

RESEARCH ARTICLE | MARCH 09 2017

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AIP Conf. Proc. 1818, 020034 (2017)

<https://doi.org/10.1063/1.4976898>



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Integrated Management System: The Integration of ISO 9001, ISO 14001, OHSAS 18001 and ISO 31000

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Abstract. The implementation of integrated management system (IMS) for better quality management has become a preference for many organizations. This can be seen as many organizations used the combination of quality ISO 9001, an environment ISO 14001 and occupational health and safety management system OHSAS 18001 as a core for the IMS that largely implemented. Besides, the linked between quality management with risk management system need to be identified as the management system that enhance the effectiveness of IMS. Therefore, the risk management system ISO 31000 also presented as a part of integration. In nowadays competitive environment, the increasing pressure and needs from customer or stakeholders make it compulsory for the organization to propose the new system and standards. This paper presents and discusses about the benefit of integration, the management system components that can be converged and the implementation approach. A series of interview was conducted through in-depth interviews with 8 experts in this field, while data collected were analyzed qualitatively. The results consist of 16 factors of IMS implementation that have been identified and the use of PDCA approach for an effective implementation of IMS. As a conclusion, the paper proposes the integration of four management systems (ISO 9001, ISO 14001, OHSAS 18001 and ISO 31000) and on how the IMS can be used to structure the process of management for quality management towards sustainability practices in the organization.

Keywords: Integrated management system, ISO 9001; ISO 14001; OHSAS 18001; ISO 31000

INTRODUCTION

The Integrated Management System (IMS) is known as a system that merge the components of business into one system [1]. IMS implementation includes ISO 9001 Quality Management, ISO 14001 Environment Management and Occupational Health and Safety Management OHSAS 18001 but not just limited to these standards [2]. The integration is a combination that consolidates the internal management practices into one system, therefore the system are linked to form one integral part of the management system. An organizations need to take action for sharing tools, methodologies and systematic management of different areas, and to fulfill the different standard or models governing the management systems [3]. Figure 1 below shows the core of an IMS and example of standards through which the integration can be achieved. Besides, the IMS is located in the center of the three systems and shares common elements with them [4].

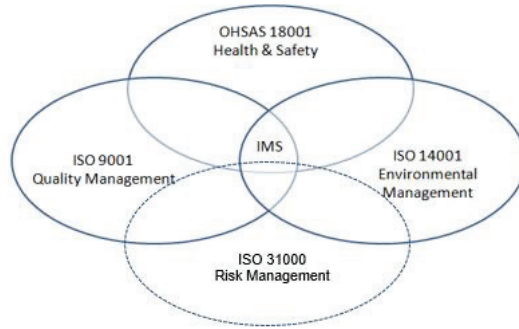


FIGURE 1. The core of the IMS and examples of standards on which it can be based and Risk Management System ISO 31000 proposed by the researcher.

IMS is a management system which combines all components of a business into one comprehensive system so as to enable the achievement of its purpose and mission [5]. As mention earlier, IMS is the integration of the systems that are focused on quality, environment, and occupational health and safety along with the process, practices and documentations. The integration consists of three main management systems: ISO 9001, ISO 14001 and OHSAS 18001. ISO 31000 Risk Management System was proposed as an additional in the IMS. After an organization has certified Quality Management System (QMS), an important addition that needs to be considered which is the risk assessment [1]. The benefit as resulting from the implementation of IMS are the improvement of business focus, a holistic approach to managing business risk, reduce the clash between individual management systems, minimize duplication and bureaucracy, more effective and efficient internal and external audits and simpler facilitation of the requirements of any new management system standard that the organization wishes to adopt [6]. Besides, the implementation of IMS can clarify the certification process, save human resources, decrease management cost and decrease complexity of internal management [7]. The integration of systems can save both time and costs in organization [8]. Moreover, the enhancement related to having an integrated system is operational benefits, better external image, improved customer satisfaction and also enhances employee motivation [7] – [9].

Implementation approach for Integrated Management System

The three standards of ISO 9001, ISO 14001 and OHSAS 18001 have a common underlying principle: continuous improvement based on Deming’s cycle (Plan-Do-Check-Act) [7]. The standard share the same structure and can be integrate using PDCA approach as shown in Figure 2.

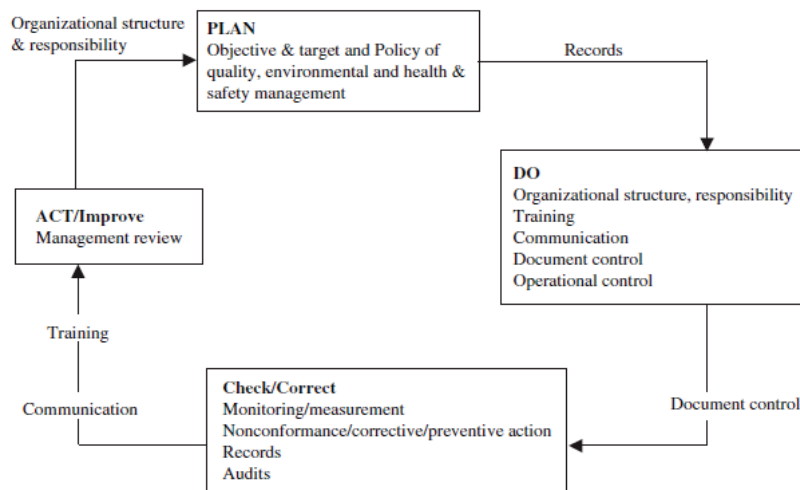


FIGURE 2: The Structure of PDCA Cycle
Source: [7]

The PDCA cycle is the continuous business improvement concept and incremental problem solving [10]. Based on the step of management method (PDCA), these four requirements can be used as a plan for IMS implementation. First step is a planning process. The planning is to plan changes and improvement as well as analyze the current situation; the attention should also be paid to possible consequences. This step is to define the problem, the relevant data collection and also to identify the problem root cause [11]. Next step is to do or to execute the plan. There is need of implementing the process that already planned [11]. The third step is to check the process in order to control or to do the improvement. This phase required monitoring and evaluating process, the results against the objective and specification also to report the outcomes. The check phase is a comprehensive study of the consequences of implementation changes and the formulation of conclusion concerning the effectiveness of implementation [11]. The final step is to act or evaluate the effectiveness and also the function of the implementation. The Act phase is the action that needs to be applied to the outcome for the further improvements [11].

Theoretical Framework

The theoretical framework is as shown in Figure 3 below.

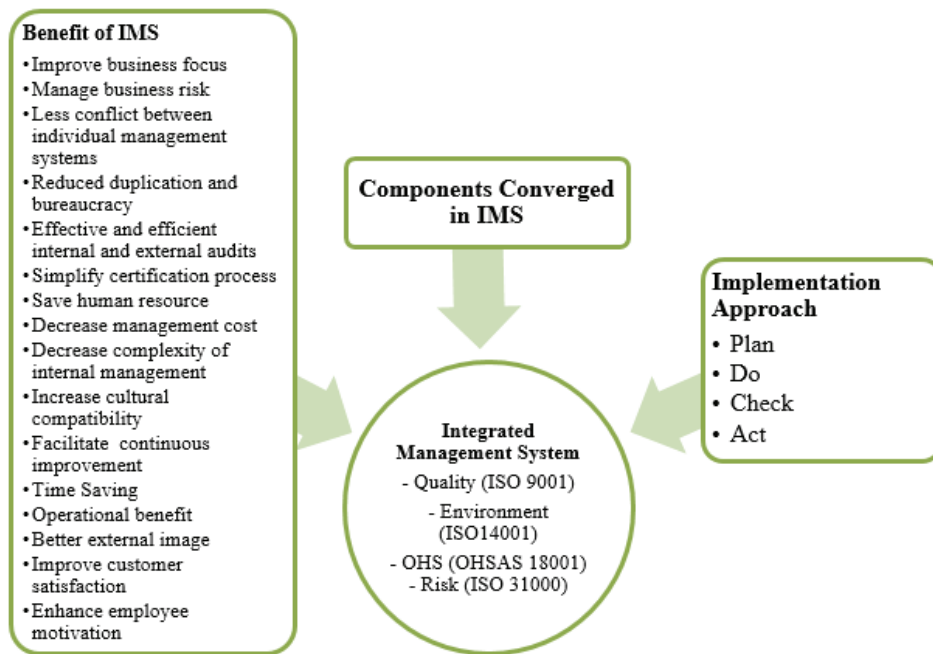


FIGURE 3: Theoretical Framework for IMS

Sources: [8], [12], [3], [5], [7], [13], [14], [15], [16], [17], [18], [10] and [11]

RESEARCH METHODS

This article is an exploratory qualitative study, based on in-depth interview. The qualitative is an approach to explore and understand the meaning of individuals or groups ascribe to the social [19] and this method offers ways of finding out what people do, know, think and feel by observing, interviewing and analyzing documents [20]. The IMS is the approach that people do practically; therefore, the researcher can gain the data from what respondents do, or experienced and ask for their opinion. In this article, the case study strategy was adopted, there are 5 respondents from AUO SunPower Sdn Bhd (AUSP) which involved in the manufacturing of solar cell technology. This company were successfully implemented the IMS for three years. Besides, the data collection also involved 3 respondents from SIRIM Bhd, which gives a total of 8 respondents from both organizations. SIRIM Bhd is an appointed body for the Department of Standard Malaysia for the Malaysian Standard that is based on ISO standards. In this article, through the interviews with respondents, the researcher could then understand the factors on the IMS implementation and the converged management system components from Malaysian standards practitioner and industrial practitioner. The interview questions were designed to be semi-structured in order to encourage participants to talk freely and openly about their opinions and experience.

Besides, for data analysis, this article applied the explanation building methods. The explanation building is designed to test a theoretical proposition [21]. The qualitative data is consist the elements of 1) Relating themes or findings to the relevant research literature, 2) Presenting the data, 3) Describing or summarizing the data 4) Interpreting the data. Based on the statement, the data analysis used is the explanation building methods. The explanation building methods required to undertake the following stages [21]:

1. Devise a theoretically-based proposition, which you will then seek to test.
2. Undertake data-collection through an initial case study in order to be able to compare the findings from this in relation to this theoretically-based proposition.
3. Where necessary, amend the theoretically-based proposition in the light of the findings from the initial case study.
4. Undertake a further round of data-collection in order to compare the findings from this in relation to the revised proposition.
5. Where necessary, further amend the revised proposition in light of the findings from the second case study.
6. Undertake further iterations of this process until a satisfactory explanation is derived.

The data was analysed using the explanation building method that described and arranged according to theory, primary or secondary data; and the researcher's opinion. Besides, the content analysis method was used to identify the clauses involved or converged in the IMS.

DISCUSSIONS AND ANALYSIS

In this section, the findings are summarized related to the data gathered for the implementation of IMS. The main research areas to be examined were as follows: 1) Benefit of IMS. 2) The components of management system that converged and 3) Implementation approach for IMS. The data analysis was arranged and explained according to the explanation building methods by Yin that involved theory, primary or secondary data; and the researcher's opinion.

Benefit of Integrated Management System

a) Improve Business Focus

IMS improve the focus of the organization as the system promotes concentrating on the organization's activity, improving and the strengthening of connections between quality, employee health and safety; and social responsibility [13]. The IMS can benefit the organization and focus organization onto the business goals [5].

"IMS is utilized as a corporate direction tool to achieve the goal of becoming a leader of an industry" (AUSP Manager 2). "IMS can enhance the management efficiency and in the long term improve business itself as well as changing and improving the organizational culture. In addition, as the organizational culture improves, the organization itself will experience business growth."(SIRIM Manager 1).

Both A USP Manager 2 and SIRIM Manager 1 agreed that IMS implementation could improve business focus. The researcher acknowledges that IMS provide a competitive advantage to an organization that implements IMS as it can guide the management direction, improve business and also organizational culture. The integration of management system can direct a company strategy to be more focused towards organizational needs and improve business focus.

b) Manage Business Risk

Integration of two or more management systems into an IMS is advantageous in terms of providing a more holistic approach to managing business risks [14]. The organization can gain a holistic approach to manage business risks after the integration [5].

A USP Manager 1 notes that the safety risks, environmental impacts and process failure modes is already covered in the main three management systems in the IMS. A USP Engineer 1 acknowledges that IMS is implemented in the department to ensure product quality and reliability as well as audits.

A USP Manager 1 and A USP Engineer 1 agreed that IMS is able to manage business risk because it covered the risk for different management system. The researcher believes that there are some component in each ISO or management system that focuses on the risk management aspect. In IMS, the system will cover the aspect of quality, environment, occupational health and safety together with the risk management system simultaneously.

c) Less Conflict between Individual Management Systems

IMS implementation identify and rationalize conflicting, confusion, redundancy or conflicts in the documentation and also expose the conflicting objectives [5]. Besides, IMS leads to a more effective resource management, mainly by entrusting the management of IMS to one leader instead of appointing separate leaders to each and every management system, including the certified one [13].

“IMS help to promote a lean management as both certifications have the internal audit and management review. Instead of having two different sessions for internal audit and management review, one session would suffice after integration.” (SIRIM H.O.D 1). According to A USP Manager 1, IMS can reduce the redundancies in management system documentation and save resources.

In the researcher’s opinion, IMS provide less conflict between individual management systems as the integration identified and rationalize conflicting, confusion, redundancy or conflicts in the documentation because it covers the procedure from different aspect, mainly quality, environment, occupational health and safety. IMS could provide less conflict between individual management systems as agreed by SIRIM Head of Department 1 and A USP Manager 1.

d) Reduced Duplication and Bureaucracy

One of the advantages for integration is the elimination of duplications between procedures in the systems [14]. The IMS allows the organizations to decrease the extent of documentation and bureaucracy which arises due to work organizing and control, referring to separate procedures or different standards [13].

“In my perspective, IMS can minimize the number of audits involved as well as a documentation replication issue and resulted error or mismatch between each procedure” (A USP Manager 3).

A USP Manager 3 mentions about IMS can minimized the replication issues. IMS is able to minimize the number of audits, minimize documentation replication issues and the error result or mismatch between the procedures. The researcher believes, after the IMS implementation, documentation management will be more structured and well organized, hence the duplication and bureaucracy issues can be prevented.

e) Effective and Efficient Internal and External Audits

IMS has the advantage in reduces the external certification costs via single certification audits and integrated audits [14]. Moreover, integration also allows carrying out an internal and external audit more clearly and effectively [13].

According to A USP Manager 1, the implementation of IMS will result in a one-time audit as previously they needed to do audit for 3 different systems. “IMS save auditing time because the auditor can do all audits under one

system. Other than that, the integration is easier to manage as it will simplify the three systems into a single system” (AUSP Manager 2).

AUSP Manager 1 and AUSP Manager 2 accepts that IMS provides more efficient audits. By using IMS, audit can be performed in one session for all management systems instead of having different types of audit process previously. The internal and external audit process be simplified and the cost for the audit also can be reduce. The integration ensure component of quality, environment, occupational health and safety; and risk that needs to be audited to be checked hence the issues regarding mismatch or mismanage can be minimized.

f) Simplify Certification Process

Three (or more) management systems are combined into one system; it will be easier for each management system to be certified. IMS implementation provides the benefit in simplifying the certification process [7].

According to AUSP Manager 2, IMS used as a method to simplify the system and also to combine audits because in the future, the company will have the different types of audits. “IMS combine audits to become one audit” (AUSP Manager 1). SIRIM H.O.D 1 and SIRIM S.L.O 1 agrees that instead of having two different sessions for certification, after consolidation, it will only need one time of certification process.

AUSP Manager 1, AUSP Manager 2, SIRIM Head of Department 1 and SIRIM State Liaison Officer all confirms that IMS can simplify the certification processes. In researcher’s opinion, the integration simplify the certification because previously the different management system need to be certified and verified for one by one accordingly, the process might take more time because of the need to check every single system, utilising a lot of manpower, spending more resources on documentation.

g) Save Human Resource

IMS provides benefit in terms of human resources as it can improve the company culture. IMS support human resources as it can improve communication and information sharing across different organizational levels [3].

“IMS provides a better resources management in term of cost and man power” (AUSP Manager 1). “IMS is reducing the man-days, before implement IMS, usually it will take three or four days. The audit cost and man time can be reduced” (SIRIM H.O.D 1).

Based on the statements, AUSP Manager 1 and SIRIM Head of Department 1 accepts that IMS can save human resources. Researcher’s believes that IMS can save human resource used in term of audit and management. This is because, after the integration, the auditing process becomes only one time audit and one procedure that needs to be manage. Other resources can also be allocated to support other functions of the business, the man power can be reduce and minimize the complexity of the management and lessen the workload for the employees.

h) Decrease Management Cost

The financial benefit refers to financial goals granted by the implementation of IMS; integration can lead to direct cost saving through reduce audit cost and reduce certification cost [15]. The implementation of IMS has been reported to result in direct cost savings (through audit cost reductions, certification cost reduction) [16].

“IMS provides cost saving for the certifications, the auditing cost will reduce as the manpower cost is minimized, save the resources as we can use repeated resources, save the documentation, reduce auditors time and enhance the effectiveness” (AUSP Manager 1). SIRIM Manager 1 also mentioned about the integration; it reduces cost in term of number of resources required, documentation required and provides better understanding for the employees.

IMS can decrease the management cost and both AUSP Manager 1 and SIRIM Manager 1 confirmed that statement. In the researcher’s opinion, the implementation of IMS plays a role in decreasing the management cost as the resources are combined together. Based on the statement from respondent, the integration benefits includes cost for certification, audit, man power, resources and for documentation cost.

i) Decreases Complexity of Internal Management

IMS is not only decrease management system cost, but also decreases the complexity of internal management. IMS gives a reduction in duplication of policies, procedures and record that will provide the advantages in the company operation [7].

AUSP Manager 1 and 2 mentions that IMS reduces cost, reduces the use of manpower, minimized redundancies, lessen documentation used and also reduce the complexity of the system in term of documentation and this is the main priorities in IMS. According to AUSP Manager 4, the IMS helps to enhance the efficiency in management like the application for external training. Additionally, IMS can also help to set the standard operating procedure in human resource and can improve the electronic training effectively.

AUSP Manager 1, AUSP Manager 2 and AUSP Manager 4 believes that IMS could decreases complicity of internal management. IMS consolidates the component in the management system as it can controlled and managed into a system. The researcher affirms that by integrating the documents, manual, procedures and others; task can simplified as the system maintains a systematic procedures that includes all the requirement required in the management system, therefore the complexity can be minimized and simplify further the process.

j) Increase Cultural Compatibility

The organizational culture is pattern of beliefs, values and learned ways of coping with experience that have developed during the course of an organization history [17]. The culture in the country and organization is important to make sure the integration can be adopted completely into the organization [3].

AUSP Manager 1 states that, the main differences from before and after the implementation of IMS is that the management become easier, IMS implementation can increase the level of employee satisfaction and manage better because further process is already simplified; and lesser work need to be done. SIRIM Manager 1 noted that IMS improve the culture of the organization.

AUSP Manager 1 and SIRIM Manager 1 affirms that the integration can increase culture compatibility. In researcher's opinion, the systematic practise and work provides an effective working environment. IMS gives better work and experiences in term of management. Besides, IMS is believed to be a medium that simplify the process, documentation, can minimize the redundancies and minimize the management risk. To summarize, a good working practise in the organization can increase the culture compatibility and enhances quality in the management.

k) Facilitate Continuous Improvement

IMS is important for organizations that are willing to move towards continuous improvement as it can help organizations to efficiently tackle quality and environmental issues more efficiently and systematically [3].

According to AUSP Manager 1, IMS reduces the redundancies of documentation, save resources and save manpower. Besides, "For the improvement in the future, there are the needs to verify and look at the other area to be consolidate in order to maximize the use of IMS and to further find out the redundancies in the system" (AUSP Manager 1). "The company already complete the qualification and documentation of IMS but the implementation of IMS is a journey and when the company achieve a new high level, the management team will put the bar higher and it is the continuous journey" (AUSP Manager 2).

AUSP Manager 1, and AUSP Manager 2 accepts that IMS is able to facilitate continuous improvement. In researcher's opinion, after implemented IMS, continuous improvement is still needed. This is because it is important to always check the suitability and update the management system requirement based on the latest revision and needs of the company management.

l) Time Saving

The integration of systems can save both time and costs for companies, it saves time for adopting different systems as common objective of continuous improvement are being followed [8].

"IMS can save the auditing time because the auditor can do the combine audit and it is easier to do everything that is under one system" (AUSP Manager 2). "IMS provides cost saving for the certifications, the auditing cost will be reduced as the manpower cost can be minimized, save the resources as we can use the repeating resources, save the documentation, reduce auditors time and enhance the effectiveness" (AUSP Manager 1).

The benefits of IMS in time saving were affirms by AUSP Manager 1 and AUSP Manager 2. The researcher affirms that after integration, the impact is time saving. The system has been simplified and there is no need to perform the different system instead of one system. Therefore the time for management is reduced.

m) Operational Benefits

IMS provides the operational benefit of improving the multiple audits [18]. Besides, IMS also gives a reduction in duplication of policies, procedures and record [7] that will give an advantage in terms of the company operation. The operating system will run based on requirement for these three systems and the operation or practice will fulfil the quality standard, environment standard and occupational health and safety standards.

AUSP Manager 1 agreed that the benefits of using IMS in management system are that the system will reduce the redundancies of documentation and save resources as the company can use same resources. The use of man power can be reduced as only needs one time audit and save auditing cost.

AUSP Manager 1 accepts that the integration can provides operational benefits. In researcher's opinion, IMS gives the positive impacts on the organization audits, policies, requirements, procedure, record and others. This is because the combination includes all main management components. Furthermore, results in cost reduction and time efficiency; this can provide advantage in terms of operation and overall organization management.

n) Better External Images

The IMS gives a positive point to firm image improvement [3] and having the IMS helps to improve customer confidences and promotes positive company images [16].

"The IMS can enhance the effectiveness, in the long term it will improve business, change and improve culture of the organization. The main thing is to reduce cost, people will treat the management system equally, therefore when the culture is changed, and then there is a business growth."(SIRIM Manager 1).

SIRIM Manager 1 confirms that IMS able to provides better external images for the company. The researcher believes the integration of the management system involves the organizational culture, give operation benefit and better quality management. When the organization have a good internal culture, then it will lead to good management, product quality and the business growth.

o) Improve Customer Satisfaction

There are a series of standards related to quality management in which is one of the element in IMS that is directed towards assessing and improving customer satisfaction, it provides guidance for planning, developing, implementing maintaining and improving processes to increase customer satisfaction [12].

"The customers are asking the company to have the IMS in the company as part of the business" (AUSP Manager 1).

AUSP Manager 1 agreed that IMS can improve customer satisfaction. The researcher realizes that there are needs and customer demands for the use of the IMS as a part of business system and management strategy. Based on the statement, the customer also is a factor for the IMS implementation in the organization as they will be more confident to do their business as they believes IMS provides the efficient and effective ways in the operational and the business will be steadier and more stable.

p) Enhance Employee Motivation

IMS implementation create a positive culture in the company towards employee motivation. The internal benefit in the integration is it can improve staff's motivation and decrease the inter-functional conflict [3].

According to SIRIM Manager 1, IMS able to gives staff and employees easier to understand the systems, as there are only one system instead of many systems and the system in IMS will be treated equally. AUSP Manager 1 also mentions about the different results from before and after integration which is easier management, increase level of employee satisfaction, better management because all the system is simplified and lesser job to be done.

SIRIM Manager 1 accepts that one of the benefit of integration is enhances employee motivation. In researcher's opinion, IMS provide comfortability and an effective management approach for the employee. Also, good internal operation enhances motivation to the employees as they will be contented with their daily work and maintain the IMS practices. The simplified management system will make the employee easier to understand the system and process therefore can give the motivation for them in doing their daily assessment and task.

Converge Components for Integrated Management System

This is the clause that can be integrate for IMS. The clauses shared the same criteria that can converge together. The clause is as shown in Table 1.

TABLE 1: The Clauses of the Component for IMS

ISO 9001 (A)	ISO 14001 (B)	OHSAS 18001 (C)	ISO 31000 (D)	RESULTS
Scope (Clause: 1,4.3)	Scope (Clause: 1, 4.3)	Scope (Clause: 1)	Scope (Clause: 1)	A, B, C and D Integrated
General Requirement (Clause: 4.1, 4.2, 4.4, 4.4.1, 4.4.2, 5.1, 5.1.1)	General Requirement (Clause: 4.1, 4.2, 4.4, 5, 5.1)	General Requirement (Clause: 4.1)	General Requirement (Clause: 4.1)	A, B, C and D Integrated
Management System Policy (Clause: 5.2, 5.2.1, 5.2.2)	Management System Policy (Clause: 5.2)	Management System Policy (Clause: 4.2)	Management System Policy (Clause: 4.3.2)	A, B, C and D Integrated
Planning (Clause: 6, 6.2, 6.2.1, 6.2.2, 6.3)	Planning (Clause: 6, 6.1.2, 6.1.3, 6.1.4)	Planning (Clause: 4.3)	Planning (Clause: 4.3)	A, B, C and D Integrated
Planning-Risk (Clause: 6.1, 6.1.1, 6.1.2)	Panning-Risk (Clause: 6.1, 6.1.1)			A and B Integrated
		Identification and evaluation of aspect, impacts and risks (Clause: 4.3.1)	Identification and evaluation of aspect, impacts and risks (Clause: 5.4.2)	C and D Integrated
		Identification of legal and other requirements (Clause: 4.3.2)	Identification of legal and other requirements (Clause: 3a)	C and D Integrated
		Contingency planning (Clause: 4.4.7)	Contingency planning (Clause: 5.4.2, 5.5)	C and D Integrated
Objectives (Clause: 6.2, 6.2.1, 6.2.2)	Objectives (Clause: 6.2, 6.2.1, 6.2.2)	Objectives (Clause: 4.3.3)	Objectives (Clause: 4.2)	A, B, C and D Integrated
Organizational structure, roles, responsibilities and authorities (Clause: 5.3)	Organizational structure, roles, responsibilities and authorities (Clause: 5.3)	Organizational structure, roles, responsibilities and authorities (Clause: 4.4.1)	Organizational structure, roles, responsibilities and authorities (Clause: 4.3.1)	A, B, C and D Integrated
Operational control (Clause: 7.1.4, 8, 8.1)	Operational control (Clause: 8, 8.1, 8.2)	Operational control (Clause: 4.4.6)	Operational control (Clause: 5.3.4)	A, B, C and D Integrated
Management of resources (Clause: 7.1, 7.1.1, 7.1.2, 7.1.3, 7.2,	Management of resources (Clause: 7.1, 7.2, 7.3)	Management of resources (Clause: 4.4.1, 4.4.2)	Management of resources (Clause:4.3.5)	A, B, C and D Integrated

7.3)				
Documentation requirement (Clause: 7.5, 7.5.1, 7.5.2, 7.5.3, 7.5.3.1, 7.5.3.2)	Documentation requirement (Clause: 7.5, 7.5.1, 7.5.2, 7.5.3)	Documentation requirement (Clause: 4.4.4, 4.4.5, 4.5.3)	Documentation requirement (Clause:5.7)	A, B, C and D Integrated
Communication (Clause: 7.4, 8.2.1)	Communication (Clause: 7.4, 7.4.1, 7.4.2, 7.4.3)	Communication (Clause: 4.4.3, 4.4.3.1)	Communication (Clause: 4.3.6, 4.3.7, 5.2)	A, B, C and D Integrated
Monitoring and measurement (Clause: 7.1.5, 7.1.5.1, 7.1.5.2, 9.1, 9.1.1)	Monitoring and measurement (Clause: 9, 9.1, 9.1.1)	Monitoring and measurement (Clause:4.5.1)	Monitoring and measurement (Clause:5.7)	A, B, C and D Integrated
Evaluation and compliance (Clause: 9, 9.1.2, 9.1.3)	Evaluation and compliance (Clause: 6.1.3, 9.1.2)	Evaluation and compliance (Clause:4.5.1)	Evaluation and compliance (Clause:5.4.4)	A, B, C and D Integrated
Internal audit (Clause: 9.2, 9.2.1, 9.2.2)	Internal audit (Clause: 9.2, 9.2.1, 9.2.2)	Internal audit (Clause:4.5.5)		A, B and C Integrated
Handling of nonconformities (Clause: 8.7, 8.7.1, 8.7.2)	Handling of nonconformities (Clause:10.2)	Handling of nonconformities (Clause:4.5.3.2)		A, B and C Integrated
Improvement (Clause: 10, 10.1, 10.3)	Improvement (Clause: 10, 10.1, 10.3)	Improvement (Clause: 4.6)	Improvement (Clause:4.5, 4.6)	A, B, C and D Integrated
Management Review (Clause:9.3.1)	Management Review (Clause:9.3)	Management Review (Clause:4.6)	Management Review (Clause:4.5)	A, B, C and D Integrated

Source: [2] [12] [22]

The management systems share many common requirements and the continual improvement goal. The different is the approach and degree of prescription, but the ISO 9001, ISO 14001 and OHSAS 18001 standards are compatible in content, terminology and many of the requirements [22].

AUSP Manager 1 mentioned the components that can be integrated are the manual, management review, resources management, document control and record; manufacturing process, monitoring and measuring process/products; audit procedure, legal and other requirement; EHS objective, target and program procedure; resources, roles, responsibility, training and awareness procedure; communication, operational control in environment management system/ safety management system procedure; and performance measurement and monitoring procedure. Furthermore, SIRIM Manager 1 accepts that, all components in management system can be integrated but it is based on an organization requirements.

The researcher can conclude that the management system component that can be integrate is based on the requirements of the company, if the company makes use of the component then the component might be able to integrated together. Different system has different requirements and not all documents or component should be integrated, if cannot be integrate then the management will use it as a single management system.

The Implementation of Integrated Management System

There are four steps of management method that had been developed by the father of quality control, Deming (1950) which is the 'Plan, Do, Check and Act' (PDCA) cycle. The PDCA cycle is the core of the continuous business improvement concept and incremental problem solving [10].

According to AUSP Manager 1, PDCA approach is used in the implementation of IMS. The first step (Plan) is to set the milestone on what the organization would like to achieve. Then, the second step (Do), it is needed for the execution as the management provides the training, EHS inspection by the committee, review and completes the security and environmental management system; and finalizes the process. The (Check) phase is to give the feedback to the top management on what are the problems or any uncertainty by going through a gap analysis, follow up gap analysis and fine tune the management system and do the internal audit. The final step is (Act), in this phase the management would decide on the future improvement based on the external audit, and after the process, the certificate of the management system is ready. Besides, SIRIM Manager 1 also confirms that there is not an issue to integrate the Risk Management System ISO 31000 together with the other management system, as long as the management system have the same management system activities which is Plan, Do, Check and Act (PDCA). The PDCA approach is suitable for the master plan of IMS implementation as it considers the process from the start up until the implementation is completed.

The Innovative Integration of ISO 31000 into the Integrated Management System

The organization that has a certificated for quality management system, an additional that needs to be considered is the risk management. This is because it will address safety risks, environmental impacts and process failure modes, by having a common approach it will be easier to compare risks occurring in different parts of the business [1]. ISO 31000 is referring to Risk Management System, this management system can help an organization to enhance the possibilities of achieving objectives, to improve the identification of opportunities and threats and also effectively allocate and use the resources for risk treatment [23].

"If the organization already certified with ISO 31000 then it will be easier to integrate" (SIRIM H.O.D 1). SIRIM H.O.D 1 added, it has the possibility to integrate the ISO 31000 and even though the latest revision of ISO 9001 is risk based but it is not as strict as ISO 31000. Besides, with the ISO 9001:2015 revisions, the combination of ISO 31000 into the main management system is very suitable because it is based on risk management system and can enhance the IMS. "The ISO 31000 mostly focused on how to implement the risk management. ISO 9001 required the organization to identify 'what is the risk' but it does not have the 'how doing it' and need to refer to ISO 31000 for risk management" (SIRIM H.O.D 1).

In researcher opinion, the additional integration of Risk management system (ISO 31000) is suitable to enhance the effectiveness of IMS. Even though the new revision of ISO applied is 'Risk Based' but based on the review and clauses that be classified, the individual ISO 31000 is considered more element of risk to be covered. The researcher believes that by adding the ISO 31000 can make sure the IMS might become more complete and effective.

The Summary of Converged Components

Table 2 below is the summary of the converged component in IMS.

TABLE 2: The Summary of Converged Components

CRITERIA	CONVERGED COMPONENTS
Management System- General Requirements	Integration formed the management system that focused on establishing, implement, maintain and continually improve the management systems (Quality, Environmental, OH&S and Risk) including the processes needed in accordance with the requirements of each International Standards.
Management System Policy	Establish, implement and maintain the management system policy. Formed the IMS policy that appropriate with the purposed and objective, the policy communicated appropriately, understood and applied within the organization for each management system.
Planning- Identification and evaluation of aspect, impacts and risks	Establish, implement and maintain the process to meet the requirement and determine the risk and opportunities that need to be addressed for each management system. Identify and control risk from quality, environment, occupational health and safety (OH&S) aspect; and for the risk management system.
Objectives	The integration, shared the same objective regards to policy, legal requirement and for continuous improvement for each management system.
Organizational structure, roles, responsibilities	The relevant roles are assigned, communicated and understood within the organization in term of requirement of International Standard and reporting on the performance of the management system, on opportunities for improvement and on the need for change or innovation.
Implementation and operation- Operational control	The organization is required to plan, implement, maintain, control the processes, and need to meet the requirements for the provision of products and services and to implement the actions with regards to quality, environmental aspect, identified the OH&S, hazard and risk.
Management of resources	Formed integrated resources for establishment, implementation, maintenance and continual improvement. Combined resource.
Documentation requirement	Effective integrated documentation by documenting information required by International Standard and establish the document and record control.
Communication	The integration establishes the effective communication as the organization maintain and implement the procedure for internal communication among the various levels and functions of the organization, besides, the organization also maintains the procedure for receiving, documenting.
Performance assessment- Monitoring and measurement	The integration formed the integrated monitoring and performance measurement in term of operational control for analysis and evaluation.
Evaluation and compliance	Integrated evaluation procedure in term of record, ensure the conformity of effectiveness for each system and applicable for legal requirements.
Internal audit	Establish the efficient and integrated audit in term of the requirement for the management system, following the international standard and provide the information for the system to effectively implement and the internal audit can be done in one time audit.
Handling of nonconformities	IMS establish, implement and maintain a procedure(s) for dealing with actual and potential nonconformity for corrective and preventive action.
Improvement- General	Formed the procedure on improvement and implement any necessary action to meet customer requirements and enhance customer satisfaction.
Corrective and improvement action	The integration can form the integrated corrective and preventive action that involved each management system.

Management Review– General	The Integration of the system leads the organization review about each management system as one system at the planned intervals, to ensure its continuing suitability, adequacy, and effectiveness.
Input	Only quality management system has the input clause as it controls the input to the management review, corrective action and audit results.
Output	Only quality management system have the output clause as it is about the decision and action related to continuous improvement.

Summarized by the researcher (2016)

CONCLUSION

The competition in the industry has become more intense due to the industrial revolution. The one of the approaches towards the sustainability is by integrating the management system to become more flexible, effective and competitive in the industry. The component that could be integrate can be merge while the component that cannot be integrate should be use as a single management system as mention by A USP Manager 1 before, “The different system have different requirements, not all document or component should be integrate, if cannot be integrate, then we will use it as a single management system”. There are a few factors in the IMS that can provide the effectiveness in the management and the main point is towards the cost effective, improve management and system; and for the operational benefit. The IMS can be applied to any of the organization that implies the management system. Moreover, the PDCA approach is able to enhance the efficiency in IMS implementation for a better management in the organization. The integration is important in order to improve the organizational culture and gain the benefit from the synergies of the combined management system.

ACKNOWLEDGMENTS

The authors would like to thank all those who have assisted to complete this research. Special appreciation is given to the responded companies and organizations involved in this research. This research was supported by the UTeM MyBrain scholarship.

REFERENCES

- [1] C. Q. Institute, "Integrated management system," 2016. [Online]. Available: <http://www.thecqi.org>. [Accessed 20 September 2015].
- [2] B. S. Institution, "PAS 99 Integrated Management System," 2016. [Online]. Available: <http://www.bsigroup.com>. [Accessed 17 May 2016].
- [3] A. Simon I Villar, "An empirical analysis of integrated management system," 2012.
- [4] T. Stamao, "Integrated management systems in small medium-sized enterprises: theory and practice.," University of East England, 2003.
- [5] M. Olaru, D. Maier, D. Nicoară and A. Maier, "Establishing the basis for development of an organization by adopting the integrated management systems: comparative study of various models and concepts of integration," *Procedia-Social and Behavioral Sciences*, vol. 109, pp. 693-697, 2014.
- [6] I. Standard, "Combine existing quality, health & safety processes (ISO 9001 & ISO 14001 & OHSAS 18001) into an integrated management system (IMS).," 2016. [Online]. Available: <http://integrated-standards.com>. [Accessed 4 January 2016].
- [7] S. X. Zeng, V. W. Tam and N. L. Khoa, "Towards effectiveness of integrated management systems for enterprises," *Engineering Economics*, vol. 21, no. 2, 2015.
- [8] A. Zutshi and A. S. Sohal, "Integrated management system: The experiences of three Australian organisations," *Journal of Manufacturing Technology Management*, vol. 16, no. 2, pp. 211-232, 2005.
- [9] S. Alexandra, S. Karapetrovic and M. Casadesús, "Difficulties and benefits of integrated management systems.

- Industrial Management & Data Systems," vol. 112, no. 5, pp. 828-846, 2012.
- [10] V. K. Singh, "PDCA cycle: a quality approach," *Utthan–Journal of Management Sciences*, vol. 1, no. 1, pp. 89-96, 2013.
- [11] M. Bugdol and P. Jedynak, *Integrated Management System*, Springer, 2015.
- [12] ISO, "International Organization for Standardization," [Online]. Available: <http://www.iso.org/>. [Accessed 20 June 2016].
- [13] A. G. Raisiene, "Advantages and limitations of integrated management system: the theoretical viewpoint.," *Socialines Technologijos*, vol. 1, no. 1, 2011.
- [14] K. Čekanová, "Integrated Management System–Scope, Possibilities And Methodology," Faculty of Materials Science and Technology Slovak University of Technology, Slovakia, 2015.
- [15] D. Rajkovic and M. Aleksic, "Corporative motives on implementation of integrated management system (IMS)," *International Journal for quality research*, vol. 3, no. 3, pp. 1-5, 2009.
- [16] M. Asif, E. J. Bruijn and O. A. Fisscher, "Corporate motivation for integrated management system implementation: Why do firms engage in integration of management systems: A literature review & research agenda," 2008.
- [17] Z. M. Diri, "Organizational Culture Impact On Reduction the Causes of Organizational Conflict (An Applied study on Jordan Hospital)," *Asian Journal of Management Sciences & Education*, vol. 4, no. 3, 2015.
- [18] H. K. Khanna, S. C. Laroiya and D. D. Sharma, "Integrated management systems in Indian manufacturing organizations: Some key findings from an empirical study," *The TQM Journal*, vol. 22, no. 6, pp. 670-686, 2010.
- [19] J. W. Creswell, *Research design: Qualitative, quantitative, and mixed methods approaches*, Sage publications, 2013.
- [20] M. Q. Patton, *Qualitative Research & Evaluation Methods: Integrating Theory and Practice*, Sage Publication Inc., 2015.
- [21] R. K. Yin, *Case study research: Design and methods*, Sage Publication, 2013.
- [22] D. o. S. Malaysia, "Risk Management - Principles And Guidelines (ISO 31000:2009, IDT).," 2010.
- [23] ISO2010, "The ISO Survey of Certification," International Organization for Standardization, Switzerland, 2009.