

IMPLEMENTATION OF DATA-DRIVEN ORGANISATION PRACTISES IN SME ENTERPRISES

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Purpose: In the modern economy, the concept of data-driven organization is gaining importance. This applies to both large, global enterprises and SMEs. The aim of this article is to examine whether implementing solutions typical of data-driven organization translates into improved financial performance in SMEs.

Design/methodology/approach: The author conducted his own survey (online survey) on a sample of 146 SMEs (respondents included managers and entrepreneurs). Respondents received a questionnaire containing closed-ended questions and questions requiring assessment based on a Likert scale, focusing on issues such as the degree of implementation of analytical tools and the approach to data in management. The theoretical section presents definitions, key characteristics of data-driven organizations, and the specific nature of the SME sector in the context of digital transformation.

Findings: Analysis of the research results indicates a clear correlation between the level of implementation of data-driven practices and a positive assessment of financial performance. Significant differences in approach were also identified depending on the industry and the level of the organizations' digitalization.

Research limitations/implications: In the future, it is also worth considering the customer perspective and the level of employee analytical competence as factors that may influence the effectiveness of data-driven organization solutions.

Originality/value: This article demonstrates the relationship between the implementation of data-driven solutions and the financial performance of SMEs. It can be a source of knowledge for entrepreneurs and managers planning investments in analytical technologies.

Keywords: data-driven organization, SME sector, small and medium enterprises.

Category of the paper: Research paper, viewpoint.

1. Introduction

In the 21st century, amidst the turbulent free market economy, data has become a key resource for companies, often exceeding the value of traditional physical assets. Their importance stems from the growing role of information in strategic decision-making, process optimization, and innovation. Access to precise data enables rapid adaptation to the changing market environment, translating into a competitive advantage and increased enterprise value.

Data from OpenAlex indicate that the topic of "data-driven organization" is enjoying growing interest in the scientific community. A total of 5377 publications related to this topic were identified. Articles constitute the largest part of the research material (3466), but there are also a significant number of dissertations (476), book chapters (346), and preprints (300). The dominant areas of research are big data and business intelligence (256 results), digital transformation in industry (64), quality and supply chain management (54), as well as HR and AI technologies. Geographically, the most research activity is demonstrated by institutions in the United Kingdom (1074), Australia (473) and the United States (468). The most frequently used keywords include "thematic analysis", "empirical research" and "business intelligence", confirming that the dominant trend is empirical research and qualitative analyses, focused on the use of data in a managerial and organizational context¹.

A search for the phrase "data-driven organization in SMEs" on OpenAlex reveals a significantly smaller number of publications – just 140. This shows that while the general topic of data-driven organizations is gaining interest, its application in the context of the SME sector remains niche. Among the publication types, academic articles predominate (69), and the topics focus primarily on entrepreneurship, big data, knowledge management, and digital transformation in companies. It is worth noting that the largest number of studies comes from universities in the UK, Australia, Germany, and Nigeria, indicating moderate but geographically diverse interest in this topic².

Valuable information on data-driven organization considerations is provided by a report generated using the Elicit platform (Table 1).

¹ https://openalex.org/works?page=1&filter=title_and_abstract.search:data-driven+organisation&group_by=publication_year,open_access.is_oa,primary_topic.id,authorships.institutions.lineage,type,authorships.countries,keywords.id

² https://openalex.org/works?page=1&filter=title_and_abstract.search:data-driven+organisation+in+SME&group_by=publication_year,open_access.is_oa,primary_topic.id,authorships.institutions.lineage,type,authorships.countries,keywords.id

Table 1.*A review of the literature on data-driven organization*

Study	Study focus	Industry sector	Digital solutions implemented	Financial metrics used
Okeke et al., 2024	Impact of data-driven financial management systems on SME performance	Manufacturing, Retail, Services	Enterprise Resource Planning (ERP) systems	Revenue change, profitability ratios, financial liquidity
Pfister, Lehmann, 2023	Digital transformation and ROI of data analytics in SMEs	Not specified (German SMEs)	Data analytics tools	Revenue, revenue per customer, ROI
Klimecka-Tatar, Ingald, 2022	Digitization and process analysis in manufacturing SMEs	Manufacturing (not specified)	Value stream mapping, Total Productive Maintenance (TPM) indicators	process improvement
Surma-Syta, Majek, 2021	Use of accounting information in SME financial management	General SMEs (Poland)	Accounting data usage	Return on Equity, debt collection
Boichuk, 2020	Industry 4.0 solutions in automotive SME	Automotive (Poland)	Automated machines, cyber-physical systems, cloud services	productivity improvement
Pech, Vrchota, 2020	Industry 4.0 implementation classification in SMEs	Manufacturing (Czech Republic)	IT infrastructure, digitalization, sensors, Big Data tools	implementation level, investment cost
Szopa, Cyplik, 2020	Digital transformation model for SME supply chains	Furniture manufacturing (Poland)	Digital platforms, cloud services, Internet of Things (IoT)	digitization index
Wasiński, 2018	Performance measurement systems and financial results in SMEs	General SMEs (Poland)	Optima (Comarch), Customer Relationship Management (CRM) tools, performance measurement systems	relationship between measurement systems and financial results
Zimon, 2018	Impact of group purchasing organizations on SME financials	Construction wholesalers (Poland)	Central warehouse, procurement strategies	Revenues, costs, profitability and liquidity
Drelichowski, 2012	ERP and Business Intelligence (BI) tool efficiency in micro/small enterprises	Printing (Poland)	Enterprise Resource Planning (ERP) and Business Intelligence (BI) tools	efficiency, success factors

Source: Elicit.

Analysis of the report reveals that research on the concept of data-driven organization in the SME sector covers a wide range of areas. Some focus on the impact of digital financial tools, such as ERP systems and data analytics, on corporate financial performance, while others analyze the broader context of digital transformation, including the implementation of Industry 4.0 solutions and process automation.

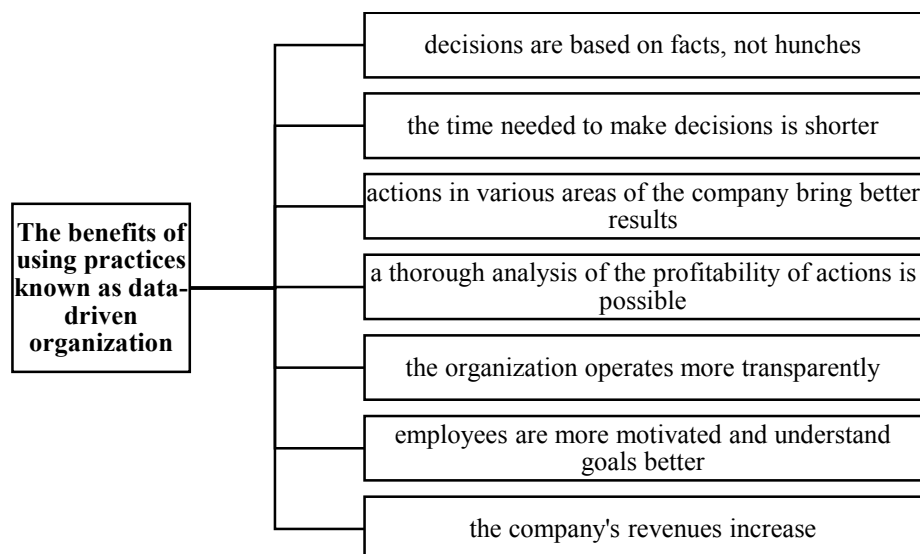
The diversity of industries – from manufacturing, through trade, to services – demonstrates that a data-driven approach is applicable across many sectors (Mandal, 2019). The range of financial metrics used is equally broad, indicating the lack of a single, universal model for assessing the effectiveness of data-driven activities in SMEs (Liu, Bell, 2019; Mehdi, 2018).

There is no single definition of the term "data-driven organization", although there are some characteristic elements. The most important is the conscious use of data by decision-makers – not just its collection. The essence of a data-driven approach is not to gather as much information as possible without putting it to practical use (Klimecka-Tatar, Ingaldi, 2022; Drelichowski, 2012). The key to success is its systematic analysis to achieve the strategic goals of the organization (enterprise) (Cao, Duan, 2017; Liu, Bell, 2019).

In the context of a data-driven organization, we refer to a model in which every decision is made based on analytical data (Surma-Syta, Majek, 2021). This approach means a shift away from basing actions on intuition, subjective opinions, or individual experiences. The implementation of this management model represents a significant organizational transformation, of paramount importance in a dynamic market environment (Klimecka-Tatar, Ingaldi, 2022; Zimon, 2018). It results in greater coordination of activities and a better understanding of shared goals by all teams (Pech, Virchota, 2020). The benefits of properly implemented techniques collectively referred to as data-driven organization are presented in Figure 1.

Figure 1.

The benefits of using practices known as data-driven organization



Source: Based on: Zimon, 2018; Surma-Syta, Majek, 2021; Drelichowski, 2012; Szopa, Cyplik, 2020; Rotella, 2012; McAfee, Brynjolfsson, 2012; Lindgardt et al., 2009; Gawin, Marcinkowski, 2017b.

A data-driven organization is one in which decisions are consistently based on reliable information. A key characteristic of such a company is the widespread belief – at every level, not just among management – that data is reliable, valuable, and forms the basis of action. In the process of transitioning to full analytical maturity, organizations progress through successive stages (Zimon, 2018; Surma-Syta, Majek, 2021; Cheah, Wang, 2017). The first is a complete lack of data – the organization neither possesses nor collects any information about its customers or processes. The second stage, "tracking", is the implementation of tools for basic traffic tracking (this can be data derived, for example, from web analytics tools). The third

stage, "data capture", involves not only collecting data but also ensuring its quality. The company ensures that the data is complete and that the collection systems are properly configured. At the fourth stage, "reporting", the data begins to be used across the organization, by employees from various departments and at various levels – from senior management, through middle managers, to assistants. Reports and dashboards are created for ongoing data visualization and interpretation. The fifth stage, "analysis and insights", is when data is actively analyzed and transformed into specific recommendations. Companies conduct campaign analyses, segment customers, test communication options, and personalize content (Surma-Syta, Majek, 2021; Drelichowski, 2012; Szopa, Cyplik, 2020; Cao, Duan, 2017). The final level is where data supports the functioning of the entire company – from operations, through HR, to management strategy (Szopa, Cyplik, 2020; Gawin, Marcinkowski, 2017a; Osterwalder, Pigneur, 2010).

Data is not only a byproduct of economic processes, but one of the most valuable strategic resources that can determine competitive advantage. Implementing the data-driven organization concept means that enterprise management is based primarily on reliable data analysis, not solely on intuition. Data becomes the foundation for rational decisions, enabling the prediction of market trends, more precise planning of activities, and optimization of operational and financial processes. Systematic data collection, processing, and interpretation enable the creation of advanced predictive models that support management in real-time decision-making. As a result, the organization gains greater flexibility, the ability to immediately respond to changing environments, and the ability to mitigate business risk. Importantly, data-driven management is not limited to large corporations; it also allows small and medium-sized enterprises to better tailor their offerings to customer needs, identify inefficiencies more quickly, and compete more effectively in dynamically developing markets. A data-driven approach therefore fosters an organizational culture in which decisions are objective, transparent, fact-based, and easy to verify, which significantly minimizes the risk of strategic errors and strengthens the long-term stability of the organization (Surma-Syta, Majek, 2021; Drelichowski, 2012; Cao, Duan, 2017).

Data-driven organization in small and medium-sized enterprises (SMEs) is currently the subject of intensive global research. Kasiri, Cirino, and Narimanian (2024) indicate that implementing business analytics and big data tools in American SMEs requires not only analyzing barriers resulting from the size and industry of the enterprise but also considering awareness of new trends and how companies adapt to dynamically changing technologies. Asgary, Ozdemir, and Özyürek (2020) demonstrate that Turkish SMEs perceive global economic, technological, and social threats differently from major global players, which influences their strategic decisions, resource allocation, and risk management plans. Chen, Li, and Zhang (2024) analyze Chinese SMEs operating within digital platforms, emphasizing that the use of data drives the development of dynamic organizational capabilities and supports the implementation of responsible innovation, while regulatory pressures and digital customer

expectations further enhance the effectiveness of these solutions. These studies indicate that regardless of the local context, SMEs face similar challenges related to access to modern technologies, adaptation to analytical trends and risk management, although regional differences shape different implementation strategies and risk perceptions.

This article puts forward the following research hypotheses, which will be verified later in the work:

- H1: Respondents' (entrepreneurs, managers) interest in using a data-driven approach increases with company size (measured by the number of employees).
- H2: Respondents' (entrepreneurs, managers) interest in using a data-driven approach increases with company time on the market.
- H3: Whether implementing data-driven solutions has a positive impact on the company's financial results correlates with company size, measured by the number of employees.
- H4: Employees have only limited knowledge of business data analysis software; there are significant gaps in this area, and this is independent of company size.
- H5: Whether operational employees are involved in data analysis processes or use analysis results does not correlate with company size.

The author verified the hypotheses based on a statistical analysis of the results of his own empirical research (for this purpose, selected methods of descriptive statistics, as well as correlation coefficients, etc., were used).

2. Methods

The survey questionnaire, which forms the basis of the empirical section of this study, was conducted from August 17 to September 4, 2025. Respondents were business owners and executives in SMEs. The questionnaire was prepared using MS Forms. The survey form contained closed-ended, single-choice, and multiple-choice questions, as well as Likert-scale questions. Table 2 summarizes questions included in the self-research questionnaire.

Table 2.
Questions included in the self-research questionnaire

Question number	Question	Answers / Instructions
1	How many people does your company currently employ?	In numbers
2	What industry does your company operate in?	Production/Trade/Services
3	How long has the company been operating on the market?	In years
4	How often is business decision-making in a company based more on data than on intuition?	Please rate on a scale of 1-5 (1 – very rarely, 5 – regularly)

Cont. table 2.

5	To what extent are the following activities undertaken in the enterprise: • Automation of decision-making processes. • Monitoring key, measurable performance and quality indicators. • Integration and analysis of data from various sources. • Sharing data with operational staff as well.	Please rate on a scale of 1-5 (1 – very rarely, 5 – regularly)
6	What areas of the company's operations are analyzed based on measurable data? • HR. • Price calculation. • Financial forecasts, sales forecasts, etc. • Cost analysis. • Staff work efficiency. • KPI performance indicators (e.g. revenue per employee, operating margin level). • Investment profitability analysis. • Creating a company budget.	Please rate on a scale of 1-5 (1 – very rarely, 5 – regularly)
7	Has the implementation of data-driven solutions had a positive impact on the company's financial results (e.g. increased revenue, reduced costs)?	Please rate on a scale of 1-5 (1 – definitely not, 3 – occasionally, 5 – definitely yes)
8	To what extent are the company's management staff able to use business data analysis software? • Microsoft Excel (with Power Query and Power Pivot). • Microsoft Power BI. • Tableau. • Programming languages, including R and Python. • SQL. • Zapier.	Please rate on a scale of 1-5 (1 – no knowledge of the software, 5 – proficient knowledge)
9	Are operational staff involved in data analysis processes or use the results of analyses?	Please rate on a scale of 1-5 (1 – very rarely, 3 – occasionally, 5 – regularly)
10	What are, in your opinion, the barriers to implementing data-driven organisation activities: • Lack of analytical skills among employees. • No time. • Low level of digitization in the company. • Employee resistance. • Lack of appropriate IT tools and systems. • Difficulty integrating data from different sources. • Concerns about data security and confidentiality.	Please rate on a scale of 1-5 (1 – a very strong barrier, 5 – the given factor is not a barrier)
11	Are you planning further investments in the development of analytical systems in the next 12 months?	Yes/No

Source: Own research.

The first set of questions (3 questions) concerned general information about the company, including: the scale of business operations measured by number of employees, company time on the market and the main sector of business activity. The next section, consisting of 9 questions, explored respondents' approaches to implementing solutions collectively referred to as data-driven organizations. A total of 146 completed forms were received.

3. Results

The study allowed us to obtain the following results (selected measures of descriptive statistics – Table 3). These results provide insight into key variables and their distributions within the sample. They serve as a foundation for further analysis and interpretation of the data-driven practices implemented by the SMEs. The detailed descriptive statistics presented in Table 3 help to contextualize the findings and highlight important trends in the dataset:

Table 3.
Survey results (selected measures of descriptive statistics)

	Question number							
	1	2	3	4	5.1	5.2	5.3	5.4
Average	30.16	Production: 19.9% Services: 60.3% Trade: 19.9%	8.31	3.29	2.14	3.23	3.36	3.33
Maximum	99		15	5	3	5	5	5
Minimum	3		2	1	1	1	1	1
1st quartile	16		6	3	2	2	3	2
2nd quartile (median)	23		7.5	3	2	3	3	3
3rd quartile	42		10	4	3	4	4	4
Variance	418.46		11.41	1.29	0.54	1.86	1.58	1.75
Mode	16		7	3	2	4	3	4
Question No	6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.8
Average	2.6	4.48	3.65	4.38	2.77	3.68	3.42	3.14
Maximum	4	5	5	5	4	5	5	4
Minimum	1	1	2	2	2	3	3	3
1st quartile	2	4	3	4	2	3	3	3
2nd quartile (median)	3	5	4	5	3	4	3	3
3rd quartile	3	5	4	5	3	4	4	3
Variance	0.57	0.75	0.38	0.68	0.28	0.37	0.3	0.12
Mode	3	5	4	5	3	4	3	3
Question No	7	8.1	8.2	8.3	8.4	8.5	8.6	9
Average	3.07	3.66	2.72	1.38	1.01	1.04	2.03	2.49
Maximum	5	5	4	4	2	2	4	5
Minimum	1	1	1	1	1	1	1	1
1st quartile	2	3	2	1	1	1	2	2
2nd quartile (median)	3	4	3	1	1	1	2	2
3rd quartile	4	5	4	1.75	1	1	2	3
Variance	1.77	1.15	1.43	0.55	0.01	0.04	0.34	1.44
Mode	2	4	4	1	1	1	2	2
Question No	10.1	10.2	10.3	10.4	10.5	10.6	10.7	11
Average	2.58	2.76	3.11	2.72	2.77	3.23	2.97	Yes: 65,1% No: 34,9%
Maximum	5	5	5	4	4	4	3	
Minimum	1	1	1	2	2	1	2	
1st quartile	2	2	3	2	2	3	3	
2nd quartile (median)	3	3	3	3	3	3	3	
3rd quartile	3	4	3	3	3	4	3	
Variance	1.58	1.4	0.86	0.22	0.26	0.76	0.03	
Mode	3	3	3	3	3	4	3	

Source: Own research.

H1: The interest of respondents (entrepreneurs, managers) in using a data-driven approach increases with company size (measured by the number of employees)

Analysis of the relationship between company size (which the author measures by the number of employees) and the frequency of making business decisions based on data rather than intuition revealed a significant positive Kendall's tau-b correlation of 0.646. Therefore, as the number of employees increases, companies' propensity to use data in their decision-making processes increases.

H2: Respondents' (entrepreneurs and managers) interest in using a data-driven approach increases with the length of a company's market presence

Unlike the previous analysis, where the correlation was strong, this relationship is significantly weaker (Kendall's tau-b correlation of 0.16), meaning that the length of a company's market presence has only a small impact on the propensity to base decisions on data. Nevertheless, this result confirms the hypothesis posed in the introduction, indicating that greater market experience promotes, albeit to a very limited extent, a more frequent use of analyses and facts.

H3: The positive impact of implementing data-driven solutions on a company's financial performance correlates with company size, measured by employee count

Analysis of the relationship between the number of employees and the assessment of the impact of implementing data-driven solutions on financial performance revealed a positive Kendall's tau-b correlation of 0.229. This indicates a moderate, yet noticeable, trend, according to which the positive impact of such solutions is more often observed in larger companies. This indicates that as employment scale increases, the likelihood of effectively utilizing a data-driven approach increases. This result is consistent with the hypothesis posed in the introduction, according to which larger companies can better derive financial benefits from implementing analytical tools.

H4: Employees are only able to use business data analysis software to a limited extent, there are serious gaps in this area and this does not depend on the size of the company

The table below presents the distribution of ratings given in response to question no. 8 (Table 4):

Table 4.

Distribution of answers to question no. 8

Rate	Microsoft Excel (with Power Query and Power Pivot)	Microsoft Power BI	Tableau	Programming languages, including R and Python	SQL	Zapier
1	0.68%	21.92%	74.66%	98.63%	95.89%	15.07%
2	17.81%	23.29%	16.44%	1.37%	4.11%	67.81%
3	21.92%	15.75%	5.48%	0.00%	0.00%	16.44%
4	33.56%	39.04%	3.42%	0.00%	0.00%	0.68%
5	26.03%	0.00%	0.00%	0.00%	0.00%	0.00%
Total:	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Source: Own research.

The highest level of familiarity (score 5) was recorded for Microsoft Excel (26.03% of respondents), although this tool also received a relatively high percentage of average ratings (scores 3 and 4 – a total of 55.48%). Microsoft Power BI received a high percentage of 4 ratings (39.04%), suggesting it is relatively well-known, although there are few experts (0% in the 5 rating). Tableau was dominated by responses indicating lack of familiarity (74.66% – score 1), and a similar situation was observed for programming languages such as R and Python (98.63% – no familiarity) and SQL (95.89% – no familiarity). Zapier, on the other hand, is relatively more likely to receive a basic rating (67.81% – score 2), which may be due to its simpler nature and use in process automation. Overall, the results show that management competencies are mainly focused on Excel and, to some extent, Power BI, while more advanced tools such as Tableau, programming languages, and SQL remain largely unknown.

4. Summary

The implementation of data-driven organizational practices is crucial for small and medium enterprises (SMEs) as it enables them to make informed decisions based on evidence rather than intuition alone. This approach improves operational efficiency, enhances customer insights, and allows SMEs to respond quickly to changing market conditions. Embracing a data-driven culture helps these enterprises gain a competitive edge, optimize resources, and foster sustainable growth in an increasingly digital and complex business environment. Based on theoretical and empirical analysis, the author made the following conclusions:

- Using a data-driven organization allows companies to make more informed decisions, increasing management efficiency and minimizing business risk.
- Small and medium-sized enterprises, despite limited resources, can use data analysis to compete more effectively with larger entities, optimizing processes and better responding to market needs.
- Entrepreneurs and managers' interest in a data-driven approach increases with company size; larger companies are more likely to make data-driven business decisions (Kendall's tau-b = 0.646).
- The length of a company's presence in the market has only a small effect on the increased use of data in decision-making (Kendall's tau-b = 0.16), although the trend is consistent with the hypothesis.
- The impact of implementing data-driven solutions on financial performance is more noticeable in larger companies (Kendall's tau-b = 0.229), suggesting that employment scale favors more effective use of analytics in practice.

- Employee competencies in using data analysis tools are limited and do not depend on company size; Excel is the most familiar, followed by Power BI, while Tableau, SQL, and the R and Python programming languages remain largely unknown.

Based on theoretical and empirical analysis, it was found that a data-driven approach significantly increases management efficiency, minimizes business risk, and allows SMEs to compete more effectively with larger entities by optimizing processes and responding more quickly to market needs. In practice, larger companies achieve clearer financial benefits, although certain limitations must be considered, including the fact that employee competencies in data analysis tools are not always at an adequate level. For practitioners, this means the need for systematic investment in training in advanced analytical tools, developing competencies in data interpretation, and building an organizational culture that supports data-driven decisions. For policymakers and SME support programs, creating initiatives to finance the purchase of analytical tools, as well as organizing dedicated industry training and mentoring tailored to the specifics of the sector, company size, and available human resources, is becoming crucial.

The considerations presented in this paper constitute a starting point for further, in-depth analyses of the phenomenon of adopting a data-driven approach in enterprises. In particular, it seems justified to expand the research perspective to include the variable of business sector. Differences in the methods and scale of data utilization may result not only from the size of the company or its length of operation, but also from the nature of the market environment, regulatory requirements, and the intensity of competition in a given sector. An industry-specific approach would allow for the capture of different patterns of analytical tool implementation, thus providing conclusions with greater application value.

Another area that requires further research is the comparison of SMEs with large companies, both in terms of technological advancement and the organizational culture supporting data-driven decision-making. Such an analysis could reveal differences in resource availability, staff competencies, and the pace of adoption of new technologies. The results of such research would be of significant importance not only to the academic community but also to management practitioners, providing them with reliable guidance on the effective implementation of data-driven strategies in various types of organizations.

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