

DESIGN OF INTEGRATED MANAGEMENT SYSTEMS ACCORDING TO THE REVISED ISO STANDARDS

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Abstract: An implementation of international standards in the management systems of organizations is increasingly promoted in non-regulated sector in globalized markets. Authors of the paper present the partial results of the research in the area of projecting and implementation of integrated management systems according to international standards ISO 9001, ISO 14001, OHSAS 18001, ISO 27001 etc. Based on an analysis of the latest standards for management sub-systems with HLS structure implementation, an innovative concept of model for an implementation and maintaining of integrated management systems is introduced. The proposed process algorithm on Deming's PDCA cycle of the implementation is applicable to any type of organization and economic sector according to the NACE codes and with the respect to newly adopted requirements of ISO standards, e.g. documented information on IMS.

Key words: management system, integration, standardization, algorithm of implementation, designing IMS, HLS structure

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Introduction

Quality of products in globalized markets is, in the aggregate, examined by customer loyalty. Acquiring the certificate according to the ISO standards presents an assessed quality and safe selection because of globally accepted quality standards adhered in it. Certification of specific management system according to the ISO standards will "mark the quality" outwards and at the same time it will improve internal operation of the organization, its processes will be more effective and efficient, level of responsibility and competence will be formalized, procedures will be more exact and clear thanks to managed documentation. Certificate of functional management system helps organizations compete for contracts in globalized markets. Often, it is a requirement also from potential foreign customers and it is a guarantee that the contractor is responsible partner supplying quality products (Majerník et al., 2016a). With the proliferation of standards (ISO 9001, ISO 14001, OHSAS 18001, ISO 27001 etc.) of management systems for organizations, the question has raised whether they should be implemented

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individually or integrated, for the purpose of synergy effects. The International Organization ISO issued the ISO Guide 83 as the Annex SL, according to which all newly adopted or revised international standards will have a uniform High Level-Structure (HLS) (Majerník et al., 2016b). In 2013, ISO 27001: 2013 was issued with HLS structure, as well as ISO 9001 in 2015 and ISO 14001, ISO 45001 (OHSAS 18001) at the turn of 2016/2017. Following these activities, there is a research work on a concept of model for standardization and implementation of integrated management systems (IMS).

A New Structuring of ISO Standards for an Implementation of Management Systems

The International Organization for Standardization ISO reviews standards of quality management systems, environmental management, health and safety, risks, etc., periodically in order to ensure their stable and effective applicability in a changing globalized environment, as well as their relevance (Železnik and Paulíková, 2011). It developed also the ISO Guide 83 which was adopted and issued as the Annex SL - Proposals for management system standards (ISO/IEC 2012). The reason for the issuing the Annex SL was an effort to formalize and unify all management system standards by providing a uniform structure of standard (Bernardo et al. 2009). All proposed standards of management systems and their justification study have to be identified by the corresponding Technical Committee (TC)/Project committee (PC) and sent to ISO Technical Management Board (ISO/TMB) for assessment before voting of New Work Item Proposal (NWIP) is carried out (Hillary, 2004). An output from the work of ISO/TMB Joint Technical Coordination Group on Management System Standard (ISO/ TMB/ JTCG) has to have the identical names of chapters, the identical text and the general terms and the basic definitions. All newly adopted projects have to pass a precedent study. Questions for the criteria set out in the Appendix 1 of the Annex SL are based on the following principles:

- 1) Relevance for the market – a standard of management system has to meet requirements of primary users and other active parties and bring added value to primary users and to other active parties.
- 2) Compatibility – compatibility have to be adhered between different standards and management systems and within the family of standard of the management system.
- 3) Covering topics – a standard of management system have to have adequate coverage application to eliminate or to minimize a need for sector-specific changes.
- 4) Flexibility – a standard of management system have to be applicable to organizations in all important sectors, cultures and sizes.
- 5) Free trade – a standard of management system have to enable the free trade of goods and services.

- 6) An application of conformity assessment is essential.
- 7) Exclusions – a standard of management system should not include directly related product specifications, test methods, the level of implementation and other forms of standardization.
- 8) Easy to use – a management system standard should ensure that a user can implement easily one or integrally more management systems standards.

According to the Annex SL, all international standards of management systems have the same structure, in the form of 10 chapters:

- | | |
|-----------------------------------|------------------------------|
| 1. Scope (Object of the standard) | 6. Planning |
| 2. Normative references | 7. Support |
| 3. Terms and definitions | 8. Operation |
| 4. Context of the organization | 9. Assessment of performance |
| 5. Management | 10. Improving |

The HLS structure may contribute to integration of management systems and standardization of process of implementation of integrated management systems in business practice significantly in the future. It continues to be based methodically on Deming's PDCA cycle where P – plan is represented by the chapters 4, 5, 6, 7, D – do is represented by the chapter 8, C – check is represented by the chapter 9 and A – act is the chapter 10 of new standards with the HLS structure.

Risk Management according to the ISO 31000 will play a key role in the application of new standards (ISO 9001: 2015, ISO 14001: 2015, ISO 27001: 2013, ISO 45000: 2016/2017) in building IMS.

Methodical Procedure of Implementation of IMS and its Maintaining in Organizations after the Issuing the HLS Standards

The decision of the top management of the organization to implement IMS (e.g. QMS U EMS U HSMS U ISMS) is followed by the basic stages showed in Figure1:

Stage 1: An initial analysis of the current state of the management of the organization - at this stage, an analytical report will be elaborated by which the current status will be identified. There will be identified which management systems according to the original standards have been already implemented or what the requirements of the ISO 9001, ISO 14001, ISO 45001 (formerly OHSAS 18001), ISO 27001 have already been met. If there are implemented and well maintained systems, it will facilitate the implementation of innovative integrated management system because the processes have already been identified and described (process map), responsibilities and competences were determined, procedures were documented which will be appended and adjusted under the requirements of new standards in HLS structure (Kausek, 2007).

Stage 2: Designing IMS (draft) – a draft (project) of IMS and a timetable for its implementation will be elaborated.

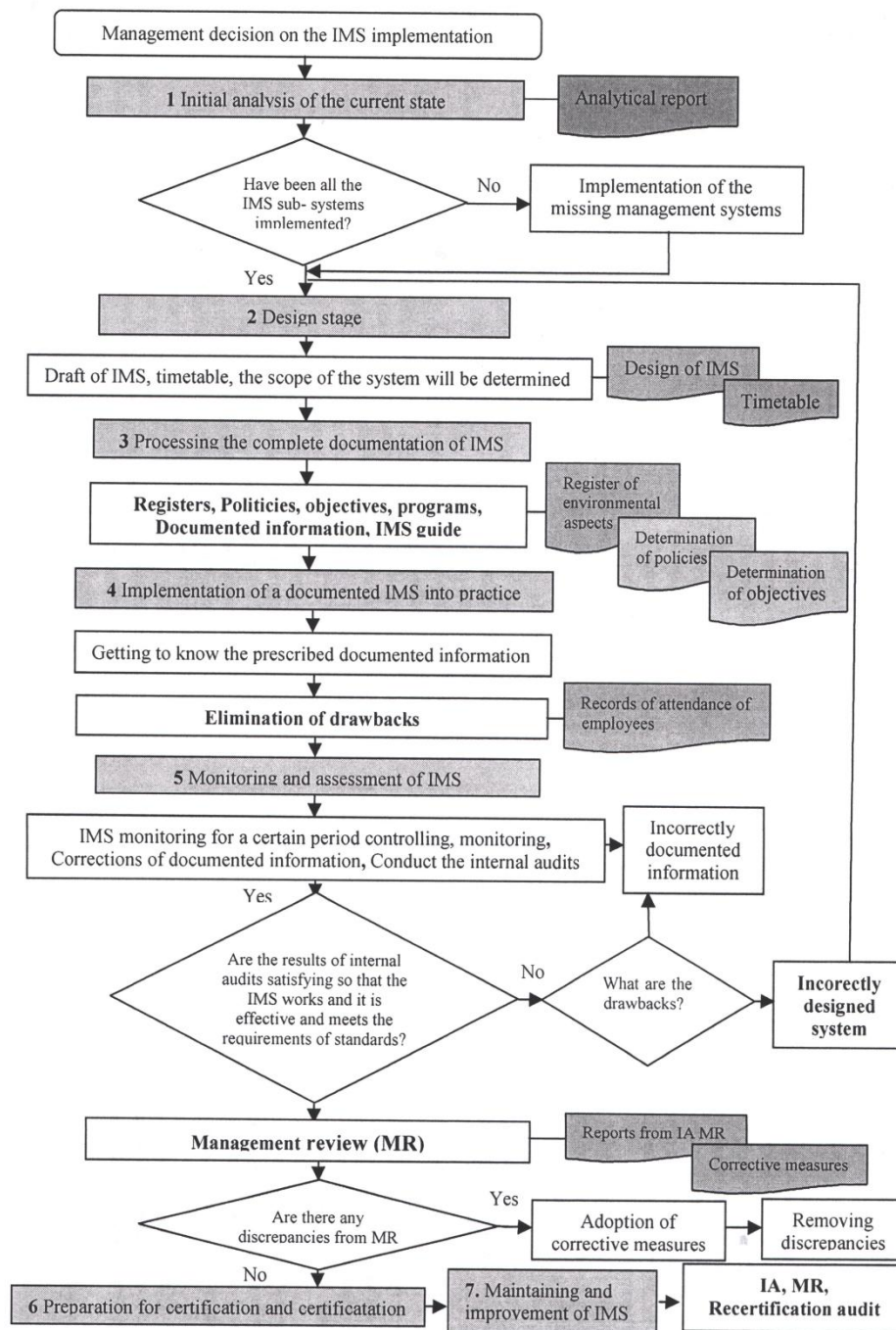


Figure 1. Algorithm of IMS implementation according to the standard with HLS structure in Deming cycle P-D-C-A

Stage 3: Elaborating complex managed documentation of IMS - The declaration of top management on improving the organization and its performance in selected areas through the implementation and maintaining of an adequate management system according to the standards and the relevant documentation.

Documentation:

- A register of legislation regarding QMS + EMS + HSMS + ISMS will be elaborated, register of environmental aspects in EMS, analysis of security risks in HSMS, and risk and assets in ISMS.
- Policies and objectives of the QMS + EMS + HSMS-ISMS will be determined, as a part of an integrated strategy.
- A new or appended documentation will be elaborated – the documented information required by individual standards (ISO 9001, ISO 14001, ISO 45001, ISO 27001).
- An integrated guide of QMS U EMS U HSMS U ISMS will be elaborated that is not required in new standards but it is appropriate to elaborate it in terms of functional clarity of the integrated management system.

The documentation should be elaborated with respect to the size of the organization, complexity of its processes, technological documentation and other specific aspects.

Stage 4: Implementation of documented IMS in practice - becoming familiar with the documentation, implementation of the content of directives, commands, procedures and elimination of discrepancies and shortcomings:

- The documentation is implemented gradually into practice.
- The employees are becoming familiar with it.

Stage 5: Monitoring and assessment of improvement within the IMS - planned internal audits will be carried out, non-compliance and discrepancies will be eliminated, corrective and preventive measures will be taken:

- The implemented IMS (QMS U EMS U HSMS U ISMS) is monitored periodically.
- Internal process audits are carried out.
- If necessary, corrections in integrated manual and documentation are made.

Stage 6: Preparation for certification audit and certification by an accredited certification body (Chovancova et al., 2010):

- Before the certification, an internal system pre-audit is carried out in order to control the integrated system before the certification audit and to eliminate any non-compliance and discrepancies.
- The certification audit is carried out.
- The certification body will issue a certificate for a functioning integrated management system of the organization.

Stage 7: Maintaining and continuous improvement of the certified IMS – it is conducted in an internal way – by self-assessment, internal audits, management

review, as well as in an external way – surveillance audit by the certification body, civil service and local government.

- A surveillance audit by the certification body is carried out usually on an annual basis.
- After three years, a recertification audit of IMS (QMS U EMS U HSMS U ISMS) is carried out.
- Continuous improvement of implemented IMS.

A Concept of Model for the IMS Implementation in Business Practice

To categorize data relating to business entities engaged in an economic activity, a statistical classification of economic activities according to the NACE codes has been elaborated. An economic activity means a production of goods or providing services whilst using the means of production, labour, manufacturing techniques, intermediate products. This classification is used by all the states of the European Union with the purpose of obtaining relevant statistical data. It is a single system that enables statistical comparison of data within the European Union (Janekova et al., 2016). The classification codes according to NACE includes categories for different types of statistical units, the unit can perform several economic activities. The classification of business entities is carried out regardless of type of ownership, way of production, execution venues, whether it is an official or unofficial product, or whether they are market or non-market activities.

The Documented Information on IMS According to the Newly Adopted Standards

An organization has to elaborate the following documented information for the Quality Management System implemented according to the ISO 9001: 2015 mainly (Kleinová, 2013): The scope of the quality management system, Quality policy, Quality objectives, Monitoring and measurement, Knowledge, Evidence of competences, Planning and operation management, Quality Plan (Planning of operation), Assessment of suppliers, Management of external procurement of goods and services, Production of goods and providing services, Distribution of goods and services, Management of noncomplying goods and services, Records of monitoring and measurement, Evidence of audit programs and audit results, Records of management review, Evidence of nature of noncompliance and subsequent actions, Records of corrective action. An organization has to elaborate the following documented information for the Environmental Management System implemented according to the ISO 14001: 2015:

- Scope of Environmental Management System,
- Environmental policy,
- Environmental aspects,
- Environmental objectives,
- Records of competences,

- Records of internal communication.
- Records of external communication.
- Other documented information determined by the organization as necessary for the EMS efficiency.
- Records of results of operational management.
- An emergency plan.
- Records of monitoring and measurement.
- Records of compliance assessment.
- Records of audit program and audit results.
- Records of management review.
- Records of nature of non-compliances and any subsequent actions.
- Records of corrective action.

An organization has to elaborate the following documented information for Information Security Management System implemented according to the ISO 27001: 2013:

- Scope of Information Security Management System.
- Information security policy.
- A process of risk assessment of information security.
- A process of utilising information security risks.
- Declaration of applicability.
- Objectives of information security.
- Evidence of competences.
- Other documented information determined by the organization as necessary for the ISMS efficiency.
- Operational planning and management.
- Risk assessment results of information security.
- Results of utilising information security risks.
- Records of monitoring and measurement.
- Records of audit programs and audit results.
- Records of management review.
- Evidence of nature of noncompliance and subsequent actions.
- Records of corrective action.

An organization has to elaborate the following documented information for OHS Management System implemented according to the ISO 45001:2017 (Antaris, 2016; Matias and Coelho, 2004):

- Scope of System of occupational health and safety.
- OHS Policy.
- Evidence of audit programs and audit results.
- Records of management review.
- Evidence of nature of noncompliance and subsequent actions.
- Records of corrective action.

Conclusion

As a part of our research, the analyses and comparison of similarities and differences of significant elements of the ISO standards were carried. Based on these analyses we can confirm the hypothesis that issued and forthcoming revisions of these standards facilitate the implementation of sub-systems of integrated management systems. A concept of innovative model for the implementation and maintaining various-designed integrated management systems for organizations regardless of their size and field of economic activity has been designed by synthesis of the results of the analyses. Hither-to published studies in this area are more oriented towards the separate implementation of particular standards, not revised and as a part of an integrated system. The outcomes can be used also in separately implemented management systems, in the transition of organization to new revisions of the standards. Organizations may revise its initial managed documentation in a form of documented information under new requirements of the ISO 9001, ISO 14001, ISO 45001, ISO 27001 thorough analyzing and comparing the differences and common significant features of the revised standards and propose IMS with more significant practical benefits for the organization. The output of our research is a practical guide for building IMS according to revised ISO standard.

The authors of the paper identify and formalize mandatory and strictly prescribed documented information for each management system which may consist of the operation procedures or records only. Generalized outputs of presented solution can also be practically utilized in implementing changes in management systems of the organization in a compulsory transition to the newly revised standards in the context of re-certification or surveillance audit by accredited certification body.

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MODEL ZINTEGROWANYCH SYSTEMÓW ZARZĄDZANIA WEDŁUG ZMIENIONYCH STANDARDÓW ISO

Streszczenie: Wdrożenie międzynarodowych standardów w zakresie systemów zarządzania organizacji jest coraz częściej promowane w nieregulowanym sektorze w zglobalizowanych rynkach. Autorzy niniejszego artykułu przedstawiają częściowe wyniki badań w zakresie projektowania i wdrażania zintegrowanych systemów zarządzania zgodnie z międzynarodowymi normami ISO 9001, ISO 14001, OHSAS 18001, ISO 27001 itd. W oparciu o analizę najnowszych standardów dla podsystemów zarządzania z wdrożeniem struktury HLS, wprowadzono innowacyjną koncepcję modelu wdrożenia i utrzymania zintegrowanych systemów zarządzania. Proponowany algorytm procesu w cyklu wdrażania PDCA Deminga, który uwzględnia nowo przyjęte wymagania norm ISO, np. udokumentowane informacje o IMS, ma zastosowanie do każdego rodzaju organizacji i sektora gospodarki według kodów NACE.

Słowa kluczowe: system zarządzania, integracja, standaryzacja, algorytm implementacji, projektowanie IMS, struktura HLS

集成管理系統根據ISO標準修訂設計

摘要：在全球化市場的非監管部門，組織管理體系中國際標準的實施越來越多。本文作者根據國際標準ISO 9001, ISO 14001, OHSAS 18001, ISO 27001等標準，提出了綜合管理系統預測和實施領域研究的部分成果。基於對HLS結構實施管理子系統的最新標準的分析，介紹了實施和維護綜合管理系統的創新概念模型。關於戴明PDCA循環實施的擬議過程算法適用於任何類型的組織和經濟部門，根據NACE規範，以及關於新採用的ISO標準要求，例如。有關IMS的文件資料。

關鍵詞：管理系統，集成，標準化，實現算法，設計IMS，HLS結構