

ACCOUNTING DRIVEN STRATEGIC INTEGRATION OF QUALITY MANAGEMENT SYSTEMS IN DIGITAL ENTERPRISES: A SYSTEMATIC APPROACH

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ABSTRACT

This paper explores approaches to designing integrated management systems (IMS) for digital enterprises. It is based on methodologies for designing corporate information systems, enterprise architectures, system analysis, system and process modelling, and a systems approach that integrates various standards.

INTRODUCTION

The rapid advancement of new equipment and technologies, particularly in information systems and technology, robotics, communication, and information processing, has facilitated their rapid implementation across various sectors, such as state administration, industrial production, transport, construction, and services. This transition has ushered in a new industrial era called 'Industry 4.0'. Consequently, it has significantly altered enterprises' organizational structure, management bodies, business processes, and approaches to quality management.

Adopting risk-oriented thinking and security standards, as stipulated in the ISO 9000 series, necessitates reassessing the implementation and integration of other standards into integrated management systems (IMS). One crucial aspect in this realm is ensuring information security and managing risks, particularly those associated with IT services. Furthermore, the standards structure has evolved to resemble libraries of best practices drawn from leading enterprises' experiences, covering various management areas.

When creating an IMS, consideration must also be given to certification processes. Apart from certification for compliance with specific standards, other types of certifications, such as maturity level certification, must also be addressed. Therefore, methods for designing integrated quality management systems, or IMS, require re-evaluation and development.

An IMS is a collection of two or more management systems functioning as a single entity.

In today's economic landscape, enterprise development strategies should prioritize enhancing product quality and competitiveness through modern concepts, methods, and approaches that amalgamate global experiences. International standards have been developed and adopted for numerous management issues, covering product quality, economy, environmental protection, social policy, health, industrial safety, information security, and food safety. Many

industrialized nations have embraced a new phase of enterprise development to address these concerns, which the establishment of IMS has marked. These IMS are based on various management systems, including Quality Management Systems (QMS) - ISO 9000, Environmental Management Systems (EMS) - ISO 14000, Occupational Health and Safety Management Systems - OHSAS 18001, SA 8000, ISO 27000, ISO 22000:2005, ISO 20225, and others.

Since these systems function as an integrated whole, a competitive enterprise's overall corporate management system should integrate all management systems applied within the organization. Integrating management systems, spanning quality, ecology, safety, social responsibility, food safety, etc., in compliance with international standards is essential for an organization's sustainable development.

FORMULATION OF THE PROBLEM

Further development is necessary for the formation of integrated management systems at enterprises. In addition to quality management standards, other standards, particularly those tailored to specific industries, must also be integrated.

Integrated Quality Management System (IQMS) creation stages are well-established and remain primarily consistent across authors. However, this approach must address critical questions: What data is involved? How are functions performed? Where are operations located? Who are the stakeholders? When does action take place? Why is action necessary? What rules govern operations? Who oversees operations and how?

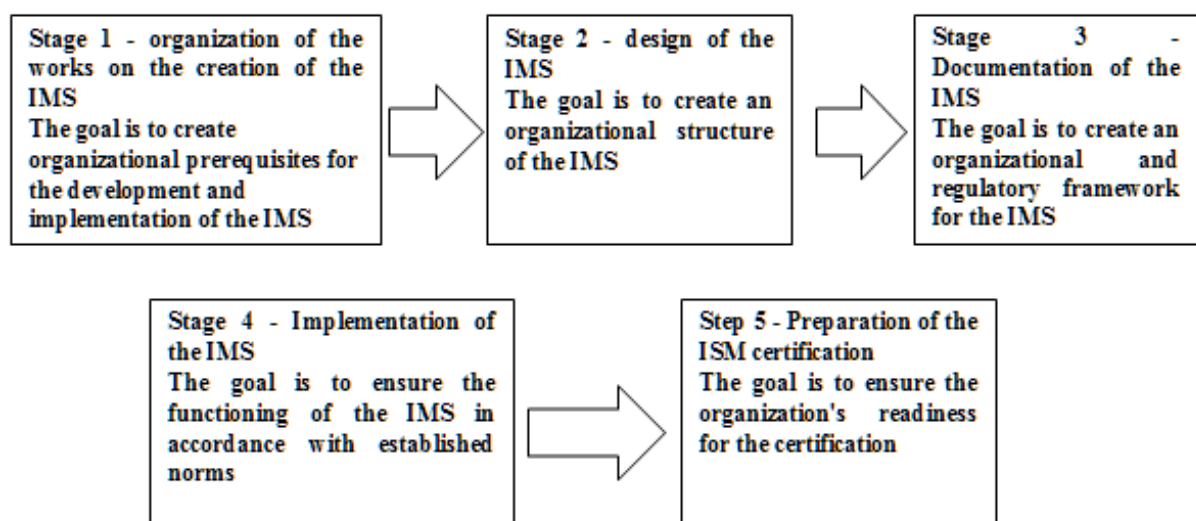


Fig 1 Illustrates the stages involved in the creation of Integrated Quality Management Systems (IQMS).

The choice of international management standards used in IMS design depends on the organization's goals, objectives, and sectoral focus. IMS implementation can follow two approaches: (1) Adding Environmental Management Systems (EMS) and Occupational Health and Safety Management Systems (OHSMS), based on ISO 14000 and OHSAS 18000, respectively, to Quality Management Systems (QMS) based on ISO 9000, or (2) Simultaneously integrating all management systems into a single complex, referred to as fully integrated models.

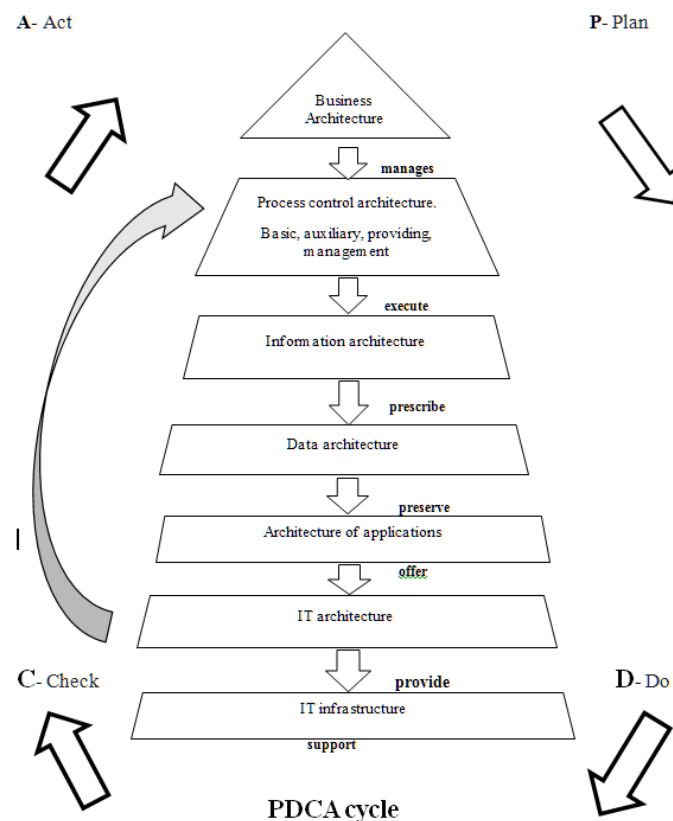


Fig. 2. Stages of the Enterprise Architecture Designing

Many enterprises are adopting project management as part of their efforts to enhance efficiency. Project management, encapsulated in the Project Management Body of Knowledge (PMBOK), is a critical element of modern management systems. The project approach enables creating a qualified team responsible for IMS functioning. The IMS is the foundation for sustainable enterprise development and is more complex than individual management systems integrated within it.

Creating an IMS for a digital enterprise can follow steps similar to those used in establishing a QMS by ISO 9000 series requirements. Organizational objectives and sectoral focus influence the selection of international management standards for IMS design. An updated enterprise architecture model can be a starting point for IMS construction.

The Integrated Systems Management (ISM) design for a digital enterprise must be approached from the perspective of enterprise architecture. The company's architecture delineates its operations from two primary angles:

1. **Business Architecture:** This facet describes the enterprise using logical elements such as interacting business processes, rules, required information, structure, and information flows.
2. **Information Technology Architecture:** This aspect views the enterprise from a technical standpoint, including hardware, software, and security components.

The enterprise architecture aligns information technologies with the enterprise's business needs, strategic planning processes, applied information systems, and supporting processes. Additionally, it encompasses other areas such as labour safety, ecology, risk management, and information security, depending on organizational objectives.

Strategic goals and objectives shape the enterprise's development directions and long-term targets. In formulating these strategic objectives, the impact of information technologies on modern enterprise structures is considered, leading to the modernization of IT development strategies.

The business architecture outlines the organizational structure of the enterprise, linked to its mission, strategy, and business objectives. It defines business processes, information flows, material flows, and organizational structure, reflecting the enterprise's industry and production orientation.

Process architecture, or the system of organizational processes, forms the basis for systematically implementing the process approach. Information architecture describes the enterprise's information model, including databases, data warehouses, and information flows. Data architecture governs data collection, storage, integration, and usage in data systems.

Application architecture encompasses identifying, designing, developing, and integrating application systems necessary for executing business processes. The IT architecture ensures the effective functioning of business processes through technical and technological solutions aligned with business architecture concepts.

Risk architecture identifies and manages organizational risks, while information security architecture defines processes, roles, technologies, and information types related to security.

In designing ISM, the process architecture and business processes are crucial. Through process modelling and decomposition, essential information for developing a digital enterprise and creating ISM is obtained.

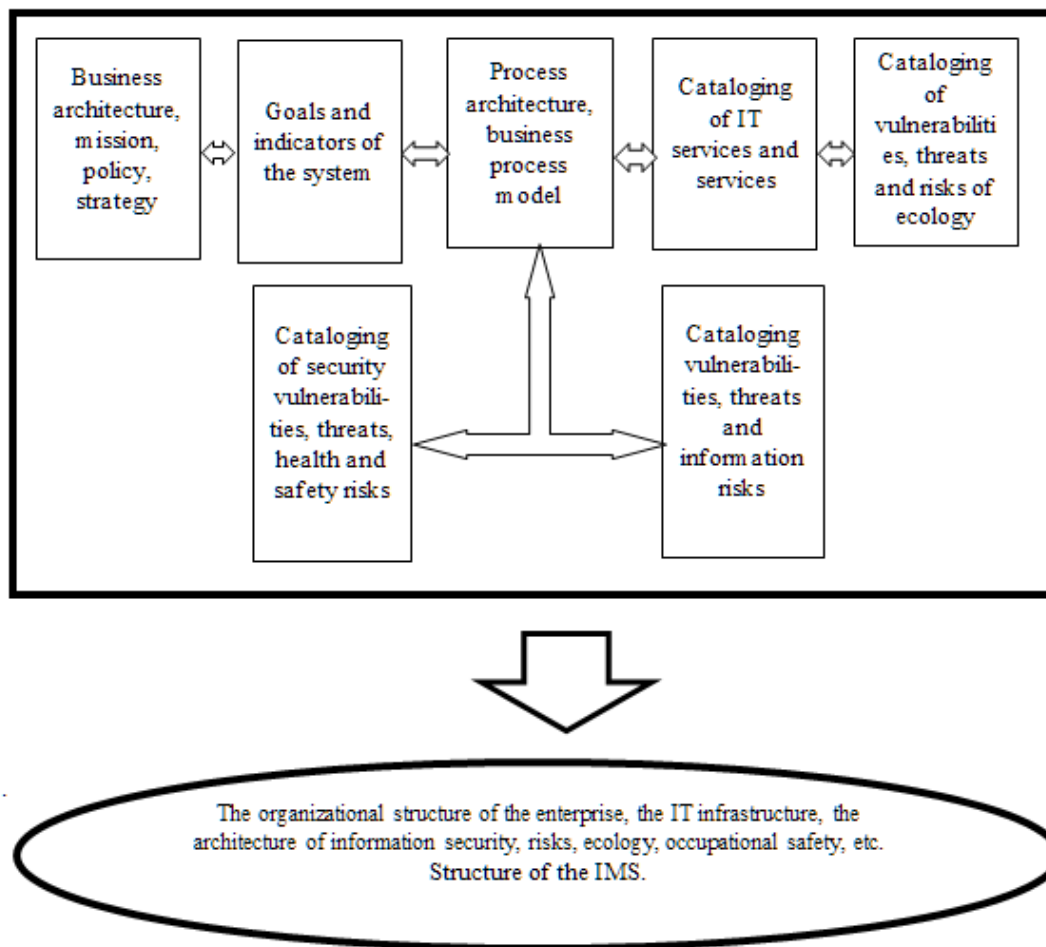


Fig. 3. Enterprise Design Stages

The systemic approach to ISM design involves creating a project team comprising quality management specialists, business analysts, financial analysts, solution architects, system architects, IT managers, information system managers, information security managers, risk managers, and ecology and occupational safety specialists.

Designing a control system involves:

- Formulating the organization's highest goals and mission.
- Developing policies and strategies.
- Defining management objects.
- Developing business process models.
- Designing the organizational structure.
- Formulating regulatory documentation.
- Building automation control systems.
- Preparing for certification.

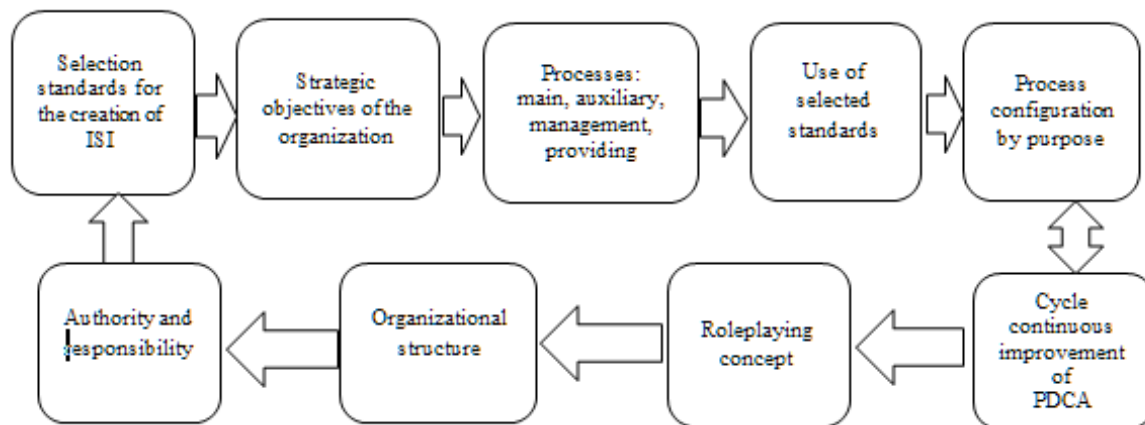


Fig. 4. System approach to the design of the IMS

CONCLUSION

In conclusion, designing ISM for a digital enterprise requires integrating information systems and technologies while considering standards and methodologies. The widespread use of information systems and technologies underscores the importance of a systemic approach, incorporating design methodologies, enterprise architectures, system analysis, and quality management tools.

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