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# **National Skills Gaps and Needs Analysis: Slovenia**

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CCIS

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## Abbreviations and glossary of terms

|      |                                                   |
|------|---------------------------------------------------|
| AI   | Artificial Intelligence                           |
| AT   | Austria                                           |
| ASP  | Associated Strategic Partners                     |
| BH   | Bosnia and Herzegovina                            |
| BG   | Bulgaria                                          |
| CE   | Circular Economy                                  |
| CZ   | Czech Republic                                    |
| DE   | Germany                                           |
| DR   | Danube Region                                     |
| EU   | European Union                                    |
| HR   | Croatia                                           |
| HU   | Hungary                                           |
| i4.0 | Industry 4.0                                      |
| IoT  | Internet of Things                                |
| LCA  | Life Cycle Assessment                             |
| LP   | Lead Partner                                      |
| MD   | Moldova                                           |
| NGO  | Non-Government Organization                       |
| PP   | Project Partner                                   |
| R&I  | Research and Innovation                           |
| RO   | Romania                                           |
| RS   | Serbia                                            |
| S3   | Smart Specialization                              |
| SK   | Slovakia                                          |
| SL   | Slovenia                                          |
| SME  | Small and Medium Enterprises                      |
| SO   | Specific Objective                                |
| STEM | Science, Technology, Engineering, and Mathematics |

# 1 Executive summary

The analysis of skills gaps and needs for women entrepreneurs in Slovenia regarding digital and circular transitions reveals several critical insights and recommendations.

## **Needs and Challenges for Obtaining Skills and Digitalisation of Businesses**

The survey among women entrepreneurs highlights significant challenges related to digital skills and knowledge. Many women entrepreneurs face difficulties in adapting to technological advancements, indicating a pressing need for improved training in digital competencies. Additionally, financial constraints are a major barrier to digital transformation. Women entrepreneurs often struggle more than their male counterparts to secure necessary funding, impeding their ability to invest in new technologies and digital solutions. Although training and development programs are available, they are not sufficiently robust or continuous to meet the evolving demands of the digital and circular economy.

## **Needs and Gaps in Skills for Circular/Digital Transition**

Interviews with stakeholders corroborate these findings, revealing that existing support structures fall short in addressing the needs of women entrepreneurs. There is a notable gap in support for transitioning to a digital and circular economy. Networking opportunities are also limited, restricting the ability of women entrepreneurs to share knowledge, resources, and support. Furthermore, stakeholders emphasized the need for improved legal and regulatory support tailored to the unique challenges faced by women entrepreneurs, suggesting that policies should aim to create a more inclusive entrepreneurial ecosystem.

## **Motivation Factors and Successful Support Measures**

The case study of Puppilam, a small company successfully integrating circular economy principles, illustrates key motivation factors and effective support measures. Financial assistance, mentorship, and a strong commitment to sustainability and social impact were pivotal in Puppilam's success. Effective support measures identified through the analysis include financial aid (such as subsidies and vouchers), comprehensive training and development programs (encompassing entrepreneurship training, mentorship, and coaching), and tailored legal and regulatory support.

## **Recommendations**

To better support women entrepreneurs in the circular and digital transition, several recommendations emerge from the analysis. Increasing public support, with a particular emphasis on financial assistance, is crucial. Enhanced financial aid can provide the necessary resources for women entrepreneurs to invest in digital and circular innovations. Additionally, organizing more events, workshops, and international exchanges can bridge regional disparities and equip women entrepreneurs with essential skills and knowledge. Promoting sustainability as a key business issue is also vital for gaining wider acceptance and support for circular economy practices. Emphasizing the importance of specialized software solutions for managing sustainability data effectively and efficiently can further aid in this transition.

By implementing these measures, Slovenia can create a more supportive and inclusive environment for women entrepreneurs, fostering sustainable business practices and driving progress in the digital and circular economy.

## 2 Introduction

This National Report for Slovenia is an integral component of the Transnational Skills Gaps and Needs Analysis, aimed at dissecting the unique barriers and opportunities that lie within Slovenia transition to a more circular, innovative, and digital economy. Through a meticulous examination of the current state, this report endeavors to illuminate the path forward, identifying specific needs and proposing strategic interventions to empower women entrepreneurs in the realm of CE, S3, and i4.0.

Amidst the backdrop of a global pandemic and shifting geopolitical landscapes, the urgency for this analysis has never been greater. The resilience and agility of economies hinge on its ability to harness the potential of its female entrepreneurs, equipping them with the skills and knowledge to thrive in an increasingly competitive and sustainable marketplace.

This report synthesizes data collected from a comprehensive survey, stakeholder interviews, and case studies, offering a nuanced understanding of the skills landscape in Slovenia. The objective is not only to chart the existing skills gaps but also to forge a roadmap for capacity building, policy intervention, and collaborative action that aligns with the nation's aspirations for economic revitalization and gender equity in entrepreneurship.

As we delve into the findings and recommendations herein, it is our hope that this report will serve as a catalyst for concerted efforts to bridge the skills divide, fostering an environment where women entrepreneurs can lead the charge towards a brighter, more sustainable future.

## 3 Methodology

Desk research, surveys, stakeholder interviews, case studies, and comparative analysis are used for to ensure a robust and inclusive analysis. By employing a multi-dimensional methodology, a detailed and nuanced understanding of the skills gaps and needs among women entrepreneurs in the Danube Region is aimed to be provided. This approach ensures that the analysis is both broad in its scope and specific in its findings, providing a solid foundation for the development of effective support strategies for the transition towards a more sustainable, digital, and circular economy.

Table 1: Methodology applied

| Approached applied                      | Description of the performed task                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Desk research</b>                    | Review of statistic data, surveys, strategies, legislation and key actors support is made in order to be established a baseline understanding of the current skills landscape for women entrepreneurs in Slovenia.                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Survey among women entrepreneurs</b> | <p>The analysis incorporates results from survey conducted among woman entrepreneurs form Slovenia. It was organized in the period 15/04/2024 – 31/05/2024.</p> <p>150 of respondents were identified from different sectors and questionnaires were provided to them by SurveyMonkey platform. Additionally, post in social media was shared.</p> <p>The survey provides both quantitative data and qualitative insights to analyse prevailing skills gaps and needs.</p> <p>30 of responses are collected which is equal to 20% responding rate and could be accepted as quite sufficient for the main goal of the current Analysis.</p> |
| <b>Stakeholders interview</b>           | In-depth interviews with industry experts, policymakers, academia, and support organizations for better understanding the broader ecosystem and support structures for WEs are made. Together five potential respondents were contacted and three of interviews are done. Through them are explored perceptions and suggestions for facilitating a successful s3 and i4.0 transition under CE aspects of WEs in Slovenia.                                                                                                                                                                                                                  |
| <b>Successful case interviews</b>       | Successful case one of interviews with WE who have effectively implemented circular transition are conducted aiming to be identified the motivational and successful factors which helped the WE through this process focusing on obtaining the necessary skills.                                                                                                                                                                                                                                                                                                                                                                          |

To effectively understand the dynamics of the skills gap and needs within Slovenia, a carefully curated sample of women entrepreneurs and female-led startups has been selected for this study. This sampling approach is designed to ensure a comprehensive analysis that reflects the diverse sectors and regions within the country. By examining a representative cross-section of businesses, this investigation aims to identify prevalent

challenges, opportunities for growth, and specific skills necessary for thriving in the realms of the Circular Economy, Smart Specialization, and Industry 4.0. This methodological step is crucial for deriving actionable insights and tailored recommendations that will empower women entrepreneurs to navigate and succeed in the evolving economic landscape of Slovenia.

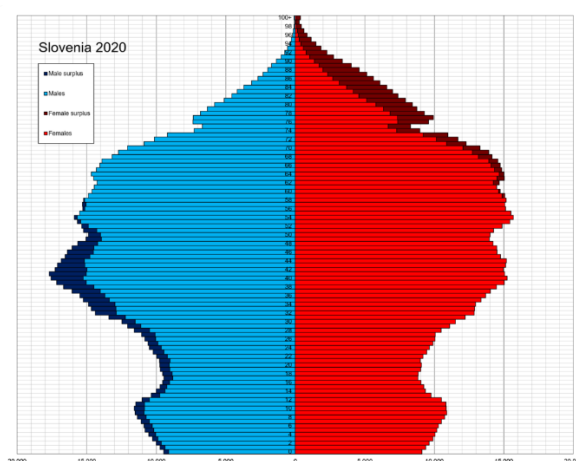
In the following text, a detailed structure of the sample comprising women entrepreneurs who participated in the survey is presented, along with the demographics of the interviewees, and an illustrative case study.

## 4 Slovenia

### 4.1 General presentation of Slovenia

Republic of Slovenia is a country in southern Central Europe. Slovenia is bordered by Italy to the west, Austria to the north, Hungary to the northeast, Croatia to the south and southeast, and a short coastline within the Adriatic Sea to the southwest. Slovenia is mostly mountainous and forested, covers 20,271 square kilometres. Ljubljana, the capital and largest city of Slovenia, is geographically situated near the centre of the country. Other major cities are Maribor, Celje, Kranj and Koper.

The **population of Slovenia** as of 2023 is 2.116.972. Male population was 1.063.271 (50,23%) and female population was 1.053.701 (49,77%)<sup>1</sup>.



<sup>1</sup> <https://podatki.gov.si/dataset/surs05c5003s>

Figure 1 - Population pyramid of Slovenia in 2020

Slovenia is among the European countries with the most pronounced ageing of population, ascribable to a low birth rate and increasing life expectancy<sup>2</sup>.

The **school system in Slovenia** is divided into three sections of education: primary, secondary and tertiary. The third segment of education, tertiary education, is provided by both public and private institutions. It consists of higher post-secondary vocational education and higher education. Higher post-secondary vocational education is provided by higher vocational colleges, while higher education is provided by faculties, academies and independent higher education institutions<sup>3</sup>.

|                        | Total            | Men            | Women          | Total           | Men          | Women        |
|------------------------|------------------|----------------|----------------|-----------------|--------------|--------------|
|                        | number           |                |                | % <sup>1)</sup> |              |              |
| <b>Total</b>           | <b>1,799,441</b> | <b>899,749</b> | <b>899,692</b> | <b>100.0</b>    | <b>100.0</b> | <b>100.0</b> |
| <b>Basic or less</b>   | <b>390,452</b>   | <b>164,380</b> | <b>226,072</b> | <b>21.7</b>     | <b>18.3</b>  | <b>25.1</b>  |
| <b>Upper secondary</b> | <b>943,601</b>   | <b>543,500</b> | <b>400,101</b> | <b>52.4</b>     | <b>60.4</b>  | <b>44.5</b>  |
| <b>Tertiary</b>        | <b>465,388</b>   | <b>191,869</b> | <b>273,519</b> | <b>25.9</b>     | <b>21.3</b>  | <b>30.4</b>  |

Table 1 - Population aged 15 or more by educational attainment and sex, Slovenia, 1 January 2023<sup>4</sup>

At the beginning of 2023, 30,4% of women aged 15+ in Slovenia had tertiary education, while the share among men was slightly lower, 21.3%.

In 2023, there were 16,629 tertiary education graduates, 9,935 or 60% of women and 6,694 or 40% of men. The largest share of women who obtained a degree at any level of tertiary education were studying business, administration and law (21,17%), followed by the field of health and welfare (18,37%) and education (14,73%). Field of engineering, manufacturing and construction has share of 8,21% and field of information and communication technologies 1,63%. On the other hand, the largest share of men who obtained a degree at any level of tertiary education were studying engineering, manufacturing and construction (32,82%), followed by the field of business,

<sup>2</sup> [https://en.wikipedia.org/wiki/Demographics\\_of\\_Slovenia](https://en.wikipedia.org/wiki/Demographics_of_Slovenia)

<sup>3</sup> <https://www.gov.si/en/topics/slovenski-solski-sistem-in-slovensko-ogrodje-kvalifikacij/>

<sup>4</sup> <https://www.stat.si/StatWeb/en/News/Index/11504>

administration and law (15,86%) and information and communication technologies (10,55%).<sup>5</sup>

In 2023, there were 989.000 employed in Slovenia, from which 45,6% were women and 54,4% were men. The majority of women are employed in manufacturing (15,7%), education (15,3%) and wholesale and retail trade (14%). The majority of men are employed in manufacturing (28,3%), wholesale and retail trade (11,5%) and construction (11,3%).<sup>6</sup>

According to statistic data for 2022, 72,2% of employed women participated in job-related non-formal education or training activity and 71,2% of employed men. Personal non-formal education or training participated 27,8% of employed women and 28,8% of employed men.<sup>7</sup>

In 2022 Slovenia had 221.483 enterprises, from which 94,88% were micro enterprises, 3,9% were small enterprises, 1,05% were medium enterprises and 0,17% were large enterprises.<sup>8</sup>

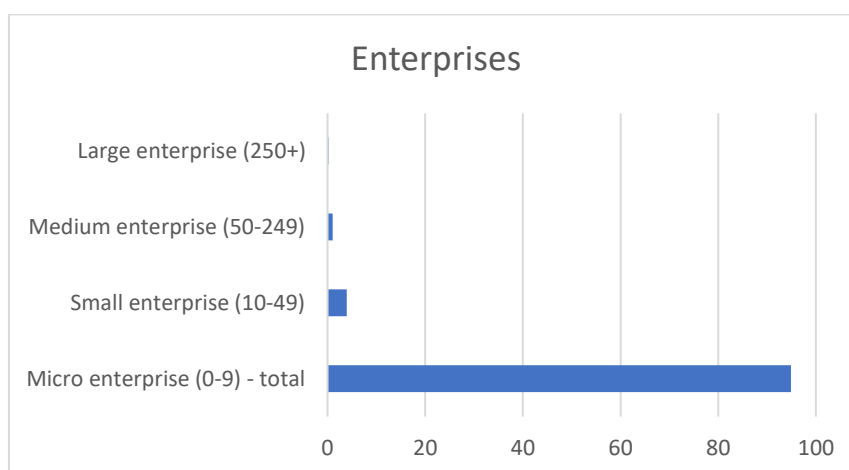


Figure 2 – Enterprises in Slovenia per size (2022)

In Slovenia, as in other countries, the entrepreneurship is still largely the domain of men, which is in line with global trends. Of all adult inhabitants in Slovenia, 8,8% have established business (4,6% women, 12,8% men) in 2023. Established entrepreneurial activity of women among all entrepreneurs in 2023 was 25%, a year before 37%. In 2023,

<sup>5</sup> STAT - <https://www.stat.si>

<sup>6</sup> STAT - <https://www.stat.si>

<sup>7</sup> STAT - <https://www.stat.si>

<sup>8</sup> STAT - <https://www.stat.si>

the share of established female entrepreneurs in Slovenia is far behind the global and European average, which indicates the specific challenges faced by female entrepreneurs in Slovenia. Targeted measures such as better access to finance, mentoring, networking and workshops are key to improving the position of women in entrepreneurship, which could reverse the negative trend, according to the GEM Slovenia 2023 - Entrepreneurship for Sustainable Future survey.<sup>9</sup>

In 2022, 58% of companies with 10 or more employees and the self-employed encountered problems with the digital transformation of the company's operations, 36% of them faced a lack of adequate staff or knowledge, and 31% faced a lack of financial resources. 26% of companies had no problems with digital transformation and 43% believed that it was not essential for successful business. In 2021, 29% of them provided education on the use of ICT. In 2021, 21% of companies employed ICT experts. In 2022, 47% of companies with 10 or more employees and the self-employed have in the systematization of jobs in the company, which digital skills or knowledge are required to perform the work. In 2022, most companies with 10 or more employees and the self-employed had a low digital index (35%).<sup>10</sup>

## 4.2 Female entrepreneurial ecosystem in Slovenia

The business support organisations are organised vertically and horizontally and incorporates public, semi-public as well as private organisations.

There are several incubators, technology parks, accelerators, coworking spaces across country and in case of physical support infrastructure is Slovenia performing well. The legislation concerning the business support environment has been changing through different governments and the support mechanisms has been upgraded a little.

**Resolution on the National Programme for Equal Opportunities for Women and Men 2023–2030** is a strategic document that defines goals and measures and key policy holders for the realization of equal opportunities for women and men in individual areas of life in the Republic of Slovenia<sup>11</sup>

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<sup>9</sup> <https://www.gemconsortium.org/file/open?fileId=51404>

<sup>10</sup> <https://www.stat.si/StatWeb/News/Index/10766>

<sup>11</sup> [https://www.gov.si/assets/ministrstva/MDDSZ/Enake-moznosti/ReNPEMZM2030/ReNPEMZM23-30\\_EN.pdf](https://www.gov.si/assets/ministrstva/MDDSZ/Enake-moznosti/ReNPEMZM2030/ReNPEMZM23-30_EN.pdf)

**The Slovenian Development Strategy 2030** declares Decent life for all. Under the Inclusive labour market and high quality jobs the promotion of employment of both sexes in gender atypical and deficient professions is proposed<sup>12</sup>.

**Resolution on the Slovenian Scientific Research and Innovation Strategy 2030** is a key strategic document for research, development and innovation. It has a chapter dedicated to gender equality (6.4. Ensuring Gender Equality in Research and Innovation).<sup>13</sup>

**Slovenian Industrial Strategy 2021 – 2030** is the strategic document of the Government of the Republic of Slovenia, that sets the guidelines for the economy's transition to a green, creative and smart economy and thus to an increase in competitiveness. Efforts should be made to promote entrepreneurship and carry out measures to encourage entrepreneurship among special target groups (e.g. youth, women, families)<sup>14</sup>.

**Slovenia's Smart Specialisation Strategy (S4)** identifies national strategic development priorities and niches, which are, in practice, supported by a focused, comprehensive and tailored policy mix. S4 implementation represents one of the main tools for strengthening and upgrading Slovenia's innovation ecosystem. The S4 also introduces economic development clusters – Strategic Research and Innovation Partnerships (SRIPs). In the chapter about Slovenian scientific research and innovation and entrepreneurship ecosystem it is also mentioned the development and implementation of services for specific target groups (e.g., young people, women, culture and creative sectors). In March 2023 Slovenia upgraded the Strategy - **Slovenia's Sustainable Smart Specialisation Strategy (S5)**<sup>15</sup>

**The Digital Slovenia 2030 strategy** is the overarching strategy for the digital transformation of Slovenia by 2030 and is the response of the Government of the Republic of Slovenia to the development challenges of digitalization. It is intended to provide strategic planning for promoting Slovenia's digital transformation in the development period by the year 2030.<sup>16</sup> In the Strategy it is mentioned, that one of the objectives of the Promotion of Digital Inclusion Act<sup>17</sup> highlights increasing interest in secondary, tertiary, and higher education programmes that include professional digital

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<sup>12</sup> <https://www.gov.si/zbirke/projekti-in-programi/izvajanje-strategije-razvoja-slovenije-2030/>

<sup>13</sup> <https://www.gov.si/assets/ministrstva/MVZI/Znanost/Nacionalne-strategije-in-dokumenti/Resolution-on-the-Slovenian-Scientific-Research-and-Innovation-Strategy-2030.pdf>

<sup>14</sup> <https://www.gov.si/en/news/2022-05-03-slovenian-industrial-strategy-2021-2030/>

<sup>15</sup> <https://evropskasredstva.si/en/slovenias-cohesion-policy-programme-2021-2027/slovenias-smart-specialisation-strategy/>

<sup>16</sup> <https://nio.gov.si/nio/asset/strategija+digitalna+slovenija+2030?lang=en>

<sup>17</sup> <https://www.uradni-list.si/glasilo-uradni-list-rs/vsebina/2022-01-0653/zakon-o-spodbujanju-digitalne-vkljucenosti-zsdv>

competences and reducing gender gaps in this area. In this context, it is crucial to encourage girls, in particular, to participate in ICT education.

From the perspective of “WE.Circular” the major institutional players are the ministries and their national agencies, but also other key actors are involved.

| Type of the actor                          | Title of the organization                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Public institutions                        | <ul style="list-style-type: none"> <li>➤ <i>Ministry of Labour, Family, Social Affairs and Equal Opportunities with its Sector for equal opportunities</i></li> <li>➤ <i>Ministry of the Economy, Tourism and Sport with its Industry, Entrepreneurship and Internationalisation Directorate, that covers innovations in enterprises, technological development and digitalisation in business and with its SPIRIT Slovenia – Public Agency for Entrepreneurship, Internationalization, Foreign Investments and Technology</i></li> <li>➤ <i>Ministry of Higher Education, Science and Innovation with its Science and Innovation Directorate and professional body Commission for equal opportunities in the field of science</i></li> </ul> |
| SMEs                                       | <ul style="list-style-type: none"> <li>➤ <i>PUPILLAM Society for the Development of Potentials - a social enterprise</i></li> <li>➤ <i>KNOF Cooperative for technological development in the field of sustainability - a social enterprise</i></li> <li>➤ <i>500 PODJETNIC, organizacija dogodkov, d.o.o.</i></li> <li>➤ <i>Circular Shield svetovanje d.o.o.</i></li> <li>➤ <i>IOS d.o.o.</i></li> </ul>                                                                                                                                                                                                                                                                                                                                     |
| Investors/<br>Financial<br>institutions    | <ul style="list-style-type: none"> <li>➤ <i>Slovene Enterprise Fund (SEF)</i></li> <li>➤ <i>SID Bank - financing and insurance</i></li> <li>➤ <i>Fund VESNA</i></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Business support<br>organizations          | <ul style="list-style-type: none"> <li>➤ <i>Chamber of Commerce and Industry</i></li> <li>➤ <i>Chamber of Crafts and Small Businesses</i></li> <li>➤ <i>Regional Research agencies</i></li> <li>➤ <i>Technology Parks</i></li> <li>➤ <i>DIH Slovenija – Digital Innovation HUB Slovenia</i></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Interested<br>organizations, incl.<br>NGOs | <ul style="list-style-type: none"> <li>➤ <i>Circular Change, Institute for Circular Economy</i></li> <li>➤ <i>Društvo Ekologi brez meja (Society Ecologists without borders)</i></li> <li>➤ <i>META Zavod za razvoj družinskega in ženskega podjetništva (META Institute for the Development of Family and Women's Entrepreneurship) - Association of Slovenian businesswomen</i></li> </ul>                                                                                                                                                                                                                                                                                                                                                  |

|                                                             |                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Academia/<br>research/<br>education and<br>training centres | <ul style="list-style-type: none"> <li>➤ <i>University of Maribor, Faculty of Economics and Business</i></li> <li>➤ <i>University of Maribor, Faculty of Chemistry and Chemical Engineering</i></li> <li>➤ <i>Faculty of information studies</i></li> <li>➤ <i>College of Sustainable Development</i></li> </ul> |
|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Table 2: Key actors in Slovenian ecosystem per types

Among the support services provided to women entrepreneurs SPIRIT Slovenia each year organizes ABC entrepreneurship trainings for potential or young entrepreneurs, focusing on women, since the trainings are the condition for applying to a Public competition/tender for the financial support for young female entrepreneurs.

Since 2011 Association of Slovenian businesswomen organizes an event for women entrepreneurs called “500 women entrepreneurs”, which has international recognition and validity, Association of Slovenian businesswomen provide also other support services for women entrepreneurs. Associations of female entrepreneurs are also organized by some chambers and other supporting business institutions.

One of Slovenia's main goals is to increase the number of ICT experts in Slovenia from the current 4.8 percent to 10 percent by 2030, and the ministry recognizes that increasing the number of female ICT experts is a necessary solution. Research still shows that there are large gender differences in specialized digital skills: in Slovenia, according to the data of the DESI index, the proportion of female ICT experts is 17 percent, and at the level of the European Union, it is 19 percent.<sup>18</sup> One of the first measures was the publication of the Public Procurement for the implementation of pilot training for women in the field of ICT. Pilot training for women were organized at the end of 2023.

The Strategic Research and Innovation Partnership – Networks for the transition into circular economy (SRIP – Circular economy) is a connection of Slovenian business subjects, educational and research institutions (RRI), non-governmental organisations and other interested parties, in collaboration with the state, into new value chains according to the economic principles of closed material flows, managed by the Chamber of Commerce and Industry of the Štajerska.<sup>19</sup>

Ministry of the Economy, Tourism and Sport Public has in April 2024 published Tender for the establishment and operation of the Slovenian Center for a Circular Economy, which will provide companies with a supportive environment and services in the field of the

<sup>18</sup><https://www.gov.si/novice/2023-07-21-pilotna-neformalna-usposabljanja-za-zenske-s-podrocja-informacijsko-komunikacijskih-tehnologij/>

<sup>19</sup><https://srip-circular-economy.eu/srip-circular-economy/about-us/>

circular economy and raise awareness and encourage society towards a green transition.<sup>20</sup>

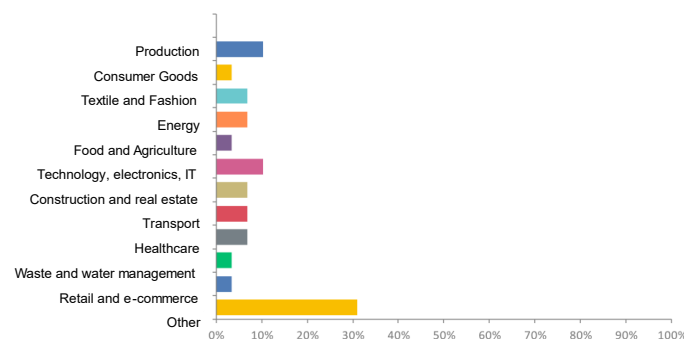
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<sup>20</sup><https://www.gov.si/novice/2024-05-28-informativni-dan-za-javni-razpis-slovenski-center-za-krozno-gospodarstvo-jr-ckg/>

## 5 Analysis of skills gaps and needs of women entrepreneurs for digital and circular transition

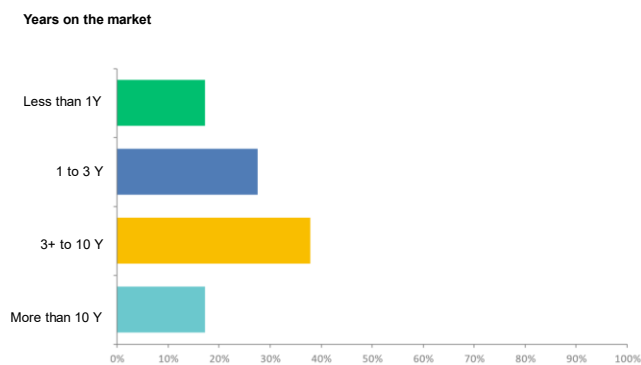
We received a total of 36 responses to the questionnaire. After excluding irrelevant ones, we are left with 30 valid answers. The distribution of respondents across different sectors aligns with the overall representation of women entrepreneurs in the Slovenian economy. Most women-owned businesses are in various service sectors, which is also where most of our responses came from. Respondents categorized under "Other" primarily work in education, services, consulting, marketing, and business consulting.

Distribution of respondents per sectors



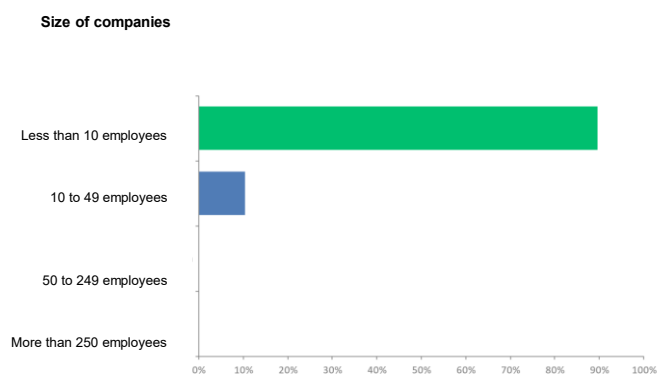
Source: authors elaboration

Most respondents have been operating in the market for 3 to 10 years. Their feedback primarily pertains to established businesses rather than startups or new ventures.



Source: authors elaboration

Regarding company size, 89.66% were micro enterprises with fewer than 10 employees, while 10.34% were small enterprises with up to 49 employees.



Source: authors elaboration

## 5.1 Circular Economy (CE)

Concerning familiarity with the concept of the circular economy, the weighted arithmetic averages indicate that overall familiarity falls between 3 and 4 on a Likert scale (scale 5 means completely familiar). The table below provides the evaluation for each specific concept.

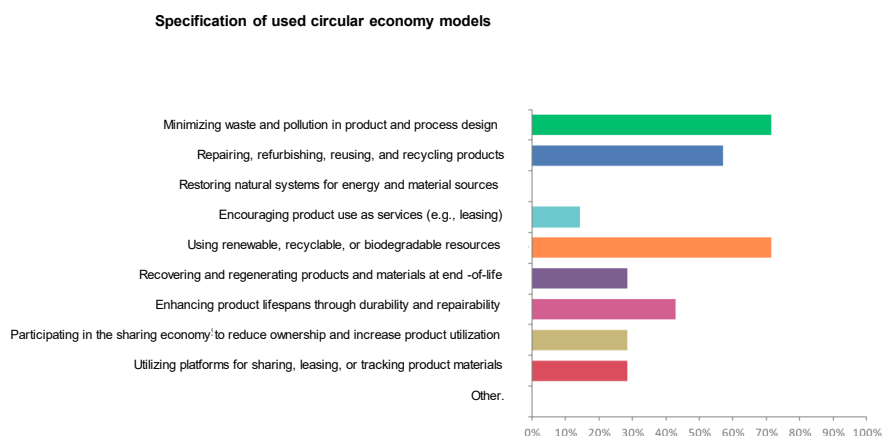
| Concept                                                                                                                                                          | Weighted Average |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| The general concept of the circular economy (CE).                                                                                                                | 3,65             |
| The concept of designing products and processes in a way that minimizes waste and pollution.                                                                     | 4                |
| Strategies to keep products and materials in use for as long as possible, through practices like repairing, refurbishing, reusing, and recycling.                | 4,04             |
| The concept of regenerating natural systems, aiming to restore, renew, or revitalize their own sources of energy and materials.                                  | 3,62             |
| The idea of rethinking business models to encourage the use of products as services (e.g., leasing rather than owning) to maximize the utilization of resources. | 3,5              |
| The concept of Product as a Service, where businesses retain ownership of the product while selling the usage or service it provides.                            | 3,31             |
| The use of renewable, recyclable, or biodegradable resource inputs to support circular production and supply chains.                                             | 3,81             |
| Strategies for recovering and regenerating products and materials at the end of their service life.                                                              | 3,73             |
| Strategies and designs intended to extend the lifespans of products through durability, repairability, and upgradeability.                                       | 4,04             |
| The concept of the sharing economy as a way to reduce ownership and increase the utilization rate of products through sharing.                                   | 3,77             |
| The role of digital technology in enabling circular economy practices, such as through platforms for sharing, leasing, or tracing product materials.             | 3,73             |

Source: authors elaboration

Respondents have the lowest familiarity with the concept of product as a Service, where businesses retain ownership of the product while selling the usage or service it provides. On the other hand, they are most familiar with the strategies to keep products and materials in use for as long as possible, through practices like repairing, refurbishing, reusing, and recycling and the strategies and designs intended to extend the lifespans of products through durability, repairability, and upgradeability, are the most familiar.

The highest familiarity with the concept of circular economy is in the Waste and water management, Textile and Fashion and in “Other” sector.

Only 26,92% of respondents stated that they use circular technologies or models in their business. The 3 most used circular economy models in Slovenia are - (1) Minimizing waste and pollution in product and process design, (2) Using renewable, recyclable, or biodegradable resources and (3) Repairing, refurbishing, reusing, and recycling products.

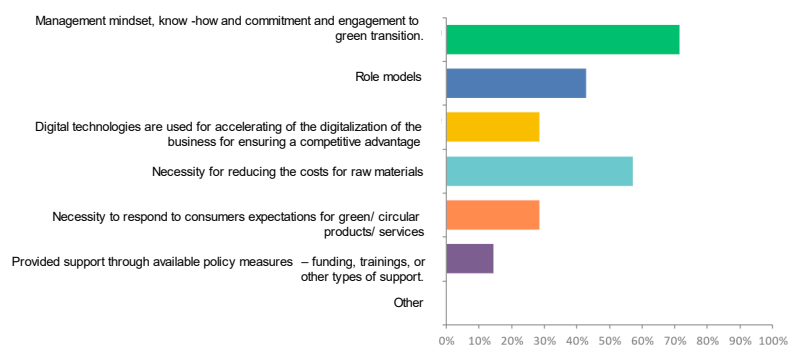


Source: authors elaboration

The primary reasons women entrepreneurs choose to implement circular models in their businesses are the *Management mindset, know-how and commitment and engagement to*

*green transition the need to adapt to consumers' expectations; followed by Necessity for reducing the costs for raw materials and Role models. Conversely, the least motivating factor for women entrepreneurs is the Provided support through available policy measures – funding, trainings, or other types of support.*

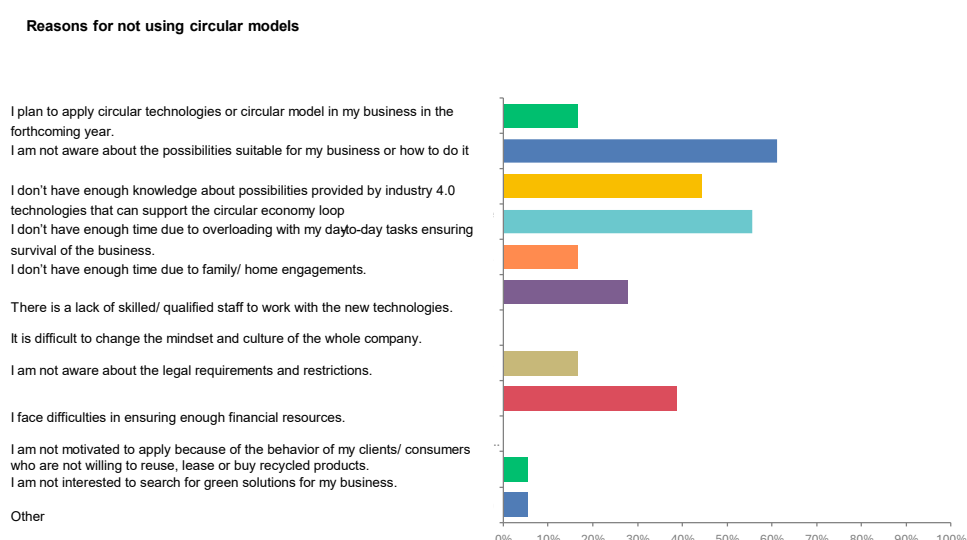
**Main drivers for application of circular models**



Source: authors elaboration

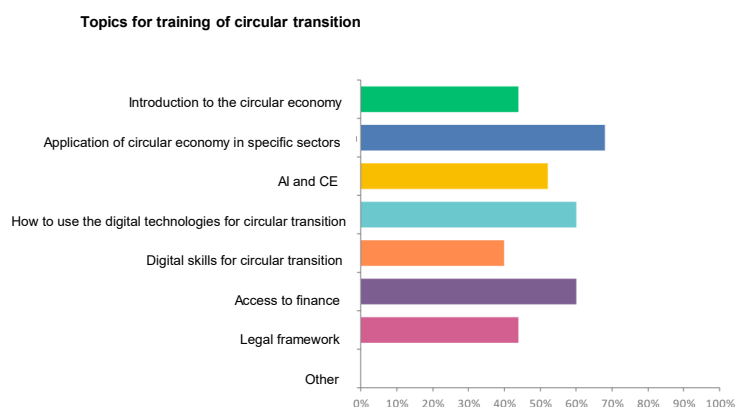
73,08 % are not using circular models in their business. The main reasons why the respondents don't use circular models are because *they are not aware about the possibilities suitable for my business or how to do it* and *that they don't have enough time due to overloading with their day-to-day tasks ensuring survival of the business*.

26,92% of the respondents who are currently not using circular economy models are not planning to use these models in the future, because they are not motivated to apply because of the behaviour of their clients/ consumers who are not willing to reuse, lease or buy recycled product.



Source: authors elaboration

The primary reason why women entrepreneurs in Slovenia are not adopting circular business models is their lack of awareness about the potential opportunities applicable to their businesses or the methods to implement them. In connection with this, the training topics they would find most useful include practical subjects such as the application of circular economy principles in relevant sectors, the use of digital technologies to facilitate this transition strategies and the knowledge how to financing the transition to circular models.



Source: authors elaboration

In the realm of the circular economy, respondents fall into two primary groups based on their motivations. The first group consists of individuals who view the circular economy as a personal conviction and lifestyle choice. The second group includes those updating their business models to align with customer expectations. Meanwhile, women entrepreneurs express a desire to integrate circular economy principles into their businesses but often lack the know-how. This is evident in their strong interest in practical training on the topic, which they would find particularly beneficial.

## 5.2 Industry 4.0 (i4.0)

To gain a clearer understanding of the digital skills requirements and deficiencies, we surveyed women entrepreneurs regarding the digitalization levels of their businesses and their willingness to embrace digital technologies. The table below summarizes the extent to which these women entrepreneurs have adopted technology, with a score of 5 indicating the highest level of adoption.

| Type of technology                                                                                                                                                                               | Weighted Average |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| <b>Mobile Technologies:</b> Employing mobile devices and applications to facilitate communication, remote work, and access to business applications and services.                                | 4,38             |
| <b>Collaboration Tools:</b> Adopting platforms for team collaboration, project management, and communication to enhance productivity and support remote work.                                    | 3,5              |
| <b>E-Commerce Platforms:</b> Using online platforms for buying and selling goods and services, including websites and mobile apps tailored for e-commerce.                                       | 3,5              |
| <b>Cloud Computing:</b> Utilizing cloud services for storage, computing power, and business applications allows for scalability, flexibility, and remote access to resources.                    | 3,88             |
| <b>Digital Marketing Tools:</b> Utilizing online platforms, social media, and analytics tools for targeted marketing, customer engagement, and sales optimization.                               | 3,25             |
| <b>Big Data and Analytics:</b> Leveraging large sets of data to analyze trends, patterns, and insights for informed decision-making and strategic planning.                                      | 2,25             |
| <b>Artificial Intelligence (AI) and Machine Learning (ML):</b> Implementing AI and ML for automation, predictive analysis, customer service (through chatbots), and personalization of services. | 2,50             |
| <b>Internet of Things (IoT):</b> Connecting devices and machinery to collect and exchange data, enabling smart operations, enhanced monitoring, and efficiency improvements.                     | 2,25             |
| <b>Blockchain:</b> Adopting blockchain technology for secure, transparent, and tamper-proof record-keeping and transactions.                                                                     | 1,50             |
| <b>Cybersecurity Technologies:</b> Implementing advanced security solutions to protect data, networks, and operations from cyber threats and breaches.                                           | 2,25             |
| <b>Augmented Reality (AR) and Virtual Reality (VR):</b> Implementing AR and VR for immersive experiences, training, product demonstrations, and customer engagement.                             | 1,25             |
| <b>3D Printing:</b> Utilizing additive manufacturing technologies for prototyping, production, and customization of products.                                                                    | 1                |
| <b>Robotics and Automation:</b> Incorporating robots and automated systems for manufacturing, warehousing, and repetitive tasks to increase efficiency and reduce costs.                         | 1                |

|                                                                                                                                                 |   |
|-------------------------------------------------------------------------------------------------------------------------------------------------|---|
| <b>Digital Twin Technology:</b> Creating virtual replicas of physical systems to simulate, monitor, and analyze their performance in real-time. | 1 |
|-------------------------------------------------------------------------------------------------------------------------------------------------|---|

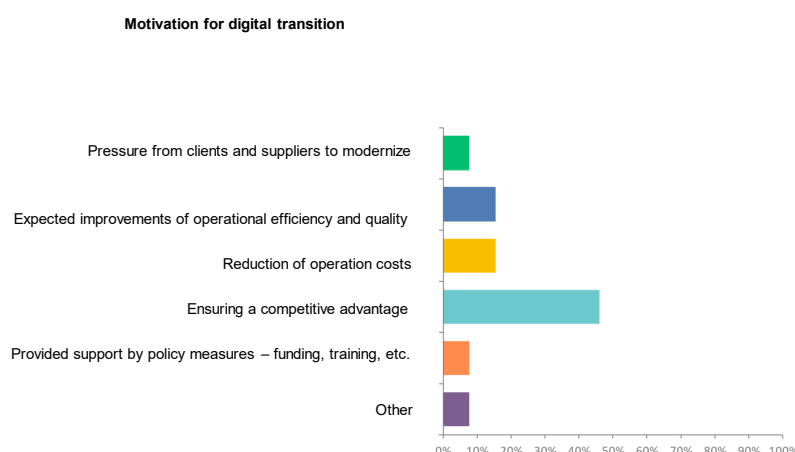
Source: authors elaboration

Of those respondents who use digital technologies, mobile technologies, and cloud computing have been adopted the most. On the other hand, 3D Printing, robotics and automation and digital twin technologies and have the lowest adoption.

In the **"Other" sector and the Transport sector**, mobile technologies and e-commerce platforms show the highest levels of adoption.

In the **Construction and real estate sector** the mobile technologies and collaboration tools have the highest degree of adoption.

The primary motivation for digital transition among women entrepreneurs is gaining a competitive edge. This is followed by anticipated improvements in operational efficiency and quality and quality, as well as the reduction of operational costs.



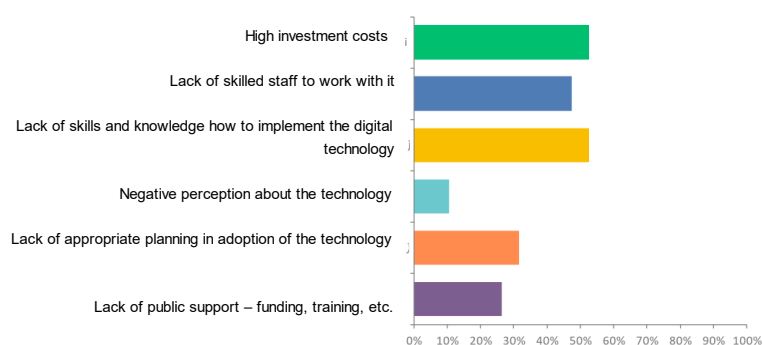
Source: authors elaboration

In Slovenia, women entrepreneurs face significant hurdles in embracing digital transformation. The primary challenges include the considerable costs associated with investments, a lack of expertise in implementing digital technologies, and the scarcity of

skilled personnel capable of managing these technologies effectively. Additionally, inadequate planning in integrating new technologies poses another substantial barrier.

Interestingly, a relatively small proportion, only 10% of those surveyed, view negative perceptions of technology as a hindrance.

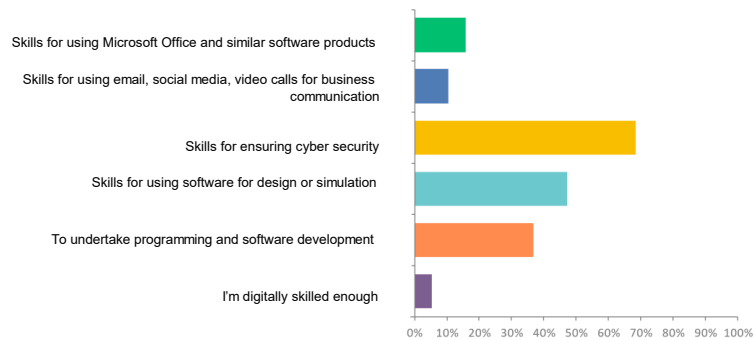
Barriers of digital transition



Source: authors elaboration

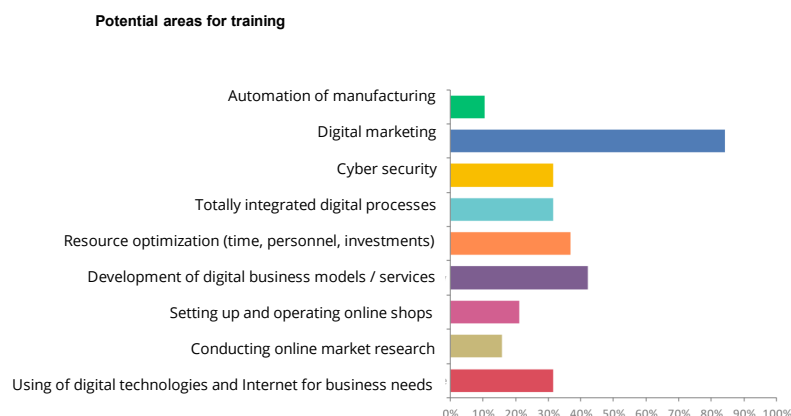
Woman entrepreneurs in Slovenia identify a deficit in digital skills as a significant obstacle to embracing digital transformation initiatives. Female respondents are least confident in the skills for ensuring cyber security, skills for using software for design or simulation and skills to undertake programming and software development. 20% of female respondents perceive that they have sufficient digital skills.

#### Digital skills needed to improve



Source: authors elaboration

The top priority for education among women entrepreneurs is digital marketing. Following closely are desires for training in developing digital business models and optimizing resources such as time, personnel, and investments. Additionally, they place equal importance on learning about cybersecurity, fully integrated digital processes, and utilizing digital technologies and the internet for business purposes.



Source: authors elaboration

In the context of Industry 4.0, there is a reluctance among companies to embrace digital transformation. Companies pursuing digital transformation are mainly motivated by extrinsic motives, such as securing competitive advantage and expected improvements of operational efficiency and quality.

Women entrepreneurs express a lack of confidence in their digital skills and recognise the need to improve their digital skills.

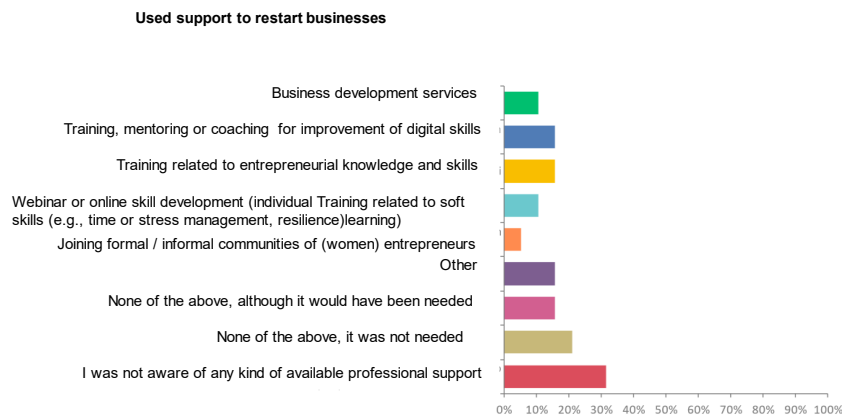
### 5.3 Smart Specialization (S3) and external impacts

Smart specialization, despite its potential, remains relatively obscure to a significant majority of respondents, with only approximately 16.67% demonstrating familiarity with this strategic approach. Nonetheless, for those actively pursuing smart specialization initiatives, there is a discernible pattern of collaboration with local clusters and academic institutions, particularly in the realm of innovation. Moreover, these stakeholders exhibit proactive engagement in regional activities, ensuring they remain abreast of developments pertinent to the smart specialization strategy. This proactive involvement underscores their commitment to leveraging local resources and expertise to advance

their

strategic

objectives.



Source: authors elaboration

External factors such as the COVID-19 pandemic and the conflict in Ukraine have had a significant impact on businesses, affecting around 80% of respondents. Surprisingly, over 31.58% of those surveyed were unaware of any support initiatives aimed at mitigating the repercussions of these crises. Additionally, 15.79% of female entrepreneurs expressed that they did not receive essential non-financial support that they believed would have been beneficial.

Among the forms of assistance utilized, training, mentoring, and coaching were most prevalent, focusing on enhancing digital skills and bolstering entrepreneurial knowledge and capabilities. Moreover, there was a notable preference for webinars and online courses tailored to individual learning needs, addressing specific areas identified by female entrepreneurs themselves as crucial for their business development.

## 6 Successful women entrepreneur

The interview was with Puppilam, a company operating in the circular practice. Puppilam was established in 2012. It is a small-sized company, with less than 10 employees.

The company principle is the shortest route from production to the shelves - that is, of course, sourcing locally, especially food, because that way it remains the best quality. Unfortunately, this is not possible for all products, as some foods are not grown here, such as rice, mangoes, avocados, etc. When sourcing these, they of course still look for the nearest supplier that also meets the other principles: all-natural, fair trade, no plastic packaging, no palm oil and no animal testing.

The interview was with Iris Magajna, the director of the company, who studied economy, worked in HR and R&R departments, organised events, training courses, etc. She consistently builds her knowledge in communication at all levels: feng shui, quantum physics, energy. She is a board member of Association Social Economy Slovenia and mentor to social entrepreneurs.

Puppilam exemplifies how a business can successfully integrate the principles of the circular economy to achieve sustainability and social impact. Their commitment to local sourcing, ethical imports, and addressing social issues through employment makes them a model social enterprise.

Puppilam is focused on:

**Waste Prevention and Minimization:** Puppilam understands that addressing waste at its source is the most effective way to minimize environmental impact. By advocating for waste prevention, they emphasize the importance of designing products and systems that inherently reduce waste generation. This proactive approach requires rethinking production processes, packaging, and consumption patterns to ensure that waste is not an afterthought but a primary consideration.

**Reuse and Repair:** The principles of reuse and repair are central to the circular economy, and Puppilam actively promotes these practices. By encouraging the reuse of products and materials, they extend the lifecycle of goods, reducing the need for new resources and minimizing waste.

**Worked Well:**

- Financial Assistance (Subsidies, Vouchers);
- Training and Development Programs (Entrepreneurship Training),
- Mentorship and Coaching),
- Legal and Regulatory Support (SPOT TOČKA)

**Did Not Work Well:**

- Lack of Networking
- No permanent Training available
- Limited consulting support
- Lack of information

**Skills needed:**

- Communication Skills,
- Adaptability and Flexibility
- Innovation and Creativity
- Technical and Digital Skills

**Challenges:**

- Time management (prioritizing tasks and managing time efficiency, balancing work and personal life)
- Technological Advancements (keeping up with rapid technological changes; integrating new technologies into existing systems)

To enhance support for women entrepreneurs in the circular and digital transition, it is advised to increase public support, especially through financial aid. Organizing more events, workshops, and international exchanges can help reduce regional disparities. Highlighting sustainability as a key business issue is vital for gaining wider acceptance and support.

## 7 Stakeholders Perspectives

The transition to a Circular Economy (CE) and Industry 4.0 (i4.0) presents both opportunities and challenges for Women Entrepreneurs (WEs). As part of our analysis of national skills gaps and needs, we have tried to find out the experiences, challenges, motivations, and support received by WEs in navigating these transitions, drawing insights from key stakeholders including industry leaders, NGOs and policymakers. It identifies gaps in the current support system and provides recommendations to enhance the success of WEs in Slovenia.

### 1. General Information: Stakeholder Experience

The IOS Institute for Environmental Protection and Sensors Production Trade and Services d.o.o. exemplifies a successful integration of CE and i4.0 principles. IOS has leveraged digitalization to enhance sustainability and efficiency through advanced sensor technologies and IoT integration. This experience underscores the potential for digital tools to optimize resource use and environmental monitoring, thus contributing to the circular economy.

### 2. Insights from Stakeholder Interviews

Interviews with stakeholders, such as Dr. Mojca Poberžnik from IOS, Barbara Kirn from Ecologists without Borders and Mojca Skalar Komljanc from SPIRIT Slovenia, reveal several critical insights:

- **Complexity and Cost:** Many perceive i4.0 technologies as complex and expensive to implement, posing a significant barrier, especially for smaller enterprises.
- **Skills and Training Gaps:** There is a notable gap in technical skills and digital literacy among WEs, limiting their ability to fully leverage i4.0 technologies.
- **Access to Resources:** WEs often struggle to access the advanced technologies and financial resources necessary for a successful transition to CE and i4.0.

### 3. Identified Gaps in Support for Women Entrepreneurs

Despite efforts to change, significant gaps remain in the support provided to WEs:

- **Technical Training:** Existing training programs often do not adequately address the specific needs of WEs, particularly in high-tech and innovation-driven sectors.
- **Financial Instruments:** Tailored financial instruments for WEs are lacking, making it difficult for them to secure the necessary capital for transitioning to CE and i4.0.
- **Digital Literacy:** There is a critical need for initiatives to improve digital literacy among WEs, essential for embracing digital transformation.

### 4. Recommendations and Proposed Actions

To better support WEs in their transition to CE and i4.0, stakeholders propose several recommendations:

- **Tailored Financial Instruments:** Develop financial instruments specifically designed to address the unique challenges faced by WEs, providing easier access to capital.
- **Targeted Training and Education:** Implement training programs focused not only on technical aspects but also on leadership, management, and strategic planning. These programs should be tailored to the needs of WEs, considering their unique challenges.
- **Enhanced Networking Opportunities:** Create platforms and networks that facilitate connections among WEs, industry experts, and potential investors. Mentorship programs that offer ongoing support and guidance are also crucial.
- **Policy Advocacy:** Advocate for policies that support gender equality in the entrepreneurial ecosystem. This includes addressing systemic biases and creating an enabling environment for women-led businesses.

The transition to a Circular Economy and Industry 4.0 offers immense potential for Women Entrepreneurs. However, to harness this potential, it is essential to address the existing challenges and gaps in support. By implementing targeted financial instruments, enhancing training and education, promoting networking opportunities, advocating for

supportive policies, and raising awareness, stakeholders can create a more conducive environment for WEs to thrive in the digital and circular transition. The collective effort of industry leaders, educators, policymakers, and the entrepreneurial community is crucial in driving this transformative change in Slovenia.

## 8 Conclusion

### Challenges and Opportunities for Women Entrepreneurs in Slovenia

In Slovenia, as in many other countries, entrepreneurship remains predominantly male-dominated. According to the GEM Slovenia 2023 - Entrepreneurship for Sustainable Future survey, 8.8% of all adult inhabitants in Slovenia had established businesses in 2023, with a significant gender disparity: only 4.6% of women compared to 12.8% of men. The established entrepreneurial activity of women among all entrepreneurs was 25% in 2023, a significant drop from 37% the previous year. This indicates a troubling trend where the share of established female entrepreneurs in Slovenia lags behind both global and European averages, highlighting the unique challenges faced by women entrepreneurs in the country.

### Challenges Faced by Women Entrepreneurs

- *Gender Disparities*

The data underscores a clear gender disparity in entrepreneurial activity, reflecting broader global trends. This gap is indicative of systemic barriers that women face, such as limited access to capital, inadequate mentorship opportunities, and a lack of supportive networks.

- *Digital Transformation Barriers*

A significant challenge is the digital transformation of business operations. In 2022, 58% of companies with ten or more employees, including the self-employed, reported encountering problems with digital transformation. Key issues included a lack of adequate staff or knowledge (36%) and insufficient financial resources (31%). Although

26% of companies did not experience problems with digital transformation, 43% did not see it as essential for business success. In 2021, only 29% of companies provided education on ICT use, and 21% employed ICT experts. By 2022, 47% of companies required digital skills or knowledge in their job systematization, yet a substantial 35% still had a low digital index.

## **Targeted Measures for Improvement**

- *Access to Finance*

Better access to finance is crucial. Women entrepreneurs often face greater difficulty securing funding compared to their male counterparts. Providing targeted financial support and creating more inclusive financial systems can help bridge this gap.

- *Mentoring and Networking*

Mentorship and networking are essential for success in entrepreneurship. Developing robust mentorship programs and facilitating networking opportunities can provide women with the guidance, support, and connections they need to thrive.

- *Training and Workshops*

Offering more training programs and workshops focused on digital skills and business management can empower women entrepreneurs. This not only enhances their capabilities but also helps them navigate the complexities of digital transformation.

- *Policy Support*

Policymakers need to recognize and address the unique challenges faced by women entrepreneurs. Implementing gender-specific policies and support mechanisms can foster a more inclusive entrepreneurial ecosystem.

Women entrepreneurs in Slovenia face distinct challenges that hinder their participation in the entrepreneurial landscape. The significant gender disparity in entrepreneurial activity and the barriers to digital transformation highlight the need for targeted measures to support women entrepreneurs. By improving access to finance, enhancing mentorship and networking opportunities, and providing comprehensive training,

Slovenia can create a more supportive environment for women entrepreneurs. Addressing these challenges is not only crucial for gender equality but also for fostering sustainable economic growth and innovation in the country.

# Annexes

## Survey Questionnaire in Slovenian

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