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DIFFUSION OF CERTIFIED MANAGEMENT SYSTEMS IN POLAND IN THE YEARS 2018-2023

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Purpose: The main aim of the paper is to update and extend evidence on the diffusion of ISO-based management system certifications in Poland in 2018-2023, quantifying dynamics (levels, YoY changes) and the current sectoral profile across six widely adopted standards. The achievement of this main objective is preceded by a verification of the chronology of the diffusion of the specific subject matter of the standards over time.
Design/methodology/approach: A quantitative, longitudinal analysis based on secondary data from the 2018–2023 ISO Survey was employed. Certificates were operationalized, and a selection filter was applied to focus on six cross-sector standards (ISO 9001, 14001, 45001, 50001, ISO/IEC 27001, ISO 22301), while highly sector-specific or nascent standards were excluded. Time-series indicators (levels, YOY) and a 2023 sectoral cross-section were computed using the ISO sector taxonomy.
Findings: The obtained results indicate that (1) The certification uptake is definitely sector-concentrated rather than uniform across the economy. (2) The ISO 9001/14001 standards dominate volumes but show stabilization/soft declines after the 2019 pre-pandemic peak. (3) The newer OH&S (ISO 45001) and the energy (ISO 50001) systems grow steadily from a lower base. (4) The certification volume of most standards decreased in the first year of the COVID-19 pandemic. (5) There are sectors with high certification rates for all systems (e.g.: Basic metal & fabricated metal products, Wholesale & retail trade, Electrical and optical equipment), but there are also sectors characteristic of selected standards (e.g.: Transport, storage and communication / Gas supply).
Research limitations/implications: The study is limited by its reliance on aggregated secondary data from the ISO Survey, where data reporting by national accreditation and certification bodies is voluntary.
Practical implications: The results can inform policymakers and accreditation bodies in designing targeted support mechanisms to encourage certification in lagging sectors. For businesses, the findings provide benchmarks and strategic insight into sectoral trends.
Originality/value: This paper offers an updated, Poland-focused, multi-standard, sector-specific analysis of certification diffusion in Poland, filling a gap in the literature by integrating multi-year ISO Survey data with a theoretical perspective. It is particularly relevant to researchers, indicating the need for more detailed, in-depth research, as well as to consultants and decision-makers.
Keywords: Certified management systems, ISO, COVID-19, sectoral analysis, Poland.
Category of the paper: Research paper.

Introduction

Since the ISO introduced the first standard of management systems in 1987, the Quality Management System, organizations around the world have shown a continuously increasing interest in their implementation (Franceschini et al., 2006). Over the years, the number of worldwide certificates for compliance with the ISO 9001 standard has been on the increase (Cabecinhas et al., 2018; Podrecca, Sartor, 2023). However, the publication of new standards was rather slow (cf. Table 1 and Figure 1). Between 1987 and 2002, only three standards in two areas of management appeared: in quality and in environment These standards also attracted considerable interest among organizations (Casadesús et al., 2008). More standards appeared in the following years. There were more detailed, industry-specific standards in the area of quality management, as well as standards in other areas of management. As previously mentioned, the following areas of management were included in the standardization: quality and environmental management first, followed by: social security, food safety, information technology, energy, event sustainability, asset, anti-bribery, occupational health and safety (OH&S) and innovation management. The level of interest in implementing these standards remained high, as evidenced by their degree of diffusion (Lira et al., 2018; Granja et al., 2021). The content and structure of individual standards have also changed over the years. Table 1 lists the chronological list of the ISO key standards for management systems, together with the area to which they apply, the symbol abbreviation, the year of publication of the first version and the current version of the standard. General information is shown graphically in Figure 1.

Table 1.
Core information on the timing and scope of introduced ISO management system standards

Date of the standard introduction	Standard symbol/code and title	
	First edition	Current version
March 1987	ISO 9001:1987 Quality systems — Model for quality assurance in design/development, production, installation and servicing	ISO 9001:2015 Quality management systems – Requirements
September 1996	ISO 14001:1996 Environmental management systems — Specification with guidance for use	ISO 14001:2015 Environmental management systems -- Requirements with guidance for use
December 1996	ISO 13485:1996 – Quality systems — Medical devices — Particular requirements for the application of ISO 9001	ISO 13485:2016 Medical devices — Quality management systems — Requirements for regulatory purposes
September 2003	ISO/TS 29001:2003 Petroleum, petrochemical and natural gas industries — Sector-specific quality management systems — Requirements for product and service supply organizations	ISO 29001:2020 Petroleum, petrochemical and natural gas industries — Sector-specific quality management systems — Requirements for product and service supply organizations
September 2005	ISO 22000:2005 Food safety management systems — Requirements for any organization in the food chain	ISO 22000:2018 Food safety management systems — Requirements for any organization in the food chain

Cont. table 1.

October 2005	ISO/IEC 27001:2005 Information technology — Security techniques — Information security management systems — Requirements	ISO/IEC 27001:2022 Information security, cybersecurity and privacy protection — Information security management systems — Requirements
December 2005	ISO/IEC 20000-1:2005 Information technology — Service management. Part 1: Specification	ISO/IEC 20000-1:2018 Information technology — Service management. Part 1: Service management system requirements
September 2007	ISO 28000:2007 Specification for security management systems for the supply chain	ISO 28000:2022 Security and resilience — Security management systems — Requirements
June 2011	ISO 50001:2011 Energy management systems — Requirements with guidance for use	ISO 50001:2018 Energy management systems — Requirements with guidance for use
May 2012	ISO 22301:2012 Societal security — Business continuity management systems — Requirements	ISO 22301:2019 Security and resilience — Business continuity management systems — Requirements
June 2012	ISO 20121:2012 Event sustainability management systems — Requirements with guidance for use	ISO 20121:2024 Event sustainability management systems — Requirements with guidance for use
October 2012	ISO 39001:2012 Road traffic safety (RTS) management systems — Requirements with guidance for use	ISO 39001:2012 Road traffic safety (RTS) management systems — Requirements with guidance for use
January 2014	ISO 55001:2014 Asset management — Management systems — Requirements	ISO 55001:2024 Asset management — Asset management system — Requirements
September 2015	ISO 18788:2015 Management system for private security operations — Requirements with guidance for use	ISO 18788:2015 Management system for private security operations — Requirements with guidance for use
October 2016	ISO 37001:2016 Anti-bribery management systems — Requirements with guidance for use	ISO 37001:2025 Anti-bribery management systems — Requirements with guidance for use
March 2017	ISO 44001:2017 Collaborative business relationship management systems — Requirements and framework	ISO 44001:2017 Collaborative business relationship management systems — Requirements and framework
March 2018	ISO 45001:2018 Occupational health and safety management systems — Requirements with guidance for use	ISO 45001:2018 Occupational health and safety management systems — Requirements with guidance for use
May 2018	ISO 21001:2018 Educational organizations — Management systems for educational organizations — Requirements with guidance for use	ISO 21001:2025 Educational organizations — Management systems for educational organizations — Requirements with guidance for use
December 2018	ISO 21401:2018 Tourism and related services — Sustainability management system for accommodation establishments — Requirements	ISO 21401:2018 Tourism and related services — Sustainability management system for accommodation establishments — Requirements
July 2019	ISO 56002:2019 Innovation management — Innovation management system — Guidance	ISO 56002:2019 Innovation management — Innovation management system — Guidance
April 2021	ISO 37301:2021 Compliance management systems — Requirements with guidance for use	ISO 37301:2021 Compliance management systems — Requirements with guidance for use
July 2021	ISO 37002:2021 Whistleblowing management systems — Guidelines	ISO 37002:2021 Whistleblowing management systems — Guidelines

Source: Own study.

It can be concluded from Table 1 that the standards themselves were improved over time. A change in the content, or in some requirements, resulted in at least a change in the standard symbol. At that time, there was a certain transition period for organizations to adapt to new requirements without losing the certificate. Sometimes the changes in the content were so significant that the result was a change in the standard title. New areas of management were covered in the first period (1987-2002) only occasionally. In later years this occurred more frequently. Especially the years 2005 and 2012, and the period between 2017 and 2020 marked the appearance of many more standards relating to new management areas. The structure of the content of the standards was also improved. In this respect, they currently use (versions of standards created after 2012) the Unified High-Level Structure and consist of 10 unified chapters: (1) Scope; (2) Normative references; (3) Terms and definitions; (4) Context of the organization; (5) Leadership; (6) Planning; (7) Support; (8) Operation; (9); Performance evaluation; (10) Improvement. Compared to their earlier versions, the standards now take account of the need for the process approach, risk analysis, consideration of the special importance of leadership and of the analysis of the context of the organization. The basic feature of these systems is the obligation to continuously improve the organization in the relevant area.

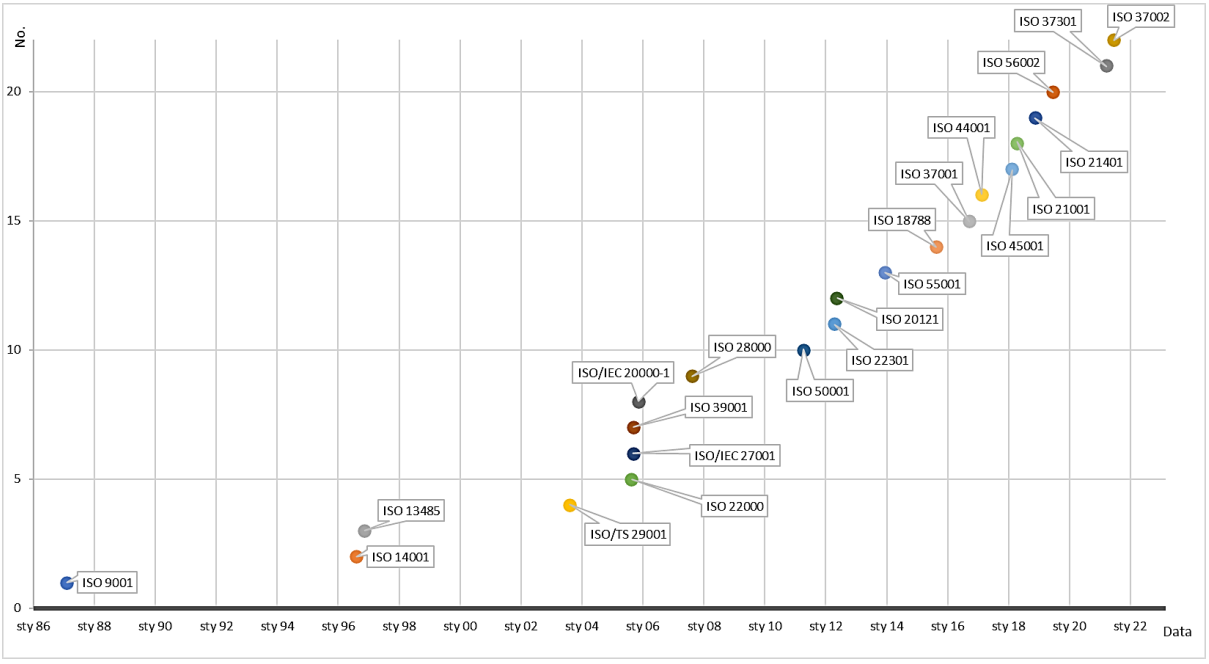

Figure 1. Graphical presentation of the chronology of the implementation of ISO standards in the field of management systems.

Source: Own study.

The adoption of the requirements of management system standards is voluntary for organizations. Nevertheless, they feel motivated to implement them, which manifests itself in the growing interest in the standards worldwide (Liu et al., 2019; Toporowicz et al., 2020; Zubeltzu-Jaka et al., 2024).

The process of the diffusion of management systems based on ISO standards reflects both the development of global standardization initiatives and the changes in socio-economic priorities. Several significant factors have appeared recently that may influence the decision whether an organization will keep or obtain the ISO certification for the compliance of its management systems with the requirements of ISO standards. This primarily concerns the factors affecting the economic system and the existing logistics channels, such as the Covid-19 pandemic, or wars in Ukraine or in the Middle East. The latest versions of the ISO 9001 and 14001 standards were created in 2015. In 2018 the ISO 45001 and the new 50001 standard were created, and the year 2019 marked the publication of the ISO 22301 standard. Therefore, it was decided to take account of the post-2018 data to also consider the impact of these phenomena on the decisions of individual organizations concerning certified management systems.

One indicator of the diffusion of standardization is the number of valid certificates for the compliance of management systems with standards. It is monitored and published annually as part of the ISO Survey. These data present, among others, the number of active certificates divided by country, region and sector of the economy.

Over the years, researchers have examined the diffusion of management system certifications in accordance with ISO standards. These analyses have addressed both global and regional perspectives (Daddi et al., 2015; Lira et al., 2021), as well as the national context of Poland (Ejdys et al., 2012; Kozel et al. 2017; Cierpioł, Wąsikiewicz-Rusnak, 2021). Studies have included both historical data and attempts to forecast future developments in certification trends (Ikram et al., 2019; Basaran, 2021). Updating knowledge in this area serves a dual role: it continues previous research and provides an opportunity to verify earlier findings. Therefore, the main objective of this paper is to update and supplement knowledge on the dynamics of changes in the volume of certification of management systems based on ISO standards in Poland in recent years using the ISO Survey data. In particular, this concerns changes in the number of certificates for compliance with the requirements of standards, and presentation of the current state of the number of implementations in individual industries. Before this main objective is achieved, the chronology of the formation of standards and of the diffusion of their specific subject matter over time is verified.

Methods

The input data used in the research come from the ISO Survey, published annually by the International Organization for Standardization (ISO). These databases are created based on the data reported voluntarily by member organizations – national accreditation and certification bodies.

The ISO Survey has its limitations due to the fact that data reporting is voluntary within the system. The reporting is the responsibility of national accreditation and certification bodies, which can sometimes lead to gaps and inconsistencies in the number of certificates over time. For example, the 2023 edition failed to include data from China, which for years was the world's leader in the number of certificates. This fact significantly affected the values of global rankings (ISO, 2024). As for Poland, not all certification bodies participated in reporting certification data for the ISO 9001 standard in 2022 (there are now 41 such bodies). This leads to unexpected fluctuations in the number of certificates at that time. Despite these limitations, the ISO Survey remains the most important global source of quantitative data on the certification of management systems. It is a valuable source of data, which is confirmed by their wide use in papers that appear in important world journals (To, Lee, 2014; Neves et al., 2018; Lira et al., 2021).

In the first stage of the research, all current standards for management systems published by the ISO were analysed. The theoretical part of the paper ('Introduction') presents the process of the diffusion of the standards over time, considering the dates of their introduction, the areas they covered and the introductory and current versions.

For the purposes of the empirical part, a selection approach was applied to the standards, taking account of the specificity of the ISO Survey data and the cross-sectional nature of the planned industry-specific analyses. Therefore, in the next stages the following were excluded:

1. Standards not covered by the ISO Survey reporting system.
2. Industry standards – dedicated exclusively to selected sectors (e.g. the ISO 13485 standard for medical devices, the ISO 22000 standard for food safety, etc.).
3. New standards – not yet observed for a sufficient number of years.
4. Marginal standards – for which the number of certificates is small, which could distort conclusions due to data incompleteness and differences in reporting.

Finally, the following standards were selected for the statistical analysis:

- ISO 9001 – quality management systems,
- ISO 14001 – environmental management systems,
- ISO 45001 – occupational health and safety management systems,
- ISO 50001 – energy management systems,
- ISO/IEC 27001 – information security management systems,
- ISO 22301 – business continuity management systems.

The time span of the analyses was selected as 2018-2023. This choice was justified by the significant changes in the content of key standards in 2015 (this concerned standards ISO 9001 and ISO 14001) and the introduction of a transition period for organizations to adapt to them, which undoubtedly contributed to fluctuations in certification volumes (Camango et al., 2023). The ISO 45001 standard was introduced, replacing the existing OHSAS 18001 standard. This finding highlights the need for further research into the dynamics of certification in this critical area of management. The year 2018 was therefore considered a logical starting point for conducting trend analyses.

For selected standards, analyses of the trends in the change in the number of certificates for organizations and sites (for the years 2018-2023) and sectoral diffusion for organizations (for the year 2023) were carried out. A certificate refers to the official document granted by a certification body once an organization has demonstrated compliance with the standard requirements. A site refers to a fixed physical location where the organization conducts its activities or delivers services. The trends were calculated as the number of certificates in individual years and their percentage difference year-on-year. Sectoral diffusion was presented as the number of certificates in individual industries for compliance with each of the standards selected for the analysis. In addition, the industries with the highest and the lowest numbers of those certificates were determined.

Results

The analysis of the data concerning Poland and taken from the ISO Survey reports from the years 2018-2023 points to a varied dynamics of the number of certificates of the management systems tested in the certification areas. Figure 2 and Table 2 show that, depending on the standard under consideration, both increases and decreases in the number of certificates could be observed in the studied period.

In particular, in terms of scale values and general trends:

- The ISO 9001 standard remains by far the most common management system in Poland, but its number of certificates recently showed fluctuations at a level below 11500. In 2023, the number of certificates of organizations totalled 11276, with a maximum in the analysed period of 11460 in 2019 – the year before the outbreak of the COVID-19 pandemic. The number of certifications for the most widely adopted standards, both globally and in Poland, had already fluctuated in earlier years, due in part to the need to adapt to evolving requirements (Ejdys et al., 2012).

- The ISO 14001 is the second most widely certified standard. In 2023 the number of certificates totalled 3213, with a maximum of 3766 in 2019. As in the case of the ISO 9001 standard, the maximum value was achieved in the year before the pandemic.
- The ISO 45001 is a standard whose number of certificates for compliance with its requirements is growing rapidly. The first version of the standard was created in 2018, but already at the end of the analysed period, in 2023, there were 2064 certificates, with a continuous and strong rise from one year to another. The highest rise in the number of certificates was recorded in 2020. It totalled 884, which was a almost three and a half times increase compared to the previous year.
- The ISO/IEC 27001 is the standard with the fourth highest number of certificates. Although the number fluctuated over the analysed time, it generally showed a slightly rising trend. In 2023, 846 certificates were reported, with a maximum in 2021 totalling 876.
- The ISO 50001 standard ranks fifth in this respect. It recorded an increase in each year of the period under consideration. The highest numbers of increase are for years 2021 and 2020, which contrasts with the trends in the number of certificates for the most important standards, where drops were observed during the pandemic. This may be due to the fact that a lot fewer certificates were granted and that the country's economy was not sufficiently saturated with them. In 2023, the number of certificates totalled 266. Effective energy management is critical to the energy security of Poland and the European Union (Janik et al., 2021).
- The ISO 22301 standard recorded the lowest number of certificates for the standards under analysis but shows a slow but steady increase in certification.

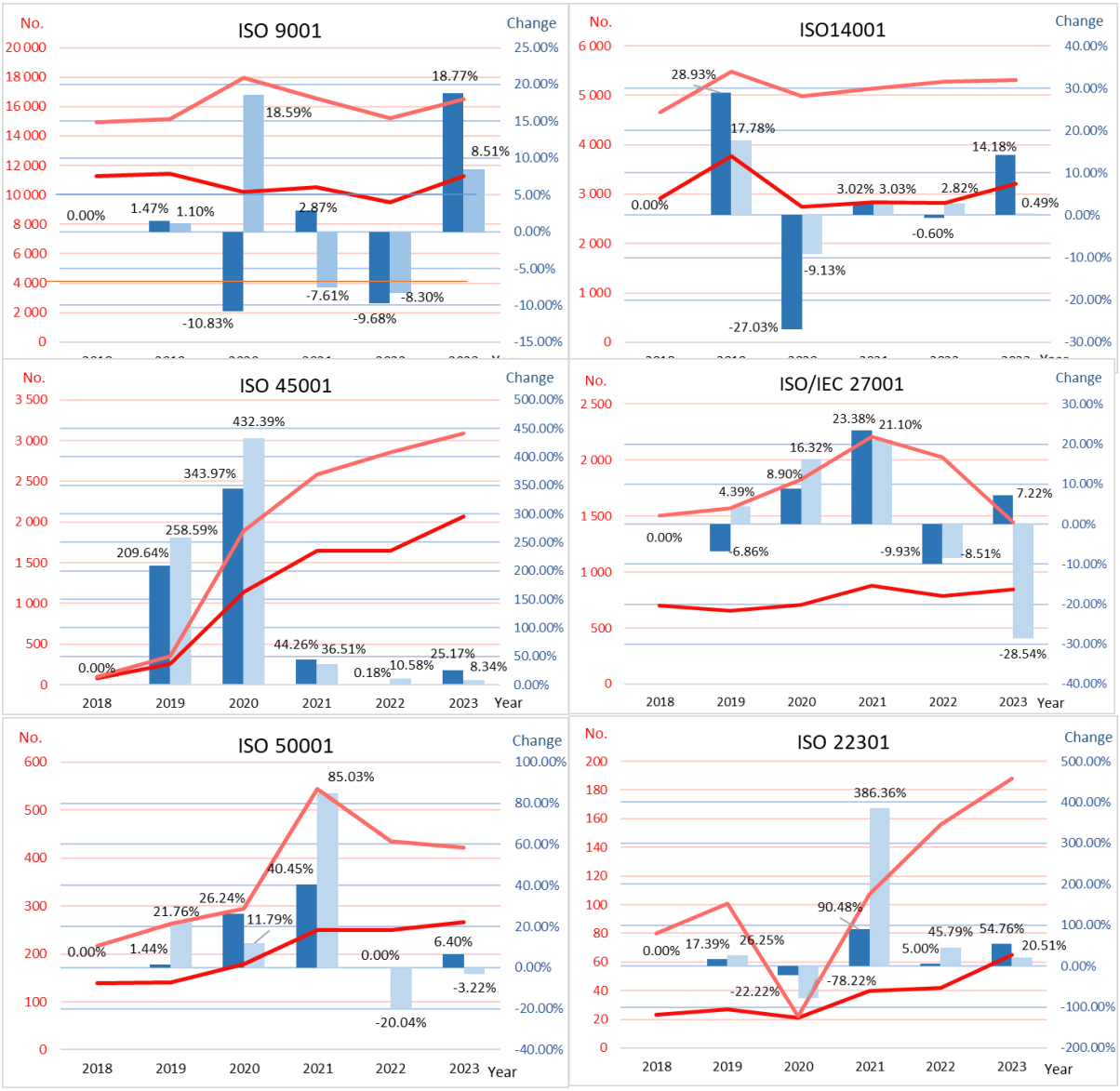

Figure 2. Number of certificates of organizations and sites and changes thereof in 2018-2023 according to the ISO Survey.

Source: Own study based on the ISO Survey 2018-2023.

The results of the cross-sector analysis are presented in Table 2.

Table 2.
Number of certificates for compliance with ISO standards of management systems in 2023 in Poland by industry

Sector	ISO 9001	ISO 14001	ISO 45001	ISO 27001	ISO 50001	ISO 22301
Agriculture, Fishing and Forestry	5	3	2	0	6	0
Mining and quarrying	36	30	27	2	2	0
Food products, beverage and tobacco	119	71	7	0	28	0
Textiles and textile products	92	27	8	0	0	0
Leather and leather products	3	2	1	0	0	0
Manufacture of wood and wood products	77	18	7	0	12	0
Pulp, paper and paper products	158	61	13	0	5	0
Publishing companies	34	12	4	0	0	0
Printing companies	136	36	5	2	0	1
Manufacture of coke & refined petroleum products	18	10	6	0	2	0
Nuclear fuel	0	0	0	0	0	0
Chemicals, chemical products & fibres	238	90	40	1	15	0
Pharmaceuticals	7	6	2	0	1	0
Rubber and plastic products	717	245	77	4	21	0
Non-metallic mineral products	95	102	22	1	9	0
Concrete, cement, lime, plaster etc.	75	37	14	0	1	0
Basic metal & fabricated metal products	1798	521	295	3	40	1
Machinery and equipment	736	239	188	8	6	0
Electrical and optical equipment	748	231	136	18	15	0
Shipbuilding	39	10	6	0	0	0
Aerospace	16	1	2	0	1	0
Other transport equipment	244	87	44	1	12	0
Manufacturing not elsewhere classified	101	41	14	0	0	0
Recycling	84	84	26	4	9	0
Electricity supply	33	40	25	3	11	7
Gas supply	53	8	31	1	20	24
Water supply	54	122	82	1	5	2
Construction	542	214	260	5	4	0
Wholesale & retail trade, repairs of motor vehicles, motorcycles & personal & household goods	1050	245	96	22	16	0
Hotels and restaurants	31	12	5	0	0	0
Transport, storage and communication	504	174	83	20	5	96
Financial intermediation, real estate, renting	84	43	9	13	8	0
Information technology	178	35	15	178	3	9
Engineering services	427	150	136	19	6	0
Other Services	524	147	77	26	3	8
Public administration	73	6	4	10	0	5
Education	366	16	19	9	2	3
Health and social work	1031	88	36	98	0	8
Other social services	106	110	120	140	2	1

Note: For given standards, the highest and the lowest 10 values are marked in **red** and **blue**, respectively. The table does not contain certifications for which the industry was not defined/was unknown.

Source: Own study based on the ISO Survey 2018-2023.

As regards the cross-sectoral analysis, in particular it was observed that (cf. Table 2):

- the sectors characterized by the highest number of certificates in the analysed areas of management are as follows: Wholesale & retail trade, repairs of motor vehicles, motorcycles & personal & household goods; Electrical and optical equipment (both rank in the top 10 in relation to 5 standards); Basic metal & fabricated metal products; Electrical and optical equipment; Rubber and plastic products; Transport, storage and communication; Engineering services; Other Services (included in the top 10 in relation to 4 standards).
- The highest number of certificates in individual areas of standards were recorded by the following sectors (three industries with the highest number of certificates):
  - ISO 9001: Basic metal & fabricated metal products; Wholesale & retail trade, repairs of motor vehicles, motorcycles & personal & household goods; Health and social work.
  - ISO 14001: Basic metal & fabricated metal products; Wholesale & retail trade, repairs of motor vehicles, motorcycles & personal & household goods; Rubber and plastic products.
  - ISO 45001: Basic metal & fabricated metal products; Construction; Machinery and equipment.
  - ISO 27001: Information technology; Other social services; Health and social work.
  - ISO 50001: Basic metal & fabricated metal products; Food products, beverage and tobacco; Rubber and plastic products.
  - ISO 22301: Transport, storage and communication; Gas supply; Information technology.

Summary and conclusions

As shown by the research results, the standardization of management systems, which began with the development of the first quality management standard in 1987, covers wider and wider areas of management. The standards currently apply to areas such as quality, environmental, social security, food safety, information technology, energy, event sustainability, asset, anti-bribery, occupational health and safety (OH&S) and innovation management.

The conducted analysis made it possible to capture the dynamics and structure of the diffusion of certified management systems in Poland in the years 2018-2023. The results confirm that the process is sector-specific. Management systems based on the ISO standards are not implemented evenly across the economy. Diffusion is clearly sectoral in nature – industrial sectors such as metal production, electrical and optical equipment, as well as trade and logistics, dominate.

The use of the sectoral approach made it possible to identify certification leaders and outsiders. This can be a starting point for the development of public policies and strategies supporting the implementation of management systems in less active sectors.

The obtained results confirmed the growing interest in certification of management systems by organizations. However, the dynamics of changes in the case of standards with a long history, such as ISO 9001 or ISO 14001, is much lower than of those created later, such as ISO 50001 or ISO 45001. This is undoubtedly related to the level of saturation with certificates.

Among those analysed, the ISO 9001 standard is the most widespread, but the dynamics of its growth in certification has decreased in recent years. The ISO 14001 standard shows a similar trend, but at lower numbers of certificates. The "younger" standards (with a shorter history), such as ISO 45001 and ISO 50001, are characterized by a steady increase in certification, which may indicate the growing importance of OSH and energy efficiency issues in the operational management of organizations, but this process is also undoubtedly related to the effect of the novelty of the standards themselves.

The year 2020, i.e. the beginning of the COVID-19 pandemic, coincides with temporary drops in the number of certificates for almost all standards. Only the newly introduced standards achieve a rise then. The effect of their novelty may overcome the problems with maintaining and obtaining certificates by organizations during this period. However, this phenomenon requires further and more detailed research.

There are some imperfections in the ISO Survey data collection system due to the voluntary nature of reporting and the risk of gaps in the reports. Nevertheless, these data remain the most important source of information on macro trends and diffusion of industry-specific management systems based on the ISO standards.

This paper also points to the need for more detailed, in-depth research into the causes of the existing fluctuations in the number of certificates for the most recognized management standards based on the ISO requirements. Further research should focus on identifying the predictors of interest in certification of management systems, e.g. economic parameters.

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