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A systematic mapping study of standards and frameworks for information management in the digital era

Gunnar Auth, Department of Digital Administration, HSF Meissen University of Applied Sciences, Germany, gunnar.auth@hsf-meissen.de

Oliver Jokisch, Department of Digital Administration, HSF Meissen University of Applied Sciences, Germany, oliver.jokisch@hsf-meissen.de

Abstract

The close links of Information Management (IM) and Information Technology (IT) create an evolving environment of tasks and processes. Management standards are normative descriptions of an agreed-upon set of management tasks and suggested ways of task execution. Certain standards like ITIL and COBIT (both used as a brand only by the owners, Axelos and ISACA respectively) have been popular for a long time in sub-areas of IM including IT governance, IT service management, or IT project management. Driven by digitalization, the number and update frequency of IM-related standards have significantly increased recently, making standard selection and implementation more difficult. This study presents a systematic mapping of the current state of IM standardization with respect to standardization bodies, types of standards, and certifications. Visual maps provide an overview of the IM standard landscape and reveal relevant topics and other categories. The article identifies the most relevant standardization bodies, standard types, and topics of the IM domain based on a full set of 109 IM standards. As a mapping outcome, the correlations of standardization bodies versus standard types, and of the topics versus IM task areas are clearly arranged in diagrams.

Keywords: Management standards, professional standards, certification, information management, systematic mapping.

Introduction

Information Management (IM) as a business function and management discipline comprises a large and manifold area of tasks for maximizing the value contribution of information to organizational success (Galliers et al., 2020; Porter & Millar, 1985). The close relationship between IM and Information Technology (IT) constitutes the dynamic nature of IM tasks and processes which is reflecting the rapid development and spread of IT innovations. As IT has evolved into digital technology, a discussion on the relationship between IM and digitalization started that is still ongoing (Riedl et al., 2017).

Management Standards (MS) are normative descriptions of an agreed-upon set of management tasks and the best way of task execution supposed to serve as a reference for practical use. MS has been popular for quite some time for several sub-areas of IM including IT governance (e.g., COBIT, originally an acronym for Control Objectives for Information and Related Technologies, since 2012 used as a brand only by the owner ISACA), IT Service Management (ITSM, e.g., ITIL,

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originally an acronym for IT Infrastructure Library, since 2014 used as a brand only by the owner Axelos) or IT project management (e.g., PRINCE2).

In a previous study (Auth, 2021), it was demonstrated that both the number and the update frequency of IT Management (ITM) standards have recently increased significantly from 12 standards in 2000 to 60 standards in 2020. Based on the former results, this article aims at exploring and structuring both published and forthcoming standards for the broader scope of IM. In contrast to the first study, we used systematic mapping as a research method. While systematic mapping is often described as a method for literature analysis (Felderer & Carver, 2017; Petersen et al., 2015), we found it suitable also for analyzing codified management standards published as documents.

This article is structured as follows: the next section provides background on management standards and IM. The following section introduces systematic mapping as our research method and describes how we applied it. Next, our results are presents as visual maps in bar and bubble diagrams, gives interpretations and draws implications. This paper ends with a conclusion and a brief outlook on future research.

Theoretical Background and Related Work

While technical standards are vital for the interoperability of technical systems, we investigate organizational standards for the interoperability and improvement of management systems in the scope of IM. This organizational perspective on standards is supported by the theory of Business Process Management (BPM) (Dumas et al., 2018) and especially business process standardization (Tregear, 2015). When looking at known management standards, it becomes obvious that no common terminology exists. The term standard is commonly used by state-approved standardization bodies like the International Organization for Standardization (ISO), although other terms with similar meanings are widely exerted too, including framework, best practice, Body of Knowledge (BOK), or method/methodology.

Management Standards and Related Concepts

In order to enable the intended reuse, standards generally require a written form, i.e., a document, for sharing and version control. Standards represent externalized and codified knowledge in the form of "rules, guidelines or characteristics for activities or for their results" (ISO/IEC, 2004, p. 12). Other typical elements of MS are term definitions and organizational structures, e.g., roles or units (Ahlemann et al., 2009). The elements of a standard and their interrelations form a conceptual framework intended to guide the standard's topic. Both framework and guidance/guide can be found as qualificator denominations for standards. Since standards are designed for reuse, they also can be understood as informal reference models (Fettke et al., 2006; Hochstein et al., 2005). The term BOK emphasizes a standard's function of knowledge externalization. Walrad (2017) considered a BOK as the foundation for teaching competencies required by professional standards of practice. According to Jimenez (2009), a BOK "defines the knowledge of a discipline necessary for individuals to perform their job in a standardized way" (p. 378). A well-known example is the BOK for project management (PMBOK, Project Management Institute, 2021), which is also formally recognized as a standard by the American National Standards Institute (ANSI). Figure 1 shows a model of the relevant concepts with their relationships.

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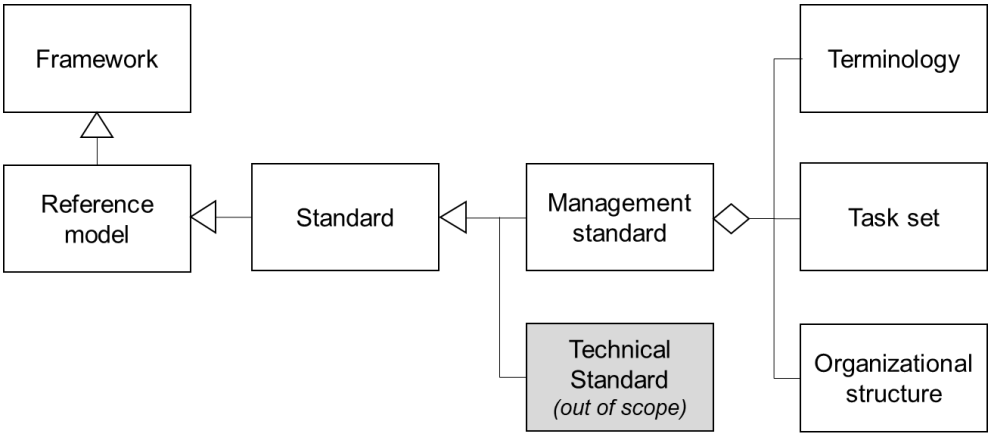

Figure 1. Conceptual Model of Management Standards and Related Concepts (Adapted from Auth, 2021, p. 305)

Information Management

From the many existing approaches to IM, we selected the task-oriented model by Krcmar (2015), which understands IM as an enterprise-wide business function and emphasizes the need for leadership and management of related tasks (Riedl et al., 2017). The task orientation of this IM framework is a commonality with the typical structure of management standards that supports our mapping approach. The top-level structure of the IM model consists of four task areas, which also define hierarchical layers. Figure 2 shows the layer model in which the area of 1) IM leadership (IML) tasks is positioned as the overarching layer for the hierarchy of 2) Information Economy Management (IEM), 3) Information Systems Management (ISM) and 4) Information and Communication Technology Management (ICTM). For each main task area, the model defines a second level of task sub-areas. In the following, we will use the IM model both to derive search words and to classify IM standards by topic.

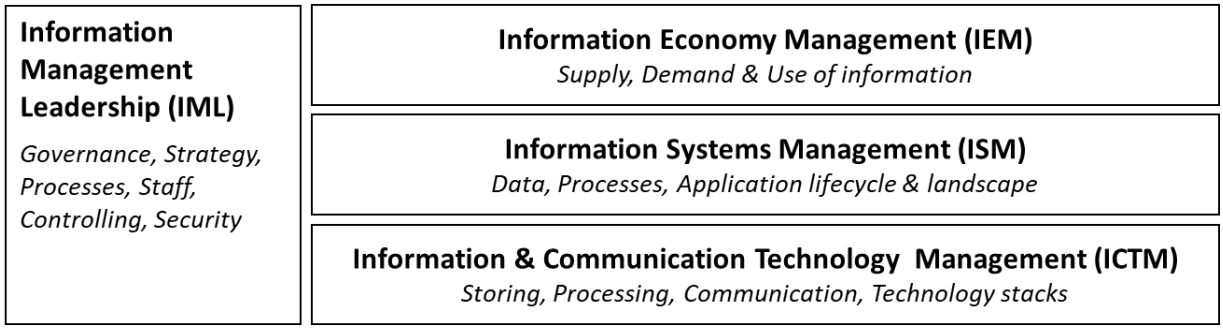

Figure 2. Information Management Framework (Adapted from Krcmar, 2015, p. 107)

Related Work

As outlined previously by Auth (2021), the literature on ITM standards often compares or evaluates selected standards or frameworks in a certain sub-area like ITSM or project management. More recently, the adoption of agile practices into existing or new frameworks has gained much attention (Conboy & Carroll, 2019; Mora et al., 2021; Theobald et al., 2019). Another perspective

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on management standards focuses on Information System (IS) certifications that attest to the fulfillment of requirements defined by an IS-related MS or best practice framework through an organization or individual (Danylak et al., 2022). Certifications are issued by neutral certification bodies after successfully completing an assessment or passing an exam. Known examples of organizational certifications are based on ISO 9001 for quality management or ISO 27001 for information security. Personal certifications can be obtained for ITIL or PRINCE2. Current research on IS certifications examines, amongst others, questions related to the challenges, effects, and implications of certifications on stakeholders and users (Lansing et al., 2018) as well as organizations (Cots et al., 2016; Gualo et al., 2021). We consider the availability and type of certification as attributes of a management standard that we use for classification in our systematic mapping process.

Ahlemann et al. (2022) developed a design theory for managing in-company IT standardization and used it to design and evaluate a management framework for improving the quality of IT processes, structures, and services in practice. The formulated design principles for the framework refer to management tasks and processes for IT standardization and support our understanding of management standards as elements of business process standardization. The focus of Ahlemann et al. (2022) was on the design and management of in-company IT standards. With our research, we intend to complement the in-company perspective by considering external IM standards with international acceptance as input for internal IT standardization.

Research Methodology

The systematic mapping method has become popular in software engineering and related disciplines to create visual maps of a research field showing the distribution of publications according to appropriate criteria (Felderer & Carver, 2017; Jabbari et al., 2016; Petersen et al., 2015). The resulting maps and accompanying tables provide an overview of the explored field and reveal relevant topics and categories of existing research work. Publication numbers can be visualized over time to analyze developments and identify trends (Petersen et al., 2008). A Systematic Mapping Study (SMS) serves as a starting point for further research and informs other scholars about published works and results (Kitchenham et al., 2011). Compared to classic systematic literature reviews (e.g., Levy and Ellis (2006)), SM studies typically have a stronger quantitative focus (Petersen et al., 2008), while concentrating on structuring and visualizing a research area (Petersen et al., 2015).

For conducting our study, we developed a review protocol following the guidelines by Petersen et al. (2015) as well as Felderer and Carver (2017). This study was planned with the purpose of extending, updating, and validating a first study with a more narrow scope of standards for IT management (Auth, 2021). The need for an extended study occurred from the broader scope of IM as well as from the analysis of standardization bodies and the more comprehensive inclusion of the standard type (BOK). Accordingly, we specified three research questions:

RQ1: What types of standards can be identified in the IM domain?

RQ2: Who are the organizations, which create and maintain IM standards?

RQ3: What are the main topics of IM covered in relevant standards and frameworks?

The search for standard documents was designed and conducted as an iterative process starting with an initial web search to identify relevant candidates for the SMS. The initial search using Google web search and the ISO's online standards catalog was performed, because published research, especially on new and emerging standards, is relatively sparse compared to articles by practitioners and professional associations (Ahlemann et al., 2022). Nevertheless, the web search was complemented by a literature search on standards in the IM field. The existing literature set from the previous study (Auth, 2021) was used as a known set of articles to assess the subjective completeness. As search resources for the extended literature retrieval in February 2023, we used the electronic databases and indexing services of Google Scholar, ResearchGate, IEEE Xplorer, and SpringerLink. The search strings were derived from our conceptualization of management standards in combination with Krcmar's IM model. The resulting 47 documents were screened for relevant standards by analyzing titles, keywords, and abstracts manually. As for the literature search, we used the set of 60 ITM standards from the previous study (Auth, 2021) for assessing completeness. The results of the literature search also revealed new search resources, which have specific relevance for ITM standards but are not commonly used in academic literature retrieval. These resources include standard catalogs of standardization bodies (e.g., Axelos, ISO, Project Management Institute (PMI)) or standard collections compiled by other stakeholders from the industry (e.g., Agutter et al., 2023; IT Governance Ltd, 2023; SFIA Foundation, 2021). With the results from the described literature review, we performed another search iteration with the scope shifted from literature on standards to standard documents. Since several standard documents contain references to other related standards we applied backward and forward snowballing for further results. ISO standards, for example, typically have a section entitled "normative references" that lists other ISO standards used as a source or provides further details. Another example is the COBIT 2019 framework which also lists referenced standards and furthermore refers to "related guidance (standards, frameworks, compliance requirements)" in its detailed description of the COBIT core model (ISACA, 2018).

For selecting the relevant standards from the search result set, we utilized the inclusion and exclusion criteria listed in Table 1. The criteria were applied to the title and the introduction section since standard documents usually lack an abstract. The standard selection was conducted by the first author and validated by the second author. Based on our criteria, we eliminated 18 candidates that were clearly irrelevant. Since the introduction always stated the purpose of the standard, no borderline candidates needed to be discussed. Unlike in systematic reviews, no further quality assessment of the included standards was conducted after the criteria-based selection. As the goal of our study is to give a broad overview, we considered the quality assurance of the standardization bodies as sufficient. In the end, the selection process produced a final set of 109 relevant standards for the mapping.

The data extraction from the standard documents was performed by analyzing the title, introduction, and metadata like author/editor and version/publication year. The metadata extraction often needed additional web searches, for instance on certification options. We used a data extraction form consisting of fields for ID code, title/long name, year of publication, year of the current version, documentation type, certification options, author/editor, and URL. The full set of relevant standards is provided as an additional online resource to this paper (Auth & Jokisch, 2023).

Table 1. Inclusion and Exclusion Criteria

Inclusion	Exclusion
Standard document in English	Software development, business, and systems modeling
International or supranational standard	National Standard
Published or updated in the year 2000 or later	Published or updated before the year 2000
Under active maintenance by an organization	Maintenance discontinued or by individuals
Technology neutral	technology related (e.g., ISO cloud, ISACA blockchain)
Industry agnostic	Industry specific (e.g., health, finance, automotive)
Practical use documented	Practical use not documented (e.g., pure research)

For the classification of standards, we developed a topic-independent scheme targeted at RQ1 and RQ2 covering the facets under investigation (type of standard, standardization organization). For answering RQ3 on the main topics of IM standards, we used the task areas and sub-areas of Krcmar's IM as the initial classification scheme. In the course of extracting and aggregating the individual topics from the standard documents through keywording (Petersen et al., 2008), we were able to determine 12 main topics of IM standards as categories.

Results and Implications

Standard Type

A basic differentiation of standards is often made into formal and de-facto standards (Belleflamme, 2002; Den Uijl, 2015) where formal relates to official approval by an acknowledged standardization body like ISO or The Open Group. All other standards are considered de facto implying that they are widely accepted in practice although they might not have been intended as standards originally. The ITSM standard ITIL, for instance, was originally developed for internal use by British government agencies (Johnson, 2021). Frameworks or approaches, which are currently trending in the IM community but have not become formal or de-facto standards are considered emerging standards (e.g., DevOps). While most of the emerging standards arise from industry we also found some research initiatives striving to develop a standard (e.g., University of Bristol, 2021). Figure 3 shows the absolute number and percentage of IM standards per standard type.

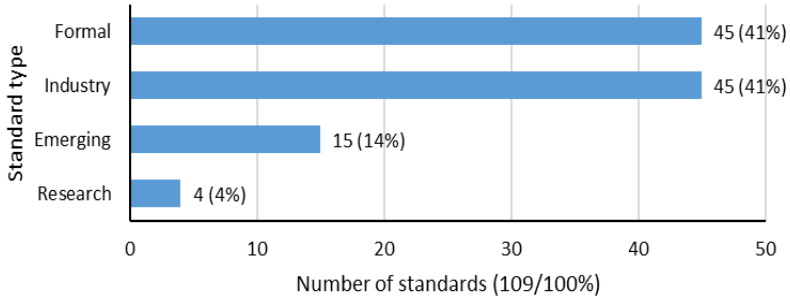

Figure 3. IM Standard Types

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The mapping in Figure 4 displays the distribution of IM standards across five categories of standardization bodies. Almost the complete category of state-approved bodies is represented by the ISO (cooperation partners like the International Electrotechnical Commission IEC were not separately extracted), and only one of 30 formal standards in our result set is developed by the European Committee for Standardization (CEN). The private sector can be broken down into single companies with a standard-related business model (e.g., Axelos Ltd.), professional associations (e.g., PMI), and industry consortia (e.g., The Open Group). On the international level, most IM standards (56%) are developed by private standardization bodies from industry. Although professional associations usually operate as non-profits, we introduced an additional category for other non-profit organizations like foundations or non-profit companies.

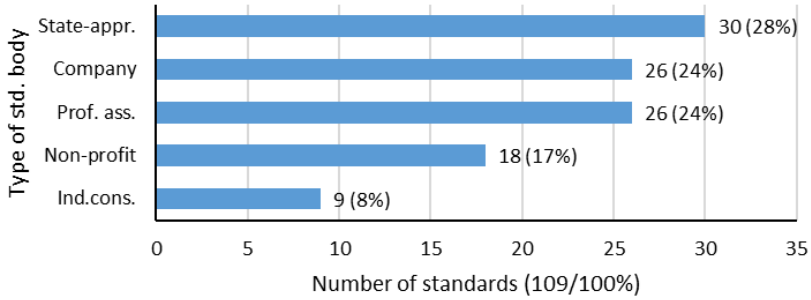

Figure 4. Distribution of IM Standards Across Standardization Bodies

Self-classification and certifications

The many different terms in use for referring to standards can also be found as self-classifications used by private standardization bodies for their normative documents, for instance, the Data Governance Framework by the Data Governance Institute (DGI) (DGI, 2023). The categories in Figure 5 were created from the terms used by the standardization bodies in the official names of their standards. In cases where the names do not provide appropriate terms (e.g., ITIL), the term used most times for referring to the standard by its body was selected (in the case of ITIL, best practice) (Axelos, 2023).

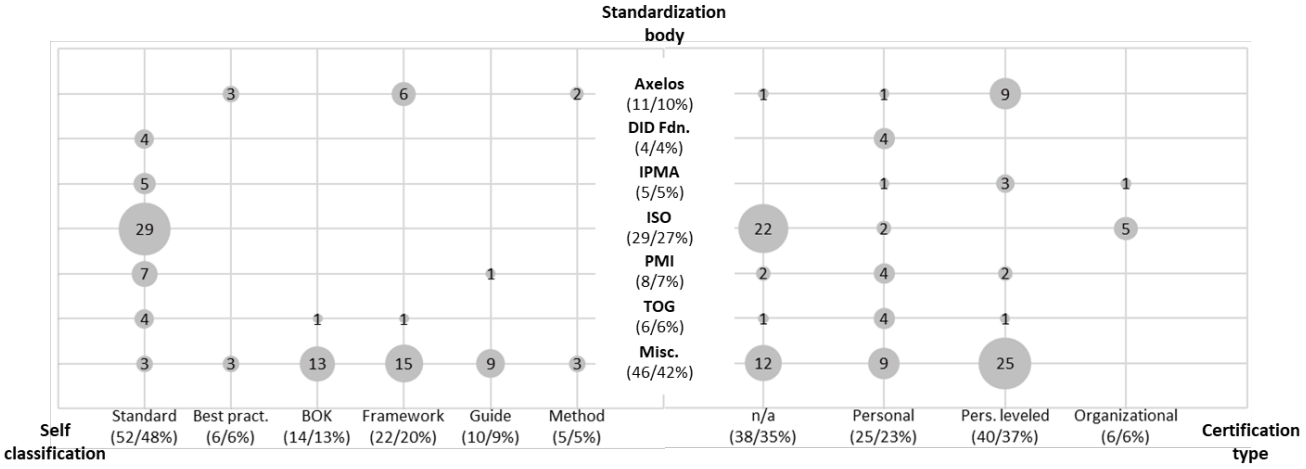

Figure 5: Mapping of Standardization Bodies with Self-Classification and Certification Type

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The second dimension which is visualized in the mapping of Figure 5 is the certification type. We differentiate between organizational certification to approve an organization's conformity to formal requirements of a standard (e.g., ISO 20000 for ITSM) and personal certification to approve an individual's knowledge about a standard. Several standards offer a personal certification scheme with different levels ranging from beginner to expert (e.g., ITIL), which we refer to with the category personal leveled. The mapping shows that personal certification predominates by far (overall 60%) while most organizational certifications (five out of six) are offered by ISO. Furthermore, for 35% of the analyzed IM standards no certification is available. The mapping in Figure 5 visualizes self-classification and certification types grouped by standardization body. In order to preserve the overview character of the mapping, all bodies with three or fewer standards are collectively displayed as category miscellaneous.

Standard Topics and IM Task Areas

The classification scheme for the main topics of IM standards was developed by extracting keywords and concepts from the title and introduction section of the standards. While many standards have their topic clearly formulated in the title (typical for ISO standards), other ones require reading their goals as stated in the introduction (e.g., VeriSM for ITSM). As a result of the keywording we defined 12 categories for topics of IM standards (alphabetically ordered): 1) Agile ITM for standards with agility being a dominant management principle, 2) BPM (excluding specialized standards for process modeling and other sub-areas), 3) Change Management for Organizations, 4) Data Management (excluding technical data standards), 5) Enterprise Architecture Management (excluding specific modeling standards), 6) Innovation management, 7) Information security and privacy (excluding technical standards), 8) IT Governance (including standards related to people, skills/competencies, and evaluation/maturity), 9) IT Service Management, 10) Knowledge Management, 11) Portfolio, Program and Project Management, and 12) Quality Management.

As categories of the second dimension in the mapping shown in Figure 6, we used the four task areas of the IM framework by Krcmar previously introduced (see Figure 2): 1) IM Leadership, 2) Information Economy Management, 3) Information Systems Management, and 4) Information and Communication Technology Management. Compared to the topic categories, the assignment of the standards to the four task areas was more difficult. Some standards follow a holistic approach and cover aspects of more than one task area. ITIL, for example, has a strong focus on IT service design, transition, and delivery, supporting an assignment to IS Management according to Krcmar (2015). On the other hand, ITIL also covers demand, supply, and service management, speaking for Leadership or IE management. In these ambivalent cases, we reviewed the standard's full text and available secondary literature to determine the main focus area of the standard in question. This way, we decided on each ambivalent standard. In the case of ITIL, we decided on IS management. From the mapping in Figure 6, a gap is visible through the complete absence of ICTM standards. This gap can be explained with our exclusion criteria (cf. Table 1) in which we defined management standards relating to certain technology out of scope.

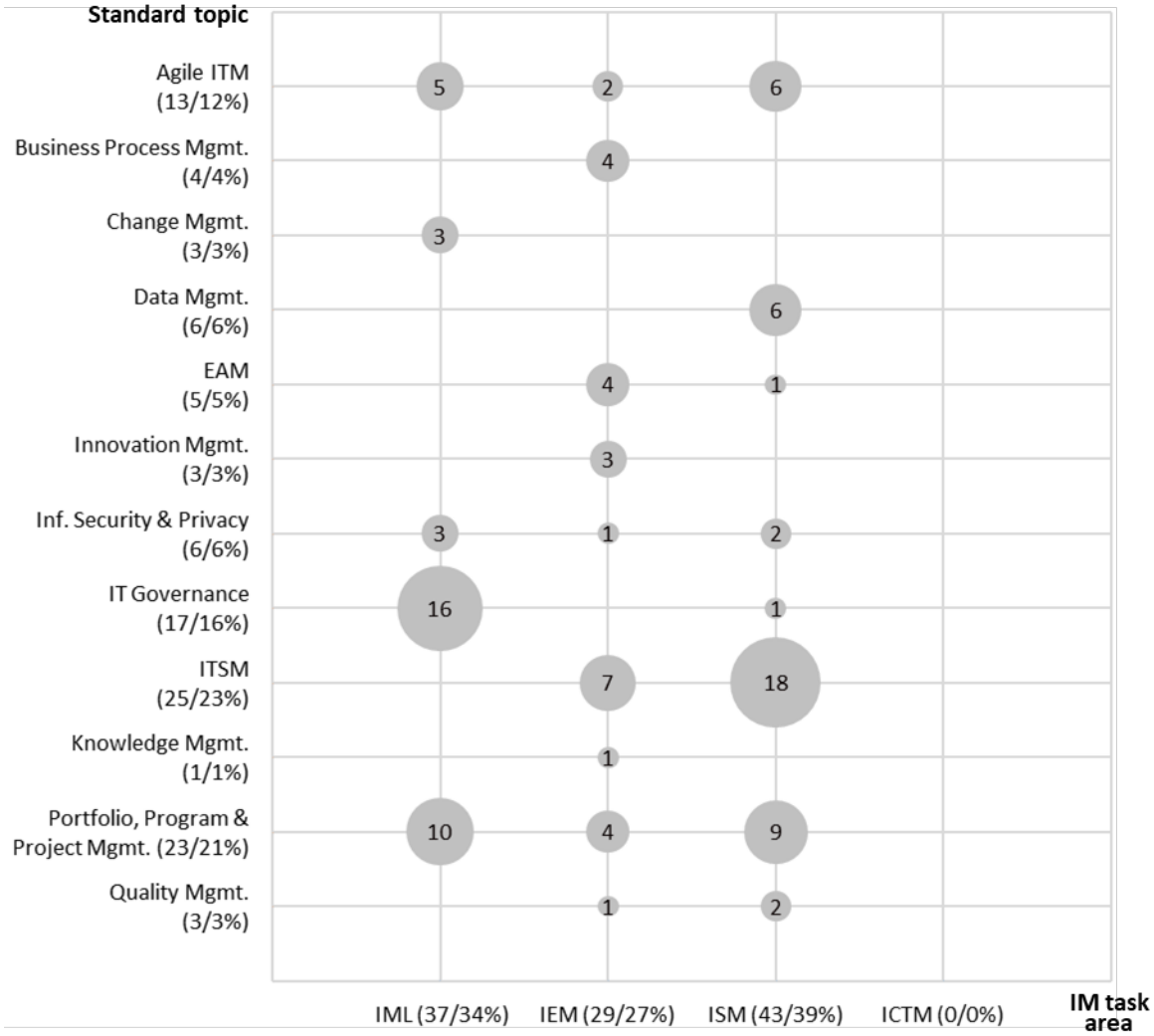

Figure 6. Mapping of Standard Topics and Task Areas of Information Management

Conclusion and Future Work

In the context of our three research questions, we identified six significant organizations that create and maintain the majority of the 109 relevant standards found in the IM domain. Beyond, we extracted 12 major topics occurring in the IM standards and derived from the title, introduction, and metadata of the standardization documents, gray literature, and scientific articles. Based on our analysis, we provide an additional online resource that contains a full set of references to relevant IM standards (Auth & Jokisch, 2023). The systematic mapping method, typically used for literature analysis, turned out to be also efficient for analyzing codified management standards published as documents. Exemplarily, we discussed the collected types of standards and standardization bodies, and visualized them linked with the type of certification. As a further mapping, we demonstrated the analyzed correlations between the extracted topics of the standards and the task areas of IM in a bubble diagram.

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Our study contributes to research on IM standards by providing a conceptualization of management standards and related concepts supported by mappings of existing and emerging international standards based on quantitative data. The identified standardization topics enable a better understanding of current standardization efforts in the IM field driven by digital transformation. Practical implications arise from the consideration of management standards as knowledge resources that bear a growing potential to improve internal IM-related business process standards but also require continuous scouting, evaluating, adopting, and improving available external standards.

The primary limitation of our study is given by a prevailing, quantitative research method that is also evident in the approach of systematic mapping itself and its visualization of the results. To foster a more qualitative perspective on the IM standards, the classification scheme needs to be extended by specific criteria. As a promising perspective, we recognized the variation of management objectives in the course of digital transformation from traditional time, cost, and quality to agility, innovation, and resilience. Another dimension is the transformation from project management to product lifecycle management. A qualitative analysis of the management objectives in new standards might support decisions on standard selection and combination fitting best to individual digital transformation strategies.

References

Agutter, C., Akershoek, R., van Bon, J., & den Broeder, R. (2023). *Global standards and publications edition 2023-2024*. Van Haren Publishing.

Ahlemann, F., Dittes, S., Fillbrunn, T., Rehring, K., Reining, S., & Urbach, N. (2022). Managing in-company IT standardization: A design theory. *Information Systems Frontiers*. https://doi.org/10.1007/s10796-022-10277-2

Ahlemann, F., Teuteberg, F., & Vogelsang, K. (2009). Project management standards – Diffusion and application in Germany and Switzerland. *International Journal of Project Management*, *27*(3), 292–303. https://doi.org/10.1016/j.ijproman.2008.01.009

Auth, G. (2021). The evolution of IT management standards in digital transformation: Current status and research implications. In S. Aier, P. Rohner, & J. Schelp (Eds.), *Engineering the Transformation of the Enterprise* (pp. 301–318). Springer International Publishing. https://doi.org/10.1007/978-3-030-84655-8_19

Auth, G., & Jokisch, O. (2023). *List of information management standards and frameworks* [Data set]. https://doi.org/10.5281/zenodo.7709673

Axelos. (2023). *What is ITIL®?* https://www.axelos.com/certifications/itil-service-management/what-is-itil

Belleflamme, P. (2002). Coordination on formal vs. de facto standards: A dynamic approach. *European Journal of Political Economy*, *18*(1), 153–176. https://doi.org/10.1016/S0176-2680(01)00073-8

Conboy, K., & Carroll, N. (2019). Implementing large-scale agile frameworks: Challenges and recommendations. *IEEE Software*, *36*(2), 44–50.

Cots, S., Casadesús, M., & Marimon, F. (2016). Benefits of ISO 20000 IT service management certification. *Information Systems and E-Business Management*, *14*(1), 1–18. https://doi.org/10.1007/s10257-014-0271-2

Danylak, P., Lins, S., Greulich, M., & Sunyaev, A. (2022). Toward a unified framework for information systems certification internalization. *Proceedings of the 2022 IEEE 24th Conference on Business Informatics*, 186–195. https://doi.org/10.1109/CBI54897.2022.00027

Den Uijl, S. (2015). *The emergence of de-facto standards* (Issue EPS-2014-328-LIS).

DGI. (2023). *DGI data governance framework*. https://datagovernance.com/the-dgi-data-governance-framework/

Dumas, M., La Rosa, M., Mendling, J., & Reijers, H. A. (2018). *Fundamentals of business process management* (2nd ed.). Springer. https://doi.org/10.1007/978-3-662-56509-4

Felderer, M., & Carver, J. C. (2017). Guidelines for systematic mapping studies in security engineering. In L. ben Othmane, M. G. Jaatun, & E. Weippl (Eds.), *Empirical Research for Software Security* (pp. 47–68). CRC Press. https://doi.org/10.1201/9781315154855-2

Fettke, P., Loos, P., & Zwicker, J. (2006). Business process reference models: Survey and classification. In C. J. Bussler & A. Haller (Eds.), *Business Process Management Workshops* (Vol. 3812, pp. 469–483). Springer. https://doi.org/10.1007/11678564_44

Galliers, R., Leidner, D. E., & Simeonova, B. (Eds.). (2020). *Strategic information management: Theory and practice* (5th ed.). Routledge, Taylor & Francis Group.

Gualo, F., Rodriguez, M., Verdugo, J., Caballero, I., & Piattini, M. (2021). Data quality certification using ISO/IEC 25012: Industrial experiences. *Journal of Systems and Software*, *176*, 110938. https://doi.org/10.1016/j.jss.2021.110938

Hochstein, A., Zarnekow, R., & Brenner, W. (2005). ITIL as common practice reference model for IT service management: Formal assessment and implications for practice. *2005 IEEE International Conference on E-Technology, e-Commerce and e-Service*, 704–710.

ISACA (Ed.). (2018). *COBIT® 2019 framework: Governance and management objectives*.

ISO/IEC. (2004). *ISO/IEC Guide 2:2004—Standardization and related activities—General vocabulary (multilingual)*. ISO/IEC.

IT Governance Ltd. (2023). *Management system standards*. https://www.itgovernance.eu/en-ie/it-standards-ie

Jabbari, R., bin Ali, N., Petersen, K., & Tanveer, B. (2016). What is DevOps?: A systematic mapping study on definitions and practices. *Proceedings of the Scientific Workshop Proceedings of XP2016*, 1–11. https://doi.org/10.1145/2962695.2962707

Jimenez, G. (2009). Business Process Engineering: In J. Cardoso & W. van der Aalst (Eds.), *Handbook of research on business process modeling* (pp. 366–383). IGI Global. https://doi.org/10.4018/978-1-60566-288-6.ch017

Johnson, B. (2021). *History of ITIL: Revolution and evolution*. Axelos white paper. https://www.axelos.com/resource-hub/white-paper/history-of-itil-revolution-and-evolution

Kitchenham, B. A., Budgen, D., & Pearl Brereton, O. (2011). Using mapping studies as the basis for further research – A participant-observer case study. *Information and Software Technology*, *53*(6), 638–651. https://doi.org/10.1016/j.infsof.2010.12.011

Krcmar, H. (2015). *Informationsmanagement (in German only)* (6th ed.). Springer Gabler.

Lansing, J., Benlian, A., & Sunyaev, A. (2018). "Unblackboxing" decision makers' interpretations of IS certifications in the context of cloud service certifications. *Journal of the Association for Information Systems*, *19*(11). https://aisel.aisnet.org/jais/vol19/iss11/3

Levy, Y., & Ellis, T. (2006). A systems approach to conduct an effective literature review in support of information systems research. *Informing Science: The International Journal of an Emerging Transdiscipline*, *9*, 181–212. https://doi.org/10.28945/479

Mora, M., Marx-Gomez, J., Wang, F., & Diaz, O. (2021). Agile IT service management frameworks and standards: A review. In H. R. Arabnia, L. Deligiannidis, F. G. Tinetti, & Q.-N. Tran (Eds.), *Advances in Software Engineering, Education, and e-Learning* (pp. 921–936). Springer. https://doi.org/10.1007/978-3-030-70873-3_66

Petersen, K., Feldt, R., Mujtaba, S., & Mattsson, M. (2008). Systematic mapping studies in software engineering. *Proceedings of the 12th International Conference on Evaluation and Assessment in Software Engineering (EASE)*. https://doi.org/10.14236/ewic/EASE2008.8

Petersen, K., Vakkalanka, S., & Kuzniarz, L. (2015). Guidelines for conducting systematic mapping studies in software engineering: An update. *Information and Software Technology*, *64*, 1–18. https://doi.org/10.1016/j.infsof.2015.03.007

Porter, M. E., & Millar, V. E. (1985). How information gives you competitive advantage. *Harvard Business Review*, *63*(4), 149–160.

Project Management Institute (Ed.). (2021). *A guide to the project management body of knowledge (PMBOK guide) and the standard for project management* (7th ed.). Project Management Institute, Inc.

Riedl, R., Benlian, A., Hess, T., Stelzer, D., & Sikora, H. (2017). On the relationship between information management and digitalization. *Business & Information Systems Engineering*, *59*(6), 475–482. https://doi.org/10.1007/s12599-017-0498-9

SFIA Foundation. (2021). *List of bodies of knowledge*. https://sfia-online.org/en/tools-and-resources/bodies-of-knowledge/list-of-bodies-of-knowledge

Theobald, S., Schmitt, A., & Diebold, P. (2019). Comparing scaling agile frameworks based on underlying practices. *International Conference on Agile Software Development*, 88–96.

Tregear, R. (2015). Business process standardization. In J. vom Brocke & M. Rosemann (Eds.), *Handbook on Business Process Management 2* (pp. 421–441). Springer. https://doi.org/10.1007/978-3-642-45103-4_18

The University of Bristol. (2021). *CyBOK – The cyber security body of knowledge, version 1.1*. https://www.cybok.org/

Walrad, C. (2017). Standards for the enterprise IT profession. *Computer*, *50*(3), 70–73. https://doi.org/10.1109/MC.2017.68

Authors Biographies

Gunnar Auth, Dr. is a professor of information systems and e-government at Meissen University of Applied Sciences (HSF), Germany. He completed his diploma degree in business information systems at the University of Bamberg, Germany, and received a Ph.D. degree in economics from the University of St Gallen (HSG), Switzerland. He started his professional career as an internal consultant at DaimlerChrysler where he later worked in several management positions in logistics, operations, and quality management. Before assuming his current position, he was the IT director and representative of the CIO board at Leipzig University in Germany. His research focuses on IT project management, IT service management, and information management.

Oliver Jokisch, Dr.-Ing. is a professor of cybersecurity at the Meissen University of Applied Sciences (HSF) in Germany and the director of the Saxon Institute for Governance Innovation (SIVIM). Oliver has studied information technology at the TU Dresden and the Loughborough University (UK), graduating as a diploma engineer. He holds a Ph.D. degree from TUD and previously had a chair of system theory at the private university of Deutsche Telekom in Leipzig. His current research focuses on cybersecurity and AI applications in audio, speech, and video communication.

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