

Digital Empowering MSMEs & TSOs: Research on OSS Training Offerings and Needs

JOINT RESEARCH REPORT

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EXECUTIVE SUMMARY

The DIGITopen project has been set to achieve three objectives: (a) to improve the staff's digital knowledge, skills and competences in using Open Source Software (OSS) tools and software in line with organizational needs (e.g management, accounting, marketing, education, internationalization etc.) of MSMEs and TSOs, (b) to enhance the capacity building of TSOs and MSMEs to better address their staff needs and develop synergies with VET providers, and (c) to enrich the educational offer of VET providers with regards to the development of digital skills. This report presents the results of an empirical study to map the current OSS usage and readiness of MSMEs and TSOs along with their training needs in six countries (i.e., France, Estonia, Greece, Italy, Spain and Poland).

Despite a considerable body of literature on Open Source Software (OSS) adoption, there is little research into adoption or rejection of OSS by MSMEs and TSOs, and into their practical experiences of using OSS. This study explored various factors that may enable or inhibit OSS adoption by MSMEs and TSOs in six European Countries from the perspectives of those involved in the management of the particular organizations. This research employed two relevant theories to study OSS adoption in the particular organizations: Diffusion of Innovation (DOI) theory and the Technology Acceptance Model (TAM). The research is based on newly developed survey which was administered to employees and leaders of MSMEs and TSOs to identify the current OSS usage but also driving factors and knowledge gaps related to OSS adoption. The aim of the study was to provide evidence-based insights on the current OSS usage of these organizations while identifying training gaps which will facilitate further adoption of OSS technology in the near future.

The survey was administered to employees and leaders of MSMEs and TSOs in the six countries (i.e., France, Estonia, Greece, Italy, Spain and Poland) adopting a convenience sampling method. The findings were analyzed through the lenses of technology adoption theories and OSS adoption literature. The findings of this study showed that OSS technology has already been explored by the sampled MSMEs and TSOs which have started acknowledging the economic advantages and that OSS is a flexible alternative to proprietary software. Overall, the sampled organizations reported high interest for OSS adoption in the future. In all countries, the respondents were contingent upon critical factors such as software quality and features that better meet organizational business needs, adaptability, reliability, maintainability and availability of support for OSS adoption. On the other hand, there were knowledge barriers in adopting OSS applications. For example, perceived lack of OSS awareness and understanding, lack of organizational knowledge on how to align business goals with OSS adoption, lack of strategic organizational commitment and limited know-how on OSS usage and managing associated risks in the context of MSMEs and TSOs.

The European analysis on current OSS training offers reveals varied landscapes in France, Spain, Italy, Poland, Estonia, and Greece. France, with a highly developed digital training sector, lacks specific OSS courses, stressing the need for targeted training. Italy and Spain identify an underdeveloped focus on OSS for MSMEs and TSOs, suggesting growth potential in **high-quality training**. Poland's diverse OSS training covers Linux, graphic design, and more, accommodating varying expertise

levels. Estonia focuses on WordPress-based web development, emphasizing practical skills. Greece and Spain face limitations in OSS training customization for MSMEs and TSOs. Regarding common themes, the study underscores the importance of tailored OSS education, highlighting accessibility and practical applicability for fostering innovation and digital literacy in MSMEs and TSOs. A collaborative European effort such as DIGITopen, needs to address regional training nuances that could enhance the OSS education strategy, fostering a competitive digital literacy and landscape inside MSMEs and TSOs.

The **training needs** for Open-Source Software (OSS) adoption among MSMEs and TSOs vary across European countries. Estonian participants prioritize training in marketing and communication, impact assessment, reporting, sales, and project management. Polish participants express needs in digital fundraising, marketing, communication, impact assessment, reporting, sales, and project management. Greek respondents emphasize OSS adoption training in management, marketing, HR, event management, and impact reporting. Italian MSMEs and TSOs prioritize OSS training in management. French participants exhibit a broad interest in various topics, including cybersecurity, management, marketing, event and project management, and sales. These diverse training needs underscore the multifaceted nature of OSS adoption, requiring tailored programs that address the specific requirements and priorities of organizations across different European regions.

The preferences for Open-Source Software (OSS) **training methods** vary across European countries. Estonian participants favor hands-on activities like tutorials, demos, and e-learning. Greek participants show broad interest in various methods, with self-directed activities being the most attractive. Spanish and Polish participants echo this comprehensive interest. In Italy, respondents find value in diverse approaches like case studies, webinars, and interactive demos. French organizations highly value tutorials, demos, and hands-on experiences, with varied preferences for other methods. The common thread is the recognition of diverse and interactive training methods as crucial for effective OSS adoption. These findings underscore the importance of flexible training programs that cater to different learning styles and preferences, emphasizing the need for customization and engagement across various European regions.

Barriers to Open-Source Software (OSS) adoption across European countries reveal common challenges and distinct regional nuances. In Poland, a lack of awareness and know-how on OSS risks are key barriers. Greek participants identify a comprehensive set of obstacles, including organizational commitment, awareness, and technical know-how. Estonian concerns focus on organizational commitment, while French participants prioritize technical know-how. In Italy, understanding OSS characteristics stands out. Overall, addressing these barriers requires targeted efforts to enhance awareness, encourage organizational commitment, improve technical proficiency, and foster a better understanding of OSS attributes, facilitating broader adoption in European regions.

The structure of this report is organized into four chapters:

1. **DigitOpen Research Design and Comparative Findings:** This chapter focuses on the methodology employed in the DIGITopen research, detailing the design of the study and presenting comparative findings. Also, it includes information on the scope, objectives, and methodology used in gathering and analyzing data.

2. **National Research Reports on Current OSS Adoption & Barriers Of MSMEs & TSOs:** This section delves into specific national research reports, and offers valuable insights into the current state of Open Source Software (OSS) adoption and the barriers faced by MSMEs and TSOs across different countries.
3. **Training Services and Programs on OSS for MSMEs & TSOs:** This chapter discusses the existing training services and programs related to OSS tailored for MSMEs and TSOs. Moreover, it covers the landscape of available training, identifying strengths and areas for improvement.
4. **Mapping the Landscape of MSMEs & TSOs & Technology Adoption in DIGITOpen Countries:** This chapter is the final and aims to provide a comprehensive mapping of the MSMEs TSOs landscape, including their technology adoption trends. Also, it offers insights into the digital landscape, providing a broader context for understanding the challenges and opportunities in the studied countries.

Each chapter seems to contribute a crucial aspect to understanding the OSS adoption scenario, barriers, training landscape, and the overall technological context in the context of MSMEs and TSOs across the six countries in the DIGITopen project.

CHAPTER 1:

DigitOpen Research Design and Comparative Findings

Introduction and Research Objectives



Image source: @freepik

The Technology Acceptance Model (TAM) (Davis, 1989) and Innovation Theory (Rogers, 1995) identify a list of factors that drive technology usage. TAM is used to study the intention to adopt a technology by individuals and organizations. Innovation theory deals with technological as well as organisational characteristics that affect innovation adoption. These theories have gained substantial attention from researchers, who used them to test and identify the factors influencing new technology adoption. The present research uses both theories to assess organisational adoption of OSS technology in micro-small-medium enterprises (MSMEs) and third sector organizations (TSOs). This research aims to build on the relevant literature by investigating factors involved in OSS adoption in the particular context. Based on this research evidence, a new educational curriculum will be developed to address relevant training needs. In particular, the present study will further explore the following key questions:

1. What is the profile of OSS adoption by MSMEs and TSOs in the six countries of the project?
2. What are the enablers and inhibitors of OSS adoption by MSMEs and TSOs in the six countries of the project?
3. What are the main OSS related training needs of the employees of MSMEs and TSOs in the six countries?

Research Methodology of the Study

The Research Model

Earlier studies on technology adoption theories in organizations emphasize the role of market characteristics and the availability of external support and services in explaining innovation adoption by small organizations. Based on the above literature, this study employs quantitative techniques to investigate the factors that influence OSS adoption in MSMEs and TS organizations along with other factors. Figure 1 illustrates the overall research model which was developed to address the research question.

The survey consisted of four main parts: (a) current usage of OSS, (b) key driving factors for OSS adoption by organizations, (c) knowledge barriers and (d) training needs identified, desirable teaching methodologies for OSS adoption and usage by MSMEs and TSOs. The later topics were used to develop the research model shown in figure 1 and construct the survey instrument.

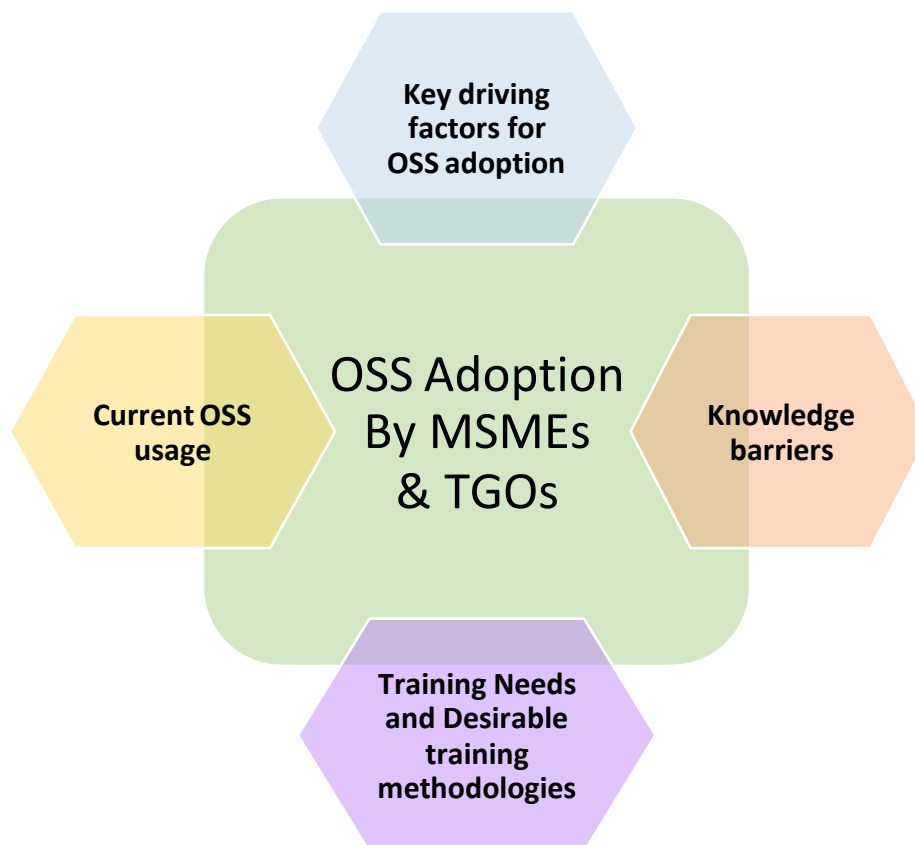


Figure 1 Research Model

Survey

The survey is used to collect quantitative data for addressing the research questions of this study. The following sections discuss the components of a survey design such as sample selection, survey instrument development, pre-testing followed by the survey administration. The questionnaire

includes mainly closed-ended questions. Closed-ended questions are effectively designed using multiple choices for each question. Two Likert scales (I e., *Non important, less important, neutral, important, very important* & *not interested, interested, very interested*) were used in the main questionnaire section. Nominal scale answers are used only in the demographics section and in the section referred to the current/future OSS usage.

The questionnaire is designed based on key theoretical factors reviewed from the literature. The concepts discussed in the literature are grouped into the following six themes in the present questionnaire: (1) Demographic profile of the organizations, (2) Current OSS usage (3) Factors driving OSS adoption by the Organizations, (4) Knowledge barriers for OSS adoption, (5) Desirable training activities for OSS adoption and (6) Perceived benefits of OSS adoption. The following table presents the main references used for developing the items and measuring the constructs of this study.

Table 1: Key Sources for Developing the Study Questionnaire.

| CONSTRUCTS | LITERATURE |
|---|---|
| OSS CURRENT & FUTURE WILLINGNESS FOR ADOPTION (PROFILING THE USAGE) | Questions were developed to collect information on the OSS usage profile of the organizations. |
| FACTORS DRIVING OSS ADOPTION | Mason & Pare (2013), Glynn et al (2005), Lenarduzzi et al., (2020); Bigliardi & Galati (2016), Chidoori Van Belle, (2018) Petrov & Obwageser (2018) |
| KNOWLEDGE BARRIERS | Nagy, Yassin, Bhattacharjee (2010); Gurusamy, K., & J. Campbell |
| PERCEIVED BENEFITS FOR OSS ADOPTION | Glynn et al (2005); Gurusamy, K., & J. Campbell (2012). |
| IDENTIFICATION OF TRAINING NEEDS | Project proposal |
| DEMOGRAPHICS | Questions were developed to collect the profile of the organizations |

Sampling & Sample

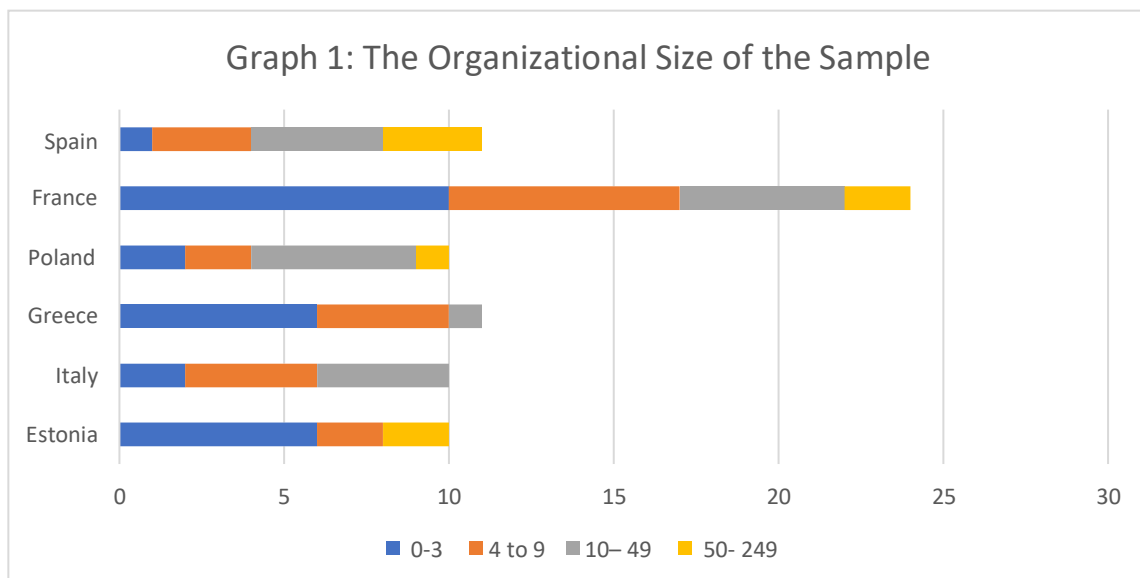
This study aims to study OSS adoption at an organizational level. So, the unit of analysis for this study is the organization and therefore the statistical analysis is conducted at the organizational level. Convenience sampling was adopted for collecting data for this survey. The main sampling criteria for this study were two: (a) Organizations classified as MSMEs, TSOs and VET providers and (b) willing to participate in this study. Drawing on from interest-based directories and reference information, various organizations were identified, and key staff members involved in Information and Communication Technology (ICT) were identified and invited to fill in the questionnaire of this survey. Overall, 76 organizations make up the sample of this study which are coming from six countries: France, Italy, Spain, Greece, Poland and Estonia. The profile of the total sample is presented in the following tables.

The Demographic profile of the Sample

Table 2: Profile of the Sample.

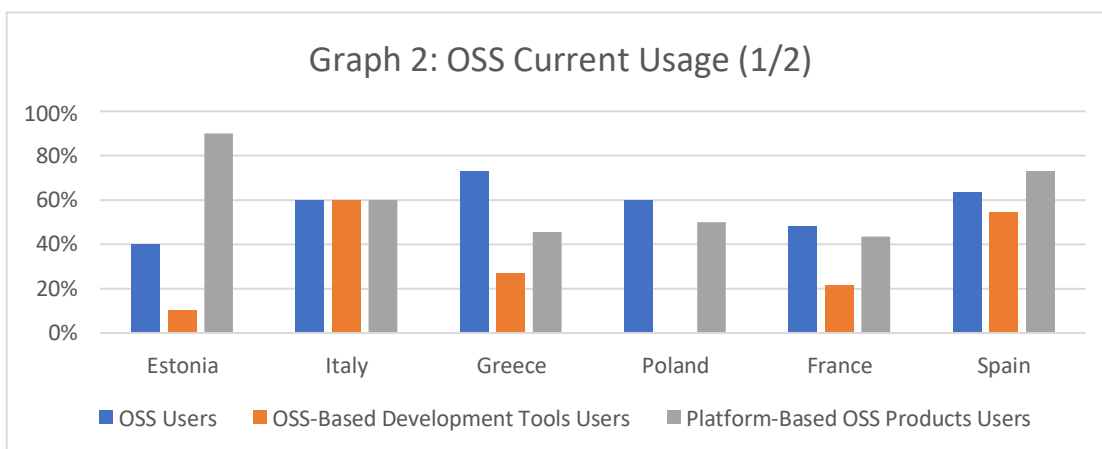
| Type of Organizations | France | Italy | Spain | Greece | Poland | Estonia |
|---|--------------|--------------|--------------|--------------|--------------|--------------|
| Micro-small-medium for-profit enterprise | 58,4% | 20% | 54,6% | 45,5% | 40% | 40% |
| Third Sector Organization & Social Enterprise | 37,4% | 50% | 36,4% | 36,4% | 40% | 40% |
| VET Provider | 4,2% | 30% | 9,1 | 18,2% | 20% | 20% |
| Total | 100% (24) | 100% (10) | 100% (11) | 100% (11) | 100% (10) | 100% (10) |

Graph 1 shows the number of employees reported for each participant organization. Twenty-seven organizations employed up to 3 employees; twenty-two organizations employed 4 to 9 employees; nineteen organizations employed 10 to 49 employees; and eight organizations employed 50 to 249 employees. The rather small sample size in combination with the six countries involved poses a problem regarding representation that could render the results less representative and reliable.

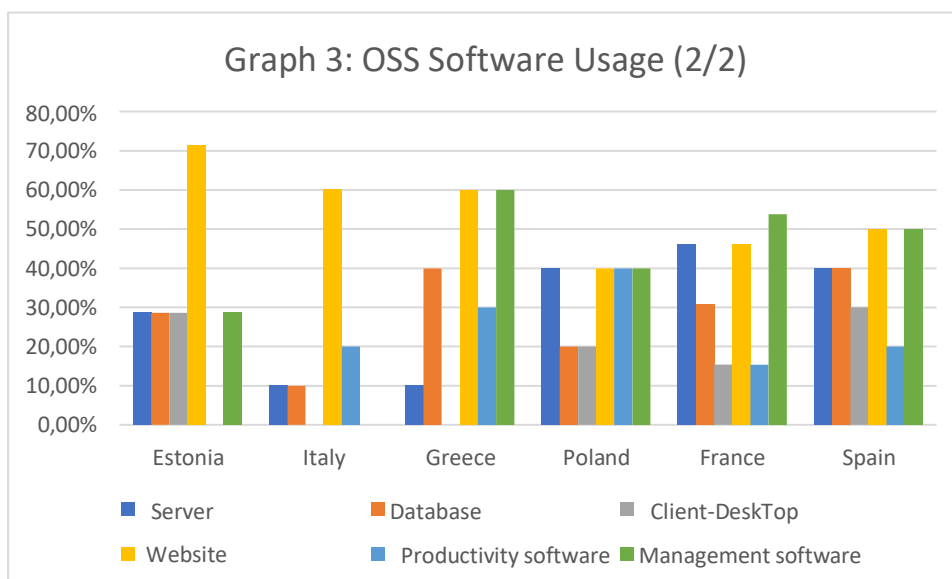


The Current OSS Usage by MSMEs & TSO's in Six Countries

As shown in Graphs 2, the current usage of OSS by the sampled organizations follows an increasing trend ranging from the lowest 40% (Estonia) to the highest 72,7% (Greece). 60% of the sampled organizations from Italy and Poland report using OSS whereas in Spain the relevant ratio is 63, 6%. Compared to the rest of the countries, organizations located in Spain and Italy reported higher adoption rates of OSS-based development tools (i.e., platforms that assist developers in creating, testing, and managing computer programs. In the same line, compared to the rest of the sample, Estonia and Spain organizations reported comparably higher adoption percentage of platform-based OSS Products (e.g., Apache, Linux, Ruby, Libre Office, WordPress etc.,).

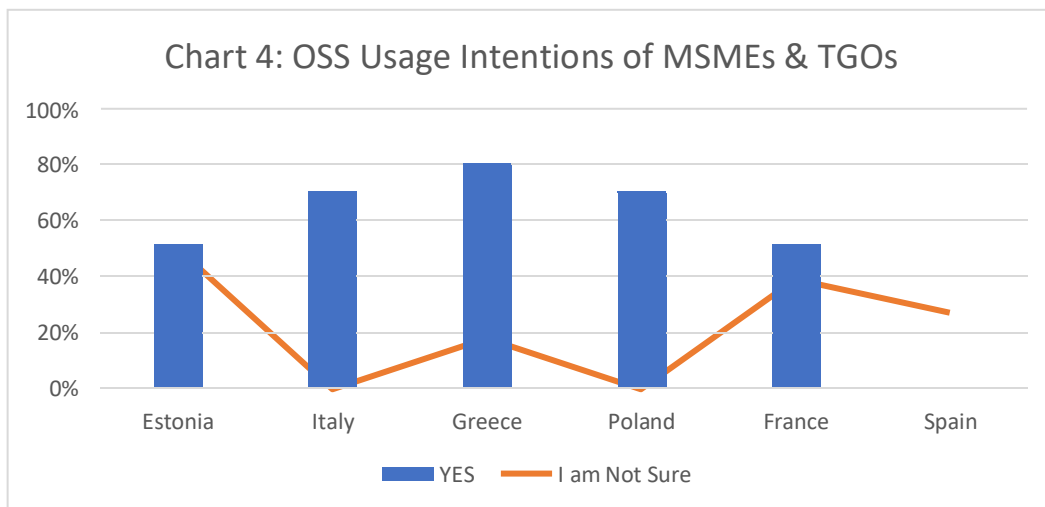


The OSS applications have been used at different levels within sampled organizations (See Graph 3). **Website** applications were dominant across all six countries followed by **management** and **server-side** applications, as well as database applications. Client-desktop software was reported as less dominant followed by productivity applications.

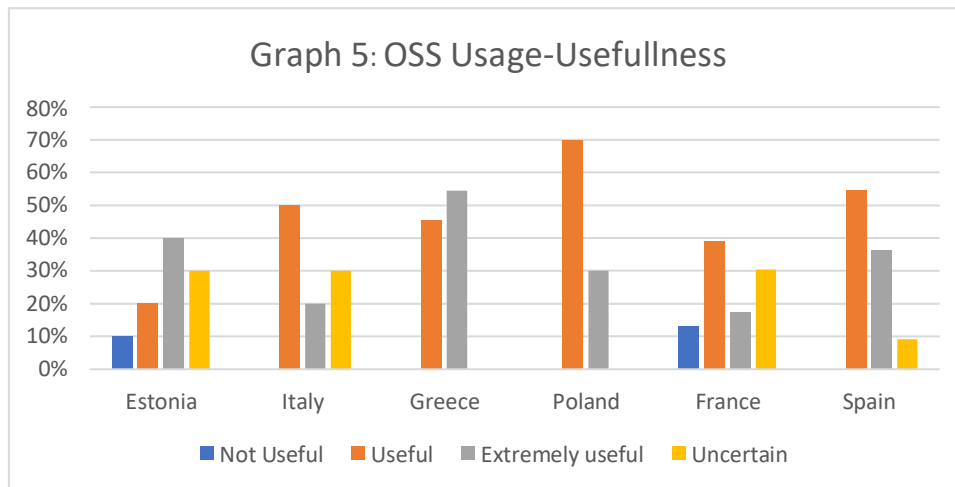


The attractiveness of future OSS Usage by MSMEs & TSOs among Six Countries

As shown in the figure 4, the sampled MSMEs and TSOs organizations reported high intentions for OSS adoption in the future. The organizations in Greece, Poland and Italy seem to drive the way with the highest percentages for OSS adoptions followed by French and Estonian organizations which reported average intentions to explore OSS options in the near future. The latter MSMEs and TSOs report comparably higher levels of uncertainty regarding OSS adoption in the future.



The results presented in Graph 5, report the perceptions of the respondents regarding the usefulness of OSS applications for their MSMEs and TSOs. The participants from Poland and Greece evaluated the OS software as useful and extremely useful for the effective operation of their organizations. The respondents from the remaining countries, though they acknowledge that OSS are particularly useful for their MSMEs and TGOs, they also report a moderate level of hesitancy or less certainty.



Most attractive training OSS topics of MSMEs & TS Os (comparative results for the six countries)



Image source: @freepic

The landscape of the six countries (Italy, France, Spain, Estonia, Greece, and Poland) presents diverse perspectives on Open-Source Software (OSS) training needs, with each country showcasing unique interests and priorities.

In **Italy**, the average interest in training areas such as Marketing & Communication and Management & Administration indicates a recognition of OSS's potential in enhancing these functions. Areas with no reported OSS usage, like Digital Fundraising and Cybersecurity, present untapped markets for potential OSS development and adoption.

French organizations demonstrate high interest in OSS training for crucial areas like Cybersecurity, Management & Administration, Finance & Accounting, Sales, Project Management, and Event

Management. Conversely, HR Management, Digital Fundraising, and Finance & Accounting are perceived as less critical for OSS adoption.

Estonian organizations express diverse training needs related to OSS adoption, emphasizing Sales, Marketing & Communication, Impact Assessment and Reporting, and Project Management. Fundraising is considered a less important area for OSS training.

Spanish organization reported diverse training needs related to OSS adoption, emphasizing Marketing & Communication, Sales, finance and accounting, and CRM. HR and management was considered less important areas for OSS training.

In **Greece**, extensive training needs for OSS adoption are evident in high ratings for Management, Marketing & Communications, HR and Volunteer Management, Digital Fundraising, Impact Assessment and Reporting, and Project Management. Conversely, CRM and Cybersecurity are evaluated as less important areas for training.

Poland stands out for already using proprietary software in Cybersecurity, Management, Finance, Project Management, and Reporting. Despite this, there are high reported needs for OSS-related training in various areas, including Management, Marketing & Communications, CRM, Digital Fundraising, HR and Volunteer Management, Impact Assessment and Reporting, and Project Management, indicating a strong interest in OSS adoption and its potential benefits.

Across the six countries, common themes emerge, with Management & Administration, Marketing & Communications, and Project Management consistently recognized as high-priority areas for OSS training. The differences in focus areas reflect unique organizational needs and the varying stages of OSS adoption in each country. These insights underscore the importance of tailoring OSS training programs to specific national contexts and industry requirements to effectively drive adoption and maximize the benefits of open-source technologies.

Table 1. Training needs of MSMEs and TSOs.

| Training Themes | France | Italy | Spain | Estonia | Greece | Poland |
|-----------------------------|--------------|---------|--------------|--------------|--------|--------------|
| Digital Fundraising | low | NI* | average low | low | high | average |
| CRM | average | low | average-high | - | low | average-high |
| Cybersecurity | average-high | low | average-high | average | low | average-high |
| Management & Administration | average-high | average | average | average | high | average-high |
| Marketing & Communication | average | NI | average | average-high | high | average-high |
| Finance & Accounting | low | average | average-high | average | low | average-high |
| HR & Volunteer Management | low | low | average | average | high | average-high |
| | low | average | average | | high | average-high |

| | | | | | | |
|--|---------|-------------|--------------|--------------|---------|--------------|
| Impact Assessment/ESG/Reporting | | | | average high | | |
| Events Management | average | average | average | average | high | average-high |
| Sales | average | low-average | average-high | average-high | average | average |
| Project Management | average | average | average | average-high | high | average-high |
| Managing Non-financial Risks and Opportunities in Environmental Social and Governance Areas | average | low-average | NI | average | average | average-high |

***NotI: Not Interested**

The preferences for training methods in Open-Source Software (OSS) adoption vary across the six European countries, reflecting slight differences among participants. In Estonia, participants find activities like getting started tutorial, interactive demos, hands-on experience, e-learning modules, and recorded demonstrations most attractive. Webinars and self-directed activities are also considered appealing, while activities like basic troubleshooting, toolbox exploration, seminars, and case studies hold moderate importance for OSS adoption. Greek participants express a broad interest in various training methods, finding getting started tutorial, interactive demos, hands-on experience, e-learning modules, recorded demonstrations, webinars, and basic troubleshooting all attractive for OSS adoption. Notably, self-directed activities emerge as the most attractive training method. Spanish and Polish participants echo the comprehensive interest seen in Greece, as they rate all suggested training activities as attractive or most attractive for OSS adoption.

In Italy, respondents identify hands-on experience, case studies, e-learning modules, self-directed activities, recorded demonstrations, basic troubleshooting, interactive demos, customized exercises, webinars, seminars, and toolbox exploration as attractive for training on OSS adoption. This diverse range indicates a recognition of the value of varied approaches. French organizations exhibit a very high interest in activities such as Getting Started Tutorial, interactive demos, basic troubleshooting, customized exercises, hands-on experience, and e-learning modules. Case studies and toolbox exploration are considered attractive, while seminars and recorded demonstrations hold moderate appeal.

Overall, the common thread is the acknowledgment of the importance of diverse and interactive training methods in fostering OSS adoption. Whether it's the hands-on approach favored in Estonia, the comprehensive interest observed in Greece and Poland, or the varied preferences seen in Italy and France, the findings emphasize the need for flexible and engaging training programs that cater to the diverse learning styles and preferences of participants across different countries.

Table 2. Most attractive OSS-related training activities of MSMEs & TSOs (comparative results for the six countries).

| Training Activities | France | Italy | Spain | Estonia | Greece | Poland |
|---------------------|--------|-------|-------|---------|--------|--------|
|---------------------|--------|-------|-------|---------|--------|--------|

| | | | | | | |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Getting Started Tutorial | Most Attractive | Moderate | Attractive | Most Attractive | Attractive | Most Attractive |
| Interactive demos | Most Attractive | Attractive | Attractive | Most Attractive | Attractive | Most Attractive |
| Basic troubleshooting | Most Attractive | Attractive | Attractive | Moderate | Attractive | Attractive |
| Toolbox exploration | Attractive | Attractive | Attractive | Moderate | Attractive | Most Attractive |
| Customized exercises | Most Attractive | Attractive | Most Attractive | Moderate | Attractive | Most Attractive |
| Hands-on experience | Most Attractive | Most Attractive | Most Attractive | Most Attractive | Attractive | Most Attractive |
| Webinars | Moderate | Attractive | Most Attractive | Attractive | Moderate | Attractive |
| Seminars | Moderate | Attractive | Most Attractive | Moderate | Attractive | Attractive |
| Case studies | Attractive | Attractive | Most Attractive | Moderate | Attractive | Attractive |
| E-learning modules | Most Attractive | Attractive | Most Attractive | Most Attractive | Attractive | Most Attractive |
| Self-directed learning | Attractive | Attractive | Most Attractive | Attractive | Most Attractive | Most Attractive |
| Recorded Demonstrations | Moderate | Attractive | Most Attractive | Most Attractive | Attractive | Attractive |

NA*: Not Attractive

The most important barriers of OSS Adoption for MSMEs & TSOs (comparative results among the Six Countries).

The barriers to Open-Source Software (OSS) adoption in the six European countries show some commonalities, reflecting shared challenges, yet also highlight certain slight differences specific to each country. In Poland, lack of awareness of OSS availability and benefits, along with the absence of know-how on managing OSS risks, are identified as the most critical barriers for MSMEs and Third Sector Organizations (TS Os). However, other risks such as lack of strategic organizational commitment, understanding OSS characteristics, aligning business goals in OSS adoption, customization, and technical know-how are also considered important factors contributing to low OSS adoption. Greek participants highlight a comprehensive set of barriers, deeming all explored factors significant contributors to the low adoption of OSS in MSMEs and TS Os. These include the lack of strategic organizational commitment, awareness of OSS availability and benefits, understanding OSS characteristics, know-how to align business goals in OSS adoption and customization, and managing OSS risks and performance. Technical know-how is also recognized as a critical barrier.

Estonian participants emphasize the crucial role of strategic organizational commitment as the primary barrier to OSS adoption. Additionally, they recognize the significance of barriers related to awareness of OSS availability and benefits, understanding OSS characteristics, and know-how to

align business goals in OSS adoption and customization. French participants identify the lack of technical know-how to use OSS and managing OSS risks and performance as the most important barriers. Similar to other countries, they also rate high barriers linked to lack of awareness of OSS availability and benefits, understanding OSS characteristics, aligning business goals in OSS adoption, customization, and strategic organizational commitment.

Italian and Spanish participants pinpoint the lack of understanding of OSS characteristics as the most substantial barrier to adoption. Other significant barriers include the lack of awareness of OSS availability and benefits, know-how to align business goals in OSS adoption and customization, strategic organizational commitment, and managing OSS risks and performance.

Overall, the findings suggest a need for targeted interventions to address these multifaceted barriers, emphasizing the importance of increasing awareness, fostering strategic commitment, enhancing technical know-how, and promoting a better understanding of OSS characteristics to facilitate broader adoption across European regions.

Table 3. Barriers to OSS Adoption by MSMEs & TSOs (comparative results for the six countries).

| Barriers to OSS Adoption | France | Italy | Spain | Estonia | Greece | Poland |
|---|----------------|----------------|----------------|----------------|-----------|----------------|
| Lack of awareness of OSS availability and benefits | Important | Important | Very Important | Important | Important | Very Important |
| Lack of good understanding of OSS characteristics | Important | Very Important | Important | Important | Important | Important |
| Lack of knowhow to align business goals in OSS adoption and customization | Important | Important | Very Important | Important | Important | Important |
| Lack of strategic organizational commitment | Important | Important | Important | Very Important | Important | Important |
| Lack of technical Know-how to use OSS | Very Important | Important | Very Important | Important | Important | Important |
| Lack of Know-how on managing OSS risks and performance | Very Important | Important | Important | Important | Important | Very Important |

CHAPTER 2:

National Research Reports on Current OSS Adoption & Barriers Of MSMEs & TSOs

Introduction

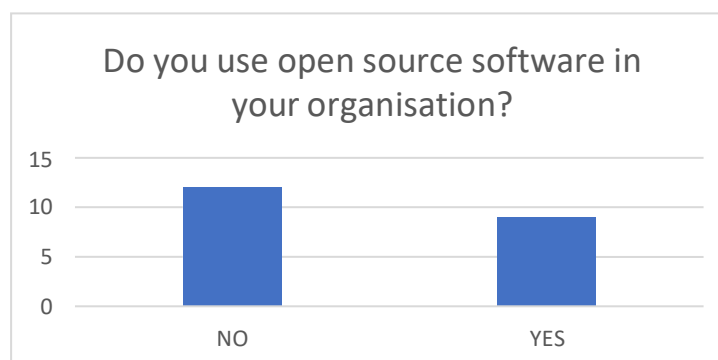
This section of the DigitOpen inquiry focuses on the first and second objective of the survey, which pertains to gathering data on the profile of current adoption of Open-Source Software (OSS) solutions by Third Sector Organizations (TSOs) and Micro, Small, and Medium Enterprises (MSMEs) across the six countries. Specifically, the inquiry delves into whether the sampled organizations are presently engaged in experimenting with OSS and the nature of their OSS usage. The results are presented in the form of mini national reports per country. Moreover, the surveyed organizations provide insights into topics related to OSS that they find appealing and express preferences for specific training activities. Attention is also given to identifying potential barriers and key driving factors associated with the adoption of OSS.

FRENCH NATIONAL REPORT

Empirical findings from France on OSS adoption and needs

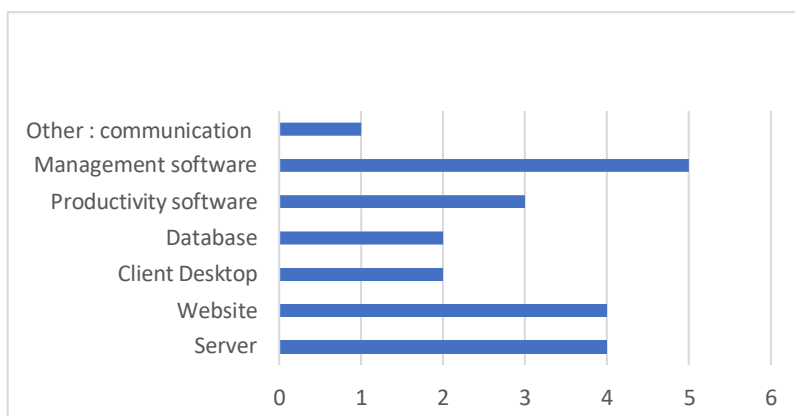
The following desk research aims at providing an updated country-based overview on the state of art in the Third Sector Organizations, MSMEs and VET providers (C-VET & Digital Skills) in terms of digital readiness and identifying existing training offers that could be relevant for the project.

OSS Adoption in MSMEs and Third Sector Organizations in France



Among the 22 French respondents, 40.9% of organizations has no more than 3 employees, 27.3% has between 4 and 9 employees, 22.7% has between 10 and 46 employees and 9.1% has more than 50 employees. 71.4 % of respondents have not outsourced their IT operations.

42.9% already use open source solutions. Open source is mainly used for management software, website and server.



High interest: the top 2 fields where OS is currently more used are Marketing & Communication-Collaboration with 28.6% and Management & Administration with 23.8%. **Moderate interest:** in Finance and accounting 14.3% of respondents use an OS, while in Digital Fundraising, Sales, Customer Relations Management, and Project management 9.5% of respondents answered positively.

Low interest: in the following fields the respondents are not currently using OS : Cybersecurity, Event, Human Resources, Impact Assessment, Managing non-financial risks and opportunities in Environmental, Social and Governance areas (ESG). However, they said to be interested in adoption of OS in these fields, especially in cybersecurity and reporting.

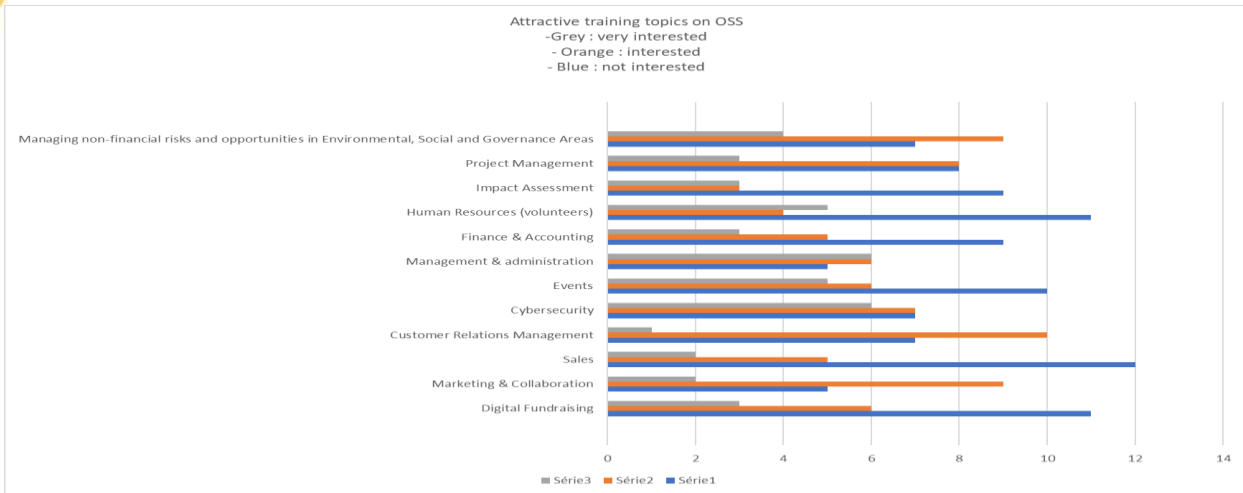
It seems that the open source topic is not very well known among some of our respondents. As a consequence, it is possible that some respondents use this type of tools without knowing that they are open source. Conversely, some responses mention the use of open source when the solution cited is not open source.

Proportionally, according to our survey, open source is more widely used in MSMEs than in the TSO.

Identified Training Needs on OSS

Over 50% of respondents say they are open to using open-source solutions in the future.

The main areas in which there is an openness to the use of open source solutions are : Customer Relations Management, Cybersecurity, Events, Management and Administration, Managing non-financial risks and opportunities in Environmental, Social and Governance Areas, Project management.



Exploring Desirable OSS-related Training Activities

In terms of training methods, we note a strong interest in practical, hands-on approaches. The most popular methods are the following: Getting Started Tutorial, Interactive demos, Basic troubleshooting, but also Hands-on experience, and E-learning modules.

On the contrary, seminars and webinars do not attract the respondents to the survey, probably because of a lack of time.

| Type of training activities preferred | | | | | |
|---------------------------------------|----------------|-----------------|---------|------------|-----------------|
| Getting Started Tutorial | 0 | 0 | 1 | 8 | 10 |
| Interactive demos | 0 | 2 | 1 | 8 | 9 |
| Basic troubleshooting | 0 | 1 | 0 | 9 | 8 |
| Toolbox exploration | 0 | 2 | 2 | 6 | 8 |
| Customized exercises | 1 | 2 | 5 | 3 | 9 |
| Hands-on experience | 1 | 1 | 1 | 8 | 9 |
| Webinars | 2 | 5 | 3 | 4 | 6 |
| Seminars | 4 | 6 | 3 | 3 | 3 |
| Case studies | 1 | 2 | 5 | 8 | 4 |
| E-learning modules | 0 | 0 | 2 | 9 | 8 |
| Self-directed learning | 0 | 3 | 2 | 7 | 7 |
| Recorded demonstrations | 1 | 3 | 3 | 3 | 9 |
| | Non beneficial | Less Beneficial | Neutral | Beneficial | Very Beneficial |
| | 1 | 2 | 3 | 4 | 5 |

General Knowledge Barriers to OSS Adoption

The first point to highlight is the general lack of knowledge about open source. Just look at the number of people who answered 'I don't know'. The subject is still not very well known, and organizations are generally lacking in strategic positioning.

The second point concerns the lack of skills required to make good usage of open source and to reduce the risks associated to it.

The respondents having more knowledge on the topic highlighted another barrier related to open source adoption which is **security**. Using open source solutions can expose to greater risks, which requires the implementation of even more secure systems to prevent data from being stolen.

| Barriers to OSS Adoption | | | | | | |
|---|---------------|----------------|---------|-----------|----------------|-------------|
| Lack of awareness of OSS availability and benefits | 0 | 0 | 1 | 5 | 3 | 3 |
| Lack of good understanding of OSS characteristics | 0 | 0 | 2 | 5 | 4 | 2 |
| Lack of how to align business goals in OSS adoption and customization | 0 | 1 | 1 | 5 | 5 | 8 |
| Lack of strategic commitment | 0 | 3 | 1 | 5 | 5 | 7 |
| Lack of technical knowledge required to implement and use OSS | 1 | 0 | 1 | 4 | 11 | 4 |
| Lack of how to manage OSS adoption risks and performance | 1 | 0 | 2 | 3 | 10 | 5 |
| | Not important | Less Important | Neutral | Important | Very Important | Do not Know |
| | 1 | 2 | 3 | 4 | 5 | |

General Driving Factor for OSS adoption

Among the factors that can lead organizations to make greater use of open source, the first is quality. In particular, a great deal of importance is attached to the factors of reliability, functionality, ease of use and adaptability. The survey also shows that open source can be well received if it reduces costs and optimizes work processes.

On the other hand, our respondents are not interested in the possibility of modifying the source code, which once again demonstrates a lack of internal expert resources and a lack of strategic positioning on open-source issues. This report highlights a very dynamic panorama made up of MSMEs and players in the third sector. Over 60% of the French population works in these structures.

Their contribution to the economy is very significant, not only in terms of the turnover generated, but also because they offer local services, they are located everywhere in the country and, in the case of third-sector organizations, they provide essential services in the social, health, solidarity, education fields. In France there is a general openness to digital technology. This sector is experiencing strong growth, with an ever-increasing number of players, networks and opportunities.

Considering the adoption of open-source solutions by our target groups, we point out that there is still room for improvement. A better understanding of the advantages and solutions available could benefit our target groups. As pointed out in national studies cited in this research, they express a

need for assistance. Plus, the DIGITopen survey gives us an idea of the form this assistance should take and the themes we should cover.

The best formats are those that provide practical knowledge in an interactive way and in a limited time. The DIGITopen survey in France highlights 2 areas of interest which are : Marketing & Communication-Collaboration and Management & Administration. Other areas not yet developed and yet to be explored could be : Cybersecurity, Events, Project Management.

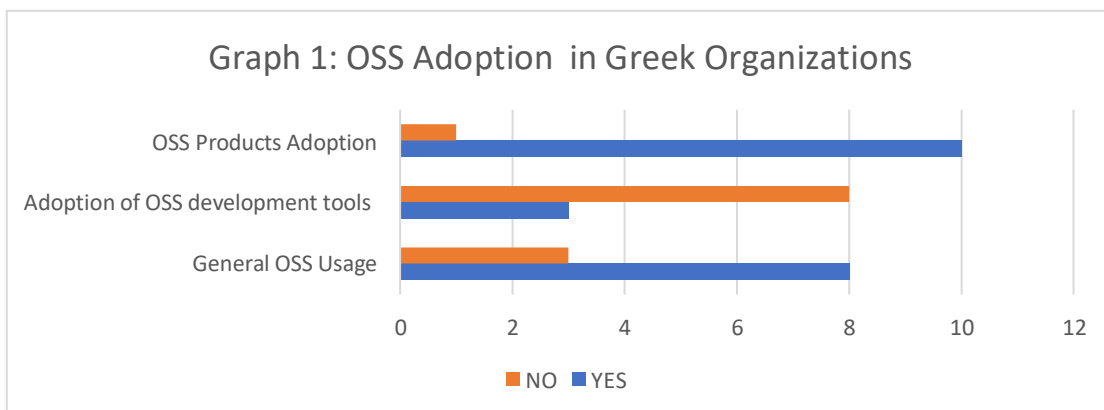
GREECE NATIONAL REPORT

Empirical findings from Greece on OSS adoption and needs

The following section presents results from the survey on OSS usage and the training needs of MSMES and TSOs in Greece. Evidence is also presented on desirable training topics and training activities, as well as barriers and driving factors for OSS adoption from the same sample.

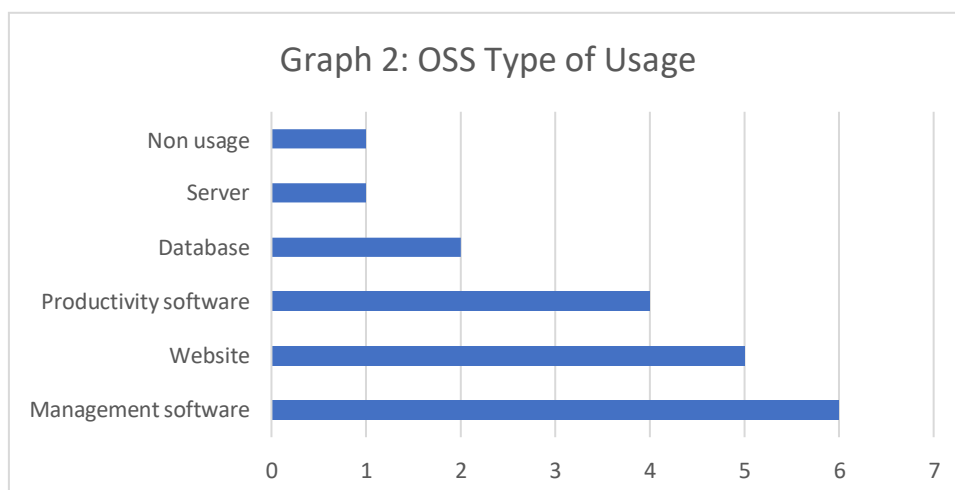
OSS Adoption in MSMEs and Third Sector Organizations

The results from the Greek sample of MSMEs and TSOs indicate that a large percentage of the organizations are familiar or use OSS tools, but the adoption of OSS development tools is rather limited. Specifically, the results are summarized as follows:



- **Low OSS adoption in critical areas:** A striking 90% of Greek MSMEs and TS organizations avoid Open-Source Software (OSS) in digital fundraising, sales, cybersecurity and events, revealing a significant gap. However, there's an expressed interest in adopting these tools in these domains.

- **Moderate adoption in key areas:** A solid 72% have embraced some specific OSS tools, particularly in databases, server productivity, websites, and general management software, indicating a moderate but favorable shift towards open-source solutions.
- **Growing interest in management and project management:** Among the limited adopters, 64% utilize OSS for management and administration, and project management, with non-users expressing a strong interest in future adoption.
- **Positive interest in untapped areas:** A substantial 60% do not currently use OSS for marketing, communication collaboration, CRM, finance, accounting, impact assessment, and reporting. However, their positive interest suggests a potential surge in OSS adoption in these critical business areas.
- **Outsourcing IT Operations:** A notable 40% of organizations have chosen to outsource their IT operations, covering website management, software development, hardware maintenance, and marketing. This suggests a strategic reliance on external expertise to handle key aspects of their technological infrastructure and promotional efforts.



Identified Training Needs on OSS

Greek MSMEs and TSO respondents have shown significant interest for Open-Source Software (OSS) training in various crucial domains. The following heatmap illustrates identified training needs for various management themes which can be served more effectively with OSS adoption. Areas highlighted with green and light present training topics of high priority for the respondents (see Graph 3). In particular:

- The areas with the highest expressed interests include marketing & communication, management & administration, finance & accounting, project management, human resources, sales, and customer relations management, highlighting a strong desire to enhance skills and competences in how OSS can serve more effectively the business functions.

- However, cybersecurity, events management, impact assessment, and risk management also stand out, with 50% expressing a particularly high interest. This underscores the perceived importance of specialized training in these critical domains for Greek MSMEs and TSOs.

| Graph 3: Attractive Training Topics on OSS | | | |
|--|----------------|------------|-----------------|
| Digital Fundraising | 3 | 2 | 6 |
| Marketing & Collaboration | 1 | 4 | 6 |
| Sales | 2 | 4 | 5 |
| Customer Relations Management | 2 | 5 | 4 |
| Cybersecurity | 4 | 4 | 3 |
| Events | 4 | 1 | 6 |
| Management & administration | 0 | 4 | 7 |
| Finance & Accounting | 1 | 6 | 4 |
| Human Resources (volunteers) | 2 | 3 | 6 |
| Impact Assessment | 4 | 1 | 6 |
| Project Management | 0 | 5 | 6 |
| Managing non-financial risks and opportunities in Environmental, Social and Governance Areas | 3 | 3 | 5 |
| | Not Interested | Interested | Very Interested |
| | 1 | 2 | 3 |

Exploring Desirable OSS-related Training Activities

This part of the research aims at exploring what are the most attractive training activities which should be utilized in OSS training for **the Greek MSMEs and TSO respondents**. **The respondents were asked to rate a series of training activities on a scale of 1-5 and the results are presented in the following heatmap (see Graph 4). The main findings are summarized, as follows:**

- **Most Attractive Training Activities.** Respondents from Greek MSMEs and TSOs expressed a strong preference for interactive training activities. These include engaging elements like interactive demos, troubleshooting sessions, toolbox exploration, hands-on experiences, self-directed learning, and recorded demonstrations. This demand underscores the importance of trainers possessing a combining technical expertise with effective communication and instructional design capabilities to deliver compelling and interactive learning experiences.
- **Next in Attractiveness:** Following closely in desirability are activities aimed at familiarizing MSMEs and TSO respondents with OSS adoption and usage. This tier includes getting started tutorials, toolbox exploration, customized exercises, webinars and seminars, case studies, and e-learning modules. These training methods cater to diverse learning preferences, combining structured guidance with real-world applications to ensure an effective and engaging learning experience for the target audience.

| Graph 4: Desirable Training Activities of OSS Adoption | | | | | |
|--|-------------------|--------------------|---------|------------|--------------------|
| Getting Started Tutorial | 0 | 1 | 1 | 1 | 7 |
| Interactive demos | 0 | 0 | 1 | 2 | 8 |
| Basic troubleshooting | 0 | 0 | 0 | 7 | 4 |
| Toolbox exploration | 0 | 0 | 0 | 7 | 4 |
| Customized exercises | 0 | 1 | 1 | 2 | 7 |
| Hands-on experience | 0 | 0 | 1 | 2 | 8 |
| Webinars | 0 | 2 | 1 | 4 | 4 |
| Seminars | 1 | 1 | 1 | 1 | 7 |
| Case studies | 1 | 0 | 1 | 2 | 7 |
| E-learning modules | 0 | 2 | 0 | 1 | 8 |
| Self-directed learning | 0 | 0 | 1 | 4 | 6 |
| Recorded demonstrations | 0 | 0 | 1 | 4 | 6 |
| | Non beneficial | Less Beneficial | Neutral | Beneficial | Very Beneficial |
| | 1 | 2 | 3 | 4 | 5 |

Identifying Barriers and Driving Factors for OSS Adoption

The incorporation of the Open-Source Software (OSS) paradigm by MSMEs and TSOs is intricately tied to the identification of associated barriers and risks perceived throughout the adoption process. This study delves into an examination of both hindering knowledge factors that block the effective adoption of the OSS paradigm in MSMEs and the motivating factors driving OSS adoptions. The following findings offer pertinent suggestions for refining training initiatives, contributing to a more seamless integration of the OSS paradigm in both MSMEs and TSOs in Greece (**Graph 5**).

General Knowledge Barriers to OSS Adoption

- **Raising Awareness for OSS Benefits:** The evidence underlines that many MSMEs and TSOs face a challenge due to a lack of awareness and understanding of the relevance, characteristics, and benefits of Open-Source Software (OSS), hindering its widespread adoption. Training programs should emphasize the relevance, characteristics, and benefits of OSS, and their potential impact on operations for the organizations.
- **Strategic Commitment and Targeted Investment on OSS:** The sampled respondents report lack of strategic commitment and associated investment in their MSMEs and TSOs, which act as barriers to OSS adoption. A lack of financial commitment may impede the integration of OSS solutions, hindering the realization of potential benefits. Bridging the gap in strategic commitment and investment requires the decision-makers to acquire skills to recognize the long-term benefits of OSS adoption and securing the necessary financial commitments for successful implementation.

| Graph 5: Knowledge Barriers to OSS Adoption | | | | | |
|---|---------------|----------------|---------|-----------|----------------|
| OSS Awareness | 0 | 1 | 2 | 4 | 4 |
| OSS Understanding | 0 | 0 | 1 | 6 | 4 |
| Business Goals | 0 | 0 | 1 | 5 | 5 |
| Commitment | 0 | 0 | 1 | 6 | 4 |
| Technical NowHow | 0 | 0 | 3 | 4 | 4 |
| Managing OSS Risks | 0 | 0 | 4 | 3 | 4 |
| | Not important | Less Important | Neutral | Important | Very Important |
| | 1 | 2 | 3 | 4 | 5 |

- Technical Knowledge and Skills for Adopting and Implementing OSS:** Respondents acknowledge insufficient technical knowledge in MSMEs and TSOs which hinders the adoption and effective use and leverage of OSS. The organizations require training on OSS technologies, and how to integrate and customize them effectively in various areas.
- Alignment of Business Goals:** Achieving alignment between business goals and OSS adoption demands competences in strategic planning. The results show that employees of MSMEs and TSOs should be equipped with skills to evaluate how OSS can support and enhance specific business objectives, evaluate their readiness of their organization and facilitate a smooth integration that maximizes the benefits of open-source solutions.
- Risk Management Competences:** Respondents report the absence of skills for managing OSS adoption risks is a significant challenge for MSMEs and TSOs. Developing competences in risk management is crucial for successful OSS adoption. Organizations should invest in training that imparts skills in identifying, assessing, and mitigating risks associated with OSS implementation. This includes understanding potential legal, security, and compatibility risks, ensuring a proactive and informed approach to manage and minimize potential challenges.

General Driving Factor for OSS adoption

The adoption of Open-Source Software (OSS) by MSMEs and TSOs is influenced by various factors that cater to both technical and organizational considerations. This part of the study aims at identifying key driving factors for OSS adoption. As presented in Table 1, the survey contained technical considerations (4 items), organizational factors (7 items), quality factors (6 items) and External Environmental Factors (5 items). The respective results, as presented in Table 1 and Graph 6, are as follows:

- Quality factors which relate to OSS functionality, reliability, usability, maintenance, adaptability and security are rated as very important by the respondents from MSMEs and TSOs. This underscores the emphasis on robust and dependable OSS solutions, highlighting the critical role these quality aspects play in the decision-making process.

Graph:6 Key Driving Factors for OSS Adoption



- Among organizational factors, respondents place significant importance on the presence of skilled employees with OSS expertise. Adequate financial resources and low hardware costs, coupled with a positive attitude towards OSS, emerge as key determinants for MSMEs and TSOs. These factors indicate that organizational readiness, both in terms of human resources and financial preparedness, significantly influences the adoption and successful implementation of OSS in these organizations.
- Perceived benefits of OSS and open rights for usage emerge as pivotal technical characteristics driving OSS adoption. Respondents recognize the advantages offered by OSS and the freedom to use and modify the software. Additionally, external environmental factors such as security considerations and successful exemplars contribute significantly to the decision-making process, reflecting the impact of external influences on OSS adoption strategies.

Table 1: Driving Factors for OSS Adoption (Means).

| Technical Characteristics (M=3,75) | |
|---|-------------|
| Perceived benefits of OSS | 4,09 |
| Open rights to use it | 4,00 |
| Access to source code to tailor functionality | 3,45 |
| Ability of OSS to run on older hardware | 3,36 |
| | |
| Organizational Factors (3,92) | |
| Limited financial resources | 4,14 |
| Limited internal IT Sources | 3,81 |
| Lack of skilled employees in OSS | 4,36 |
| Organizational rules | 3,36 |
| Management support | 3,81 |
| Less cost for hardware | 4,00 |
| Positive attitude towards OSS | 4,00 |
| Quality Factors (4,43) | |
| Functionality (the right tool for the job) | 4,45 |
| Maintenance | 4,36 |
| Security | 4,36 |
| Reliability | 4,54 |
| Usability (perceived easy to use) | 4,54 |
| Adaptability | 4,36 |
| External Environment Factors (3,75) | |
| Community interest in OSS | 3,54 |

| | |
|------------------------|-------------|
| Successful exemplars | 3,90 |
| Need for transparency | 3,81 |
| Value for public money | 3,36 |
| Security | 4,18 |

Concluding Remarks from the Greek Survey

The findings from the survey of MSMEs and TSOs in Greece shed light on critical factors influencing Open-Source Software (OSS) adoption. The main concluding remarks are:

- Greek MSMEs and TSOs exhibit a degree of familiarity with Open Source Software (OSS); however, the incorporation of OSS development tools remains notably limited. Most organizations tend to refrain from integrating OSS into their core management and marketing operations.
- Despite the positive attitudes towards OSS solutions, these entities tend to embrace them primarily in the context of website development, server management, and administrative functions.
- Notably, there is a noteworthy inclination among Greek MSMEs and TSOs to express interest in adopting OSS tools across various domains, including marketing and communication, finance and accounting, project management, human resources, sales, and customer relations management. This signals a potential shift towards broader integration of OSS beyond the conventional domains observed thus far.
- The respondents' strong preference for interactive training activities (i.e., interactive demos, troubleshooting sessions, hands-on experiences, self-directed learning etc.) underscores a demand for engaging learning opportunities. This preference aligns with the need for practical application, providing for a deeper understanding of OSS functionalities.
- Furthermore, the emphasis on quality factors such as functionality, reliability, usability, and security highlight the importance placed on the performance of OSS solutions in the decision-making process for MSMEs and TSOs, emphasizing the need for OSS developers to prioritize these aspects in their offerings.
- In terms of organizational factors, the respondents' high rating for the existence of skilled employees in OSS, adequate financial resources, and low hardware costs, coupled with a positive attitude towards OSS, indicates the importance of organizational readiness.
- Technical characteristics, particularly the perceived benefits of OSS and open rights for usage, emerge as key driving factors for adoption. Respondents recognize the advantages offered by OSS, including flexibility, cost-effectiveness, and the ability to customize solutions to meet specific needs.
- The prominence of security aspects indicates a growing awareness among MSMEs and TSOs of the importance of secure software solutions, especially in a digital landscape where cybersecurity is paramount.

In conclusion, the survey results underscore the multifaceted nature of factors influencing OSS adoption among MSMEs and TSOs. From current usage and training needs, preferences and quality considerations to organizational readiness and technical characteristics, the landscape is diverse.

Recognizing and addressing these factors will be crucial for OSS developers, policymakers, and organizations seeking to harness the full potential of open-source solutions in their operations and strategic initiatives.

ESTONIA NATIONAL REPORT

The following desk research aims at proving an updated country-based overview on the state of art in the Third Sector Organizations, MSMEs and VET providers (C-VET & Digital Skills) in terms of digital readiness and identifying existing training offers that could be relevant for the project.

The current usage of OSS by MSMEs and Third Sector organizations

The digitalization status of Estonian companies shows that the country is an active promoter of digitalization, distinguishing itself with its successful e-government solutions. Estonian companies, although relatively small, are often flexible and adapt quickly, which is an important advantage in a changing business environment. Estonian people have good digital skills, and the country has a strong startup culture. However, despite some outstanding technological achievements, Estonian companies are not yet realizing the full benefits of new technologies. Joel Järvik, the digitalization project manager of the joint agency of EAS and KredEx, emphasizes that although Estonia is at the forefront of public digital services in Europe, there is still a lot to be done in the field of digitalization in the corporate sector

The digitalization of the Estonian third sector and the issues of funding for its organizations are multilayered topics that cover the activities of different NGOs, their funding sources and the use of digital tools to achieve their goals.

On the one hand, Estonia is known for its digital success stories, but the digitisation of the third sector is an area where information can be scattered. Existing studies and analyses show that third sector organisations deal with a wide range of issues, from the development of civil society to specific social or environmental problems. Studies and analyses on civil society include, for example, NGO viability indices, donation statistics, volunteering surveys and many others.

Specific information on digitisation for the third sector is more difficult to find, but it can be assumed that the uptake of digital technologies and the development of digital skills are important issues for the effectiveness of organisations and for achieving a wider societal impact.

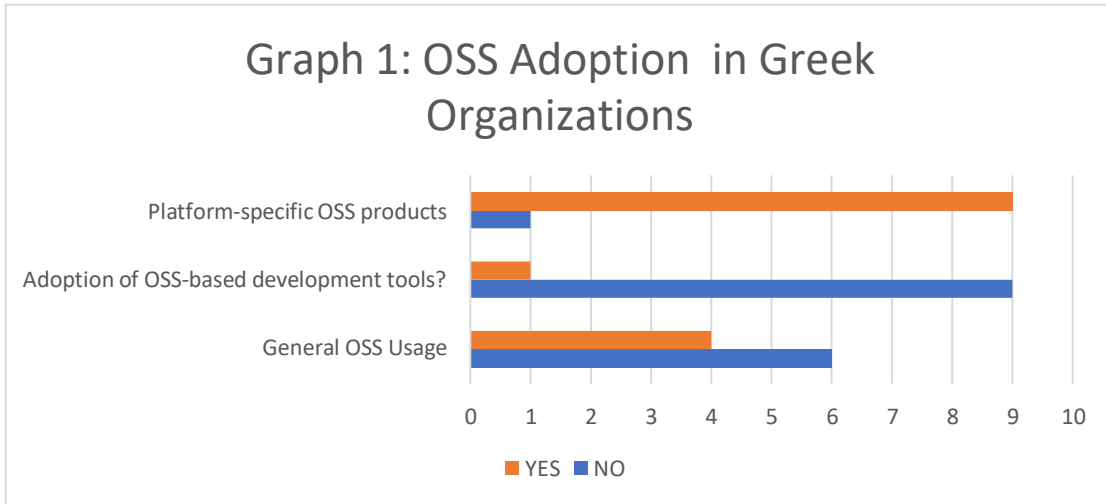
Identified needs in digital knowledge, skills and competences.

Unfortunately, no study or scientific article has been done about Estonia, which deals with the use of OSS in Estonia. You can also find very little information about OSS in Estonian. The main places where OSS is used are websites on WordPress and in some cases server management when Linux is used.

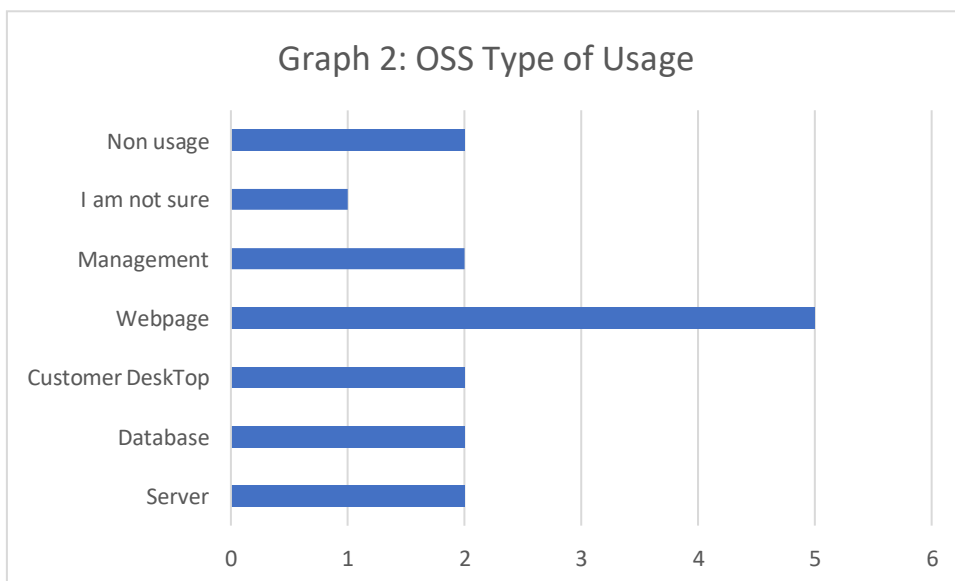
Open-source software adoption and user review

A survey conducted in Estonia revealed that very few companies know and use OSS, mainly because organizations may not even realize that, for example, WordPress is OSS, even though this solution is mainly used to create websites. We were able to draw this conclusion from the feedback we received after completing the questionnaire. This can also be seen from the questionnaire, where at first 60%

answered that they do not use OSS, but in the following part it turned out that 90% have still used a platform based on OSS.



- Low outsourcing of IT services: Apart from 2 VET providers, which are large organizations, the majority of respondents were Micro entrepreneurs or NGOs, and 80% of the respondents do not use external IT services, from which we can conclude that they do not have the ability to outsource it.
- Use of OSS in organizing events - 100% of respondents said that they have not used OSS software and 33% are not interested either.
- It was also answered that OSS software has not been used by 100% of respondents in digital fundraising, management and administration activities, finance and accounting and personnel management



Graph 2, shows that the use of open-source software (OSS) by companies is varied but generally low. Its use in servers, databases and customer support is relatively low, with only two out of ten companies reporting OSS use in these areas. Website management has a higher use of OSS, by five out of ten companies, suggesting that this area may be more attractive to OSS. In leadership and in the "Not sure" category, it is also mentioned by two out of ten companies. The rate of non-use is two companies out of ten, which indicates that certain companies do not use OSS at all.

OSS training needs on OSS

Estonian MSMEs and TSO respondents have shown an average interest in OSS adoption, it can be pointed out that there is a very high interest in marketing and sales software. There is also an average interest in OSS from finance and accounting, customer relationship management and project management.

| Graph 3: Attractive Training Topics on OSS | | | |
|--|----------------|------------|-----------------|
| Digital Fundraising | 6 | 4 | 0 |
| Marketing & Collaboration | 1 | 4 | 5 |
| Sales | 3 | 2 | 5 |
| Customer Relations Management | 2 | 6 | 2 |
| Cybersecurity | 2 | 5 | 3 |
| Events | 4 | 5 | 1 |
| Management & administration | 3 | 4 | 3 |
| Finance & Accounting | 2 | 7 | 1 |
| Human Resources (volunteers) | 3 | 6 | 1 |
| Impact Assessment | 4 | 4 | 2 |
| Project Management | 1 | 6 | 3 |
| Managing non-financial risks and opportunities in Environmental, Social and Governance Areas | 3 | 4 | 3 |
| Other | 4 | 4 | 2 |
| | Not Interested | Interested | Very Interested |
| | 1 | 2 | 3 |

- Digital Fundraising: Shows a low level of interest, with the majority of respondents not interested.
- Marketing & Collaboration: This area received a mixed response, showing a moderate level of interest.
- Sales: Similar to Marketing & Collaboration, there is a moderate level of interest.
- Customer Relations Management: Interest is moderate, leaning slightly more towards interested.
- Cybersecurity: Shows a moderate to high level of interest.
- Events: A moderate number of respondents are interested in training for managing events.
- Management & Administration: Interest levels are moderate.
- Finance & Accounting: This area has a higher level of interest compared to others.

- Human Resources (volunteers): Shows a moderate to high interest level.

Graph 4: Desirable Training Activities of OSS Adoption

| | | | | | |
|--------------------------|----------------|-----------------|---------|------------|-----------------|
| Getting Started Tutorial | 0 | 0 | 0 | 6 | 4 |
| Interactive demos | 0 | 0 | 0 | 7 | 3 |
| Basic troubleshooting | 1 | 0 | 6 | 3 | 0 |
| Toolbox exploration | 0 | 1 | 5 | 2 | 2 |
| Customized exercises | 0 | 0 | 4 | 5 | 1 |
| Hands-on experience | 0 | 0 | 1 | 6 | 3 |
| Webinars | 0 | 0 | 2 | 8 | 0 |
| Seminars | 0 | 0 | 6 | 2 | 2 |
| Case studies | 0 | 0 | 5 | 4 | 1 |
| E-learning modules | 0 | 0 | 1 | 6 | 3 |
| Self-directed learning | 0 | 0 | 2 | 6 | 2 |
| Recorded demonstrations | 0 | 0 | 1 | 5 | 4 |
| | Non beneficial | Less Beneficial | Neutral | Beneficial | Very Beneficial |
| | 1 | 2 | 3 | 4 | 5 |

- Impact Assessment: Interest is moderate.
- Project Management: There is a moderate to high interest in project management training.
- Managing non-financial risks and opportunities in Environmental Social and Governance Areas: Interest is moderate.

From Graph 4: Desirable Training Activities of OSS Adoption, we can deduce the following:

- Hands-on Lab Sessions are Most Favored: A significant majority of respondents (about 80%) prefer hands-on lab sessions. This indicates that practical, interactive learning experiences are highly valued by those looking to adopt Open Source Software (OSS).
- Workshops and Seminars are Popular: More than half of the respondents (around 60-70%) find workshops and seminars beneficial. This suggests that structured group learning environments are also considered effective for understanding and adopting OSS.
- Moderate Interest in Online Training and Webinars: There is a moderate level of interest (around 50-60%) in online training and webinars. This reflects a growing trend towards remote learning, although it is less preferred compared to hands-on and in-person training methods.
- Lesser Preference for Traditional Lecture-Based Training: Traditional lecture-based training methods are less popular among the respondents, with less than 50% showing preference for this mode of learning. This indicates a shift away from passive learning to more active, participatory forms of learning.
- Limited Enthusiasm for External Training: Only a small portion of respondents prefer external training methods. This could suggest that individuals or organizations are looking for training solutions that are more integrated with their own systems and processes, or that they prefer in-house training for reasons of cost, convenience, or relevance.

Overall, the graph suggests a strong preference for interactive, **practical training methods over traditional, lecture-based** ones when it comes to adopting open-source software.

The "Graph 5: Knowledge Barriers to OSS Adoption" indicates significant challenges in adopting Open-Source Software (OSS) due to knowledge-related barriers. The primary obstacle is the lack of internal knowledge or expertise within organizations, making the absence of in-house OSS proficiency a critical hindrance. This is compounded by insufficient OSS training programs, making it difficult for organizations to upskill employees effectively. Furthermore, unfamiliarity with available OSS products limits adoption, as organizations are not aware of the options or their benefits.

| Graph 5: Knowledge Barriers to OSS Adoption | | | | | |
|---|---------------|----------------|---------|-----------|----------------|
| OSS Awareness | 1 | 3 | 0 | 2 | 4 |
| OSS Understanding | 1 | 0 | 1 | 5 | 3 |
| Business Goals | 2 | 1 | 0 | 4 | 3 |
| Commitment | 2 | 1 | 0 | 2 | 5 |
| Technical NowHow | 1 | 1 | 0 | 4 | 4 |
| Managing OSS Risks | 1 | 1 | 1 | 5 | 2 |
| | Not important | Less Important | Neutral | Important | Very Important |
| | 1 | 2 | 3 | 4 | 5 |

Graph 6 shows the main factors driving the adoption of open-source software (OSS), including technical characteristics, organizational factors, quality factors and the external environment. Technical features such as the ability to customize software and the ability to run on older hardware are important, but organizational factors such as limited financial resources and lack of IT skills play a major role.

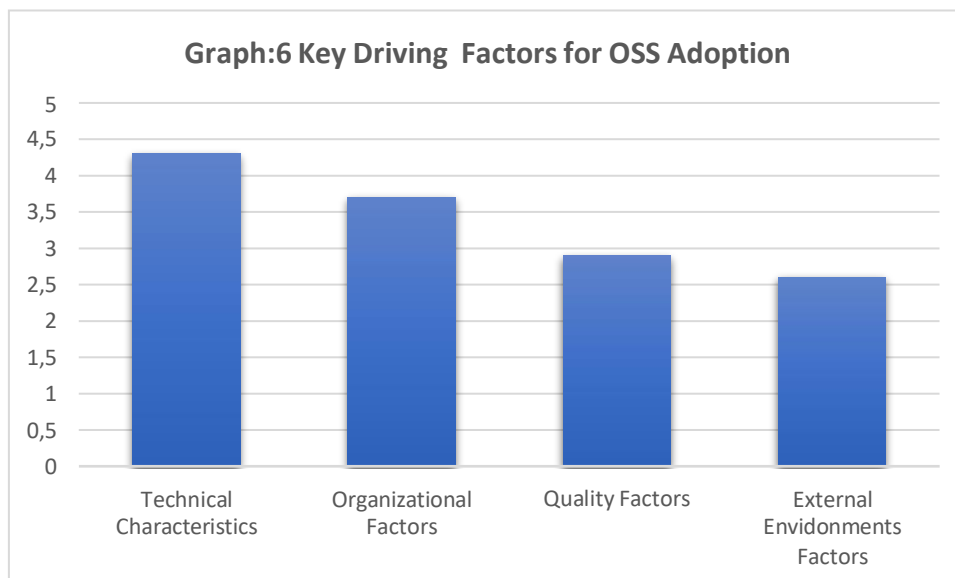


Table 1: Driving Factors for OSS Adoption (Means).

| Technical Characteristics (M=3,35) | |
|------------------------------------|------|
| Perceived benefits of OSS | 4,30 |
| Open rights to use it | 3,70 |

| | |
|---|------|
| Access to source code to tailor functionality | 2,90 |
| Ability of OSS to run on older hardware | 2,50 |
| Organizational Factors (3,21) | |
| Limited financial resources | 3,60 |
| Limited internal IT Sources | 3,50 |
| Lack of skilled employees in OSS | 2,80 |
| Organizational rules | 2,60 |
| Management support | 3,20 |
| Less cost for hardware | 3,10 |
| Positive attitude towards OSS | 3,70 |
| Quality Factors (4,00) | |
| Functionality (the right tool for the job) | 3,70 |
| Maintenance | 3,60 |
| Security | 4,40 |
| Reliability | 4,20 |
| Usability (perceived easy to use) | 4,40 |
| Adaptability | 3,70 |
| External Environment Factors (3,60) | |
| Community interest in OSS | 3,30 |
| Successful exemplars | 4,10 |
| Need for transparency | 3,70 |
| Value for public money | 3,10 |
| Security | 4,20 |
| Free to use | 3,20 |

Concluding Remarks

The survey presented in this document offers valuable insights into the current state of open-source software (OSS) adoption within Estonia. It is evident from the findings that while there is a foundational awareness of OSS among the respondents, there remain significant barriers that impede its widespread adoption. These barriers include a lack of in-depth knowledge, limited exposure to practical applications, and prevailing misconceptions about the reliability and support structure of OSS. Despite these challenges, the survey reveals a latent interest and a potential shift towards a more open, collaborative, and innovative approach to software use and development in

the Estonian context. The moderate to high interest in OSS training indicates a willingness among IT professionals and stakeholders to bridge the knowledge gap and explore OSS benefits more fully.

ITALIAN NATIONAL REPORT

The following desk research aims at providing an updated country-based overview on the state of art in the Third Sector Organizations, MSMEs and VET providers (C-VET & Digital Skills) in terms of digital readiness and identifying existing training offers that could be relevant for the project.

OSS Adoption in MSMEs and Third Sector

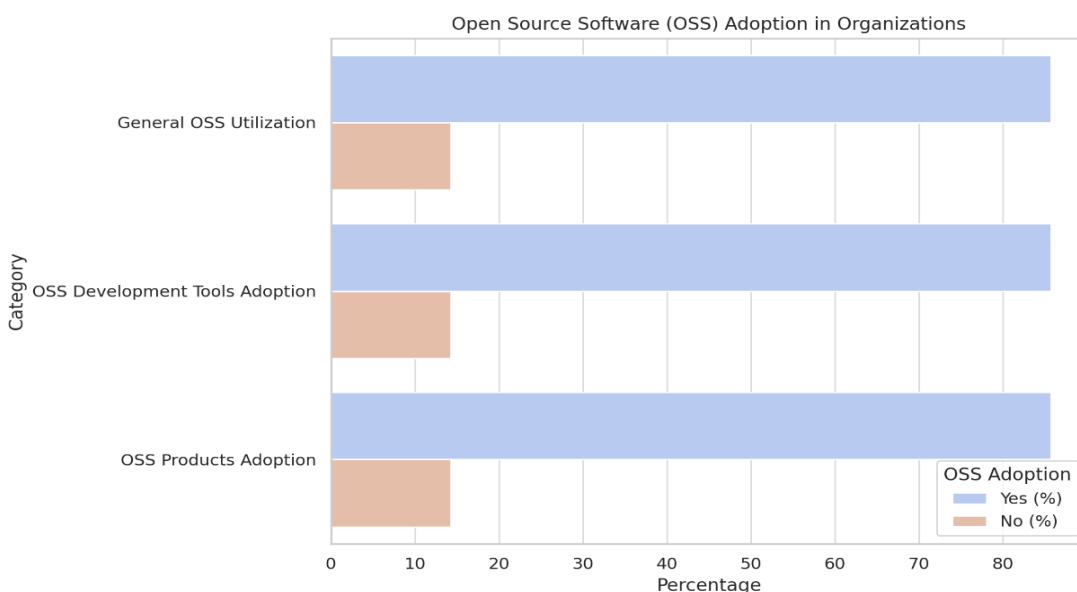
Little research was found on the OSS adoption in MSMEs and Third Sector in Italy so we based our analysis on the responses collected through the DigitOpen survey.

According to the survey administered in Italy, 85.71% of the organizations reported using OSS within their operations, indicating an inclination towards OSS adoption among the surveyed entities. Only 14.29% of the organizations do not use OSS, showcasing the prevalence and acceptance of OSS in various operational aspects of organizations.

A significant majority, 85.71%, have adopted OSS-based development tools, which highlights the critical role of OSS in the development environments of these organizations. Conversely, only 14.29% have not adopted OSS development tools, further underlining the widespread utilization of OSS in the development sector.

Similar to the adoption of development tools, 85.71% of organizations have adopted OSS-based products. This indicates a robust integration of OSS products into the operational fabric of these organizations, spanning various applications and services.

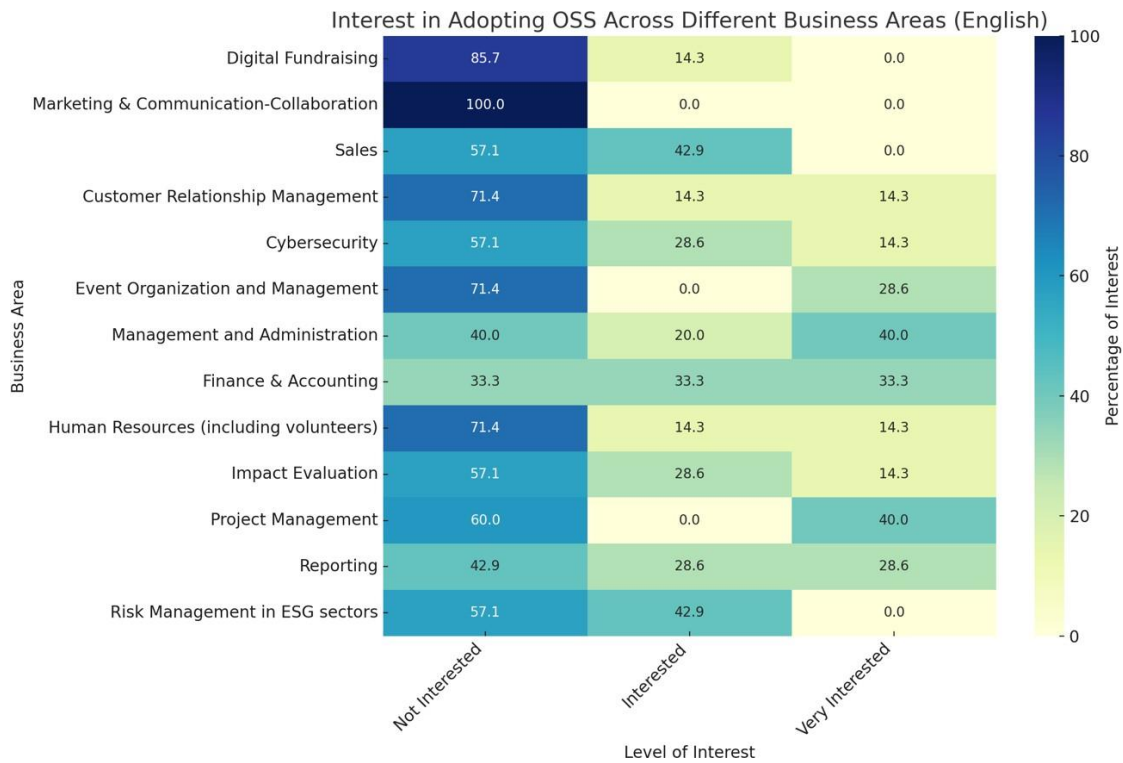
A small fraction, 14.29%, have not adopted OSS products, pointing towards a minor reluctance or potential barriers to OSS product integration in certain cases.



The findings indicate a strong adoption rate of OSS among the surveyed organizations, both in terms of general usage and the specific adoption of development tools and products. This demonstrates the critical value and reliance on OSS within the operational, development, and product landscapes of modern organizations, especially among MSMEs and Third Sector Organizations. The high adoption rates suggest that OSS is seen as a viable, if not preferred, solution for a variety of IT needs, offering benefits such as cost reduction, flexibility, and access to extensive support communities. For organizations not yet adopting OSS, this could represent an untapped opportunity for innovation, cost savings, and enhanced operational efficiency. It also highlights the importance of OSS literacy and the potential need for increased awareness or training in OSS adoption and utilization. This analysis underscores the significance of OSS in the current digital ecosystem and its role in empowering organizations to meet their digital and operational challenges effectively.

Areas of OSS Usage and Interest

According to the data emerging from the DigitOpen survey, the analysis suggests varying degrees of OSS adoption across different organizational functions. High interest in areas like Marketing & Communication and CRM points towards OSS's recognized value in enhancing these functions. Conversely, areas like Digital Fundraising and Cybersecurity, with no reported OSS usage, represent potential markets for OSS development and adoption. In the heatmap below, the high interest rates are represented:



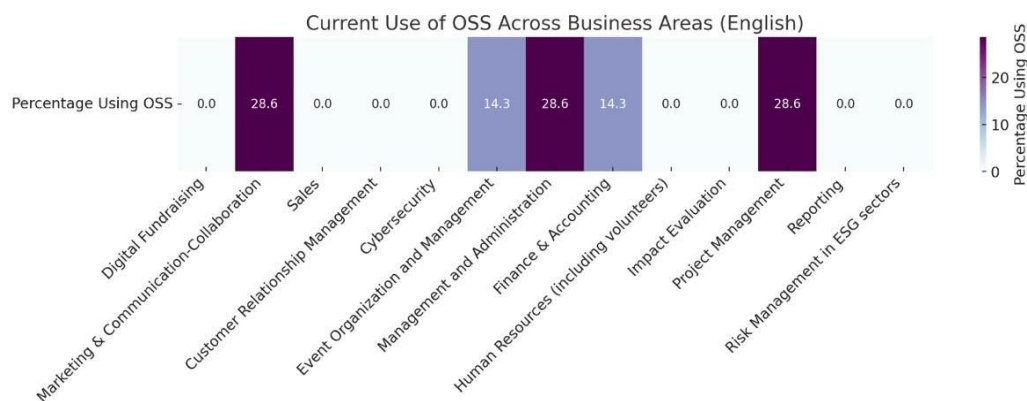
This disparity in OSS adoption across areas could be attributed to several factors, including awareness of available OSS solutions, perceived reliability and support, and the specific needs of the organization.

- Digital Fundraising: 100% of the responses indicate no usage of OSS, suggesting a potential gap or opportunity for OSS solutions in this area.
- Marketing & Communication-Collaboration: A significant interest is shown, with 85.71% of organizations interested in OSS solutions, indicating a high demand and potential adoption area.
- Sales: 28.57% of the responses indicate OSS usage, while 71.43% indicate no usage, suggesting moderate adoption with room for growth.
- Customer Relationship Management (CRM): 100% interest in OSS solutions, indicating a unanimous recognition of the value OSS can bring to CRM.
- Cybersecurity: Similar to Digital Fundraising, 100% indicate no OSS usage, highlighting another critical area for potential OSS integration.

The detailed analysis of the current use of Open Source Software (OSS) across specified business areas, reveals the following percentages of respondents currently using OSS:

- Marketing & Communication-Collaboration: 28.57%
- Event Organization and Management: 14.29%
- Management and Administration: 28.57%
- Finance & Accounting: 14.29%
- Project Management: 28.57%

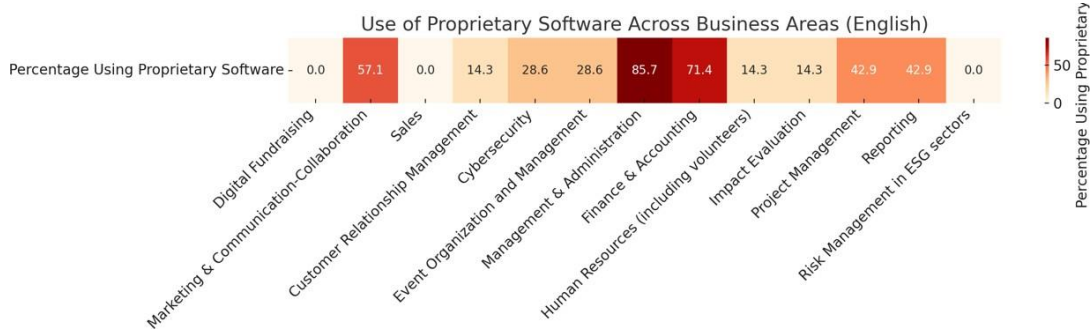
All other surveyed business areas show a 0% current usage rate of OSS according to the respondents' answers in this dataset. The heatmap below shows visually the OSS current use:



The current usage of OSS by MSMEs and Third Sector Organizations is rather spread and diverse, spanning various operational areas. The adoption interest rate underscores the importance of OSS in supporting these organizations' digital and operational strategies. However, the potential for further adoption, particularly in areas like digital fundraising and cybersecurity, highlights opportunities for growth. In addition, looking at the responses, the adoption seems limited to very well-known tools (ex. WordPress) and certain areas. Addressing barriers through increased

awareness, technical training, and strategic planning support can enable more effective and expansive use of OSS. Enhancing the current usage of OSS requires a multifaceted approach, including promoting the benefits of OSS, providing accessible training resources, and fostering community engagement and support.

It is finally interesting to compare the usage and interest in using OSS with the current use of proprietary software by the respondents:

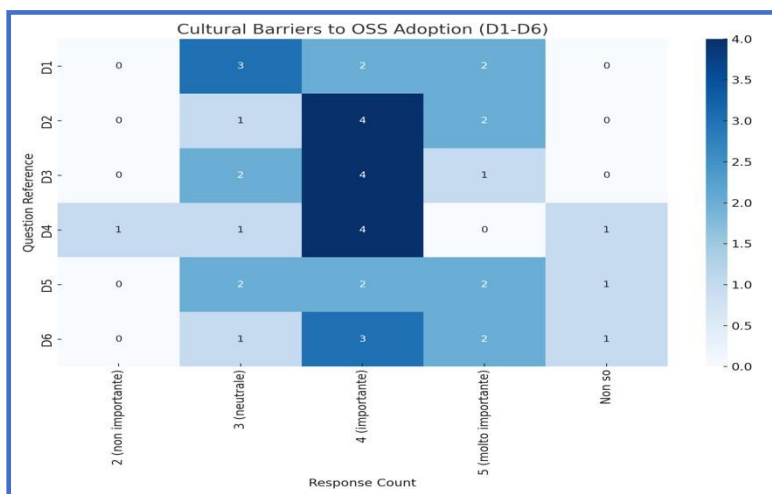


The heatmap shows a higher rate of usage compared to OSS confirming the wider knowledge and usage of proprietary software.

Identified needs in digital knowledge, skills and competences in regard to using Open-Source Software for TS & MSMEs

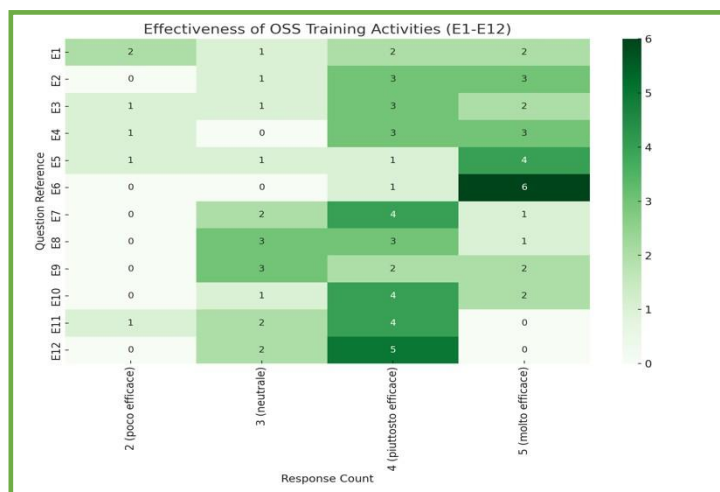
To provide a comprehensive analysis and observe the needs, skills and competences, we visualized the perceived importance of the barriers (Section D) and the effectiveness of training methods (Section E) as reported by the survey respondents.

Let's start with an analysis of Section D (Barriers to OSS Adoption), followed by Section E (Effectiveness of Training Activities for OSS).



The heatmap visualizes the cultural barriers to adopting Open-Source Software (OSS) as reported in Section D of the survey. Each row represents a specific barrier, and the columns indicate the count of responses that highlight the importance of these barriers. The color intensity reflects the frequency of responses, with darker shades indicating a higher count of responses emphasizing the barrier as significant.

The heatmap for Section E provides insights into the effectiveness of various training activities and methodologies for familiarizing users with Open-Source Software (OSS). Each row in the heatmap represents a different training activity or methodology, while the columns reflect the count of responses that rate the effectiveness of these methods.



The analyses of Sections D and E underscore the importance of addressing cultural barriers and providing effective training to enhance OSS adoption within organizations. By identifying the most significant barriers and the most effective training methodologies, organizations can tailor their strategies to foster a more OSS-friendly culture and skill set among their members.

Based on the analysis of the survey results, particularly focusing on the sections regarding the adoption of Open-Source Software (OSS) and the effectiveness of training activities, we can identify several key needs in digital knowledge, skills, and competences for Micro, Small, and Medium-sized Enterprises (MSMEs) and Third Sector organizations in regard to using OSS. This includes:

- **Awareness and understanding of OSS Benefits:** There's a need to increase awareness about the existence, advantages, and potential of OSS among MSMEs and Third Sector organizations. This includes understanding how OSS can be cost-effective, customizable, and supportive of collaborative development efforts.
- **Technical Skills for OSS Implementation and Use:** Organizations require technical skills to implement and use OSS effectively. This includes knowledge of installation, configuration, customization, and integration of OSS with existing systems.
- **Support and Maintenance Knowledge:** Skills in maintaining and updating OSS solutions are crucial to ensure their sustainable use. Organizations need knowledge on how to access and leverage community support, as well as how to perform regular maintenance tasks.

- **Security and Risk Management:** Competences in assessing and managing the security aspects of OSS are necessary. Organizations need to understand the security practices relevant to OSS, including vulnerability management and compliance with data protection standards.
- **Strategic Planning for OSS Adoption:** Skills in strategic planning for OSS adoption that align with organizational goals are important. This includes assessing organizational readiness, aligning OSS adoption with business objectives, and planning for long-term OSS strategy.

Concluding Remarks Italy

The analysis carried out in Part A elaborates on the digital landscape within Italy, focusing on the prevalence of MSMEs and Third Sector Organizations, their contribution to the economy, and the adoption and utilization of Open-Source Software (OSS). It highlights the vast majority of businesses in Italy being MSMEs, contributing significantly to employment and value addition and at same time underlines the importance of Third Sector organizations in the social context.

Despite the high adoption rate (conceived as interest in using rather than current use) of OSS among these entities, there's a gap in digitalization, particularly in specialized activities. The research identifies barriers to OSS adoption, such as lack of skills and awareness, and suggests the need for enhanced training in digital competences. It underscores the potential for OSS to drive innovation, cost savings, and operational efficiency within these sectors, advocating for a multifaceted approach to improve OSS literacy and utilization.

- **Awareness and Perception:** There might be a lack of awareness among training providers about the specific benefits and relevance of OSS for MSMEs and Third Sector Organizations. This could extend to a broader perception issue, where OSS is not seen as a critical component of digital skills training compared to more general digital literacy or proprietary software skills.
- **Resource Allocation:** Training programs may prioritize digital skills that are deemed to have broader applicability or immediate demand, such as basic digital literacy, cybersecurity, and use of common proprietary software, over specialized areas like OSS. This could be due to funding limitations, perceived market demand, or a focus on quick employability outcomes.
- **Specific Needs Unaddressed:** The specific digital transformation challenges and opportunities faced by MSMEs and Third Sector Organizations may not be adequately addressed in the available training offerings. These entities often operate with limited budgets and may benefit significantly from OSS's cost-effectiveness and flexibility, but the training ecosystem might not yet be fully aligned with these needs.
- **Fragmented Efforts:** There might be fragmented or isolated efforts to promote OSS training that have not yet coalesced into widely recognized or accessible programs. This can result in a scattered landscape where available opportunities are not well-known or are difficult to access by the target groups.
- **Opportunity for Development:** The current gap presents an opportunity for the development of targeted training programs that specifically address the needs of MSMEs and Third Sector

Organizations in leveraging OSS. This could involve partnerships between educational institutions, industry, government, and non-profit sectors to create tailored training initiatives.

- Policy and Support Frameworks: There may be a need for stronger policy initiatives and support frameworks that encourage the adoption of OSS and related training in the Third Sector and among MSMEs. This could include incentives for training providers to develop and offer OSS-focused courses or for organizations to participate in such training.

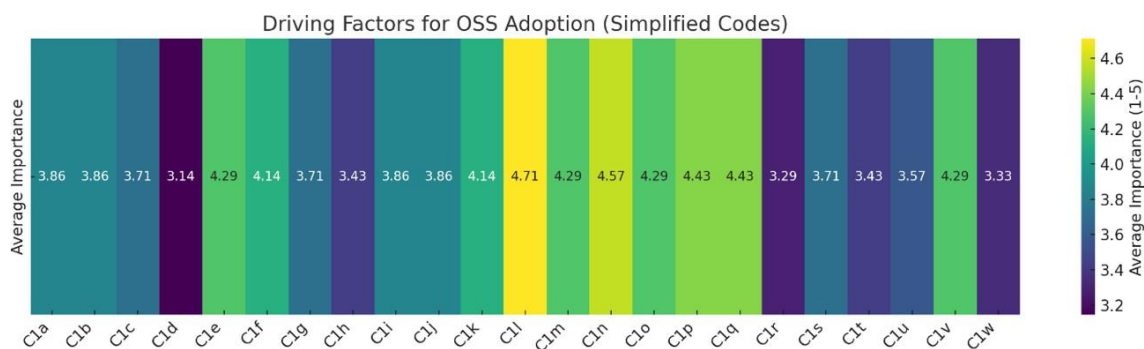
This analysis suggests that while there is a clear recognition of the importance of digital skills training, the specific focus on OSS for MSMEs and Third Sector Organizations remains underdeveloped. It indicates a potential area for growth and investment, considering the advantages OSS can offer in terms of cost savings, innovation, and flexibility. Addressing this gap could enhance the digital resilience and competitiveness of these organizations within the Italian economy and beyond.

The interest in overcoming Open-Source Software adoption barriers underscores the potential value of training programs focused on:

- Demystifying Open-Source Software: Education on the benefits, uses, and practical steps for adopting open-source solutions.
- Risk Management and Performance: Guidance on evaluating and managing the risks associated with open-source software, ensuring performance meets organizational needs.
- Enhancing Digital Literacy: Broadening the understanding of digital tools and technologies, including open source, to support informed decision-making.

These insights, derived from the survey analysis can inform the development of targeted training programs for MSMEs and third sector organizations, emphasizing practical, relevant digital skills that address expressed needs and concerns. We should then read the data from the survey (“85.71% of the organizations reported using OSS within their operations”) with a different light: the use of the OSS tools is common, but it is limited to few tools (ex. WordPress) which highlights the lack of a strategic planning in the exploitation of OSS.

With regards to training, the driving factors for the adoption of OSS in MSMEs and Third Sector Organizations should also be considered. According to the DigitOpen survey carried out in Italy, the following emerged:



This visualization provides insights into what motivates organizations to consider or adopt OSS, highlighting aspects such as Perceived OSS Benefits, Open Usage Rights, Source Code Access, and

Security as significant drivers. Factors like Limited Financial Resources and Community Interest also play crucial roles, indicating a complex interplay of technical, organizational, qualitative, and external considerations in the decision-making process for OSS adoption. In the design of the DigitOpen training, it will be then pivotal to consider several factors, including how the adoption of OSS can be facilitated and what are the strategies to make sure that the educational scope of the project can also be reflected in the organizational backbone of the target group.

POLISH NATIONAL REPORT

The following desk research aims at proving an updated country-based overview on the state of art in the Third Sector Organizations, MSMEs and VET providers (C-VET & Digital Skills) in terms of digital readiness and identifying existing training offers that could be relevant for the project.

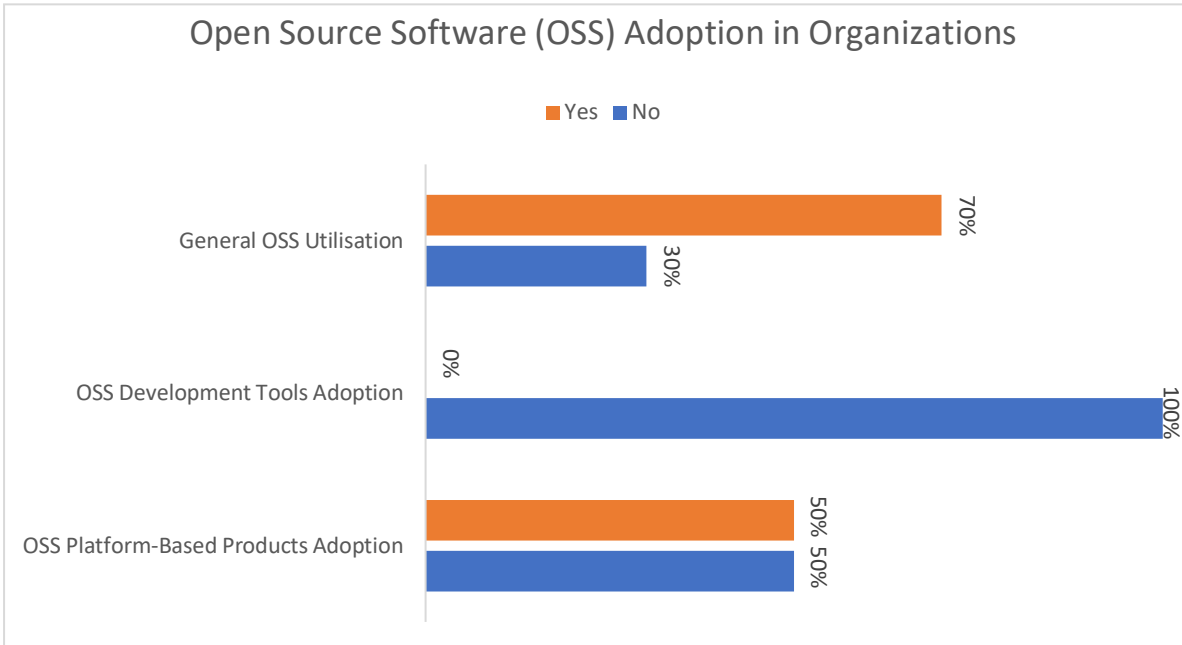
OSS adoption in MSMEs and Third Sector

Limited academic literature exists regarding the adoption of Open-Source Software (OSS) within Micro, Small, and Medium Enterprises (MSMEs) and the Third Sector in Poland. Thus, the analysis presented below relies on the data gathered from responses obtained through the DigitOpen survey.

The adoption of open-source software within organizations shows varying levels across different aspects. Overall, 70% of organizations reported utilizing OSS, while 30% did not. However, when it comes to the adoption of OSS development tools, none of the organizations have adopted them, indicating a complete absence in this area. In contrast, there is a split adoption rate for OSS platform-based products, with 50% of organizations adopting them and the remaining 50% not. This suggests a mixed reception to OSS platform-based products among surveyed organizations.

According to respondents, open-source software is primarily utilized in various aspects of operations. The main areas of usage include servers, websites, productivity software, and management software, each accounting for 40% of respondents. Additionally, OSS is used for client desktops and databases, each representing 20% of respondents. None of the respondents were

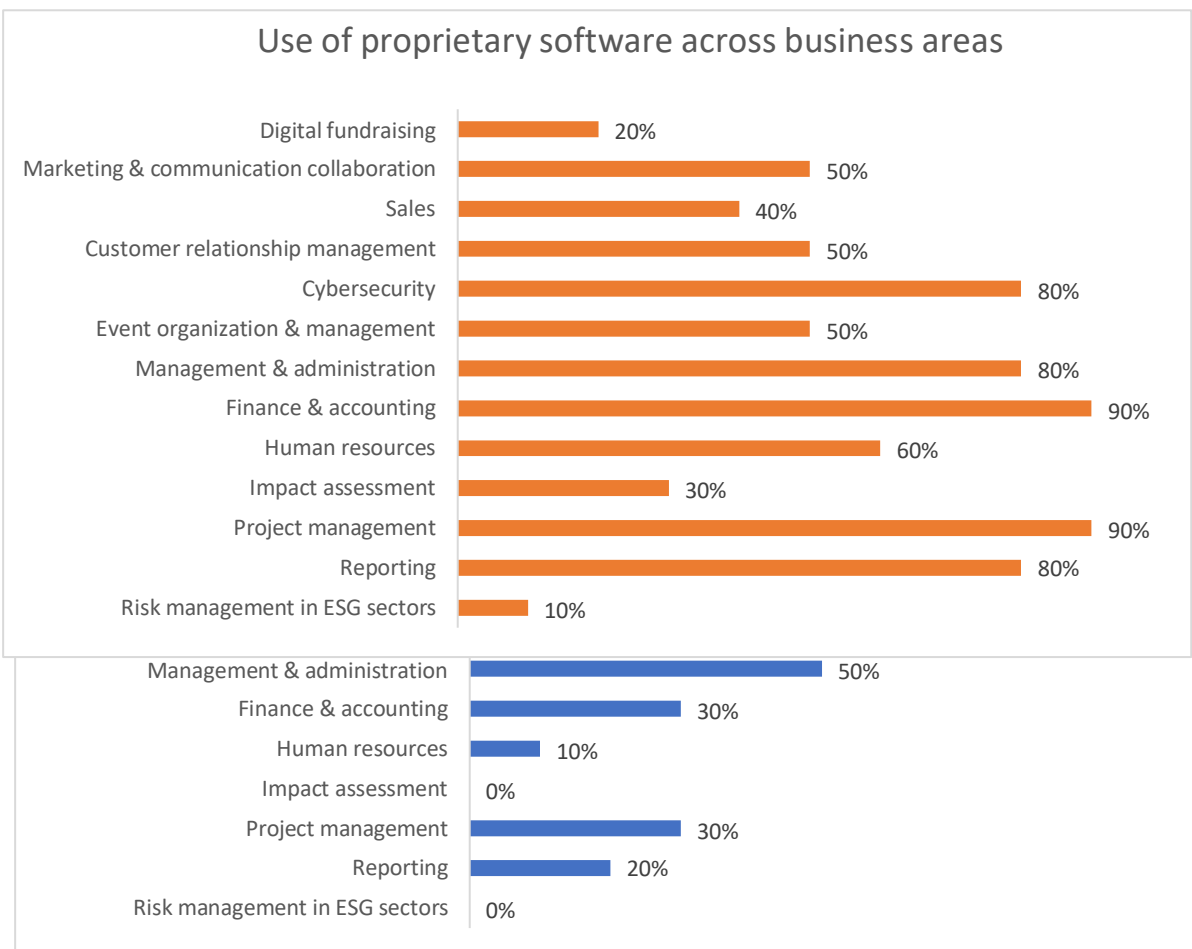
unsure about OSS usage, while 30% reported non-usage. No respondents mentioned other forms of OSS usage.



The survey assessed the usage and interest in adopting open-source software across various organizational functions. In digital fundraising, only 20% of respondents currently use OSS, while 100% express interest in its adoption. Similarly, for marketing & communication-collaboration and sales, 20% of respondents currently use OSS, with 87.5% expressing interest in adoption. Customer relations management sees a higher current usage rate of 40%, with 71.4% interested in adoption. Cybersecurity has the highest current usage rate at 50%, with 85.7% interested in adoption. Events management, management & administration, finance & accounting, and project management each have a current usage rate of 20-50%, with interest in adoption ranging from 80% to 85.7%. Human resources (volunteers) have a low current usage rate of 10%, with 77.8% interested in adoption. Impact assessment has no current usage, but 90% interest in adoption. Reporting has a current usage rate of 20% with 100% interest in adoption. Managing non-financial risks and opportunities in environmental, social, and governance areas (ESG) currently sees no usage, but 80% interest in adoption. These findings suggest a significant interest in OSS adoption across various organizational

functions, with digital fundraising, impact assessment, cybersecurity and reporting showing particularly high potential for adoption.

The survey results show a significant contrast between the use of proprietary software and OSS across various business areas. While proprietary software dominates in most categories, particularly in finance & accounting (90%) and project management (90%), OSS usage remains relatively low in these areas (30% each). Overall, the findings suggest a nuanced situation where both proprietary and open-source software play distinct roles, with opportunities for OSS expansion in select domains where it currently lags behind proprietary counterparts.



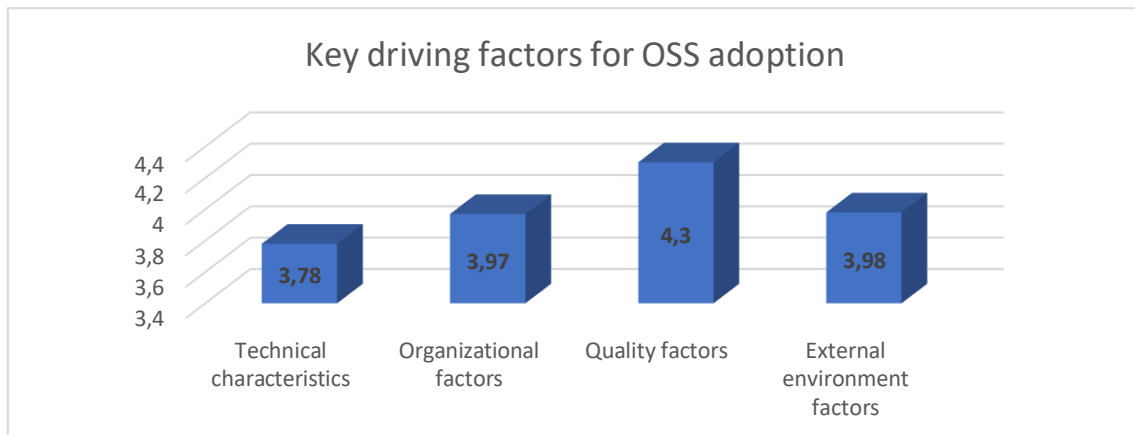
Identified needs in digital knowledge, skills and competences in regard to using Open-Source Software for TS & MSMEs

In Poland, MSMEs and TS face challenges in fully embracing digital solutions despite the country's dynamic entrepreneurial landscape. MSMEs cite financial constraints and uncertainties about ICT benefits as key barriers to investment. Similarly, TSOs struggle with limited resources and state support but actively engage in fostering digital competencies. There is limited data on the adoption of Open-Source Software (OSS) within both sectors, necessitating further research.

The survey results reveal varying levels of interest in different training topics related to open-source software (OSS). While topics like digital fundraising, marketing & collaboration, and customer relations management garnered moderate interest, with some respondents expressing high interest, subjects like cybersecurity and project management saw consistent interest across both levels, indicating a strong demand for training in these areas within the OSS community. Interestingly, management & administration, sales, and finance & accounting garnered significant interest, particularly in the "very interested" category, suggesting a need for OSS training specifically tailored to these functional areas. Overall, the findings highlight the diverse training needs within the OSS community, with certain topics standing out as particularly popular and in demand.

| Attractive Training Topics on OSS | | | |
|--|----------------|------------|-----------------|
| Digital Fundraising | 3 | 5 | 2 |
| Marketing & Collaboration | 1 | 6 | 3 |
| Sales | 0 | 5 | 5 |
| Customer Relations Management | 1 | 6 | 3 |
| Cybersecurity | 1 | 5 | 4 |
| Events | 2 | 5 | 3 |
| Management & administration | 1 | 4 | 5 |
| Finance & Accounting | 2 | 3 | 5 |
| Human Resources (volunteers) | 1 | 7 | 2 |
| Impact Assessment | 2 | 7 | 1 |
| Project Management | 0 | 7 | 3 |
| Managing non-financial risks and opportunities in Environmental, Social and Governance Areas | 0 | 7 | 3 |
| | Not Interested | Interested | Very Interested |
| | 1 | 2 | 3 |

According to the data emerging from the DigitOpen survey, key driving factors for OSS adoption need to be considered when dealing with the aforementioned target groups.



Technical characteristics, such as access to the source code and perceived benefits of OSS, emerged as significant motivators for adoption, albeit with slightly lower mean scores. Organisational factors, particularly financial resources and the availability of skilled employees, were strongly associated with OSS adoption, indicating its appeal as a cost-effective solution with potential for customisation. Quality factors, including functionality, security, and usability, were consistently rated highly, underscoring the importance of OSS meeting organisational needs effectively and reliably. External environment factors, such as community interest and transparency, also played a role, albeit to a slightly lesser extent. Overall, the findings suggest that while quality considerations are crucial, organisational and external factors also significantly influence OSS adoption decisions, highlighting the multifaceted nature of OSS adoption within organisations.

Driving Factors for OSS Adoption (Means).

| Technical Characteristics (M=3,78) | |
|---|------|
| Perceived benefits of OSS | 3,90 |
| Access to source code to tailor functionality | 4,00 |
| Ability of OSS to run on older hardware | 3,44 |
| Organizational Factors (3,97) | |
| Limited financial resources | 3,80 |
| Limited internal IT Sources | 3,90 |
| Lack of skilled employees in OSS | 4,20 |
| Organizational rules | 3,70 |
| Management support | 3,80 |
| Less cost for hardware | 4,40 |
| Positive attitude towards OSS | 4,00 |
| Quality Factors (4,30) | |
| Functionality (the right tool for the job) | 4,33 |
| Maintenance | 3,90 |
| Security | 4,56 |
| Reliability | 4,11 |

| | |
|--|-------------|
| Usability (perceived easy to use) | 4,50 |
| Adaptability | 4,40 |
| External Environment Factors (3,98) | |
| Community interest in OSS | 4,00 |
| Successful exemplars | 4,10 |
| Need for transparency | 4,20 |
| Value for public money | 4,00 |
| Security | 4,00 |
| OSS undervalued because free | 3,20 |

The results of the survey also reveal different inclinations regarding preferred training activities for open-source software adoption. Interactive demos, toolbox exploration, and hands-on experience were perceived as highly favourable, with a majority of respondents rating them as beneficial or very beneficial. Basic troubleshooting and customized exercises also garnered significant positive responses. Webinars and seminars received mixed feedback, with some respondents finding them beneficial but others less so. Similarly, case studies and recorded demonstrations had a range of responses, with some finding them beneficial while others were neutral or less enthusiastic. Notably, getting started tutorials received positive ratings overall, indicating a general appreciation for introductory training materials. The findings suggest a preference for interactive and practical training methods.

| Desirable Training Activities on OSS Adoption | | | | | |
|---|----------------|-----------------|---------|------------|-----------------|
| Getting Started Tutorial | 0 | 0 | 0 | 5 | 4 |
| Interactive demos | 0 | 1 | 0 | 8 | 1 |
| Basic troubleshooting | 0 | 0 | 1 | 6 | 3 |
| Toolbox exploration | 0 | 0 | 0 | 7 | 3 |
| Customized exercises | 0 | 1 | 0 | 5 | 4 |
| Hands-on experience | 0 | 0 | 0 | 7 | 3 |
| Webinars | 0 | 2 | 2 | 5 | 1 |
| Seminars | 0 | 1 | 2 | 6 | 1 |
| Case studies | 0 | 1 | 2 | 6 | 1 |
| E-learning modules | 0 | 1 | 0 | 6 | 3 |
| Self-directed learning | 0 | 1 | 1 | 4 | 4 |
| Recorded demonstrations | 0 | 1 | 2 | 6 | 1 |
| | Non beneficial | Less Beneficial | Neutral | Beneficial | Very Beneficial |
| | 1 | 2 | 3 | 4 | 5 |

However, knowledge barriers pose significant challenges to open-source software adoption, as highlighted by the survey responses. The findings presented below underscore the importance of addressing knowledge gaps – especially regarding OSS awareness – and ensuring alignment with organisational objectives to facilitate smoother OSS adoption processes.

| Knowledge Barriers to OSS Adoption | | | | | |
|------------------------------------|---------------|----------------|---------|-----------|----------------|
| OSS Awareness | 0 | 1 | 0 | 5 | 3 |
| OSS Understanding | 0 | 0 | 2 | 5 | 2 |
| Business Goals | 0 | 2 | 1 | 4 | 2 |
| Commitment | 0 | 0 | 3 | 4 | 2 |
| Technical Know-How | 0 | 1 | 1 | 4 | 3 |
| Managing OSS Risks | 0 | 1 | 1 | 4 | 3 |
| | Not important | Less Important | Neutral | Important | Very Important |
| | 1 | 2 | 3 | 4 | 5 |

Although the survey uncovered knowledge barriers, respondents' outlook on the future adoption of open-source software within their organisations is decidedly positive. Seven out of ten respondents expressed the belief that increasing the use of OSS would be useful, with additional three respondents indicating that it would be extremely useful. This optimistic outlook suggests a strong willingness among organisations to embrace OSS as a valuable resource in the future. With such enthusiasm for OSS adoption, there is great potential for organisations to overcome the barriers through targeted education and training initiatives, paving the way for a more widespread and successful integration of open-source solutions into their operations.

By providing accessible training opportunities and fostering digital innovation, Poland can empower its MSMEs and TSOs to leverage OSS effectively, driving greater digitalization and resilience.

Concluding Remarks

In Poland, both MSMEs and Third Sector organizations play crucial roles in the economy and society. MSMEs, mainly micro-enterprises, dominate the enterprise landscape, yet face challenges in fully embracing digital solutions. Third Sector organizations, despite limited resources, contribute significantly to societal welfare.

The survey findings shed light on the existing challenges and opportunities in the adoption of open-source software among Micro, Small, and Medium Enterprises and Third Sector Organizations in Poland. Regarding OSS adoption, while 70% of organizations use OSS overall, none have adopted OSS development tools. However, there's a split adoption rate for OSS platform-based products, indicating varied reception. Primary OSS usage includes servers, websites, and productivity software.

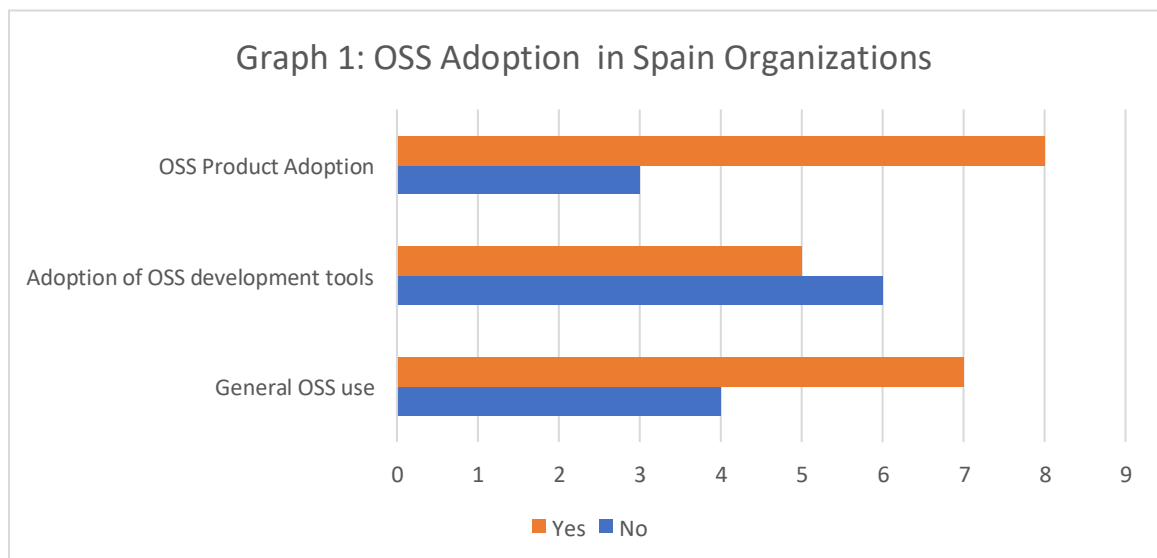
Despite facing knowledge barriers, particularly regarding OSS awareness and understanding, respondents exhibited a strong inclination towards increasing OSS usage in their organisations in the future. This positive outlook presents an encouraging prospect for the broader integration of OSS solutions, potentially driving digital innovation and resilience within these sectors. The diverse training needs identified, coupled with the existing landscape of OSS training programs offered by VET providers, present avenues for addressing knowledge gaps and fostering digital competencies.

To address digital skill needs, specialized OSS training tailored for Third Sector organizations and innovative teaching methods like blended learning can enhance accessibility. Collaborative initiatives and financial support can expand training availability. For MSMEs, alternative delivery models like self-paced online modules can overcome barriers. Partnerships between VET providers, industry associations, and technology companies can ensure training relevance, empowering organizations to thrive in a digital economy. By leveraging targeted education initiatives and collaborative partnerships, Poland can empower its MSMEs and TSOs to harness the full potential of OSS, paving the way for enhanced digitalization and competitiveness.

SPANISH NATIONAL REPORT

OSS Adoption in SMEs, Third Sector Organizations and VET Providers

The following section presents results from the survey on OSS usage and the training needs of SMES, TSOs and VET providers in Spain. Specifically, the results are summarized as follows:



The data on open-source software (OSS) adoption among organizations in Spain reveals a mixed landscape. While a majority of organizations, specifically 7 out of 11, have embraced the utilization of OSS in some capacity, there appears to be a disparity in the adoption of OSS development tools. 45.5% of the positive respondents outsourced the following operations: Network and computer management, IT, Configuration of computer equipment and software, Networking. A significant portion, 6 out of 11, have not incorporated these tools into their workflows. However, there is a more positive outlook when it comes to OSS product adoption, with 8 out of 11 organizations indicating their use of OSS products. This suggests that while there is a willingness to leverage existing OSS solutions, there may be hesitation or barriers to integrating OSS development tools into organizational practices. Understanding these nuances is crucial for stakeholders in promoting further OSS adoption and addressing any challenges hindering its full utilization within Spanish organizations.

Areas of OSS Usage and Interest

According to the data emerging from the DigitOpen survey, the analysis suggests varying degrees of OSS adoption across different organizational functions. High interest in areas like Marketing & Communication and CRM points towards OSS's recognized value in enhancing these functions. Conversely, areas like Digital Fundraising, with few reported OSS usage, represent potential markets for OSS development and adoption.

In the heatmap below, the high interest rates are represented:

| Graph 2: Attractive Training Topics on OSS | | | |
|--|----------------|------------|-----------------|
| Digital Fundraising | 4 | 4 | 2 |
| Marketing & Communication | 0 | 8 | 1 |
| Sales | 0 | 6 | 4 |
| Customer Relations Management | 0 | 4 | 5 |
| Cybersecurity | 4 | 3 | 3 |
| Events | 4 | 4 | 2 |
| Management & administration | 4 | 2 | 2 |
| Finance & Accounting | 0 | 6 | 4 |
| Human Resources (volunteers) | 4 | 4 | 1 |
| Impact Assessment | 2 | 3 | 3 |
| Project Management | 3 | 6 | 0 |
| Managing non-financial risks and opportunities in Environmental, Social and Governance Areas | 10 | 1 | 0 |
| | Not Interested | Interested | Very Interested |
| | 1 | 2 | 3 |

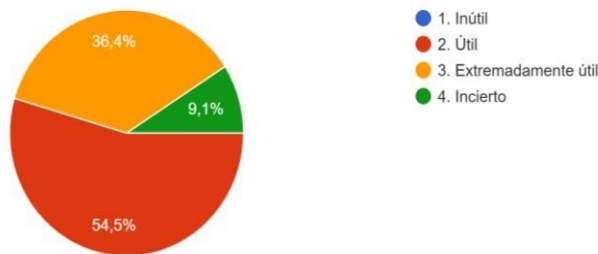
When talking about digital fundraising, most respondents (90,9%) say they do not use OSS, but the percentages change when asked if they would be interested in adopting it. 40% say they are interested, 20% are very interested and 40% are not interested.

The questionnaire also revealed a big disparity in the use of OSS in the various areas of the organisation. More specifically, there are some sectors that are almost split in half between negative and positive responses, and they are: Marketing and Communication, Customer Relationship Management, Management and Administration, Project Management

In contrast, there is a great disparity, with more negative percentages, in the areas of: Cybersecurity, Events, Finance and Accounting, Human Resources, Impact Assessment, Reporting, Management of non-financial risks and opportunities in the environmental, social and governance areas.

The only sector where the majority of organisations use OSS is Sales (90.9 yes).

In almost all cases where organisations do not use OSS, they would be interested in adopting it. In fact, as graph 5 shows, the largest number of respondents believe that it would be useful to increase the use of OSS in their organisation in the future



Graph 3

1. Unuseful. 2. Useful 3. Extremely useful 4. Not sure)

Exploring Desirable OSS-related Training Activities

This part of the research aims at exploring what are the most attractive training activities which should be utilized in OSS training for the Spanish MSMEs and TSO respondents. The respondents were asked to rate a series of training activities on a scale of 1-5 and the results are presented in the following heatmap (see Graph 4). The main findings are summarized, as follows:

| Graph 4: Desirable Training Activities of OSS Adoption | | | | | | |
|--|---|---|---|---|---|---|
| Getting Started Tutorial | 0 | 0 | 4 | 2 | 3 | 2 |
| Interactive demos | 0 | 0 | 3 | 3 | 3 | 2 |
| Basic troubleshooting | 0 | 0 | 3 | 3 | 3 | 2 |
| Toolbox exploration | 0 | 0 | 3 | 3 | 3 | 2 |
| Customized exercises | 0 | 1 | 1 | 4 | 3 | 2 |
| Hands-on experience | 0 | 0 | 3 | 2 | 4 | 2 |
| Webinars | 0 | 0 | 1 | 3 | 5 | 2 |
| Seminars | 0 | 1 | 1 | 3 | 4 | 2 |
| Case studies | 0 | 0 | 1 | 4 | 4 | 2 |
| E-learning modules | 0 | 1 | 1 | 2 | 5 | 2 |
| Self-directed learning | 0 | 0 | 1 | 4 | 4 | 2 |

| | | | | | | |
|-------------------------|----------------|-----------------|---------|------------|-----------------|------------|
| Recorded demonstrations | 0 | 0 | 1 | 4 | 4 | 2 |
| | Non beneficial | Less Beneficial | Neutral | Beneficial | Very Beneficial | Don't Know |
| | 1 | 2 | 3 | 4 | 5 | |

The data from Graph 4 on the desirable training activities for open-source software (OSS) adoption among respondents highlights several key preferences. Among the nine participants surveyed, there is a strong inclination towards a variety of training activities.

The majority, comprising 5 out of 9 respondents, express interest in getting started tutorials, indicating a need for foundational knowledge and guidance.

Additionally, interactive demos, basic troubleshooting, toolbox exploration, and customized exercises are perceived as beneficial by 6 out of 9 respondents, suggesting a desire for hands-on and tailored learning experiences. Notably, webinars and case studies are highly favored, with 8 out of 9 participants preferring these methods, indicating a preference for interactive and real-world learning scenarios.

Moreover, seminars, e-learning modules, self-directed learning, and recorded demonstrations are also well-received, as 7 or 8 out of 9 respondents express a preference for these formats. These findings suggest a multifaceted approach to training activities is desired among respondents, encompassing both traditional methods like seminars and innovative approaches such as interactive demos and self-directed learning. Overall, the data underscores the importance of providing diverse and adaptable training options to cater to the varied preferences and learning styles of individuals seeking to adopt OSS. By offering a comprehensive array of training activities, organizations can effectively support and empower individuals in their journey towards OSS adoption, hereby fostering a more robust and inclusive open-source ecosystem.

Identifying Barriers and Driving Factors for OSS Adoption

The insights gleaned from Graph 5, which elucidates the barriers and driving factors for open-source software (OSS) adoption in Spain, reveal several critical considerations among respondents.

| Graph 5: Knowledge Barriers to OSS Adoption | | | | | | |
|---|---|---|---|---|---|---|
| OSS Awareness | 0 | 0 | 2 | 4 | 3 | 2 |
| OSS Understanding | 0 | 0 | 5 | 3 | 1 | 2 |
| Business Goals | 0 | 0 | 1 | 5 | 3 | 2 |
| Commitment | 0 | 1 | 3 | 2 | 2 | 3 |
| Technical NowHow | 0 | 1 | 1 | 3 | 4 | 2 |

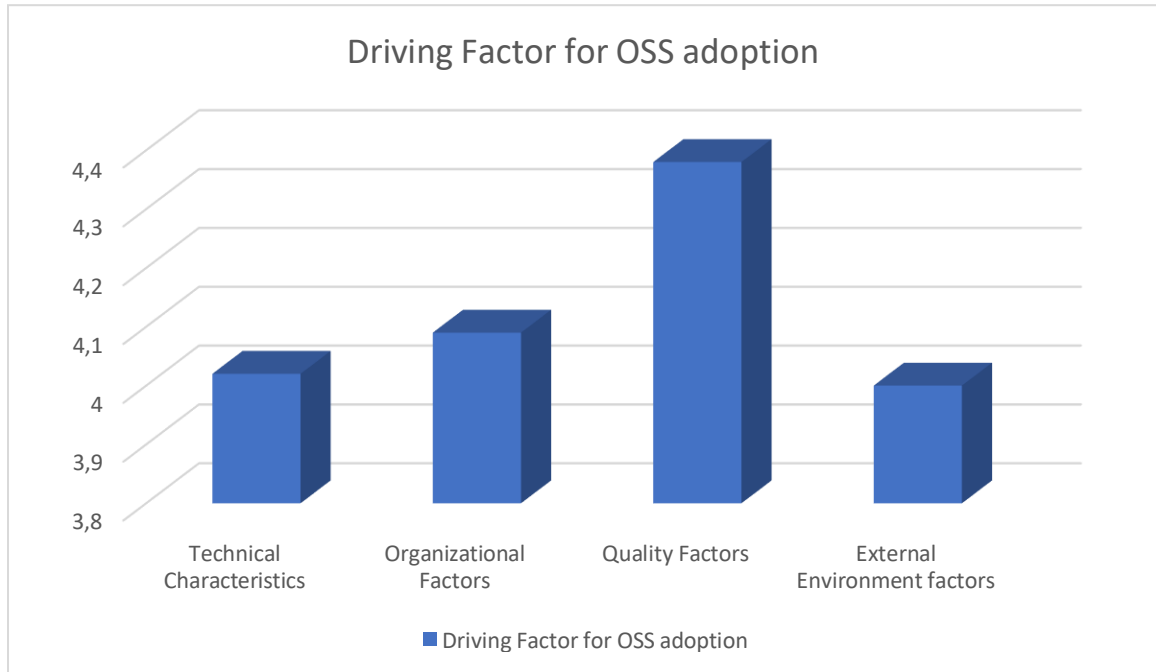
| | | | | | | |
|--------------------|---------------|----------------|---------|-----------|----------------|------------|
| Managing OSS Risks | 0 | 0 | 3 | 3 | 3 | 2 |
| | Not important | Less Important | Neutral | Important | Very Important | Don't Know |
| | 1 | 2 | 3 | 4 | 5 | |

Firstly, the lack of awareness regarding the availability, benefits, and relevance of OSS emerges as a significant hurdle, with 7 out of 9 participants identifying it as important. This underscores the necessity for increased education and advocacy efforts to illuminate the advantages and applicability of OSS within various sectors. Additionally, aligning business goals with OSS adoption and customization, particularly in areas such as CRM, management, marketing, and finance, is deemed crucial by 8 out of 9 respondents, indicating a recognition of the strategic value OSS can offer in achieving organizational objectives.

However, challenges related to understanding OSS characteristics and quality, strategic commitment, technical knowledge, managing risks, and performance persist, as evidenced by varying degrees of importance attributed to these factors among respondents. Collectively, these findings underscore the multifaceted nature of barriers and driving factors influencing OSS adoption, highlighting the need for comprehensive strategies that address both awareness-raising and skill-building initiatives while aligning OSS adoption efforts with organizational goals and priorities. By addressing these challenges holistically, stakeholders can foster a more conducive environment for widespread OSS adoption and realization of its potential benefits across diverse industries and sectors.

General Driving Factor for OSS adoption

Section C is entirely dedicated to the factors driving SMEs, TSOs and VET Providers to adopt OSS. The adoption of Open-Source Software (OSS) by MSMEs and TSOs is influenced by various factors that cater to both technical and organizational considerations. This part of the study aims at identifying key driving factors for OSS adoption. As presented in Table 1, the survey contained technical considerations (4 items), organizational factors (7 items), quality factors (6 items) and External Environmental Factors (6 items). The respective results, as presented in Table 1 and Graph 6, are as follows:



This part of the questionnaire reveals that organisations find all factors (technical, organisational, qualitative and external environmental) to be mostly important, very important or neutral in prompting them to adopt or express interest in adopting OSS in the future:

Table 1: Driving Factors for OSS Adoption (Means)

| Technical Characteristics (M= 4,02) | |
|---|------------|
| Perceived benefits of OSS | 4.3 |
| Open rights to use it | 4.3 |
| Access to source code to tailor functionality | 3.8 |
| Ability of OSS to run on older hardware | 3.7 |
| | |
| Organizational Factors (4,09) | |
| Limited financial resources | 4.3 |
| Limited internal IT Sources | 4.2 |
| Lack of skilled employees in OSS | 3.7 |
| Organizational rules | 3.4 |
| Management support | 4.3 |
| Less cost for hardware | 4.4 |
| Positive attitude towards OSS | 4.3 |
| Quality Factors (4,38) | |
| Functionality (the right tool for the job) | 4.3 |
| Maintenance | 4.2 |
| Security | 4.6 |

| | |
|---|-----|
| Reliability | 4.5 |
| Usability (perceived easy to use) | 4.2 |
| Adaptability | 4.5 |
| External Environment Factors (4,0) | |
| Community interest in OSS | 4.1 |
| Successful exemplars | 4.1 |
| Need for transparency | 3.9 |
| Value for public money | 3.8 |
| Security | 4.6 |
| OSS undervalued because free | 3.5 |

Concluding Remarks from the Survey

The survey on OSS adoption and needs in Spain among SMEs, Third Sector Organizations (TSOs), and VET providers provides comprehensive insights into the current landscape and future prospects of open-source software (OSS) utilization. The data indicates a mixed landscape of OSS adoption, with a majority of organizations embracing OSS to some extent, while facing disparities in the integration of OSS development tools. Despite this, there is a positive outlook on OSS product adoption, suggesting a willingness to leverage existing solutions. However, barriers such as lack of awareness, understanding of OSS characteristics, and strategic commitment persist, underscoring the need for targeted education and advocacy efforts. The survey also highlights varying levels of OSS usage and interest across different organizational functions, with potential markets for OSS development identified, particularly in areas like digital fundraising. Moreover, the findings emphasize the importance of providing diverse and adaptable training activities to cater to the preferences and learning styles of individuals seeking to adopt OSS. Lastly, driving factors for OSS adoption encompass technical, organizational, qualitative, and external environmental considerations, emphasizing the multifaceted nature of factors influencing OSS adoption. Overall, addressing these challenges and capitalizing on driving factors is crucial for fostering further OSS adoption and realizing its potential benefits across diverse sectors in Spain.

Chapter 3: Training Services and Programs on OSS for MSMEs & TGOs

Introduction

This part of the DigitOpen inquiry aims to map the existing landscape of the **training offers and programs** in digital skills and competences, with a specific emphasis on Open-Source Software (OSS). The target audience of the training programs are staff of Third Sector Organizations and Micro, Small, and Medium Enterprises (MSMEs). The methodology of this part of the enquiry was desc research and the primary focus for data collection was the official sites of Vocational Education and Training providers (VET) in the six countries. The data collection process involved the recording of the following information: program title, target group, skills, teaching methods, and the provider. The data are presented in tables followed with concluding remarks per country.

OSS Training offers and programs in France.

France has a very developed training offer in the digital sector. We have listed a number of general training courses on digital skills in the table above. Website management is probably the most common theme according to our research.

By focusing on the search of training courses specific to open source, we found courses that are often very specific and aimed at understanding and mastering one tool for one specific task (e.g. learning to use an open source CMS, an open source desktop publishing software, creating a website with an open source approach, etc.). There are, however, a few training courses aimed at raising awareness, but they are relatively rare compared with the number of technical courses.

Training courses are available both face-to-face and remotely. IT skills are often required for enrolment on technical training courses. Concerning the audience of these training courses, these are people in employment seeking vocational training. These programs usually last between 1 day to 1 week. Training providers often indicate that they are willing to adapt the training and to provide it directly on the company's premises.

According to our research, there are no training programs on OSS specifically designed for non-profit organizations and members of the social economy in general. However, it seems obvious that members of the third sector could have access to the training courses listed above, provided they have the technical requirements. The following table presents the most representative examples of training offers.

| Program title & web link | OSS Skills/ Competences | Teaching Methods Used | Target Group | Provider (eg VET etc.,) |
|---|---|---|--|-------------------------|
| Building an Open Source information system with open source software (best practice) https://www.plb.fr/format ion/management- | Knowing how to build an Open Source IT system using free software ; provide a global overview of the Open Source offer ; sharing best practices for | Theory and practical cases. Duration 2 days. | IT Directors, Technical Directors, Project Managers, Consultants, Database | PLB consultant |

| | | | | |
|---|---|---|--|-----------------|
| informatique/formation-open-source-bonnes-pratiques,19-206.php | personalized implementation. | | Administrators, Developers. | |
| Website training from scratch: how to create a website and email addresses https://www.2i2l.fr/formation-site-web-de-a-a-z-savoir-creeer-un-site-web-et-des-adresses-de-messagerie | <ul style="list-style-type: none"> - setting up and managing a website - master the basics of the web and email - reserve a domain name - use a CMS website management tool - publish content on a website - understand the basics of law and licences - writing content to optimise search engine optimisation. | Theoretical input and practical application exercises. On-line configurations and publications. Duration 3 days | For all. Only Web browsing skills are needed. | 2i2L |
| Mastering social media - Level 1: The basics https://www.digitalacademy.fr/formations/medias-sociaux/ | social media strategy; learn how to use social media for business purposes | Face-to-face or distance learning; theory, case studies, role-playing, exercises, sharing of experience and best practice. Duration 2 days. | E-Marketing managers, marketing managers, communications managers, product managers, e-commerce managers, external relations managers, press relations managers, press officers and anyone wanting to learn more about social media. | Digital Academy |
| SEO training: optimising your natural referencing and gaining visibility https://www.digitalacademy.fr/formations/formati-on-seo/ | Fundamentals of SEO, develop a SEO strategy | The trainer's expertise, quizzes, practical work, workshops and exchanges of experience. Duration 2 days. | Decision-makers, product managers, webmarketing managers, project managers, e-merchants, communications or marketing managers... and more generally anyone in charge of the visibility of an e-commerce or institutional website. | Digital Academy |
| Managing customer relations and interacting on social media | Gain a deeper understanding of the role of digital channels in | Expert input from the trainer, | Customer relations directors and managers, | Digital Academy |

| | | | | |
|---|--|---|---|---------------------------|
| https://www.digitalacademy.fr/formations/gerer-la-relation-client-et-interagir-sur-les-medias-sociaux/ | <p>customer relationship management ; understand Internet users' questions and conversations on these new digital channels ; Acquire and deploy a methodology for responding to Internet users ; Identify new trends in digital customer relations</p> | <p>quizzes, workshop, exchange of experience. Duration 1 day.</p> | <p>community managers, customer relations officers, customer advisers, communications and marketing managers.</p> | |
| <p>Open Source, best practices https://www.orsys.fr/formation/osb</p> | <p>Understand the concepts and challenges of Open Source ; Understand the Open Source business model ; Understand the regulatory framework associated with the Open Source model: intellectual property, licences, etc. ; Discovering the main Open Source technologies and understanding their formats and standards ; Anticipate and support change as part of Open Source migration projects.</p> | <p>Face-to-face or distance learning ; Duration 2 days.</p> | <p>Developers, decision-makers, IT directors, user services managers, project managers and anyone involved in IT implementation. Previous IT knowledge are needed.</p> | <p>Orsys Formation</p> |
| <p>Training on Joomla https://www.devictio.fr/internet/web/formation-joomla-lyon.php</p> | <p>Learn how to use this OSS in order to create and manage a website, manage the content and customize it.</p> | <p>Role-playing exercises. Repetition of procedures to memorise the use of the tools presented. Duration not specified.</p> | <p>Anyone who wants to create a website, blog or e-commerce site.</p> | <p>Devictio Formation</p> |
| <p>Training on Scribus https://www.devictio.fr/multimedia/pao/formation-scribus-lyon.php</p> | <p>Learn how to use an open source desktop publishing software to create brochures, magazines, newspapers, posters for printing.</p> | <p>Practical learning. Duration 3 days.</p> | <p>Anyone wishing to learn desktop publishing.</p> | <p>Devictio Formation</p> |
| <p>Training on Python https://www.devictio.fr/internet/web/formation-python-lyon.php</p> | <p>Learn the syntax of the language, be able to develop applications.</p> | <p>Flexible duration: 2, 3 or 5 days. Practical learning.</p> | <p>Developers, webmasters... anyone wanting to learn the Python language.</p> | <p>Devictio Formation</p> |
| <p>Training on CMS Made Simple</p> | <p>Learn how to use a CMS (Content Management System) open source</p> | <p>Practical learning.</p> | <p>For all</p> | <p>Devictio Formation</p> |

| | | | | |
|---|---|---|--|---------------|
| https://www.devictio.fr/internet/web/formation-cms-made-simple-lyon.php | | Duration not specified. | | |
| Building your digital tools on open source https://laplateforme.io/construire-ses-outils-numeriques-sur-de-lopen-source/ | Learn the main features of OS ; Managing intellectual property on an OS project ; Being able to choose the right OS tool for your needs; | Duration 1 day - Face-to-face or distance learning | IT DEPARTMENT Developer IT Project Manager | La plateforme |

The digital training offer is highly developed in France, but there are not many courses specific to open source. Training courses specific to open source are highly technical and focused on mastering a single tool for a specific task (e.g. Learn how to use an open source CMS (Content Management System)). This leads us to believe that for the DIGITopen tools to be attractive, they need to offer real skills development on a specific subject, while remaining accessible to a public that does not have advanced digital skills or expert in-house resources.

Lastly, it is interesting to point out that this study reflects the results of the needs analysis carried out before the submission of the project. The respondents to our survey are motivated by solutions that will enable them to save time and money, while optimizing the way they work.

OSS Training offers and programs in Italy

The existing landscape of training offers and programs in digital skills and competences, with a specific emphasis on Open-Source Software (OSS) in Italy is presented in the following table. The evidence shows that the trainings focused on OSS exist for MSMEs but they are rather addressed to the use of specific tools (ex. NextCloud) or topics (ex. licenses). There is no evidence of training offers specifically addressed to the Third Sector organized with an emphasis on OSS. The remarkably limited training offers and programs in digital skills and competences with a specific emphasis on Open-Source Software (OSS) for Micro, Small, and Medium Enterprises (MSMEs) and Third Sector Organizations in Italy suggests several potential insights and challenges in the current landscape. In the table below are reported the relevant training opportunities in Italy taking into account the criteria set (target group and training provider).

| Program title & web link | OSS Skills/ Competences | Teaching Methods Used | Target Group | Provider (eg VET etc.,) |
|---|--|-----------------------|------------------------|-------------------------------------|
| Basic graphic design and editorial layout | - Graphic design with GIMP - Editorial layout | Online course | Professionals and SMEs | Professional Academy (VET provider) |

| | | | | |
|---|--|------------------|--|-------------------------------------|
| Video creation and editing with OSS | - video creation - video editing | Online seminar | Professionals and SMEs | Professional Academy (VET provider) |
| The Open Source Tools | - understanding OSS - benefits of OSS - productivity software (Office) - security - email client - web editor - graphic design | Online course | Technician and SMEs owner | FORMart (VET provider) |
| Legal management of open source software | - licenses - intellectual property and copyright | 1-day F2F lesson | Professionals, SMEs owners, and managers | SOIEL International (VET provider) |
| Understanding and managing open-source licenses | - licenses | Online seminar | Technician and SMEs owner | Corsidia (VET provider) |
| Nextcloud standard user | - file management - online collaboration | Online course | Professionals, SMEs owners, and managers | RIOS (Italian Open Source Network) |

This analysis suggests that while there is a clear recognition of the importance of digital skills training, the specific focus on OSS for MSMEs and Third Sector Organizations remains underdeveloped in regard to training programs. This indicates a potential area for growth and investment in high quality training services, considering the advantages OSS can offer in terms of cost savings, innovation, and flexibility. Addressing this gap could enhance the digital resilience and competitiveness of these organizations within the Italian economy and beyond.

OSS Training offers and programs in Poland

This inquiry aims to assess the existing landscape of training offers and programs in digital skills and competences, with a specific emphasis on Open-Source Software (OSS). The target audience for the training programs should be staff of Third Sector Organizations and Micro, Small, and Medium Enterprises (MSMEs). To gather comprehensive data, the research will primarily focus on official sites of Vocational Education and Training (VET) providers only.

| Program title & web link | OSS Skills/ Competences | Teaching Methods Used | Target Group | Provider (eg VET etc.,) |
|--|---|-----------------------|---------------------|-------------------------|
| Szkolenia Cirrus https://www.cirrus.pl/szkolenia/ | Handling Linux, Debian, other OSS on demand | 5-day F2F course | MSMEs, Third Sector | Cirrus (VET provider) |

| | | | | |
|---|--|----------------------|-------------------------|--|
| Szkolenia specjalistyczne https://wbdata.pl/szkolenia-specjalistyczne/ | Using GIS/QGIS | F2F & online courses | MSMEs, Third Sector | WB Data (VET provider) |
| Szkolenia IT https://www.compendium.pl/katalog-szkolen/c:46-open-source | Fundamentals of Linux, Linux server administration, Kubernetes | Hybrid courses | Professionals and MSMEs | Compendium Centrum Edukacyjne (VET provider) |
| Administracja podstawowa systemem Linux https://oedu.pl/produkt/administracja-podstawowa-systemem-linux-opensuse-sle201v15-na-bazie-opensuse-15/ | Linux system administration | Online course | Everyone | On-Line Education (VET provider) |
| Kurs WordPress https://expose.pl/szkolenia/kurs-wordpress/ | Content management | F2F course | Everyone | Expose (VET provider) |
| Kurs GIMP - tworzenie atrakcyjnych projektów graficznych https://www.cognity.pl/kurs-gimp-tworzenie-atrakcyjnych-projektow-graficznych | Graphic design | F2F course | Everyone | Cognity (VET provider) |
| MySQL – Implementacja baz danych https://www.comarch.pl/szkolenia/bazy-danych/mysql/implementacja-baz-danych-mysql/ | Database implementation | F2F/online course | Everyone | Comarch (VET provider) |
| Szkolenia i egzaminy – LibreOffice https://academy.asseco.pl/katalog-szkolen/?category=18288&spage=1 | Using productivity software | F2F/online courses | Everyone | Asseco Academy (VET provider) |

The landscape of digital skills training in Poland, particularly in Open-Source Software, is diverse, with Vocational Education and Training (VET) providers offering various courses to cater to different levels of expertise and needs. These courses cover a range of OSS skills, including Linux administration, database implementation, graphic design, and content management systems, utilizing both face-to-face and online teaching methods.

To enhance this landscape for Third Sector organizations and Micro, Small, and Medium Enterprises, several suggestions can be considered. Firstly, VET providers could develop specialized OSS training programs tailored specifically for Third Sector organizations, considering their unique digital skill requirements and operational contexts. Innovative teaching methods, like blended learning or flexible scheduling, can improve accessibility. Collaborative initiatives between VET providers, Third Sector organizations, and stakeholders can facilitate the creation of relevant training programs. Financial support from governmental or philanthropic sources can expand the availability of affordable OSS training programs.

Additionally, for MSMEs, alternative delivery models such as self-paced online modules or community-based training initiatives can address cost and scheduling barriers. Partnerships between VET providers, industry associations, and technology companies can ensure that training programs remain up-to-date and relevant, empowering TS and MSMEs to thrive in a digital economy. Implementing these suggestions can make OSS training more inclusive and supportive for all stakeholders involved.

OSS Training offers and programs in Estonia

In Estonia, only a few training courses are offered for open-source software, mainly for **web page development** - creating websites based on WordPress. VET schools as well as many private training companies offer website creation training based on WordPress. There are some training courses where **video and picture editing** is also taught using OSS.

| Program title & web link | OSS Skills/ Competences | Teaching Methods Used | Target Group | Provider (eg VET etc.,) |
|--|---|-----------------------|--|----------------------------|
| Computer training | Web development page | Classroom | Students | VET |
| WordPress - creating and managing websites | Web development page | Online | open to all | private training companies |
| 3D visualization in Blender | 3D visualization | Classroom | open to all | private training company |
| Tallinn University | video montage based on DaVinci Resolve | Classroom | a company employee who needs to know how to edit audiovisual content | University |
| Let's make a video: OpenShot 2.6 | During the training, you will learn to create videos in the free OpenShot program | Classroom | open to all SME also | VET |
| GIMP - image processing | image processing | classroom | open to all | private training company |
| Creation of information materials with free software and free online tools | image and video processing | Classroom | Open to all | VET |

OSS Training offers and programs in Greece

In this section, the inquiry aims to explore the landscape of training offers and programs in digital skills and competences, with a specific emphasis on Open-Source Software (OSS) in Greece. The focus of this desc research is on existing training programs primarily targeted to MSMEs & TSOs. The comprehensive data is retrieved from the official sites of Vocational Education and Training (VET) centers in the private and public sector. The following Table presents representative examples of training opportunities which are either currently valid or have been implemented over the last 2-3 years.

| Program Title & Web Link | OSS Skills/ Competences | Teaching Methods Used | Target Group | Provider (eg VET etc.,) |
|--------------------------------------|-------------------------|-----------------------|--------------|-----------------------------|
| Seminar on OSS Usage | Licensing, Legal issues | On-line | MSMEs, VET | Enterprise Network-Hellas + |

| | | | | |
|---|---|--|--|--|
| | | | | Open Software Enterprise Greece |
| Seminar on the OSS Adoption for Business Applications | Software Engineering Principles, Content tools, OSS tools | Face-to-face | Business Employees & Researchers | Athens University of Economics & Business |
| OSS Training Tools | OSS Concepts & benefits Web editor Graphic design Cloud services | On-line | OSS Technicians | EDU Resources |
| Business Software in Practice | Data analysis, interaction design, FrontPage design, System analysis, Management Information Systems (MIS) Visual Basic for Applications | Distance learning Web Training Asynchronous learning Assessment tools Assignments | Business professionals and employees with experience | VET Centre of the University of Athens, Greece |
| E-Accounting for Business | Business with Office Data analysis with Excel & Access, Internet, Yahoo, Explorer, e-mail και Outlook Express MIS Accounting & finance | Distance learning. Web Training Asynchronous learning Assessment tools Assignments | Business professionals and employees with experience | VET Centre of the University of Athens, Greece |
| E-Business | General e-Business Skills, business models, internet tools such as yahoo, google & Front Page, business plan, marketing plan, internet security, knowledge management & supply chain management, software for management and accounting | Distance learning Web Training Asynchronous learning Assessment tools Assignments | Business professionals and employees with experience | VET Centre of the University of Athens, Greece |

Based on the above data in Greece, the landscape of OSS training programs targeted to MSMEs and TSOs is marked by a significant limitation in offerings. The available programs, while covering essential areas such as licensing, content tools, web & graphic design, and cloud services, do not specify OSS options and fell short in customization to meet the unique needs of both MSMEs and TSOs.

Training offers and programs on OSS in Spain

In this section, the inquiry aims to explore the landscape of training offers and programs in digital skills and competences, with a specific emphasis on Open-Source Software (OSS) in Spain. The focus of this desc research is on existing training programs primarily targeted to MSMEs & TSOs. The comprehensive data is retrieved from the official sites of Vocational Education and Training (VET) centers in the private and public sector. The following Table presents representative examples of training opportunities which are either currently valid or have been implemented over the last 2-3 years.

| Program Title & Web Link | OSS Skills/ Competences | Teaching Methods Used | Target Group | Provider (eg VET etc.) |
|---|--|--|---|---|
| Curso Universitario en Software Libre y Conocimiento Abierto - TECH España (techtitute.com) | Introduction to Free Software - Open Knowledge and CC licenses - Main Free Software tools | On-line | MSMEs, VET | Tech España: School of Information Technology |
| Especialidad en Desarrollo de Software. Online ICEB (iceb-edu.com) | Lead and implement software management and development projects with quality criteria | On-line | Entrepreneurs Business owners | ICEB International Center for Entrepreneurs in Barcelona |
| Master en Software de Gestión: Open Source, SaaS & Cloud Online (iebschool.com) | Conduct detailed analyses of what open source software is and interpret its economic implications | On-line | Executives and professionals Entrepreneurs and professionals | IEBS Digital School |
| Curso: MOOC de Conocimiento Abierto y Software Libre. 6ª Edición AbiertaUGR | Open Science Free Software and Communities Intellectual Property in Spain | MOOC | Higher Education Students | UGR University of Granada |
| Cursos Open Source para empresas - FormadoresIT | Learning Web Managers with sufficient implementation in companies Learning PHP, Python and Ruby languages | Face to Face On-line | Trainings for companies | Formadores IT |
| CURSO SOFTWARE LIBRE PARA BIBLIOTECAS Euroinnova | Open Software for Libraries Course | Distance learning Web Training Asynchronous learning | Higher Education Students | EuroInnova Universidad Católica de Murcia |

| | | | | |
|--|--|---------------------------------|--|--|
| | | Assessment tools Assignments | | |
|--|--|---------------------------------|--|--|

Based on the above data in Spain, the landscape of OSS training programs targeted to MSMEs and TSOs is marked by a significant limitation in offerings. The available programs, while covering essential areas such as licensing, content tools, web & graphic design, and cloud services, have really few OSS trainings options and fell shorter in customization to meet the unique needs of both MSMEs and TSOs. The present findings can be justified as follows, and highlight the following challenges:

- **Language Barrier:** While English is widely used in the tech industry, MSMEs & TSOs in Spain might prefer training materials in Spanish. Finding comprehensive training resources in Spanish can be challenging, especially for niche open-source software.
- **Limited Availability:** MSMEs & TSOs often have limited budgets for training and development. As a result, they may struggle to find affordable or free training resources tailored to their needs.
- **Specific Needs:** MSMEs & TSOs may require training that is customized to their specific industry or business model. Generic open-source software training might not address their unique requirements.
- **Lack of Awareness:** Many SMEs might not be aware of the benefits of open-source software or the availability of training resources. There may be a need for awareness campaigns or outreach efforts to inform MSMEs & TSOs about these opportunities.
- **Quality of Training:** Even if training resources are available, their quality and relevance to MSMEs & TSOs needs may vary. It can be challenging to find high-quality training materials that provide practical, hands-on guidance suitable for MSMEs & TSOs.
- **Technical Support:** MSMEs & TSOs may require ongoing technical support or mentoring as they adopt and implement open-source software. Finding resources that offer reliable support tailored to MSMEs & TSOs needs can be challenging.

To address these challenges, it may be helpful to collaborate with local industry associations, government agencies, or educational institutions to develop and promote open-source software training programs specifically designed for in Europe. Additionally, leveraging online platforms and communities focused on open-source software can help MSMEs & TSOs access a broader range of training resources and support.

Concluding Remarks

The analysis of digital skills training across various European countries reveals a nuanced landscape, emphasizing the importance of tailoring Open-Source Software (OSS) training to meet specific needs and skill levels. The present findings across the six countries lead to the following concluding remarks:

- In France, the existing digital training landscape is robust, but courses specific to open source are predominantly technical, focusing on mastering singular tools for specific tasks. To make DIGITopen tools attractive, there is a suggested need for courses that not only provide real skill development in a specific subject but are also accessible to a broader audience without advanced digital skills.

- Similarly, in Italy, there's a recognition of the significance of digital skills training, but the focus on OSS for Micro, Small, and Medium-sized Enterprises (MSMEs) and Third Sector Organizations (TSOs) is underdeveloped. Similar are the results in Spain marking also significant absence of OSS training programs for the target market. Addressing this gap is seen as an opportunity to enhance digital resilience and competitiveness.
- Poland boasts a diverse landscape of digital skills training, including Open-Source Software. Vocational Education and Training (VET) providers offer varied courses covering Linux administration, database implementation, graphic design, and content management systems. The use of face-to-face and online teaching methods caters to different levels of expertise and needs (Poland).
- Estonia, while having a limited number of training courses for open-source software, specifically focuses on web page development using WordPress. VET schools and private training companies offer courses that include video and picture editing using OSS, emphasizing practical skills.
- Contrastingly, Greece faces a limitation in OSS training programs tailored for MSMEs and TSOs. While covering essential areas like licensing, content tools, web and graphic design, and cloud services, the existing programs lack specificity regarding OSS options and customization for the unique needs of the target audience.

In conclusion, the observations underscore the importance of recognizing regional variations and tailoring OSS training to suit the distinct requirements and skill levels of diverse audiences. The identified gaps in each country's training landscape suggest opportunities for targeted investments and development to harness the full potential of OSS in enhancing digital skills and fostering innovation.

Chapter 4

Mapping the Landscape of MSMEs & TSOs & Technology Adoption in DIGITOpen Countries

Introduction



Image source: @freepik

The following desk research aims at providing an updated country-based overview on the state of art in the Third Sector Organizations, MSMEs and VET providers (C-VET & Digital Skills) in terms of digital readiness. To comprehensively understand the contemporary demands within target markets concerning digital knowledge, skills, and competences related to Open-Source Software (OSS), this investigation relies on insights derived from published papers, national reports, and other pertinent sources, with citations formatted in accordance with APA guidelines. The content is structured as follows (sub-headings).

1. Short description of the number of MSMEs and Third Sector Organizations operating in your country including staff employment etc.,
2. Identified current usage of OSS by MSMEs and Third Sector Organizations, prepare relevant table with indicative results.
3. Identified needs in digital knowledge, skills and competences in regard to using Open-Source Software for **TS & MSMEs**

The outcomes of the desc research are presented separately for each from the six countries (i.e., France, Greece, Poland, Italy, Estonia and Spain).

The Landscape of MSMEs & TSOs and Digitalization in France

The French productive system consists of 4.5 million companies in the non-agricultural and non-financial sectors. For this study we are considering official data from INSEE¹ referring to 2021.

¹ Institut National de la Statistique et des Etudes Economiques (National Institute of Statistics and Economic Studies)

In 2021 158 600 SMEs are operating in France employing 29% of the active population. They operate in sectors in direct contact with households, such as trade, transport and logistics, as well as in services such as accommodation and catering, real estate and consumer services.

Microenterprises represent the vast majority (96.3%) of all businesses established in France. In 2021 we count 4 332 400 units. They employ 18% of the active population in France. It is important to underline that they play an essential role in the local economic life, since they often propose essential services (craftsmen, local shops, personal and business services, etc.). Their importance is also related to the fact that they are very widely distributed across the country. Only 3% of them export: in fact, they tend to serve local markets and are not very export-oriented. In 2021, the turnover (excluding tax) of MSMEs was €956 billion, i.e 36.3% of the national turnover. SMEs generated 22.3% while micro-businesses generated 14% of the national turnover. Mid-sized and big companies contributed to 63.7% of the national turnover.

If we add together the number of micro, small and medium-sized enterprises, we realize that together they represent 99% of French businesses. Nearly half of French employees work for a MSMEs (+45%)

Third Sector Organizations Landscape in France

In France, the third sector brings together a wide range of players under the umbrella of the so called *social and solidarity economy (SSE)*.

The notion of social and solidarity economy refers to a group of companies organized in the form of associations, cooperatives, mutual insurance companies, foundations, whose internal operations and activities are based on the principles of solidarity and social utility.

SSE is constituted by the following entities:

- Associations: 1.3 million
- Cooperatives: +23,000
- Mutual societies: +7,000
- SSE commercial companies: 500
- Foundations: +700
- Social and solidarity enterprises: +2,000

In 2022, a total of 2.6 million employees worked in the social and solidarity economy sector, which represents 13.9% of the private sector paid employment in France.

The majority of jobs in the SSE sector are generated by associations and cooperatives :

- +120,000 associations employ 2 million people (full-time and part-time combined), i.e. 79% of SSE jobs.
- +23,000 cooperatives employ 300,000 people, i.e. 12% of SSE jobs.

The SSE sector generates 10% of the French GDP.

In 2022, the sectors in which the SSE played a significant role include :

- Social work (59.5% of jobs in the sector come from the SSE) ;
- Sport and leisure (58.1% of jobs in the sector come from the SSE) ;
- Arts and entertainment (31.1% in the sector come from the SSE) ;
- Financial and insurance activities (29.7% of jobs in the sector come from the SSE) ;
- Education, (19.4% of jobs in the sector come from the SSE).

Moreover, if we take into account SSE structures that do not employ paid staff and are constituted solely by volunteer members, the figures increase. The more dynamic sector is the one of associations.

According to official figures provided by INJEP² in 2018, there were 1.3 million active associations. On average in France 69 000 new associations are created each year.

Associations make extensive use of voluntary work. According to INJEP investigations, one out of four French people declared to be a volunteer in an association in 2021, which represents around 15 million people aged 16 or more. Seven out of ten volunteers are involved in some form of voluntary activity at least once a week. Sport field represents almost a third of the volume of volunteer work, followed by the field of defense of rights and the one of social, humanitarian and charitable actions.

Digitalization and usage of open-source solutions inside French MSMEs

France Num program is a national plan to support the digital transformation in France. Since 3 years they conduct a survey to evaluate the perception and uses of digital technologies inside MSMEs. The data for 2023 confirms that MSMEs are increasingly confident in digital technology and see it as an opportunity for growth. In fact, 76% of business leaders interviewed believe that digital technology represents a real benefit for their company. 51% of the companies (+8 points compared to 2022) now reach at least 5% of their customers online. 39% of MSMEs believe that digital technology helps them to make money and 48% believe that digital technology enables them to save money.

Plus, 40% of MSMEs continue to invest at least €1,000 a year in digital technology, and 71% intend to carry out digital projects over the next two years.

In 2023 there is a growing concern about security. 48.1% of MSMEs against 44.1% in 2022 are afraid of losing or having their data hacked when using digital technology.

Among the most popular digital tools, MSMEs look for solutions in management, invoicing and payments. 90% of the companies surveyed use at least one management tool.

According to the latest study, there is a growing professionalism in digital transformation support. When it comes to innovation in the digital field, it becomes more and more important to be supported by experts in the field.

² Institut National de la Jeunesse et de l'Éducation Populaire (National Institute for Youth and Popular Education)

According to the *Open Source Monitor France 2023*, a study focusing specifically on the use of open source, two-thirds of French companies are supportive of open source software solutions. MSMEs represent 93.6% of the respondents to this study.

8 out of 10 MSMEs already use Open Source tools and 1 out of 3 adapt the source code for internal purpose.

We can notice that French companies are generally in favor of open source. However, the degree of openness decreases when the number of employee decrease. As a consequence, in companies with less than 100 employees the topic of open source is often less developed. This gap can be explained by SMEs' lack of knowledge of the open source solutions available on the market and by preconceptions about open source software within these organizations. Moreover there is a lack of digital skills inside MSMEs of less than 20 employees and it is more difficult for them to identify the proper tool, often because of a lack of time.

The three main factors driving the adoption of OS in France are (a) the positive image of open source, (b) the security and reliability, (c) cost savings compared with proprietary software.

The two main barriers are: (a) skills-related obstacles, in particular the strong need for training and the lack of specialists in the field, and (b) low stability and high propensity for errors. When adopting an open source solution, 80% of companies seek expert assistance.

Digitalization and usage of open source solutions inside French TSOs

Associations are the most represented structures in the SSE sector. The studies on digitalization cited below refer to the association sector in France.

The paper *The place of digital technology in associations' projects in 2022* highlights the following perceptions about digital readiness :

- 22% of associations consider themselves " not very initiated " and feel that they are still far away from the digital targets ;
- 53% said to be "in progress", and consider that their association is on the right path in terms of digital practices;
- 21% are "experienced" and consider that they have enough experience.

24% of managers in associations say that they do not encounter any difficulties in the field of digitalization. This figure was 16% in 2019. This 8-point increase can be explained by the acceleration in digital practices as a result of the health crisis, by the skills development of associations and by the increasing number of support services provided in recent years.

Associations use digital tools mainly to increase their visibility. 71% of them think it is important to have a website and be present on social networks. They also increased their usage of videoconferencing tools which are currently used by 59% of them. Lastly, they look for tools useful for document sharing and storage (43% of them).

Associations believe that digitalization brings some positive impacts on their organizations, such as an increased visibility, a better participation of their network, an optimized activity management, a simplified way of work in a collaborative way, an optimization of time management, a simplified decision-making process. Moreover, digitalization offers the possibility to innovate in the fields of memberships and ticketing which are crucial aspects, especially for associations.

On the other hand, associations still face some barriers for the adoption of digital solutions:

- human difficulties faced by almost half the managers (48%)
- technical issues (34%)
- lack of financial resources (30%)
- strategic issues (24%)

According to the same paper mentioned above, **41% of associations make use of open-source**. This percentage of over 40% of users is particularly stable from 2016.

It is important to underline that the usage of open source varies according to the sector of activity. On one hand, in health and sport organizations we have less users, while in the environment and popular education there is a major commitment to open source because these organizations are culturally closer to the “free mentality” allowing everyone to access information or make use of a service.

The usage figures tell us that the COVID crisis has not changed people's habits in terms of using open source tools. It seems that open source is used by associations with a good command of digital technology.

Among the 41% of associations using open source, 25% state they use it primarily for practical reasons (functionality of tools, costs, etc.). Another 16% use open source for ethical reasons (transparency, solidarity, knowledge sharing, freedom and dissemination of information).

Identified needs in digital knowledge, skills and competences in regard to using Open-Source Software for TS & MSMEs

Support for MSMEs and TSO in using open source should cover many aspects.

Firstly, according to our research and thanks to the DIGITopen survey, there is a need to raise awareness about the concept of open source, its definition, its advantages and disadvantages. In this respect, the goal would be to design tools to raise general awareness of open source.

Secondly, there is the lack of technical skills allowing organizations to increase the usage of open source. Open source brings advantages, but its implementation requires technical skills that are sometimes quite complex. In the paper *L'usage de l'open source au sein des entreprises* it is clear that French MSMEs need the support of experts, the so called *digital services companies*, for the design and implementation of open source solutions. The professional profiles requested are mainly systems integrator and development service provider. Even if the contribution of these experts

remains vital, it is possible to offer a skills upgrade through training courses about specific tools, the basis of programming languages and best practices.

In order to reduce costs, which is an important element for our target audience, it seems important to make organizations autonomous in the use of open source and to reduce their dependence from IT companies for the daily use of the tool and for its maintenance.

Lastly, there is an important figure coming from *The place of digital technology in associations' projects in 2022* : 15% of associations that are not using open source at the moment state they would use it if they could benefit of some kind of support. Consequently, in the third sector too, there is an opportunity to increase the use of open source through support and skills development.

The Landscape of MSMEs & TSOs and digitalization in Greece

The following desk research aims at proving an updated country-based overview on the state of art in the Third Sector Organizations, MSMEs and VET providers (C-VET & Digital Skills) in terms of digital readiness and identifying existing training offers that could be relevant for the project.

MSMEs Entrepreneurship Landscape and Digitalization in Greece

Over the past decade, entrepreneurship in Greece has navigated through the turbulent waters of the financial crisis, witnessing a profound impact on Small and Medium-sized Enterprises (SMEs). The following paragraphs explore the evolving landscape, shedding light on the challenges faced, transformations observed, and the resilience exhibited by the entrepreneurial ecosystem in Greece.

The financial crisis, as outlined by Jonston (2020) and Tsakanikas et al. (2020), significantly hampered entrepreneurship. The rate of new businesses fell rapidly, and unemployment went upwards. The Small Business Act for Europe (SBA) reported a drastic decrease in the number of SMEs from approximately 726,000 in 2012 to 530,000 in 2013, marking a 27% decline (Tsakanikas et al., 2016). This period was marked by economic turmoil and a challenging environment for business growth.

The situation has shown signs of improvement in recent years. Data from the 2019 GEM Report on Entrepreneurship, presented by Vasilopoulos and Tsitsakis (2021), indicates a decline in business suspensions or closures to 2.0% of the population in 2019, compared to 2.8% in 2018. This suggests a positive trajectory, aligning closer with the country's income average. However, challenges persist, requiring ongoing attention and strategic interventions.

The Greek Trade Report of 2020, published by IN.EM.Y, brings attention to employment trends. Despite five years of continuous growth, employment in the Greek economy fell by 2.8% in 2020. This underscores the complexity of the economic recovery process post-crisis.

The 2018 Small Business Act for Europe underscores the pivotal role of Greek SMEs in the country's economy. Generating 63.6% of value-added and providing employment for 85.2% of the workforce, Greek SMEs surpass the EU averages of 56.8% and 66.4%, respectively (SBA fact sheet, 2018). Micro firms, in particular, play a crucial role, offering 6 out of 10 jobs in Greece, double the EU average.

The digitalisation landscape of Small and Medium-sized Enterprises (SMEs) in Greece has come under scrutiny in the 2020 EU research, revealing a notable lag compared to other EU-27 Member States. The 2020 EU research sheds light on a considerable disparity in the digitalisation levels of Greek SMEs compared to their EU peers. While the average digitalisation progress in EU-27 Member

States stands above average, Greece lags significantly behind. This raises concerns about the readiness and adaptability of Greek SMEs to the evolving digital landscape.

One striking revelation from the research is the variance in digitalisation strategies among SMEs based on their size. Larger SMEs, particularly medium-sized ones, lead in having a structured approach to digitalisation. The survey indicates that 59% of medium-sized SMEs and 49% of small SMEs report having a strategy or action plan for digitalisation. In contrast, micro SMEs exhibit a lower level of strategic planning, with only 32% having a defined plan.

Furthermore, based on the above study, (EU, 2020), the key digitalisation activities reported as being under consideration by SMEs with strategies are: (a) to improve their internal ICT skills (77% of SMEs); (b) to change their use of social media (74% of SMEs); (c) to improve their ICT security systems (72% of SMEs); (d) to adopt more advanced technologies (71% of SMEs); and (e) to introduce online marketing and/or sales (60% of SMEs).

Despite progress, challenges persist, as reflected in Greece's Business Enterprise Expenditure on R&D (BERD) by SMEs, which falls below the EU average at 0.26% of GDP. As Greece navigates its digital transition and economic recovery, addressing the digital divide and enhancing research and development in the SME sector will be critical for sustainable growth (Department of Political Science and International Relations of the University of Peloponnese, Thalys program).

Concluding, the trajectory of entrepreneurship in Greece over the past decade reflects a story of resilience and transformation. Despite the challenges posed by the financial crisis, the entrepreneurial spirit has endured. The recent positive trends and the vital role played by SMEs in the Greek economy offer a glimmer of hope. Ongoing support, strategic initiatives, and policies that address challenges will be critical for sustained growth and prosperity in the years to come.

The Landscape of the Third Sector in Greece

The landscape of civil society in Greece has undergone transformation over the years, with both challenges and advancements. Historically lagging European counterparts, the growth of formal civil society organizations has seen a notable increase in the past two decades (Loukidou, 2014). Estimates only 14-30% actively participating (Sotiropoulos, 2004).

Trade unions, sports clubs, social enterprises, and cultural associations contribute to the diversity within the formal segment of civil society. While some organizations thrive through patron-client relationships with the state, others are weaker and have a limited lifespan. Challenges include a lack of digitalization and updates in the existing register of non-profit organizations (NPOs) and cooperatives, creating a fragmented understanding of the types and impact of these entities in the broader economy (NGEnvironment, 2015).

However, in the realm of digitalization, Greece has initiated projects to modernize public administration and support SMEs, including nonprofits, in adopting digital technologies. Efforts include the digitalization of archives, development of IT infrastructure, and simplification of administrative processes. However, only 41% of SMEs in Greece have a basic level of digital intensity, and adoption rates for advanced digital technologies like cloud computing and artificial intelligence are below the EU average. Notably, projects under the Recovery and Resilience Plan (RRP) aim to accelerate smart manufacturing by SMEs and contribute to the digital transition of businesses (EU 2023).

suggest that civil society organizations, including sports clubs, number between 12,820 and 14,000, (Panayotopoulou, 2003), along with 2,106 registered social enterprises (Register,

2024). However, despite the increase in numbers, the size of these organizations remains modest, with the majority having fewer than 50 members and

Adoption of Open-Source Software (OSS) and Its Impact on Technology Adoption by Greek SMEs

Open Source Software (OSS) is software that comes with source code and its license allows users to modify and redistribute the modified work under the same license agreement. OSS is often available free or at low cost and allows organizations to customize the software to better meet their organizational business needs and to integrate it with existing technical environments. OSS has emerged as a significant force in shaping technological landscapes globally. This report contributes to the existing body of knowledge on the adoption of Open-Source Software by providing insights into the factors that enable or inhibit OSS adoption within Greek SMEs.

In Greece, the influence of OSS extends across various sectors, however empirical findings are scarce and refer particularly in the realms of e-Government (eGov) and accounting. Lakka *et al.*, (2013) underscore the pivotal role of OSS in eGov reforms. The European Union's Ministerial Declaration (2009) emphasizes the benefits of open specifications and endorses the OSS model in eGov projects. Lakka and Stamati posit that OSS, with its collaborative values, aligns seamlessly with eGov goals, positively influencing both demand and supply sides. Notably, innovative technologies, including OSS, have been shown to catalyze eGov growth (Ifinedo, 2011).

Nikolopoulos and Tsouramanis (2016) offer insights into the adoption of technology by accountants in Greece. Despite awareness of Enterprise Resource Planning (ERP) and OSS technologies, the accountants in the study predominantly do not integrate them into their daily work. This stands in contrast to expectations, revealing a gap in the adoption of cloud computing technologies among Greek accountants. Koutouridou *et al.* (2016) explore the economic viability of implementing OSS Enterprise Resource Planning (ERP) systems in Greek industries. They find that, amidst unfavorable economic conditions, the transparency and cost-effectiveness of OSS make it a viable solution for businesses looking to implement information systems. The study advocates for an exploratory approach, combining industry processes, interviews, and cost estimation, to tailor OSS ERPs for economic suitability.

Batikas (2011) delves into the motivations behind Small and Medium-sized Enterprises (SMEs) contributing to Free Libre Open Source Software (FLOSS) communities. Drawing on the Theory of Planned Behavior, the study identifies factors such as organizational openness, perceived importance of FLOSS, and the role of developers as influential in SMEs' decisions to participate in FLOSS communities. These findings offer valuable insights for governments in designing policies to encourage FLOSS adoption, particularly during economic crises.

The adoption of Open Source (OS) software in both the public and private sectors in Greece is perceived as technologically mature and compatible with existing systems. Interviewees emphasized the flexibility of OS in dealing with future upgrades and its reliability, ensuring that its use won't result in data loss or technical failures. However, successful implementation requires alignment with the overall business strategy.

Despite technological maturity, challenges in the adoption of OS were identified by policy makers and top managers. A key aspect overlooked was the significance of employee acceptance and external support for the deployment and maintenance of OS. The lack of acknowledgment regarding these factors could pose difficulties in realizing successful OS implementations in Greek public and private organizations (Papadopoulos *et al.*, 2013).

Obstacles stem from insufficient national innovation policies, as well as the prevailing philosophy, structure, and culture within both private and public organizations. Moreover, the constantly changing policies due to government transitions add another layer of complexity (Papadopoulos et al., 2013). Overcoming these challenges necessitates the development of a new model or policy based on the private-collective model so as to leverage innovation and foster growth through emphasizing collaborative efforts and shared knowledge (Papadopoulos et al., 2013). Implementing such a model could be instrumental in addressing the identified barriers and promoting the effective adoption of OS in the Greek context.

The above limited studies showcase the diverse impact of OSS in Greece, spanning eGov reforms, accounting practices, industrial ERPs, and FLOSS motivations in SMEs. The findings underscore the multifaceted nature of technology adoption, influenced by economic conditions, collaborative values, and organizational openness. As Greece navigates technological advancements, understanding these dynamics becomes pivotal for informed policy and strategic decisions.

The Landscape of MSMEs & TSOs and digitalization in Poland

The following desk research aims at providing an updated country-based overview in the Third Sector Organizations, MSMEs and VET providers (C-VET & Digital Skills) in terms of digital readiness and identifying existing training offers that could be relevant for the project.

In recent years, there has been a steady increase in the number of enterprises in Poland, showcasing a vibrant entrepreneurial landscape. By the year 2020, the country boasted nearly 2.3 million active enterprises, marking a 2.3% rise from the previous year and a notable 21.4% surge since 2008. The overwhelming majority of these enterprises fall under the category of micro, small, and medium-sized enterprises (MSMEs), constituting 99.8% of all enterprises in Poland. Among them, micro-enterprises dominate, accounting for 97.0% of the total, followed by small enterprises at 2.2%, and medium-sized and large enterprises at 0.6% and 0.2% respectively (Skowrońska & Tarnawa, 2022, p. 6).

Observing the structural composition of these enterprises based on size reveals a consistent pattern, with slight fluctuations over the years. Comparing the structure in 2020 to that of 2008, there is a noticeable increase in the share of micro-enterprises and a corresponding decrease in the share of small and medium-sized enterprises (Skowrońska & Tarnawa, 2022, p. 13).

By the end of 2020, Poland's enterprise sector employed nearly 10 million people, marking a marginal decrease of 0.1% from the previous year. Micro-enterprises dominated, providing jobs for around 4.2 million individuals, followed by small and medium-sized enterprises. Large enterprises, despite their smaller numbers, collectively employed over 3.2 million people. Comparing 2020 to 2019, there was a slight increase in micro and small enterprise employment, but a decline in medium-sized and large enterprise employment. These fluctuations underscore the sector's dynamic nature (Skowrońska & Tarnawa, 2022, p. 22).

Furthermore, the analysis of the industry structure of micro, small, and medium-sized enterprises shows that the services sector houses the largest share, with 53.0% of all enterprises operating within it. Approximately one-fifth of the enterprises are engaged in trade, while nearly one-seventh operate in construction. Notably, 10.0% of MSMEs operate in the industrial sector. In contrast, the structure of large enterprises differs significantly, with over half operating in the industrial sector (Skowrońska & Tarnawa, 2022, p. 14).

Third Sector Organizations in Poland

In 2022, Poland witnessed a flourishing Third Sector characterized by a diverse array of 103.4 thousand non-profit organizations. This marked an impressive growth of 8.6% compared to 2020, underscoring the sector's dynamism and resilience. Among these organizations, associations and social groups constituted the majority, with a notable presence of foundations and rural community circles as well. Particularly striking was the significant role played by 9.5 thousand entities recognized as public benefit organizations, highlighting their commitment to serving the community (Główny Urząd Statystyczny, 2023, p. 1).

These organizations were deeply involved in various spheres of societal engagement, ranging from sports and tourism to culture, education, and humanitarian aid. It's noteworthy that a substantial portion of the sector focused on activities aimed at addressing pressing social issues, such as healthcare, welfare, and support for vulnerable populations (GUS, 2023, p. 2).

Despite the predominant reliance on volunteer work, a portion of organizations also engaged in paid activities, providing employment opportunities through both contractual and full-time positions. In 2022, community work for TS was performed by 3 million people, while the organizations themselves employed 187 thousand full-time employees (GUS, 2023, p. 3).

Current usage of OSS by MSMEs and Third Sector Organizations

The digitalization of Micro, Small, and Medium Enterprises in Poland faces challenges despite the perceived benefits of information and communication technologies (ICT). While nearly 40% of MSMEs utilize ICT, many do not fully implement digital solutions, impacting their growth potential (Orłowska & Żołądkiewicz, 2018, p. 95).

Polish MSMEs primarily adopt basic digital solutions, such as internet banking and having a website. However, integration into digital processes remains low, with only 14% implementing digital solutions comprehensively. Challenges include limited financial and human resources, coupled with reluctance to adopt new technologies due to uncertainties about their benefits (Orłowska & Żołądkiewicz, 2018, p. 98).

Despite Poland's dynamic MSME sector, their digitalization lags behind the EU average. Studies show a slow pace of digitalization, with only marginal improvements over the years. The reluctance to invest in ICT stems from short-term planning and individual decision-making by business owners. Financial constraints and uncertainties about ICT benefits remain significant barriers (Orłowska & Żołądkiewicz, 2018, p. 100).

Third Sector organizations in Poland play a crucial role in fostering digital competencies, particularly in addressing issues like online security. Despite limited resources and insufficient state support, the Third Sector in Poland remains proactive in embracing the digital revolution, striving to capitalize on new opportunities (Skill It, 2020, pp. 4-7).

The Landscape of MSMEs & TGOs and Digitalization in Italy

According to the latest data from ISTAT, companies with fewer than 250 employees make up the vast majority of Italian businesses. Employees in SMEs, including micro-enterprises, account for approximately 76.5% of the total and contribute to nearly 65% of the value added at factor cost (64.4%).

To better understand the significance of Small and Medium Enterprises within the Italian economic and productive framework, it is important to delve into the numbers. Out of 4.4 million active businesses in Italy, micro-enterprises with fewer than 10 employees are the most numerous, representing 95.13% of the total, compared to 0.09% for large enterprises.

Italian SMEs number around 211,000, accounting for the remaining 4.78% of the Italian entrepreneurial fabric. However, they alone are responsible for 41% of the total turnover generated in Italy, 33% of all private sector employment, and 38% of the country's value added.

With the exception of Germany, Italy aligns with the rest of Europe in terms of the number of small and medium-sized enterprises. Looking at productivity, it emerges that Italian SMEs are performing well: they generate a value added significantly higher than the European average of €48,000 per employee. The same cannot be said for micro-enterprises, which depict an Italy context far from European average values.

From an innovation standpoint, only 26% of Italian small and medium-sized enterprises can be considered mature. There are still few SMEs that demonstrate a good orientation towards digitalization and possess the necessary tools to develop their business in light of digital transformation and remain competitive in the market.

The landscape of the Third Sector in Italy

According to the latest update from Istat's Permanent Census of Non-Profit Institutions, as of December 31, 2020, there were over 360,000 organizations in Italy, specifically 363,499, with an increase of around 0.2% (compared to a 0.9% increase in 2019).

The numbers tell the story of a sector that has been growing significantly in recent years: in 2011, there were just over 301,000 entities, and in 2001, around 235,000, representing a growth of 52.8%. The data encompass a wide range of entities, from volunteer organizations to trade unions, from social enterprises to political parties.

In light of the results of the sample survey, 72.1% of non-profit institutions active in 2021 benefited from the free activity of 4.661 million volunteers. Although down compared to the latest available data from 2015 (-15.7%), Italian volunteers remain one of the main pillars of the sector, carrying out activities that significantly impact the country's economic and social development, quality of life, social relationships, and citizens' well-being. Employees are on the rise, numbering over 870,000, 870,183, depicting a possible new scenario that branches out into both old and new forms of civic engagement and initiatives for responsible economy.

Non-profit entities in Italy are mostly associations: there are over 309,000 of them, representing 85.2% of the total. However, from an occupational perspective, they only cover 19.6% of the total workforce, with 170,000 people. From this standpoint, the real driving force is social cooperatives, which, despite representing only 4.1% of the total number of entities, provide employment for over 461,000 people, accounting for 52.9% of the total. Additionally, there are over 8,200 foundations with over 105,000 paid employees, and there are still over 30,000 "other legal forms" that employ over 132,000 people.

Micro, Small, and Medium Enterprises (MSMEs) and third sector organizations in Italy share a fundamental similarity in their contribution to the country's socio-economic development, albeit in different spheres. MSMEs are pivotal in the Italian economy, where they exhibit potential for global trade and internationalization, leveraging their competencies and technological capabilities (Sadeghi & Biancone, 2017). On the other hand, third sector organizations, including social cooperatives and nonprofits, play a crucial role in social inclusion and community services, often stepping in where the public sector withdraws, thereby addressing the needs of disadvantaged groups (Borzaga & Fazzi, 2014).

The digital transformation in both Micro, Small, and Medium Enterprises (MSMEs) and third sector organizations in Italy reflects a pivotal shift towards leveraging digital technologies for enhanced performance, innovation, and value creation. This transition is characterized by the adoption of digital tools and strategies that foster a dynamic capability, enabling these entities to navigate the complexities of the digital age effectively.

For MSMEs, digital transformation involves the innovation of business models through the use of digital instruments, creating new distribution channels, and new ways to create and deliver value to customer segments. This transformation is significantly driven by the development of sensing and learning capabilities, which act as triggers for digital adaptation and growth (Matarazzo, Penco, Profumo, & Quaglia, 2021). Similarly, the digital transformation strategy within the context of small innovative enterprises (SIEs) emphasizes the importance of digital collaboration and the adoption of digital tools in enhancing social innovation capital, demonstrating how digital processes can positively affect the collective capacity of organizations to innovate (Chierici, Tortora, Del Giudice, & Quacquarelli, 2020).

In the third sector, digital transformation is not only about technological adoption but also involves a socio-political solution that addresses the culture of the organization. This mirrors the experiences within MSMEs, where digital transformation requires specific organizational structures and a cultural shift towards digital readiness and agility. Both MSMEs and third sector organizations in Italy face the challenge of digital transformation as an ongoing process that requires strategic renewal, technological adaptation, and a shift in organizational culture.

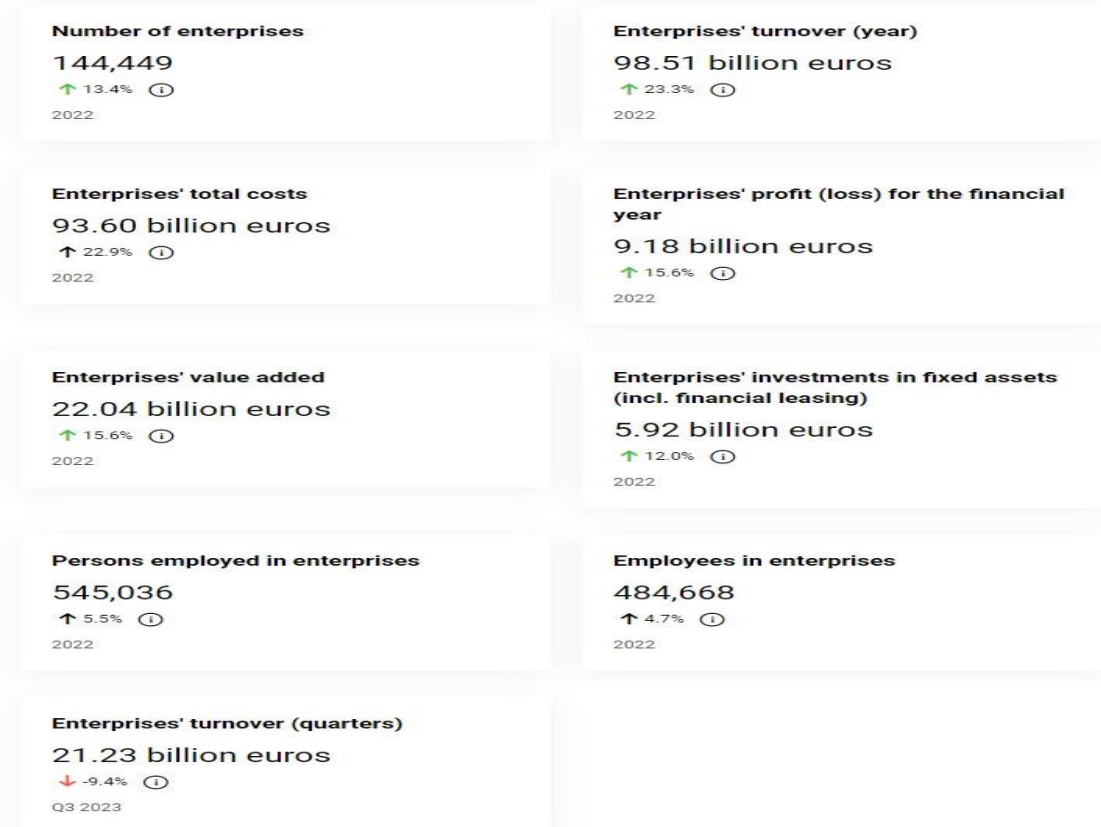
The digitalization of MSMEs and Third Sector Organizations

In 2023, small and medium-sized enterprises (SMEs) are still lagging behind in specialized digitalization activities. In 2023, 60.7% of SMEs adopt at least 4 digital activities out of the 12 used to compose the Digital Intensity Index (57.7% in the EU27).

Among businesses with at least 10 employees, leading indicators compared to EU businesses include cloud computing (61.4%, compared to 45.2% in the EU27) and electronic invoicing, mandated by law in Italy for a wide range of economic operators (97.5%, compared to 38.6% in the EU27).

47.9% of SMEs (48.7% of EU SMEs) use at least one management software, but only 13.6% electronically share data with suppliers or customers within the supply chain (compared to 23.5% in the EU average). The lack of skills hampers the adoption of artificial intelligence (AI) technologies: it is an obstacle for 55.1% of businesses that have considered using AI technologies but have not adopted them.

According to Istat, the process of digital transition is undertaken in a heterogeneous manner by non-profit organizations, especially when considering the type of digital technologies they adopt. Looking at the distribution by legal form, non-profit institutions (NPIs) that use digital technologies more than the national average (79.5%) include foundations (86.5%) and social cooperatives (86.4%). Regarding the different technologies used, specifically, 44.7% of digitized foundations have adopted infrastructures such as digital platforms, achieving significant levels also in the use of mobile applications (38.7%) and cloud services (21.1%). Social cooperatives show a varied propensity in



adopting digital technologies, embracing not only internet connection but also more innovative tools such as platforms (39.3%), apps (33.9%), and cloud services.

Among the non-digitized INPs (which account for 20.5% of the total), 29.5% believe that the adoption of digital technologies is not necessary for carrying out their activities. The main factors that have slowed down the digitalization of the nonprofit sector include a lack of financial resources (26.4%), a poor digital culture (15.7%), the presence of other more urgent challenges and/or issues (13.8%), a shortage of qualified personnel (12.6%), and a lack of investment in technological innovation (9.0%).

The Landscape of MSMEs & TSOs and Digitalization in Estonia

The following desk research aims at providing an updated country-based overview in the Third Sector Organizations, MSMEs and VET providers (C-VET & Digital Skills) in terms of digital readiness and identifying existing training offers that could be relevant for the project.

The MSMEs Landscape and Digitalization in Estonia

The landscape of MSMEs is growing fast in Estonia. Here is an infographic about Estonian companies prepared by the Estonian Statistical Office.

According to the Estonian Statistical Office, it can be seen that 95% of enterprises in Estonia are micro-enterprises with less than 10 employees.

| | TOTAL | Less than 10 | % total number of companies |
|--|--------|--------------|-----------------------------|
| Agriculture, forestry and fishing | 10,812 | 10,507 | 97% |
| Mining and quarrying | 168 | 119 | 71% |
| Manufacturing | 9,927 | 8,198 | 83% |
| Electricity, gas, steam and air conditioning supply | 676 | 627 | 93% |
| Water supply; sewerage, waste management and remediation activities | 320 | 243 | 76% |
| Construction | 16,579 | 15,565 | 94% |
| Wholesale and retail trade; repair of motor vehicles and motorcycles | 23,653 | 22,325 | 94% |
| Transportation and storage | 9,237 | 8,634 | 93% |
| Accommodation and food service activities | 4,583 | 3,954 | 86% |
| Information and communication | 13,102 | 12,709 | 97% |
| Financial and insurance activities | 3,592 | 3,479 | 97% |
| Real estate activities | 10,24 | 10,115 | 99% |
| Professional, scientific and technical activities | 22,802 | 22,332 | 98% |
| Administrative and support service activities | 7,857 | 7,381 | 94% |
| Education | 2,907 | 2,844 | 98% |
| Human health and social work activities | 2,604 | 2,243 | 86% |
| Arts, entertainment and recreation | 5,518 | 5,443 | 99% |
| Other service activities | 9,304 | 9,226 | 99% |

Table 1. Statistics of companies by number of employees

Third Sector Organizations

According to the Center for Registers and Information Systems, there are approximately **23,000** non-profit organizations and foundations in Estonia. About 800 of them are foundations.

At the same time, the number of NGOs does not describe the situation truthfully, because it is estimated that a third of NGOs may be inactive. Non-profit organizations that have not been deleted from the register, but which do not operate temporarily or permanently, are considered inactive.

According to Statistics Estonia, in 2020 the share of NGOs with paid employees was 22.5 percent. **9,300 NGOs** included in the statistical profile, including housing associations, have at least 1 salaried employee.

According to the data of the Tax and Customs Board, the share of employees of NGOs and SAs is a little more than eight percent in total, while in NGOs separately it is slightly less than five percent. Most, or about 95 percent, of NGOs are at the micro-enterprise level, so to speak, employing one to nine people.

According to the data of the network of social enterprises, there were 128 social enterprises in Estonia in 2019, which employed 1,759 people. The income of social enterprises was 44.8 million euros.

The Landscape of MSMEs & TSOs and digitalization in Spain

The following desk research aims at providing an updated country-based overview on the state of art in the Third Sector Organizations, MSMEs and VET providers (C-VET & Digital Skills) in terms of digital readiness and identifying existing training offers that could be relevant for the project.

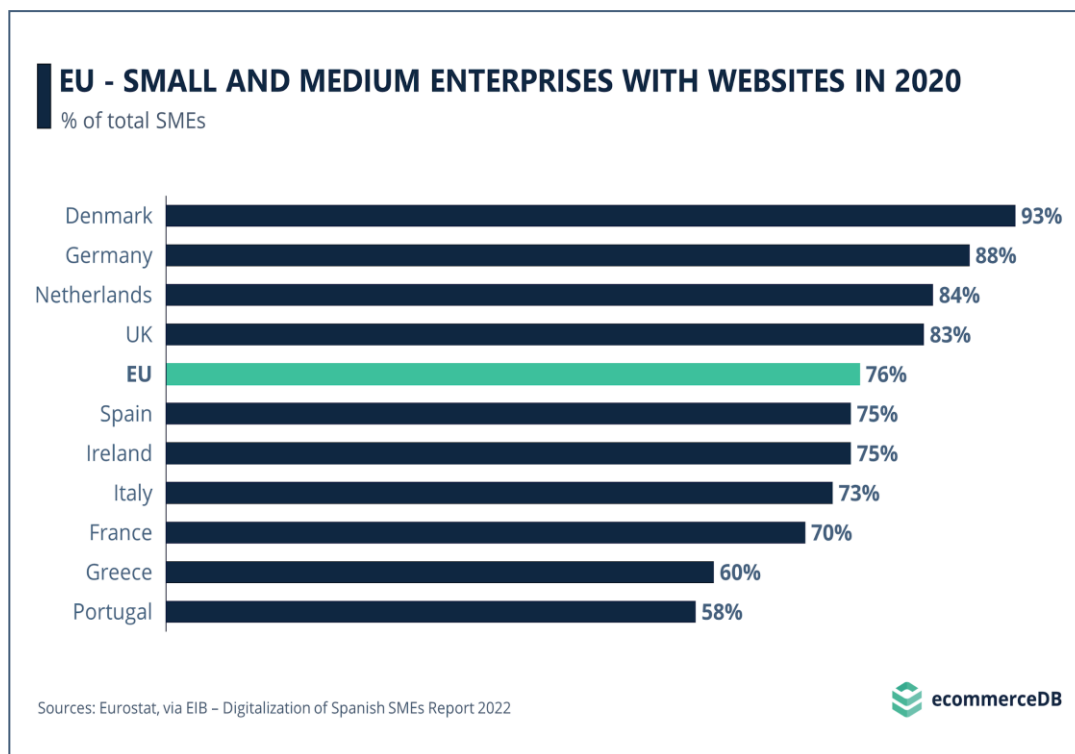
SMEs Entrepreneurship Landscape and Digitalization in Spain

According ECDB (eCommerceDB GmbH) in Spain, the world's 16th largest eCommerce market, has shown resilience since its economic hardship following the financial crisis of the early 2010s. Amid the pandemic, the government initiated a digital transformation strategy that includes the development of its small and medium-sized enterprises (SMEs).

In Spain, SMEs account for 99% of active businesses, or about 2.8 million in total, considerably higher than the EU average of 67%. SMEs generate 60-61% of the country's value added and employ 72% of the Spanish workforce. However, in terms of productivity, they contribute less value per person compared to larger companies, a trend that mirrors the EU average.

It shows that Spanish SMEs are in dire need of improvement in their business strategies and sales. But the Spanish government has already identified one factor that will help them make progress: Digitization.

The European Commission's Digital Economy & Society Index (DESI) of 2022 shows the share of SMEs in the EU that have a web presence. While this does not imply that companies are also engaged in eCommerce, this metric shows us how digitally inclined SMEs are at the national level. It also allows for cross-country comparisons.



The graph shows that Spain is positioned around the EU average (76%), with 75% of Spanish SMEs having a website in 2020.

The Landscape of the Third Sector in Spain

The Third Sector plays a major role in satisfying the many social needs of the population in areas of action which are beyond the reach of other organisations and institutions. The Third Sector's importance in Spain is borne out by the almost 30,000 organisations that make up the sector, the more than seven million people they attend to annually, the €10,500 million managed or the more than two million people, including volunteers and employees, who work daily in the fight against poverty and social exclusion. Particularly relevant is the Third Sector's role especially in hard times, for example, during the years of the economic crisis. During this period, sector organisations played an essential role in mitigating the undesirable effects of the crisis for the population.

The growing importance on the public agenda of the needs of those people who are at risk of poverty or exclusion shapes the Third Sector's vital role in the social and economic development of Spain. TS organisations currently satisfy a large number of social needs, which might otherwise go unattended, through a solid structure of employees and volunteers who work daily to meet society's demands. In order to meet society's demands, there are currently around 30,000 organisations and more than 2 million people in the Third Sector which receives.

In order to ensure that the sector continues to be relevant in society and can continue to develop, it will be essential to adapt to the disruptive changes taking place worldwide. These changes will be prompted by five global trends that PwC has named megatrends: demographic changes, accelerated urbanisation process; climate change and lack of resources; major technological breakthroughs;

changes in global economic powers. These megatrends will have a major impact for the TS in the medium and long term and the sector has to be ready, foresee and successfully address them in order to leverage the opportunities for growth and development and take on the challenges and threats. In this respect, it will be necessary to carry out an exercise of critical strategic reflection on how these global changes will impact from two perspectives, namely, that of the funders and the beneficiaries.

Main elements and distinctive features of VET in Spain

Main features of the VET system include :

- in the last ten years participation in VET increased by more than 70%;
- in the same period, early leaving from education and training has considerably decreased but is still below the national target;
- in VET programmes managed by the education authorities, males are the majority of learners: 71.1% in basic VET, 56.9% in intermediate VET and 52.4% in higher VET programmes;
- 50% of VET learners are found in three professional branches : health, administration and management ; information and communications technology; and sociocultural and community services;
- the number of apprenticeships/dual VET learners is slowly increasing but is still a minority option compared to school-based programmes.

The Spanish constitution provides the right to education and retraining, which public authorities have to promote. Initial vocational education and training (VET) is the responsibility of education authorities; continuous training is the responsibility of employment authorities. The national system for qualifications and vocational training is the umbrella for VET programmes, leading to formal qualifications awarded by either the education or employment authorities: they share the same consultation bodies but the governance and objectives of their VET qualifications and programmes differ.

Mutual recognition of some parts of the training (modules), acquired in training programmes offered by the education or employment authorities, is possible as both take as reference the occupational standards of the national catalogue. VET programmes are modularised and include compulsory workplace learning at the end of, or during, studies. Learners need to pass all modules to obtain the relevant qualification. However, modularisation allows partial certification and re-engagement from a lifelong learning perspective.

The introduction of basic VET programmes (ISCED 353) and direct access to intermediate VET (ISCED 354) programmes in upper secondary have opened up progression routes for youngsters at risk of dropping out of compulsory education and, in some cases, for adults with low or no qualifications. Adults may have their skills recognised or acquire a formal qualification through training. Key competences tests have been developed for advanced VET programmes and professional certificate access. VET programmes using online or virtual learning environments and platforms are being developed to ease access to VET.

The Spanish Open-Source Environment

According to the research carried out by the ISA Programme of Wavestone's European Services team, the use of open-source software (OSS) in Spain is rooted in civil society and the industry. This bottomup approach is shown on an annual basis at various free software conferences, such as OpenExpo Europe held in Madrid for the past seven years and LibreCon, which have both proved to be highly popular events. LibreCon is the successor of the Open-Source World Conference, which came into existence in 2004.

While civil society plays an important role, in Spain, there are policy and legislative initiatives advocating for the use and production of Open-Source Software (OSS) in public administrations. In 2015, the government reinforced legislation on the use of OSS by public entities, and published guidelines to encourage the development of reusable assets with appropriate licensing.

A characteristic of the Spanish open-source environment is the effective decentralisation of public administrations and the ability of individual regions to autonomously develop their own regulations. This helps to explain why some regions in Spain play an important role in driving the implementation of OSS solutions. The region of Andalucia houses the largest regional repository of reusable solutions for public administrations and also notably the Forge of the Government of Galicia². Another key regional player is the Basque Country, where there are numerous laws and regulations in place which aim to nudge public administrations to share and reuse ICT solutions. In Spain, for example, open source has a strong presence in the financial, insurance, energy, retail, telco, healthcare and public administration sectors, among many others (El Periodico, 2020).

Concluding remarks on Digital Gap: Challenges, motivators and impact for MSMEs and TSOs

According to Fran Leal (2020) Open source should be a fundamental part of any SME's IT strategy, as it offers unrestricted access to the latest technological innovations at a very competitive price. For any business challenge that can be solved with the help of technology, open-source software allows MSMEs to test the software without having to rely on any particular vendor or upfront investment. Looking ahead, when professional support for this software is desired, many open-source projects have vendors that provide business services around these technologies.

It is true that for an SME, searching the open-source space, finding popular and useful projects, can be time consuming. But they can look at companies, such as Red Hat, the leading provider of open-source software solutions for the enterprise, associated with open source projects and see what they are working on. This can provide more confidence in the long-term viability of the project.

According to a study by Red Hat (2020), this type of software is playing an increasingly important role at a strategic level for organizations. Because of this, it is strongly displacing proprietary software. In addition, it is noted that cloud computing and open-source software now go hand in

hand. And, what seems even more important, IT leaders choose this type of software because of its high quality and the security it provides.

According to their report, 95% of companies consider open source to be very important to their overall software strategy, up from 89% last year. In addition, 89% of respondents believe that enterprise open source is being adopted by the most innovative companies, further driving the open-source trend. As a result, it is predicted that in the next two years, at least, Open-Source software will continue to displace proprietary software.

While in 2019 55% of software used by organizations was proprietary, in 2020 the percentage has fallen to 42%. Meanwhile, respondents to this study say that 36% of their organization's software is currently open source, and they predict that within two years the percentage will rise to 44%.

One of the main factors that will drive this transition in the future is the close link between the cloud and open-source software, something that is increasingly important for 63% of IT leaders who have a hybrid infrastructure. And, of the 37% who do not have such an infrastructure, 54% plan to implement one within the next two years. And the vast majority of these leaders are expected to turn to open source to build their hybrid IT platforms, with 83% of all of them saying that open source software has been vital to their organization's ability to take advantage of the possibilities of the cloud.

Another fact to take into account from this study is that cost is no longer the only motivation for organizations to adopt Open Source, but now the first reason for the change is the better quality of the software (33%), followed by the lower total cost (30%) and the greater security it offers (29%). Finally, the study indicates that this software modality is extending to new areas, as currently the three main infrastructure areas where organizations use Open Source are security (52%), cloud management tools (51%) and databases (49%).

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