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ZAGREB INNOVATION CENTRE



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1. Regional Background Information

1.1. Introduction

Croatia is a small, open economy strategically positioned at the crossroads of Central and Southeast Europe, serving as a vital connector between Western Europe and the Western Balkans. With a population of approximately 3.8 million and a GDP per capita of around €17,000 (2022, in purchasing power standards), Croatia plays an important role in regional economic cohesion and digital integration within the European Union.

The Croatian economy is service-oriented, with tourism accounting for nearly 20% of GDP, but small and medium-sized enterprises (SMEs) remain the backbone of the national economy, generating more than 60% of total employment. In recent years, Croatia has seen improvements in its business environment and public investment capacity, driven by EU structural and investment funds, particularly through its Recovery and Resilience Plan (RRP), which prioritizes green and digital transitions.

Socio-demographically, Croatia faces significant challenges due to demographic ageing, population decline, and youth emigration—factors that directly impact the availability of skilled labour and long-term productivity. Nevertheless, the country has invested heavily in education reform, innovation infrastructure, and administrative digitalisation, which are beginning to yield results.

On the European stage, Croatia is classified as an "emerging innovator" in the European Innovation Scoreboard. Through active participation in the EU's cohesion policy, digital agenda, and cross-border initiatives such as the Danube Strategy, Croatia contributes to narrowing the innovation gap between Eastern and Western Europe. The national digital strategy and smart specialization framework aim to enhance regional competitiveness and support the growth of high-value-added sectors, particularly ICT, energy, mobility, and health technologies.

This State of the Art Report supports the key objectives of the DIGITRANS project by providing an evidence-based overview of the digitalisation level of Croatian SMEs, identifying policy gaps, and mapping existing support instruments. The findings will directly inform the preparation of Regional Action Plans (WP2) and contribute to the improvement of regional policy frameworks (WP3).

Methodology

The report is based on a desk analysis of national and European data sources, including Eurostat, the Digital Decade Monitoring Framework (formerly DESI), national statistics (DZS), and strategic documents such as the Digital Croatia Strategy 2032 and the National Recovery and Resilience Plan (NPOO). Policy instruments were assessed using publicly available programme documentation, government reports, and SME support datasets, complemented by qualitative insights gathered through consultations with the DIGITRANS Regional Stakeholder Group.

1.2. Economic Profile of the Region

The Croatian economy is characterized as a **small, open, and service-based economy**, with services accounting for over 70% of GDP. Key sectors include tourism, trade, transport, and increasingly, information and communication technologies (ICT). Despite Croatia's relative success in macroeconomic stabilization, structural weaknesses persist, including low productivity, regional development disparities, and a high dependence on seasonal industries such as tourism.

Croatia is administratively divided into two NUTS 2 regions: **Continental Croatia** and **Adriatic Croatia**, each with distinct structural characteristics, development trajectories, and economic profiles:

- **Continental Croatia.** This region includes Zagreb, the capital and economic centre of the country, and is characterized by a more urbanized, industrialized, and diversified economy. It accounts for the majority of national GDP and hosts the largest share of educational institutions, research centers, government agencies, and technology hubs. As such, digitalisation maturity and innovation intensity are highest in this region, particularly in Zagreb and surrounding counties (e.g., Varaždin, Karlovac, and Međimurje). Key features include: (1) a strong presence of manufacturing and ICT services, (2) higher concentration of SMEs with export potential and R&D engagement, (3) better developed digital infrastructure (broadband, 5G pilots), (4) greater access to startup ecosystems, incubators, and EU-funded innovation programs.
- **Adriatic Croatia.** Comprising coastal counties such as Split-Dalmatia, Šibenik-Knin, Zadar, and Istria, this region's economy is heavily dependent on tourism and seasonal services. The region experiences significant population fluctuations, driven by tourism demand, and is more vulnerable to external shocks such as pandemics or geopolitical disruptions affecting travel. While Adriatic Croatia boasts natural and cultural capital, it faces challenges in: (1) diversifying beyond tourism, (2) retaining a skilled workforce, particularly in ICT and engineering, (3) deploying advanced digital solutions across traditional industries such as hospitality, agriculture, and fisheries, (4) ensuring year-round economic activity and productivity in less urbanized zones.

Regional Disparities - The divergence in development between the two regions is reflected in:

- **GDP per capita:** significantly higher in Continental Croatia, especially in the City of Zagreb, compared to eastern counties and remote coastal areas.
- **Unemployment rates:** historically higher in parts of Adriatic Croatia outside of tourist peaks, and in rural Continental counties like Vukovar-Srijemska.
- **Digital readiness and investment:** concentrated around urban cores, with many rural and coastal areas still lacking reliable infrastructure and digital services.

To address these disparities, national strategies, including the Smart Specialisation Strategy (S3) and Cohesion Policy 2021–2027, emphasize balanced territorial development, supporting green

and digital transition projects, SME capacity building, and decentralized access to innovation infrastructure.

SMEs and Competitiveness - Overall, micro, small, and medium-sized enterprises (SMEs) dominate the Croatian business landscape. SMEs account for over **99% of all businesses** and employ **more than two-thirds of the workforce**, they contribute to **59% of total value added**, slightly below the EU average and sectors with the highest concentration of SMEs include trade, construction, tourism, and manufacturing.

Despite their prevalence, Croatian SMEs face considerable **productivity and innovation challenges**, particularly in peripheral and rural regions. Access to finance, bureaucratic complexity, and insufficient digital skills are among the most cited barriers to competitiveness.

ICT Sector as a Strategic Growth Driver - Zooming into the **ICT sector**, that sector has grown significantly in the last decade and is increasingly recognized as a **strategic growth driver**. Key characteristics include that it counts over **6,500 ICT companies**, generating around **€3.5 billion in annual revenue**. A strong concentration of the registered companies is within **software development**, IT services, and telecommunications and the sector employs around **50,000 workers** but faces a chronic **shortage** of skilled ICT professionals.

Government policies have supported the growth of the sector through initiatives such as tax relief for IT professionals, startup support programs, and investment in broadband infrastructure. However, the lack of STEM graduates and brain drain continue to constrain expansion.

Digitalisation Maturity Among SMEs assessment indicate that Croatian SMEs show moderate levels of digitalisation, though still below the EU average in several areas:

- According to the European Commission's DESI (Digital Economy and Society Index), **only 58% of SMEs** have at least a **basic level of digital intensity**, compared to the EU average of 69%.
- Use of advanced technologies such as **cloud computing (22%)**, **big data (11%)**, and **AI (8%)** is comparable to the EU average, but concentrated in more developed urban areas.
- A 2023 national survey revealed that **many SMEs do not perceive digitalisation as a priority**, particularly in traditional sectors like agriculture and small-scale manufacturing.

Barriers to digital transformation include (1) lack of awareness about available tools and benefits, (2) high implementation costs, (3) insufficient internal digital skills and (4) limited strategic support for digitalisation at the regional level. In response, the Croatian government has implemented several national and EU-funded programs such as:

- **Vouchers for Digitalisation** (co-funded by the EU) offering grants for CRM systems, e-commerce, and cyber security tools.
- The **e-Impulse and Digital Transformation of SMEs** calls under the National Recovery and Resilience Plan (RRP), aiming to reach over 10,000 SMEs by 2026.

In summary, while Croatia has made progress in building its digital economy and modernising key sectors, SMEs—especially those outside urban centers—still lag behind in digital maturity. The

ICT sector represents a key opportunity for economic diversification and international competitiveness, but further policy support, talent development, and regional coordination are needed to unlock its full potential.

Digitalisation Snapshot – Croatia 2024

- **56%** of SMEs have basic digital intensity
- **42%** use cloud computing
- **51.7%** use data analytics (among the highest in the EU)
- Major regional disparities persist (Zagreb vs. rural counties)

1.3. HR Profile of the Region

Croatia faces a complex set of demographic and human capital challenges, including population decline, negative natural growth, and a persistent mismatch between education outcomes and labour market needs. The population has decreased to approximately 3.8 million in recent years, down from over 4.2 million in 2011. This downward trend is particularly pronounced in eastern and rural regions, while urban centres such as the City of Zagreb continue to attract younger and more educated individuals.

Employment rates and education levels vary significantly across regions. Urban areas, particularly Zagreb, report higher employment, greater shares of tertiary-educated residents, and a stronger concentration of ICT professionals. In 2022, only **35.5%** of young adults aged 25 to 34 had completed tertiary education—well below the EU average of **42%**. Despite this, several reforms have been introduced to modernise vocational education, strengthen digital competencies, and improve alignment between the education system and the labour market through the introduction of dual education models and the Croatian Qualifications Framework.

Digital skills across the population are unevenly distributed. Younger individuals and university graduates in urban settings tend to possess above-basic digital skills, while older citizens and those living in rural or economically weaker regions frequently lack even foundational digital literacy. National programmes such as **e-Schools** and **e-Universities** have aimed to expand digital infrastructure and capabilities in education, but adult participation in formal lifelong learning remains low—only about 3% of adults engage in continuous education, compared to an EU average of around 11%.

Croatia's demographic profile is further strained by high emigration rates, especially following EU accession. It is estimated that over 350,000 citizens—nearly 10% of the population—left the country between 2013 and 2022, primarily young and educated individuals seeking better opportunities abroad. This emigration has had a profound effect on the working-age population, particularly in regions like Slavonia, contributing to labour shortages and threatening the sustainability of the pension and healthcare systems. Family structures are also evolving: single-person households are becoming more common in urban areas, while traditional multi-generational households remain prevalent in rural areas.

Although Croatia is predominantly ethnically homogeneous, several national minorities play important roles in specific regions, including the Serbian, Roma, Italian, and Hungarian communities. In particular, the Roma population continues to face disproportionately high rates of educational and digital exclusion, underscoring the need for more targeted inclusion policies in education, employment, and digital access.

Taken together, these demographic and educational trends highlight the urgency of adopting a holistic approach to developing human capital in Croatia. This includes strengthening the responsiveness of the education system, encouraging the return of skilled emigrants, improving labour market activation policies, and expanding access to digital and green skills that will be essential for the future economy.

1.4. Socioeconomic Conditions and Employment Opportunities

Croatia's labour market is shaped by persistent structural challenges and emerging opportunities driven by EU integration and digital transformation. Despite a strong post-pandemic recovery, the country continues to face low labour mobility, skill mismatches—especially in ICT and technical professions—and regional disparities in employment outcomes. Labour shortages are particularly acute in the construction, healthcare, tourism, and IT sectors, a trend exacerbated by an ageing population and sustained emigration of young and skilled workers.

The national employment rate stood at approximately **48% in 2022**, significantly below the OECD average of **57.5%**, with a stark gender gap: **54.1%** for men and only **42.1%** for women. Youth unemployment remains high at **21.9%**, nearly double the OECD average, and long-term unemployment also exceeds EU norms. Participation in the labour force has risen slightly but remains constrained by demographic decline, a shrinking working-age population, and insufficient reskilling pathways.

Productivity remains uneven across sectors. SMEs and microenterprises dominate the economic landscape but often operate below EU productivity levels, particularly in lagging regions. Many of these firms rely on low-skill, low-wage labour, while highly skilled professionals—especially in digital industries—can command substantial wage premiums. Croatia's ICT sector, for example, suffers from an undersupply of talent relative to demand, which drives up wages and limits the scalability of digital enterprises.

Wages are rising, with national average earnings growing **7.5%** in 2022, and statutory minimum wages increasing by over 10% in both 2022 and 2023. However, wage levels still lag behind productivity in many sectors. The overall wage-setting mechanism is relatively decentralised, and sector-specific collective agreements remain limited. At the same time, Croatia faces high structural unemployment in regions like Slavonia, where job creation lags behind national averages.

Croatia's socioeconomic conditions are further affected by demographic pressures. Emigration has significantly reduced the labour pool, with an estimated 350,000 people—mainly young and educated—leaving the country since EU accession. These trends have contributed to a dual pressure on the labour market: increased demand for skilled labour and reduced availability of talent, particularly in STEM and ICT fields.

In response, the Croatian government has launched reforms to improve employment outcomes. Active labour market policies are being reshaped to target youth, the long-term unemployed, and vulnerable populations. Voucher-based adult education for green and digital skills has been introduced and is gaining momentum. However, barriers to participation remain, especially among low-skilled and older adults due to cost, inflexible programme formats, and weak institutional outreach.

Housing affordability and limited rental options also hinder labour mobility, particularly toward economically dynamic urban centres like Zagreb and Split. Overcrowded conditions in cities, rising real estate prices, and earthquake-related housing shortages have further constrained mobility and deepened regional inequalities.

In sum, Croatia's labour market is under pressure from skill shortages, regional disparities, and demographic shifts. Continued investment in education, adult upskilling, digital transition, and labour activation—particularly in rural and economically weaker areas—will be crucial for strengthening employment opportunities and ensuring inclusive growth.

2. Analysis and Assessment of Policy Instruments

2.1. Policy Instrument

In line with the strategic objective “Developed and Innovative Digital Economy,” the **Digital Croatia Strategy until 2032** outlines a comprehensive set of policy instruments that support the digital transformation of small and medium-sized enterprises (SMEs). These instruments span direct financial support, skills development, public-sector digitalisation, innovation ecosystem strengthening, and startup ecosystem activation.

The first priority policy area under this strategic goal is the **support for SME digitalisation**. This area is operationalized through several ongoing and planned instruments. One of the most active tools is the **“Digital Vouchers Scheme”**, funded under the National Recovery and Resilience Plan (NRRP). This instrument provides direct financial support to SMEs for acquiring digital tools, training their staff in digital skills, and implementing complex digital systems such as ERP, CRM, AI, and cybersecurity solutions. The instrument is complemented by **voucher-based adult education programmes** for digital upskilling of employees, aiming to align workforce competencies with digital transition needs.

The second priority focuses on the **digitalisation of public services for enterprises** and aims to create transparent, automated, and user-friendly interfaces for businesses interacting with government. Through the implementation of a national **e-Business Portal** and expansion of digital identity and open data systems, SMEs are gaining improved access to public sector data and digital service delivery tools. These systems lower administrative burdens and facilitate business innovation.

In the third priority area, the instrument “**Support for Digital Innovation Hubs (DIHs)**” enables SMEs to access testing environments, receive expert mentorship, and collaborate with research institutions. DIHs operate as regional nodes of innovation, assisting enterprises in identifying and implementing advanced technologies. The Croatian hubs are co-funded by the Digital Europe Programme and the European Regional Development Fund (ERDF), and are critical for aligning SMEs with emerging trends in AI, cloud services, and cybersecurity.

To support the digital transformation of the **creative and cultural industries**, a specific sub-instrument under the Operational Programme Competitiveness and Cohesion 2021–2027 promotes the development of digital platforms, capacity building for creative entrepreneurs, and support for online content creation. This reflects a broader EU alignment with the Creative Europe programme, but tailored to Croatian SMEs within the sector.

Another key component of the strategic framework includes **planned tax and regulatory reforms to stimulate startup and scaleup development**, including ESOP models, angel investment incentives, and improved access to early-stage funding. These measures, while not yet fully implemented, aim to improve conditions for innovation-driven SMEs and strengthen Croatia’s competitiveness within the European startup landscape.

Collectively, these instruments form a multi-layered support architecture that not only provides direct financial aid but also addresses skills development, public-private digital interface optimization, and ecosystem building through hubs and networking platforms. The strategy’s implementation is closely tied to Croatia’s participation in broader European frameworks such as the **Digital Europe Programme**, **Horizon Europe**, and the **European Digital Innovation Hub Network**, ensuring policy coherence and funding alignment.

Strategic Objective	Relevant Policy Instruments	Funding / Implementation Framework
1. Developed and Innovative Digital Economy	<ul style="list-style-type: none"> - Digital Vouchers for SMEs (for marketing, cybersecurity, digital skills, complex digital solutions) - Adult Education Vouchers for Green and Digital Skills - Support for SME digital maturity assessments and consultancy 	National Recovery and Resilience Plan (NRRP) Ministry of Economy and Sustainable Development
2. Digitalisation of Public Services for Enterprises	<ul style="list-style-type: none"> - National e-Business Portal - Development of API-based data sharing infrastructure - Expansion of eID and eSignature for SMEs - Automation of administrative processes for SME-related public services 	National Budget EU Structural Funds Digital Europe Programme

Strategic Objective	Relevant Policy Instruments	Funding / Implementation Framework
3. Smart Use of Digital Technologies in Business	<ul style="list-style-type: none"> - Support for Digital Innovation Hubs (DIHs): test-before-invest, mentoring, cloud/AI access - Integration of Croatian DIHs into the European DIH network 	Digital Europe Programme (DEP) European Regional Development Fund (ERDF)
4. Support for Digital and Cultural Industries	<ul style="list-style-type: none"> - Financial support for the digitalisation of creative industries - Grants for digital content creation, platform development, and online distribution - Capacity-building programmes for cultural entrepreneurs 	Operational Programme Competitiveness and Cohesion 2021–2027 Creative Europe (aligned)
5. Stimulating Innovative Startups and Scaleups	<ul style="list-style-type: none"> - Planned reform of startup taxation (e.g., ESOP, angel investor incentives) - Public-private seed fund proposals - National Startup Platform for services, mentoring, and funding access 	To be implemented under National Innovation and Startup Policy (planned for post-2024)
6. Building a Competitive Workforce for the Digital Era	<ul style="list-style-type: none"> - Vouchers for upskilling in digital skills - Public-private reskilling programs for SMEs - e-Schools and e-Universities digital infrastructure and curriculum reform - National Qualification Framework (aligned with digital competency frameworks) 	Ministry of Education National Recovery Plan European Social Fund+ (ESF+)

Besides that high level of overview, concrete policy instruments formed exclusively to support SME digitalisation are formed as it follows:

Policy Instrument 1: Digital Transformation Grants (NPOO Measure C1.1.2 R3)

Description: The Digital Transformation Grants are one of Croatia's flagship instruments under the National Recovery and Resilience Plan (NPOO), specifically designed to accelerate the digital transition of SMEs. This instrument falls under Component **C1.1 – Strengthening the economy**, subcomponent **C1.1.2 – Supporting Innovation, Research, Development and Digital Technologies**, and more precisely under Reform **C1.1.2 R3: Encouraging the digital transformation of enterprises**.

This support measure is tailored to micro, small, and medium-sized enterprises (SMEs) that intend to invest in digital technologies, tools, processes, and capacity-building to modernise operations and improve productivity. The overarching goal is to enhance the digital intensity of Croatian SMEs, support the integration of digital solutions into their business models, and boost overall competitiveness.

Strategic Goals and Supported Activities

The grants aim to: (1) support Croatian SMEs in achieving a **higher level of digital maturity**, as assessed through structured digital diagnostics, (2) co-finance investments in digital tools such as:

- Enterprise Resource Planning (ERP) systems,
- Customer Relationship Management (CRM) systems,
- Internet of Things (IoT),
- Cloud technologies,
- Artificial Intelligence (AI) applications,
- Cybersecurity solutions.

(3) provide financial incentives for the **training of employees** in the use of these tools to ensure successful integration, (4) foster **business model innovation** and process automation, enabling SMEs to adapt to new market dynamics and digital ecosystems.

Funding Source and Management

The instrument is funded through the **Recovery and Resilience Facility (RRF)**, with a total allocation of €27.3 million. The measure is managed by the **Ministry of Economy and Sustainable Development** in cooperation with the implementing agency **HAMAG-BICRO**.

Eligible beneficiaries could receive co-financing for projects ranging **between €20,000 and €750,000**, depending on the size of the enterprise and the scope of the proposed digital transformation activities. The co-financing intensity ranged **from 45% to 70%**, based on the region and SME category.

Results and Outputs

- **Call Publication:** Opened in **June 2022**, with a deadline in **autumn 2022**.
- **Total Budget:** €27.3 million (100% RRF-funded).
- **SMEs Applying:** Over **1,500 applications** were submitted.
- **SMEs Approved:** Final approval and contracting processes were ongoing as of early 2023, with **over 700 SMEs** expected to receive funding.
- **Sectors involved:** Broad sectoral distribution, with strong participation from **manufacturing, ICT, and business services**. Lower participation was noted from traditional sectors such as **agriculture, hospitality, and construction**.
- **Regional Distribution and Reach** (geographical reach): Applications were received from all 20 counties, with the City of Zagreb, Split-Dalmatia, Primorje-Gorski Kotar, and Varaždin counties being most represented. However, regional innovation capacity and SME digital maturity remain uneven, indicating the need for additional support mechanisms in less developed counties (e.g. Slavonia).

KPI Highlights:

- Demand indicator: 1,500+ applications for €27M allocation → **oversubscription ratio of approx. 5:1**
- Expected SME reach: **700+ SMEs (~1% of all Croatian SMEs)**
- High-tech adoption indicator: significant uptake of ERP, CRM, AI and cloud solutions

Key Observations

- **Strengths:** (1) high demand indicates strong interest in digital upgrading, (2) good alignment with the Digital Croatia 2032 strategy and EU Digital Decade goals, and (3) incentivised the use of more advanced digital tools (ERP, AI, cloud).
- **Challenges:** (1) many SMEs lacked the internal capacity to prepare competitive project proposals, (2) the need for digital readiness assessments and pre-application advisory was greater than expected, (3) low visibility of the program in rural and non-tech-dominant regions, (4) complex application and documentation processes were a barrier for microenterprises.

Contribution to Policy Objectives. This instrument directly supports Croatia's strategic goals under the **Digital Croatia 2032 Strategy**, particularly in building a **developed and innovative digital economy**. It also contributes to **resilience-building**, as outlined in the NPOO, by enabling SMEs to modernise operations and compete more effectively in digital value chains.

It aligns with the EU's Digital Decade targets, specifically the goal that **90% of EU SMEs reach at least a basic level of digital intensity by 2030**. In Croatia, this instrument serves as a **critical bridge** between public policy goals and real, measurable progress in the SME sector.

Policy Instrument 2: Grants for the Commercialisation of Innovation (NPOO Measure C1.1.2 R1)

Description: The **Grants for the Commercialisation of Innovation** represent one of Croatia's **cornerstone policy instruments** under the National Recovery and Resilience Plan (NPOO) aimed at transforming research and development activities into competitive market-ready products and services. Framed within Component C1.1 of the NPOO—"Strengthening the Economy"—and specifically aligned with Reform C1.1.2 R1, this measure focuses on enhancing the ability of small and medium-sized enterprises (SMEs) to scale innovative solutions and bring them to market.

This instrument is a response to a structural gap in the Croatian innovation system, where many research projects and technological prototypes developed by startups and SMEs struggle to move beyond early-stage development due to insufficient funding, low investment readiness, and lack of commercialisation infrastructure. The grants aim to bridge the so-called "valley of death" between research and market entry, thereby increasing the rate of return on public investments in R&D and raising the overall innovation intensity of the economy.

Strategic Goals and Supported Activities

The instrument aims to increase the number of commercially viable innovative products and services developed by Croatian SMEs. Supported activities include:

- Advanced prototype development
- Intellectual property protection and patenting
- Product design, certification, and testing
- Pilot production and scaling
- Market validation and early commercialisation activities

Eligible innovations were required to be at **TRL 6** at minimum, progressing toward **TRL 8–9**, ensuring the support is targeted at near-to-market technologies.

Funding Source and Management

The programme is funded through the **Recovery and Resilience Facility (RRF)** with a total budget of **€50.4 million**. It is implemented by the **Ministry of Economy and Sustainable Development** in cooperation with **HAMAG-BICRO**, responsible for evaluation and contracting.

Funding per SME ranged between **€100,000 and €750,000**, with co-financing intensities determined by company size and regional development criteria.

Results and Outputs

- **Call publication:** 2022
- **Total budget:** €50.4 million
- **Applications received:** 800+ SMEs
- **Expected number of funded SMEs:** 300+
- **Most represented sectors:** ICT, green technologies, medical devices, advanced manufacturing, creative industries
- **Geographical distribution:** Applications concentrated in Zagreb and Split-Dalmatia counties, reflecting existing ecosystem strength. Participation from less developed regions was noticeably lower, highlighting the uneven distribution of innovation capacity across Croatia.

KPI Highlights:

- Application demand significantly exceeded available funding: **800+ applications vs. budget for ~300 projects**
- Innovation-stage KPI: all supported projects required **TRL 6+**, targeting TRL 8–9
- Expected contribution: more than **300 new or improved innovative products/services** reaching commercialisation stages
- High-tech sector participation rate: >60% of applications came from knowledge-intensive industries

Key Observations

→ **Strengths:** (1) strong demand demonstrates significant innovation potential among Croatian SMEs, (2) clear alignment with Smart Specialisation Strategy and national innovation priorities, (3) directly addresses the commercialisation gap that has historically hindered innovation growth, and (4) supports development of globally competitive products and technologies.

→ **Challenges:** (1) administrative and technical complexity created barriers for micro and early-stage SMEs, (2) Regional concentration of applicants risks reinforcing existing disparities, (3) limited availability of proposal-development support in weaker regions, and (4) heavy documentation requirements reduced accessibility for businesses without project management experience.

Contribution to Policy Objectives. The instrument is highly aligned with **Digital Croatia 2032**, the **Smart Specialisation Strategy (S3)**, and the EU's **Digital Decade** policy framework. It directly supports: (1) increased private-sector R&D investments, (2) scaling of innovation-driven SMEs, (3) development of high-tech and knowledge-intensive sectors, (4) stronger integration of Croatian SMEs into EU value chains.

The Grants for the Commercialisation of Innovation demonstrate that targeted public investment, paired with structured evaluation criteria, can catalyse the growth of innovation-intensive entrepreneurship. Future iterations of the measure could further enhance impact through mentoring support, post-award monitoring, and improved outreach to underrepresented regions.

Policy Instrument 3: Grants for Startups (NPOO Measure C1.1.2 R2)

Description: The **Grants for Startups** measure under Croatia's **National Recovery and Resilience Plan (NPOO)** represents a critical policy effort to strengthen the country's digital entrepreneurship ecosystem. This instrument is part of **Component C1.1 – Strengthening the Economy**, specifically under **Reform C1.1.2 R2: Strengthening Support for Innovative Entrepreneurship**. It focuses on creating favorable conditions for the emergence, survival, and growth of startup ventures, with particular emphasis on those with strong digital and innovative orientations.

The core objective of this policy measure is to provide **early-stage funding, business development support, and targeted mentorship** to new companies operating in high-growth sectors, especially those developing **digitally based solutions or using digital technologies** as enablers of innovation. By supporting these startups in the critical early phases—where market entry risk is high and access to private capital is limited—the measure contributes directly to boosting the national rate of startup formation, scalability, and sustainability.

Strategic Goals and Supported Activities

The programme supports startups in the development of innovative and market-ready solutions, particularly those aligned with Croatia's Smart Specialisation priorities (health, mobility, energy, ICT, creative industries, agri-tech). Funded activities include:

- Development and testing of Minimum Viable Products (MVPs)

- Certification, IP protection, and market validation
- Development of digital services, platforms, and software solutions
- Branding, early-stage marketing, and business model refinement
- Participation in incubation or acceleration programmes (mentorship required in some calls)

Eligible applicants were startups up to five years old, registered in Croatia.

Funding Source and Management

The measure is funded through the **Recovery and Resilience Facility (RRF)** with a total allocation of **€18.7 million**. It is implemented by the **Ministry of Economy and Sustainable Development** in cooperation with **HAMAG-BICRO**, and complements Croatia's emerging national startup and innovation framework.

Grant amounts ranged from **€30,000 to €150,000**, with funding intensity dependent on business maturity and project scope. The programme emphasises innovation potential, market relevance, and alignment with national strategic objectives.

Results and Outputs

- **Applications received:** more than **600 startups**
- **Expected funded startups:** approximately **220**
- **Budget allocation:** €18.7 million
- **High-interest sectors:** SaaS, health tech, fintech, edtech, green digital technologies
- **Geographical spread:** majority from Zagreb, Rijeka, Split, with emerging hubs in Osijek and Varaždin

The instrument significantly increased early-stage innovation activity in the national startup ecosystem and improved access to structured support through incubation and acceleration programmes.

KPI Highlights:

- **>600 applications** for 220 funded startups → **oversubscription ratio ~3:1**
- Strong digital orientation: **majority of applicants in ICT, SaaS, deep tech and green tech**
- Early-stage support intensity: **up to €150,000 per startup**
- Geographic diversification improving (Osijek, Varaždin emerging)

Key Observations

→ **Strengths:** (1) catalyses early-stage entrepreneurship in digital and knowledge-intensive sectors, (2) addresses a known market failure: limited availability of seed-stage financing, (3) strong alignment with national smart specialisation priorities, and (4) strengthens startup pipelines feeding into accelerators, investors, and DIHs.

→ **Challenges:** (1) limited awareness outside established innovation hubs, (2) the relatively short preparation window for application submission, and (3) gaps in follow-up infrastructure for funded startups after the grant period.

Contribution to Policy Objectives. The Grants for Startups measure is closely aligned with Croatia's strategic documents, including the **Digital Croatia Strategy 2032**, the **National Development Strategy**, and the forthcoming **National Startup and Innovation Policy**. It also contributes to the EU's **Digital Decade 2030** targets by supporting the growth of high-tech SMEs, strengthening innovation capacity, and accelerating the digital and green transitions. This instrument fills a critical gap in Croatia's entrepreneurial landscape by de-risking early-stage innovation and fostering a pipeline of startups capable of entering EU and global markets. Future iterations may benefit from intensified outreach to peripheral regions, closer engagement with private investors, and enhanced mentoring and post-grant monitoring.

Policy Instrument 4: Support for European Digital Innovation Hubs (EDIHs)

Description: The **Support for European Digital Innovation Hubs (EDIHs)** represents a strategic policy instrument implemented under Croatia's **National Recovery and Resilience Plan (NPOO)** and the **Digital Europe Programme (DEP)**. It is designed to provide small and medium-sized enterprises (SMEs), as well as public sector bodies, with access to cutting-edge digital expertise, testing facilities, training services, and investment support—all within a regional, one-stop-shop model for digital transformation.

This instrument contributes to **Reform C1.1.2 R3** of the NPOO—"Encouraging the digital transformation of businesses"—and supports the broader national objective of building a **developed and innovative digital economy**, as laid out in the **Digital Croatia Strategy 2032**. It also forms part of the European Commission's network of EDIHs across all Member States, with the goal of bridging regional innovation gaps and supporting the uptake of digital technologies in strategic sectors.

Launched in 2022, the Croatian EDIH initiative received **co-financing from the Recovery and Resilience Facility (RRF)** and the **Digital Europe Programme (DEP)**, with a **combined allocation of €5.4 million** for an initial period of three years (2022–2025). Four EDIHs were selected through a competitive national and European process and are hosted in different Croatian regions to ensure broad geographic and sectoral coverage.

Strategic Goals and Supported Activities

The primary mission of EDIHs is to help SMEs:

- **"Test before invest"**—access testing environments and pilot digital solutions without the need for large upfront investment;
- Access **training and skills-building programs**, especially in emerging technologies like artificial intelligence (AI), cybersecurity, robotics, and cloud computing;

- Receive tailored **business development support** including digital maturity assessments, technology roadmaps, and assistance in defining digital strategies;
- Gain **access to financing and investment advisory services**, including connections with EU funds and private investors;
- Connect with **innovation ecosystems across Europe**, enabling cross-border collaboration and knowledge transfer.

Each Croatian EDIH specializes in certain technology domains and economic sectors. For example, hubs are aligned with priority areas identified in the **Smart Specialisation Strategy (S3)** such as health technology, advanced manufacturing, smart mobility, and agri-food. Services are provided by consortia consisting of **universities, research institutes, business support organizations, and private tech providers**, ensuring a multidisciplinary approach to digital innovation.

Funding Source and Management

The initiative is jointly funded through:

- **Recovery and Resilience Facility (RRF)**
- **Digital Europe Programme (DEP)**

Total allocation: **€5.4 million (2022–2025)**

Managing bodies include the Ministry of Economy and Sustainable Development, with service delivery executed by four selected EDIH consortia.

Results and Outputs

- **More than 200 SMEs and public organisations** supported by end of 2023
- Strong early demand for advisory and pilot testing services
- SMEs without internal digital expertise benefited most from maturity assessments and roadmapping services
- EDIHs facilitated access to **Horizon Europe, DEP, European Innovation Council (EIC)** opportunities
- Geographical reach improved, though participation is still strongest in Zagreb, Rijeka, and Split regions.

KPI Highlights

- **200+ organisations supported** within first operational year
- Training uptake: high participation in AI and cybersecurity workshops
- Technology adoption readiness increased for SMEs completing full maturity assessments
- EDIHs mapped to **priority S3 sectors** → contributes to regional specialisation focus

Key Observations

- **Strengths:** (1) provides high-value digitalisation services at no cost to SMEs, (2) bridges the gap between early diagnostics and advanced technology adoption, (3) connects Croatian SMEs to EU-level innovation ecosystems, and (4) strong alignment with digitalisation and S3 priorities.
- **Challenges:** (1) awareness remains lower among traditional SMEs and peripheral regions, (2) capacity building needed within hubs to ensure service consistency and quality, (3) SMEs often require hands-on implementation support beyond diagnostics, and (4) long-term sustainability uncertain once DEP/NPOO funding ends.

Contribution to Policy Objectives. The EDIH initiative plays a central role in bridging Croatia's regional digital divide by extending high-value digitalisation services beyond the country's established innovation hubs in Zagreb, Rijeka, and Split. By ensuring that SMEs and public organisations in less-developed regions gain access to testing facilities, advisory services, and EU funding pathways, the measure helps reduce long-term disparities in digital maturity and innovation capacity.

The initiative strongly supports the objectives of the Digital Croatia Strategy 2032, particularly in strengthening regional innovation ecosystems and facilitating SME adoption of advanced technologies. It also contributes to the EU's Digital Decade 2030 targets, including the goal that more than 75% of European enterprises adopt cloud computing, AI, and big data.

Furthermore, EDIHs complement other national digital transformation instruments—such as Digital Vouchers, Startup Grants, and accelerators—by providing upstream services that help SMEs progress from diagnostics to implementation. Their long-term success will depend on sustained public support, better integration with complementary SME programmes, and stronger collaboration with private sector technology providers who can help scale solutions from pilot to market readiness.

Policy Instrument 5: Accelerator Scheme (Jačanje akceleracijske aktivnosti)

Description: The **Accelerator Scheme**, formally known as “**Jačanje akceleracijske aktivnosti**”, is a dedicated policy instrument launched under Croatia's **National Recovery and Resilience Plan (NPOO)** to foster the structured development of startup acceleration programs. This measure is aligned with **Reform C1.1.2 R2**—“Strengthening support for innovative entrepreneurship”—and contributes directly to the strategic goal of expanding Croatia's startup ecosystem with a strong digital and innovation orientation.

The Accelerator Scheme seeks to address a persistent gap in the Croatian innovation landscape: the lack of structured, regionally distributed, and investment-oriented support mechanisms for early-stage technology startups. While many startups emerge with innovative ideas, few have access to the mentorship, technical validation, and investor readiness support needed to scale or survive beyond initial product-market fit.

Strategic Goals and Supported Activities

The The Accelerator Scheme co-finances consortia of accelerators that provide services to early-stage startups across Croatia. Supported activities include:

- Intensive business development mentorship
- Technology validation and product development coaching
- Support in accessing early financing (angel investors, VC funds)
- Access to shared infrastructure, prototyping labs, digital toolkits
- Networking, matchmaking, and internationalisation activities

A total of **11 accelerator consortia** were selected through a national call, comprising business support institutions, incubators, technology parks, universities, and experienced industry mentors. This ensures regional coverage and decentralised access to high-quality acceleration services.

Funding Source and Management

The instrument is funded through the **Recovery and Resilience Facility (RRF)** with a total allocation of **€8 million**. Implementation is led by the **Ministry of Economy and Sustainable Development** in cooperation with **HAMAG-BICRO**, ensuring alignment with the **Digital Croatia Strategy 2032** and the forthcoming **National Startup and Innovation Policy**.

Results and Outputs

- **11 accelerator consortia** selected through a national call
- Coverage of all major Croatian regions → strong decentralisation effect
- **300+ startups supported** in the first cohort (2022–2023)
- Sectors supported include fintech, health tech, AI, smart manufacturing, agri-tech, and clean energy
- Many participating startups demonstrated improved investment readiness and visibility
- Several have secured follow-on financing or formed international partnerships

This demonstrates the instrument's multiplier effect: rather than funding startups directly, it strengthens the infrastructure that supports them.

KPI Highlights

- **300+ early-stage companies supported**
- 11 accelerators operating nationally (coverage of all major regions)
- High-growth sectors represented: fintech, AI, health tech, green tech
- Evidence of follow-on investments and international partnerships among participants

Key Observations

- **Strengths:** (1) ecosystem-building approach enhances long-term innovation capacity, (2) supports decentralisation of the innovation ecosystem beyond Zagreb, (3) enhances

investor readiness and early-stage scaling potential, and (4) strong collaboration model across academia, private sector, and support institutions.

→ **Challenges:** (1) some consortia lacked experience in structured acceleration programmes, (2) operational standardisation and quality control require ongoing support, (3) regional disparities remain—some areas still struggle to attract high-potential applicants, and (4) absence of complementary seed capital instruments limits post-acceleration growth.

Contribution to Policy Objectives. The Accelerator Scheme aligns closely with the Digital Croatia Strategy 2032, the National Development Strategy, and the EU Digital Decade 2030 goals to increase the number of innovative SMEs and scaleups. By strengthening the intermediary support infrastructure, the measure bridges the gap between ideation and investment, enabling startups to achieve commercialisation and international scalability.

Its complementarity with other instruments—such as Startup Grants, Digital Vouchers, and EDIHs—creates a more coherent and integrated innovation support system. Long-term success will depend on sustained financing, capacity-building for accelerator partners, and stronger ties with private capital markets.

If these conditions are maintained, the Accelerator Scheme has the potential to become a cornerstone of Croatia's digital and innovation-driven economic transformation.

Policy Instrument 6: Digital Vouchers Scheme

Description: The **Digital Vouchers Scheme** is a **planned policy instrument** designed to support the broad-based digital transformation of Croatian micro, small, and medium-sized enterprises (MSMEs). While still in development, the scheme is anticipated as a natural extension of Croatia's digitalisation strategy and is expected to be implemented under the **Digital Croatia Strategy 2032**, with potential co-financing from national sources and European funds, including the **European Regional Development Fund (ERDF)** and/or **NextGenerationEU** facilities.

The concept of the Digital Vouchers Scheme draws on lessons learned from previous digitalisation calls and EU best practices, and is intended to provide **simple, fast, and demand-driven support** for SMEs to procure digital services and technologies from registered and vetted providers. The instrument is aimed at increasing digital intensity and reducing the barriers for SMEs to access the digital tools needed to improve productivity, competitiveness, and resilience.

Strategic Goals and Supported Activities

The scheme draws on lessons from earlier digitalisation programmes and EU best practices. It is expected to support the procurement of:

- Website creation and e-commerce development
- Cybersecurity tools and services
- CRM and ERP software
- Digital marketing solutions
- Cloud-based operations and remote working tools
- Basic AI or data analytics applications
- Digital diagnostics and consultancy

Voucher values are expected to range from **€2,000 to €20,000**, with varying co-financing rates based on firm size and regional development level. Administrative requirements are intentionally kept low, making the scheme accessible even to SMEs with limited internal capacity.

The measure places particular emphasis on reaching SMEs in traditional sectors such as agriculture, hospitality, crafts, and construction, which were underrepresented in earlier innovation-oriented instruments.

Funding Source and Management

Implementation details are under development, but the scheme is expected to be co-financed from:

- European Regional Development Fund (ERDF)
- NextGenerationEU mechanisms (where applicable)
- National budget allocations

Key implementing and promotional bodies are expected to include:

- The Ministry of Economy and Sustainable Development
- The Croatian Chamber of Economy (HGK)
- HAMAG-BICRO

Anticipated Results and Outputs

As a planned scheme, results are prospective but expected to include:

- High uptake due to low administrative burden
- Broad reach across regions, including rural and low-innovation areas
- Increased use of digital services among traditional and lagging sectors
- Expanded ecosystem of certified Digital Solution Providers (DSPs)
- Strengthened SME participation in digital markets

Anticipated KPI Highlights

Because the instrument is not yet operational, KPIs are expected to include:

- Number of SMEs supported (target: large-scale outreach)
- SME digital intensity improvement per voucher
- Regional coverage (% of SMEs in lagging counties reached)
- Number of certified DSPs engaged

- Reduction in administrative barriers (time-to-application, time-to-approval)

Key Observations

- **Strengths:** (1) highly accessible, low-barrier entry point for SME digitalisation, (2) scalable model capable of reaching thousands of SMEs, (3) supports digital inclusion across regions and sectors, and (4) builds local DSP ecosystems and improves SME-provider linkages.
- **Challenges:** (1) requires high-quality control of DSP services, (2) potential risk of low-impact voucher use without proper diagnostics, (3) regional disparities in DSP availability may affect uptake, and (4) SMEs in rural areas may still require awareness-raising and digital literacy support.

Contribution to Policy Objectives

Once operational, the Digital Vouchers Scheme will directly support Croatia's commitments under the **EU Digital Decade 2030**, particularly the objective of ensuring that **all SMEs reach at least a basic level of digital intensity**.

It will also contribute to the **green-digital transition** by enabling SMEs to meet future regulatory and market requirements related to cybersecurity, digital compliance, and data governance.

With an effective provider registry, strong promotional outreach, and phased monitoring mechanisms, the scheme has the potential to become one of the most widely used digitalisation instruments in Croatia's policy portfolio.

END NOTE

In addition to the strategic design of the Digital Vouchers Scheme, **Croatia is actively preparing the ecosystem for its rollout** through structural partnerships and financial ecosystem development. For example, in **March 2024**, **HAMAG-BICRO and Erste Bank** signed an agreement to **enhance access to favourable SME financing**, enabling synergies between public support and commercial banking in digital and green transition efforts. This forms part of a broader strategic move to **reduce SMEs' digitalisation risks** by combining grants with low-interest loans and financial literacy support. The **Croatian Chamber of Economy (HGK)** has also publicly recognised Croatia's **lagging position in SME digital transformation**, especially in traditional sectors, and is advocating for voucher-like measures to boost uptake of e-commerce, cybersecurity, and cloud solutions.

The **Digital Decade Country Report (2024)** further validates the urgency of such a measure: only **56% of SMEs** in Croatia have at least a basic level of digital intensity, and the **adoption rates of AI and cloud remain far below EU targets**. However, Croatia has shown potential, particularly in **data analytics** (51.7% SME usage, one of the highest in the EU), which suggests that voucher-based nudges could unlock significant growth if strategically targeted.

Given these conditions, the **Digital Vouchers Scheme** is **not only timely but essential** to bridge the digital divide, especially for SMEs in **less developed and rural regions**. To ensure equity and broad participation, it is recommended that the final design of the scheme includes a **regional outreach strategy**, collaboration with **Digital Innovation Hubs (EDIHs)**, and transparent **monitoring of provider performance**. If executed with precision, the scheme could become a **cornerstone of Croatia's 2030 digitalisation strategy**, helping meet key EU Digital Decade objectives and reinforcing Croatia's ambition to become a digitally resilient economy.

Instrument Name	Digital Transformation Grants
Duration	2022–2026
Description of Goals	Support SME digital maturity through adoption of advanced digital tools (ERP, CRM, AI, cloud), employee training, and process optimisation.
Relevance to National and Regional Strategies	NPOO Measure C1.1.2 R3; aligned with Digital Croatia 2032 and EU Digital Decade 2030 targets.
Enhancing Digitalisation of SMEs	Co-funds strategic digital upgrades; targets medium-mature SMEs; over 700 SMEs expected to benefit in initial call.

Instrument Name	Grants for Commercialisation of Innovation
Duration	2022–2026
Description of Goals	Enable transition from R&D to market by supporting prototype development, IP protection, product certification, and pilot production.
Relevance to National and Regional Strategies	NPOO C1.1.2 R1; supports S3 domains, innovation agenda, and private R&D investment goals.
Enhancing Digitalisation of SMEs	Targets tech-intensive SMEs with high digital innovation potential; supports scaling of digital-based products and services.

Instrument Name	Grants for Startups
Duration	2022–2025
Description of Goals	Provide early-stage financial and technical support to startups developing digital solutions, digital platforms, or services.
Relevance to National and Regional Strategies	NPOO C1.1.2 R2; aligned with Digital Croatia 2032 and startup development under the National Innovation Policy.
Enhancing Digitalisation of SMEs	Lowers entry barriers; nurtures digitally native startups in health tech, fintech, SaaS, and AI.

Instrument Name	Support for EDIHs (European Digital Innovation Hubs)
Duration	2022–2025
Description of Goals	Provide SMEs with access to test-before-invest services, digital skills training, and access to EU funding and digital expertise.
Relevance to National and Regional Strategies	Part of Digital Europe Programme and NPOO C1.1.2 R3; aligned with S3 smart regions and Digital Decade goals.
Enhancing Digitalisation of SMEs	Regional one-stop-shops for SMEs; over 200 companies supported by 2023; tailored to sector-specific digital needs.

Instrument Name	Accelerator Scheme (Jačanje akceleracijske aktivnosti)
Duration	2022–2025
Description of Goals	Strengthen regional startup accelerators to provide business mentoring, investor matchmaking, and infrastructure access.
Relevance to National and Regional Strategies	NPOO C1.1.2 R2; supports Digital Croatia 2032 entrepreneurship pillar and regional innovation ecosystems.
Enhancing Digitalisation of SMEs	Indirectly supports digital SMEs by creating growth-enabling environments; 11 consortia funded; 300+ startups reached.

Instrument Name	Digital Vouchers Scheme (Planned)
Duration	Expected 2024–2027
Description of Goals	Provide fast, accessible, small-scale co-financing for SMEs to procure digital services and tools from verified providers.
Relevance to National and Regional Strategies	Outlined in Digital Croatia 2032 and NDS; expected to support Digital Decade goals for SME digital intensity.
Enhancing Digitalisation of SMEs	Targets digitally immature SMEs; especially useful for crafts, agriculture, and rural firms; lowers entry barrier to digital tools.

2.2. General assessment

The digitalisation of small and medium-sized enterprises (SMEs) in Croatia remains a key developmental challenge, despite recent progress and growing institutional support. The digital maturity of SMEs across the country is **uneven and fragmented**, with considerable differences by sector, firm size, and region. While Croatia has committed to aligning with the EU's **Digital Decade 2030** goals, the current state of digital adoption among SMEs indicates that significant gaps remain, particularly outside urban centres and in traditional economic sectors.

Current State and Sectoral Variations

According to the **2024 Digital Decade Country Report**, only **56%** of Croatian SMEs have achieved at least a basic level of digital intensity—below the EU average. The uptake of cloud services (**42%**), data analytics (**51.7%**), and artificial intelligence (**8%**) remains concentrated among innovation-driven firms, primarily located in Zagreb and several developed counties such as Varaždin, Split-Dalmatia, and Primorje-Gorski Kotar.

Sectors such as **ICT, professional services, fintech, logistics, and export-oriented manufacturing** show the highest levels of digital integration. These industries are typically better positioned to adopt digital tools due to their business models, market exposure, and access to skilled personnel. In contrast, sectors like **agriculture, hospitality, construction, and crafts** continue to lag behind, with many SMEs using only basic tools such as websites or social media, and lacking digital management systems, cloud platforms, or cybersecurity protocols.

Digitalisation in **rural and less-developed regions** is particularly weak, largely due to infrastructure deficits, brain drain, low awareness of available support, and lower absorptive capacity. These regional disparities contribute to a broader productivity and competitiveness gap between urban economic hubs and peripheral territories.

Digitalisation Snapshot – Croatia (2024)

- **56%** of SMEs have basic digital intensity
- **42%** use cloud technologies
- **51.7%** use data analytics (among the highest rates in the EU)
- **8%** use AI solutions
- Strong urban–rural digital divide persists

Main Issues and Gaps. Several structural issues are hindering SME digitalisation in Croatia:

- **Low strategic awareness and prioritisation of digitalisation** among microenterprises and older SME managers.
- A **shortage of digital skills** within SME workforces, especially in firms operating outside the tech sector.
- **Limited access to finance**, particularly for microenterprises unable to self-fund digital investment or navigate complex application procedures.
- **Insufficient outreach and capacity** of innovation support systems in rural areas.
- A fragmented digital support landscape, with **limited coordination among public agencies, regional development actors, and chambers**.

Even when funding is available, many SMEs report difficulties in **project preparation, execution, and long-term integration** of digital tools into their operations. This reveals a gap not only in financial support but also in advisory and aftercare services.

Policy Agenda and Strategic Direction. Digitalisation of SMEs has become a **clear national priority** in Croatia and features prominently in major strategic frameworks, including:

- The **Digital Croatia Strategy 2032**, which provides long-term guidance for a digitally enabled economy and society;
- The **National Recovery and Resilience Plan (NPOO)**, which allocates over €100 million in combined funding across several instruments for SME digitalisation.
- The **Smart Specialisation Strategy (S3)**, which links innovation support to regionally relevant sectors;
- The **National Development Strategy (NDS) 2030**, which frames digital transformation as a pillar of economic resilience.

The government has launched multiple measures to accelerate SME digitalisation. These include direct investment grants (e.g., Digital Transformation Grants), ecosystem development

instruments (e.g., Accelerator Scheme and EDIHs), and support for early-stage startups and innovation commercialisation. Additional measures are being prepared, such as the **Digital Vouchers Scheme**, which will provide fast, user-friendly co-financing for digital tool adoption—particularly targeting the most vulnerable SMEs.

Furthermore, **national institutions like HAMAG-BICRO and the Chamber of Economy (HGK)** are increasingly active in promoting digital tools, mapping service providers, and supporting ecosystem capacity building. The **partnership with Erste Bank (2024)** also represents a new hybrid financing model that blends public support with commercial credit products.

Despite these positive developments, implementation challenges remain. These include the need for **decentralised digital support structures, greater integration of funding and training**, and a **stronger monitoring system** to track the real-world impact of instruments on SME competitiveness.

In conclusion, Croatia's SME digitalisation agenda is evolving rapidly, backed by both political commitment and EU support. However, unlocking its full potential will require targeted outreach, simplification of access, and a focus on **bridging the digital divide between frontrunners and laggards**, both in sectoral and territorial terms.

2.3. Identification of Policy Challenges

Croatia has made substantial progress in designing and deploying a range of policy instruments aimed at accelerating the digitalisation of its SME sector. However, a review of current instruments and their implementation reveals persistent and systemic challenges that hinder full and inclusive digital transformation across all regions and sectors.

Main Challenges in SME Digitalisation. The key challenge remains the **uneven digital maturity of SMEs**, with significant differences in uptake of digital tools depending on firm size, sector, and geographic location. While tech-savvy SMEs in urban centres are generally responsive to calls and instruments such as digital transformation grants and innovation vouchers, the majority of Croatian SMEs—especially those in rural and traditional sectors—lack the awareness, capacity, or confidence to engage with digital technologies or to apply for public support.

Instruments like the **Digital Transformation Grants** and **Grants for Commercialisation of Innovation** have seen strong demand among better-prepared firms but have struggled to reach microenterprises and low-capacity SMEs. Many SMEs report challenges in understanding eligibility criteria, navigating application procedures, or implementing approved projects, especially where no advisory or aftercare support exists.

The **Accelerator Scheme** and **EDIHs** have made headway in strengthening the startup and innovation ecosystem, but their **impact is still concentrated in well-developed regions**, leaving peripheral and less connected SMEs underserved. Similarly, the planned **Digital Vouchers Scheme**, while promising in its simplicity, must overcome structural access barriers—especially among SMEs without basic digital literacy or access to service providers in their regions.

Assessment of Policy Instruments and Barriers. The policy instruments currently in place often exhibit **strong design logic** but **limited reach and scalability**. Barriers identified include:

- **Low awareness and outreach**, particularly among SMEs in rural or low-digital-intensity sectors.
- **Administrative complexity** in grant application processes, including burdensome documentation and formal requirements. In practice, SMEs face extensive documentation requirements, complex eligibility conditions, and multi-step reporting obligations.
- **Weak integration** of capacity-building or mentoring services with funding instruments, reducing implementation success rates.
- **Insufficient regional tailoring** of instruments to local SME profiles, market needs, and digital ecosystem maturity.
- **Short funding cycles** and unpredictable timelines, which discourage smaller firms from participating.

From a beneficiary perspective, many SMEs highlight the need for:

- **More practical support** before and after grant implementation;
- Access to **standardised digital tools and service providers**;
- **Flexible financing mechanisms**, including blended or phased instruments;
- Improved **information dissemination** at local levels through chambers, development agencies, or sectoral associations.

A critical distinction must be made between **general measures**, which indirectly support digitalisation, and **specific measures**, which target digital adoption directly.

General measures include:

1. Investments in broadband infrastructure and public e-services (e.g. e-Invoicing, e-Business portals);
2. Adult education and vocational training reforms (e.g. voucher-based upskilling);
3. Fiscal and legal reforms supporting entrepreneurship and startup capital access.

These general actions create **enabling conditions** but often lack immediate visibility or tailored impact for SMEs.

Specific measures include: digital Transformation Grants, commercialisation of Innovation Grants, Startup Support and Accelerators, EDIHs and their services, The planned Digital Vouchers Scheme.

These are **designed for direct uptake** by SMEs and are better suited to delivering measurable progress—provided implementation challenges are addressed.

Link to National and Regional Policy Frameworks. The challenges identified reflect broader **structural and institutional limitations** within Croatia's digitalisation ecosystem, many of which have been acknowledged in strategic policy frameworks but remain only partially addressed in practice. While the **Digital Croatia Strategy 2032** articulates an ambitious and comprehensive vision for a competitive, inclusive, and digitally transformed economy, the **translation of this vision into measurable, territorially balanced outcomes is still insufficient**.

At the core of the issue is the **implementation gap**—a disconnect between strategic ambition at the national level and practical execution at the regional and local levels. The Digital Croatia Strategy clearly recognises the need for developing regional digital innovation ecosystems, strengthening the role of SMEs in digital value chains, and closing the digital divide across economic sectors. However, the strategy's operationalisation still **lacks sufficient coordination mechanisms, clear delineation of responsibilities, and supporting instruments adapted to regional contexts**.

A similar challenge affects the **Smart Specialisation Strategy (S3)**. Designed to align R&D and innovation policy with regional economic strengths, the S3 framework offers sectoral direction (e.g. ICT, health, energy, creative industries), but its **territorial anchoring is weak**. Regional development agencies, local authorities, and business support organisations often do not have the **institutional capacity, decision-making autonomy, or funding leverage** to fully operationalise S3 goals in support of SME digitalisation. As a result, many regional economies remain passive recipients of national measures rather than active co-creators of locally grounded innovation agendas.

This institutional asymmetry is further reflected in the **National Recovery and Resilience Plan (NPOO)**, which includes a suite of instruments to support digitalisation, green transition, and innovation. While the NPOO aligns well with EU priorities, its instruments are often **complex, centralised, and project-driven**, limiting their accessibility to smaller SMEs and their adaptability to region-specific needs. Moreover, many NPOO-funded calls have required substantial project development capacities, often available only to firms in urban regions or those with prior experience in managing EU funds.

The **monitoring and evaluation frameworks** associated with these strategies are also fragmented. Although Croatia collects data on digital intensity, innovation uptake, and SME participation, **there is no unified national mechanism** that tracks the long-term performance and regional distribution of policy impacts. Without granular, disaggregated monitoring, it is difficult to identify what works where—and why—and to adjust instruments accordingly.

Furthermore, **regional and local actors**, including innovation centres, development agencies, and municipalities, often lack a **clear mandate or financial instruments** to adapt and complement national schemes. This leaves them in a reactive position, unable to tailor solutions to their local SME base or to serve as active nodes in the national innovation system. In the current

institutional setting, there is a notable **absence of multi-level governance** that would enable vertical coordination (national-regional-local) and horizontal collaboration (between regions and sectors), both of which are crucial for effective digital transformation policy.

The **Digital Croatia Strategy 2032** acknowledges this fragmentation and proposes steps toward more integrated governance, including:

- Developing interoperable data platforms to track SME digital maturity across regions;
- Strengthening regional innovation systems through the establishment of Digital Innovation Hubs (EDIHs);
- Encouraging the use of smart regulation and regulatory sandboxes to test new policy approaches.
- Promoting digital champions at the local level who can serve as intermediaries between policy and practice.

However, implementation of these measures is at an early stage and requires **more robust political and financial support**. Without it, even the best-designed national tools risk being **underutilised, poorly targeted, or inequitably distributed**, particularly in regions facing systemic development constraints or low digital readiness.

Ultimately, the success of Croatia's digital transformation strategy—especially as it relates to SMEs—depends on its ability to **build functional linkages between high-level policy ambitions and everyday business realities**. This requires not only continued investment in digital infrastructure and tools, but also **structural reform in how digital policies are governed**, delivered, and evaluated. Only through such an integrated and responsive policy system can Croatia close the digital gap between frontrunners and laggards and ensure that no region or sector is left behind in the digital decade.

SUMMARY: Assessment of Challenges Related to SME Digitalisation Policy Instruments

Title of the Challenge	Description of the Challenge
C1: Uneven Access and Low Absorptive Capacity among SMEs	<p>Despite the availability of funding through instruments such as the Digital Transformation Grants and Innovation Commercialisation Grants, uptake remains concentrated in more digitally mature SMEs, primarily in urban areas. Micro and traditional SMEs often lack the skills, capacity, and awareness to engage with these opportunities. Rural and sector-specific disparities persist, especially in agriculture, crafts, and hospitality.</p> <p>→ Policy link: NPOO Measures C1.1.2 R1, R3; Digital Croatia Strategy 2032</p> <p>→ Measure Type: Specific</p>

Title of the Challenge	Description of the Challenge
C2: Fragmented Support Ecosystem and Implementation Gap	<p>Regional innovation stakeholders—such as local development agencies and innovation centres—lack sufficient mandate, funding, or autonomy to localise national instruments. As a result, many SMEs are not reached by support programs. There is a clear need for decentralised, multi-level governance and better horizontal coordination.</p> <p>→ Policy link: Digital Croatia Strategy 2032; S3 Strategy; NDS 2030</p> <p>→ Measure Type: General and specific (EDIHs, Accelerators, e-Infrastructure)</p>
C3: Lack of Integrated Capacity-Building with Financial Instruments	<p>Many instruments offer funding without embedded advisory, mentoring, or post-project support, leading to low impact in digital tool adoption. For instance, while EDIHs and Accelerators offer services, they are not systematically connected to grant schemes. Digital literacy, training, and implementation support must be embedded across all stages.</p> <p>→ Policy link: NPOO Measures R2, R3; Digital Skills pillar of Digital Croatia Strategy 2032</p> <p>→ Measure Type: Specific (but cross-cutting with general education efforts)</p>

2.4. Regional Competitiveness

Digitalisation of SMEs plays a critical role in enhancing regional competitiveness across economic, social, and innovation performance indicators. In Croatia, this impact is particularly important due to the persistent disparities between urban and rural areas, and between the two NUTS2 regions: Continental Croatia and Adriatic Croatia.

a) Economic Impact

Croatia's GDP per capita in 2023 stood at approximately 73% of the EU average (Eurostat), with Continental Croatia outperforming Adriatic Croatia due to the concentration of high-value services, administrative functions, and research institutions in Zagreb. However, the regional economic gap is exacerbated by uneven levels of digitalisation. Regions with a more advanced SME digital base—such as Zagreb, Varaždin, and Rijeka—tend to exhibit higher productivity and employment rates, particularly in the ICT and innovation-driven SME sector.

The ICT sector in Croatia is among the best-paid industries, with average **gross monthly wages exceeding €2,000**, significantly above the national average (**around €1,200 gross**). Digitally mature SMEs in this sector tend to attract and retain higher-skilled workers, contributing to regional brain gain. Conversely, SMEs in low-tech or traditional sectors face wage stagnation and difficulty accessing skilled labor, partly due to insufficient digital transformation. Salary

premiums for digitally skilled professionals continue to widen, reinforcing competitiveness in regions with a higher density of tech-enabled SMEs.

b) Social Impact: Quality of Life, Inclusion, and Community Resilience

The digitalisation of SMEs significantly influences social well-being across Croatia, affecting quality of life, social inclusion, and community resilience. The impact varies notably between urban and rural regions, reflecting disparities in digital infrastructure, economic opportunities, and access to services.

Quality of Life and Smart Services. Croatia's overall **Quality of Life Index** stands at **177.4**, ranking it 23rd globally. Regions with a high concentration of digitally mature SMEs, such as Zagreb, Rijeka, and Varaždin, benefit from:

- **Enhanced access to digital public services**, including e-health and e-government platforms.
- **Improved transportation and mobility solutions**, facilitated by digital logistics and smart city initiatives.
- **Increased remote work opportunities**, contributing to better work-life balance.
- **Greater resilience during crises**, as digitally equipped SMEs can adapt more readily to disruptions.

These factors collectively contribute to higher life satisfaction and attract a skilled workforce, further reinforcing regional development.

Rural and Underserved Areas: Digital Divide and Declining Services. In contrast, rural regions like parts of Slavonia, Lika-Senj, and Banovina face challenges due to limited SME digitalisation:

- **Reduced access to digital services**, impacting healthcare, education, and administrative processes.
- **Higher unemployment rates**, as traditional industries struggle to compete without digital tools.
- **Youth migration**, driven by the search for better opportunities in digitally advanced urban centers.

This digital divide exacerbates regional inequalities and hampers overall national cohesion.

Social Inclusion and Gender Equality. Digitalisation fosters social inclusion by:

- **Creating flexible work environments**, accommodating diverse needs, including those of caregivers and individuals with disabilities.
- **Empowering women entrepreneurs**, particularly in sectors like e-commerce and digital marketing.

- **Facilitating access to education and upskilling**, through online platforms and resources.

However, these benefits are predominantly realized in regions with robust digital infrastructure, highlighting the need for targeted interventions in lagging areas.

Community Resilience and Digital Public Value. Digitally advanced SMEs contribute to community resilience by:

- **Maintaining operations during crises**, such as the COVID-19 pandemic, through remote work and online services.
- **Collaborating with public institutions**, to develop community support systems and digital tools.
- **Driving local innovation**, by integrating into regional development strategies and fostering public-private partnerships.

These contributions underscore the role of SME digitalisation in building adaptive and sustainable communities.

Conclusion

The digital transformation of SMEs is pivotal for enhancing social well-being and reducing regional disparities in Croatia. Strategic investments in digital infrastructure, targeted support for SME digitalisation, and inclusive policies are essential to ensure equitable development and social cohesion across all regions.

c) Innovation Performance: Regional Innovation Index

According to the **European Innovation Scoreboard (EIS) 2023**, Croatia is classified as an "**Emerging Innovator**", with an overall innovation performance at **63.6%** of the EU average. This places Croatia in the lower tier of EU Member States regarding innovation capabilities. Key weaknesses contributing to this status include **low private R&D investment**, **limited SME product and process innovation**, and **underutilization of intellectual property (IP) systems**, such as patents and trademarks. These deficiencies hinder the country's ability to foster a robust innovation ecosystem and integrate into higher-value segments of the global economy.

The **Regional Innovation Scoreboard (RIS) 2023** further highlights significant internal disparities within Croatia. The **City of Zagreb (Grad Zagreb)** stands out as a "**Strong Innovator**", with an innovation index of **102.8**, surpassing the EU average. This performance is attributed to a concentration of research institutions, higher education facilities, and a vibrant business environment that encourages innovation. In contrast, other regions, particularly in **Eastern Croatia**—such as **Vukovar-Srijem, Brod-Posavina, and Požega-Slavonia**—are categorized as "**Emerging Innovators**", with innovation indices ranging from **60.6 to 68.1**, significantly below the EU average. These regions face challenges like **low business R&D intensity**, **minimal SME collaboration on innovation**, and **limited access to innovation-supporting infrastructure**.

The correlation between SME digitalisation and regional innovation performance in Croatia is evident and substantiated by recent data. Regions with higher levels of SME digital adoption tend to exhibit stronger innovation outputs, as digital tools enable firms to integrate into knowledge networks, leverage data for R&D, and collaborate effectively with universities and innovation hubs. Initiatives like the establishment of European Digital Innovation Hubs (EDIHs) and the Digital Innovation Hub (DIH) Croatia aim to bolster SME digital capabilities. However, the reach of these programs remains uneven, often limited to more developed urban areas.

The digitalisation of SMEs is directly correlated with improved regional innovation performance. Digital tools enable firms to integrate into knowledge networks, leverage data for R&D, and collaborate effectively with universities and innovation hubs. Where SME digitalisation is systematically supported, such as through EDIHs or DIH Croatia, innovation capacity improves. However, without expanding local access to digitalisation support and fostering smart specialisation linkages, Croatia risks consolidating innovation capacity in just a few metropolitan areas.

In 2023, Croatia advanced in the digitalisation of SMEs, reaching 56%, a 6.3% increase compared to the previous year, though this remains slightly under the EU average of 57.7%. Notably, Croatia is among the EU leaders for enterprises using data analytics, with 51.7% of enterprises compared to an EU average of 33.2%. Despite these advancements, challenges persist, particularly in the digitalisation of government services and increasing connectivity in rural areas. For example, only 25.5% of Croatian rural areas are covered by very high-capacity networks (VHCN), compared to an EU average of 55.6%.

To address these disparities, initiatives like EDIH ADRIA have been established. Coordinated by the University of Rijeka, EDIH ADRIA supports the digital transformation of companies in Adriatic Croatia. The project offers support in areas such as high-performance computing, artificial intelligence, cybersecurity, advanced digital skills, and the deployment of digital capacity. It operates as a user-centric consortium, allowing interested users to test digital technologies, attend workshops, and learn how to implement various digital solutions in their businesses.

Despite these efforts, the reach of digital innovation programs remains uneven, often limited to more developed urban areas. Without expanding local access to digitalisation support and fostering smart specialisation linkages, Croatia risks consolidating innovation capacity in just a few metropolitan areas, leaving peripheral regions further behind.

In conclusion, while Croatia has made notable progress in SME digitalisation and innovation performance, significant regional disparities persist. Addressing these disparities requires expanding access to digitalisation support across all regions, fostering smart specialisation linkages, and ensuring that initiatives like EDIHs and DIH Croatia reach SMEs in less developed areas. Such efforts are crucial for enhancing regional innovation performance and ensuring balanced economic development across the country.

2.5. Good practices and recommendations:

Croatia has implemented a range of **policy instruments** at national and regional levels to boost innovation, entrepreneurship, and R&D, with a strong focus on small businesses and digitalisation. Below we highlight several successful initiatives since 2014 (especially from the last five years), describing their goals, structure, responsible bodies, and reported outcomes or impacts. These instruments have shown positive results and offer **lessons for transfer** or scaling to other regions.

Venture Capital and Financing Initiatives

Croatian Venture Capital Initiative (CVCi) – Phases I & II: To spur startup financing, the Ministry of Regional Development and EU Funds partnered with the European Investment Fund (EIF) to launch a fund-of-funds supporting venture capital. **CVCi I** was introduced in 2018 with €35 million, and by 2023 it had **financed about 140 early-stage startups** across Croatia. This success led to **CVCi II** in 2023, scaling up to €80 million (with ERDF 2021–27 funding and reinvested returns). The program invests through private VC funds and accelerators, aiming to **“crowd-in” private investors** and grow the innovation ecosystem. *Implementing bodies:* EIF manages the fund, with oversight by the Croatian Ministry. *Outcomes:* A stronger domestic VC market (initial fund almost fully invested) and dozens of startups funded; the follow-up fund expects a **total impact around €100 million** including private co-investment. This public-private VC model is seen as a **replicable approach** for other regions seeking to boost startup investment.

ESIF Loan and Guarantee Programs: Through HAMAG-BICRO (Croatian Agency for SMEs, Innovations and Investments) and HBOR (Croatian Development Bank), Croatia deployed **EU Structural Funds 2014–20** to improve SME financing. For example, **ESIF Micro and Small Loans** provided affordable credit to SMEs (up to €50k)cepor.hr, and an **ESIF individual guarantee scheme** helped SMEs secure bank loans by covering part of the risk. These instruments improved access to finance (rejection rates for SME loans dropped to 0% in 2017). While not exclusively digital, they enabled SMEs to invest in new equipment and technology. *Implementers:* HAMAG-BICRO and HBOR, via local banks. *Outcomes:* Improved credit conditions for hundreds of SMEs; the cost of borrowing for small loans relative to large fell significantly by 2017. These financial tools complement innovation policy by strengthening the **financial environment for SMEs**, and are adaptable to other regions.

Innovation and R&D Grant Programs

R&D Grants (“IRI” Program): The **IRI program** (Istraživanje, Razvoj i Inovacije) is Croatia’s largest R&D grant scheme, funded by EU cohesion policy. Launched around 2016, its goals are to **co-finance corporate R&D projects** that develop new products or services, often in collaboration with research institutes. The Ministry of Economy (then Entrepreneurship and Crafts) and HAMAG-BICRO ran IRI calls (sometimes termed IRI-1, IRI-2 for successive rounds). *Structure:* Competitive calls awarding grants to innovative SMEs and partnerships, focusing on later-stage development to bring innovations to market. *Outcomes:* Over 250 projects have been supported (as of World Bank reviews), helping firms increase R&D investment and innovate. However, evaluations noted that while IRI addresses a clear market

failure (low private R&D), it tended to favor less risky, near-market projects. Even so, many beneficiaries have commercialized new products. For instance, companies like **Rimac Automobili** (electric supercars) expanded exports after receiving R&D support, and multiple tech SMEs (e.g. Geolux sensors, Repsly SaaS, Amodo insurtech) grew into global markets following grant-backed innovation projects. The IRI model – large-scale matching grants for innovation – is common in the EU and **transferable**, though Croatia's experience shows the importance of targeting truly risky, breakthrough R&D for greater impact.

Proof of Concept (PoC) Program: Originally developed by the pre-accession agency BICRO and later run by HAMAG-BICRO, PoC has been a **flagship early-stage innovation instrument**. It offers small grants to test and validate innovative ideas (prototyping, market research), aimed at researchers and nascent entrepreneurs. *Goal:* create a pipeline of R&D-based innovation by bridging the gap between idea and full R&D projects. *Operational structure:* Frequent calls where applicants (startups, SMEs or research teams) compete for grants (often ~\$35k each) to prove a concept's feasibility. *Implementing body:* HAMAG-BICRO, with funding from national sources and the World Bank in earlier years. *Outcomes:* **High success rate in spawning startups and technologies.** A World Bank assessment noted PoC scored highly in Croatia's policy mix, with a "proven track record of creating a pipeline of R&D-based innovation". Despite funding fluctuations after 2015, PoC supported many firms that later achieved international success. For example, **Geolux** (now exporting hydrology sensors worldwide) and **Amodo** (telematics insurance platform with 75% export share) both benefited from PoC grants in their early stages. **Rimac Automobili**, Croatia's first unicorn, also received PoC support for battery systems R&D. The PoC model has clear transfer potential – many regions adopt similar "innovation voucher" or proof-of-concept schemes to stimulate entrepreneurial experimentation with relatively small public funds.

"Entrepreneurial Impulse" Grant Scheme: The **Entrepreneurial Impulse** was a national SME grant program (run by the Ministry of Entrepreneurship and Crafts) active through the mid-2010s. It consolidated various SME support measures into an annual call, making it easier for firms to access aid. It targeted different SME groups (startups, crafts, women entrepreneurs, exporters, etc.) with co-financing for equipment, training, and business development. *Implementing body:* Ministry (and HAMAG-BICRO for disbursement). *Outcomes:* It funded thousands of small businesses – e.g. in 2017 alone over 3,400 craft businesses received grants (including hundreds for training) cepor.hr. The **2018 EU SME Fact Sheet** cited Entrepreneurial Impulse as a **positive example** of targeted state aid to SMEs. While it was phased out as EU structural fund programs took over, its integrated approach and reach (over 7,300 grants awarded by one report) helped strengthen the SME sector. The concept of a one-stop, broad-based SME grant program can be **adapted by other regions** to streamline support.

Title of the Good Practice	GP Description
GP 1: EDIH Adria – European Digital Innovation Hub	<p>EDIH Adria, coordinated by the University of Rijeka, supports SME digital transformation in Adriatic Croatia. It provides access to services in AI, cybersecurity, advanced digital skills, and high-performance computing. Funded through the Digital Europe Programme and the NPOO, it operates as a regional one-stop shop for testing and adopting digital solutions, with strong potential for replication across other regions.</p>
GP 2: PISMO Novska – Gaming Industry Incubator	<p>The PISMO incubator in Novska, a rural region, focuses on developing Croatia's gaming industry. Co-funded by EU and local sources, it offers infrastructure, training, and incubation for gaming startups. Since 2018, it has supported over 60 companies and 200+ developers (source: PISMO 2023 report). The project illustrates how niche-focused incubation in underserved areas can yield transformative results and is widely seen as a top national example of EU fund use.</p>
GP 3: Proof of Concept (PoC) Program – HAMAG-BICRO	<p>Croatia's PoC program provides early-stage innovation grants to validate ideas through prototype development or market research. Operated by HAMAG-BICRO, it has supported hundreds of tech startups like Rimac and Amodo, many of which expanded globally. The instrument is seen as a pipeline builder for larger R&D and innovation funding and is easily adaptable across other regions or countries aiming to boost entrepreneurial innovation.</p>
GP 4: ZICER – Zagreb Innovation Centre	<p>ZICER, established by the City of Zagreb, serves as a central hub for startups and innovators. It offers co-working spaces, laboratories, mentorship, and acceleration programs. Since its inception, ZICER has incubated numerous startups, contributing significantly to the local innovation ecosystem. Its model of municipal support combined with comprehensive services provides a replicable framework for urban innovation centers.</p>
GP 5: ICT Županija – Split-Dalmatia County Initiative	<p>ICT Županija is a regional initiative aimed at fostering the ICT sector in Split-Dalmatia County. It encompasses various programs, including coding schools, startup incubators, and tech events, to stimulate digital skills and entrepreneurship. The initiative has successfully nurtured a vibrant tech community in the region, demonstrating the impact of coordinated regional efforts in digital development.</p>
GP 6: CEKOM – Competence Centers for Smart Specialization	<p>CEKOMs are collaborative platforms that bring together businesses, research institutions, and public entities to work on R&D projects aligned with Croatia's Smart Specialization Strategy. These centers focus on areas like smart cities, health, and energy, facilitating applied research and innovation. The CEKOM model promotes regional development through targeted innovation and has potential for adaptation in other contexts.</p>
GP 7: Digital Innovation Hubs (DIHs) Network	<p>Croatia's network of DIHs provides SMEs with access to digital technologies, expertise, and testing facilities. These hubs support companies in their digital</p>

Title of the Good Practice	GP Description
GP 8: Strategic Partnerships for Innovation (SPIN) under S3 Strategy	<p>transformation journeys, offering services like training, consultancy, and pilot projects. The DIH network enhances regional innovation capacities and serves as a bridge between research and industry, aligning with EU digitalization goals.</p> <p>SPIN initiatives under Croatia's Smart Specialization Strategy foster collaboration among academia, industry, and government to drive innovation in key sectors. By aligning regional strengths with national priorities, SPIN projects enhance competitiveness and support the development of high-value products and services. This collaborative approach to innovation policy can be tailored to various regional contexts.</p>

SME Digitalisation Support Programs

Digitalisation Vouchers (2023): In the wake of COVID-19, Croatia's **National Recovery and Resilience Plan (NPOO)** earmarked significant funds for SME digital transformation. In 2023 the Ministry of Economy launched a **€9.95 million “Vouchers for Digitalisation” program** (file-9kjs9mzgwycawavxbefolb) (around \$11 million) offering small grants to help SMEs adopt new digital technologies. **Goals:** Increase the digital maturity of SMEs by funding specific digitalisation needs. **Structure:** SMEs apply for **vouchers in categories** such as improving digital skills, developing a digital transformation strategy, digital marketing, cybersecurity diagnostics, or implementing complex digital solutions. Each voucher (worth up to ~€10k) covers the cost of services or training in that domain. **Implementing body:** Ministry of Economy, funded by the EU Recovery Facility. **Reported outcomes:** As a very recent measure, full results are pending, but demand has been strong – the call aims to support **hundreds of SMEs** across all regions. The **expected impact** is to raise competitiveness and resilience by integrating digital tools (cloud, e-commerce, AI, etc.) in traditional businesses. This voucher model, already used in some EU countries, is **highly transferable**: it addresses common digitalisation hurdles (knowledge, strategy, cybersecurity) in an SME-friendly way. Croatia's program is notable for its comprehensive scope (five voucher types) and alignment with EU's Digital Decade targets.

Grants for Digitalisation (RRP): Alongside vouchers, Croatia's RRP included **direct grants for SME digitalisation projects** (~€27 million allocated). A 2023 call invited proposals for larger projects involving deployment of new or significantly improved digital processes, products or business models in SMEs (file-9kjs9mzgwycawavxbefolb) (file-9kjs9mzgwycawavxbefolb). **Goal:** Accelerate post-pandemic recovery by boosting productivity through advanced technology adoption (e.g. automation, digital customer service, etc.). **Implementer:** Ministry of Economy (funding from EU Recovery Plan). **Outcomes:** Still in early stages – expected to fund a portfolio of SME projects that demonstrate tangible business improvements via digital tech. These Recovery Plan measures fill a gap by funding digital upgrades that might be too costly for small firms alone.

They also complement longer-term cohesion policy programs and can be mirrored in other countries' recovery strategies.

Innovation Infrastructure and Incubation

Competence Centres (CEKOMs) – Cluster-Based Innovation: Croatia introduced **Competence Centers (CEKOM)** as part of its innovation infrastructure under the 2014–20 ERDF programs. A CEKOM is essentially an **innovation cluster partnership** focused on a strategic domain, which receives public funding to conduct collaborative R&D projects and build shared facilities. One notable example is the **CEKOM for Smart Cities in Rijeka**, approved in 2020 under the OP Competitiveness and Cohesion. It brings together 20 partners (companies, the City of Rijeka, and research institutes) to work on six R&D projects addressing urban challenges (traffic flow optimization, smart energy management, e-health, etc.), with **36 innovative solutions expected** over three years. **Goals:** strengthen industry–science cooperation and produce marketable innovations that solve real-world problems (in this case, city services) **Operational model:** Each competence center is usually coordinated by a lead entity (e.g. SMART RI d.o.o for Smart Cities) and funded by grants (multi-million EUR) to execute a portfolio of sub-projects. **Outcomes:** While still ongoing, the Rijeka Smart City CEKOM is **creating new products and startups** (e.g. intelligent transport systems) and has fostered effective triple-helix collaboration. Another CEKOM, focusing on advanced engineering in Slavonia, aims to boost eastern Croatia's competitiveness through applied innovation In policy evaluations, the CEKOM instrument was the **only one rated “high” on strategic justification**, directly tackling the market failure in industry-research linkagesThis cluster-centric approach has clear transfer value – it mirrors models like innovation clusters and living labs

elsewhere. Croatia's experience shows that a well-designed competency center can anchor regional innovation and align R&D with local economic needs.

Business Incubators and Accelerators: A network of incubators across Croatia has expanded since 2014, often with EU funding, providing critical support to startups and SMEs. For example, **ZICER (Zagreb Innovation Centre)** is a leading incubator owned by the City of Zagreb. Established in 2017 by repurposing a municipal space, ZICER offers coworking areas, labs, mentorship and an accelerator program to tech startups. *Goals:* nurture innovative companies from idea stage to market. *Structure:* ZICER houses around **80–100 startups on site** and runs the **Startup Factory** pre-seed accelerator which has created 80 new companies since 2016. It's managed by a city agency, demonstrating strong local government involvement in entrepreneurship. *Outcomes:* In five years, over **100 startups** have passed through ZICER, some achieving global traction. The center has grown from 1,000 m² to a much larger facility and is now "the flagship of the city" for innovation. ZICER's director notes that its model – a publicly backed hub with holistic startup support – could **expand nationally or regionally**, highlighting its potential as a template for other regions. Indeed, other cities have launched similar hubs: **BIOS in Osijek** (a long-running incubator now expanded), and **TIC Međimurje** in Čakovec (a regional innovation center), have both been bolstered through EU projects, offering workspace, FabLabs and coaching to local entrepreneurs cepor.hrcepor.hr. These incubators have contributed to spreading tech startup activity beyond the capital.

PISMO – Novska Gaming Incubator: A standout regional success story is **PISMO Business Incubator** in the small town of Novska (Sisak-Moslavina County). Founded in 2018 with about €3.6 million from the EU and county funds, PISMO set out to create a **video gaming industry hub** in a formerly underserved region. Two refurbished buildings were equipped with state-of-the-art hardware for game development, VR/AR, and digital animation. *Implementers:* The Sisak-Moslavina County Development Agency led the project, with backing from the Ministry of Regional Development. *Goals:* generate new high-tech businesses and jobs in a region of high unemployment by focusing on the booming gaming sector; also, diversify the local economy (complementing the county's tradition in metal industries). *Operationally,* PISMO provides office space, incubation for startups, specialized training programs, and access to game development labs. *Outcomes:* The project had **immediate impact** – within a few years, PISMO housed **60+ gaming startups and over 200 developers** trained through its courses. It has put Novska on the tech map, to the extent that an ambitious €50–60 million **Gaming Campus** is now planned to further grow this ecosystem. In 2020, PISMO was voted the "**Most Successful EU-Funded Project in Croatia**" in a national competition, recognized for its contribution to entrepreneurship. This initiative clearly demonstrates **transferable insight**: even small, rural regions can carve out a niche in the digital economy with visionary focus and smart use of EU funds. Other regions could emulate the PISMO model by targeting a specific high-growth tech niche (gaming, AI, biotech, etc.) and building an innovation cluster around it.

Regional and Local Digitalisation Initiatives

"ICT Županija" – Split-Dalmatia County Project: At the regional level, one example is the **ICT Županija** program (Digital Dalmatia) initiated by Splitsko-dalmatinska County. This is a comprehensive effort by county authorities to improve the local tech startup scene and digital skills base. *Goals:* Encourage IT

entrepreneurship and talent development in the Split region, traditionally not a tech hub. **Measures:** It unites a variety of actions – **seed funding for startups, free coding schools and hackathons, support for tech events (conferences like Shift), and the creation of co-working spaces.** ICT Županija also co-finances a local accelerator (Startup Academy) for early-stage teams. **Implementer:** The County's Department for Economy, in partnership with local tech companies and the university. **Outcomes:** Since its start around 2016, the Split region has seen a renaissance in entrepreneurship – dozens of startups have emerged (e.g. Parklio, a smart parking startup that raised €1M), and the community of developers and “digital nomads” has grown. The initiative helped establish **Digital Dalmatia** as a brand and physical hub in Split for innovators. While harder to quantify than a single program, ICT Županija's **holistic approach** (combining education, networking, and funding) has been credited with energizing the local tech ecosystem and is **relevant to other regions** seeking to build innovation culture outside the capital. It shows the importance of regional authorities taking ownership of digital development by coordinating stakeholders and resources.

Smart Specialisation Strategy & Transregional Learning: Croatia's *Smart Specialisation Strategy (S3)*, implemented from 2016, provided an umbrella for many of these instruments by identifying priority domains (like ICT, biotech, energy, etc.) for investment. Under S3, Croatia has encouraged **inter-regional collaboration** and participation in EU programs (e.g. Horizon 2020, Interreg). For instance, the country has engaged in **Interreg projects** to exchange good practices on incubator management, cluster policies, and SME digitalisation. One concrete outcome is that Croatian agencies and regions have been actively learning from peers – e.g. taking part in the “**Digital Europe for SMEs**” initiative and OECD reviews on **digital and green SMEs**. **Impact:** This has led to continuous refinement of policy instruments. A recent OECD report noted that the number of Croatian SMEs in ICT sectors grew by over 50% between 2019 and 2023, suggesting an improving environment. The **transregional knowledge transfer** (through EU networks, clusters alliances, etc.) is both a policy instrument in itself and a driver to adapt successful tools from elsewhere. Croatia's progress in the last five years – from launching voucher schemes to establishing EDIHs and niche incubators – reflects this interplay of domestic initiative and European-level support, offering a rich set of **examples for other regions** on their innovation journey.

Data Infrastructure

Croatia's approach to SME digitalisation is guided by national strategies closely aligned with EU policies. The **National Development Strategy 2030** highlights the “digital transition of the economy” as a priority, alongside digitalising public administration and developing digital skills. Building on this, the government adopted the **Digital Croatia Strategy 2032**, which is led by the Središnji državni ured za razvoj digitalnog društva (SDURDD, Central State Office for Digital Society Development). SDURDD is responsible for drafting and implementing the strategy in coordination with stakeholders across government, industry, and academia.

Data Sources and Tools for Assessing SME Digitalisation

Croatia's **official statistical system** provides key data for assessing SME digitalisation and competitiveness. The national statistical office (DZS) conducts an annual survey on ICT usage in enterprises, aligned with Eurostat methodology. According to the latest results, 99% of Croatian

enterprises use computers with internet access, 92% have broadband, and 62% maintain a website – indicating a broad basic digital uptake. More advanced metrics show growing adoption of digital tools: as of 2024, 42% of enterprises use cloud computing services. However, **e-commerce remains underutilized**, accounting for only 19% of total business sales. These official statistics (published for businesses with 10 or more employees) are crucial for tracking digitalisation trends over time and by sector. DZS data releases break down ICT usage by broad industry categories and firm size, enabling analysis of how, say, manufacturing vs. services or small vs. medium firms utilize digital technology.

At the European level, Croatia's performance is benchmarked through the **EU Digital Economy and Society indicators**, now part of the Digital Decade monitoring. These compile national data (like DZS's survey) into comparable indicators. The European Commission's country reports highlight Croatia's mixed digitalisation landscape – e.g. near-average SME engagement in online trade, but strong leadership in data analytics usage. They also track advanced technology adoption: **65.6% of Croatian enterprises use at least one of AI, cloud, or big data**, above the EU average of 54.6%. Such indicators provide a composite view of SME digital competitiveness, feeding into policy reviews and targets.

Beyond official statistics, various **analyses and studies** contribute to understanding SME competitiveness in the digital era. For instance, the World Bank's *Croatia Digital Economy Diagnostic* finds that aside from tourism, Croatian firms lag regional peers in productivity, and it explicitly links this to slower uptake of digital technologies. The **OECD** and EU also produce *SME Performance Reviews* and *Small Business Act fact sheets* that include indicators on innovation, skills, and digitalisation for Croatian SMEs. These analyses often draw on a range of data (from ICT usage rates to SME value-added and innovation expenditure) to assess how digital readiness is affecting SME growth and competitiveness. Overall, Croatia's data infrastructure for SME digitalisation assessment is a combination of **national statistical surveys, administrative data, and EU-wide benchmarks**, supplemented by targeted reports or research. The data is increasingly accessible – e.g. through the DZS open data portal and Eurostat – and is used by institutions like SDURDD and the Ministry of Economy to identify gaps and measure the impact of digitalisation initiatives.

Role of SDURDD and CDU in Data Infrastructure

SDURDD (Central State Office for the Development of the Digital Society) plays a pivotal role in coordinating Croatia's digital transformation and the related data infrastructure. As the lead agency for the Digital Croatia Strategy, SDURDD not only formulates policy but also oversees its implementation and monitoring. This involves gathering data on digitalisation progress (for example, compiling inputs for the EU's Digital Decade reports) and ensuring different institutions contribute information. SDURDD also champions improvements in data sharing and e-government services that indirectly benefit SMEs. One priority in the digital strategy is to enhance the national **open data portal** and release "high-value datasets" based on interoperable public registers. By improving open data availability, SDURDD aims to provide businesses, researchers,

and policymakers with richer data – for instance, data on companies, markets, or digital service usage – which can be used to assess and foster SME competitiveness.

A cornerstone of Croatia's digital infrastructure is the **Centar dijeljenih usluga (CDU)**, or Shared Services Center, which SDURDD helped establish. The CDU is essentially the government's cloud and data exchange platform – a *centralized IT infrastructure for public administration*. It provides a secure, scalable environment where ministries and agencies can host applications and share data. Importantly, the CDU has vastly improved the interconnection of national databases and registries. As of 2023, it had integrated **34 key registries with 94 e-services used by over 160 institutions**, enabling seamless digital data exchange across government. This has several benefits: faster and safer transfer of information between agencies, central management of data resources, and elimination of previous paper-based data sharing.

While CDU primarily serves government users, it significantly **supports the SME data ecosystem** indirectly. Better integration of business registries, tax data, employment data, etc., means that comprehensive information on companies can be aggregated more easily. For example, data from the business registry and financial reports could be linked to track SME performance, or e-government usage stats can show how many businesses use online administrative services. The CDU's secure cloud also hosts services like the e-Citizens/e-Companies portals, through which SMEs interact with government – usage of these services can be measured to gauge digital uptake. Moreover, by strengthening data security and reliability in government systems, CDU builds trust in digital services, encouraging more SMEs to go online. SDURDD and CDU together thus create the **digital backbone**: SDURDD sets standards and strategies for data and digital development, and CDU provides the technical infrastructure for data sharing and service delivery. This combination is crucial for collecting consistent data (through interoperable systems) and providing the analytical tools needed to assess SME digitalisation progress across Croatia's economy.

Key Data Gaps in Assessing SME Digitalisation

Despite the advances in data infrastructure, there are notable **gaps that hinder a high-quality assessment** of SME digitalisation and competitiveness in Croatia:

- **Limited coverage of micro-enterprises:** Official ICT surveys and EU indicators typically cover enterprises with **10 or more employees**, excluding micro-businesses. However, micro-firms form the vast majority of businesses (by count) – about **99.8% of all Croatian business entities are SMEs**, many of them micro-enterprises. The digital behaviours of these smallest firms (e.g. family businesses, sole proprietors) are not well captured. This gap means that policy-makers lack data on a huge segment of the economy, which may have very different digitalisation challenges (often micros lag in adoption of advanced tools). Without extending surveys or data collection to micros, the overall picture of SME digital maturity is incomplete.
- **Insufficient regional data:** Most data on SME digitalisation is available only at the **national level**. Croatia's statistics and EU reports do not break down SME digital uptake

by region or county in a meaningful way. This is problematic because digital development can be uneven – for instance, the capital city (Zagreb) and a few major hubs may far outpace rural or less developed regions in broadband access, IT skill availability, or technology adoption. The lack of granular regional indicators makes it difficult to identify local disparities or target regional policy measures. High-level national averages can mask the fact that, say, SMEs in Slavonia or Dalmatia might be much less digitalised than those in Zagreb. Currently, there is no regular, detailed **regional digitalisation index** for SMEs in Croatia.

- **Gaps in sector-specific insights:** While broad industry categories are reported (manufacturing vs. services, etc.), there is a lack of **fine-grained sector data** on digital adoption. Different sectors face different digitalisation opportunities – e.g. tourism and retail SMEs might benefit from e-commerce and digital marketing, while manufacturing SMEs might need automation and AI. However, data on specific technologies (IoT, AI, cloud, etc.) by sector or use-case is scarce. The available statistics tend to aggregate all “SMEs” or only split by size, not by detailed industry. This makes it harder to assess which sectors are lagging (for example, are agricultural SMEs or construction firms notably behind in going digital?). Similarly, data on how SMEs use sector-specific digital platforms or standards (for instance, usage of e-invoicing in trade, or precision agriculture tools in farming) is not systematically collected.
- **Lack of longitudinal performance data linked to digitalisation:** To truly gauge competitiveness impacts, one would want to relate SMEs’ digital adoption to outcomes like productivity, export growth, or innovation. Currently, this linkage is not well documented due to data silos. **Administrative and financial data on SMEs** (revenues, productivity, exports) are collected by various agencies, but are not yet fully integrated with digital uptake data. For example, we know the share of firms using cloud services, but we cannot easily see if those firms perform better in sales or innovation than those who do not – such analysis would require micro-level data linking, which is still limited. The CDU’s integration of registries is a step toward enabling this, but as the digital strategy notes, much potential remains “*unused due to very limited access to data from public registries*” so far. Researchers and analysts often rely on ad-hoc surveys or case studies to infer these impacts, pointing to a gap in official analytical data.
- **Real-time and SME-specific digital metrics:** In a fast-changing digital landscape, data collected annually (or less frequently) may be outdated by the time it’s reported. There is a gap in more real-time indicators of SME digital engagement. For instance, data on **website traffic, e-commerce transactions, or digital payment usage by SMEs** could complement traditional surveys, but such data either aren’t collected or aren’t publicly available in Croatia. Also, many global digital indexes (e.g. e-commerce penetration, startup ecosystem metrics) mix large and small firms, making it hard to isolate SME-specific performance. SME owners often point out the lack of detailed benchmarks to compare their digital maturity against peers in the same region or industry.

In summary, the **data gaps** center on granularity – by size (missing micros), geography, and sector – and on connecting digital adoption to competitiveness outcomes. These gaps make it

challenging to design finely tuned policies (for example, regional digitalisation funds or sector training programs) and to rigorously evaluate how going digital translates into SME growth or resilience.

Recommendations for Improving Data Collection and Analysis

To strengthen the assessment of SME digitalisation and competitiveness, several improvements in data infrastructure and practices are recommended:

- **Expand survey coverage and frequency:** The national ICT usage survey should be extended to include micro-enterprises (perhaps via stratified sampling or separate surveys for businesses under 10 employees). Even a lighter version of the questionnaire for micros would yield invaluable insights into the smallest firms' digital tools and needs. Additionally, conducting key surveys more frequently or adding interim pulses (e.g. a mid-term mini survey on SME e-commerce) could capture trends in a timelier manner.
- **Enhance regional and sectoral data collection:** Statistical authorities and relevant ministries could collaborate to gather data at the **regional level**. This might involve oversampling certain regions in surveys or using administrative data (like broadband subscriptions or e-service usage by county) as proxies for digital readiness. Publishing an annual "**Digital Economy Regional Atlas**" for Croatia, with metrics for each county or region, would illuminate local disparities. Similarly, deeper dives into specific sectors can be done through occasional focused surveys or by partnering with industry associations. For example, a one-time survey on digital technology usage in agriculture SMEs, or in manufacturing, could fill knowledge gaps for those sectors.
- **Leverage administrative and platform data:** With the **CDU interconnecting databases**, Croatia is well-positioned to utilize administrative data for statistical insights. Authorities should identify and release relevant indicators derived from administrative sources – for instance, the percentage of companies in each region using the e-Tax system or e-invoicing, the number of SME users of the e-Citizens business portal, etc. Such data, when aggregated and anonymized, can provide up-to-date measures of digital engagement. Moreover, the government could collaborate with private platforms to obtain anonymized data on SMEs (for example, data from e-commerce marketplaces on Croatian SME sellers, or from payment processors on digital payment adoption). These would complement traditional surveys with real-world usage statistics.
- **Improve the Open Data portal for business data:** As envisaged in the Digital Croatia Strategy, the national open data portal should prioritize publishing **high-value datasets** related to businesses and the digital economy. This could include disaggregated results of the ICT usage survey, regional broadband coverage, startup ecosystem data, and datasets from projects like the digital voucher program (e.g. list of voucher recipients by sector and region). By making such data easily accessible to analysts and researchers, Croatia can encourage external analysis and feedback. Universities and think-tanks could then more readily study SME digitalisation, producing independent insights that feed back into policy.

- **Integrate digital and performance data for analysis:** To address the link between digitalisation and competitiveness, Croatia could set up a secure **data integration project** (perhaps under SDURDD or the Ministry of Economy) that combines different datasets at the firm level. Using strong privacy safeguards, data from the business registry, tax filings, innovation surveys, and ICT usage could be pseudonymously linked. This would enable economists to perform panel analyses – for example, checking if SMEs that adopted cloud or received a digital voucher see faster growth in productivity or exports over time. The findings would help quantify the benefits of digitalisation. If direct integration is complex, an alternative is to conduct longitudinal “*SME Digital Maturity and Performance*” studies, tracking a sample of SMEs over several years with detailed questions on both tech usage and business results.
- **Regularly monitor and report on SME digital trends:** Establish a dedicated **SME Digitalisation Scoreboard** or annual report in Croatia. This report (possibly produced by SDURDD in collaboration with the statistical office and Ministry of Economy) would synthesize all available data each year – including DESI indicators, national survey results, program uptake stats, etc. – to provide a comprehensive state-of-play. It should highlight not just overall progress but also breakdowns by region and sector wherever possible, to keep inequalities visible. Such a report, presented to stakeholders and the public, would increase transparency and accountability for digitalisation efforts. It would also help measure the impact of initiatives like the voucher program (by reporting how many SMEs utilized it and to what effect). Over time, this could evolve into an interactive online dashboard where users can query SME digitalisation data by various filters.
- **Targeted qualitative research to fill gaps:** Not all aspects of digital competitiveness can be captured quantitatively. For nuanced areas where data is thin – for instance, the quality of SMEs’ digital skills, or barriers faced by specific sectors – the government should commission qualitative studies or case studies. Interviews, focus groups, and on-site assessments in different regions can reveal issues behind the numbers (e.g. why an SME in a certain county isn’t online, or how a manufacturing SME implemented robotics). Publishing these insights will provide context to the numbers and highlight areas for improvement that surveys might overlook (such as cultural attitudes or specific regulatory hurdles impacting digital uptake).

By implementing these recommendations, Croatia can develop a **more robust data infrastructure** that captures the multi-faceted nature of SME digitalisation. This will enable policymakers to track progress toward digital transformation goals more accurately and design interventions (be it training, infrastructure investment, or financial incentives) grounded in evidence. Ultimately, better data will support Croatia’s ambition to have all its SMEs – across every region and industry – fully participate in the digital economy, thereby boosting their competitiveness at home and in global markets.

3. Summary

The digitalisation of SMEs in Croatia is recognized as a strategic driver of regional competitiveness, innovation, and economic resilience. As SMEs make up over 99% of all businesses in the country, their ability to adopt and integrate digital technologies is essential for enhancing productivity, accessing new markets, and achieving alignment with EU Digital Decade goals. The process of digital transformation, however, remains **uneven across sectors and regions**. While progress has been made in adopting basic ICT infrastructure and cloud services—particularly among medium-sized enterprises and in urban areas—many **microenterprises and SMEs in rural or less developed counties** lag behind in digital intensity and advanced technology uptake.

The government has responded with a comprehensive policy framework that includes strategic documents such as the **Digital Croatia Strategy 2032**, the **National Development Strategy 2030**, the **Smart Specialisation Strategy**, and the **National Recovery and Resilience Plan (NPOO)**. These are complemented by operational programs and targeted financial instruments such as:

- Digitalisation Vouchers Scheme (2023–2024),
- Grants for SME Digital Transformation (NPOO),
- European Digital Innovation Hubs (EDIHs),
- Proof of Concept (PoC) and R&D (IRI) Grants,
- Venture Capital Instruments (CVCi I and II),
- Regional innovation infrastructure like ZICER and PISMO Novska incubator.

Despite this multi-instrumental support system, several key **challenges persist**:

- Digitalisation support is **concentrated in urban areas**, leaving many peripheral regions underserved.
- The **smallest SMEs and traditional sectors** (e.g. agriculture, crafts, construction) face **low awareness, skill gaps**, and difficulty accessing financing or advisory support.
- Administrative burden and fragmented coordination among public bodies hamper full program uptake and impact.
- Many instruments, while well-designed, **lack sustained monitoring and impact evaluation frameworks**.

Another critical constraint is the **lack of granular, integrated, and real-time data** to track SME digital maturity and outcomes. Existing national data (e.g. ICT usage surveys by DZS, DESI/Digital Decade indicators) provide a general overview but do not adequately reflect:

- **Microenterprises** (under 10 employees),
- **Regional disparities**,
- **Sector-specific digitalisation patterns**, or

- The **link between digital adoption and business performance outcomes** (e.g. revenue, exports, innovation).

The institutional backbone for data collection and integration is provided by the **Središnji državni ured za razvoj digitalnog društva (SDURDD)** and the **Centar dijeljenih usluga (CDU)**. SDURDD leads strategic planning and coordination, while CDU provides cloud infrastructure and database interoperability for public sector digital services. However, the potential of integrated data use for policy evaluation is still **underdeveloped**, and open data access for external analysis is limited.

Key Measures Needed

- Expand data collection to include **micro-SMEs** and regional indicators;
- Improve **integration and accessibility of public registers** via CDU for analytical use;
- Provide **sector-specific and needs-based digitalisation programs**, especially for lagging regions;
- Reduce **administrative burden** in application and reporting processes;
- Establish an **SME Digitalisation Scoreboard** to annually track progress and regional disparities.

Overall Conclusion

Croatia has established a solid and comprehensive strategic framework for SME digitalisation, supported by significant EU and national investments. Moving forward, impact will depend on improving regional implementation capacity, ensuring equitable access for all SME groups, and strengthening the data infrastructure required for evidence-based policymaking. With targeted interventions and better-integrated governance mechanisms, Croatia can significantly accelerate SME digital transformation and narrow the digital divide across its regions.

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