DIGITALIZATION OF THE CRAFT AND ENTREPRENEURIAL SECTOR: LEGAL, TECHNOLOGICAL AND GDPR CHALLENGES

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Abstract

Digital transformation of the craft and entrepreneurial sector is an important prerequisite for improving competitiveness, service availability and the long-term sustainability of micro and small business entities. This paper examines the digitalization of craftspeople and self-employed entrepreneurs through the use of digital tools for administration, client communication, service promotion and simplified business process management. Special attention is given to legal challenges accompanying this transformation, particularly personal data protection, lawfulness of processing, transparency and information system security in accordance with the principles of the General Data Protection Regulation. The research is based on an anonymized survey of 150 respondents, processed in a Python environment through descriptive statistics, correlation analysis and segmentation using the Digital Readiness Index and the General Compliance Index. The results indicate partial digitalization, strong reliance on social media and a clear gap between digital tool use and written privacy rules. The contribution of the paper is a practical support model for chambers, institutions, IT experts and entrepreneurs moving toward sustainable and compliant digital business.

1. INTRODUCTION

1.1. Research context

The digital transformation of micro and small business entities increasingly determines their ability to respond to client needs, accelerate administrative procedures and increase market visibility. Craftspeople and self-employed entrepreneurs have a specific role in local economic development because they provide direct services to citizens and often operate with limited human, financial and technological resources. For this reason, digitalization in this sector cannot be viewed only as the technical introduction of software or online channels. It is an interdisciplinary process that includes business models, legal security, personal data protection and the development of digital competences.

The analysis presented in this paper was carried out in February 2026 on an anonymized dataset collected through a Google Forms questionnaire. The questionnaire focused on the use of basic digital tools, the level of knowledge of data protection obligations and the expressed need for training. The data were processed in a Python environment, where two composite indicators were calculated: the Digital Readiness Index (DRI) and the General Compliance Index (GCI).

1.2. Aim and research questions

The aim of the paper is to determine, through a legal and technological approach, the level of digital maturity of the craft and entrepreneurial sector and to identify the areas in which targeted support by chambers, institutions and professional organizations is needed. The research questions are: (1) What is the level of digital maturity among the surveyed entities? (2) Does technological adoption correspond to basic legal compliance? (3) Which areas show the largest gap? (4) Which groups have the greatest need for education and institutional support?

2. THEORETICAL AND LEGAL FRAMEWORK

2.1. Self-employed entrepreneurs and areas of activity

The legal framework of the Republic of Srpska recognizes a self-employed entrepreneur as a natural person performing a registered market activity for profit. The Law on Self-Employed Entrepreneurs of the Republic of Srpska regulates business characteristics, registration, register management, the organization of entrepreneurs, craft activities and other issues relevant to entrepreneurial operations (Republic of Srpska, 2024). For the purposes of this paper, areas of activity were grouped according to the legal and statistical framework, with reference to the Classification of Activities of the Republic of Srpska 2010, which is based on the European NACE Rev. 2 classification and harmonized with classifications at the level of Bosnia and Herzegovina (Agency for Statistics of Bosnia and Herzegovina, 2010; Republic Institute of Statistics of the Republic of Srpska, 2010).

Table 1. Areas of activity used for classifying responses (Source: Authors)

Area of activity	**Explanation for the research**
Craft production and processing	Production, processing and small craft manufacturing.
Personal and other craft services	Direct services to citizens, including repair, cosmetic, hairdressing and related services.
Traditional and artistic crafts	Traditional skills, handmade products and household or workshop-based production.
Construction and specialized works	Construction, finishing works, installation and related services.
Trade and repair	Trade in goods, repair and maintenance activities.
Hospitality and food services	Accommodation, food preparation and serving.
ICT and professional services	Information technology, technical, business and consultancy services.

2.2. Digitalization and personal data protection

Digitalization in the craft and entrepreneurial sector most often begins with the use of social media, electronic communication, photographs of work, online orders, appointment records or simple invoicing software. Although these are basic tools, they frequently involve the processing of personal data, such as a client name, telephone number, e-mail address, photographs, order data or information about requested services. The introduction of digital tools should therefore be accompanied by transparent information for clients, purpose limitation, basic security measures and clear retention rules (European Parliament and Council, 2016; European Data Protection Board, 2023).

From the perspective of a chamber, the main challenge is not only to increase digital use, but also to provide simple legal templates and practical instructions that are understandable to micro entities. This includes short privacy notices, consent forms where necessary, social media guidance and security instructions for the use of software and online communication.

3. RESEARCH METHODOLOGY

3.1. Survey design and sample description

The research was conducted in February 2026 through a Google Forms questionnaire. An anonymized set of 150 valid responses from craftspeople and self-employed entrepreneurs was used for processing. Direct identifiers, such as name and surname, exact address, telephone number and e-mail address, were not included in the analytical dataset. The data were analyzed at an aggregated level, and variables were coded numerically for processing in Python.

Table 2. Variables in the anonymized survey dataset (Source: Authors)

Variable	Type	Range/categories
sector	categorical	grouped activity areas
number_of_employees	numeric	0-5
uses_website	binary	0 = no, 1 = yes
uses_social_media	binary	0 = no, 1 = yes
uses_online_payment	binary	0 = no, 1 = yes
uses_business_software	binary	0 = no, 1 = yes
collects_client_data	binary	0 = no, 1 = yes
has_privacy_policy	binary	0 = no, 1 = yes
knows_gdpr_obligations	Likert	1-5
digital_readiness	Likert	1-5
training_need	binary	0 = no, 1 = yes

Based on these variables, an analytical processing flow was defined. It included the collection of responses, anonymization, database preparation, calculation of the DRI and GCI indicators and visualization of results in Python. The procedure is shown in Figure 1.

Figure 1. Flowchart of data collection, anonymization and Python processing (Source: Authors)

3.2. Indices and analytical procedure

The Digital Readiness Index (DRI) was calculated as the average of four binary variables: having a website, using social media, enabling online payment and using business software. The index value ranges from 0 to 1:

DRI_i = (website_i + social_media_i + online_payment_i + business_software_i) / 4

The General Compliance Index (GCI) was calculated as a weighted combination of the existence of a privacy policy, the level of knowledge of GDPR obligations and lower exposure among entities that do not collect client data:

GCI_i = 0.40 x privacy_policy_i + 0.35 x (GDPR_knowledge_i / 5) + 0.25 x (1 - client_data_i)

The analysis was performed using pandas, numpy, matplotlib and scikit-learn. Descriptive statistics, correlation analysis and segmentation according to readiness levels were applied.

4. RESULTS

4.1. Descriptive statistics

This section presents the basic descriptive indicators for the main variables used in the analysis. The objective is to obtain an initial insight into the sample structure, the level of use of digital tools, the extent of client data collection and the basic elements of compliance with data protection principles.

Table 3. Descriptive statistics of key variables (N = 150; Source: Authors)

Variable	Mean	Std. dev.	Min	Max
number of employees	1.35	1.41	0.00	5.00
uses website	0.41	0.49	0.00	1.00
uses social media	0.65	0.48	0.00	1.00
uses online payment	0.19	0.40	0.00	1.00
uses business software	0.44	0.50	0.00	1.00
collects client data	0.65	0.48	0.00	1.00
has privacy policy	0.20	0.40	0.00	1.00
knows GDPR obligations	2.32	1.13	1.00	5.00
digital readiness	2.74	1.11	1.00	5.00
DRI	0.42	0.23	0.00	1.00
GCI	0.33	0.20	0.08	0.92

The average DRI value in the sample is 0.42, indicating a low to moderate level of digital maturity. The average GCI value is 0.33, which shows that some entities use digital channels without sufficiently developed written privacy rules. The most commonly used digital tool is social media (65.3%), while online payment is the least represented (19.3%).

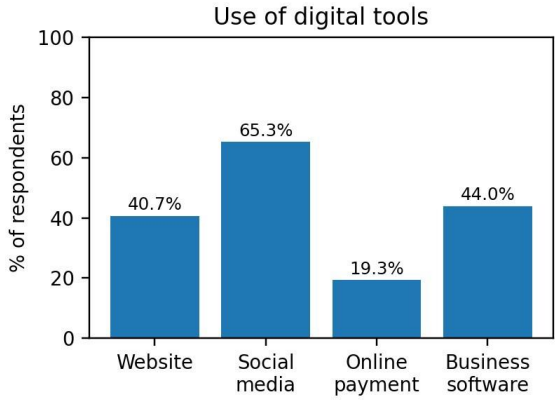

Figure 2. Share of respondents using selected digital tools (Source: Authors)

4.2. Digital readiness by area of activity

The distribution of respondents by DRI categories and areas of activity makes it possible to identify sectors in which digitalization is more developed and those in which additional support and education are needed.

Table 4. DRI categories by area of activity (Source: Authors)

Area	Low	Moderate	Medium	High
Construction and specialized works	72.4%	27.6%	0.0%	0.0%
ICT and professional services	5.9%	23.5%	41.2%	29.4%
Personal and craft services	44.4%	50.0%	5.6%	0.0%
Trade and repair	34.6%	38.5%	23.1%	3.8%
Hospitality and food	35.0%	55.0%	10.0%	0.0%
Craft production and processing	59.1%	27.3%	13.6%	0.0%

The highest level of digital maturity appears among ICT and professional services, while construction and traditional personal services are more frequently placed in lower categories. This finding suggests that education should not be designed identically for all areas of activity, but tailored to the processes and digital habits of each group.

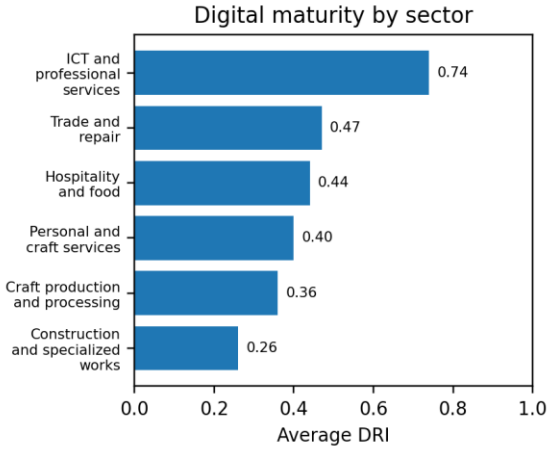

Figure 3. Average Digital Readiness Index by area of activity (Source: Authors)

4.3. Data protection compliance and correlation analysis

In the analyzed sample, 65.3% of entities collect client data, while only 20.0% have a privacy policy or a similar written notice. This ratio indicates the need for legal and information support through short templates, practical explanations and sector-specific guidelines.

Table 5. Pearson correlations between selected variables (Source: Authors)

Variable pair	r	Interpretation
DRI - GDPR knowledge	0.01	very weak
DRI - privacy policy	0.09	very weak
client data - GDPR knowledge	-0.00	no linear relation
DRI - GCI	0.08	very weak
digital readiness - DRI	0.74	strong positive

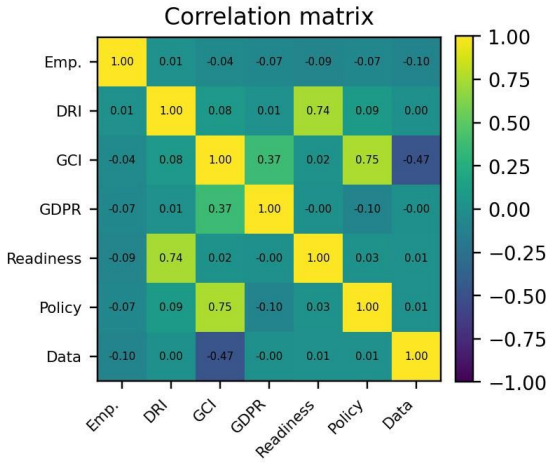

Figure 4. Correlation matrix of key variables (Source: Authors, Python processing)

The correlation between self-assessed digital readiness and the DRI confirms that respondents largely recognize their own digital maturity. At the same time, the weak relationship between DRI and GCI shows that technological progress does not automatically produce legal compliance. Digital and legal education should therefore be planned jointly.

4.4. Cluster analysis and comparative positioning

To understand differences among respondents more precisely, a cluster analysis was applied using DRI and GCI values. The entities were grouped according to the level of digital and legal readiness.

Table 6. Characteristics of digital readiness clusters (Source: Authors)

Cluster	Share	DRI	GCI / training need
Low readiness	36.0%	0.20	GCI 0.24 / 72.2%
Medium readiness	48.7%	0.47	GCI 0.36 / 67.1%
Higher readiness	15.3%	0.78	GCI 0.49 / 52.2%

After the clusters were identified, the results were compared with indicative normalized benchmark values for Serbia, Croatia and the average of the European Union in order to place the BiH/RS sample in a wider regional and European context. The comparison is not an official statistical

ranking, but an analytical orientation for support measures and realistic development targets.

Table 7. Comparative normalized benchmark of DRI and GCI (Source: Authors)

Area	DRI	GCI
BiH/RS sample	0.42	0.33
Serbia	0.53	0.41
Croatia	0.64	0.50
EU average	0.76	0.59

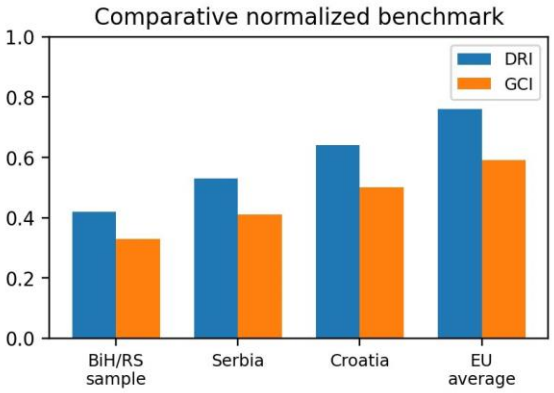

Figure 5. Comparative benchmark: BiH/RS sample, Serbia, Croatia and EU average (Source: Authors, normalized research overview)

The comparative presentation indicates that the observed BiH/RS sample is approximately 20% lower than the indicative benchmark for Serbia, while Croatia and the EU average are significantly better positioned. This gap supports the need for targeted interventions that combine technology adoption with privacy and security guidance.

5. DISCUSSION

The results confirm the basic assumption of the paper: digitalization of the craft and entrepreneurial sector cannot be viewed only as a technical matter of software procurement or the opening of social media profiles. A digital channel often becomes a place for client communication, promotion of work, receiving orders and recording data. Therefore, every digital step also raises issues of legal certainty, transparency and responsibility in data processing.

From the legal perspective, the most important finding is the low share of entities that have a privacy policy or written information for clients. From the information technology perspective, the key finding is partial digitalization: social media are used much more frequently than websites, business software or online payment. From the chamber perspective, the most useful finding is the possibility of segmenting members according to their needs, which enables more economical and precise education.

In practice, a chamber can act as an intermediary between the regulatory framework, educational institutions, IT experts and entrepreneurs. Education should be short, practical and sector-specific. For personal services, emphasis should be placed on appointment scheduling, client records and rules for communication on social media. For construction services, support should focus on offers, contracting and storage of client data. For trade and repair, the main topics should be invoices, service orders and customer data. For ICT and professional services, the focus should be on system security and processor responsibility.

5.1. Limitations of the research

Although the analysis is based on a survey sample, the results have several limitations. A sample of 150 responses does not necessarily represent all self-employed entrepreneurs in the Republic of Srpska and Bosnia and Herzegovina. Some variables are based on self-assessment, which may lead to the overestimation or underestimation of the actual level of knowledge. The study is cross-sectional and describes the situation in February 2026, without measuring changes after potential training activities.

6. PRACTICAL RECOMMENDATIONS AND IMPLEMENTATION MODEL

The empirical findings point to a practical need for a support model that is simple enough for micro and small entities, but still sufficiently comprehensive to cover both digital and legal aspects of business. The proposed model is not based on the assumption that all entrepreneurs

should immediately adopt advanced digital systems. Instead, it follows a gradual approach in which the first phase strengthens basic digital visibility, the second phase introduces safe data handling practices, and the third phase supports more advanced business software and electronic payments. This gradual model is suitable for chambers and local institutions because it can be implemented with limited resources and adapted to different sectors.

The first support module should focus on digital visibility and communication with clients. It should include practical training on the use of social media profiles, basic website presentation, digital catalogues of services, online appointment requests and standardized messages for client communication. For many craftspeople, this is the first contact with digitalization, and therefore the training should avoid abstract terminology. It should be based on examples from everyday practice, such as a hairdresser confirming appointments, a repair service receiving photographs of a defect, a small producer presenting products, or a construction entrepreneur sending an offer by e-mail. The expected result of this module is not only higher visibility, but also more consistent communication and reduced administrative burden.

The second support module should address personal data protection and legal certainty. Since 65.3% of respondents collect client data, while only 20.0% have a privacy policy or similar written notice, this is the most important compliance gap identified in the research. The chamber could prepare short model documents, including a one-page privacy notice, a basic consent form for specific cases, instructions for publishing photographs, and rules for storing client contact data. These documents should be written in plain language and accompanied by examples, because micro entities often do not have internal legal departments. The purpose is not to create excessive administration, but to build a minimum level of transparency, trust and accountability.

The third support module should be oriented toward business software, online payment and information security. Only 19.3% of respondents use online payment, while 44.0% use business software. This indicates that a significant part of the sector is still operating through fragmented records, informal communication and manual administrative procedures. In this module, entrepreneurs should be introduced to simple tools for invoicing, appointment management, service orders, stock records and secure cloud storage. At the same time, they should receive basic instructions on password management, access control, backups and the responsible use of client data in third-party applications.

The implementation model should also differentiate support by sector. Personal and other craft services require guidance on client appointments, photographs, health-sensitive information where applicable and communication through social networks. Construction and specialized works require templates for offers, contracts, documentation of completed work and the retention of client data. Trade and repair services require support related to invoices, service records, warranty communication and customer databases. Hospitality and food services need guidance on reservations, online reviews, photographs and digital promotion. ICT and professional services, although digitally more mature, require more advanced guidance on security, processor obligations and contractual responsibility.

From the perspective of public policy, the results suggest that digital transformation measures should be linked with local economic development instruments. Training, vouchers for digital tools, mentoring sessions and model legal documents can be combined into a single support package. A particularly important role can be played by chambers, because they have direct access to entrepreneurs and understand sector-specific barriers. Local development agencies and universities can provide methodological support, data analysis and evaluation of results. This cooperation would make it possible to monitor the impact of training and to update the support model according to measurable indicators.

For sustainability, the support model should include periodic measurement. The same DRI and GCI indicators can be used before and after training in order to assess whether entrepreneurs have adopted new tools and whether their data protection practices have improved. This would transform the chamber support system from one-time education into a continuous evidence-based service. The use of a standardized questionnaire, anonymized data and Python processing makes the method reproducible and suitable for repeated annual monitoring.

Finally, the psychological and organizational dimension of digitalization should not be neglected. Many micro entrepreneurs do not resist digital tools because they reject innovation, but because they face time pressure, uncertainty, fear of making legal mistakes and limited financial resources. Support measures should therefore be encouraging, practical and oriented toward immediate benefits. When entrepreneurs see that digital tools can save time, reduce errors and improve communication with clients, the willingness to adopt additional tools increases. At the same time, when legal obligations are explained through short and understandable templates, compliance becomes more realistic and less intimidating.

7. CONCLUSION

The paper shows that it is possible to develop a simple and reproducible methodological framework for assessing digital maturity and basic data protection compliance among craftspeople and self-employed entrepreneurs. The use of a Google Forms survey and Python processing provided sectoral insights, DRI and GCI indices, correlation values and segmentation of entities according to support needs.

It is recommended that the chamber, in cooperation with legal and IT experts, develop three support modules: (1) a basic module for digital promotion and client communication; (2) a legal compliance and data protection module; and (3) an advanced module for digital business, software, online payments and transaction security. Short sectoral guides should be prepared for personal services, construction crafts, hospitality, production crafts, trade and repair, and ICT/professional services.

Future research should expand the sample, include longitudinal measurement before and after training and conduct qualitative interviews with entrepreneurs. This would make it possible to determine more precisely which barriers most strongly affect slow digitalization: tool cost, lack of knowledge, mistrust of online payment, legal uncertainty or lack of time.

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