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MAŁGORZATA MAGDZIARCZYK

kancelaria@magdziarczyk.pl
Opole University of Technology. Faculty of Economics and Management
7 Luboszycka St., 45-036 Opole, Poland
ORCID ID: http://orcid.org/0000-0003-1503-8469

KATARZYNA WIDERA

k.widera@po.edu.pl
Opole University of Technology. Faculty of Economics and Management
7 Luboszycka St., 45-036 Opole, Poland
ORCID ID: http://orcid.org/0000-0003-0651-8049

Analysis of the Characteristics Conditioning the Implementation of the GDPR by Micro, Small and Medium-Sized Entrepreneurs

Keywords: change management; personal data; GDPR

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Abstract

Theoretical background: As of 25 May 2018, every entrepreneur doing business in the EU is obliged to adapt the operation of the business to the requirements under Regulation (EU) 2016/679 of the European Parliament and of the Council on the protection of individuals with regard to the processing of personal data and on the free movement of such data and repealing Directive 95/46/EC (General Data Protection Regulation) (hereinafter: GDPR). The objective of the EU is to provide uniform protection for the personal data of individuals (hereinafter: personal data) residing in the EU. Entrepreneurs with larger than medium-sized operations have successfully adapted their operations to comply with the legal requirements.

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Data: 30/10/2026 22:20:28

However, it has been observed that micro, small, and medium-sized entrepreneurs have faced challenges in implementing the changes brought about by the GDPR regulation.
Purpose of the article: The paper aims to answer the question of what is the relationship between the adaptation of micro, small and medium-sized enterprises from the Opolskie Voivodeship to the GDPR and characteristics of the entrepreneur such as the size of the enterprise, the location of the entrepreneur, the predominant activity and the gender of its managers.
Research methods: This research paper provides an analysis of the outcomes of an empirical study. The study was conducted using a questionnaire technique on a sample of 425 micro, small, and medium-sized entrepreneurs from the Opolskie Voivodeship. It aimed to investigate the influence of particular individual characteristics of an entrepreneur on the ability of their enterprise to adapt to the legal environment on the example of the GDPR. The study selected four characteristics for analysis: enterprise size, entrepreneur's location, prevailing economic activity, and gender of enterprise managers. Hypothesis verification was performed using Pearson's non-parametric χ^2 independence test and the V-Cramér correlation coefficient. A significance level of 0.05 was adopted.
Main findings: Based on the analysis, it has been confirmed that the adaptation of micro, small and medium-sized businesses from Opolskie Voivodeship to comply with the GDPR is subject to the unique characteristics of the entrepreneur. However, the verification of the hypothesis that the characteristics determining enterprise adaptation to GDPR by micro, small, and medium-sized entrepreneurs in the Opolskie Voivodeship are their size, predominant business activity, location, length of business activity and gender of enterprise managers, showed that it is only partially correct.

Introduction

The Regulation (EU) 2016/679 of the European Parliament and of the Council, known as the General Data Protection Regulation (GDPR), came into force on 25 May 2018. It compels entities processing personal data of natural persons residing in the EU to significantly change their approach towards processing and protecting such data against unauthorized data breaches. To a great extent, the GDPR has affected entrepreneurs who, almost without exception, process personal data in the course of their business activities. Within the meaning of the GDPR, personal data is any information about an identified or identifiable natural person (the data subject). The catalogue of personal data is therefore not a closed catalogue. It is important to consider several types of personal data beyond the obvious ones such as first and last name, identification number (e.g. PESEL – Polish Resident Identification Number) or telephone number. These include internet identifier, location data, bank account number, education, consumer behavior, and factors that define a person's physical, physiological, genetic, mental, economic, cultural or social identity. In other words, any information that relates to a natural person and makes it possible to identify that person should be considered personal data (Krzysztofek, 2016; Litwiński et al., 2018; Magdziarczyk, 2018). Processing refers to any operation that involves personal data, whether it is done manually or by automated means. It includes activities such as collecting, recording, organizing, storing, adapting, altering, retrieving, viewing, using, transmitting, disclosing, disseminating, aligning, combining, restricting, erasing, or destroying personal data (Błażewski, 2018; Magdziarczyk, 2022). Even though the EU legislature did not mandate a single system for processing and safeguarding

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Data: 30/10/2026 22:20:28

personal data, it established consistent principles for all organizations that handle such data. These principles form the basis for the procedures entities should follow when processing and protecting such data and help prevent unauthorized breaches. The handling of personal data should follow three main principles: Firstly, it must comply with the law. Secondly, it should consider the interests of those handling the data as well as the reasonable expectations of the individuals whose data is being processed. Thirdly, all information and communications related to the handling of such data should be easily accessible, understandable, and presented in a clear and simple language. Moreover, personal data should only be collected for specific, explicit and legitimate purposes. The personal data collected must be adequate and limited to the scope that is necessary. It should be accurate and it should be kept in a form that does not allow the identification of the data subject. Lastly, the personal data processor should respect the principle of data integrity and confidentiality, which obliges the processor to apply technical and organizational measures for the protection of personal data appropriate to the potential risks.

The vast majority of entrepreneurs, over 90%, both in Poland and in the rest of the EU are micro, small and medium-sized entrepreneurs. They are affected by the GDPR to the same extent as entrepreneurs from outside this group, who, for ease of reference, can be referred to as large entrepreneurs. While large entrepreneurs, by virtue of their financial resources, human resources and organisational capabilities, effectively implement institutional changes in the company, this ability seems to be missing in many cases for micro, small and medium-sized entrepreneurs. Due to the larger number of micro, small, and medium-sized entrepreneurs compared to large ones, it can be argued that their failure to comply with GDPR requirements results in a significant lack of personal data protection. This lack of protection increases the likelihood of unlawful data breaches. In other words, it is only by verifying the alignment of the processing of personal data in micro, small and medium-sized entrepreneurs with the GDPR that it becomes apparent whether personal data is protected at a level in line with the legislator's intention. A survey conducted in 2021 among micro, small and medium-sized entrepreneurs in the Opolskie Voivodeship to assess the adaptation of their enterprises to the GDPR gave a result indicating that these entrepreneurs failed to cope with the implementation of the changes enforced by the GDPR. There may be many reasons for this situation. Some of them may stem from the individual characteristics of an entrepreneur. Therefore, it is important to analyze if certain characteristics of entrepreneurs, such as the size, the subject, the location of business, and the duration of their business operations, affect the implementation of GDPR. The choice of these characteristics is not accidental, they are the most common basis for categorizing entrepreneurs if only by the Central Statistical Office. The publication furthermore examines the impact of the gender of business managers on the level of the GDPR implementation in the company. Numerous publications can be found in the literature indicating the difference between women and men in their approach to business (organization) management (PARP, 2022; Kaźmierczak & Łabuz, 2018; Biernat et al., 2012).

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Data: 30/10/2026 22:20:28

For the sake of consistency in the conceptual aspect, it should be indicated that the notion of entrepreneur in the paper is understood in accordance with Article 1(1) of the Act of 6 March 2018 Law on entrepreneurs (Polish Journal of Laws of 2023, item 221). The concepts of micro, small and medium entrepreneur remain in line with Article 7 of the aforementioned Act, and the concept of enterprise is based on the definition contained in Article 55^1 of the Act of 23 April 1964 Civil Code (Polish Journal of Laws of 2023, item 1610), taking into account that its structure, in addition to tangible and intangible components, also includes human resources.

Literature review

Entrepreneurs operating their business within the European Union and handling personal data are required to take appropriate measures to adapt to the changed legal environment, regardless of their unique characteristics. This is in accordance with the expectations of the legislator. These actions should constitute a coherent process of implementation of the so-called institutional change in the company. The theory of institutional change, is not very widely described in the literature. It points to legal norms as one of the important factors in the entrepreneur's macro-level environment, forcing the need to implement changes in the enterprise (Selznick, 1996; David et al., 2019). Indeed, the entrepreneur is not only subject to the pressures of the environment in terms of technical and economic requirements, but also in terms of values and social regulations (Powell & DiMaggio, 1991; Dacin et al., 2002). Given that it is the provisions of the law that determine the extent of freedom of business activity and set the rules for its initiation, conduct and termination, the entrepreneur's failure to adapt to the legal environment in which they operate poses a significant threat to their livelihood. Institutional change affects the operational level of the enterprise.

The issue of personal data has been the subject of research in many academic and popular publications, particularly since the entry into force of the GDPR (Hoofnagle et al., 2019). The most discussed issue seems to be the protection of personal data, due to the ever-increasing number of cases of theft and loss of such data. The absolute need to protect personal data is pointed out by Sobczak. The activities related to the protection of personal data undertaken in connection with their processing within a company are presented by this author as a process of personal data protection management (Sobczak, 2016). The protection of personal data, on the other hand, enforces the need to assess the risk of breach and loss of such data. This topic is addressed, among others, by Izydorczyk (2017), Gumlarz and Izydorczyk (2021), Quelle (2017) as well as Kwapisz and Pelikant (2019). Gumlarz and Izydorczyk argue that the risk assessment should serve three basic purposes: a) a verification of how to meet the requirements of the GDPR; b) a verification of what means to use to demonstrate that the requirements of the GDPR have been met; c) a verification of the risk assessment procedure itself (Gumlarz & Izydorczyk, 2021). It is worth

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Data: 30/10/2026 22:20:28

noting that the subject of analysis in the literature is not only the risk assessment of a personal data breach at the stage of data processing, but also at the stage of design by the processor (controller) of the means of processing such data (Błoński & Otmianowski, 2020; Quelle, 2015). The concept of the protection of personal data in the phase of designing the means of processing such data, known as "privacy by design", was first presented by Anna Cavoukaian at the 31st International Conference of Data Protection and Privacy Commissioners in 2009. The literature prominently presents considerations about implementing GDPR methods and selecting appropriate technical and organizational measures to protect personal data from potential risks. Effective methods and tools to help implement the GDPR are pointed out, for example, by Martin and Kung (2018) as well as Gawroński (2018).

So far, however, there is no broader discussion of the actual level of adaptation of businesses to the requirements of the GDPR. Research aimed at assessing how businesses have implemented the change enforced by the GDPR is fragmentary at both national and EU level. A study was conducted one year after the GDPR was implemented, examining small businesses across several EU countries. The results of the survey were published by GDPR.eu. However, only seven hundred and sixteen small entrepreneurs from four EU countries took part in this survey: Spain, the UK (then still a member of the EU), France and Ireland. The results of this survey showed that more than half of the entrepreneurs surveyed were processing personal data in complete disregard of the guidelines under the GDPR, which in practice meant that personal data was not protected by these entrepreneurs in a manner appropriate to the potential risks (GDPR.eu, 2019). Interestingly, statements from entrepreneurs who had implemented the GDPR indicated that their main motivator for taking the necessary adaptation measures was the fear of high financial penalties.

A similar study over the same time period was conducted by Barnard-Wills and colleagues. The group of entrepreneurs given the survey was even smaller, with only 22 entrepreneurs classified as micro, small and medium entrepreneurs. These entrepreneurs came from Lithuania, Greece, Belgium, Malta, Cyprus, Denmark, Ireland and Spain. It appeared that almost half of the entrepreneurs surveyed had not made any efforts to implement the changes enforced by the GDPR in the company (Barnard-Wills et al., 2019). Also described in the literature is a study conducted by Zanker et al., which included 307 entrepreneurs from eight EU countries: Bulgaria, the Czech Republic, Germany, France, the UK (then an EU member), Poland, Slovakia and Spain. The authors of the research aimed to verify entrepreneurs' knowledge of the GDPR and the implementation of the resulting rules in their companies. Instead, the analysis of the results of this research showed that the majority of the entrepreneurs surveyed presented a relatively high level of awareness of the GDPR. These entrepreneurs paid particular attention to ensuring the security of personal data processing in IT systems (Zanker et al., 2021).

The most recent research on the adaptation of enterprises to the GDPR, a description of which can be found in the literature, was conducted in 2021 on a sample of 425

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Data: 30/10/2026 22:20:28

micro, small and medium-sized entrepreneurs from the Opolskie Voivodeship. The aim of the research was to answer the question at what level in the surveyed enterprises the processed personal data is protected, in the context of the requirements under the GDPR. Unfortunately, the analysis of the results of this survey did not give reasons for optimism, it turned out that in most cases the surveyed entrepreneurs did not apply technical and organizational measures for the protection of these data appropriate to the risks. They also showed low awareness of the GDPR regulations (Magdziarczyk, 2023).

So far, the literature lacks the analysis of which individual characteristics of an entrepreneur significantly affect their ability to adapt to the legal environment.

Research methods

Entrepreneurs are often categorized based on their individual characteristics in statistical surveys. These characteristics may include the size of their enterprise, the location of their seat, the predominant economic activity they engage in, the duration of their business, the legal form of their business, or the gender of their managers. These characteristics not only individualize the entrepreneur, but can also significantly affect the entrepreneur's ability and flexibility to adapt the business to the macro-level environment, and one of the elements creating this environment is the legal regulations.

The study aims to determine the unique characteristics of micro, small, and medium-sized entrepreneurs in Opolskie Voivodeship that influence their compliance with GDPR. The following research hypotheses were formulated:

H1. The adaptation to the requirements of the GDPR of micro, small and medium-sized enterprises from the Opolskie Voivodeship is determined by the individual characteristics of the entrepreneur.

H2. The characteristics conditioning the adaptation of the enterprise to the GDPR by micro, small and medium-sized entrepreneurs from the Opolskie Voivodeship are: the size of the conducted enterprise; the subject of the predominant business activity; the location of the seat; the duration of the business activity; the gender of the persons managing the enterprise.

The hypotheses have been verified using empirical data obtained from a quantitative survey conducted in the first quarter of 2021. The survey was conducted using a questionnaire technique among micro, small, and medium-sized entrepreneurs with registered offices in the Opolskie Voivodeship. The choice of the Opolskie Voivodeship as the survey area was determined by its structure in terms of the size of entrepreneurs, which turned out to be almost identical to the structure of entrepreneurs in Poland. As the survey was conducted in the first quarter of 2021, the last available data on the structure of entrepreneurs in the Opolskie Voivodeship and in Poland was from 2020. A comparison of the structure of entrepreneurs in Poland and in the Opolskie Voivodeship is presented in Table 1.

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Data: 30/10/2026 22:20:28

Table 1. Structure of entrepreneurs in 2020 in Poland and in the Opolskie Voivodeship

Structure of entrepreneurs in 2020			
Opolskie Voivodeship		Poland	
micro-entrepreneurs	96.28%	micro-entrepreneurs	96.43%
small entrepreneurs	3.05%	small entrepreneurs	2.89%
medium-sized entrepreneurs	0.59%	medium-sized entrepreneurs	0.59%
large entrepreneurs	0.08%	large entrepreneurs	0.10%

Source: Authors' own study based on data available at: www.bdl.stat.gov.pl

To collect empirical data, a standardized questionnaire was utilized, consisting of closed questions with a request for completeness from respondents (Koniarek, 1972). The survey questionnaire was only available in electronic version and could only be completed electronically (online) using either computer or mobile devices. The data collection process was based on the licensed, paid Webankieta system. A total of 425 correctly completed survey questionnaires were collected. The selection of entrepreneurs – respondents to the survey – was quota-random. The research sample was constructed on the basis of data obtained from the Local Data Bank in order to meet the requirement of representativeness. Its detailed characteristics are presented in Table 2.

Table 2. Characteristics of the research sample

Category	Number of entrepreneurs in the Opolskie Voivodeship	Minimum number by category	Number of correctly completed questionnaires collected
micro-entrepreneurs	101,757 (96.36%)	369	375 (88.23%)
small entrepreneurs	3,228 (3.06%)	12	37 (8.71%)
medium-sized entrepreneurs	625 (0.59%)	2	13 (3.06%)
	Total number of entrepreneurs: $N = 105{,}610$	Minimum total sample size: $n = 383$	425 (100%)

Source: Authors' own study based on data published at: www.bdl.stat.gov.pl

In order to verify the correctness of the formulated hypotheses, only the responses of entrepreneurs who rated their enterprises as sufficiently adjusted to the GDPR requirements were analyzed. There were 300 such entrepreneurs. The analysis of the survey results was carried out using the Statistica PL statistical software. The response cafeterias for the questions in the survey questionnaire allowed respondents' answers to be measured on a rank or nominal scale, which translated into the type of statistical tools used. The variables used in the analysis were selected questions from the survey questionnaire. A non-parametric test based on the χ^2 Pearson statistic was used to verify the relationship between variables measured on a rank or nominal scale. This test verified the hypothesis that there is no statistically significant relationship between the selected characteristics, against the alternative hypothesis that such a relationship exists. If a statistically significant relationship was confirmed,

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Data: 30/10/2026 22:20:28

a V-Cramér coefficient of convergence was additionally calculated to indicate the strength of the relationship. The distribution of responses by categories of selected characteristics individualizing the entrepreneurs was shown on box diagrams of the quartile/median/quartile type appropriate to the statistical test used. In addition to the median values, the mean values are also shown to better illustrate the diversity of respondents' (entrepreneurs') answers.

Results

One of the basic characteristics individualizing an entrepreneur is the size of the company he or she runs. The EU has divided entrepreneurs into micro, small, medium and other based on their average annual employment and annual net turnover. Those other entrepreneurs who qualify neither as micro, nor as small or medium-sized entrepreneurs are referred to in the literature as large entrepreneurs (this nomenclature, however, does not follow directly from the law). The size of the entrepreneur translates into its financial and organizational capabilities, so it was appropriate to verify whether this characteristic affects the adaptation of the company to the legal environment in the context of the requirements arising from the GDPR. Entrepreneurs participating in the survey were asked to assess to what extent they believe the operation of their businesses is compliant with the GDPR regulations. Entrepreneurs were able to select three answers: sufficient, good or very good. These responses were then cross-referenced with the responses to the question on the size of the entrepreneur. The distribution of the surveyed entrepreneurs' responses to the question on their assessment of the implementation of the GDPR regulations in their businesses categorized by entrepreneur size is shown in Table 3, Table 3.1 and Figure 1.

Table 3. Distribution of surveyed entrepreneurs' responses to the question on their assessment of the implementation of the GDPR regulations in their companies, categorized by size of the surveyed entrepreneurs

Assessment of the GDPR implementation in the company by the entrepreneur	Size of the entrepreneur			Row in total
	micro 0–9	small 10–49	medium 50–249	
Sufficient	93	13	2	108
Good	79	17	1	97
Very good	79	6	10	95
Total	251	36	13	300

Source: Authors' own study.

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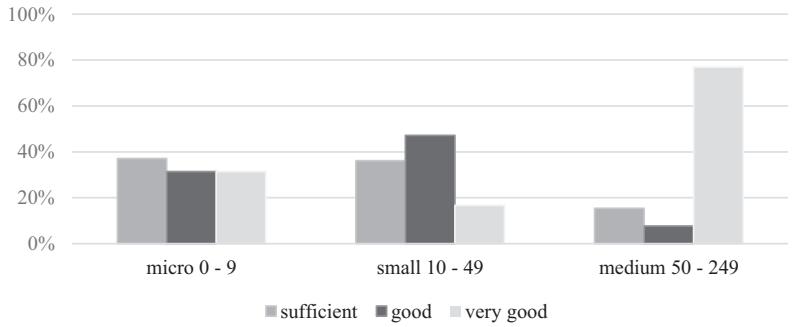


Figure 1. Entrepreneurs' assessment of the GDPR implementation in the company versus the size of the surveyed entrepreneurs

Source: Authors' own study based on survey conducted.

Table 3.1. Values of statistics for assessing the dependence of characteristics: GDPR implementation in the company versus the size of the surveyed entrepreneurs

	Chi-squared	df	*p*-value
Pearson's chi-squared	17.5477	4	0.0015
Cramér's V	0.1710		

Source: Authors' own study.

The analysis of the answers obtained and the values of the statistics from Table 3.1 showed that the size of the entrepreneur significantly differentiates the assessment of the implementation of the GDPR regulations in the enterprise, as this is indicated by the Pearson statistic value of $\chi^2 = 17.548$ and the corresponding p-value = 0.002 < 0.05. There is therefore a statistically significant relationship between the entrepreneur's assessment of the level of GDPR implementation in the company and the size of the company. As the value of the V-Cramér's coefficient can oscillate in the range (0;1), the obtained value of 0.1710 indicates the relatively low strength of the correlation of the studied characteristics. Analyzing Figure 1, it can be seen that a medium-sized entrepreneur assesses the adaptation of their enterprise to the requirements of the GDPR significantly better than a micro-entrepreneur. Figure 2 displays the mean and median values of respondents' answers on GDPR implementation in their enterprises based on their size. Due to the variation in the size of the micro, small and medium-sized entrepreneur categories (resulting from the structure of the survey sample) in Figure 2, as well as: 4, 6, 8 and 10, not only the mean values, but also the median values of the answers on the assessment of the implementation of the GDPR in companies are illustrated. These figures represent the central tendencies of distribution based on surveyed entrepreneur characteristics.

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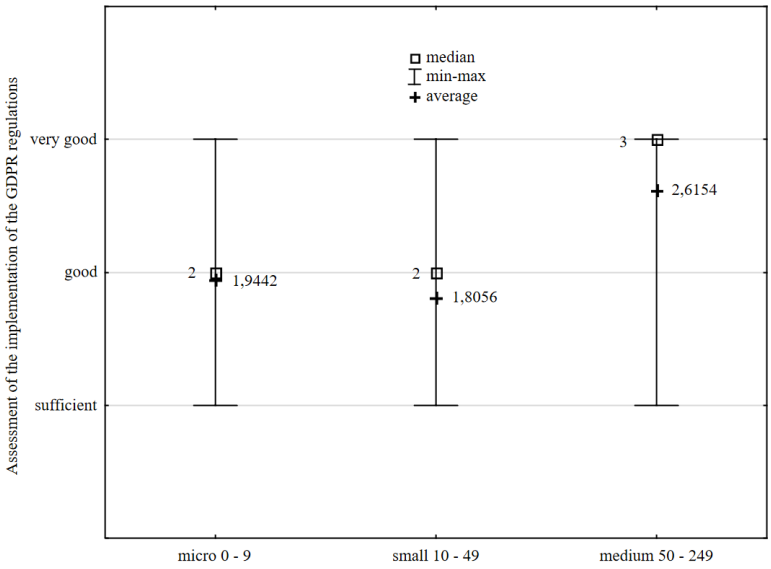


Figure 2. Mean and median values of the surveyed entrepreneurs' responses on the assessment of the implementation of the GDPR in their companies against their size

Source: Authors' own study.

Considering the median value of the responses, the lowest (below a good rating) rating of the implementation of the GDPR in their enterprises is given by small entrepreneurs, and the highest (above a good rating) by medium-sized entrepreneurs. According to the median values, it can be observed that medium-sized entrepreneurs rate the implementation of GDPR in their companies very well, which is the highest rating. On the other hand, micro and small entrepreneurs rate it as good. The median values represent the rating given by at least half of the respondents in a given category.

Another characteristic individualizing the entrepreneur is the predominant economic activity. It determines in the first place what kind of personal data the entrepreneur processes and whether these are sensitive data (special categories of data). The categories of processed personal data imply, in turn, what technical and organizational measures for personal data protection the entrepreneur should implement in the enterprise. The responses of the surveyed entrepreneurs to the question on their assessment of the implementation of the GDPR provisions in their businesses were contrasted with the responses of these entrepreneurs to the question on their predominant business activity. The predominant economic activity is the activity that has the largest share in the entrepreneur's overall activity as measured by the criterion of sales and number of employees (Ordinance of the Council of Ministers of 30 November 2015…). The result of this compilation is shown in Table 4 and Figure 3 and Figure 4.

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Data: 30/10/2026 22:20:28

Table 4. Distribution of surveyed entrepreneurs' responses concerning their assessment of the GDPR implementation in their companies versus their prevailing economic activity (industries)

Assessment of the GDPR implementation in the company by the entrepreneur	Predominant economic activity (industry)				Row in total
	Services	Consulting	Production	Sales	
Sufficient	66	3	12	27	108
Good	63	7	11	16	97
Very good	59	4	12	20	95
Total	188	14	35	63	300

Source: Authors' own study.

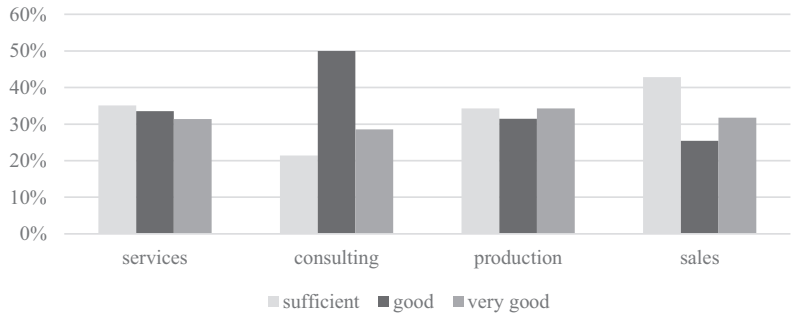


Figure 3. Surveyed entrepreneurs' assessment of the GDPR implementation in the company versus the prevailing business activity of the surveyed entrepreneurs

Source: Authors' own study.

The type of predominant business activity of the entrepreneur (industry) therefore does not significantly differentiate the entrepreneurs' assessment of the implementation of the GDPR regulations in the company. This is indicated by the value of the Pearson statistic $\chi^2 = 4.2203$ and the corresponding p-value = 0.6469 > 0.05. This means that there is no dependence between the assessment of the implementation of the GDPR regulations in the company and the predominant business activity of the entrepreneur. However, when analyzing Figure 3, it can be seen that in the case of consulting-based business activities, the majority of entrepreneurs rate the implementation of the GDPR regulations in their businesses as good. In the case of a sales-based business, on the other hand, the largest number of entrepreneurs rated the implementation of the GDPR regulations in their businesses as sufficient. Figure 4 shows, in turn, the mean and median values of the respondents' answers to the question on the assessment of the implementation of the GDPR regulations in their businesses against the predominant business activity (industry) of the entrepreneur. Entrepreneurs surveyed, who are primarily engaged in consulting, rated the implementation of GDPR provisions in their businesses slightly above good. However, entrepreneurs who are primarily engaged in sales rated the GDPR implementation in their businesses below good. An analysis of how the implementation of the GDPR

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is rated by at least half of the respondents in a given category (median) shows that, regardless of industry, all entrepreneurs rate the implementation of the GDPR as good.

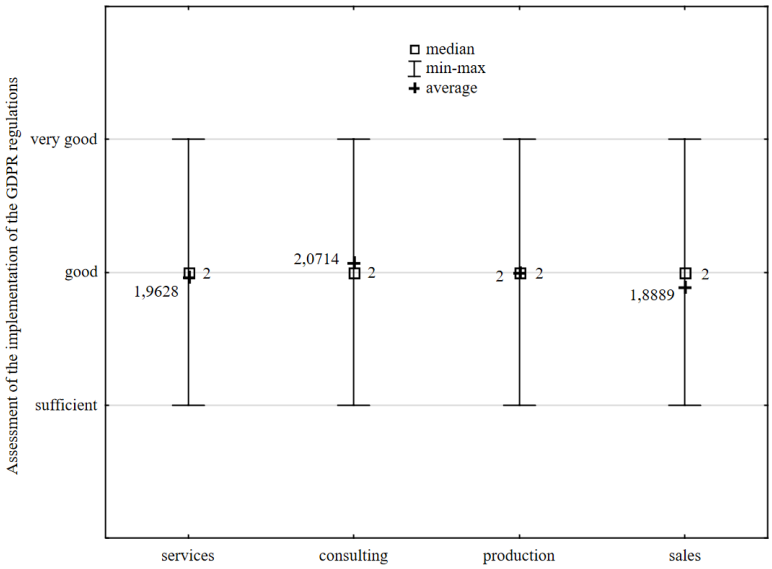


Figure 4. Mean and median values of the surveyed entrepreneurs' responses concerning the assessment of the implementation of GDPR in their companies versus the type of their prevailing economic activity (industries)

Source: Authors' own study.

Another feature that may influence an entrepreneur's approach to changes forced by the legal environment is also his or her seniority as an entrepreneur (experience acquired as an entrepreneur). In order to verify this on the example of the GDPR, the answers of the surveyed entrepreneurs to the question on their assessment of the implementation of the GDPR regulations in their companies were juxtaposed with the answers on their seniority in business. The result of this juxtaposition is included in Table 5, Table 5.1, Figure 5 and Figure 6.

Table 5. The distribution of surveyed entrepreneurs' responses concerning their assessment of the GDPR implementation in their companies versus the length of time they have been in business

Assessment of the GDPR implementation in the company by the entrepreneur	Time in business				Row in total
	up to 2 years	2 to 4 years	4 to 6 years	6 years and over	
Sufficient	14	22	17	55	108
Good	27	18	13	39	97
Very good	13	12	12	58	95
Total	54	52	42	152	300

Source: Authors' own study.

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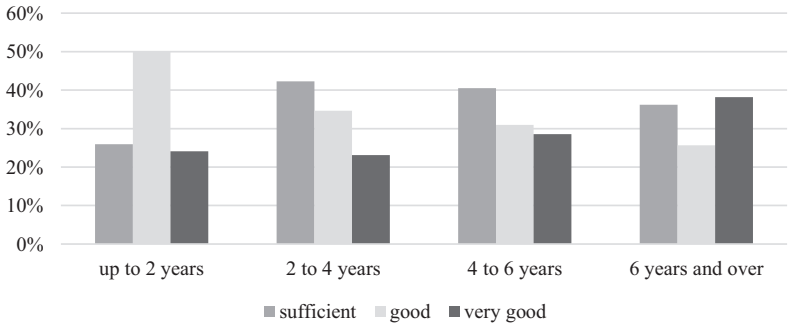


Figure 5. Surveyed entrepreneurs' assessment of the implementation of GDPR regulations in the company versus the length of time they have been in business

Source: Authors' own study.

Table 5.1. Values of statistics for assessing the dependence of characteristics: assessment of the GDPR implementation in the company, and the length of time the entrepreneurs have been in business

	Chi-squared	df	*p*-value
Chi^2 Pearson	14.0924	6	0.0286
Cramér's V	0.1534		

Source: Authors' own study.

Based on the analysis of the values of the statistics in Table 5.1, it can be concluded that the length of time an entrepreneur has been in business significantly differentiates the assessment of the implementation of the GDPR regulations in their company, this is indicated by the Pearson's statistic value of $\chi^2 = 14.0924$ and the corresponding p-value = 0.0286 < 0.05. Thus, there is a statistically significant relationship between the assessment of implementation of GDPR regulations in a company and the seniority of the entrepreneur. The obtained value of the V-Cramér coefficient of 0.1534 indicates a relatively low strength of interdependence of the studied characteristics.

Entrepreneurs who had been in business for 2–6 years generally rated the implementation of GDPR regulations in their companies as sufficient. However, those who had been in business for up to 2 years rated the implementation of GDPR regulations as good. Figure 6, shows the mean and median values of the responses of the surveyed entrepreneurs to the question on the assessment of the implementation of the GDPR regulations in their businesses versus the length of time these entrepreneurs have been in business.

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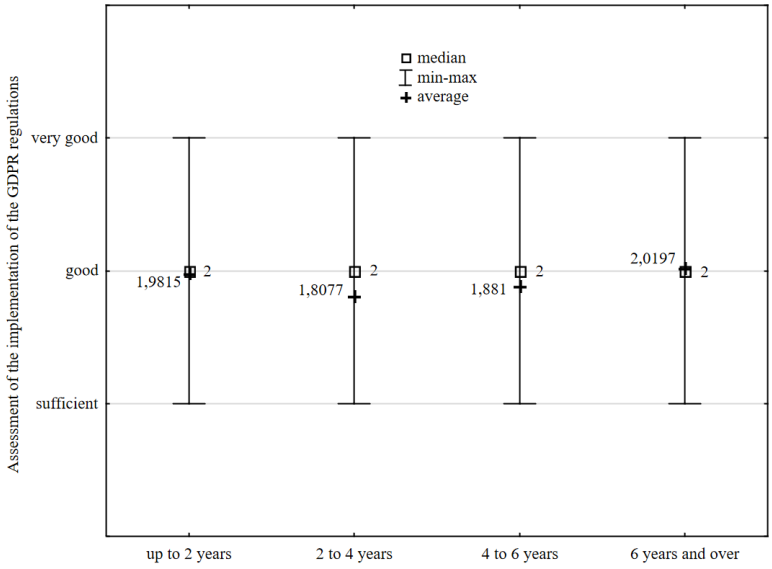


Figure 6. Mean and median values of the surveyed entrepreneurs' responses to the question on their assessment of the GDPR implementation in the company versus the time they have been in business

Source: Authors' own study.

On average, the implementation of GDPR regulations in the company was rated highest (above a good rating) by entrepreneurs who have been in business for 6 years and longer. The remaining surveyed entrepreneurs rated the implementation of the GDPR regulations in their businesses below a good rating. An analysis of the information on how the implementation of the GDPR is rated by at least half of the surveyed entrepreneurs in a given category (median) shows that, regardless of the length of time in business, all entrepreneurs rate the implementation of the GDPR as good.

Verification was conducted to determine whether the location of an entrepreneur's seat affects their ability to adapt their company to GDPR requirements. To this end, the results of the surveyed entrepreneurs' responses to the question on the assessment of the implementation of the GDPR regulations in their businesses were compared with the responses to the question on where these entrepreneurs are based – whether it is a village or a small, medium or large city. The size of the cities was determined based on their population. The scale of city size was based on guidelines from the Central Statistical Office. The result of this comparison is presented in Table 6 and Figure 7 and Figure 8.

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Data: 30/10/2026 22:20:28

Table 6. Distribution of surveyed entrepreneurs' responses concerning the assessment of the implementation of the GDPR regulations in their companies against the their location

Assessment of the GDPR implementation in the company by the entrepreneur	Place of business				Row in total
	village	city			
		under 20,000	20,000–100,000	100,000 and over	
Sufficient	50	22	17	19	108
Good	41	23	14	19	97
Very good	41	17	17	20	95
Total	132	62	48	58	300

Source: Authors' own study.

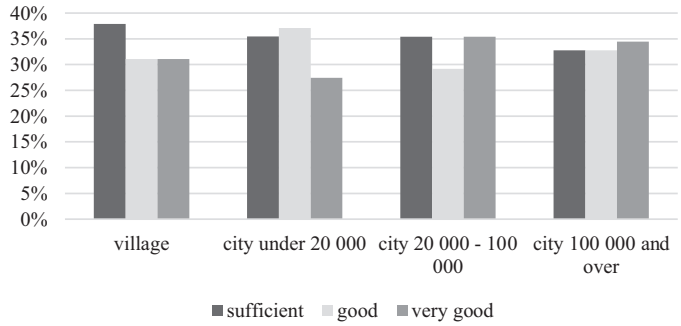


Figure 7. Surveyed entrepreneurs' assessment of the GDPR implementation in the company versus their location

Source: Authors' own study.

It appears that the place of business for the entrepreneurs surveyed does not significantly differentiate the assessment of the implementation of the GDPR regulations in their companies. This is indicated by the Pearson's statistic value $\chi^2 = 1.6881$ and the corresponding p-value = 0.9461 > 0.05. Thus, there is no dependence between the entrepreneur's assessment of the implementation of the GDPR regulations in the enterprise and the place of business of this entrepreneur. The mean and median values of entrepreneurs' responses to the GDPR implementation question are shown in Figure 8. On average, the highest (slightly above a good rating) assessment of the GDPR implementation in the enterprise was given by entrepreneurs operating in cities with a population of 20,000 or more. Based on the analysis of information gathered from surveyed entrepreneurs on their assessment of GDPR implementation in their respective enterprises, it was found that at least 50% of respondents in each category (median) rated their GDPR implementation as good.

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Data: 30/10/2026 22:20:28

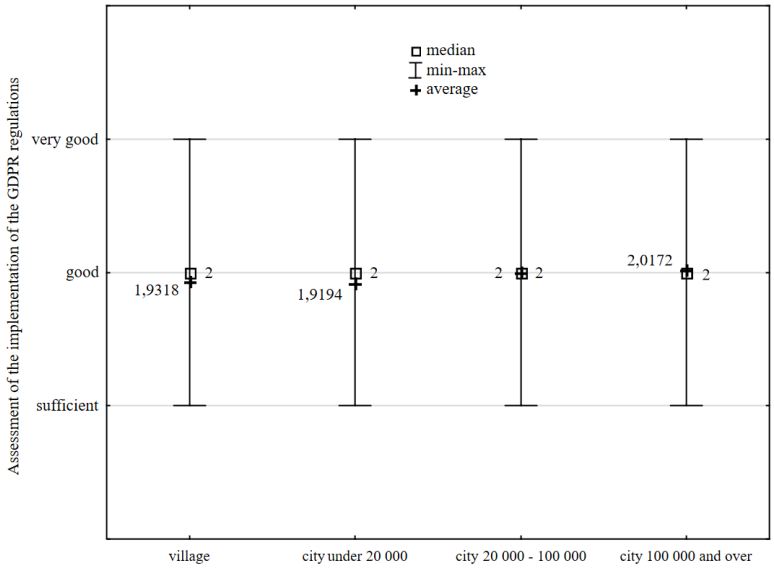


Figure 8. Mean and median values of the surveyed entrepreneurs' responses concerning their assessment of the GDPR implementation in the company versus their location

Source: Authors' own study.

The last characteristic analyzed that may individualize the entrepreneur and be relevant in assessing the company's adaptation to the GDPR requirements was the gender of the persons who manage the company. Table 7, Figure 9, and Figure 10 present an analysis of the responses provided by the surveyed entrepreneurs. The analysis compares their assessment of the implementation of the GDPR provisions in their company with the gender of the persons who manage the company.

Table 7. Distribution of entrepreneurs' GDPR compliance based on gender of managers

Assessment of the GDPR implementation in the company by the entrepreneur	Gender of company managers (e.g. owner, board members)					Row in total
	only women	most women	half by half	most men	only men	
Sufficient	22	5	20	17	44	108
Good	26	9	14	11	37	97
Very good	31	6	7	13	38	95
Total	79	20	41	41	119	300

Source: Authors' own study.

The gender of those representing and managing the company therefore does not significantly differentiate the entrepreneurs' assessment of the implementation of the GDPR provisions in the company. This is indicated by Pearson's statistic value $\chi^2 = 10.0539$ and the corresponding p-value = 0.2613 > 0.05. It should be concluded that there is no dependence between the surveyed entrepreneurs' assessment of the

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implementation of the GDPR regulations in their companies and the gender of the persons managing these companies, as shown in Figure 9 and Figure 10.

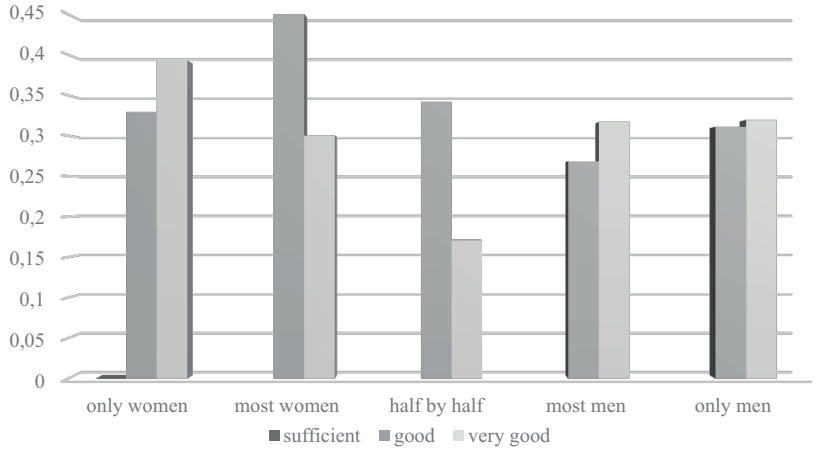


Figure 9. Entrepreneurs' assessment of GDPR implementation compared by managers' gender

Source: Authors' own study.

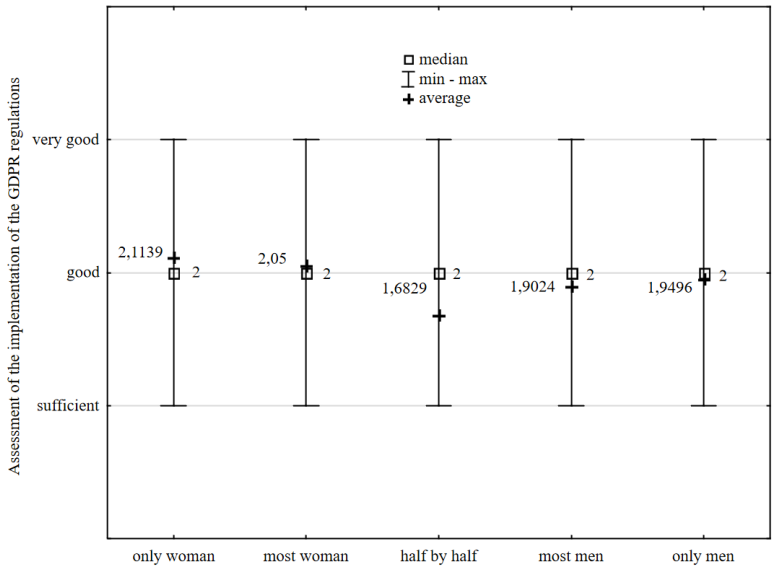


Figure 10. Mean and median values of the surveyed entrepreneurs' responses to the question on the assessment of the implementation of the GDPR in the company versus the gender of the company managers

Source: Authors' own study.

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Data: 30/10/2026 22:20:28

Analyzing the average value of the responses, entrepreneurs where there is a predominance of men or only men among the managers of the company give a rating below good to the implementation of the GDPR provisions. By far the lowest rating for this implementation is given by entrepreneurs where gender parity is equal. On the other hand, when there is a predominance of women or only women among the company's managers, the assessment of the implementation of the GDPR provisions in the company is above a good rating. The median value, which informs how at least half of the respondents in a given category rate the implementation of the GDPR provisions in the enterprise, indicates that regardless of gender parity, all entrepreneurs rate the implementation of the GDPR provisions in the enterprise as good.

Discussion

It is difficult to compare the empirical study and its results, which focused on determining the characteristics that influence an enterprise's adaptation to the GDPR regulations, with any other similar research in the literature as no such study has been described so far. An issue that may raise questions is the selection of the characteristics that were chosen and analyzed in terms of their relevance in terms of assessing an entrepreneur's implementation of the GDPR provisions in the enterprise. The rationale behind the selection of characteristics for the analysis, such as the size of the entrepreneur, the subject of the predominant business activity, the seniority of the entrepreneur and the location of the entrepreneur's registered office, is the fact that these are the most commonly used factors to differentiate entrepreneurs in surveys conducted by the Central Statistical Office, the Polish Agency for Enterprise Development (PARP), and Eurostat. In turn, taking gender into account in business management is a long-standing topic in literature.

Given the limited availability of comparable data analyses, it is advisable to view this presentation as an opportunity to initiate a discussion on the challenges that micro, small, and medium-sized enterprises face when complying with legal regulations enforced by an authority. This discussion would focus on how these entrepreneurs manage institutional changes. In addition, the issue of the consequences of an enterprise operating contrary to its legal environment should be a topic of reflection. These consequences may have administrative, financial as well as social dimensions and may lead to the termination of a business.

Another interesting and as yet unexplored issue is how of behavioural and non-measurable (intangible) factors affect the micro, small and medium-sized entrepreneur's adaptation to the GDPR and thus to the legal environment (Shapiro & Borie-Holtz, 2020). Indeed, due to such factors, micro and small entrepreneurs may face challenges aligning their operations with the legal environment due to limited human resources. The impact of the factors in question will affect a company's compliance not only with the GDPR but also with other legal standards.

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Data: 30/10/2026 22:20:28

Conclusions

The purpose of the study described in this paper was to analyze empirical data obtained from micro, small, and medium-sized entrepreneurs from the Opolskie Voivodeship. The survey used the characteristics that differentiate and individualize the surveyed entrepreneurs, such as the size of their enterprise, the primary business activity, the duration of their business operations, the location of their office, and gender of the persons managing the enterprise. The analysis aimed to find out how these factors influence the adjustment of their enterprises to the provisions of the GDPR.

The legislator left no doubt that any entity processing personal data must comply with the principles of processing and protection of such data included in the GDPR. This means that every entrepreneur, regardless of the characteristics that describe them, is subject to the obligation to conduct his or her business in such a way that data is processed and protected so that it is not unlawfully compromised. However, while none of the characteristics exempt the entrepreneur from the obligation in question, a particular characteristic may affect the entrepreneur's adaptability to the change imposed by the GDPR.

The analysis conducted has led to the verification and acceptance of the hypothesis that the compliance of a micro, small and medium-sized enterprise based in Opolskie Voivodeship with GDPR requirements is influenced by the unique characteristics of the entrepreneur (H1). However, it is only partially possible to confirm the hypothesis that particular characteristics determine the ability of a micro, small, and medium-sized enterprise from Opolskie Voivodeship to adapt to GDPR. These characteristics include the size of the enterprise, the predominant business activity, the location of the registered office, the length of the business activity period, and the gender of the persons managing the enterprise.

The size of the entrepreneur was found to be the most significant factor differentiating GDPR implementation among surveyed enterprises. The adaptation of their enterprise to the GDPR regulations was assessed by far the best by medium-sized entrepreneurs and the worst by small entrepreneurs. This result confirms that larger entrepreneurs have better organizational and financial capabilities, as well as a greater awareness of the consequences of operating in conflict with their legal environment. A seniority-based characteristic of entrepreneurs must also be considered when implementing the GDPR regulations in businesses. It may be surprising that entrepreneurs with up to 2 years of experience rated the adaptation of their businesses to the GDPR regulations better, indicating that it was at a good level, than those who had been in business for between 2 and 6 years (they indicated a rating of sufficient). On the other hand, entrepreneurs with more than 6 years of experience did best in this respect, although the difference between "sufficient" and "very good" responses was only a few percent. It should be noted that entrepreneurs with up to two years' seniority had already started their business during the period when the GDPR was in force, and certainly during the period when the act was awaiting entry into force,

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Data: 30/10/2026 22:20:28

and therefore when building and organizing their businesses, these entrepreneurs immediately did so in accordance with the requirements of the GDPR. Entrepreneurs with more seniority, on the other hand, had to demonstrate their ability to manage institutional change. The entry into force of the GDPR forced them to reorganize the way their businesses had previously operated.

The characteristics that appeared to be ambivalent in the context of the surveyed entrepreneurs' assessment of the implementation of the GDPR regulations in their enterprises were: the location of the entrepreneur's registered office, the subject of the predominant business activity and the gender of the managers of the enterprise. It appears that among the group of surveyed entrepreneurs, it did not have much impact on their assessment of the company's adaptation to the GDPR regulations whether the entrepreneur was based in a small or medium or large town. This may indicate that the size of the locality does not have a significant impact on the entrepreneur's access to information. It may also mean that operating in a larger locality does not involve more "pressure" on the entrepreneur with regard to GDPR-compliant processing and protection of personal data. The subject of the predominant business activity also appeared not to differentiate the entrepreneurs' assessments of the company's adaptation to the GDPR regulations. This is because the type of conducted business activity (its subject) undeniably has a significant impact on the categories of personal data processed by the entrepreneur. On the other hand, the categories of personal data processed determine the necessary technical and organizational resources for personal data protection. The processing of sensitive data certainly necessitates the entrepreneur to establish a secure data processing system. However, it cannot be ruled out that the surveyed entrepreneurs do not differentiate personal data protection measures depending on the category of these data, but focus on potential threats, which may be the same for all the data in question. The thesis that the influence of the gender of the business managers of the surveyed entrepreneurs determines the adaptation of companies to the provisions of the GDPR has not been confirmed either.

The conclusion that emerges, based on the results of the analysis of data obtained through a questionnaire survey among micro, small and medium-sized entrepreneurs from the Opolskie Voivodeship, is that entrepreneurs who, due to their size, have adequate financial resources and organizational capabilities, are more flexible in adapting their businesses to the legal environment on the example of the GDPR. Entrepreneurs who have already started their business after the entry into force of the GDPR are also better able to cope with the implementation of GDPR regulations. Moreover, entrepreneurs with over six years of seniority were more successful in GDPR compliance than those with two to six years of seniority.

Currently, the legal environment for entrepreneurs is highly volatile and can even be described as turbulent. Research into the determinants of the ability and capacity of micro, small and medium-sized entrepreneurs to adapt their businesses to the legal environment should contribute to further in-depth research on this topic.

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Data: 30/10/2026 22:20:28

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