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Integrated Management Systems - Theoretical and Practical Implications

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Abstract

Organisations worldwide strive to develop their management systems for business functions, ranging from quality and environment to safety, information security and social responsibility. During the latest decade a considerable amount of these efforts has been concentrated on introducing and applying standards such as the ISO 9001 and ISO 14001. The need for Integrated Management Systems (IMS) often arises as a result of decisions to implement Environmental Management System (EMS) and/or an occupational health and safety management system in addition to a Quality Management System (QMS). At the end of 2003, approximately 3200 organisations in Sweden had an ISO 9001 certificate, and approximately 3400 organisations had a certificate based on an EMS. Dealing with separate management systems and ensuring that they align with the organisation's strategies and goals, has proved difficult. Owing to the large number of organisations certified according to multiple types of systems, an increasing number of organisations are establishing IMS. There are examples of companies, which chose to integrate EMS and QMS into a co-ordinated implementation approach, and although sparse, the research within this area indicates potential benefits of using an integrated approach.

This paper presents both a theoretical and an empirical investigation with the aim to elucidate problems related to the integration of management systems. Furthermore, the paper will present recommendations for succeeding in such integrations and, hence, contributing to an increased understanding on how IMSs should be designed and implemented.

1. Introduction

Organisations worldwide strive to develop their management systems, for business functions ranging from quality and environment to safety, information security, social responsibility systems. During the latest decade a considerable amount of these efforts has been concentrated on introducing and applying to standards such as ISO 9001, ISO 14001, EMAS and OHSAS 18001 and ISO 17799. Consequently, integration of the corresponding manage-

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ment systems has gained increased interest among practitioners and researchers.

At the end of 2003, approximately 3200 organisations in Sweden had an ISO 9001 certificate, and approximately 3400 organisations had a certificate based on an EMS, see ISO (2004). Karapetrovic (2003) means that, “faced with the need to implement multiple internal systems, companies then basically have two choices: leave these function-specific systems as separate, or integrate them”.

1.1 Main Objectives with the Paper

Organisations are, due to both external and internal demands, forced to work with and conform to a large variety of management standards. Moreover, separate management systems are sometimes considered by organisations to be rigid and bureaucratic and can therefore become an obstacle considering continuous improvement and an innovative climate. Although the new ISO 19011 auditing guidelines span over both EMS and QMS, the integration of management systems in organisations is not thoroughly addressed in the different standards. Furthermore, there is a lack of research within the field of IMS concerning how organisations should design and implement IMS. The purpose of this study is to elucidate problems related to the integration of management systems. Furthermore, the paper will present recommendations for succeeding with an integration and, consequently, contributing to an increased understanding on how IMSs should be designed and implemented.

2. Methodology

2.1 Literature Review

In this paper the integration of management systems is examined by means of literature review and case studies. The literature sources have been chosen to identify aspects of importance considering IMS and the successful implementation of IMS. The case studies have been chosen to verify and develop the findings derived from the comparative literature study and to gather empirical data in order to formulate recommendations for succeeding with an integration and, hence, contributing to an increased understanding on how IMS should be designed and implemented.

The literature review surveyed a range of papers and books dealing with Management Systems, Standards, and IMS, collected over several years of research. The main databases used were Academic Search Elite, Business Source Elite, EconLit and Emerald, while the main keywords used were “Integrated Management Systems”, “IMS”, “Integration of Management Systems” combined in some searches with “Implementation”. Papers of interest were also found by studying the reference lists in the literature sources consulted. The literature

searches located a great deal of material, and approximately 20 to 25 papers on the subject were considered relevant to this paper and were compared.

2.2 Case Study

A case study was performed to obtain in-depth knowledge of the design, use and problems of conforming to an IMS. Such an approach is appropriate when studying managerial processes, since the boundaries between the phenomena and their contexts are not obvious, see Yin (1994). In the current case, the phenomena studied were the integration and implementation processes. Case studies allow researchers to gain a better understanding of complex social phenomena, see Yin (1994). In this study, the authors gained, through the case study a better understanding of how organisations could deal with the integration and implementation of Management Systems. The data collection methods used in the case study was interviews and documentation review. These approaches are further discussed in McNiff (1995), Gummesson (2000) and Denzin and Lincoln (2000). The interviews were conducted with the head of overall management system and one employee administrating the same system. The interviews were conducted and recorded with support of a case study protocol in order to increase the reliability and validity. The question areas, presented in Figure 1, were developed based on the theoretical investigation and are further outlined in section 4.1 and forward.

3. Theoretical Frame of Reference

3.1 Stand-alone Systems or Integration

Owing to the large number of organisations certified according to multiple types of systems, an increasing number of organisations are establishing integrated, i.e. cross-functional, management systems. Although sparse, the research within this area indicates potential benefits of using an integrated approach, see e.g. Miles and Russel (1997), Wilkinson and Dale (1999), Lundh (2002), Ofori *et al.* (2002), Berg *et al.* (2003) and Karapetrovic (2003). Among the reasons to integrate management systems are:

1. The possibility to link quality related and environmental related aspects with ethics and organisational profitability.
 2. The likelihood of resource savings by means of increased efficiency and reduced redundancies.
 3. The possibility to develop management systems matching the concept of sustainable development.
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Dealing with separate management systems and ensuring that they align with the organisation's strategy has proved difficult. Previous research has also pointed out problems related to the increasing use of separate management systems that independently cover different areas. Korhonen (2003) argues that lack of a system perspective increases the risk of problem displacement and sub optimisation, for example between different life cycles, processes and companies. Improvements in one part can thereby be made at the expense of the benefit of a potential network system as a whole. Furthermore, Karapetrovic (2003) means that given that the current Management Systems Standards (MSS) were largely developed to be compatible with each other, and the future MSS will essentially have to follow the same structure as the existing ones, the second choice, i.e. establishing an integrated management system (IMS), makes more sense. The resulting synergy effects and a leaner system without redundancies are a few additional benefits of integration.

The choice of integrating is, however, not unchallenged. For instance, Hillary (1997) argue for developing stand-alone systems on the basis that integration before the maturity of the new system could disrupt existing systems. Hillary (1997) also points out that developing a stand-alone system initially raises its profile and that integration should be tried after the assessment requirements for certification to quality and EMS became clear. For a comprehensive analysis of the overall issues and literature regarding IMS, the interested reader is referred to Wilkinson and Dale (1999, 2001).

3.2 Integration or Alignment

Wilkinson and Dale (1999) mean that integrated management systems (IMS) is increasingly being seen as part of the organisation's management portfolio. Wilkinson and Dale (1999) performed a thorough analysis of published results in the area of IMS. One conclusion from their analysis is that many published studies so far in the area only treat integrated management system as a secondary issue. In particular, Wilkinson and Dale (1999) conclude that there is an urgent need for definitions, and explanations on what actually *integration* means and how it should be accomplished. MacGregorAssociates (1996) found that the concepts of integration and alignment need to be clearly distinguished. Integration is seen as: "a single top level management core standard with optional modular supporting standards covering specific requirements". On the other hand, alignment is seen as "parallel management system standards specific to an individual discipline, but with a high degree of commonality of structure and content". The implication for "integration" is that the "core" elements cover the QMS, EMS and Occupational Health and Safety Management Systems (OH&SMS), plus future management systems, which may not be immediate objectives of the organisation. The "aligned" approach, with similar common elements, allows adoption "that part of the common elements appropriate to the standards under immediate consideration". The "aligned" approach is therefore deemed to be the more flexible of the two approaches,

see also Wilkinson and Dale (1999).

3.3 Strategies to Implement IMS

The need for integrated management systems (IMS) often arises as a result of the decisions to implement environmental management system (EMS) and/or an occupational health and safety management system in addition to a quality management system, see Wilkinson and Dale (1999). In contrast, Karapetrovic and Willborn (1998) suggest a system approach that uses the identified linkages in the standards in order to develop three different strategies of an implementation of IMS, see below:

1. Introducing ISO 9001 first and then adding ISO 14001 using the ISO 9001 framework and the identified linkages between the two standards.
2. Introducing ISO 14001 first and then adding ISO 9001 using the ISO 14001 framework.
3. Introducing ISO 9001 and ISO 14001 concurrently, using the "system of systems" concept.

Douglas and Glen (2000) state that where integration of QMS and EMS has occurred in the SMEs studied, it has been based on combining similar aspects of the two standards, thus reflecting the level 2 integration suggested by Wilkinson and Dale (1999). The second level integration implies combining systems based on the identified linkages between the three standards, see Wilkinson and Dale (1999). These organisations have a considerable way to go before 'true' integration can be said to have been achieved, defined by Wilkinson and Dale (1999) as certificated and uncertificated systems integrated with the overall management system, thus resulting in a true IMS. Perhaps this is not surprising given the design of both systems standards and the demands of certification bodies regarding the auditing of the systems. The SMEs are simplifying their management systems within the constraints laid down by the standards themselves and the certification bodies. As more and more systems are introduced, whether certificated or uncertificated, their management will become more complex and so 'true' integration will become more desirable. However, such a desired state may become yet more difficult to achieve, according to Douglas and Glen (2000).

3.4 Impact and Problems of Integration

In an investigation by Schylander and Zobel (2003) aiming at analysing previous research concerning EMS implementation and environmental effects, a majority of the studies included in the analysis showed positive environmental performance. However, so far it has been difficult to substantiate such performance improvements quantitatively. Findings by Poksinska *et al.* (2003) indicate that besides improvements regarding environmental aspects, EMS also

contributed to improved stakeholder relations and marketing advantages. Published results also indicate that QMS have a positive economic impact on companies that successfully implement such systems, see Hansson (2003). A few attempts on analysing effects of IMSs have been carried out during the late 1990s and early 2000s; see e.g. Lundh (2002) and Wilkinson and Dale (1999). Their studies indicate positive performance effects of using IMSs, but also problems related to the integration process. For instance, if the IMS is not implemented and developed properly, an integrated system that simultaneously deals with both quality management issues (technical, financial and organisational aspects) and environmental issues (aspects of a conserving nature, for instance non-renewable resources and pollution), could become overly rigid and difficult to control. Besides problems related to system design and implementation, IMS also needs to address different types of organisational aspects, see e.g. Block and Marash (2002). For example, the size and maturity of an organisation affect the design of an IMS and also the implementation approach. Low degree of hierarchical levels and high degree of cross-functional activities could facilitate the integration of management systems while the opposite could impede the implementation. There is also considerable variation among companies concerning the design of their IMSs and their efforts in continuous improvement, see Axelsson *et al.* (2003). As a result, companies may be making sluggish progress but still be awarded a certificate. In the long run, this discrepancy risks to undermining the credibility of IMSs and the aim of such systems. Furthermore, Jonker and Klaver (1998) view the lack of methodology as the main reason why integration is difficult.

4. Empirical Findings

By reviewing literature the authors developed pre-understanding of the concepts at issue and derived question areas that were further investigated during the case study, see Figure 1.

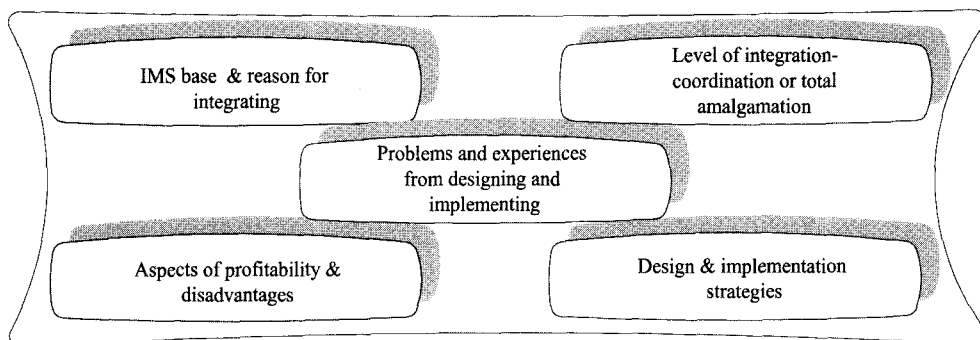


Figure 1. Question areas that constituted the foundation for the case study interviews

The findings, presented in sections 4.1 to 4.6, outline the compilation of the interviews and indicate how the case study organisation have dealt with and experienced their IMS.

4.1 Presentation of F7

The chosen organisation for serving as a case unit was F7 Sätenäs, which is an air force unit within the Swedish Armed Forces. F7 was established on the shore of Lake Vänern in July, 1940. F7 has approximately 800 employees and the primary tasks concern transportation activities, domestic and international, and educating pilots for the Gripen Aircraft. Today, F7 holds the main responsibility for the education of all Swedish Gripen Pilots. F7 also conducts training of pilots belonging to countries that have bought the Gripen Aircraft, for example Hungarian pilots. F7 has two Gripen squadrons and it is also the only Air Force Base in Sweden that operates C-130 Hercules, used for transports within the Swedish Armed Forces and for example during international aid activities.

Owing to the organisation's area of operation, e.g. air force training, airborne transports and marine operations, F7 has several stakeholders with high demands on safety, systematisation and standard compliance. F7 has, for example, clear and comprehensive directions concerning rules for military air traffic (system standard called RML, which is based on international guidelines) and information security. F7 works mainly towards two different standards; "RML" and "FMS VHL". The latter deals with quality, environmental and occupational health and safety management and is built upon the ISO 9001:2000, the criteria used in the Swedish Quality Award, and other aspects concerning, for example, environmental legislations.

F7 was chosen as a case unit due to its long-term exposure to different management systems and high, complex stakeholder requirements. This choice was considered by the authors to be a suitable source of information, concerning both design and implementation issues, along with experiences of integration problems and resistance among actors involved in the process of integration.

4.2 IMS base and Reasons for Integrating

When investigating the foundation for the IMS and the reasons the organisation set out on the integration journey, the incentives for initiating the integration process is of great interest. As the case unit is a part of a larger organisation, managed on a national level, the integration process was a response to requirements from the Headquarters of the Swedish Armed Forces. The Swedish Armed Forces has in its function as mother organisation required a systematic work aiming at developing and implementing an integrated management system. The major reason for integrating the management systems was the possibility to gain coordination benefits when conforming to the variety of system standards that the different

stakeholders require. The case unit also experienced considerable shortcomings due to sub-optimization when several processes and activities that fulfilled the same purpose were in progress. These activities included both established activities and activities required by the IMS. This phenomenon produced confusion among the IMS users.

The case unit has formally been working with developing and implementing the IMS since the year 2000. The IMS is based on system standards from the areas of quality, environment and occupational health and safety, all coordinated within the overall “FMS VHL” standard. The case unit also works with system standards that handle Information security and Economy. These parts are to be integrated in the forthcoming development of the IMS.

4.3 Level of Integration - Coordination or Total Amalgamation

The level of integration of the IMS at F7 is more characterised of a coordination approach than a total amalgamation. First of all, when looking at the organisational structures, it is obvious that the functions for the different areas in the IMS are not integrated. There are different officials for the areas of quality, environment, and occupational health and safety, although the quality manager is head of the IMS that handles all areas. The decision-making process is also integrated on an upper management level, but there exist partial preparations and decisions further down the chain of command.

Furthermore, policies for the areas included in the IMS are handled and presented separately. Looking at the routines, a two-sided picture appears. On a detailed operational level, routines are handled separately, but on management level, routines are integrated. For instance, the process of handling non-conformances and the routines dealing with auditing, are integrated.

When it comes to resource allocation, decisions of major importance are resolved on upper management level where stakeholders from each area of the IMS are present, reducing the risk of sub-optimisation and conflicts. Still, resources are distributed based on business direction and the specific goals that follow each sub-unit. These goals are to a great extent influenced by external stakeholders and different regulations.

4.4 Design and Implementation Strategies

The systematic work with a management system within the Swedish Armed Forces was initiated at the end of 1990s through a massive training program. The aim of the program was that each unit within the Swedish Armed Forces was expected to build up a quality management system. The supreme commander of the Swedish Armed Forces and the project leader executed the training program without any direct involvement of the middle management. The personnel that participated in the training built up a lot of expectations. However, the unit of F7 was not organisationally prepared for the new way of working with

quality issues, which resulted in a jittery and confusing start. Training of unit managers has thereafter been performed on a regular basis at F7. The unit managers are after the completion of the training supposed to train their personnel in the integrated management system. Depending on each unit manager, the employees have been differently involved in the work. The involvement and commitment of the top management of F7 has also shifted since the beginning, according to the respondents.

From the start of 2000, F7 has chosen to organise the management system in accordance with an integrated design. There exist eight units within F7 and each unit has one Quality Handling Officer, one Environmental Handling Officer and one Occupational Health and Safety Handling Officer. The two latter groups of Handling Officers have not been involved to the same extent as the first group. Input to the work with the integrated system came primarily from other units within the Swedish Armed Forces and from training organised by the Headquarters. However, the benchmarking activities have not been extensive. In October 2004 the integrated system at F7, with quality, environmental and occupational health and safety, was the unit certified through a revision performed by the personnel of the Headquarters from the Swedish Armed Forces.

The implementation has taken a lot of time and resources, especially in order to create awareness and to create a different culture, and the implementation of the integrated management system is still ongoing at F7, according to the respondents.

4.5 Problems and Experiences from Designing and Implementing

The great emphasis on the involvement of the employees has almost been too extensive during the implementation, according to the head of the overall management system. It was also a lot of resistance among the users at F7, who questioned the meaning and purpose of the work with the integrated management system. Especially, some users had difficulties understanding why their daily work routines should be documented. Also, there has been resistance at some subunits, mainly due to a fear for that the audits would highlight weaknesses.

According to the respondents, the employees at F7 are not fully aware that they work with an integrated management system. To use the term "integrated" is sometimes seen as too abstract. Therefore, the term has seldom been used at F7. Furthermore, the notions of "processes" and "systems" have been difficult to grasp by some IMS users.

If F7 had the opportunity to implement the integrated management system again, the leaders' involvement would have been emphasised to a larger extent, especially during the beginning of the implementation. In the case of F7, one had a combination of "top-down" and "bottom-up" approach to the implementation, but did not, according to the respondents, involve the middle management to a necessary extent.

Recommendations to other organisation also involve keeping documentation to a minimum and allowing the employees be involved, for example, during internal revisions. Furthermore,

the respondents recommended not performing actions that one cannot go through with. For example, the organisation mapped their processes at an early stage of the implementation, but did not follow-up and use the process maps. Also, the respondents recommend that one should look upon the standards as a “Checklist”. They suggest that one should try to adjust the management system one already has to fit with the standard, instead of building a new structure and content that does not concur with how the organisation actually works. The focus should be on refining the management system at different levels of the organisation.

4.6 Aspects of Profitability and Disadvantages

One advantage with the integrated management system at F7 is that the systematic work with quality has also strengthened the work with environmental and occupational health and safety, according to the administrator of the overall management system. It is difficult to measure exactly what this work has resulted in, but it is likely that the cost of poor quality has decreased. This is believed to be due to improved communication. One reason for the improved communication is that different personnel now represent the three areas of the integrated management system during the forums connected to the management processes. The head of the management system also believes that some resources are saved thanks to the integrated management system. Other positive results are less duplication, consensus, a larger focus on deviations, an increased understanding of the different areas and a better holistic view.

The main disadvantage of the integrated management system is the large amount of documentation and all cross-references in the integrated management system. This results in the fact that the users experience the system difficult to overview and explore. However, the respondents believe that their integrated management system, in total, results in less documentation than “stand - alone” systems. Today, there is still some resistance to the integrated management system, even if a more positive culture to the system can be noticed. One cause of this resistance could be that some employees believe that this kind of work does not fit F7. Especially, the notions of and connection between “customers” and “suppliers” are difficult to comprehend since F7 is a tax-financed organisation with sometimes vague customer definitions. When the employees have had difficulties to apprehend these notions and their content, the employees have already created an obstacle to work with them. However, through training this obstacle has been reduced.

5. Final Conclusion and Discussion

The interest of using integrated management systems is growing among organisations mainly due to increased external demands and increased exposure to different system standards. This paper set out to investigate problems related to the integration of manage-

ment systems along with presenting recommendations for succeeding with integration and thereby contribute to the understanding of IMSs designs and implementation.

The findings cover both theoretical and practical perspectives and indicate that the IMS approach is needed for organisations operating within a context of exposure to multiple management system standards and stakeholder requirements.

5.1 Challenges of the IMS Approach

When it comes to the problems related to the integration of management systems, both theory and case study findings indicate that there are several potential pitfalls. Increased system documentation and bureaucracy was perceived as problematic among the users at F7. Even if the total amount of documentation decreases by reduced overlaps and sub-optimisation, users are required to utilize the 'total system' when, for example, addressing a quality issue, and therefore experience the IMS as more rigid. In this specific case, the computer based IMS has been perceived as problematic to use, mainly due to comprehensive documentation and complex cross-references.

Furthermore, as emphasised by Block and Marash (2002), complex hierarchical structures tend to abate optimistic attitudes towards the IMS construction and implementation. A plausible statement since the high hierarchical level at F7 influenced the results, where the 'uninvited' middle managers inhibited parts of the creativity among the bottom-line personnel. By improved involvement of middle management at F7, the design and implementation of the IMS would have been facilitated.

The usage of terms and concepts related to the integration were shown to have impact on the success. Many employees were unaware of the meaning of 'integration' and also to other concepts in close connection to the area of management systems, e.g. 'processes'. Based on these results, the findings by Wilkinson and Dale (1999) regarding an urgent need for definitions obviously still seem to be well-founded.

5.2 Opportunities and Tangible Benefits

As the preceding theoretical discussion has shown, see e.g. Wilkinson and Dale (1999), the usage of management systems could positively affect the organisational performance. At F7, the environmental- and occupational health & safety area, was strengthened by a systematic quality development work. The IMS also were perceived to positively affect the communication as well as reducing the cost of poor quality.

As the IMS were perceived to improve communication, an enhanced understanding of the areas included in the IMS followed, along with an improved holistic view. The issue of decreased sub-optimisation and increased focus on improvement areas also point in the direction of IMS advantages.

5.3 IMS Design and Recommendations

From the preceding discussion it seems obvious that organisations adopting an IMS are facing a challenge with both great potential and possible pitfalls. An essential concern is to elucidate what the term ‘integration’ should imply within the context of the organisation and of equal importance, the degree of integration that is sought. One interpretation of the theoretical and empirical investigation would be that several factors influence the choice of ‘integration level’;

- **organisational characteristics**, such as, *organisational size, hierarchical structure, maturity concerning IMS constituents and prevailing cultural aspects, e.g. willingness to continuously improve and management involvement,*
- **organisation’s context**, such as, *number of stakeholders and stakeholder requirements regarding compliance to system standards, and business norms concerning, e.g. aspects of quality and environment,*
- **number-and maturity of existing management systems**

The empirical investigation revealed that F7 had used the ISO 9001:2000 structure when designing their IMS. That is in line with recommendations from earlier research pointing towards using the QMS as point of departure when designing and implementing an IMS; see e.g. Block and Marash (2002) and the level 1 approach suggested by Karapetrovic and Willborn (1998). However, in the case of F7, the actual approach was more of a combination of level 1 and level 3.

With that as a basis, we present an overarching model for the development and systematic improvement of an IMS, with the ISO 9001:2000 process model as a foundation, see Figure 2.

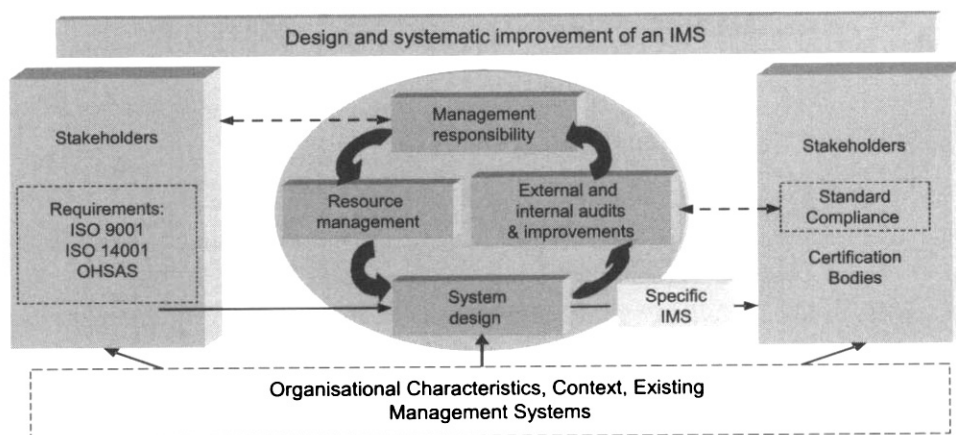


Figure 2. Process model for the design and systematic improvement of an IMS, based on stakeholder demands and the succeeding requirements set by the certification bodies

Irrespective of which and how many management system standards the organisation apply to, the process model stress the necessity to employ stakeholder requirements and to consider prevailing business norms when designing an IMS. The importance of taking organisational characteristics into account during the development of the IMS could not be sufficiently stressed, and is considered as a prerequisite for successful design and deployment.

This study reveals that the design and usage of an IMS could prove both challenging and beneficial for an organisation, and especially suitable when exposed to a variety of management system standards. The authors believe that a further scrutiny of how specific organisational characteristics affect the design and implementation phase is of major significance for the area of IMSs.

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References

1. Axelsson, U., Almgren, R., and Hjelm, O.(2003), *Effektivare miljöledningssystem. En studie om brister, behov och möjligheter till förbättring [More efficient environmental management systems. A study of deficiencies, needs and opportunities for improvements]*. Stockholm, Naturvårdsverket (In Swedish).
 2. Berg, H. P., Beckmerhagen, I. A., Karapetrovic, S. V., and Willborn, W. O.(2003), "Integration of management systems. Focus on safety in the nuclear industry," *International Journal of Quality & Reliability Management*, Vol. 20, No. 2, pp. 210-228.
 3. Block, M. R. and Marash, I. R.(2002), *Integrating ISO 14001 into a quality management system*, Milwaukee, ASQ Quality Press.
 4. Denzin, N. K. and Lincoln, Y. S.(2000), *Introduction. The discipline and practice of qualitative research*, Thousand Oaks, California, Sage Publications.
 5. Douglas, A. and Glen, D.(2000), "Integrated management systems in small and medium enterprises," *Total Quality Management*, Vol. 11, No. 4/5&6, pp. 686-690.
 6. Gummesson, E.(2000), *Qualitative methods in management research*, Thousand Oaks, California, Sage Corporation.
 7. Hansson, J.(2003), *Total Quality Management. Aspects of implementation and performance. Investigations with a focus on small organisations*, Doctoral Thesis. Luleå, Division of
-

- Quality & Environmental Management. Luleå University of Technology.
8. Hillary, R.(1997), *Environmental management systems and cleaner production*, Chichester, Wiley Corporation.
 9. Jonker, J. and Klaver, J.(1998), “Integration. A methodological perspective,” *Quality World*, Vol. 24, No. 8, pp. 1-24.
 10. Karapetrovic, S.(2003), “Musings on integrated management systems,” *Measuring Business Excellence*, Vol. 7, No. 1, pp. 4-13.
 11. Karapetrovic, S. and Willborn, W.(1998), “Integrated audit of management systems,” *International Journal of Quality & Reliability Management*, Vol. 15, No. 7, pp. 694-711.
 12. Korhonen, J.(2003), “Should we measure corporate social responsibility,” *Corporate Social Responsibility and Environmental Management*, Vol. 10, pp. 25-39.
 13. Lundh, J.(2002), *Trippelintegrerade ledningssystem. Samordning av ledningssystem för kvalitet, arbetsmiljö och miljö*, Master thesis. Luleå, Sweden, Luleå University of Technology (In Swedish).
 14. MacGregorAssociates(1996), *Study on management systems standards*, London, British Standards Institution.
 15. McNiff, J.(1995), *Action research. Principles and practice*, London, Routledge.
 16. Miles, M. P. and Russel, G. R.(1997), “ISO 14000 Total Quality Environmental Management. The integration of environmental marketing, Total Quality Management, and corporate environmental policy,” *Journal of Quality Management*, Vol. 2, No. 1.
 17. Ofori, G., Gang, G., and Briffett, C.(2002), “Implementing environmental management systems in construction: lessons from quality systems,” *Building and Environment*, Vol. 37, No. 12, pp. 1397-1407.
 18. Poksinska, B., Dahlgaard, J. J., and Eklund, J.(2003), “Implementing ISO 14000 in Sweden: motives, benefits and comparisons with ISO 9000,” *International Journal of Quality & Reliability Management*, Vol. 20, No. 5, pp. 585-606.
 19. Schylander, E. and Zobel, T.(2003), *Environmental effects of EMS, Evaluation of the evidence*. Vienna, Austria.
 20. Wilkinson, G. and Dale, B. G.(1999), “Integrated management systems: an examination of the concept and theory,” *The TQM Magazine*, Vol. 11, No. 2. pp. 95-104.
 21. Yin, R. K.(1994), *Case study research. Design and methods*, Thousand Oaks, California, Sage Publications.
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