to Support the Requirements of ISO 9001 Software Process Certification"; Abran, Alain, University of Quebec, Canada, 2010.
- [16] Molnar, Wolfgang, "Managing a New Computer Device Development in a Creative ISO 9001 Certified Company: a Case Study"; Nandhakumar, Joe, University of Bath, United Kingdom, 2007.
- [17] Hassan, Annous, "OffshoreQA: A Framework for Helping Software Development Outsourcing Companies Comply with ISO 9001:2008 (Extended Abstract)"; Livadas, Lelia; Miles, Gail, University of Liverpool, United Kingdom, 2010.
- [18] Demirors, Elif, "Process Improvement Towards ISO 9001 Certification in a Small Software Organization"; Demirors, Onur; Dikenelli, Oguz; Keskin, Billur, University Izmir Turkey, Turkey, 1998.
- [19] Walker, A, "Quality Management Applied to the Development of a National Checklist for ISO 9001 Audits for Software", University of The Witwaterstand, South Africa, 1997.
- [20] Debnath, Narayan, "A Web Application to Prepare Police Stations to Face an ISO 9001:2008 Certification Process and to Improve Watching Activities of Human Rights", Winona State University, USA; Uzal, Roberto; Montejano, Universidad Nacional de San Luis; Daniel, Universidad de Buenos Aires, Argentina, 2010.