

Freelancer Competences: National Analysis Report

Serbia

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Project coordinator – name	Grażyna Paliwoda-Pękosz paliwodg@uek.krakow.pl
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Contributors

Zoran Kalinic, University of Kragujevac, Serbia

Vladan Ivanovic, University of Kragujevac, Serbia

Vladimir Rankovic, University of Kragujevac, Serbia

Ljiljana Matic, University of Kragujevac, Serbia

Andrija Djonic, University of Kragujevac, Serbia

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The quantitative analysis of the national datasets within the ENTEEF project was carried out by Florin Stoica (Lucian Blaga University of Sibiu), following a standardized methodological framework. This centralized approach ensured consistency, comparability, and methodological rigor across all participating countries.

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Table of Contents

Introduction	7
1 Descriptive Statistics: Respondent Profiling.....	9
1.1 Freelancers	9
1.2 Companies	26
2 Competency Analysis: Importance and Proficiency.....	37
2.1 Freelancers	37
2.2 Companies	49
3 Cross-Tabulation Analysis of Competency Importance, Proficiency, and Gaps (χ^2 Tests).....	54
3.1 Freelancers	54
3.2 Concluding interpretation	59
4 Group Mean Differences in Competency Importance, Proficiency, and Gaps (ANOVA).....	60
4.1 Interpretation of significant group mean differences.....	61
5 Gap Analysis (Paired t-tests).....	76
5.1 Interpretation of paired mean differences between importance and proficiency ratings of competences by categorical variables	76
5.2 Global Gap Analysis (Paired t-tests).....	80
6 Segmentation and Profile Analysis (k-means and CHAID)	83
6.1 Freelancers	83
6.2 Companies	87
7 Identifying Training Needs.....	90
Conclusions.....	94
References.....	98
List of Tables.....	102

List of Figures 103

Introduction

This national report is a result of the Activity 3.5 within WP3 *Research on freelancer competences* of the ENTEEF project. It provides quantitative analysis of the Serbian freelance market, based on primary (survey) data collected within the same activity for both, freelancers, on the supply side, and companies hiring freelancers, on the demand side.

The report aims to answer the following research questions:

- **RQ1:** What are the key competences (skills, knowledge, attitudes, and experience) required by freelancers across different sectors and countries?
- **RQ2:** How do freelancers and hiring companies perceive skill gaps and competence mismatches in the freelance economy?
- **RQ3** (adapted for data analysis purpose): How can freelancers' training needs be determined, aligned with their professional development goals?

The presented analyses are preformed following the methodological guidelines entitled *Freelancer Competences: A Research Framework*, developed within Activity 3.1 of the WP3, and following the adopted uniform rules for the quantitative analysis of the national datasets.

The report consists of the several chapters. In the Chapter 1, the respondents' profile (for both, freelancers and hiring companies) is presented, based on the analysis of descriptive statistics data. Competency analysis, focused on perceived importance and proficiency, is presented in Chapter 2. Chapter 3 provides cross-tabulation analysis of competency importance, proficiency, and gaps. The analysis of group mean differences in competency importance, proficiency, and gaps using ANOVA test is performed and presented in Chapter 4. Chapter 5 brings gap analysis, based on paired t-tests, which presents the most significant gaps between competence importance and proficiency/performance, as identified by freelancers and hiring companies in Serbia. Segmentation and profile analysis, based on k-means and CHAID, is used to identify the main clusters of respondents based on seven most significant characteristics, and the results are presented in the Chapter 6. Finally, Chapter 7 brings the identification of the

training needs of the respondents, which is an important result for the next WP of the ENTEEF project – development of MOOCs which will be developed on here identified needs and gaps. The Report ends with the Conclusion section, with the most significant outputs and future steps in research.

1 Descriptive Statistics: Respondent Profiling

1.1 Freelancers

The data on Serbian freelancers was collected in Fall 2025, via online questionnaire. Following adopted research methodology, after data collection, cleaning and pre-processing, 149 valid answers are obtained (which stated Serbia as its country of origin). In this section major characteristics of this sample will be presented.

Concerning basic demographic variables, majority of the Serbian freelancers are male (Figure 1), which is generally in line with previous studies (Andjelkovic et al., 2025b). However, the share of female freelancers is considerably higher than it was identified in most of the previous studies (Andjelkovic et al., 2025b; Payoneer, 2023; Ivanovic & Kalinic, 2020). Moreover, a tiny portion of freelancers were not stating their gender, giving a more complete picture of the gender structure of Serbian freelancer market, which is a step forward in comparison of previous studies, which measured gender structure on binary scale (male/female).

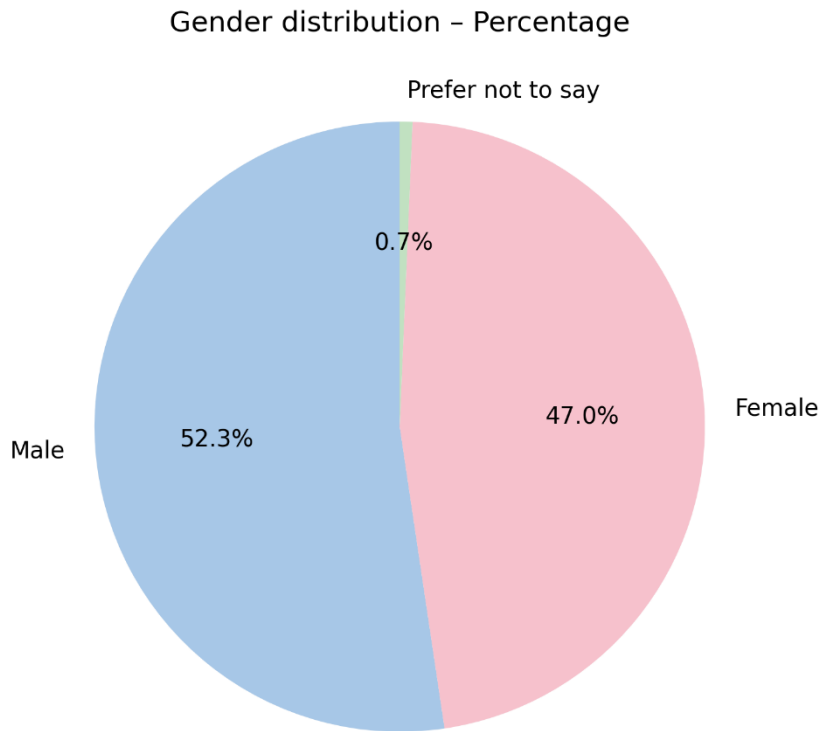


Figure 1. Gender structure of Serbian freelancer market.

Serbian freelancers are usually of young age (Figure 2). 66.5% or 2/3 of them younger than 36 years, which again is in line with previous studies, which reported younger people as the main workforce in freelancing (Ivanović, Kalinić & Radonjić, 2025). Yet, it is notable to mention that there were 5.4% of freelancers older than 53 years. It means that the age, with the right set of skills (corresponding to them which are in demand) is not an obstacle for one to fully integrate on the freelancer market.

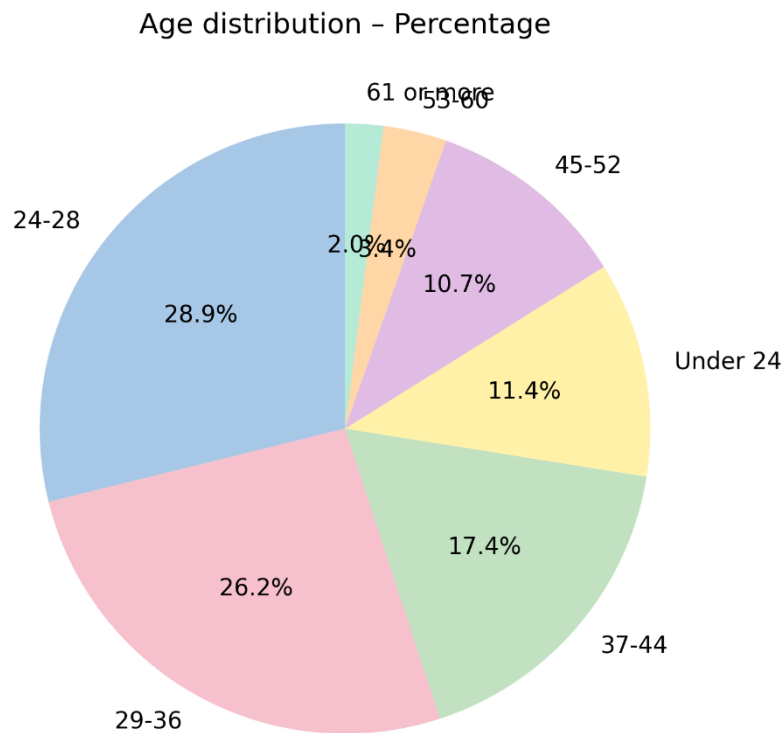


Figure 2. Age distribution of Serbian freelancers.

Most of the respondents are well-educated (Figures 3 and 4). It not only confirms assumption that most of the jobs in freelance market require considerable knowledge, conceptual and practical. Not only that the level of education is positively correlated with the success in freelancing, then also reconfirms findings of some other studies that found majority of freelancers with at least bachelor degree, although the numbers are varying significantly between world regions (Rani, Dhir, & Gobel, 2023; Ivanović, Kalinić, & Radonjić, 2025). Only 28.2% of the respondents had only high school or less.

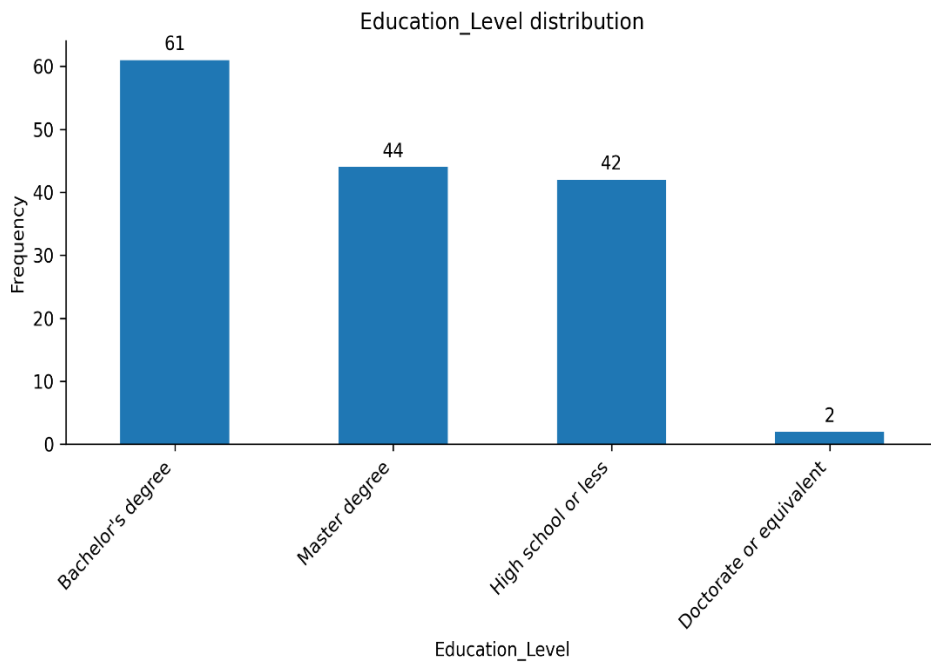


Figure 3. Education distribution of Serbian freelancers (absolute terms).

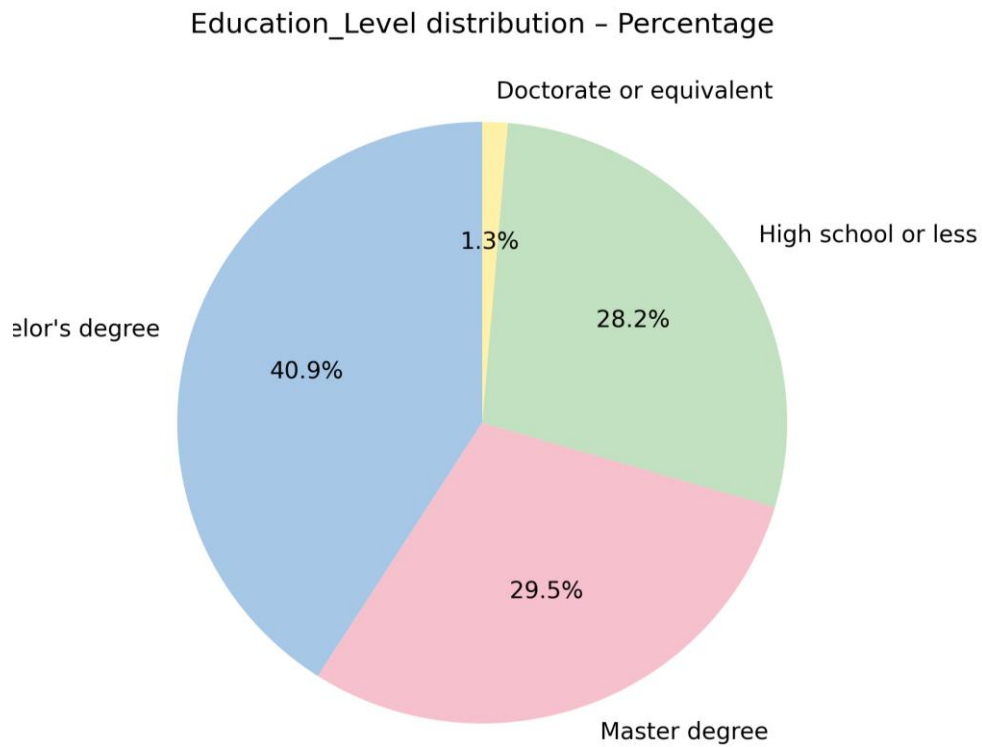


Figure 4. Education distribution of Serbian freelancers (relative terms).

When analysing the main freelancer profession, i.e., in which occupation they usually perform their jobs (Figure 5), the majority of Serbian freelancers belongs to the area of Creative and Multimedia (42.3%), followed by Software Development and IT (24.2%). It corresponds to the findings of the Gigmetar project over the period 2020-2025 (Anđelković et al., 2025c). Other important areas of activity for Serbian freelancers include Sales and Marketing Support (12.1%), while the rest is quite fragmented with Teaching (8%) and Clerical and Data Entry (4%) with more pronounced shares, and other areas having less than 3% share altogether.

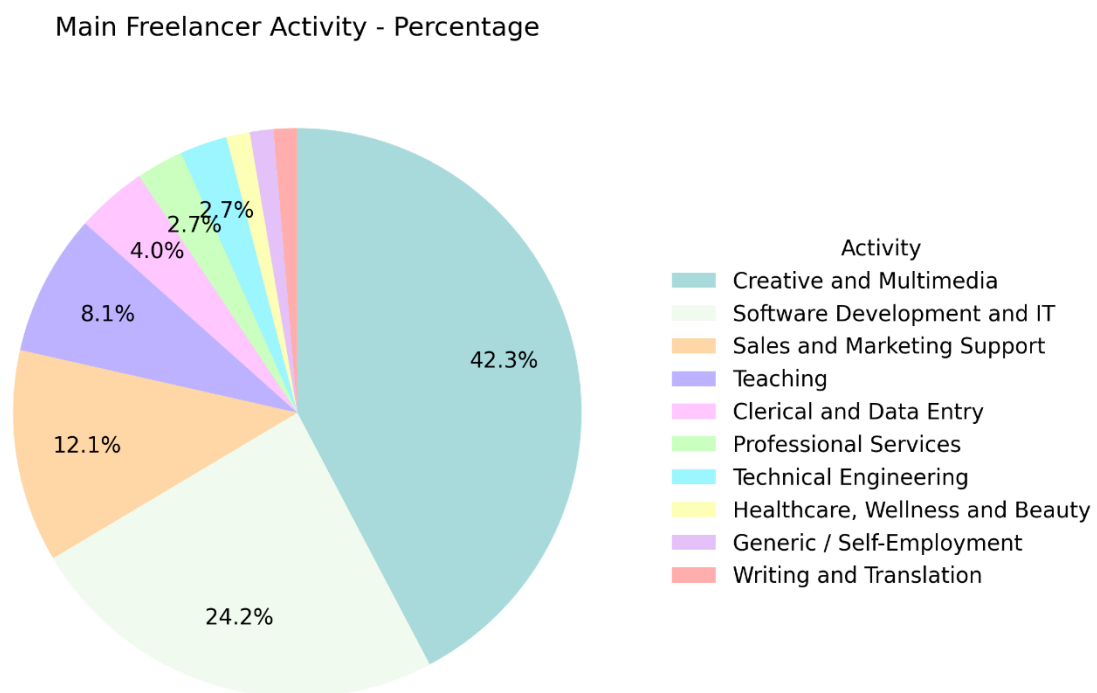


Figure 5. Main freelancer profession.

There is considerable diversity when it comes to the number of clients Serbian freelancers worked with in the last 12 months (Figure 6). However, the most frequent categories are 1-5 clients, suggesting that “an extreme micro-tasking” isn’t present to a larger scale. Moreover, multitasking or practice of doing projects in parallel (Gupta, Fernandez-Crehuet & Hanne, 2020), is of very limited importance for the majority of freelancers. Moreover, small number of clients reflects potentially an importance of building long-term relationship with clients, similarly to the practice on conventional markets. Moreover, since the client’s satisfaction is multidimensional and crucial in

success of freelancing (Haq, Raja, Nosheen & Sajjad, 2018), concentrating on a fewer number of clients enables freelancers to effectively manage diverse aspects of client’s satisfaction function. However, these findings should be interpreted with caution in this direction. Namely, the fact that freelancers have limited number of clients over the year could indicate a hardship of achieving “full employment” (over 30 hours per week) or simply a tendency, for an important number of them, to use freelancing as a supplementary source of income. Additionally, more than 10 clients over the last year had only a limited number of freelancers, while extreme values (more than 100 projects) could potentially arise from sampling error (incorrect answers given or misunderstanding of the question of freelancers – for example, they perceived how many clients they had up to date and not in the last year).

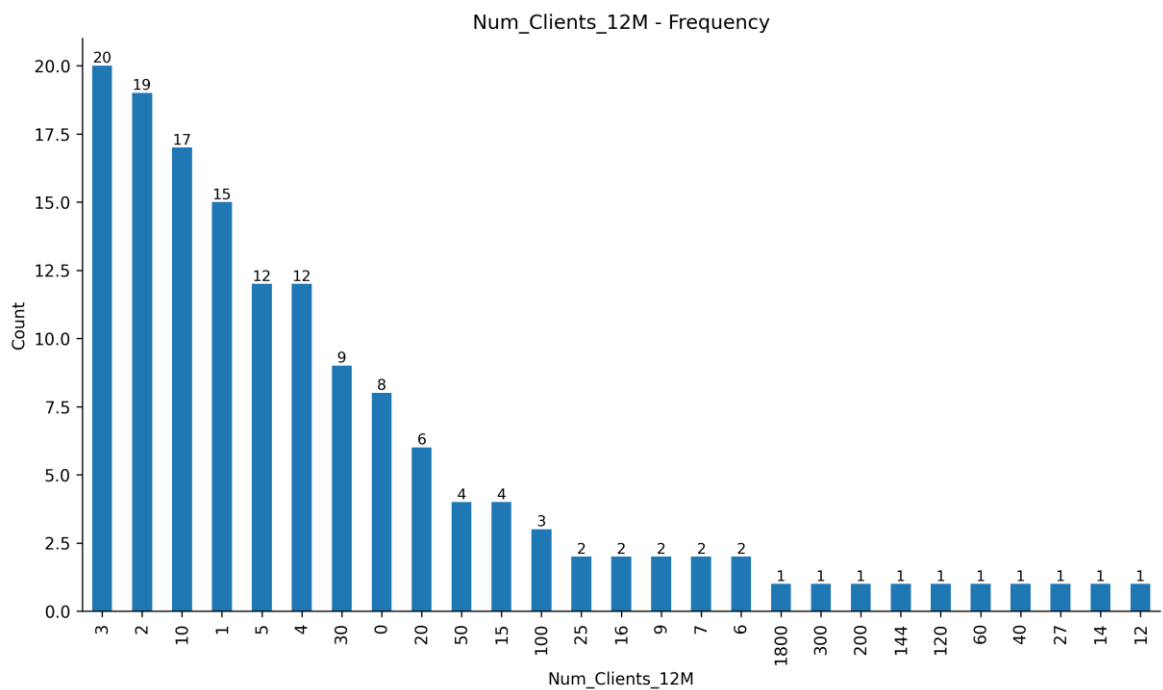


Figure 6. Number of clients in the last 12 months.

Most of Serbian freelancers – 21.9% - has educational background in ICT (Figure 7), followed by Engineering, Manufacturing and Construction (18%) and Business, Administration and Law (12.9%). Above 10% of the sample are the groups of freelancers with background in Education (11.2%), Arts and Humanities (including languages, history, philosophy) (11.2%) and Social Sciences, Journalism and

Information (10.1%). Altogether, the majority of Serbian freelancers are educated in STEM disciplines, which corresponds to the findings at the global level (Rani, Dhir, & Gobel, 2023). Only 5% of them doesn't speak fluently any other language than Serbian. On the other hand, 45% speaks one, 43% speaks two, and 7% of them speaks three or more foreign languages, which again reconfirms considerably higher-than-average level of education reflecting in (foreign) language knowledge, compared to regular population.

Areas of Education - Percentage of 'Yes'

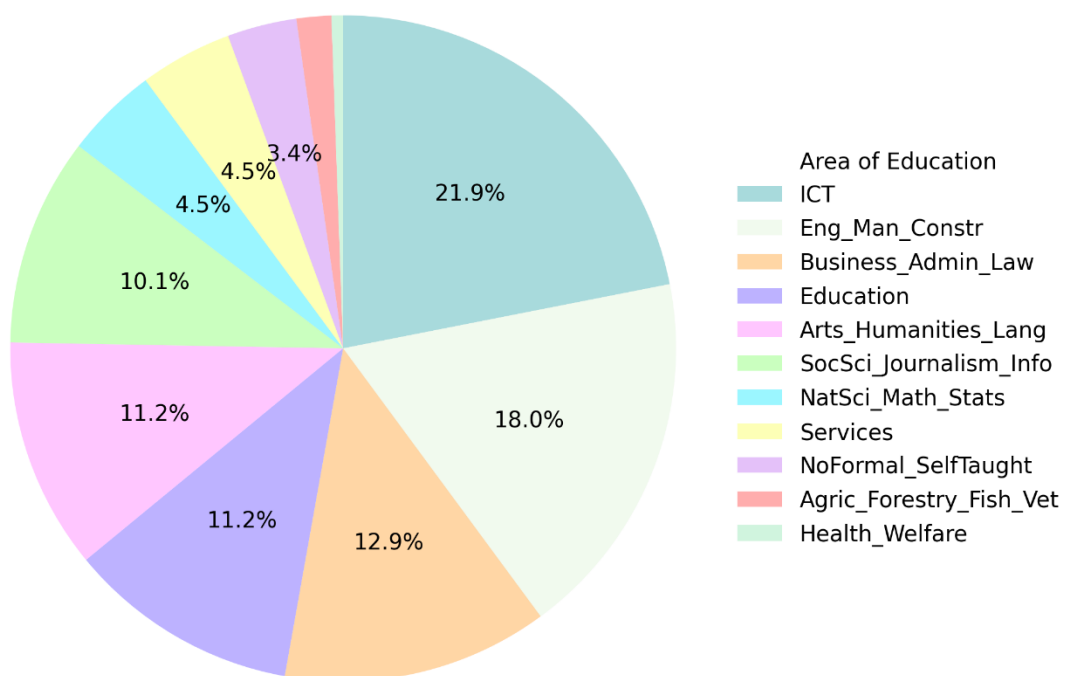


Figure 7. Areas of education of Serbian freelancers.

Majority of Serbian freelancers are in an early stage of their freelance career development (Figure 6), with 28.2% of them with less than one year of experience, and additional 52.3% with one to five years of experience. Only 4.7% of Serbian freelancers have more than 10 years of experience. This also confirms the fact that freelancing and platform work are relatively new form of employment, which had its peak during COVID pandemics. Additionally, it may confirm as well the challenging career of being freelancer, where uncertainty (of income) and many open regulatory issues (Freeland,

Garin & Koustas, 2025), are surpassing benefits of flexibility and (possible higher) earnings, pushing, in the long run, people toward standard forms of jobs (on conventional labour market).

Years_Experience_Freelancer - Percentage

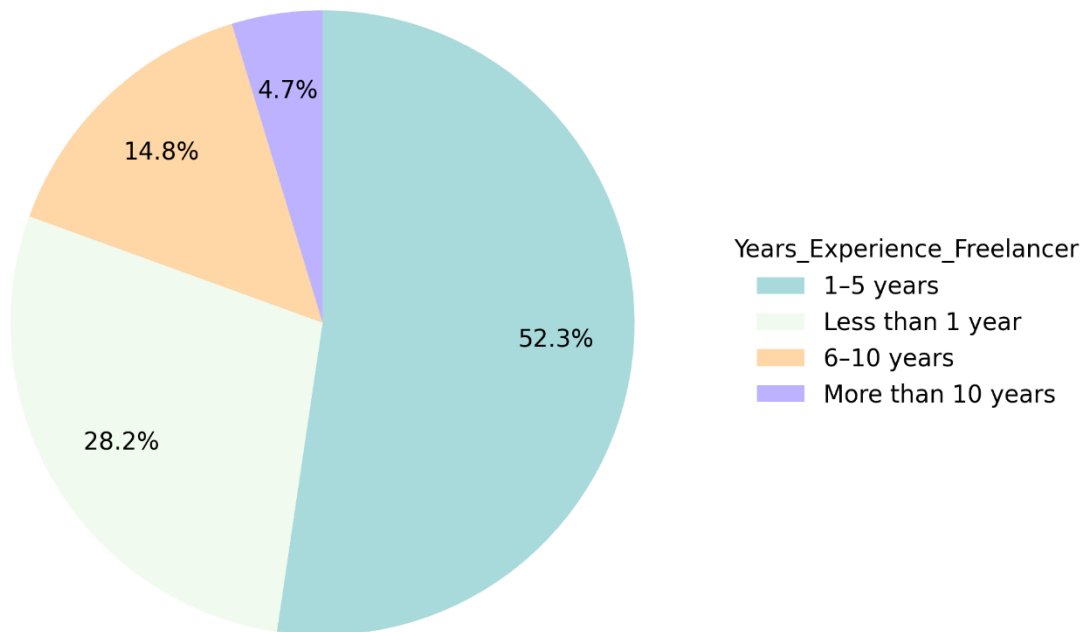


Figure 8. Years of experience of Serbian freelancers.

Interestingly, about 30% of respondents consider freelancing as their main job, i.e., main source of income, with workload of more than 30 hours per week. About 22% of Serbian freelancers use freelancing as their part-time job (with less than 30 working hours per week) and as an additional source of income. The convincing majority of respondents (47.7%) use freelancing as an occasional activity. Both of this cohorts of freelancers are using the freelancing as an additional source of income rather than the main income source, which is in line with other studies (Kässi, Lehdonvirta, & Stephany, 2021). Most of freelancers had 3 (13.4%) or 2 (12.8%) clients in the last 12 months. Those with the highest workload (11.4% of people in the sample) were having 10 clients in the same period.

Most of the freelancers find their job via personal contacts, followed by social networks and digital platforms (Figure 9). It is the case with the 80% of the freelancers

in the sample. Other ways of job search are very diverse, and include, among others, professional networking sites, agencies or personal websites. Our results suggest that successful acquisition of clients goes via different channels, but sustainability of freelancer career suggest that different methods should be applied in searching, attracting, acquiring and detaining the clients (Katsimpiri & Kinias, 2021).

How freelancers find jobs - Percentage of 'Yes'

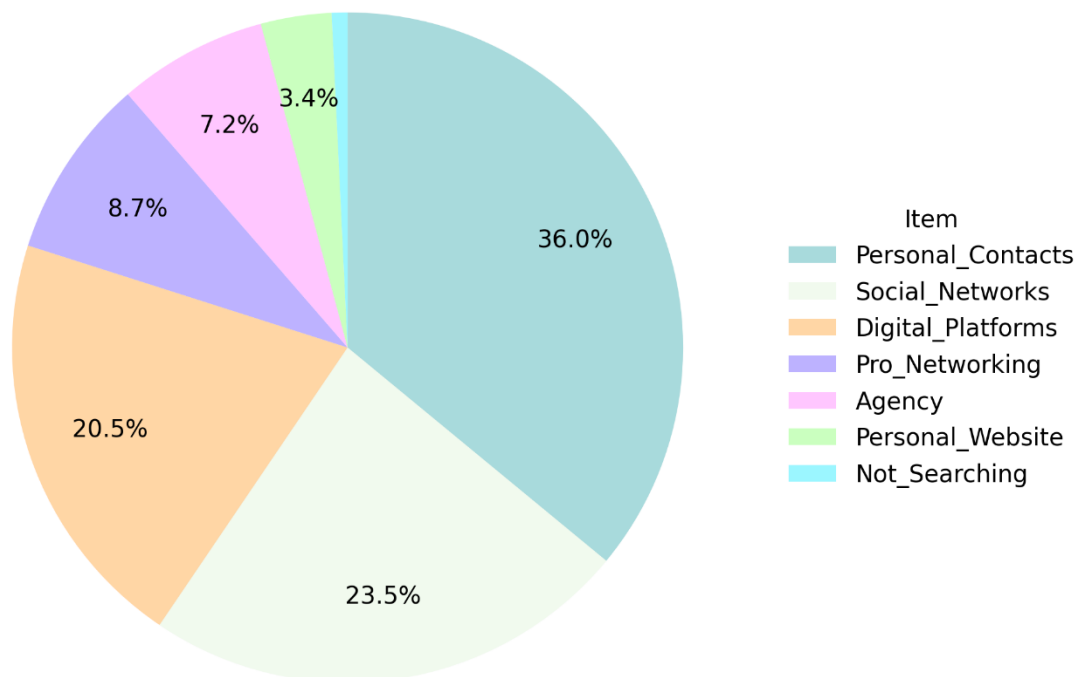


Figure 9. How freelancers find their job.

When using digital labour platforms for job search, most of Serbian freelancers prefer globally leading general-purpose platforms, such as Upwork (Figure 10). It is not only in line with the findings of Andjelkovic et al. (2025b), who identified Upwork as a leading platform in Southeast Europe, than with the fact that the Upwork is (one of) the leading global digital labour marketplace(s) (Berg et al., 2018). Almost half of the respondents chose this platform, followed by Fiverr (22.8%) and Freelancer (8.9%). The freelancers who use social networks for job search, usually use LinkedIn (39.6%) and Facebook (26.4%), followed by Instagram and TikTok. The result is expected, since LinkedIn is considered as the most significant professional social

network, and Facebook is a social network with the highest number of users. Moreover, social media are not only important for client acquisition, then they also give freelancers informational benefits making them more successful, which are essential for their career development (Utz, 2016).

Digital labour platforms - Percentage of 'Yes'

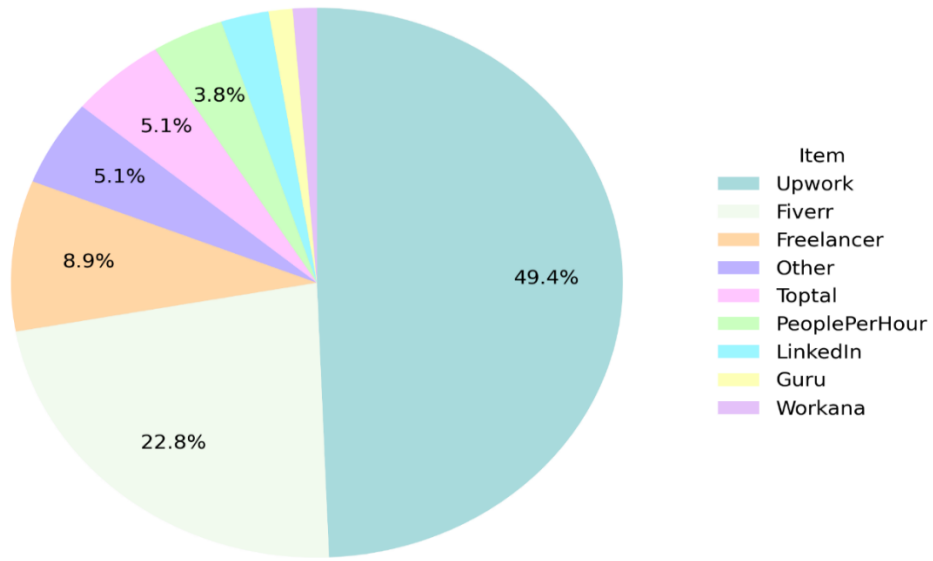


Figure 10. Most popular digital labour platforms used for job finding.

Social networks - Percentage of 'Yes'

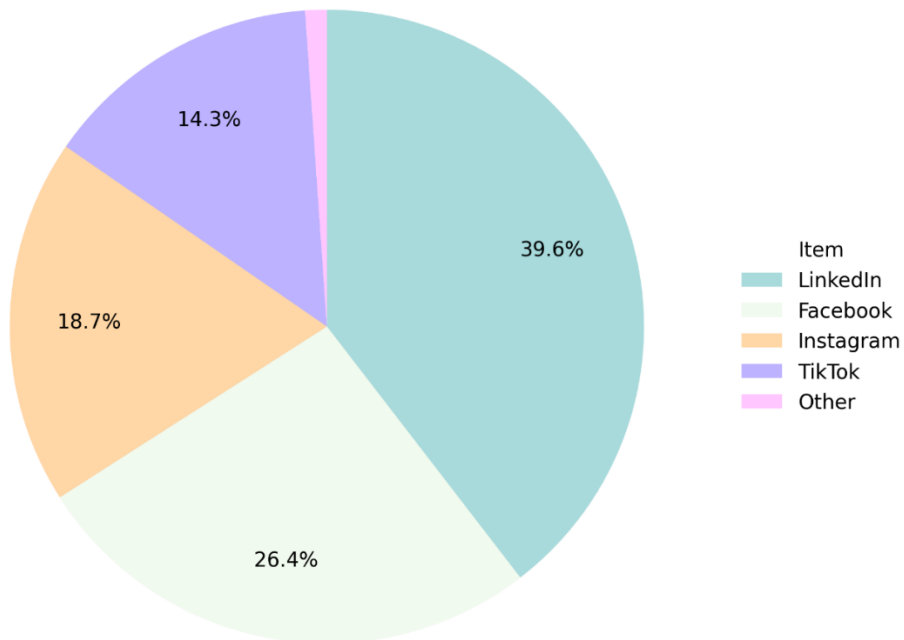


Figure 11. Most popular social networks used for job finding.

When employed, almost 60% of Serbian freelancers charge their work as a fixed price (Figure 12), which is a method usually used for short-term, project-like type of tasks. It is a very common pricing method employed on digital platforms. According to some studies, $\frac{3}{4}$ of jobs are based on fixed pricing method (Ivanović, Kalinić & Radonjić, forthcoming). Second most popular choice is payment by the hour (33.6%), while other methods, such as monthly or mixed payments, are rarely used. When charging per hour, they usually ask hourly rates between \$10 and \$19 (43.2%) and \$20 and \$29 (36.4%). It corresponds largely to the average hourly wage on digital labour platforms – 23,9\$ found by Andjelkovic et al. (2025b).

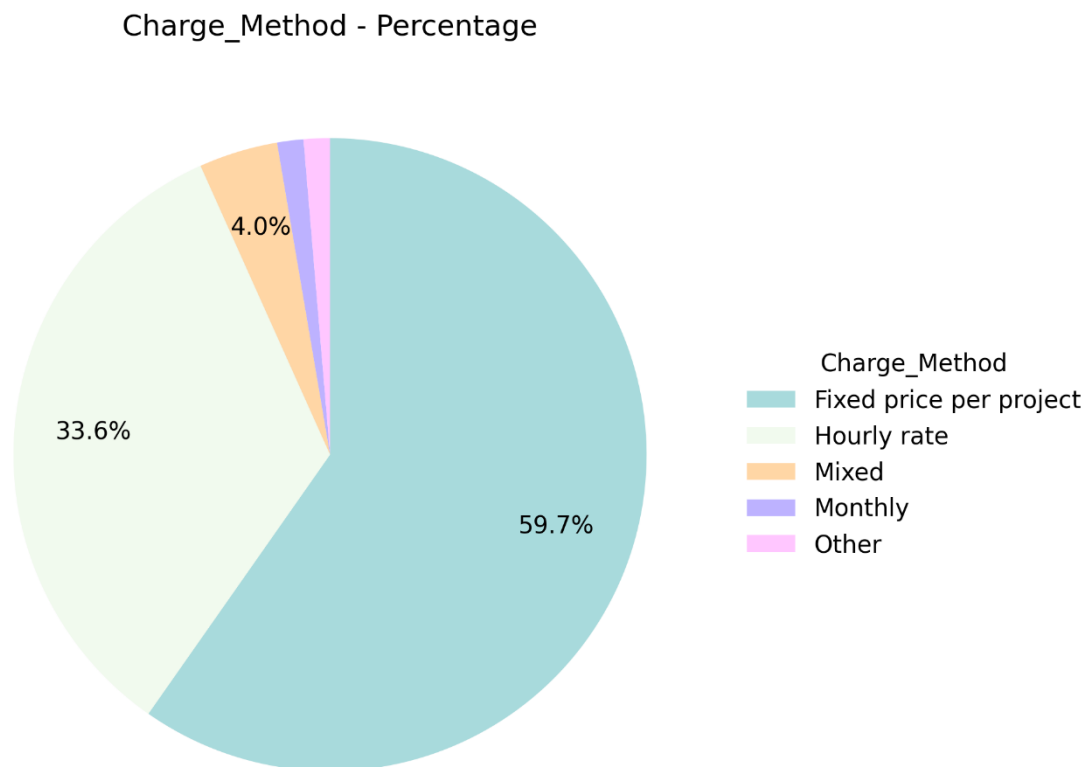


Figure 12. How freelancers usually charge for their freelance work.

When asked to compare their income as a freelancer to some regular, salaried job that they could perform, considering one-year period, the respondents were divided in opinions. Namely, 37% of them think that they earn more via freelancing than salaried job, 36% see it as almost equal, while 27% of them have an opinion that they earn less. However, for more than 2/3 of them freelancing is, in terms of income, better or at least equally good option. This finding is in line with the studies which are advocating

freelancing as the more desirable alternative compared to standard forms employment (Gandini, 2016).

There are relatively numerous challenges Serbian freelancers are expecting to be confronting with in the near future. Among top challenges that they will experience in the near future (Figure 13), the main problem for 2/3 of them is to have stable income. Income volatility is generally also the main disadvantage of the freelancing stated in different studies (Casalhay, Guevarra & Bragas, 2025), which is, together with the shift of the risk from employer to employees, in the core of criticism of precarity of freelancer work (Sutherland, Jarrahi, Dunn & Nelson, 2020). It is interesting that the need to upskill and keep up with trends is the second major challenge, but with almost same weight with market changes that could reduce demand or replace them and problems to keep resilience, discipline, and mind-set needed to thrive long-term and changes in customer expectations and contracts. These findings suggest that the main portion of the risks in the near future comes from the market forces and business surrounding, additionally and specifically underlining specific (entrepreneurial) nature of freelance profession.

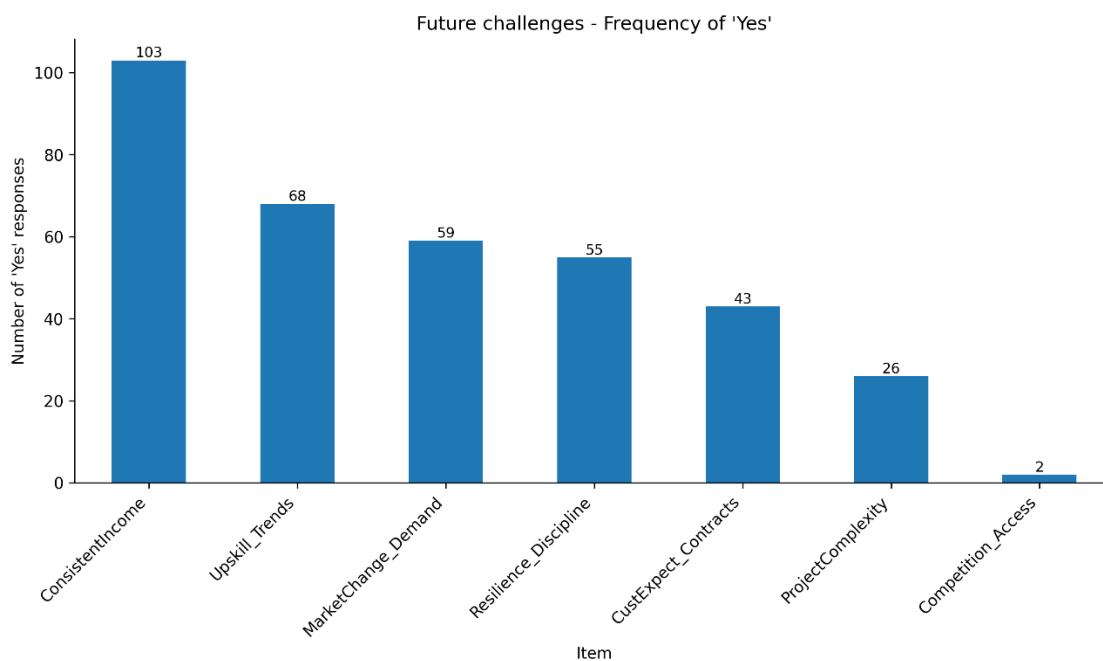


Figure 13. Top challenges perceived by Serbian freelancers.

Serbian freelancers share an opinion that the most important factors that are driving the growth of freelancing are Business flexibility need, Technological advances and Worker lifestyle preferences (Figure 14). Economic shifts and Globalization are both considered as less important than previous ones. This indirectly reveals a (too) strong technological imprint of freelancer profession, where the importance of regulatory issues and economic trends are not possibly well conceived and which impact on their work is not appropriately calculated.

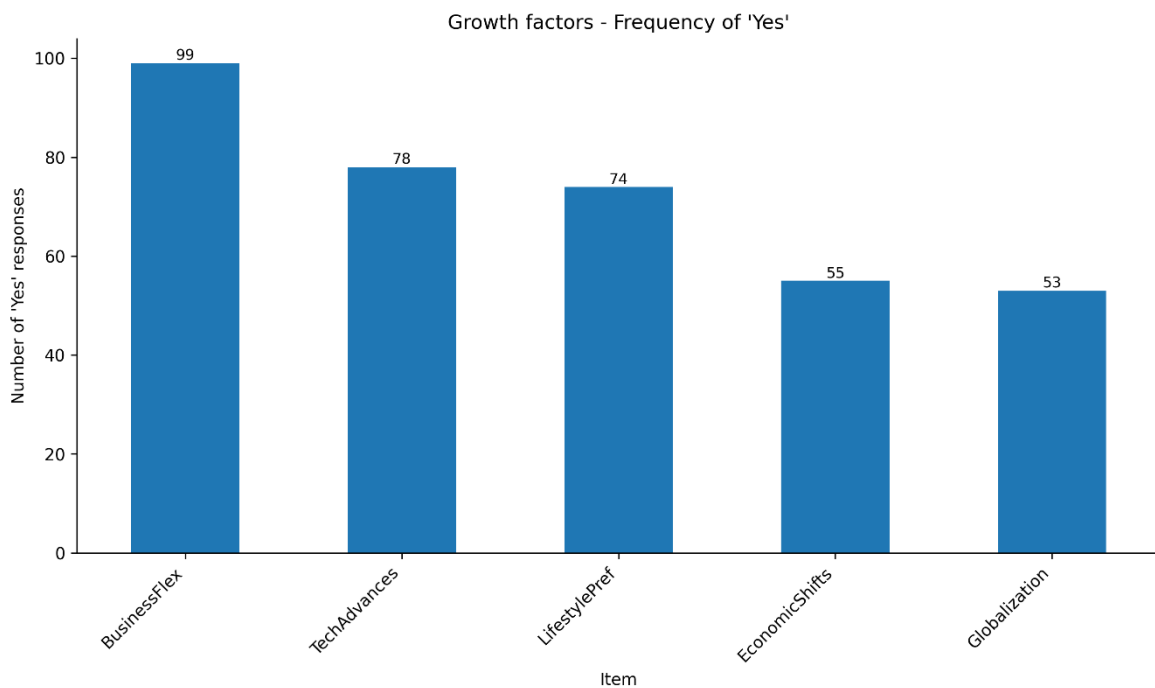


Figure 14. Most important factors driving the growth of freelancing.

Generally, Serbian freelancers have quite optimistic perspective on the future of freelancing (Figure 15). It reflects through the fact that 43.6% are very optimistic and 31.5% are somewhat optimistic. These findings are aligned to findings of some other studies covering the most developed freelance market in the USA (Dua et al., 2022). Altogether, it makes $\frac{3}{4}$ of the sample, with positive perspectives. While 19.5% are neutral in opinion, only 5.4% of Serbian freelancers are pessimistic about future of freelancing. These findings implicate several important dimensions. One refers to the fact that there are a lot of work opportunities in the online labour market despite disruptive (and to some degree negative) effect of technology change introduced by AI,

for example, launching the ChatGPT (Demirci, Hannane & Zhu, 2025). Secondly, despite obvious challenges and to some extent negative characteristics of freelance career (Sutherland, Jarrahi, Dunn, & Nelson, 2020), for large majority pursuing freelancing payoffs are obviously considerably exceeding costs of being freelancer. Thirdly, it reveals big potential which exists in freelancer profession. Namely, despite generally challenging economic, technological and regulatory environment (Andjelkovic et al, 2025b; World Intellectual Property Organization, 2024), the attitudes toward freelancing are surprisingly positive, reflecting, to some degree, huge potential this profession offers, outside of the influence of short-term turbulences exacerbating negative influence on the demand for freelancer services.

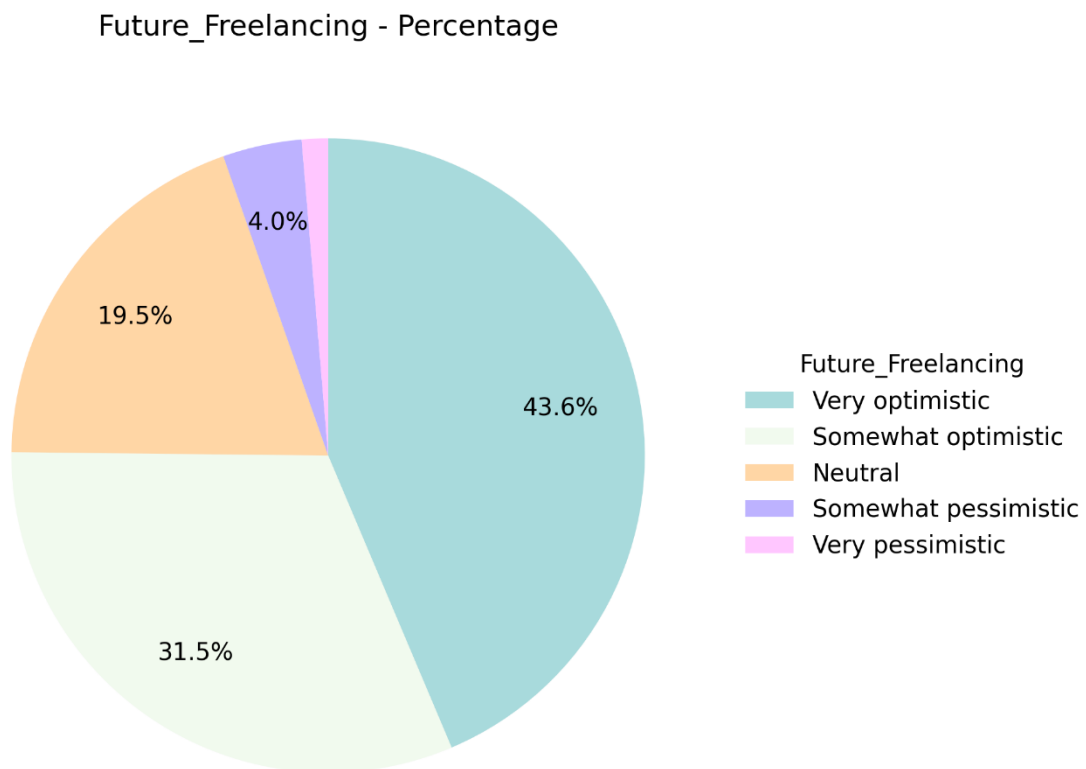


Figure 15. Opinion on the future of freelancing in their field.

Fast development and proliferation of artificial intelligence, particularly after the end of 2022 when first LLMs as powerful examples of generative AI were presented, influences all areas of our lives. Some consequences of the wider usage of AI in business operations on freelancing are already noted (Andjelkovic et al., 2023b). When asked about their expectations how often they will use AI in their work as a freelancer in the

next 5 years, the great majority of them stated that they will use it regularly (46.3%) or often (29.5%) (Figure 16). It confirms expected significance of AI for freelance profession in the future. Only 4% of freelancers responded that he/she will use it rarely, and no one answered that he/she will never use it. This finding is especially important, since the integrating and use of AI knowledge into the set of skills of freelancers is crucial for sustainability of freelancer career in many ways. For example, according to Umbreen et al. (2025) AI enhances income stability, financial inclusion and job quality in freelance market.

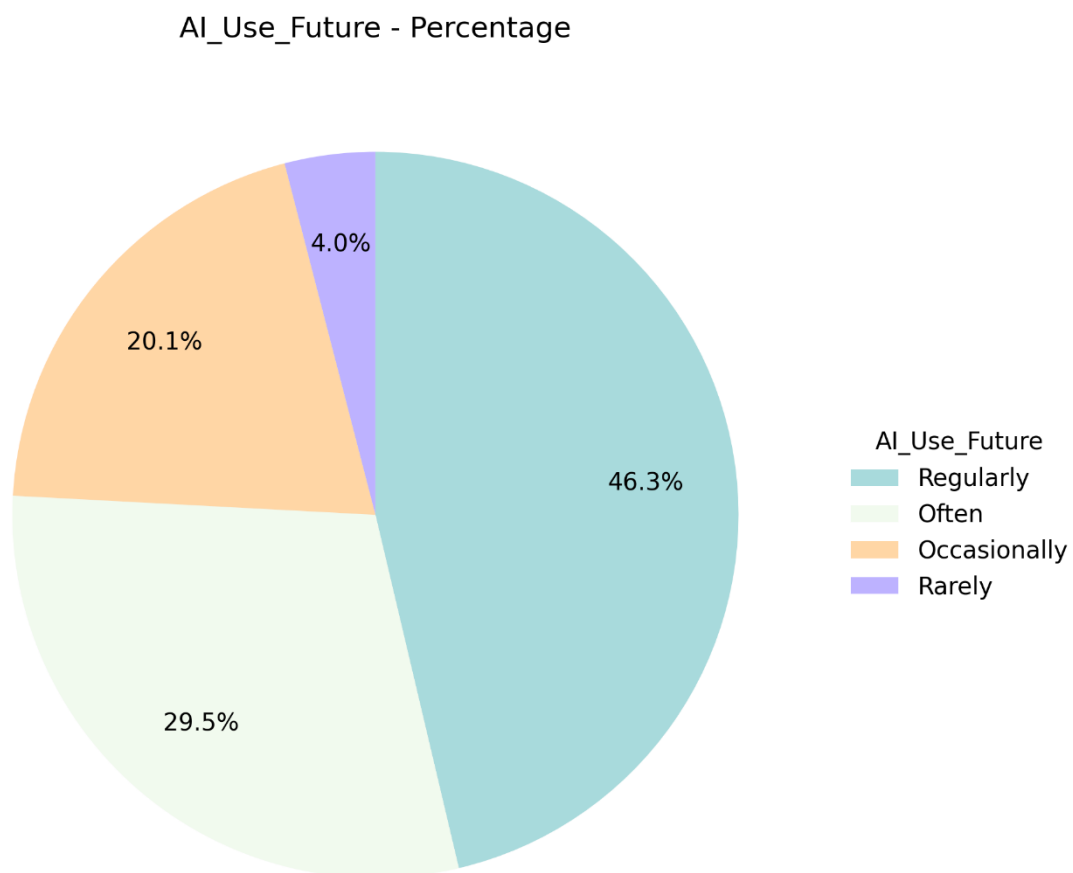


Figure 16. Opinion on the future usage of AI.

An important consequence emerged with the rise of digital technologies and their undisrupted evolution is request for constant adjustments in skills and knowledge of freelancers in order to stay competitive on the market, since freelancers completely depend on their skills (Jeyalakshmi, Dharani, Rajendran & Vijayakumar, 2025). When it comes to Serbian freelancers, the practices regarding frequency in upskilling or

reskilling are presented in Figure 17. According to this, the majority of freelancers (42.3%) only occasionally work on personal upskilling or reskilling. This is not a surprising, since Ivanovic, Kalinic & Radonjic (2025) found similar result observing formal and informal education among the top freelancers in SEE region. They suggest that the learning process goes via learning-by-doing channel and frequently not recorded into official certificates. Positive result of these results is that almost half of respondents work on personal education regularly or often. Since only 3.4% of freelancers never perform activities related to upskilling and reskilling, it is obvious that working on skill set is recognized as an undeniable aspect for surviving and thriving on the digital labour market among Serbian freelancers.

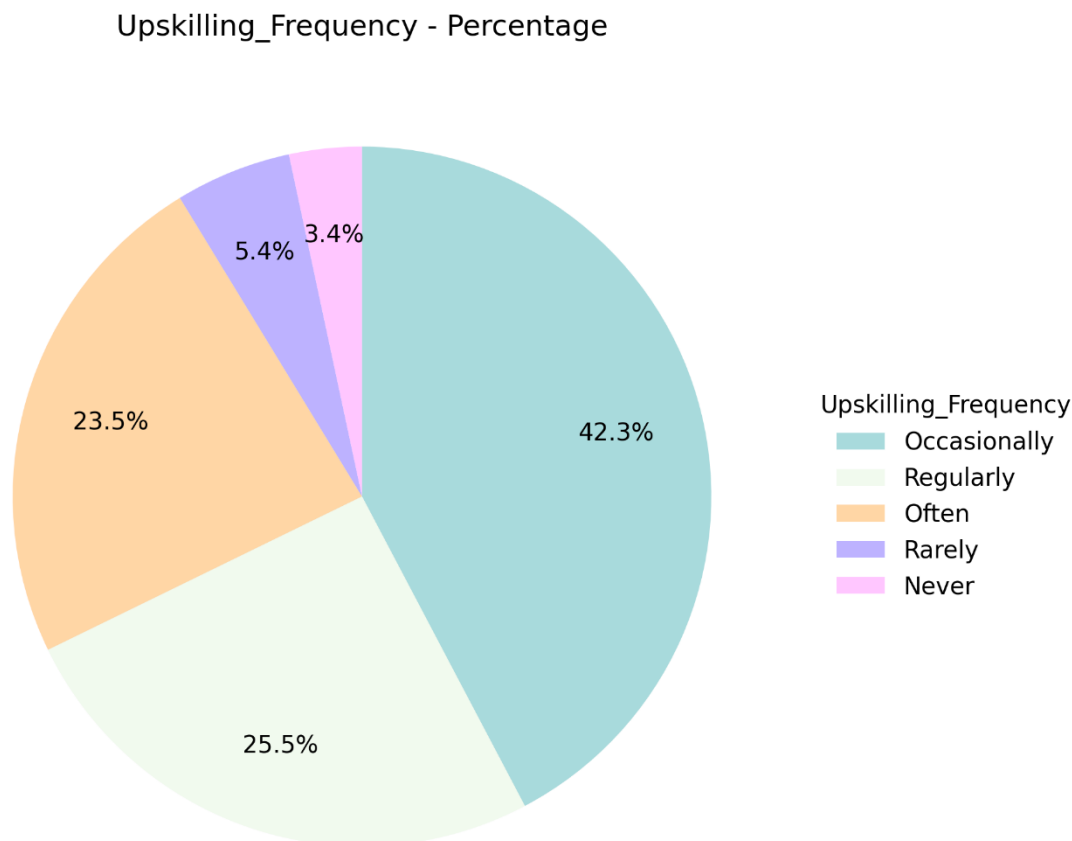


Figure 17. Opinion on how often freelancers invest in upskilling or reskilling.

In order to escape “skill trap” (Gruenewald & Mueller, 2025), most of Serbian freelancers use online resources and work experience when improving existing or acquiring new skills (Figure 18). Only 10.1% uses formal education for such activities, which may lay in fact that Serbian HEIs require more deeper transformation to be able

to offer adequate knowledge for freelancers. However, this is not uniquely a challenge for Serbian HEIs, since here is generally an urgent need for HEIs to move from their conventional approaches and align with revolutionary technological developments to leverage technology and skill sets offering in the most fruitful ways (Padmaja & Mukul, 2021).

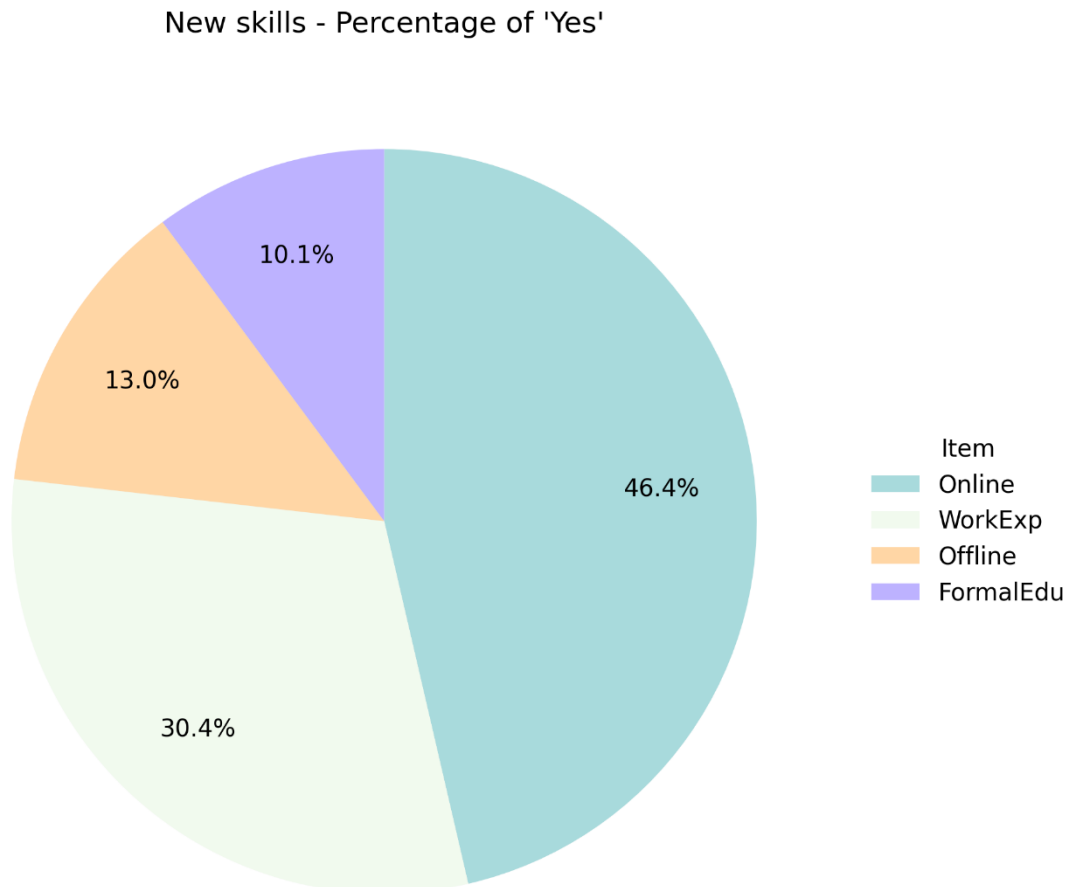


Figure 18. Opinion on how freelancers improve or acquire new skills.

1.2 Companies

Serbia is generally considered as a country which is dominantly source of workforce in freelancing. On the other hand, demand for freelancers by Serbian companies is low and not comparable with main demand markets, such as United States of America, United Kingdom, and other developed countries. Therefore, finding Serbian companies that are hiring freelancers is a challenging task. The data on

companies that hire freelancers was collected in Fall 2025, via online questionnaire. Following adopted research methodology, after data collection, cleaning and pre-processing, we 11 valid questionnaires remained (companies operating in Serbia, regardless of the country of headquarters). In this section major insights describing demand for freelance workforce will be presented. Since the sample is quite small, all findings are of informative nature.

Concerning the main area of your activity (following NACE statistical classification), the distribution of the sample is presented in Figure 19.

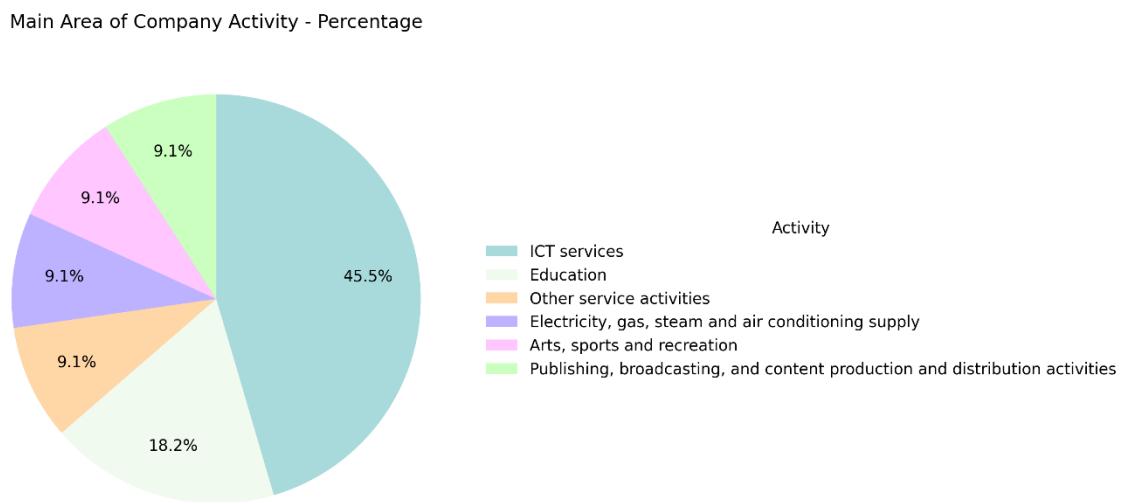


Figure 19. Distribution of companies based on the main area of activity.

Most of the companies (5 companies or 45.5%) comes for ICT sector, which is in line with previous results, because companies in this sector are first to use advanced digital technologies and tools, and their tasks (e.g. software development) are easy to split and outsource. Moreover, the majority of innovations comes in this sector, where freelancers are seen as a mean to reduce barriers to entry, risk and financial requirements, while enhancing business efficiency and flexibility, i.e., freelancers are seen as fundamental inputs enabling innovation activities (Burke & Cowling, 2015). Two companies are in the area of Education, followed by one representative in other four areas (Figure 19). Majority of the companies in the sample are (72.7%) are micro companies (1-9 employees), while remaining 27.3% of the sample represent small companies (10-49 employees). In Serbian sample, there were no medium (50–249 employees) nor large (250+ employees) companies. This result underlines an

important aspect of freelancing, where freelancers are observed not only as facilitators of entrepreneurship, then also important supplementary ingredients which help SME to overcome a lack of resources in key areas important for success, i.e., barriers in financial, managerial and social capital (Youssef & Sikdar, 2020).

When asked about the years active in the market, most of the companies (81.8%) responded that they are already well established in the market, with five or more years of existence (Figure 20). This may illustrate even more the importance of freelancers for survival and development of SMEs, since without freelancing, declining working age population and emigration of skilled workforce from Serbia, some of this companies would have less options to hold the business on track.

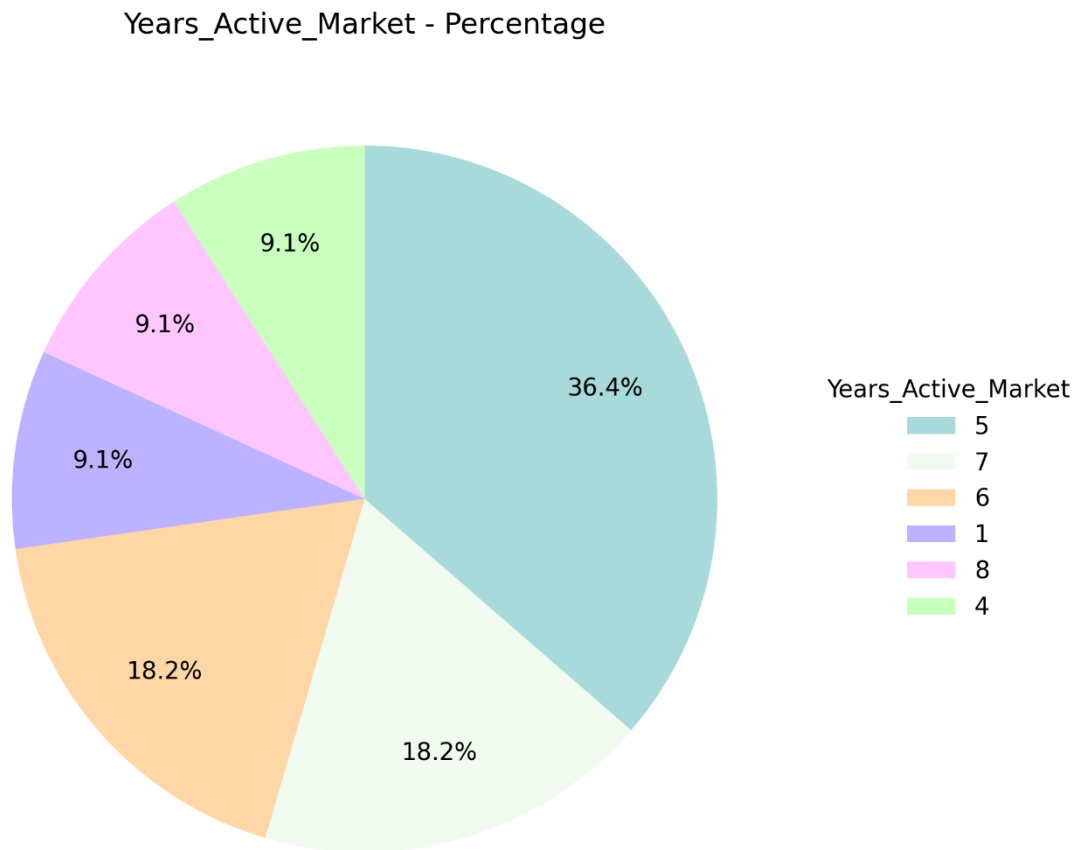


Figure 20. Distribution of the years active in the market.

Most of the companies operates on local, e.g., national market (Figure 21), whereas market activity at the global and regional (for example, Europe or Asia) levels is each characterized by the presence of only one company. Concerning the company

ownership, 71.8% are owned by Serbian citizens, while remaining 18.2% of the companies had foreign ownership. This finding may even indicate that opportunities offered by freelancing are not only recognized by those companies coming from more advanced markets, then also as important element in overall strategy of Serbian companies to upgrade their business operations and to stay competitive on the national market.

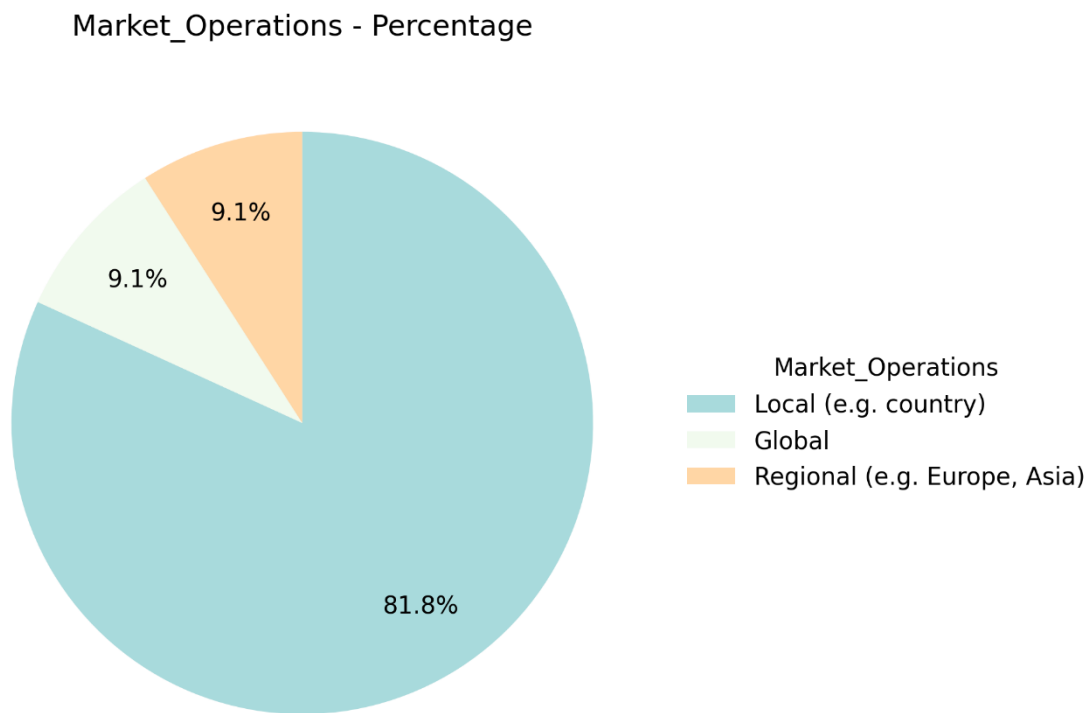


Figure 21. Distribution of the market of operations.

Figure 22 presents the years of presence in freelance market i.e. for how many years the company is hiring freelancers. The companies are here almost evenly distributed: some of them have just started hiring freelancers, while some others are hiring them over a longer period (4 or 5 years). Data suggest that freelancing is spreading over the years. Interestingly, all but one companies hired freelancers in the last 12 months, which reflects the fact that companies from the sample frequently use the services offered by digital labour market. Moreover, once they use freelancing in their business model, they integrate it as a constituent part of their business operations.

Years_Hiring_Freelancers - Percentage

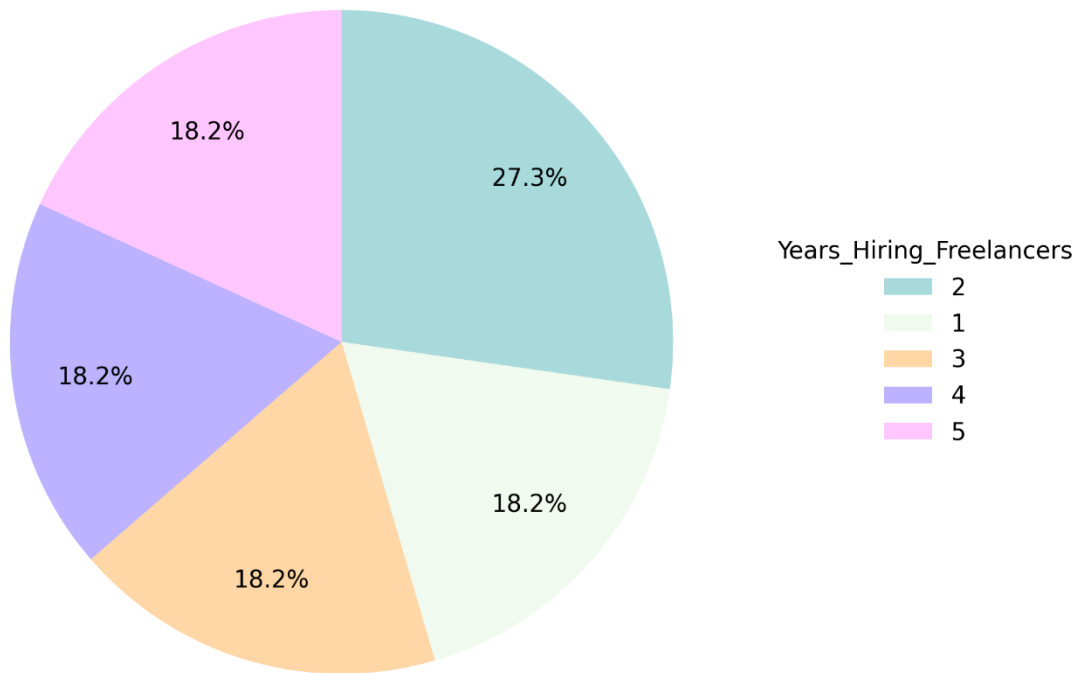


Figure 22. Years of presence in freelance market.

The Serbian companies usually hire freelancers in the areas of Sales and Marketing; Software Development and IT; and Creative and Multimedia (Figure 23). Only one company hired freelancers for Clerical and Data Entry, while there were no companies hiring freelancers from other areas (e.g. Writing and Translation or Professional Services). It reflects the fact that freelancing is a source of business upgrading in areas which require more sophisticated skills and in industries with higher intensity in use of digital technologies. Moreover, it corresponds to the structure of global demand (Kässi et al., 2018; Alauddin, 2025), where the companies from advanced economies are searching, on average, the same professions, indicating that business transformation takes place in similar patterns in different economies, independently of their level of development.

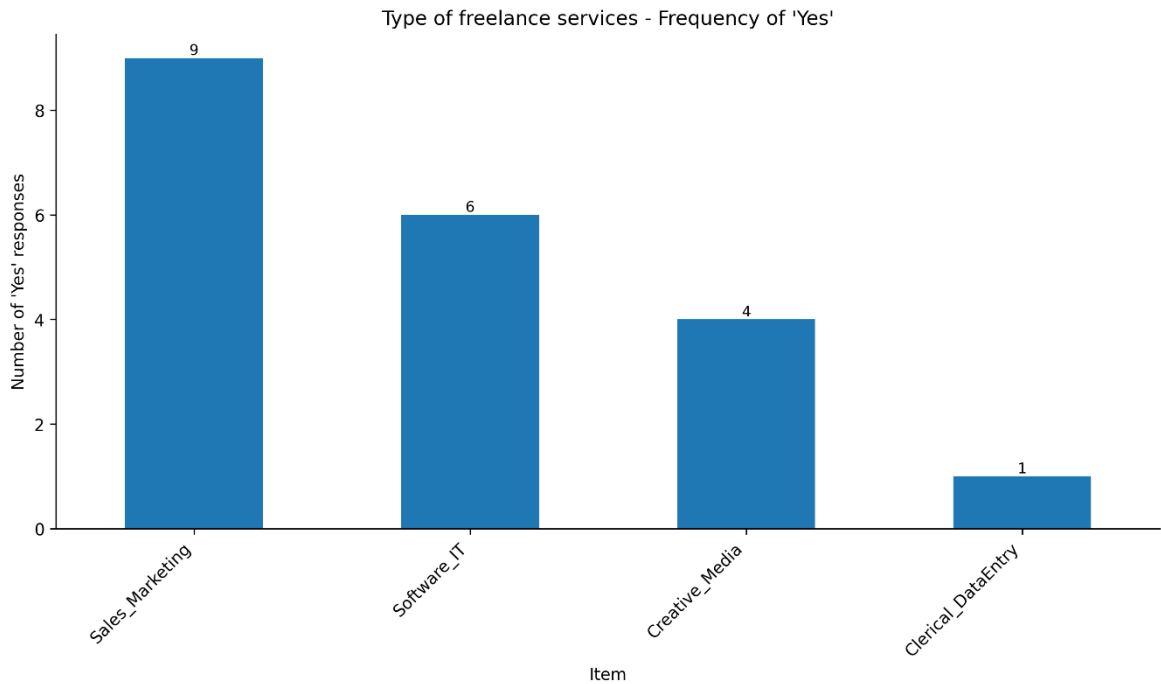


Figure 23. Type of freelance services hired.

One of the important questions refers to the motivation of companies to hire freelancers. In a case of Serbian companies there are diverse incentives (presented in Figure 24). As the most important reason the companies stated access to skills not on disposal in-house, followed by faster delivery and cost-effectiveness, which are all well-known advantages of freelancing (Youssef & Sikdar, 2020; Zadik, Bareket-Bojmel, Tziner & Shloker, 2019).

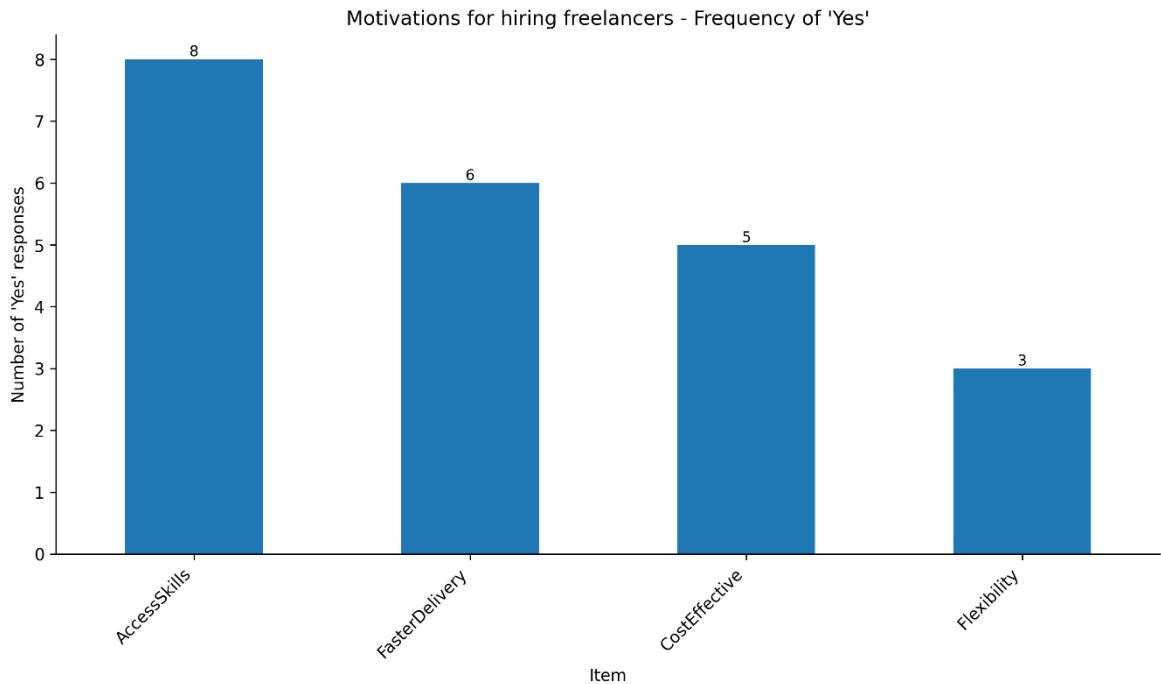


Figure 24. Why companies choose to hire freelancers.

On the other hand, hiring freelancers also introduces some risks, and the main risks perceived by Serbian companies are presented in Figure 25. The hiring companies are the most concerned of the risk of project delays and unreliability of freelancers, followed by lack of control and transparency. Other identified risks of hiring freelancers include integration and communication challenges (with team and/or clients), inconsistent work quality and rework needs, unavailability and data breaches and leaks. Interestingly, only one company finds payment disputes as a potentially significant risk of hiring freelancers. It is obvious that engaging into cooperation with external employee requires careful calculation of potential benefits and risks, in which different prerequisites have to be fulfilled in order to fulfil expectations on both sides. According to Barlage, van den Born & van Witteloostuijn (2023) jobs offered should not only suit the task requirements at hand, fit with the skills of freelancers, then also leave ample of space for freelancer to develop both individual growth and in the domain of skills.

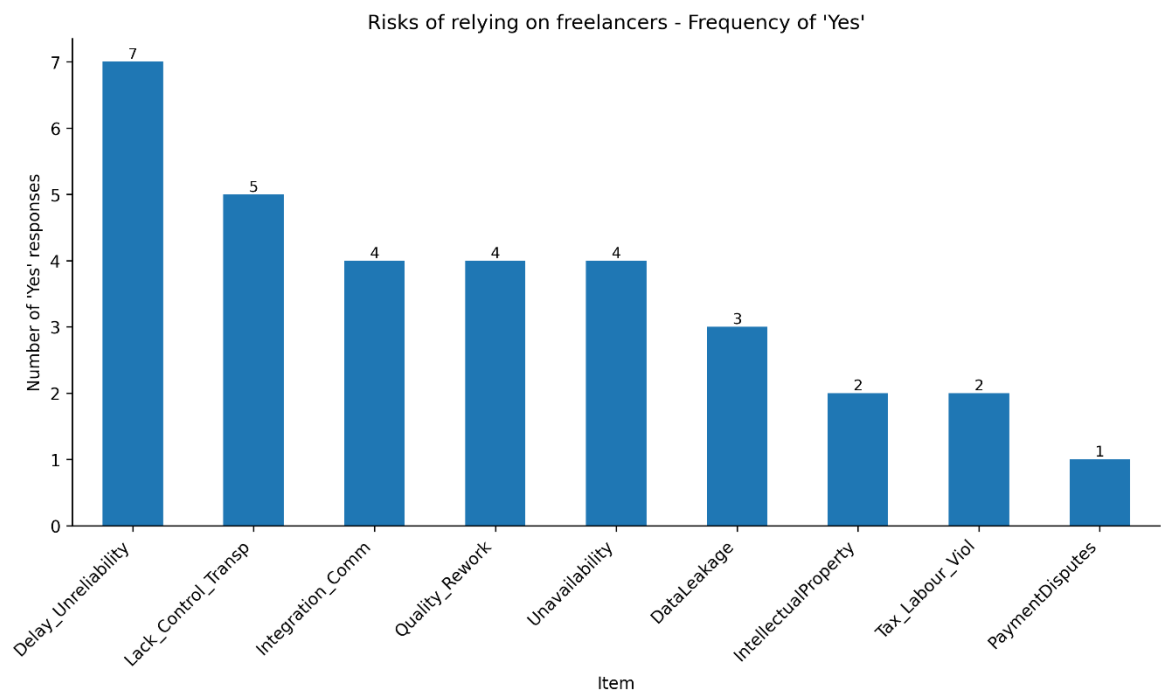


Figure 25. The major risks of relying on freelancers.

As the most important challenges that companies will face in the near future, the majority sees the challenges related to the availability of freelancers with required competences and increased costs of freelancers' engagement (Figure 26). Additionally, a bit less relevant, challenges include the new generation attitude to work-life balance and increasing project complexity, followed by changes in freelancers' expectations and market/social changes that could reduce availability of freelancers. From ordering different factors, it is obvious that operative (short-term business) concerns overweight strategic risks (related to structural changes in social and technological landscape), while the first are more precisely measurable, where the others are followed with significant uncertainty (but also not only related to the freelance market, then also for broader economy).

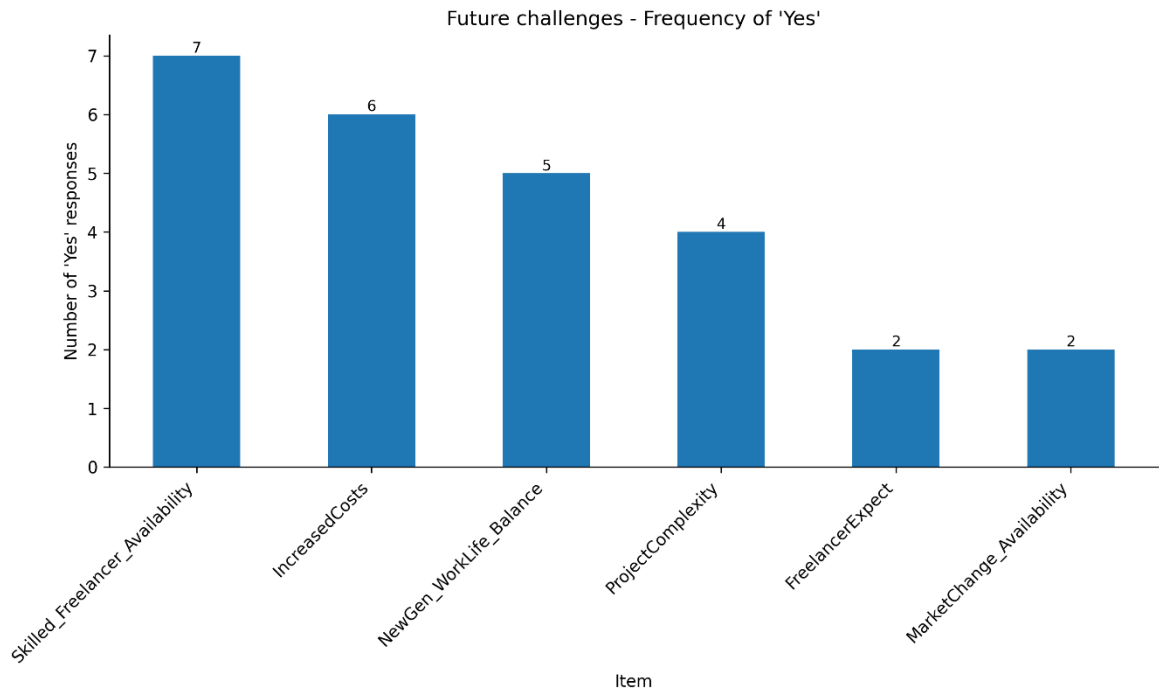


Figure 26. Most important challenges that companies will face in the near future.

When asked how will the use of AI influence hiring freelancers in their company, the respondents had quite different attitudes (Figure 27). Almost a half of the respondents had an opinion that the use of AI will have no effect on hiring freelancers. On the other hand, we have two opposed groups: 36.4% of the companies think that the use of AI will lead to less hiring of freelancers, while remaining 18.2% have opposite opinion. This aspect also reflects relatively limited influence that AI had generally on employment in Serbia until now (ICT Hub, 2025), and that it will stay like that in the near future. Moreover, long-term influence will depend not only on the further development of AI, then also on adaptations made by companies and freelancers to maximally exploit possibilities brought by new technological breakthroughs in AI.

AI_Influence_Freelancer_Hiring - Percentage

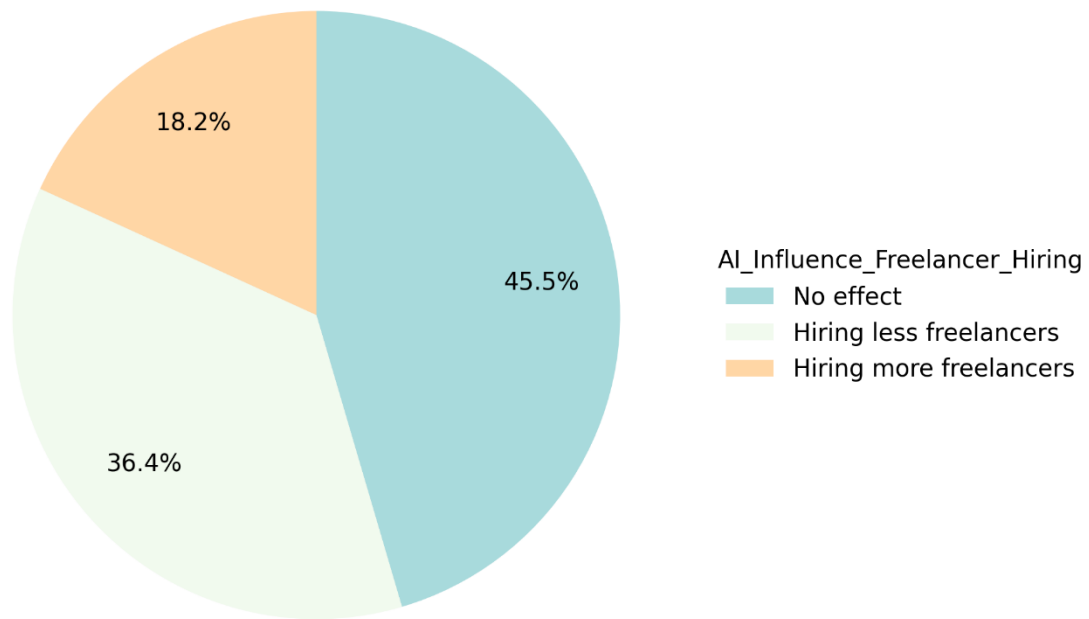


Figure 27. How will the use of AI influence hiring freelancers.

Equal number of companies express neutral, positive and negative stance toward the influence of AI technology on the freelancing market. Namely, attitudes are equally distributed between the absence of any influence of AI on freelancer market, new AI-driven service opportunities and a shrinking of freelance opportunities (Figure 28). This is related to relatively limited probability of accessing the impact of AI, but also of accessing the speed and extent by which it will disrupt existing business practises. To other perceived effects belong higher demand for AI skills, increased global competition, and reduction of routine tasks.

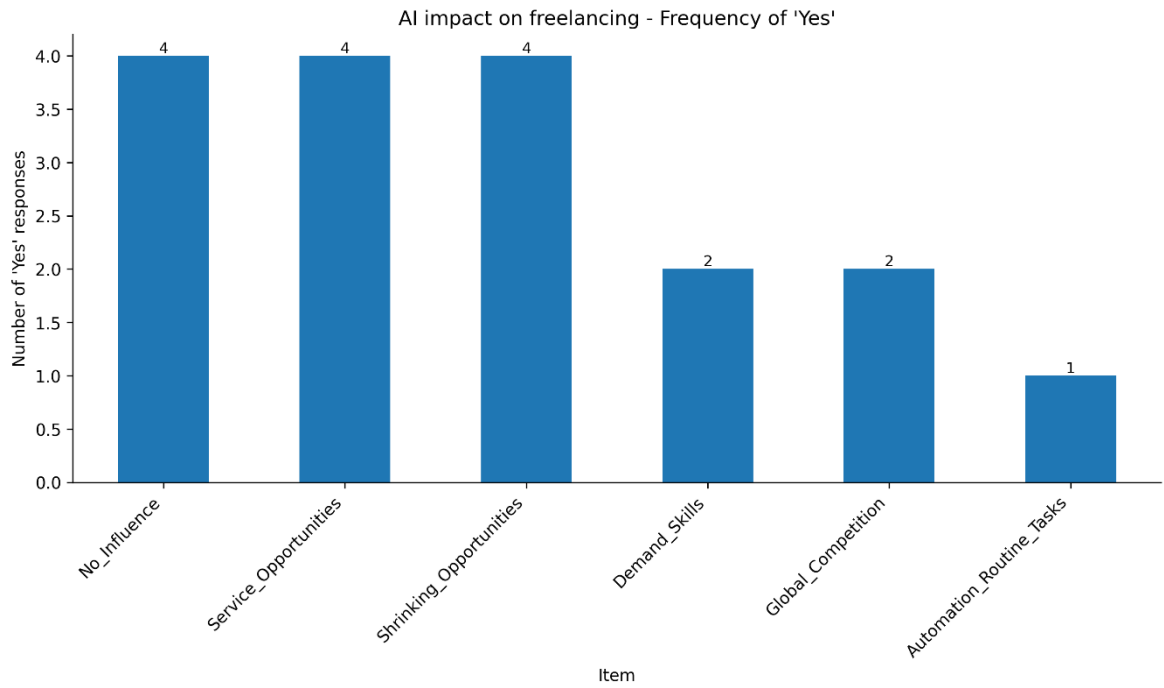


Figure 28. The use of AI technology and its influence on the freelancing market.

2 Competency Analysis:

Importance and Proficiency

2.1 Freelancers

One important objective of the research was to examine (self-reported) proficiency and importance of freelancer competences/skills (here, we are taking about “soft”, general competences, important and relevant for all freelancers, and not about specific freelancer knowledge i.e. “hard” competences, like programming in Python, or Serbian-Polish translation, etc.). As a part of the research, key 23 skills were identified and grouped into three categories. The distribution of the competences across groups, as well as codes/acronyms for each group and competence is presented in Table 1.

Personal profile (PP)

Self-organization and work discipline (PP_SelfOrg_WorkDisc)
Dealing with uncertainty and stress (PP_Uncert_Stress)
Ability to engage in and maintain relationships (PP_Engage_Relat)
Ability to learn quickly and expand knowledge (PP_Learn_Expand)
Experience in the work domain (PP_Exper_Domain)
Ability to identify, analyse and solve problems (PP_Identify_Solve)
Knowledge of and compliance with formal regulations (e.g. law, taxes) (PP_Formal_Reg)
Ability to manage personal finance (budgeting, savings, etc.) (PP_Pers_Fin)

Communication and work in a team (CWT)

Clarity of expression while communicating with others (CWT_ClarityExpr)
Courage and assertiveness in communication (CWT_Courage_Assert)
Self-promotion and brand building (CWT_SelfPromo_Brand)
Understanding of multi-cultural environment (CWT_MultiCult)
Ability to keep good relationships in business collaboration (CWT_BusinessRel)
Right prioritization and task management (CWT_PrioritizationTask)
Ability to work in a team (CWT_TeamWork)
Negotiation skills (CWT_Negotiation)

Digital literacy skills (DL)

Ability to assess the relevance of online information (DL_AssessOnlineInfo)

Ability to use cloud-based project management tools (e.g., Trello, Asana) (DL_CloudProjMgmt)

Use of a cloud-based storage system (e.g. Dropbox, Google Drive) to share material with other members of the group (DL_CloudStorageShare)

Choosing right tools for effective collaboration (e.g. online spaces for co-creation, shared project management tools) (DL_CollabTools)

Use of search engines, social media and content platforms (DL_SearchSocialContent)

Use of digital labour platforms (choice of the right platform, registration, search and application for job, communication over platform, etc.) (DL_DigitalLabourPlatforms)

Use of AI tools (DL_AITools)

Table 1. Distribution of the skills across groups, with codes.

Using five-point scale, the respondents were assessing their proficiency (1 – beginner, 5 - master) and perceived importance (1 – not important, 5 – extremely important) of each skill enlisted above. The mean values of perceived importance and proficiency in each competence item, as well as the gap – the difference between perceived importance and proficiency are presented in Figure 29.

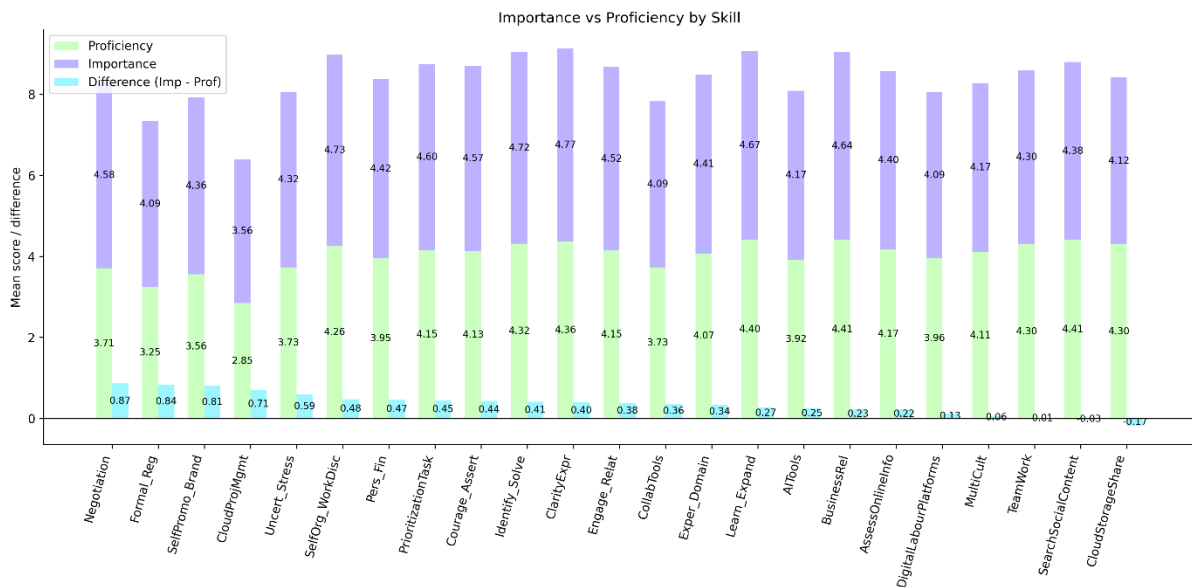


Figure 29. Importance vs. Proficiency by Skill.

Serbian freelancers perceive Clarity of expression while communicating with others; Self-organization and work discipline and Ability to identify, analyse and solve problems as the three most important freelancer competences. Highest deviations i.e. disagreement in their answers were found for the skill Ability to use cloud-based project management tools (probably because some of freelancers do not need and/or do not use these tools), while lowest deviations were found for the skill Clarity of expression while communicating with others – for most of the freelancers this seems to be very important skill.

On the other hand, when assessing their own proficiency, the three highest ranked skills are: Ability to keep good relationships in business collaboration; Use of search engines, social media and content platforms and Ability to learn quickly and expand knowledge. Highest deviations i.e. disagreement in their answers was again reported for the skill Ability to use cloud-based project management tools, while lowest deviations were found for the skill Ability to learn quickly and expand knowledge – majority of the freelancers highly evaluated themselves in this skill.

One of the important aims of this research is to identify gaps, i.e., significant differences between perceived importance and proficiency. The high gaps are good candidates for the development of additional learning materials/courses, which would be able to help freelancers to close these gaps. The identified gaps in Serbian sample are presented in Figure 26 (light-blue columns), in descending order. The highest differences between perceived importance and proficiency are identified for Negotiation skills; Knowledge of and compliance with formal regulations (e.g. law, taxes, accounting) and Self-promotion and brand building.

Perceived importance is not the same across gender. For example, top 5 competences for Serbian freelancers across different gender groups are presented in Figure 30.

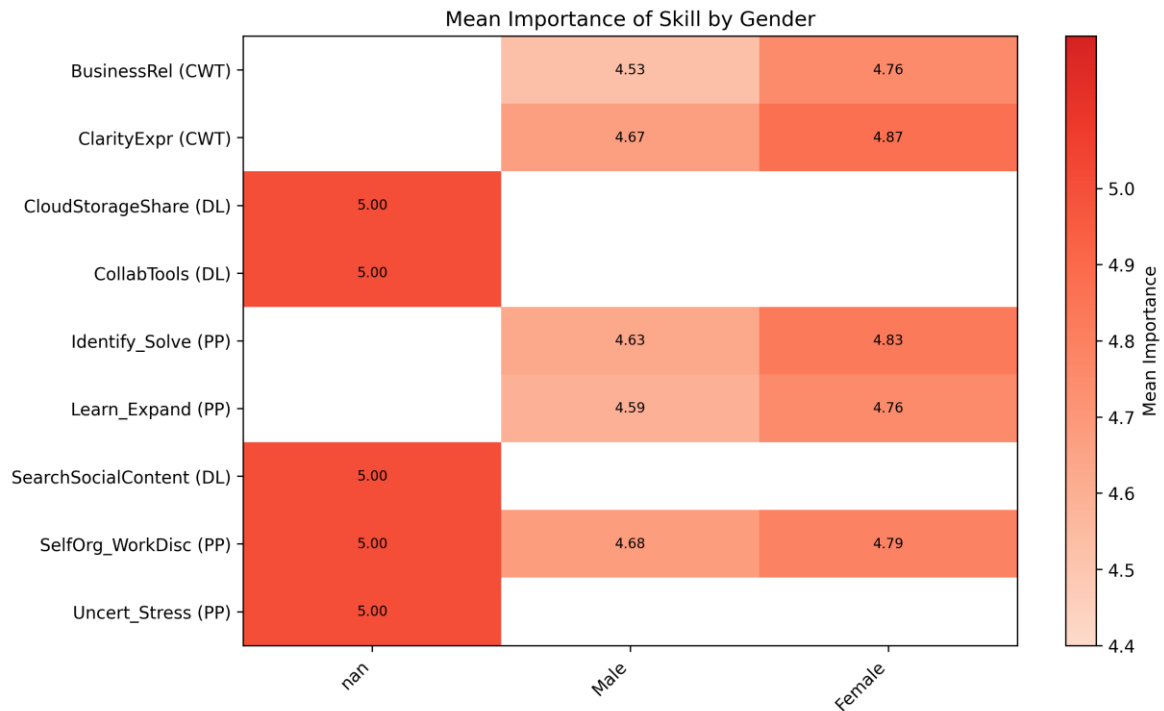


Figure 30. The most important skills by gender.

To the most important skills belong Ability to keep good relationships in business collaboration, Clarity of expression while communicating with others, Ability to identify, analyse and solve problems, Ability to learn quickly and expand knowledge and Self-organization and work discipline. There are several regularities we may notice in data presented. The obvious fact is that the most important skills are identical among men and women, while every single being more pronounced by women than by men. In the same time, the overall importance of single competencies within the gender doesn't vary a lot, holding for both men and women. Those findings suggest that there is some gap between gender, although they perceive same bundle of competencies as fundamental. and refer to while difference arise to not declared persons (they constitute a small part of the sample (only 1 person), which makes any description of the results for people with alternative identities, i.e., identities outside male/female spectrum, impossible) ¹. Another insight is related to the fact that technical requirements (knowledge and technology) for being freelancer are not an obstacle, so

¹ From this reason, we find it reasonable to proceed analysis within binary framework, i.e., describing characteristics of male and female group of freelancers, letting out one freelancer with undetermined gender.

the problems with the storage or searching social content are not among those found to be the most decisive for a freelancer career.

Comparing top 5 skills for different age groups, we obtain heat map presented on the Figure 31. This figure shows the importance of individual skills represented by their mean importance for different age groups, which potentially reflects different career pathways of different age groups, besides experience, but also different behavioural patterns established in different working environments, which, in return, tend to be persistent ones they are established (if they enable adequate pay offs for freelancers).

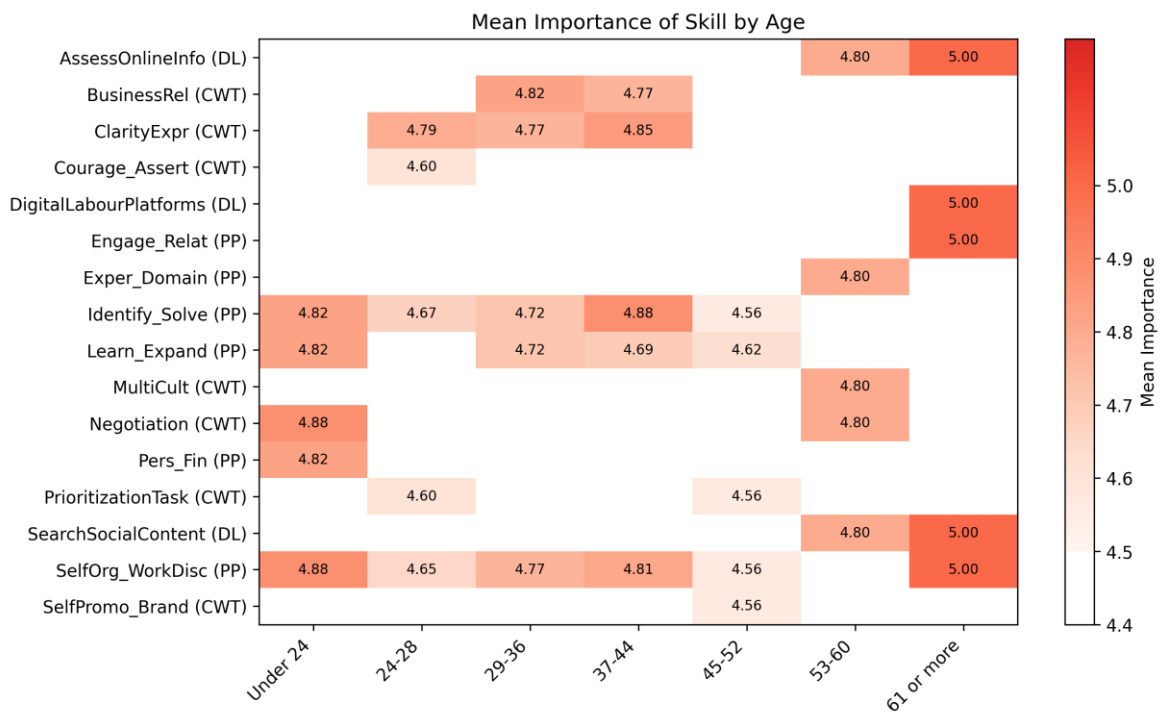


Figure 31. The most important skills across different age groups.

For the youngest freelancers, there are five most important skills: Learning and skill expansion, Problem identification and solving, Negotiation and work in a team, Skills related to personal finance and Self-organisation and work discipline. There are several insights coming from presented distribution of skills among this group of freelancers. One relates to the fact that these 5 groups of skills are almost equally important for the beginners, since there is a very small variation comparing their individual importance. Bearing in mind that they are related to different domains of

the freelancing, it indicates that the initial requirements to succeed are relatively high since high heterogeneity of skills: from learning to personal finance issues. It, additionally, indicates a considerable gap between the skills one obtains during the formal education and skills required to successfully integrate into the digital labour market as a freelancer.

For the next age group, i.e., between 24 and 28, Problem identification and solving and Self-organisation and work discipline continue to play an important role, while new set of skills emerges as the most important: Clarity of expression, Courage and assertiveness in communication, and Prioritization of tasks. So, after some time, i.e., after obtaining some work experience, in this group comes to the shift in skills toward more entrepreneurial elements (for example, courage and assertiveness), while managerial aspects (for example, problem identification and solving) continue to have an important role.

For freelancers in next two groups, between 29 and 36 years and between 37 and 44 years, challenges stay to the largest extent the same as for the previous groups. Namely, the most important skills are Clarity of expression, Problem identification and solving, Negotiation and Self-organisation and work discipline, the same is the case with the age group 24-28, while importance of skills related to Learning and expending knowledge reappears, as it is the case with the freelancers in 24-28 age group. As a new set of skills of particular importance are skills related to the Keeping good relationships in business collaboration. This results may suggest that after one has enough (basic) skills and experience to establish himself as a freelancer (whether those skills are coming from online or offline world), the main (further) challenge is how to stabilize and make his business grow and develop, since main issues are related to nurturing existing business relations, but also learning and expending knowledge, which is a precondition for scaling-up of freelancer services.

While Problem identification and solving and Learning and expending knowledge and Self-organisation and work discipline continue to be of fundamental importance for the people in the age group between 45 and 52 years old, Prioritization of tasks reappears (as it is a case within the group 24-28), which may indicate problems with more work volume, but also balancing between private and business issues among this

group. Additionally, a unique (for this group) entrepreneurial aspect emerges and it is related to the Self-promotion and brand building, indicating that for the people with developed business model, its expansion requires different strategies compared to those required to establish freelance career. Moreover, within this group, although the relative importance of different skills listed here is relatively high, it is worth mentioning that they are slightly lower compared to the other groups, suggesting that level of different skills is the highest among this group.

The people in the fifties (age group 52-60 years old) are the most diverse group compared to the other age groups. Namely, except the Negotiation skills, which are highly relevant for the freelancers at the beginning of their career, all other skill sets are unique, i.e., are characteristic only for this group. To this group belong Access to online information, Experience in the work domain, Understanding multicultural environment and Use of search engines, social media and content platforms. There are several important insights regarding such a distribution of importance regarding the skills. The reappearance of Negotiation skills may indicate, to some degree, an inappropriateness of the negotiation techniques, coming from the offline businesses experience, but also lead to conclusion that this could present severe obstacle for the development of freelancer career, since behavioural pattern established in the long-term are generally very hard to be changed and adapted according to the requirements of new working environments. Moreover, bearing in mind that this group has a need to some skills which are of the most basic importance for freelancer career (such as use of social platforms or even access to online information), a straightforward conclusion is that this age group confronts to the highest risks to integration on the freelance market.

For the most mature group (age 61 and over), the skills requirements are to some degree the same as to the previous one (Access to online information and Use of search engines, social media and content platforms), Self-organisation and work discipline reapers making it a one of the most fundamental challenges for all age groups (except for those between 53 and 60), while unique importance arises in Ability to engage in and maintain relationships and, more fundamentally, in Use of digital labour platforms (choice of the right platform, registration, search and application for job,

communication over platform, etc.), suggesting that deficiencies in knowledge are spread around very diverse aspects implicating that integration on online labour market could pose severe challenge to the oldest workers. However, it may be mitigated by differential approach to the integration. For example, not starting career on the online labour platform (after commanding the basics about online platforms) only as an independent freelancer, then affiliated to some agency (which, in turn, requires some social capital, i.e., integration into some of the existing social networks around which the agencies are organized).

Important conclusions may be drawn observing cross-age distribution of skills. First, as core skills for all the freelancers under the 53-year-old appear, with only one exception, Self-organisation and work discipline, Problem identification and solving and Learning and expending knowledge. This finding points out to the fact that being a freelancer requires simultaneous “battle” on two fronts: workflow management and continuous learning efforts. Moreover, Self-organisation and work discipline represents the most frequently stressed set of skills, indicating the fundamental difference between being a freelancer and regular employee. By later, this issue usually not emerges, since the structure and the nature of the work in business organisation solves for it automatically (via hierarchical organisational structure). Additionally, findings for older groups, over 52 years, suggest that integration into the online market poses quite a challenge, whether it is because of the lack of basic familiarity with realm of digital work (as it is especially a case with the oldest group) or dealing with structural features in working environment (for example, working in multicultural setting).

Figure 32 depicts a mean importance of different skills across education level. We may differentiate between three possible situations regarding the competences bearing in mind their spread across differences in educational level of freelancers².

To one group belong competencies which are common to all freelancers, independently of their educational level. Those competences are the most numerous

² Since there are only two (female) freelancers with PhD level, this group was not analyzed – from obvious reason of biasedness, in a more detail.

and encompass Clarity of expression while communicating with others, Problem identification and solving, Learning and expanding knowledge and Self-organisation and work discipline. Separate is the situation with Ability to keep good relationships in business collaboration, which emerges only by individuals with bachelor and master degrees. It is not surprising, since those belong to most educated group, and are probably able to estimate the importance of these competencies, especially when it comes to the growth and development their businesses. Negotiation skills are seen as of immense importance only by those freelancers with lowest level of formal education, suggesting that getting an opportunity is less challenge than getting the most from it when job opportunity arises.

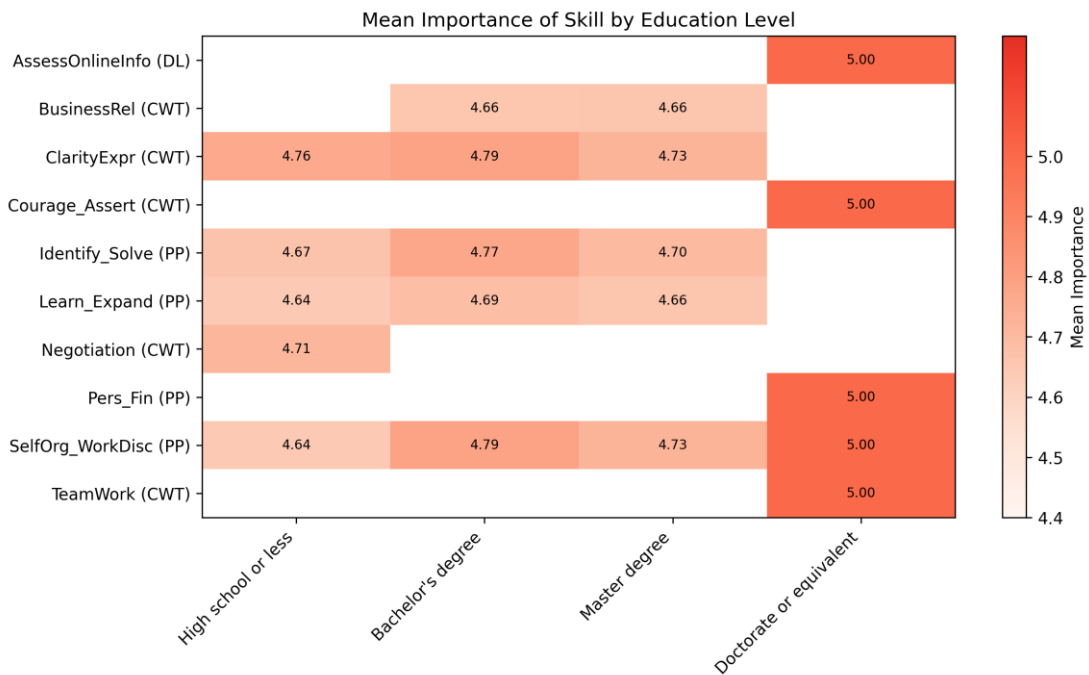


Figure 32. The most important skills by educational level.

It is highly interesting that freelancers with bachelor’s and master’s degree look at the skills through the same lenses, i.e., both educational groups identified the same competences as the most important. The difference is, however, in the level of importance, though not too large: Bachelor’s degree freelancers tend to attribute higher importance to (almost) all skills than those with master’s degree. This result may indicate that formal education brings a bit more granulated and sophisticated look at the strategy of succeeding at the freelancer market, meaning that although some

skills seen as very important, they are not seen as of ultimate importance by those with higher level of education (in our case master degree), since the composition of skills, even different compositions, are more decisive for success than a single skill observed.

Figure 33 describes the most important skills across different groups of freelancers according to their level of experience. The least experienced are those under 1 year, while the most experienced have more than 10 years of experience.

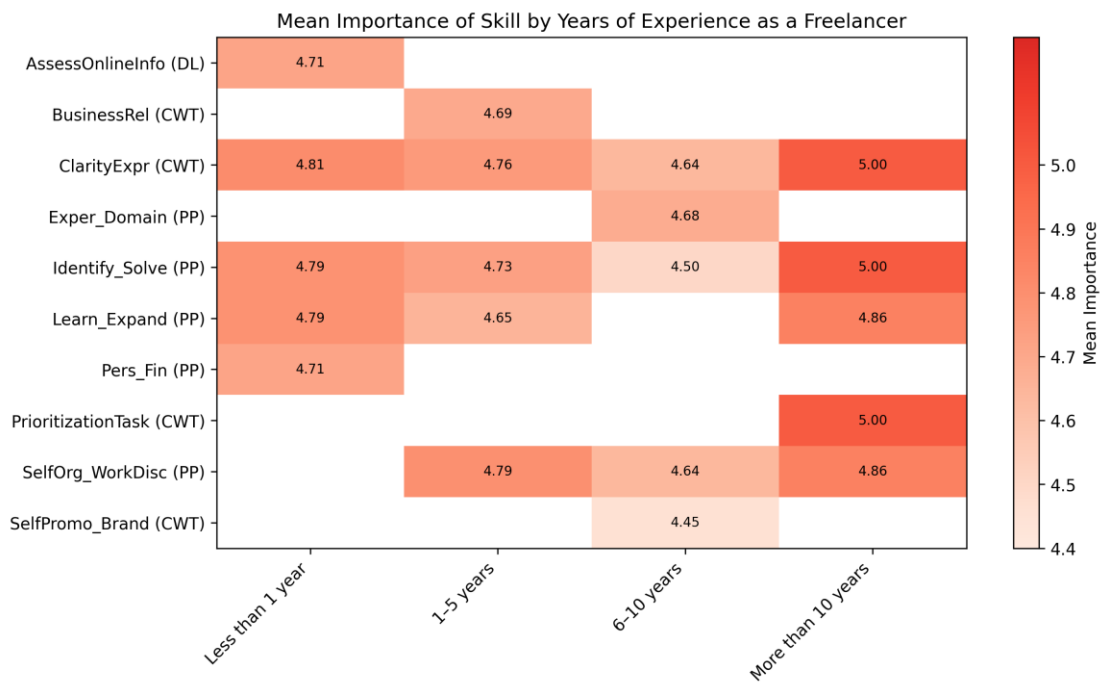


Figure 33. Importance of different skills by level of experience.

Observing Figure 34, we may notice that two skills, i.e., Clarity of expression while communicating with others and Ability to identify, analyse and solve problems is present to all freelancers, independently how much experience they have. It may be said that doing the job and communicating the work process with the clients make a constant in freelancer work operations, a unique characteristic not prone to any changes over the career development. The fact that only the most experienced (10 years and more) freelancers see critically Right prioritization and task management, moreover uniquely as extremely important (mean value of 5), may be related to the volume and complexity of job which are coming with advancement of freelance career. Those with considerable experience in freelancing, i.e., between 6 and 10 years, besides

the skills seen as most important by other experience groups, find, in contrast to others, very high importance in Self-promotion and brand building and Experience in the work domain as critical assets to success in freelancing. This may be, at least partially, related to the needs regarding further development of business and entering more lucrative niches in their professional domain. Not surprisingly, only those who survived first year on the market (group between 1 and 5 years of experience) see Ability to keep good relationships in business collaboration as of critical importance, since after (successful) getting the clients, the next step is to hold them in the longer run – an element fundamental for rising predictability and stability of income and generally work prospects.

The most important skills perceived by freelancers in different professions-activities, are presented in Figures 32. Huge diversity in perceptions about the importance of individual skills suggest to the existence of different markets requirements when it comes to (combination of) critical skills one needs to possess to thrive on the market. However, it seems that still there are some skills which have more pronounced horizontal importance, i.e., that arise among freelancers more frequently independently of the domain of expertise. To such expertise belongs Self-organisation and work discipline, and to a bit lesser extent, Learning and continuous skill expansion, Clarity of expression and communication and Problem identification and solving. This fact suggests that those skills and competencies are more generic in nature, i.e., are generally a precondition for successful freelance career.

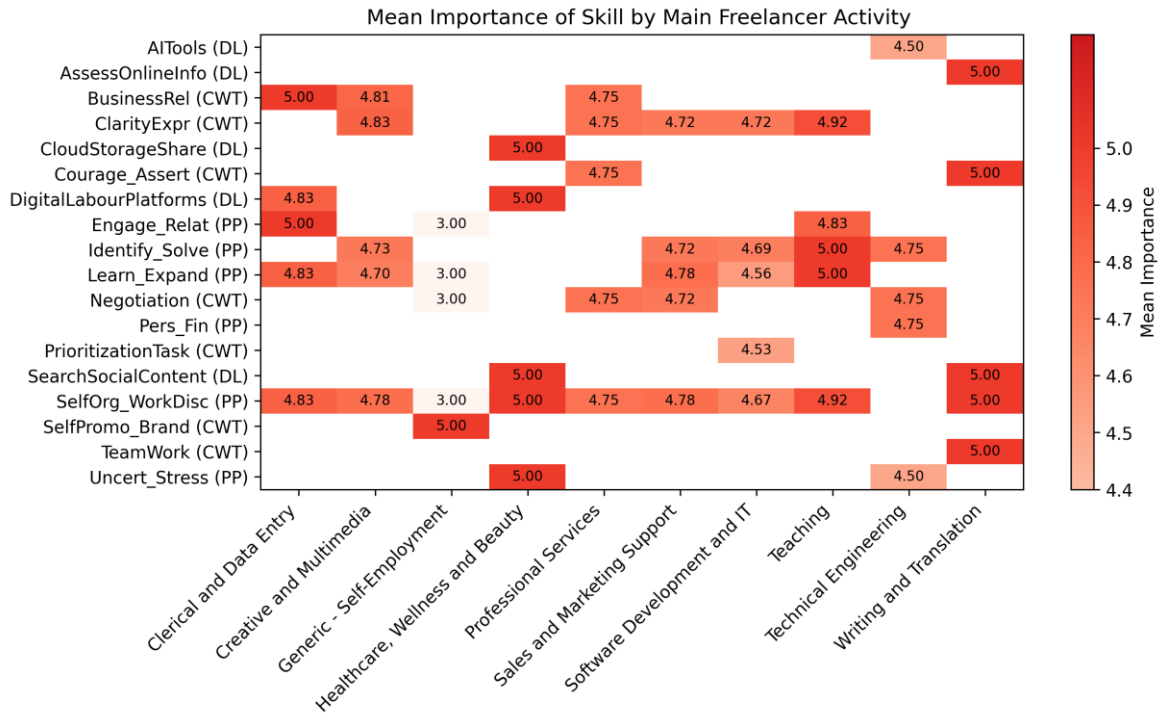


Figure 34. The most important skills over different professional occupations.

Beside Generic and Self-employment category, where only skill with extreme importance is Self-promotion and personal branding, while the rest are important at moderately level, all other professions record some kind of specificity, which may be determined by specific professional domain. Additionally, in two professions – Healthcare, Wellness and Beauty and Writing and Translation are recorded maximal levels of importance in skills observed as the most important – suggesting that without this adequate level of identified skills, which are to large extent different in these two professions, is not possible to strive being a freelancer.

2.2 Companies

Another important objective of the research was to examine the opinions of the demand side in freelancing, i.e., hiring companies. Using the same set of skills presented in Table 1, the representatives of the companies hiring freelancers were assessing importance and proficiency of hired freelancers, i.e., how well they met the standards of the company. The assessment was made using five-point scale, by which respondents were assessing the importance (1 – not important, 5 – extremely important) of each skill and how well hired freelancers met company’s standards (1 – did not meet company’s standards at all, 5- met all company’s standards). The mean values of perceived importance and proficiency in each competence item, as well as the gap – the difference between perceived importance and proficiency/meeting standards are presented in Figure 35.

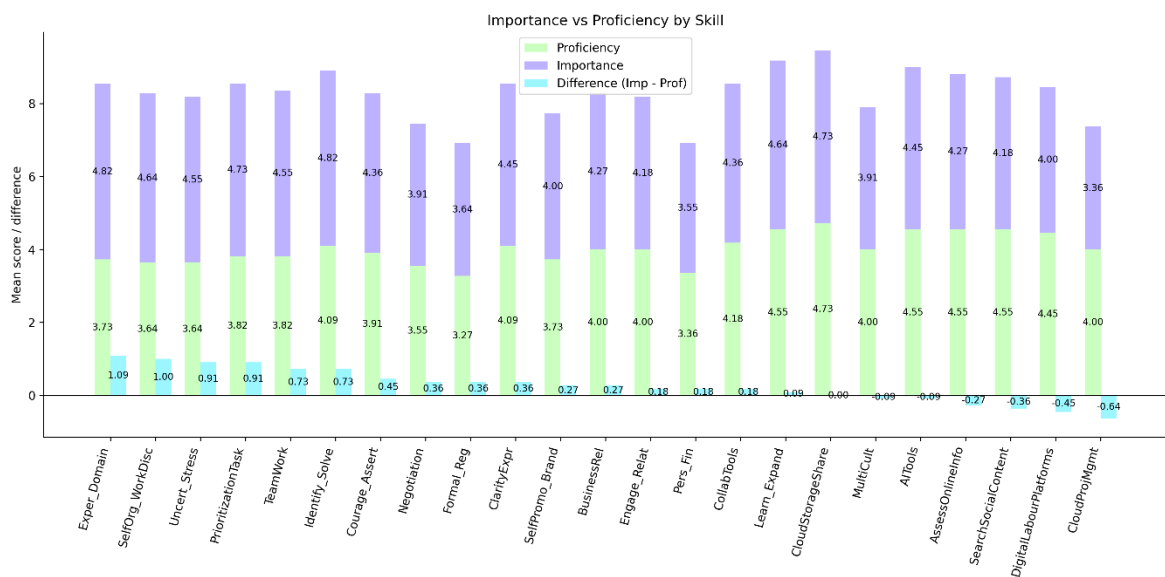


Figure 35. Importance vs. Proficiency by Skill.

Serbian companies perceive Experience in the work domain; Ability to identify, analyse and solve problems; Use of a cloud-based storage system; and Right prioritization and task management as four most important freelancer competences, which is quite different from the freelancers’ perspective. Highest deviations i.e. disagreement in their answers were found for the skill Ability to manage personal finance (probably many companies didn’t find this relevant, since it is a kind of

personal characteristic of freelancer), while lowest deviations were found for the skill Ability to identify, analyse and solve problems – majority of the companies finds it as a very important skill.

On the other hand, when assessing the proficiency of hired freelancers i.e. how well they meet company's standards, the highest ranked skill was Use of a cloud-based storage system, followed by four skills with the same level of meeting standards: Ability to learn quickly and expand knowledge; Use of search engines, social media and content platforms; Ability to assess the relevance of online information and Use of AI tools, which again is quite different of the set of skills which freelancers see as their strong side. Highest deviations i.e. disagreement in their answers was again reported for the skill Ability to manage personal finance, while lowest deviations were found for the skill Use of a cloud-based storage system. When assessing freelancer performance, companies were more focused on their digital literacy skills.

Another important aim of the research is to identify gaps i.e. significant differences between perceived importance and proficiency i.e. how well freelancers meet set standards. Again, the high gaps perceived by companies are good candidates for the development of additional learning materials/courses, which would be able to help freelancers to close these gaps and better meet company's standards. The identified gaps in Serbian sample are presented in Figure 38 (light-blue columns), in descending order. The highest differences between perceived importance and meeting standards are identified for Experience in the work domain; Self-organization and work discipline; Dealing with uncertainty and stress; and Right prioritization and task management, which again is quite different than identified gaps in freelancers' perceptions. On the other hand, the lowest gaps were identified in Use of a cloud-based storage system (e.g. Dropbox, Google Drive) to share material with other members of the group, with identical levels of perceived importance and proficiency.

The perceived importance is not the same across different groups of companies. Perception of companies regarding the most important skills are presented in Figure 36.

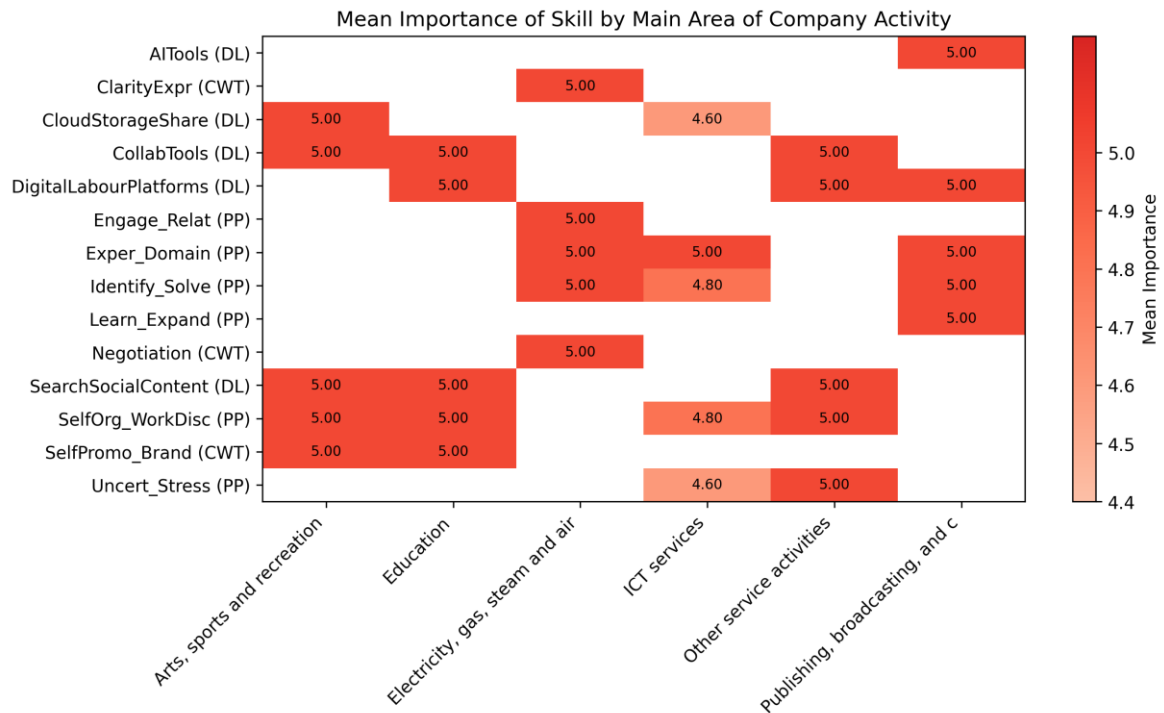


Figure 36. The level of different skill importance across different sectors in the economy.

There is considerably diversity among firms about the competencies they find critical in their businesses. Only one skill arises more frequently (4 times) among firms. It refers to Self-organization and work discipline, which is natural since efficient organisation of workflow is critical aspect of every business organisation. Another interesting insight refers to very high similarity of two hardly intuitively related areas, i.e., in Education and Arts, Sport and recreation. It points out that successful digital transformation of businesses may, in some cases, lead to convergence when it comes to change from traditional doing business to more technology dependent business models. Unique nature of ICT services reflects through the fact that companies in this industry see only skills regarding Experience in the work domain as extremely critical, while others being more company specific requirements. This is partly the result of more companies (5) coming from this domain, so more variation is a natural consequence of it.

All companies in Serbian sample belong either to micro (1-9 employees) or small (10-19 employees) companies. The most relevant skills observed across different size of the firms are presented in Figure 37.

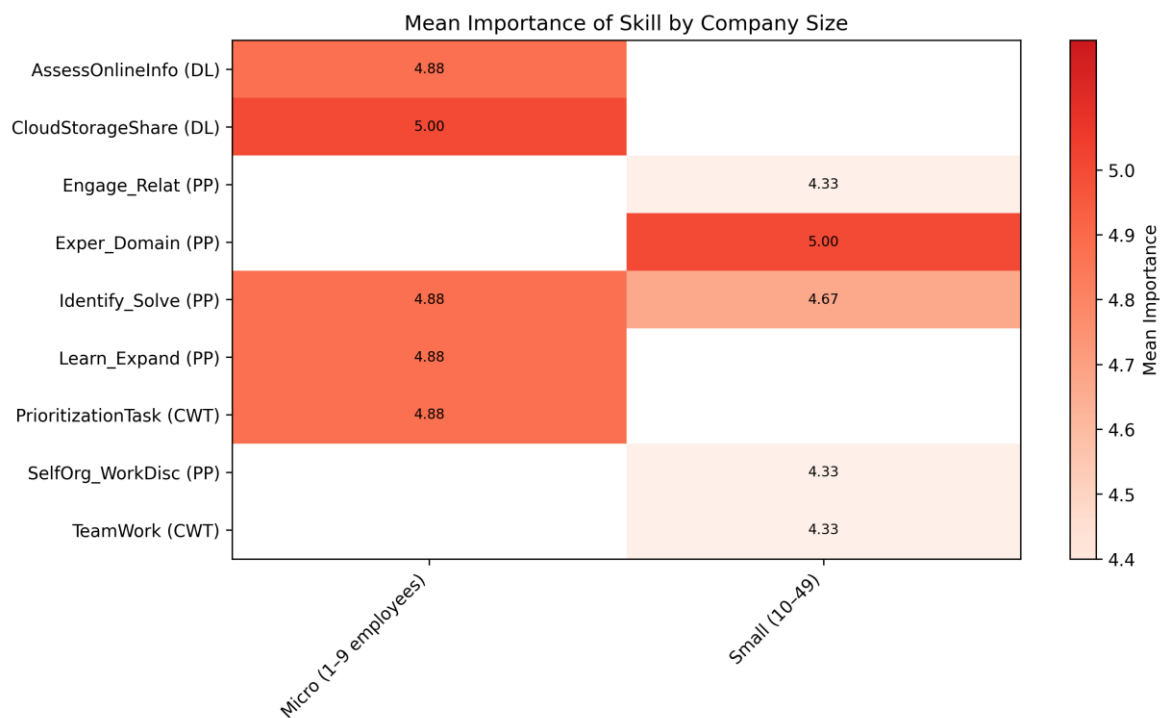


Figure 37. The most important skills by the size of Serbian companies.

Size of the firm indicates to different resources firm has, but also to different needs when it comes to growth and expansion strategies. It seems that these assumptions, at least to some degree, are true, since there is only one overlapping in skills importance between these two groups of the firms. It refers to Ability to identify, analyse and solve problems. This may, indirectly, lead to conclusion that applying freelancer knowledge into specific (industry) domain is always critical when it comes to delivering the service. Different needs of the small firms are visible also through the fact that some basic skills are required, such as Ability to assess the relevance of online information, since a considerable part of activities are related to expansion and discovering new clients/markets for their products/services. Moreover, high importance of Ability to learn quickly and expand knowledge and Right prioritization and task management indicate that usually pronounced agility and flexibility of small firms should be backed-up by complementary skills and job execution freelancers are entering with in the business relation. The greater heterogeneity of skills requirements is visible among the medium size enterprises, which may be a result of a very small sample size. However, outside of Experience in the work domain is the only skill univocally seen as a one with

extreme importance among all (3) Serbian companies. This result may indicate a much higher degree of specialisation, but also a more precise knowledge about what is expected to be obtained from freelancers. Ability to engage in and maintain relationships, Self-organisation of work and work discipline and Team work suggest that skills (with critical importance) also lay in successful integration of freelancer in company's culture and the way of doing business.

3 Cross-Tabulation Analysis of Competency Importance, Proficiency, and Gaps (χ^2 Tests)

To examine relationships between categorical variables derived from the freelancer and company surveys, Chi-square (χ^2) tests of independence were applied. This statistical method is widely used to assess whether observed differences in frequency distributions across categories reflect statistically significant associations or are likely due to random variation.

In this analysis, the Chi-square test was used to check associations between demographic and professional variables (such as age, gender, education level, and company size) and categorized competence-related variables, including perceived importance, self-assessed proficiency, and competence gap levels. Continuous or ordinal survey responses were transformed into three categorical levels (Low, Medium, High) to ensure methodological consistency and applicability of the test.

The analysis was based on contingency tables comparing observed and expected frequencies under the assumption of independence. Statistical significance was evaluated using χ^2 values and corresponding p -values, while the strength of identified associations was assessed using Cramer's V . In cases where statistically significant results were found, standardized residuals were examined to identify specific category combinations that contributed most to the observed associations.

3.1 Freelancers

Within this section of the report, the results of the Chi-square tests conducted on the collected data are presented, in accordance with the defined methodological

guidelines. The analysis was carried out on the freelancers' dataset, as the number of collected responses (N = 149) was more than sufficient to support reliable inferential statistical testing.

Only results that meet both statistical and practical significance criteria were considered, namely:

- statistically significant Chi-square tests ($p_value < 0.05$),
- strong association strength between categorical variables, defined as Cramer's $V > 0.22$ for $df > 5$, in line with effect size thresholds adjusted for degrees of freedom.

Detailed results are presented in the following Table 2, describing competence gaps among Serbian freelancers based on χ^2 statistics.

Categorical Variable	Competence Gap* Score Variable	χ^2	df	p-value	Cramers'_V	Effect Size
AI_Use_Future	DL_CloudStorageShare_gap	57.94	6	1.18E-10	0.42	Strong
Main_Freelancer_Activity	DL_AITools_gap	25.61	9	0.002	0.33	Strong
Age	DL_AITools_gap	18.32	6	0.005	0.29	Strong

Table 2. Competence gaps (χ^2 statistics).

*) Competence gap scores are computed for each competence C using the formula:

$$\text{Gap Score}_C = (\text{Importance Mean}_C - \text{Proficiency Mean}_C) * \text{Importance Mean}_C$$

Based on the predefined interpretation rule, only standardized residuals with an absolute value greater than 2 were considered meaningful contributors to the overall Chi-square association.

3.1.1 Interpretation of Significant Associations

AI_Use_Future x DL_CloudStorageShare_gap

Based on the test results, a strong and statistically highly significant association was identified between expectations regarding the future use of artificial intelligence and the perceived gap in competences related to cloud storage and file-sharing tools ($\chi^2 = 57.94$, $df = 6$, $p < 0.001$). The strength of this relationship, as indicated by Cramér's V

coefficient ($V = 0.42$), points to a strong association. This suggests that the observed competence gap differs substantially across categories reflecting different expectations about the future adoption of artificial intelligence technologies.

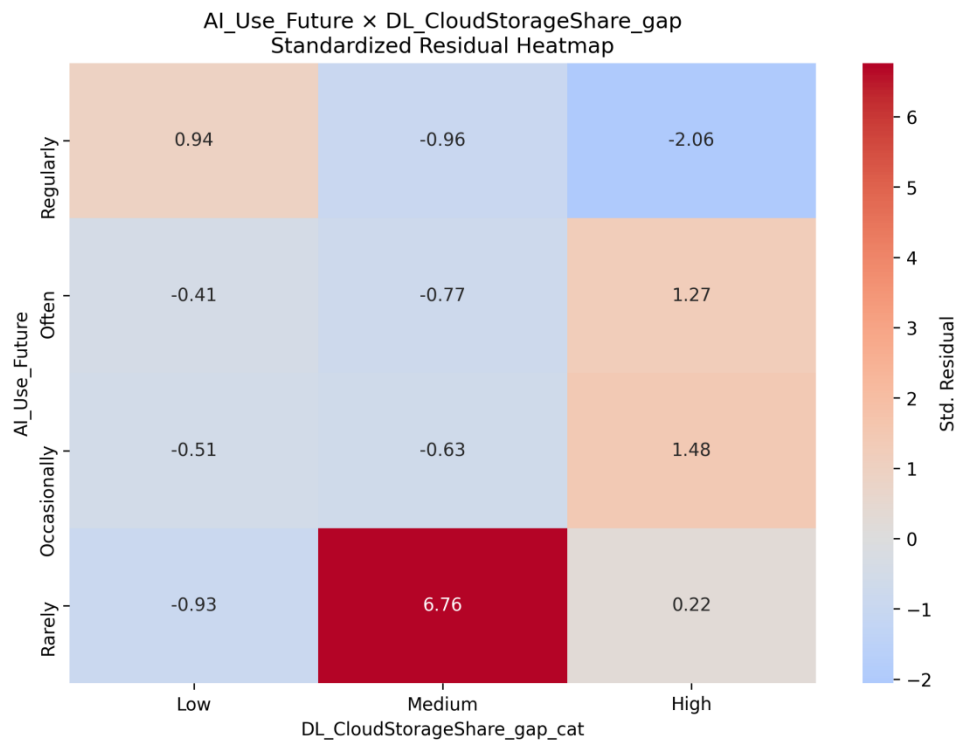


Figure 38. AI future use and cloud storage and competence gap in file-sharing tools.

The observed association is further clarified through the heatmap analysis, which reveals clear patterns in the distribution of competency gaps. The most pronounced deviation is observed among respondents who rarely expect to use artificial intelligence in the future, as they are strongly represented in the medium competency gap category related to cloud storage and file-sharing tools (standardized residual = 6.76). In contrast, respondents who regularly expect to use artificial intelligence are notably underrepresented in the high competency gap category (-2.06), indicating lower perceived deficiencies in this area. Overall, these patterns suggest that more positive expectations regarding the future use of artificial intelligence are associated with smaller perceived competency gaps in the use of cloud-based tools.

Main_freelancer_activity x DL_AITools_gap

After analyzing the results of the Chi-square test, a statistically significant association was identified between the main area of freelance activity and the perceived gap in competencies related to the use of AI tools ($\chi^2 = 25.61$, $df = 9$, $p = 0.002$). Based on Cramer’s V coefficient ($V = 0.33$), the strength of this relationship indicates a moderately strong association. It can be concluded that the perceived competency gap in the area of AI tools differs significantly among freelancers belonging to different professional domains. This suggests that requirements and experiences related to the use of artificial intelligence vary considerably across different fields of work.

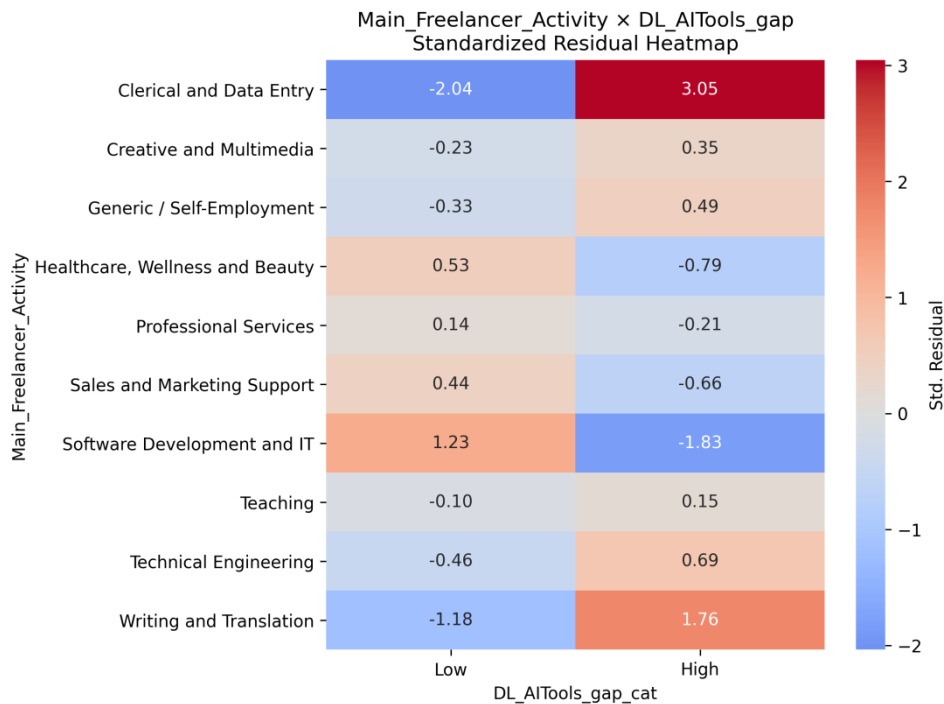


Figure 39. Main freelancer activity and competence gap in AI use.

The most pronounced positive deviation is observed among freelancers engaged in administrative and data entry activities, who are overrepresented in the high AI tools competency gap category (standardized residual = 3.05). Conversely, the same group is underrepresented in the low gap category (-2.04). This indicates that

freelancers in this field more frequently experience substantial shortcomings in competences related to the use of artificial intelligence techniques and tools.

Age x DL_AITools_gap

Based on the results of the Chi-square test, a statistically significant association was identified between freelancers' age and the perceived competency gap related to the use of AI tools ($\chi^2 = 18.32$, $df = 6$, $p = 0.005$). A moderate strength of association was observed, as indicated by Cramér's V coefficient ($V = 0.29$). These findings indicate that the perceived competency gap in the area of AI tools systematically differs across age groups of freelancers, pointing to generational differences in experience, adaptability, and confidence in the use of artificial intelligence technologies.

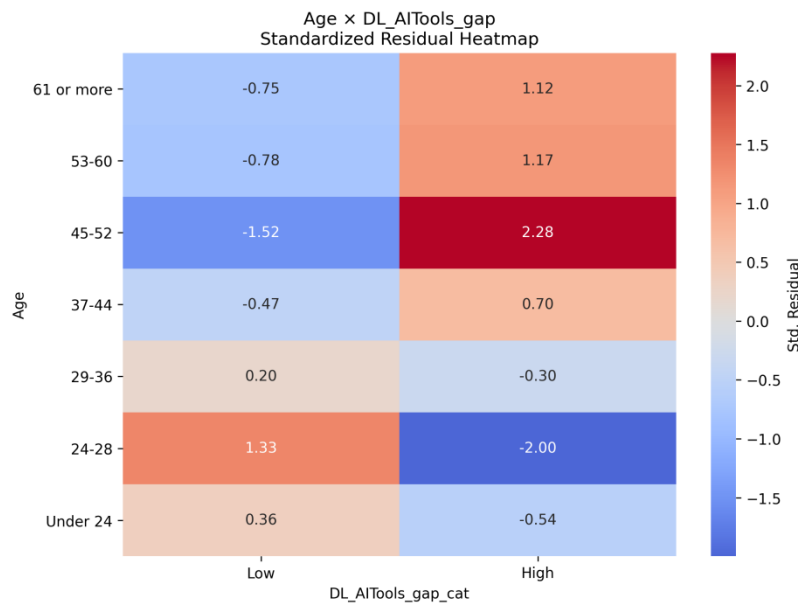


Figure 40. Freelancer age and competence gap in AI use.

In this case, the most pronounced positive deviations were observed among freelancers aged 45–52, who more frequently fall into the category of a high competency gap related to the use of AI tools (standardized residual = 2.28). In contrast, freelancers aged 24–28 appear less frequently in this category (−2.00), indicating a lower perceived competency gap among younger respondents.

3.2 Concluding interpretation

Overall, the results of the cross-tabulation analyses indicate that the perceived competency gap among freelancers is systematically shaped by expectations regarding the future use of artificial intelligence, professional domain, and the age of respondents. The analyses show that self-assessments of competences related to artificial intelligence and cloud tools differ significantly across freelancer groups, clearly reflecting differences in experience, exposure, and readiness to use advanced digital technologies. These findings lead to the conclusion that there is a need for tailored upskilling programs in the domain of artificial intelligence tools and digital technologies in general, while explicitly taking into account generational characteristics as well as the specific requirements of different professional fields.

4 Group Mean Differences in Competency Importance, Proficiency, and Gaps (ANOVA)

This section examines differences in mean competence gap scores across groups using one-way ANOVA and Welch’s ANOVA, applied in accordance with established methodological guidelines. The analysis is based exclusively on the freelancers’ dataset, as the available company responses were insufficient to support reliable group mean comparisons.

Only results meeting both statistical significance and practical relevance criteria are reported. Specifically, the section focuses on competence gap scores for which one-way ANOVA or Welch’s ANOVA indicated statistically significant group differences ($p < 0.05$), together with a large effect size, defined as Partial $\eta^2 \geq 0.14$. This combined criterion ensures that the reported findings reflect not only statistically detectable differences, but also effects of substantive magnitude.

For each significant result presented below, an analytical interpretation is provided, describing how competence gap levels vary across relevant grouping variables (e.g., age, education level, upskilling frequency, and anticipated AI use). Post-hoc analyses were conducted using the Games–Howell procedure to further examine the nature of the observed group differences. A summary of the corresponding statistical results is presented in the following table:

Grouping Variable	Competence Gap Score Variable	Test Type	Equal Variances Assumed	F	p-value	η^2	Effect Size
AI_Use_Future	CWT_Business Rel_gap	Welch	false	3.04	0.026	0.46	Large
Upskilling_Frequency	PP_SelfOrg_WorkDisc_gap	Welch	false	4.65	0.011	0.39	Large
Years_Experience_Freelancer	DL_AssessOnlineInfo_gap	Welch	false	5.61	0.004	0.37	Large
Years_Experience_Freelancer	DL_CollabTools_gap	Welch	false	4.69	0.001	0.65	Large
Years_Experience_Freelancer	DL_CloudStorageShare_gap	ANOVA	true	2.43	0.013	0.20	Large

Table 3. Competence gap levels vary across relevant grouping variables.

4.1 Interpretation of significant group mean differences

4.1.1 Group mean differences in competence gaps by future AI use

Competence: Building and Managing Business Relationships

Differences in the competence gap related to building and managing business relationships, defined as the ability to establish, maintain, and develop professional relationships with clients and partners, were examined across groups defined by anticipated future AI use. This competence gap reflects the mismatch between the perceived importance of business relationship skills and freelancers' self-assessed proficiency in this area.

Because the assumption of homogeneity of variances was violated, a Welch ANOVA was applied. The analysis revealed a statistically significant effect of future AI use on the competence gap for building and managing business relationships (Welch's $F = 3.04$, $p = 0.026$). The associated effect size was large (Partial $\eta^2 = 0.46$), indicating that

anticipated AI use explains a substantial proportion of the variance in the perceived competence gap. This suggests that differences between AI use groups are not only statistically detectable but also practically meaningful.

■ *Post-hoc Analysis (Games–Howell)*

To identify which future AI use groups differ significantly, Games–Howell post-hoc tests were conducted, as this procedure is robust to unequal variances and unequal group sizes.

The analysis identified statistically significant pairwise differences between selected AI use groups with respect to the competence gap in building and managing business relationships.

Significant pairwise difference

- Occasionally vs. Often
 - Mean gap (Occasionally): 0.50
 - Mean gap (Often): 2.70
 - Mean difference: -2.20
 - $p = 0.004$ (Games–Howell)
- Often vs. Regularly
 - Mean gap (Often): 2.70
 - Mean gap (Regularly): 0.99
 - Mean difference: +1.72
 - $p = 0.031$ (Games–Howell)

Freelancers who anticipate occasional future AI use report a significantly lower competence gap in building and managing business relationships compared to those who expect to use AI often. Freelancers reporting often anticipated AI use exhibit significantly higher competence gaps than those who plan to use AI regularly, who display the lowest levels of perceived mismatch.

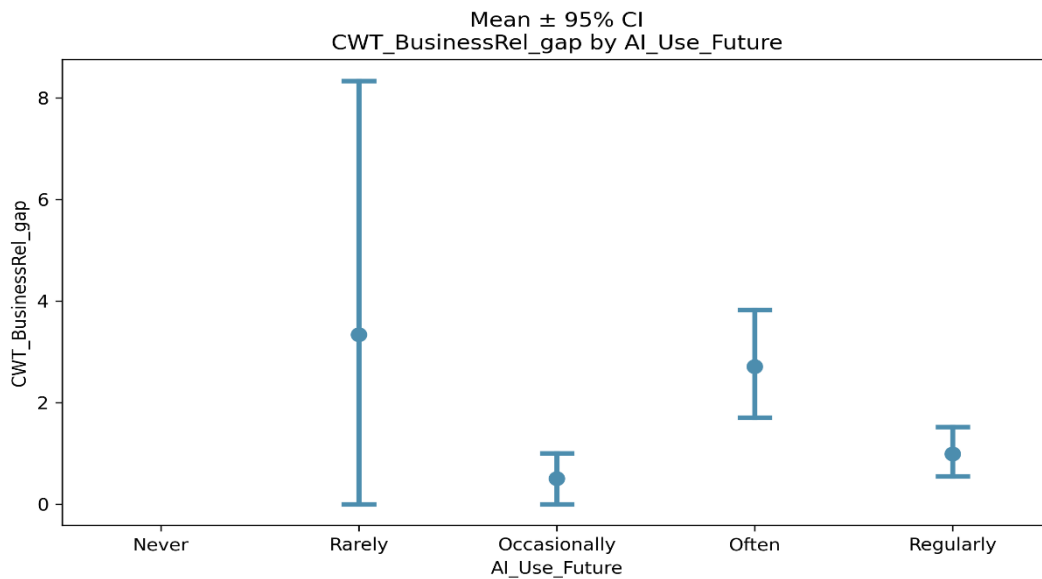


Figure 41. Frequency in future AI use and competence gap in building and managing business relationships.

Interpretation

The results indicate a non-linear relationship between anticipated future AI use and the business relationship competence gap among freelancers. Notably, freelancers who anticipate occasional AI use report relatively lower competence gaps, suggesting that selective and task-specific engagement with AI may provide immediate functional support without requiring deep or continuous integration.

In contrast, freelancers who expect to use AI often exhibit significantly higher competence gaps, indicating that frequent but insufficiently systematic use may increase awareness of relational demands without a corresponding increase in perceived proficiency. This pattern suggests that moderate AI use, when not accompanied by structured learning or strategic application, may temporarily exacerbate perceived skill mismatches.

Finally, freelancers who anticipate regular AI use report the lowest competence gaps, likely reflecting more advanced familiarity, routinization, and effective integration of AI tools into relationship management and communication practices.

Overall, the findings suggest that competence alignment depends not only on the frequency of AI use but also on the depth, consistency, and purposefulness of engagement with AI tools.

Conclusion

Overall, the significant Welch ANOVA effect of future AI use on the business relationship competence gap is driven by systematic but non-linear differences across anticipated AI engagement levels. While occasional AI use may yield short-term reductions in perceived competence gaps, potentially through targeted, task-specific support, frequent but insufficiently embedded use appears to be associated with larger gaps. In such cases, increased exposure to AI tools may heighten awareness of relational and organizational demands without a corresponding development of stable competencies. Only regular and sustained AI use is consistently linked to lower competence gaps.

These findings indicate that AI adoption should not be conceptualized as a uniformly linear driver of competence development. Rather, its effects appear to be moderated by factors such as the degree of integration into daily work practices, users' digital literacy, learning strategies, and task complexity. AI may function as an enabling factor primarily when its use is systematic, reflective, and supported by adequate skills and routines.

This underscores the importance of supporting freelancers, particularly those in intermediate or transitional stages of AI adoption, in developing both digital literacy and strategic AI usage capabilities. Targeted interventions, including guided AI adoption pathways, training in AI-supported relationship and client management, and opportunities for reflective and skills-oriented AI use, may help mitigate temporary competence mismatches and promote more sustainable freelance careers.

4.1.2 Group Mean Differences in Competence Gaps by Upskilling Frequency

Self-Organization and Work Discipline

Differences in the competence gap related to self-organization and work discipline were examined across groups defined by upskilling frequency. This competence gap

reflects the mismatch between the perceived importance of effective self-organization and work discipline and freelancers' self-assessed proficiency in managing their work tasks, time, and responsibilities.

Because the assumption of homogeneity of variances was violated, a Welch ANOVA was applied. The analysis revealed a statistically significant effect of upskilling frequency on the competence gap for self-organization and work discipline (Welch's $F = 4.65$, $p = 0.011$). The associated effect size was large (Partial $\eta^2 = 0.39$), indicating that differences in upskilling frequency explain a substantial proportion of the variance in the perceived competence gap.

Post-hoc Analysis (Games–Howell)

To identify which upskilling frequency groups differ significantly, Games–Howell post-hoc tests were conducted.

The analysis identified one statistically significant pairwise difference between upskilling frequency groups with respect to the competence gap in self-organization and work discipline (i.e., the mismatch between the perceived importance of effective self-organization and freelancers' self-assessed proficiency).

Significant pairwise difference

- Occasionally vs. Regularly
 - Mean gap (Occasionally): 3.13
 - Mean gap (Regularly): 1.21
 - Mean difference: : +1.92
 - $p = 0.012$ (Games–Howell)

Freelancers who engage in upskilling occasionally exhibit a significantly higher competence gap in self-organization and work discipline compared to those who upskill regularly.

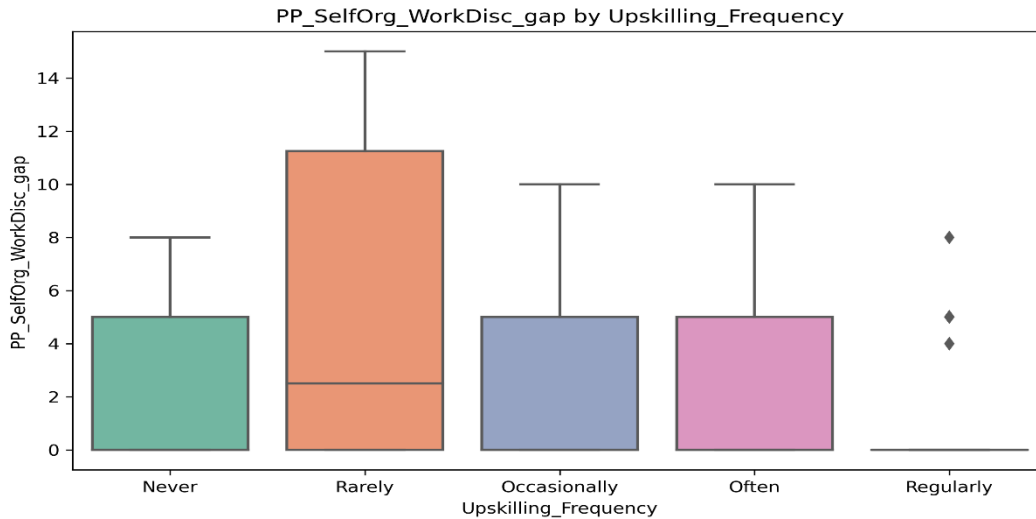


Figure 42. Frequency in upskilling and competence gap in self-organization and work discipline.

█ *Interpretation*

These findings indicate that continuous engagement in learning and skill development plays an important role in aligning the demands of autonomous freelance work with perceived competence in self-organization and work discipline. Freelancers who upskill more frequently may benefit from exposure to structured productivity methods, improved time-management strategies, and reflective practices that support sustained work discipline.

Conversely, sporadic or infrequent upskilling appears to be associated with greater uncertainty in managing work routines and responsibilities, resulting in larger perceived competence gaps. The substantial variability observed among freelancers who rarely or only occasionally upskill further suggests that unstructured learning efforts may not consistently translate into improved self-organization outcomes.

█ *Conclusion*

The results demonstrate that the significant Welch ANOVA effect of upskilling frequency on the self-organization and work discipline competence gap is driven by systematic differences across levels of engagement in professional development activities. In particular, regular upskilling is associated with substantially lower competence gaps in this domain.

These findings highlight the importance of sustained and relevant upskilling for freelancers operating in highly self-directed work environments. Targeted interventions that promote regular learning, such as structured training programs, productivity-focused workshops, and access to self-management resource, may help reduce competence gaps and support long-term effectiveness and resilience in freelance careers.

4.1.3 Group Mean Differences in Competence Gaps by Years of Freelance Experience

Competence: Assessing the Reliability and Quality of Online Information

Differences in the competence gap related to assessing the reliability and quality of online information were examined across groups defined by years of freelance experience. This competence gap reflects the mismatch between the perceived importance of critically evaluating online information and freelancers' self-assessed proficiency in performing this task effectively.

Because the assumption of homogeneity of variances was violated, a Welch ANOVA was applied. The analysis revealed a statistically significant effect of freelance experience on the competence gap in assessing online information (Welch's $F = 5.61$, $p = 0.004$). The associated effect size was large (Partial $\eta^2 = 0.37$), indicating that years of freelance experience explain a substantial proportion of the variance in the perceived competence gap. This suggests that differences between experience groups are not only statistically detectable but also practically meaningful.

Post-hoc Analysis (Games–Howell)

To identify which freelance experience groups differ significantly, Games–Howell post-hoc tests were conducted.

The analysis identified statistically significant pairwise differences between experience groups with respect to the competence gap in assessing the reliability and quality of online information.

Significant pairwise difference

- Less than 1 year vs. 6–10 years

- Mean gap (Less than 1 year): 3.36
 - Mean gap (6-10 years): 0.77
 - Mean difference: +2.58
 - $p = 0.019$ (Games-Howell)
- Less than 1 year vs. 1-5 years
 - Mean gap (Less than 1 year): 4.71
 - Mean gap (6-10 years): 4.31
 - Mean difference: +0.41
 - $p = 0.016$ (Games-Howell)

Freelancers with less than one year of freelance experience exhibit a significantly higher competence gap in assessing online information compared to those with one to five years of experience, as well as those with six to ten years of experience.

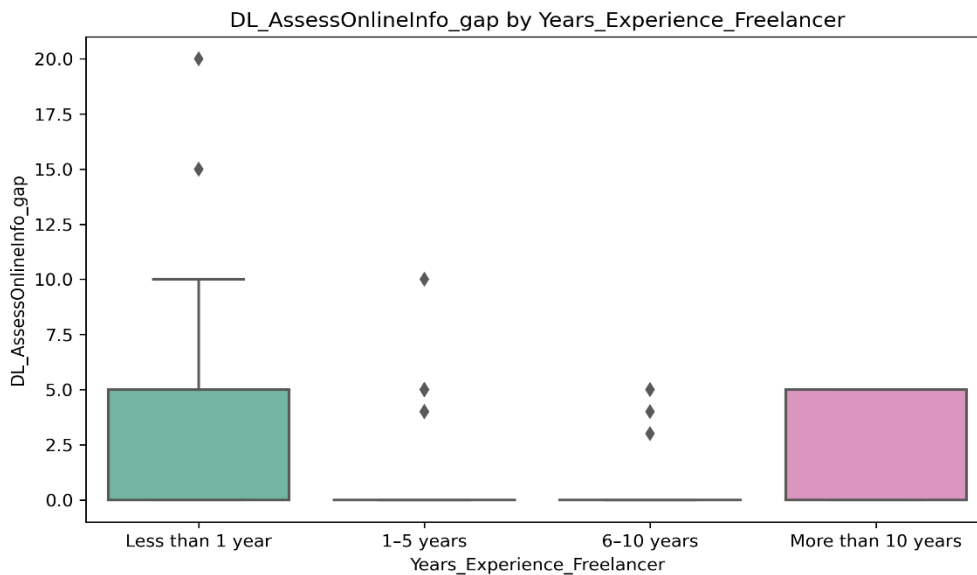


Figure 43. Years of experience and competence gap in accessing online information.

Interpretation

These findings indicate that early-stage freelancers face the greatest mismatch between the importance they assign to critically assessing online information and their perceived ability to do so. Limited professional exposure, reduced familiarity with information verification practices, and lower confidence in evaluating digital content may contribute to the elevated competence gaps observed among freelancers with less than one year of experience.

As freelance experience accumulates, repeated exposure to diverse information sources, client requirements, and real-world decision-making contexts appears to support the development of more robust information assessment skills. The substantially lower gaps observed among freelancers with one to ten years of experience suggest improved alignment between competence demands and perceived proficiency.

Conclusion

The results demonstrate that the significant Welch ANOVA effect of freelance experience on the competence gap in assessing online information is primarily driven by differences between early-stage and more experienced freelancers. In particular, the transition from initial entry into freelance work to more established professional practice is associated with a marked reduction in perceived competence gaps.

These findings underscore the importance of targeted support for novice freelancers, such as training in digital literacy, information verification techniques, and critical evaluation strategies. Early career interventions focused on strengthening information assessment skills may help reduce competence gaps and promote more effective and confident engagement in digitally intensive freelance work environments.

4.1.4 Group Mean Differences in Competence Gaps by Years of Freelance Experience

Competence: Use of Digital Collaboration Tools

Differences in the competence gap related to the use of digital collaboration tools were examined across groups defined by years of freelance experience. This competence gap reflects the mismatch between the perceived importance of effectively using digital collaboration platforms (e.g., shared workspaces, communication tools, and collaborative project environments) and freelancers' self-assessed proficiency in applying these tools in their daily work.

Because the assumption of homogeneity of variances was violated, a Welch ANOVA was applied. The analysis revealed a statistically significant effect of freelance experience on the competence gap for digital collaboration tools (Welch's $F = 4.69$, $p = 0.001$). The associated effect size was large (Partial $\eta^2 = 0.65$), indicating that years of freelance experience explain a substantial proportion of the variance in the perceived competence gap. This suggests that differences between groups are both statistically robust and practically meaningful.

Post-hoc Analysis (Games–Howell)

To identify which freelance experience groups differ significantly, Games–Howell post-hoc tests were conducted, as this procedure is robust to unequal variances and unequal group sizes.

The analysis identified statistically significant pairwise differences between experience groups with respect to the competence gap in the use of digital collaboration tools (i.e., the mismatch between the perceived importance of collaboration platforms and freelancers' self-assessed proficiency).

Significant pairwise difference

- Less than 1 year vs. 1–5 years
 - Mean gap (Less than 1 year): 4.48
 - Mean gap (1–5 years): 1.69

- Mean difference: +2.78
- $p = 0.027$ (Games-Howell)
- Less than 1 year vs. More than 10 years
 - Mean gap (Less than 1 year): 4.48
 - Mean gap (More than 10 years): 0.71
 - Mean difference: +3.76
 - $p = 0.014$ (Games-Howell)

Freelancers with less than one year of freelance experience exhibit significantly higher competence gaps in the use of digital collaboration tools compared to both freelancers with one to five years of experience and those with more than ten years of experience.

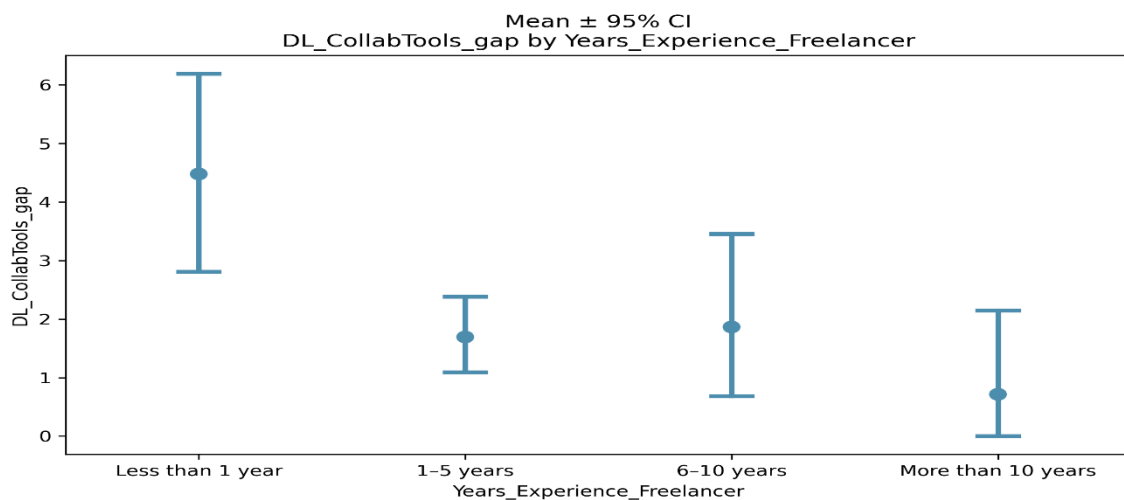


Figure 44. Years of experience and competence gap in using collaboration tools.

█ Interpretation

These findings indicate that limited freelance experience is associated with a pronounced mismatch between the importance attributed to digital collaboration tools and perceived ability to use them effectively. Early-career freelancers may lack sufficient exposure to distributed teamwork, platform-based collaboration, and

coordinated digital workflows, which can contribute to higher perceived competence gaps.

As freelance experience accumulates, repeated engagement with collaborative platforms, client coordination processes, and multi-stakeholder projects appear to support the development of more effective digital collaboration practices. The substantially lower gaps observed among highly experienced freelancers suggest that collaboration tool proficiency becomes increasingly integrated into routine professional workflows over time.

Conclusion

The results demonstrate that the significant Welch ANOVA effect of freelance experience on the digital collaboration tools competence gap is driven primarily by differences between early-stage freelancers and those with greater professional experience. In particular, the largest reductions in perceived competence gaps occur after the initial entry into freelance work.

These findings highlight the importance of targeted support for novice freelancers, including onboarding initiatives, guided exposure to collaboration platforms, and training focused on digital teamwork practices. Strengthening early-career competence in collaboration tools may help accelerate professional integration and improve long-term effectiveness in digitally mediated freelance work environments.

4.1.5 Group Mean Differences in Competence Gaps by Years of Freelance Experience

Competence: Use of Cloud Storage and File-Sharing Tools

Differences in the competence gap related to the use of cloud storage and file-sharing tools were examined across groups defined by years of freelance experience. This competence gap reflects the mismatch between the perceived importance of efficiently storing, sharing, and managing digital files and freelancers' self-assessed proficiency in using cloud-based solutions for both collaborative and individual work.

As the assumption of homogeneity of variances was met, a one-way ANOVA was conducted. The analysis revealed a statistically significant effect of freelance experience on the competence gap for cloud storage and file-sharing tools ($F = 2.43$, $p = 0.013$). The associated effect size was large (Partial $\eta^2 = 0.20$), indicating that years of freelance experience explain a meaningful proportion of the variance in the perceived competence gap. This suggests that differences between experience groups are not only statistically detectable but also practically relevant.

■ *Post-hoc Analysis (Games–Howell)*

To further examine group differences, post-hoc comparisons were conducted using the Games–Howell procedure.

The analysis identified statistically significant pairwise differences between experience groups with respect to the competence gap in the use of cloud storage and file-sharing tools.

Significant pairwise difference

- Less than 1 year vs. 6–10 years
 - Mean gap (Less than 1 year): 2.12
 - Mean gap (6–10 years): 0.00
 - Mean difference: +2.12
 - $p = 0.006$ (Games–Howell)
- 1–5 years vs. 6–10 years
 - Mean gap (1–5 years): 0.68
 - Mean gap (6–10 years): 0.00
 - Mean difference: +0.68
 - $p = 0.044$ (Games–Howell)

Freelancers with less than one year of experience, as well as those with one to five years of experience, exhibit significantly higher competence gaps in the use of cloud storage and file-sharing tools compared to freelancers with six to ten years of freelance

experience.

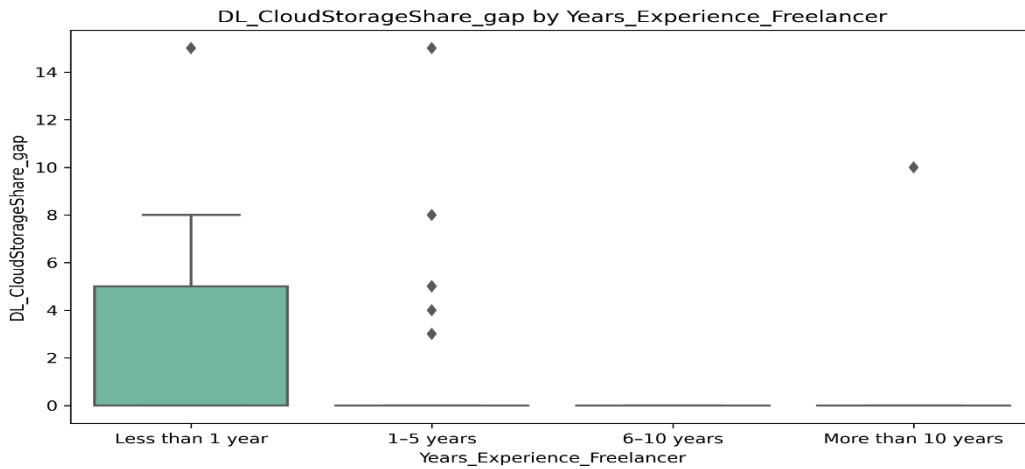


Figure 45. Years of experience and competence gap in use of cloud storage and file-sharing tools.

Interpretation

These findings indicate that early-career freelancers experience the greatest mismatch between the importance they assign to cloud storage and file-sharing tools and their perceived ability to use them effectively. Limited exposure to collaborative digital infrastructures, inconsistent workflow practices, and lower familiarity with cloud-based ecosystems may contribute to the elevated competence gaps observed during the initial stages of freelance work.

As freelance experience increases, repeated engagement with shared repositories, client-driven file exchange, and collaborative project environments appears to support rapid competence development in this domain. The consistently low competence gaps observed among freelancers with six to ten years of experience suggest that cloud storage and file-sharing tools become a foundational component of effective freelance work relatively early in the career trajectory.

Conclusion

The results demonstrate that the significant effect of freelance experience on the cloud storage and file-sharing competence gap is primarily driven by differences between novice freelancers and those with more established professional experience.

Once freelancers move beyond the initial entry phase, competence gaps in this domain decrease substantially and remain low across subsequent experience levels.

These findings highlight the importance of early exposure to cloud-based collaboration infrastructures for freelancers entering the market. Targeted onboarding resources, practical training in file-sharing workflows, and guided adoption of cloud tools may help reduce early competence gaps and facilitate smoother integration into digitally mediated freelance work environments.

5 Gap Analysis (Paired t-tests)

This section reports the findings of the competence gap analysis based on paired t-tests, which were used to examine within-respondent differences between perceived competence importance and self-assessed proficiency. The analysis is conducted solely to freelancers, as the corresponding dataset for companies comprises only eleven observations. This sample size is insufficient for robust inferential statistical analysis and reliable effect size estimation.

5.1 Interpretation of paired mean differences between importance and proficiency ratings of competences by categorical variables

Paired t-tests are applied to subsamples defined by categorical variables such as demographic characteristics, work patterns, and upskilling behaviour. For each competence, paired comparisons are therefore performed within homogeneous subgroups, corresponding to the levels of the respective categorical variables. This approach enables the identification of competence gaps that may be systematically associated with specific respondent profiles, rather than being uniformly distributed across the entire freelancer population.

To ensure both statistical validity and substantive relevance, the analysis was restricted to results meeting several cumulative criteria:

1. Statistical significance is set to $p < 0.05$ and only tests with this level of significance are retained.
2. Only results with Cohen's $d \geq 0.80$ were considered, corresponding to large or very large effect sizes, and thus reflecting competence gaps of practical importance.
3. In addition, a minimum sample size threshold of $N \geq 15$ paired observations is applied. This criterion is grounded in standard statistical power

considerations. For paired t-tests, a sample size of approximately 15 (or more) observations is required to achieve adequate statistical power (≈ 0.80) to detect large effects (Cohen's $d \approx 0.80$) at a conventional significance level of $\alpha = 0.05$ (Cohen, 1988; Lakens, 2013).

Applying all the mentioned (simultaneously) all the criteria (statistical significance, effect size, and sample size), the gap analysis delivers results which are of practical importance in analysing mismatches between importance and proficiency. It enables us to obtain useful information in developing MOOCs in subsequent phases of the project. The results are presented in Table 4.

The main conclusion is a very high degree of heterogeneity within Serbian population of freelancers when it comes to the significance (practical and statistical) of gaps in perceived importance and mastering of different skills. Practical implications are related to the fact that the efficient strategy of upgrading freelancer capacities on Serbian market requires very segmented and tailored approach, taking care about very specific combination of different dimensions of their educational, demographic and professional profile. It can be seen from the fact that there is reported high statistical significance in 34 pairs with always considerable, although varying, level of practical importance.

However, if we differentiate results observing Cohen's d , almost $\frac{1}{4}$ of results suggest pronounced competence gaps (Cohen's d greater than 1) emerge by very diverse grouping categories. For example, dealing with Uncertainty and stress, by Negotiation skills and Ability to use cloud-based project management tools are of especially pronounced practical importance among age group between 45 and 52. Since all of mentioned gaps are in different skill domains suggest that for these freelancers tailored-made course aiming to combine digital skills upgrade, personal profile development and communication and work in teams is required.

Variable	Category	Level	N	Mean_Profic.	Mean_Import.	Mean_Gap	t	p	Cohen's d
PP_Uncert_Stress	Age	45-52	16	3.19	4.25	4.94	-4.58	0.0004	1.14
PP_Uncert_Stress	AI_Use_Future	Often	44	3.52	4.30	3.55	-6.38	0.0000	0.96
PP_Identify_Solve	Education_Level	Master degree	44	4.18	4.70	2.73	-5.52	0.0000	0.83

Variable	Category	Level	N	Mean_Profic.	Mean_Import.	Mean_Gap	t	p	Cohen's d
PP_Forma_Reg	Education_Level	Bachelor's degree	61	3.21	4.18	4.80	-6.31	0.0000	0.81
PP_Forma_Reg	Main_Freeln_Activity	Creative and MM	63	3.30	4.25	4.87	-7.07	0.0000	0.89
PP_Forma_Reg	Years_Exp_Freelancer	Less than 1 year	42	3.00	4.29	6.76	-5.55	0.0000	0.86
PP_Forma_Reg	AI_Use_Future	Often	44	3.18	4.25	5.48	-5.69	0.0000	0.86
PP_Forma_Reg	Upskilling_Frequency	Often	35	3.09	4.20	5.60	-4.75	0.0000	0.80
PP_Pers_Fin	Age	Under 24	17	4.18	4.82	3.18	-4.40	0.0004	1.07
PP_Pers_Fin	Age	45-52	16	3.38	4.38	5.13	-3.65	0.0024	0.91
PP_Pers_Fin	AI_Use_Future	Often	44	3.68	4.68	4.86	-6.41	0.0000	0.97
CWT_Courage_Assert	Age	45-52	16	3.56	4.38	3.94	-3.31	0.0047	0.83
CWT_SelfPromo_Brand	Age	37-44	26	3.46	4.50	5.04	-4.61	0.0001	0.90
CWT_SelfPromo_Brand	Age	45-52	16	3.19	4.56	6.69	-3.56	0.0028	0.89
CWT_SelfPromo_Brand	Years_Exp_Freelancer	Less than 1 year	42	3.26	4.33	5.19	-5.52	0.0000	0.85
CWT_PrioritizationTask	Age	45-52	16	3.81	4.56	4.00	-3.50	0.0032	0.88
CWT_PrioritizationTask	Years_Exp_Freelancer	6-10 years	22	3.68	4.45	3.68	-3.93	0.0008	0.84
CWT_Negotiation	Gender	Male	78	3.85	4.53	3.35	-7.68	0.0000	0.87
CWT_Negotiation	Gender	Female	70	3.54	4.63	5.64	-7.64	0.0000	0.91
CWT_Negotiation	Age	29-36	39	3.77	4.49	3.54	-5.05	0.0000	0.81
CWT_Negotiation	Age	Under 24	17	3.82	4.88	5.18	-6.63	0.0000	1.61
CWT_Negotiation	Age	45-52	16	3.00	4.38	6.44	-4.57	0.0004	1.14
CWT_Negotiation	Education_Level	Bachelor's degree	61	3.77	4.62	4.16	-7.32	0.0000	0.94
CWT_Negotiation	Education_Level	High school or less	42	3.81	4.71	4.52	-6.68	0.0000	1.03
CWT_Negotiation	Main_Freeln_Activity	Creative and MM	63	3.78	4.65	4.57	-6.39	0.0000	0.80
CWT_Negotiation	Main_Freeln_Activity	Soft. Dev. and IT	36	3.72	4.53	3.78	-6.15	0.0000	1.02
CWT_Negotiation	Years_Exp_Freelancer	1-5 years	78	3.76	4.56	4.05	-7.37	0.0000	0.83
CWT_Negotiation	Years_Exp_Freelancer	Less than 1 year	42	3.67	4.69	5.19	-6.81	0.0000	1.05
CWT_Negotiation	AI_Use_Future	Regularly	69	3.61	4.49	4.43	-6.73	0.0000	0.81
CWT_Negotiation	AI_Use_Future	Often	44	3.70	4.68	4.75	-6.99	0.0000	1.05
CWT_Negotiation	Upskilling_Frequency	Occasionally	63	3.59	4.52	4.71	-7.57	0.0000	0.95
DL_CloudProjMgmt	Age	45-52	16	2.38	4.00	7.00	-6.79	0.0000	1.70
DL_CloudProjMgmt	Years_Exp_Freelancer	Less than 1 year	42	2.48	3.74	5.79	-6.08	0.0000	0.94
DL_CloudStorageShare	Years_Exp_Freelancer	6-10 years	22	4.23	3.55	0.00	3.81	0.0010	-0.81

Table 4. Statistically significant results of paired t-tests, total sample of freelancers.

Moreover, previous conclusions are additionally strengthened by the fact that several other gaps are important for this group, although with to some degree lower importance (Cohen's d lower than 1, but higher than 0.8). Namely, this group experiences important gaps in domains of Ability to manage personal finance, Self-promotion and brand building and Courage and assertiveness in communication, making an upgrade in Communication and work in teams skills of a bit of higher

priority when dealing with this age group. However, since Negotiation skills (for age group between 29 and 36 Cohen's d equals 0.81, while for those who are at the beginning of the career value of Cohen's d reaches 1.61) and Self-promotion and brand building (for age group between 37 and 44) emerge as the skill domains of the most importance, suggesting that communication skills and work in teams, especially related to those two skills, are having almost cross-age relevance.

Important gaps regarding the educational level arise in domains of Identifying and solving the problem by those with master level of education (Cohen's $d = 0.83$), which is to some extent a surprising result. However, it is an expected result, since freelancing means huger diversity of tasks, requiring relatively highly developed skills by identifying and solving problems, even by those with high level of education. Those with Bachelor degree register highest gaps in domains of Knowledge of and compliance with formal regulations (Cohen's $d = 0.94$) and Negotiations skills and work in teams (Cohen's $d = 0.81$). The last is similarly important for those with the lowest level of education (Cohen's $d=1.03$).

By groups with different experience there are overlapping in skills gap, but also some differences emerge. Expectedly, by those who are just starting their career as freelancers, more gaps are recorded with, on average higher importance, where Negotiation skills emerge as skill domain with the most urgent need to be improved. How important negotiation skills are, suggests additionally the fact that this is the single domain where gap shows importance by different gender. Moreover, importance of comparable magnitude (value of Cohen's d equals 0.87 by male, and 0.91 by female).

Regarding the future AI use, the gaps are not only significant than the most frequent by those who plan to use it often. They arise in Dealing with the stress and uncertainty, Personal finance as well as Negotiation skills. Similarly, for those who are upskilling rather occasionally, the main challenge consists how to negotiate, where for those who learn more frequently (often) Formal regulation possesses the domain with the most pronounced skill gap. The later result may suggest that there are not enough offers on Serbian market, although there is a group of freelancers, who are having not only obvious need, then also who are willing to learn about how to fit better their freelancer business within existing regulatory framework.

Only two groups, by professions category, are freelancers in Creative services and multimedia and Technology and Software development by which there are identified gaps. Both are experiencing problems in Negotiation skills, a bit more pronounced by Software developers, while those in Creative services and multimedia experience deficiency in Knowledge of and compliance with formal regulations.

As an overall result for Serbian freelancers, we may conclude that the most frequent gaps, among different pairs, emerge in the domain of Communication and work in team, while gaps in the domain of Digital literacy points to rather lower significance/relevance. The single most important gap, which emerges by different categories, are Negotiation skills, putting obviously the most pronounced need for the development of a course which would close a gap between perceived importance and one's assessment in this domain.

5.2 Global Gap Analysis (Paired t-tests)

This section presents the results of the competence gap analysis based on paired t-tests conducted at the global level on the freelancer dataset. The analysis examines within-respondent differences between perceived importance and self-reported proficiency for each competence. The aim is to identify systematic mismatches between how important a competence is considered and how it is currently mastered.

Paired t-tests were applied to the full sample of freelancers to assess whether the mean difference between importance and proficiency ratings for each competence differs significantly from zero. To ensure that the reported findings are both statistically reliable and substantively meaningful, the interpretation of results is restricted to competences that meet two cumulative criteria. First, only statistically significant paired comparisons are considered ($p < 0.05$). Second, only results with Cohen's $d \geq 0.50$ are retained, corresponding to medium to large effect sizes and indicating competence gaps of practical relevance rather than merely statistical detectability.

By combining statistical significance testing with effect size thresholds, this global analysis prioritizes competences for which evidence of mismatch between importance

and proficiency is both robust and meaningful for training needs identification and policy-oriented interpretation. Results are presented in Table 5.

Variable	Mean_Proficiency	Mean_Importance	Mean_Gap_Score	t_stat	p_value	Cohen_d
PP_SelfOrg_WorkDisc	4.26	4.73	2.50	-7.41	0.0000	0.61
PP_Uncert_Stress	3.73	4.32	3.38	-6.77	0.0000	0.55
PP_Identify_Solve	4.32	4.72	2.19	-7.16	0.0000	0.59
PP_Formal_Reg	3.25	4.09	4.46	-8.11	0.0000	0.66
CWT_ClarifyExpr	4.36	4.77	2.13	-7.06	0.0000	0.58
CWT_SelfPromo_Brand	3.56	4.36	4.19	-8.15	0.0000	0.67
CWT_PrioritizationTask	4.15	4.60	2.58	-6.12	0.0000	0.50
CWT_Negotiation	3.71	4.58	4.40	-10.45	0.0000	0.86
DL_CloudProjMgmt	2.85	3.56	3.68	-6.45	0.0000	0.53

Table 5. Statistically significant results of paired t-tests, total sample of freelancers.

Low p-values indicate a very strong statistical significance of the obtained results for all the variables presented in the Table 4. However, the highest Cohen's d value is found for Negotiation skills (0.86), which indicates large to very large effect of this mismatch. Medium to large effects (based on Cohen's d value between 0.50 and 0.79) were found for: Self-promotion and brand building (0.67); Knowledge of and compliance with formal regulations (0.66); Self-organization and work discipline (0.61); Ability to identify, analyse and solve problems (0.59); Clarity of expression while communicating with others (0.58); Dealing with uncertainty and stress (0.55); Ability to use cloud-based project management tools (0.53) and Right prioritization and task management (0.50).

Contrary to mentioned and identified important gaps previously mentioned, Serbian freelancers perform relatively good (with small difference between perceived importance and self-assessed mastering of particular skill) number of domains, which mainly belong to the Digital literacy skills. The results are presented on the Graph ___. Concretely, high performance emerges in the skills related to the Ability to keep good relationships in business collaboration and Use of search engines, social media and content platforms. Although a bit higher gaps arise for Ability to use cloud-based

project management tools and Knowledge of and compliance with formal regulations, they are still considerably lower to those related to, for example, Negotiation skills.

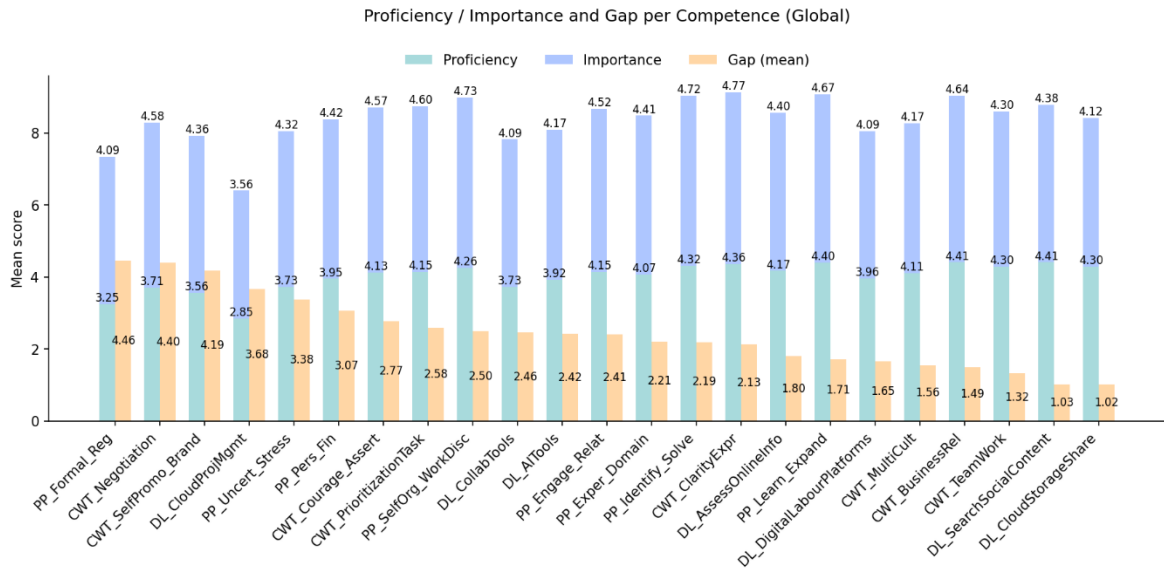


Figure 46. Proficiency, importance and mean gap score, per competence, for total Serbian sample-freelancers.

6 Segmentation and Profile Analysis (k-means and CHAID)

6.1 Freelancers

In order to distinct freelancer profiles based on seven main characteristics (overall competence levels, domain experience, freelance experience, digital literacy, non-digital competences, AI future usage, and upskilling frequency), cluster analysis, i.e., k-means method is applied (Hair, Black, Babin, & Anderson, 2019). Main freelancer activity/profession was excluded, to obtain clusters that are focused on general freelancer's competence, experience, and technology-adoption patterns rather than specific professions.

Ordinal variables, such as upskilling frequency and future use of AI, were converted into five-point scale, while experience categories were transformed to approximate numeric values (e.g., <1 year = 0.5; 1–5 years = 3; etc). Finally, before clustering, all variables were standardized using z-scores. Based on interpretability of the results and initial internal validity tests, a five-cluster solution ($k = 5$) was adopted.

Following the approach of Tan et al. (2019), two complementary metrics were used (to ensure cluster quality): the Calinski–Harabasz index and the Davies–Bouldin index. The Calinski–Harabasz (CH) index focuses on the distinctness of the groups, where higher values signal that the freelancer profiles differ significantly in terms of competences, professional experience, AI usage, and upskilling behaviour. In addition, the Davies–Bouldin (DB) index assessed cohesion; the low values suggest that the clusters are compact and exhibited limited overlap.

In the case of Serbian sample, the value of CH index was 13.5039, and it is considered as a normal value for social science/behavioural studies. While behavioural data inherently involves some degree of overlap, this value of CH index confirms that the between-cluster variance is significantly higher than the within-cluster variance,

supporting the existence of distinct freelancer typologies. For the same sample and clustering, the value of DB index was 2.7172, which is considered a relatively high. While lower DB values typically indicate sharper separation, this elevated score reflects the continuous nature of professional attributes. It suggests that while distinct freelancer archetypes exist (as previously confirmed by the CH index), the boundaries between them are fluid rather than rigid. This indicates that the identified clusters represent dominant 'centres of gravity' in the freelancer population, with a natural degree of intersection in skills and behaviours between the groups.

The results of the cluster analysis are presented in Figure 47.

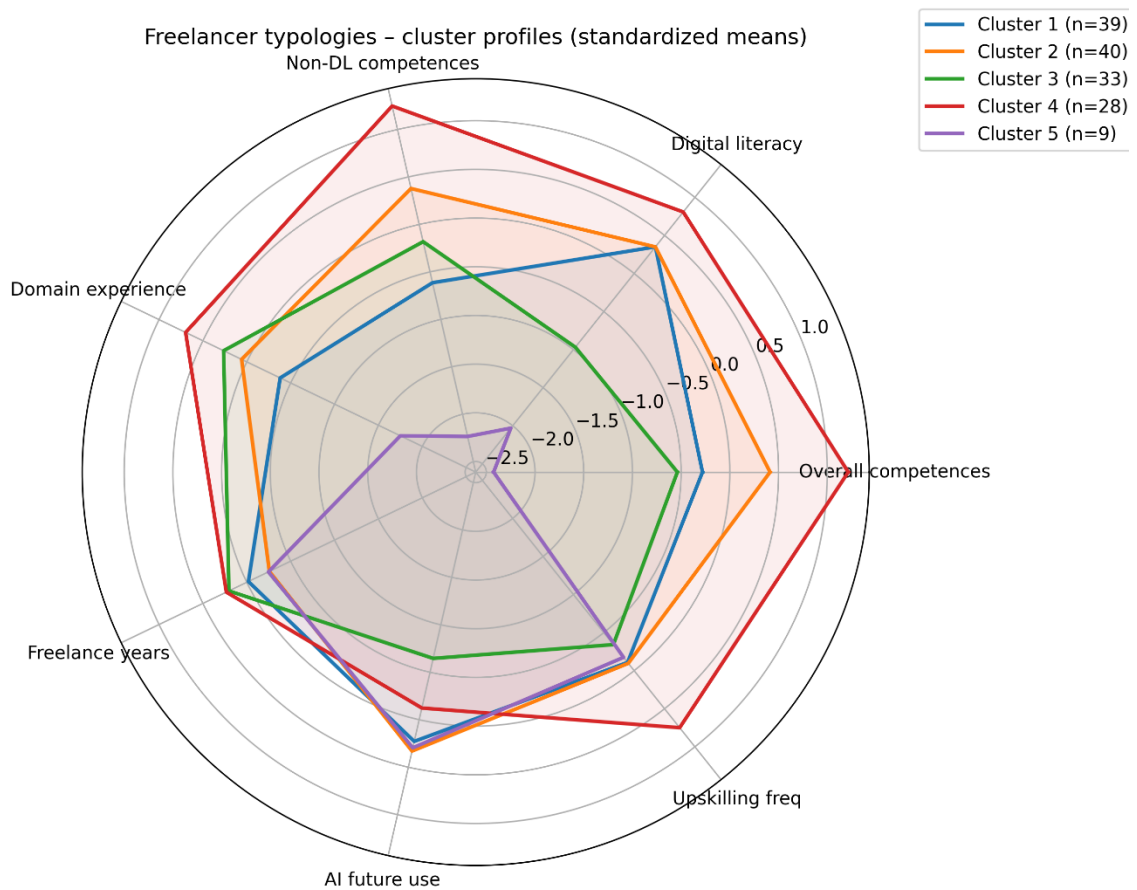


Figure 47. Main clusters of Serbian freelancers.

In Serbian sample, five clusters were identified, as following:

- **Cluster 1 - “The Mainstream Middle”** – This cluster contains 26.2% of Serbian freelancers. The shape of this cluster hugs the centre line (0.0)

almost perfectly across all axes. The freelancers in this cluster represent the statistical average of our dataset. They usually possess a baseline level of experience and digital literacy but do not stand out as either hyper-innovative or resistant to change. These freelancers can be considered as the "standard" freelancers, against everyone else is compared.

- **Cluster 2 – “The Adaptive Learners”** - This cluster contains 26.8% of the Serbian sample and it is the largest one. This group of freelancers is defined by their drive to learn. While they lack of freelance experience, they score above average on overall competences, digital literacy, and importantly, upskilling frequency (second best score). The freelancers belonging to this cluster are likely mid-career professionals compensating for less experience with high agility and modern skills, i.e., they are relaying on the knowledge and accumulated experience to climb the ladder of experience.
- **Cluster 3 – “The Analog Veterans”** - This cluster represents 22.1% of the Serbian sample. These freelancers are established professionals, with high levels of domain experience, but also freelance experience. On the other hand, they have low digital literacy and very low interest in future usage of artificial intelligence, i.e., suggesting that they rely on traditional methods and past experience rather than new tools and new skills acquisition. They are resistant and experienced experts, who care deeply about their specific domain knowledge, but are generally not prone to adapt the application of modern digital technologies in delivering services.
- **Cluster 4 – “High-Performing Integrators”** - This cluster contains 18.8% of Serbian freelancers. This group is the "Gold Standard." They possess the rare combination of long-term freelance experience and high adaptability. Unlike typical veterans in Cluster 3, they follow modern trends, with the highest scores in digital literacy and future usage of AI. These freelancers represent “digital elite”, the most sophisticated cohort of freelancer population, that integrate old-school wisdom and deep domain knowledge with new technologies.
- **Cluster 5 – “The Disconnected Novices”** - This cluster contains only 6% of the Serbian sample and it is the smallest one. This cluster exhibits the

lowest scoring on almost every metric. These freelancers are usually beginners in freelancing, but also without significant domain experience. Unfortunately, they also score very low on digital literacy and future usage of artificial intelligence, suggesting they are starting their careers with a significant skills gap compared to the market demand.

In the Serbian sample, the best freelancers, High-Performing Integrators, are located in Cluster 4, which has the highest scores in almost all categories. Highly ranked are also Adaptive Learners, located in Cluster 2, with lower scores compared to High-Performing Integrators in almost all categories but future use of AI. It may influence their position on the market in the (near) future because they should possess more competitive knowledge compared to High-Performing Integrators. Although well positioned, Analog Veterans might have a vague and uncertain future, due to their resistance to adopt modern tools. Moreover, these group probably represents an important part of the people leaving the freelancers market, recorded in the last year (Andjelkovic et al., 2025b). Although not highly scored, The Mainstream Middle might have good perspectives, due to relatively good scores in digital skills, future usage of AI and upskilling frequency – they are eager to learn and use modern tools, which could help them to advance quickly and successfully compete on the freelance market. Finally, Disconnected Novices will probably have to significantly change their behaviour, i.e., they would need to invest considerable efforts to master new competences and experience, to rise their chance on a demanding and ever evolving freelance market.

6.2 Companies

In order to identify how organizational variables, such as size, area of activity, AI adoption, perceived risks, influence company's decision to hire freelancers, we have implemented CHAID (Chi-square Automatic Interaction Detection) analysis (James, Witten, Hastie, & Tibshirani, 2021). CHAID is a decision-tree-based ML technique often used to identify statistically significant relationships between an output variable and a set of its predictors. By applying chi-square tests of independence, CHAID recursively segments the dataset into groups that are increasingly similar regarding the target outcome, by selecting the predictor with strongest statistically significant association with the outcome and splitting the data in that way.

In our study, the model output, i.e., dependent (categorical) variable is availability of freelancers with required competences, which captures companies' perceptions of challenges in accessibility of skilled freelancers in the near future. As input variables (predictors) we used company size, activity sector, years active on the market, market scope of operations, ownership structure, years of hiring freelancers, number of freelancers hired in the last 12 months, motivations for hiring freelancers, perceived risks of relying on freelancers, future challenges and perceived impact of AI on freelancing market. To comply CHAID's requirement for categorical predictors, before the analysis, continuous variables were discretized into ordinal categories. The results of the CHAID analysis of the Serbian companies' sample are presented in Figure 48. Due to small data sample size, the results should be interpreted as exploratory, meaning that this analysis is valid descriptively for this specific group, but should be treated with caution if generalizing to the entire Serbian economy.

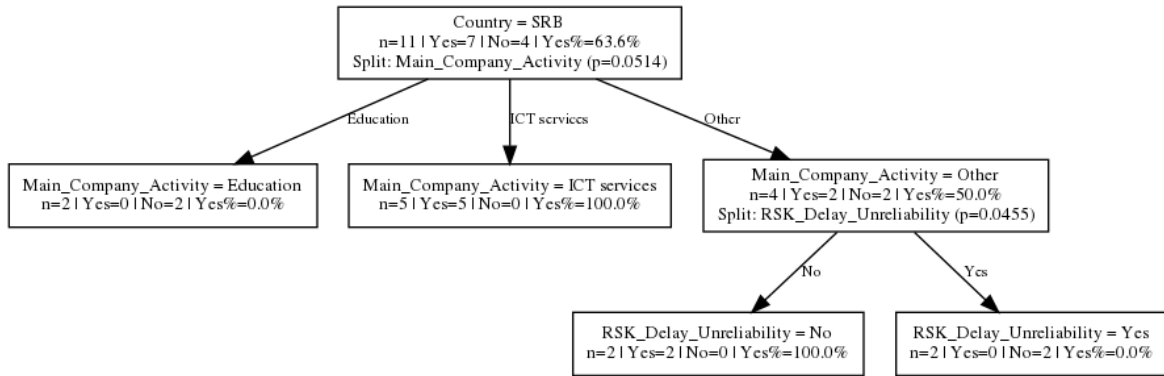


Figure 48. CHAID decision-tree segmentation for Serbian companies.

Out of 11 companies in the Serbian sample, seven of them reported availability of freelancers with required competences, while remaining four perceive that they will have problems in accessing skilled freelancers in required domain in the near future. Level 1 split is based on company's main activity area, as the most significant driver of our outcome (p-value = 0.0514, so approx. 0.05 level). Using these criteria, the algorithm splits the companies into three distinct groups with radically different behaviours:

- Education (left node): In this sample, both companies from the Education sector report absolutely no availability of skilled freelancers, which means that this is a completely negative segment.
- ICT services (middle node): This is the strongest performing segment, as every single ICT service company in the sample reported having access to skilled freelancers. This suggests that the freelance market in Serbia is heavily optimized for or integrated with the ICT sector.
- Other (right node): Industries falling outside of Education and ICT services sectors are mixed in perceptions about availability of freelancers, so the CHAID algorithm attempts to find another variable to explain the variance, leading to the Level 2 split.

So, for companies in the "Other" category, the deciding factor for Level 2 split is related to perceived risks relying on freelancers, particularly on the Risk of project delays/unreliability (p-value = 0.0455). Using these criteria, the algorithm splits the companies into two distinct groups:

- No Risk Perceived (Left Sub-Node): Both "Other" companies that do not view delay or unreliability as a significant risk report full availability of skilled freelancers for their needs.
- Risk Perceived (Right Sub-Node): Conversely, both "Other" companies that perceive the risks of project delays/unreliability when hiring freelancers report no availability of skilled freelancers. This may indicate an important finding (although conditional, because of small sample size): companies that struggle to find freelancers likely attribute that struggle to reliability and high risk issues, or perhaps their risk aversion and lack of trust prevents them from engaging freelancers effectively.

Therefore, our model has three "pure" segments (nodes with 100% or 0% probability of availability): if the company is in ICT, they have skilled full freelancer availability (100%), regardless of other factors; if the company is in Education, they do not perceive any availability of freelancers (0%); finally, for other industries, availability depends entirely on their experience with or perceived risks on relying on freelancers. If the risk perception is high, the perception of freelancer availability is low and vice versa.

7 Identifying Training Needs

The identification of the training needs of Serbian freelancers was done using a training-needs matrix approach. The training-needs matrix was constructed using competency gap scores perceived by both sides: freelancers, as a supply side, and companies, as a demand side. In initial phase, a set of general skills was selected, and grouped into three major groups/families: Personal profile; Communication and work in a team; and Digital literacy skills. The distribution of the skills across groups, as well as the codes/acronyms for each group and skill used in training-needs matrix is already presented before, in the Table 1, in Chapter 2.

Based on selected set of skills/competences and the answers of Serbian respondents, gap scores were computed for each competency, as the difference between perceived importance and self-reported proficiency for freelancers and between perceived importance and perceived standards fulfilment/performance for the companies (multiplied by the importance), and mean gap values were calculated (separately for freelancers and companies). In this way, comparable measures were obtained, and presented in a single matrix, combining and comparing the perceptions of two main stakeholders in digital labour: freelancers and hiring companies. Training needs were identified using two complementary rules:

- Max-gap rule prioritizes on the larger of the two mean gaps. This approach is more focused on the highest unmet need, identified on either side of the market.
- Joint-gap rule assigns the highest priority level (critical) only if both sides (freelancers and companies) perceive simultaneously high gaps, while medium and high priorities are assigned when at least one side reports a significant competence gap.

Based on predefined thresholds on the gap scale, priority levels were encoded on an ordinal scale as 1 = LOW, 2 = MEDIUM, 3 = HIGH, and 4 = CRITICAL. The training-needs matrix for Serbian freelancers, based on competences is presented in Table 6.

Competence	Freelancers_Gap_Mean	Companies_Gap_Mean	Priority_MaxGap	Priority_JointGap	TrainingNeed_MaxGap	TrainingNeed_JointGap
PP_Engage_Relat	2.41	1.27	2	2	MEDIUM	MEDIUM
PP_Exper_Domain	2.21	5.91	4	3	CRITICAL	HIGH
PP_Formal_Reg	4.46	2.55	4	3	CRITICAL	HIGH
PP_Identify_Solve	2.19	4.09	4	3	CRITICAL	HIGH
PP_Learn_Expand	1.71	1.18	1	1	LOW	LOW
PP_Pers_Fin	3.07	2.64	3	3	HIGH	HIGH
PP_SelfOrg_WorkDisc	2.50	5.18	4	3	CRITICAL	HIGH
PP_Uncert_Stress	3.38	4.00	4	3	CRITICAL	HIGH
CWT_BusinessRel	1.49	1.45	1	1	LOW	LOW
CWT_ClarityExpr	2.13	3.09	3	3	HIGH	HIGH
CWT_Courage_Assert	2.77	2.00	2	2	MEDIUM	MEDIUM
CWT_MultiCult	1.56	1.09	1	1	LOW	LOW
CWT_Negotiation	4.40	3.18	4	3	CRITICAL	HIGH
CWT_PrioritizationTask	2.58	4.55	4	3	CRITICAL	HIGH
CWT_SelfPromo_Brand	4.19	2.73	4	3	CRITICAL	HIGH
CWT_TeamWork	1.32	3.55	3	3	HIGH	HIGH
DL_AITools	2.42	0.00	2	2	MEDIUM	MEDIUM
DL_AssessOnlineInfo	1.80	0.36	1	1	LOW	LOW
DL_CloudProjMgmt	3.68	0.36	3	3	HIGH	HIGH
DL_CloudStorageShare	1.02	0.45	1	1	LOW	LOW
DL_CollabTools	2.46	2.64	2	2	MEDIUM	MEDIUM
DL_DigitalLabourPlatforms	1.65	0.45	1	1	LOW	LOW
DL_SearchSocialContent	1.03	0.00	1	1	LOW	LOW

Table 6. Training-needs matrix for Serbian freelancers, based on competences.

When using Max-gap rule approach, several competence gaps were identified as critical:

- Experience in the work domain (PP_Exper_Domain)
- Knowledge of and compliance with formal regulations (PP_Formal_Reg)
- Ability to identify, analyse and solve problems (PP_Identify_Solve)
- Self-organization and work discipline (PP_SelfOrg_WorkDisc)
- Dealing with uncertainty and stress (PP_Uncert_Stress)
- Negotiation skills (CWT_Negotiation)
- Right prioritization and task management (CWT_PrioritizationTask)
- Self-promotion and brand building (CWT_SelfPromo_Brand)

Interestingly, there are no critical competence gaps in digital literacy skills, and the most of unmet needs can be found in Personal Profile group. Companies perceive higher gaps in competences such as experience in the work domain; freelancer's ability to identify, analyses and solve problems; their self-organization and work discipline and the way how they are dealing with uncertainty and stress as well as how they prioritize and manage their work. On the other hand, freelancers perceived higher gaps (than companies) in their knowledge of and compliance with formal regulations, their negotiation skills and self-promotion and brand building.

On the other hand, when using Joint-gap rule approach, which compare and combine identified gaps by both sides, no critical gaps were identified. In other words, there are no skill gaps that both freelancers and companies simultaneously perceive as critical. Yet, there are 13 (out of 23) competence gaps identified as HIGH, again mainly from Personal Profile (skills) group.

Both approaches show that there is a remarkable potential for the improvement, particularly in the areas of personal freelancer characteristics and his/her communication skills.

Although primary objective of this research was to identify the most significant competence gaps, which would be used to develop learning materials/massive open online courses for freelancers to improve their skills and reduce identified gaps, the results can be also used for more strategic approach. The later refer to curriculum design at the universities and policy decision-making, but also by other stakeholders, such as digital labour platforms, governmental bodies or NGOs. So, the identified gaps are also grouped at a higher level (by competency groups, by averaging gap means within each group and reapplying the same priority rules) and this training-needs matrix for Serbian freelancers in presented in Table 7.

Competence_Group	Freelancers_Gap_Mean	Companies_Gap_Mean	Priority_MaxGap	Priority_JointGap	TrainingNeed_MaxGap	TrainingNeed_JointGap
Personal profile (PP)	2.74	3.35	3	3	HIGH	HIGH
Communication and work in a team (CWT)	2.56	2.70	2	2	MEDIUM	MEDIUM
Digital literacy skills (DL)	2.01	0.61	2	2	MEDIUM	MEDIUM

Table 7. Training-needs matrix for Serbian freelancers, based on competence groups.

As already elaborated, the highest gap by both approaches was identified in the Personal profile group of competences, and both sides (companies a bit more than freelancers) are aware of existing gap in personal profile group of skills. For Communication and work in a team both approaches result in medium priority levels, with approximately the same level of awareness of existing gap by both sides. Finally, for Digital literacy skills group again both approaches result in medium priority levels, but here companies perceive this gap at much lower level than freelancers.

Conclusions

The National Analysis Report for Serbia is prepared within WP3 (Research on Freelancer Competences) of the ENTEEF project providing a quantitative assessment of the Serbian freelance market, focusing on both the supply side (freelancers) and to lesser extent (because of the sample size) to the demand side (companies hiring freelancers). The report addresses three core research questions that refer to the identification of key freelancer competences, perceptions of competence gaps and mismatches, and the determination of training needs aligned with freelancers' career development.

The analysis is based on primary survey data collected in Fall 2025, comprising of 149 freelancers and 11 companies, and follows a harmonized methodological framework applied across partner countries, ensuring comparability of results.

The Serbian freelancer sample reveals several structural characteristics of the supply side of Serbian freelance market. Freelancers in Serbia are predominantly young and highly educated, with approximately two-thirds being under the age of 36 and the majority holding (at least) a bachelor's degree. This confirms that freelancing in Serbia is largely a knowledge-intensive form of work, requiring substantial cognitive and digital skills.

Although men still constitute the majority of freelancers, the report identifies a notable increase in female participation compared to previous studies, as well as the inclusion of non-binary responses (although there are only 2 such responses). This suggests a gradual diversification of the freelance workforce and improved inclusiveness in data collection practices.

On the demand side, surveyed companies represent various sectors and demonstrate rather illustratively that there some demand for freelancer's services for specialized tasks, which is enabling Serbian companies to find flexible workforce and to access to skills not readily available in the domestic labor market.

In the report, clear difference between digital, non-digital, entrepreneurial, and regulatory competences is made. Both freelancers and companies consistently rate a wide range of competences as highly important, indicating rising expectations regarding freelancer professionalism and adaptability.

Serbian freelancers demonstrate relatively high proficiency in digital literacy competences, particularly in areas such as online communication, use of search engines, social media, and content platforms. These competences show small gaps between perceived importance and self-assessed proficiency, suggesting that freelancers are generally well equipped in core digital skills.

However, notable gaps emerge in non-technical and business-oriented competences, especially negotiation skills, knowledge of formal regulations, and the use of advanced digital tools such as cloud-based project management systems. These gaps indicate areas where freelancers may struggle to meet market expectations despite possessing strong technical abilities.

Gap analysis, conducted using paired t-tests and cross-tabulation methods, reveals systematic mismatches between competences: importance and proficiency. These gaps are identified by both freelancers and companies, although companies tend to perceive gaps as more pronounced, particularly in strategic, organizational, and compliance-related skills. This result should be observed only conditionally, since the sample of companies is non-representative.

The findings suggest that while Serbian freelancers are competitive in operational and technical tasks, they are less prepared for complex market interactions, such as contract negotiation, pricing strategies, long-term client management, and compliance with legal and regulatory requirements. This imbalance may limit freelancers' capacity to scale their activities, move toward higher-value segments of the freelance economy or even survive in strongly competitive global freelancer market.

Using k-means clustering and CHAID analysis, the report identifies five distinct freelancer profiles in Serbia, based on competence levels, experience, digital literacy, upskilling behavior, and attitudes toward future use of artificial intelligence. These clusters demonstrate that the Serbian freelance market is highly heterogeneous,

encompassing both highly skilled, innovation-oriented freelancers who engage in continuous upskilling and more vulnerable groups with lower competence levels and limited engagement in lifelong learning. Importantly, cluster boundaries are fluid rather than rigid, indicating potential mobility between profiles through targeted training and skills development.

The identification of training needs represents one of the most policy-relevant outcomes of the report. The analysis undoubtedly highlights a strong demand for training in:

- business and negotiation skills,
- legal and regulatory knowledge relevant to freelancing,
- strategic use of AI,
- project management and advanced digital tools,

These findings directly inform the next phase of the ENTEEF project, particularly the development of MOOCs tailored to the actual competence gaps observed in the Serbian freelance market.

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List of Tables

Table 1. Distribution of the skills across groups, with codes.	38
Table 2. Competence gaps (χ^2 statistics).....	55
Table 3. Competence gap levels vary across relevant grouping variables.	61
Table 4. Statistically significant results of paired t-tests, total sample of freelancers.	78
Table 5. Statistically significant results of paired t-tests, total sample of freelancers.	81
Table 6. Training-needs matrix for Serbian freelancers, based on competences.....	91
Table 7. Training-needs matrix for Serbian freelancers, based on competence groups.	93

List of Figures

Figure 1. Gender structure of Serbian freelancer market.....	10
Figure 2. Age distribution of Serbian freelancers.....	11
Figure 3. Education distribution of Serbian freelancers (absolute terms).....	12
Figure 4. Education distribution of Serbian freelancers (relative terms).	12
Figure 5. Main freelancer profession.	13
Figure 6. Number of clients in the last 12 months.....	14
Figure 7. Areas of education of Serbian freelancers.....	15
Figure 8. Years of experience of Serbian freelancers.....	16
Figure 9. How freelancers find their job.....	17
Figure 10. Most popular digital labour platforms used for job finding.	19
Figure 11. Most popular social networks used for job finding.....	19
Figure 12. How freelancers usually charge for their freelance work.	20
Figure 13. Top challenges perceived by Serbian freelancers.	21
Figure 14. Most important factors driving the growth of freelancing.	22
Figure 15. Opinion on the future of freelancing in their field.....	23
Figure 16. Opinion on the future usage of AI.	24
Figure 17. Opinion on how often freelancers invest in upskilling or reskilling.	25
Figure 18. Opinion on how freelancers improve or acquire new skills.....	26
Figure 19. Distribution of companies based on the main area of activity.	27
Figure 20. Distribution of the years active in the market.	28
Figure 21. Distribution of the market of operations.	29
Figure 22. Years of presence in freelance market.....	30

Figure 23. Type of freelance services hired.....	31
Figure 24. Why companies choose to hire freelancers.	32
Figure 25. The major risks of relying on freelancers.	33
Figure 26. Most important challenges that companies will face in the near future.	34
Figure 27. How will the use of AI influence hiring freelancers.	35
Figure 28. The use of AI technology and its influence on the freelancing market.....	36
Figure 29. Importance vs. Proficiency by Skill.	38
Figure 30. The most important skills by gender.....	40
Figure 31. The most important skills across different age groups.....	41
Figure 32. The most important skills by educational level.....	45
Figure 33. Importance of different skills by level of experience.	46
Figure 34. The most important skills over different professional occupations.	48
Figure 35. Importance vs. Proficiency by Skill.	49
Figure 36. The level of different skill importance across different sectors in the economy.....	51
Figure 37. The most important skills by the size of Serbian companies.....	52
Figure 38. AI future use and cloud storage and competence gap in file-sharing tools.....	56
Figure 39. Main freelancer activity and competence gap in AI use.....	57
Figure 40. Freelancer age and competence gap in AI use.	58
Figure 41. Frequency in future AI use and competence gap in building and managing business relationships.....	63
Figure 42. Frequency in upskilling and competence gap in self-organization and work discipline.	66
Figure 43. Years of experience and competence gap in accessing online information.	68
Figure 44. Years of experience and competence gap in using collaboration tools.....	71

Figure 45. Years of experience and competence gap in use of cloud storage and file-sharing tools.....	74
Figure 46. Proficiency, importance and mean gap score, per competence, for total Serbian sample-freelancers.	82
Figure 47. Main clusters of Serbian freelancers.....	84
Figure 48. CHAID decision-tree segmentation for Serbian companies.....	88