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REGIONAL MAPPING REPORT - CROATIA

Project: Improving RD and business policy conditions for transnational cooperation in the manufacturing industry

Acronym: Smart Factory Hub

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TARGET GROUP ASSESSMENT

Has this deliverable addressed any of the target group indicated in the application form?

Yes / **No**

If yes, please describe the involvement of each individual target group in the table below.

Target group	Number reached by the deliverable	Description of target group involvement
SME		
Regional public authority		
National public authority		
Higher education and research		
Business support organisation		

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ACRONYMS

DTP	Danube Transnational Programme
PP	Project Partner
TBC	to be continued

1 Introduction

The objective of regional mapping is to provide insight into the current state of the manufacturing sector, particularly functioning of support environment in Croatia from which production oriented small and medium enterprises (SME) can benefit on a long term. The regional report is drafted by following common methodology, which includes the analysis of supportive environment for manufacturing oriented companies - particularly smart specialization measures, priorities, indicators, implementation schemes, instruments, emerging trends in the manufacturing sector, analysis of existing support ecosystems and analysis of the main regional actors.

This report is provided as a single report, similar to reports from other countries, where each partner delivered mapping covering its own region. As a result, regional mapping reports are prepared for Austria, Bulgaria, Croatia, Czech Republic, Germany, Hungary, Romania, Serbia, Slovakia and Slovenia.

After the introduction, Chapter 2 is providing strategic background for the Smart Specialization Strategy including top-down description of strategies and status of their evolution at a national level, background analyses supporting development of strategies and highlight Smart manufacturing topics.

Chapter 3 is presenting support environment by highlighting the support environment structure, detecting actors responsible for implementation of strategies and other supporting actors like clusters, technology parks, R&D centres, competence centres, University incubators, Business incubators.

Chapter 4 presents Smart Factory support schemes and programmes including list of currently available or future programmes, grants, loans, etc.

Chapter 5 provides national Smart Factory related projects in execution by the project partner or partnering organisations.

Chapter 6 presents list of regional actors relevant for area of Smart Factory whereas actors are grouped by relevance (User, Solution provider or User/solution provider)

2 Strategic background

Europe 2020 is the EU's growth strategy for the coming decade. In a changing world, we want the EU to become a smart, sustainable and inclusive economy. These three mutually reinforcing priorities should help the EU and the Member States deliver high levels of employment, productivity and social cohesion.

Concretely, the Union has set five ambitious objectives – on employment, innovation, education, social inclusion and climate/energy – to be reached by 2020. Each Member State has adopted its own national targets in each of these areas. Concrete actions at EU and national levels underpin the strategy.

The Smart Specialisation Strategy (S3) has been developed by the Croatian government in response to the European Commission's Europe 2020 strategy and as ex-ante conditionality for usage of ESI Funds intended through thematic objective 1 – Strengthening research, technological development and innovation.

The key objectives of the Croatian S3 are to foster economic growth and jobs through the three mutually reinforcing Europe2020 priorities. By doing so, Croatia will contribute to making Europe a smarter, more sustainable and more inclusive place to live.

The main purpose of Smart Specialization is to transform the Croatian economy and increase its competitiveness by concentrating knowledge resources and linking them to a limited number of priorities. (Figure 1) The identification of the Smart Specialization priorities will allow concentration of research capacities and infrastructure. This will provide advantage to both public and private sector and will bring together the critical mass of researchers who will jointly work on strategic R&D topics with goal of research excellence and its commercialization.

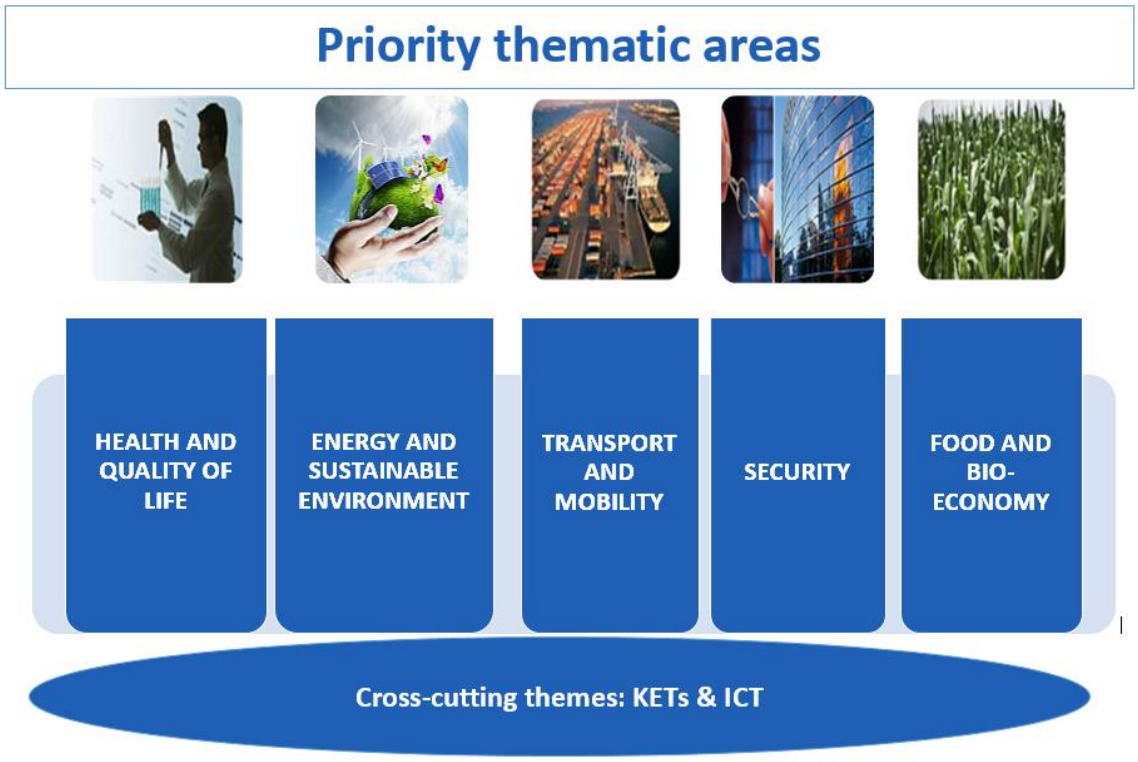

Figure1: The S3 TPAs and cross-cutting themes

The vision and overall strategic objectives have been detailed in six specific strategic objectives that will direct policy initiatives and actions towards increasing smart, inclusive and sustainable growth in Croatia:

1. Increased capacities of RDI sector to perform excellent research and to serve the needs of the economy,
2. Overcoming the fragmentation of innovation value chain and the gap between research and business sector,
3. Modernizing and diversifying Croatian economy through increasing private R&D and non R&D investment,
4. Upgrading in global value chain and promoting internationalization of Croatian enterprises,
5. Working in partnerships to address societal challenges,
6. Creating smart skills - upgrading the qualifications of existing and new work force for smart specialization

2.1 Governance system for the S3[1]

The organizational structure of Governance system for the S3 in Croatia is shown in the below-given figure:

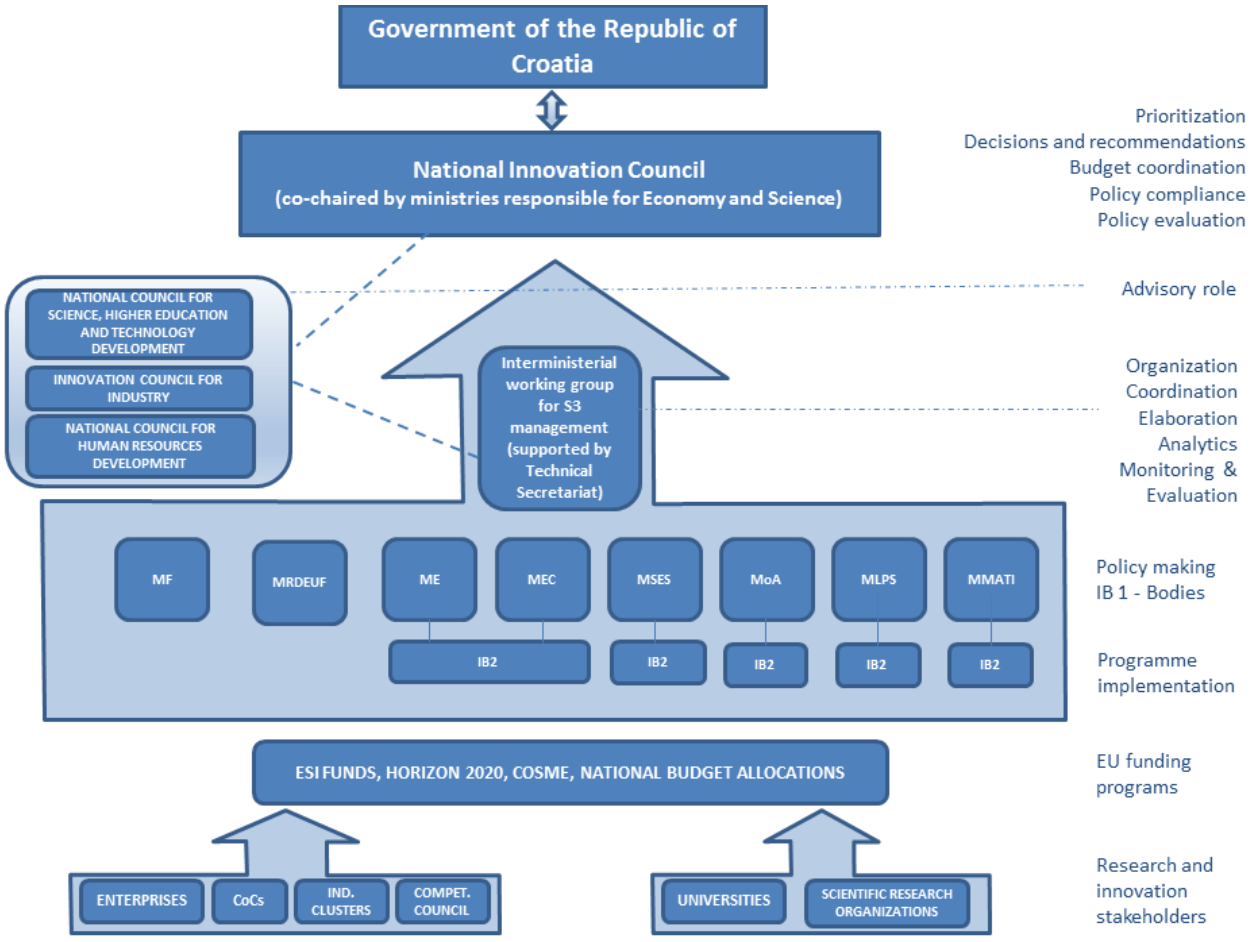

Figure 2: Organizational structure of the S3 governance system

The configuration of Croatian institutions in charge of governing science, technology and innovation is similar to governance structures of most of the EU countries. Higher levels of governance are in charge of orienting and programming policy and include the Parliament (in particular, the Parliamentary Committee for Education, Science and Culture in addition to the general body's say on changes in legislation) and four central government ministries: the Ministry of Science, Education and Sport (MSES), the Ministry of Economy (MoE), the Ministry of Entrepreneurship and Crafts (MoEC) and the Ministry of Regional Development and EU Funds (MRDEUF). In addition, each ministry has a fairly distinct set of stakeholders. Lower-level

[1] Source: https://rio.jrc.ec.europa.eu/en/library/smart-specialisation-strategy-republic-croatia-period-2016-2020-and-action-plan

implementation, monitoring and funding involve various intermediaries in the form of councils, committees and funding agencies, although some funding functions remain in the ministries.

Effective policymaking to support the S3 is complex, given the long-term impact and systemic nature of RDI and the significant risk by stakeholders. In this context, institutional arrangements should embody the following governance principles:

1. Clarity of vision, objectives, and strategy. After the situation has been diagnosed and barriers to RDI identified, it is necessary to clearly define (a) expected outputs and outcomes; and (b) the inputs, lines of action, and strategic initiatives needed to achieve them.
2. Clear jurisdiction and mandate of responsible institutions. Each type of institution must have the authority and instruments needed to effectively carry out its role.
3. Coordination mechanisms at various levels. Establishing an effective governance system is complex and requires the participation of many institutions. The challenge is to put in place mechanisms that balance coordination with interdependence, in order to prevent duplication of efforts, reduce transaction costs and information problems, and take advantage of possible synergies.
4. Transparency and accountability. Both are key elements of effective governance.
5. Establishment of formal M&E mechanisms and feedback loops at different levels of government to inform decision and policy makers.
6. Public access to information on decision making processes, criteria and procedures for allocation of resources, and project performance.
7. Integrating learning into policy and practice. Good governance also requires that the system has the ability to continually adapt to change, and to incorporate lessons from both successes and failures.

Monitoring and evaluation framework of the S3

S3 strategy enables the monitoring and evaluation mechanisms in order to link the S3 output indicators with the overall strategic policy and expected outcomes and impacts which are measured through result/outcome and context indicators. According to RIS3 Guidelines, there is a need to concentrate on monitoring and evaluation of outputs and its contribution to the innovation policy as a whole rather than monitoring the absorption of financial allocations designated for the S3. The monitoring system of the S3 should therefore allow, through the monitoring of selected output indicators, their assessment against the targets and change the policy approach in case of failure. This will be done through several monitoring and evaluation tools and mechanisms involving external experts:

- *ex-ante* assessment of Croatian S3 as a first milestone for setting up the baseline values, targets for indicators and expected results, including cost-benefit assessment,
- institutionalization of the monitoring and evaluation system for S3 using existing institutional capacities (including data collection system (MIS)) and external experts resources,
- *interim* evaluation of the selected S3 indicators (output, outcome/result and context),

- *ex-post* evaluation of the S3 through integrated monitoring and evaluation system and final reporting of the S3 achievements.

Monitoring and evaluation as a public management tool will help policymakers in Croatia to track performance and determine the impact of policy interventions. Monitoring is first of all a process of information gathering and systematization. The main purpose of monitoring in this respect is to enhance understanding of the achievements that have been put in place through policy interventions. Monitoring will provide quantitative and qualitative information on the progress of a policy, program, or project to defined baseline or objective. Moreover, monitoring is a pre-condition for conducting any meaningful evaluation. Evaluation will attempt to provide an evidence of a change and show whether interventions are achieving the desired outcomes. Evaluation will be carried out by independent experts, facilitated by those responsible for the policy i.e. by the National Innovation Council which will approve the Evaluation plan and by the S3 IWG which will approve terms of references for every evaluation study.

2.2 Smart Specialization Strategy (S3)

The strategy concentrates on a limited number of priority sectors that are defined based on strengths and R&D potential for innovation development with basis for export. Proposed measures in S3 are focused on avoiding fragmentation of research, on concentration of structural funds, public budgets and private resources on priorities with competitive advantage and with the highest development potential.

The end result of these processes is the selection of 5 TPAs with relevant technological and production fields as the main focus for the S3 in Croatia: (1) **Health and quality of life**, (2) **Energy and sustainable environment,** (3) **Transport and mobility**, (4) **Security** and (5) **Food and bio-economy**. Additionally, Croatia has identified two **cross-cutting** themes able to create the biggest added value and foster the emergence of new economic activities, rising of the productivity of the Croatian economy and the creation of new and sustainable job opportunities. Cross-cutting themes are **KETs and ICT**.

The capabilities of the business sector for innovation are highly influenced via so-called growth-relevant „cross-cutting themes“. Cross-cutting themes are cross-industry technologies and processes which are important for Croatian development because they are the additional source of innovation in all thematic priority areas, supporting them in a value-added manner. They indirectly lead to product and process innovations in the respective industries, i.e. they are only turned into market-ready services and products in the context of the business potential. Cross-cutting themes are acceleration factors and growth drivers within the thematic priority areas.

2.2.1 Key Enabling Technologies (KETs)

Key Enabling Technologies (KETs), as the technologies of the future[2], will provide the technological building blocks and key source of innovation in Croatia that will enable a wide range of product applications in S3 Thematic and Sub-thematic Priority Areas including those required for developing low carbon energy technologies, improving energy and resource efficiency, boosting the fight against climate change or allowing for healthy ageing. They will create added value along different industrial chains and sectors - from materials through equipment and devices, to products and services. Due to their cross-cutting nature and systemic relevance, KETs will be instrumental for modernizing Croatia's industrial base as well as driving the development of entirely new industries.

2.2.2 Information and Communication Technologies (ICT)

ICT sector in Croatia represents one of the key factors of the economic and social development, taking into consideration employees' skills, high share of the overall active population employed in this sector, technology level, value added, business performance, high BERD values, share in GDP, increasing export orientation and growth potential[3]. It is impossible to envisage further technological advancement of particular industry segments, research areas and niches without integrating ICT solutions within their operation. ICT sector integration within many economic activities can be particularly used across large number of industries. It is also a source of dramatic change in business practices of other industrial activities. Characteristics of the ICT industry are innovation, support to higher added values of industry segments and high dependence on continuous technological progress. Because of these characteristics and its role in further technological development, ICT was selected as S3 cross-cutting theme with the aim to further develop particular areas of application that can support development of all 5 identified TPAs.

1. **Robotics and automatization**

Robotics has initial potential for the development of elements that, together with the elements listed in the communication software, can be integrated in complex systems for the development of new industrial plants (Industry 4.0) or with the full application of the IoT ensure the creation of "cyber-physical systems''. So far, the most robotics projects were oriented towards health, security and transport application. It is notable that one RDI topic particularly emerges throughout every identified TPA's RDI topics of Croatian Smart specialization strategy: **Process and embedded computer automation and control processes**. This field of investment is of most interest to various industry branches identified under TPA's and it can be said that this particular

[2] Micro- and nanoelectronics, nanotechnology, industrial biotechnology, advanced materials, photonics and advanced manufacturing technologies
3 Analysiy, sub-chapter 2.2.7.

ICT application area is needed link for improving current level of technological development for Croatian industries.

In order to develop competitive industry (industry 4.0. and lean manufacturing capacities), important prerequisite will be to develop capacities in area of Process and embedded computer automation and control processes (microcontrollers, sensors, lasers for positioning the object, PLC's, HMI's, SCADA systems) for which Croatian ICT sector has capacities, has potential demand and future prospects.

2. Internet of Things, Big Data and Internet-based services

R&D activities in Croatia related to Future Networks and Future Internet cover three related segments of the global value chain: Internet of Things (communication software and platforms for interconnected objects), Big Data (acquisition, processing and analysis of data originating from physical and virtual world) and Internet-based services, all for application domains defined by TPAs. Croatia tends to focus its investments for the purpose of supporting identified TPAs in following specific areas: e-health solutions and related technologies; ICT-based services and applications for improving quality of life for persons with disabilities, including solutions for Alternative and Augmentative Communication; Solutions for Smart Metering and Internet of Things; ICT solutions connected to energy sector (Smart Cities and Utilities, Smart Mobility and Smart Living); Environmental monitoring based on Internet of Things and Big Data analysis; **S**mart citizen solutions for environmentally friendly multimodal transport; Internet of Things and Big Data in transport; mine-information and geo-information systems (e.g. systems for multi-criteria decision making based on geo-information system, development of E-learning for EOD training);Internet-based services for managing agricultural and food production operations; ICT solutions in wood furniture production; all RDI topics in STPA Cyber Security are related to ICT.

3 Support environment

Supporting institutions for business oriented SMEs are chambers of commerce, chambers of crafts, centres of excellence, research centres, development centres, competence centres, technology centres, technology parks, incubators and other operating in the eligible program area.

All these institutions promote the emergence of new competitive companies that promise high added value and equitable regional development. Incubators support the realization of entrepreneurial ideas, the creation and development of enterprises, stimulating environment, subsidised leases of premises and administrative, intellectual services and other services for its tenants. Technology parks in one location bringing together business development, research and operations of new technology companies, its members while offering a supportive environment consultancy, easy exchange of information, transfer of knowledge, the necessary infrastructure and the like.

3.1 Clusters

Croatian manufacturing industry can best be presented through identified 13 industrial sectors organized through clusters of competitiveness. **Clusters of competitiveness** represent formal collaboration structure and concentration of stakeholders (Triple Helix model) from identified industrial sectors with common interest and capacity to: strengthen competitiveness of sector through pursuing and upgrading existing comparative advantages, focus on R&D&I investments and projects, identify technologies based on identical demand, connect and position in EU and Global value chains.

A competitiveness cluster is a sector specific non-profit organisation, identified and established on the initiative of the Government of the Republic of Croatia, which brings together the commercial, scientific and policy making communities in a formal structure.

The intention is to gather the best players in their field – small, medium and large companies, public institutions and science and research institutes in order to develop synergies and cooperative efforts. The final outcome of this synergy will be increased national sector competitiveness.

13 Competitiveness clusters based on information from Agency for Investments and Competitiveness[4]:

1. Automotive industry

[4] http://www.aik-invest.hr/en/competitiveness/

2. Wood processing industry
3. Food Processing industry
4. Defense industry
5. Medical Industry
6. Chemical, Plastics and Rubber Industry
7. Sector of Electro and production machinery and technologies
8. ICT Industry
9. Maritime industry
10. Creative and Cultural Industry
11. Construction Industry
12. Textile, Leather Goods and Footwear Industry
13. Personalized Medicine

Important role for the future development and strengthening the role of competitiveness clusters will be their focus on R&D&I projects that tend to be funded through ESI Funds. Focused on similar pursuit for technologies that can upgrade their current market position and identification of projects with joint benefits for the whole sector is the key challenge for Competitiveness clusters in the future.

3.2 Centres of excellence

Centres of Research Excellence are structures where research and technology development is performed of world standard, in terms of measurable scientific production (including training) and/or technological innovation. Some of the key features of the concept area "critical mass" of high level scientists and/or technology developers, a well-identified structure (mostly based on existing structures) having its own research agenda capable of integrating connected fields and to associate complementary skills, maintenance of a high rate of qualified human resources exchange, a dynamic role in the surrounding innovation system (adding value to knowledge), high levels of international visibility and scientific and/or industrial connectivity, a reasonable stability of funding and operating conditions over time (the basis for investing in people and building partnerships) and sources of finance which are not dependent over time on public funding. Centers of Excellence represent the network of innovative top researchers and research teams along with the business and other public subjects which are systematically conducting research in areas of most importance for both science and society at large.

Centre of Research Excellence gathers and crosslinks the best scientists in a particular field at a national level that are focused on contemporary research topic. They also have to be internationally competitive and recognizable group in terms of quality and scope of scientific production, capable of effective international cooperation and have to give significant contribution to the development of science, higher education and the economy at the national level.

Research organization or its organizational part or a group of scientists are declared to be a Centre of Research Excellence by Minister of Science, on the proposal of the National Council for Science, Higher Education and Technology Development, with the consent of the named scientific organization or a group of scientists and based on evaluation made in compliance with the law that regulates quality assurance in science and higher education and procedure which must include international assessment.

The objective of the establishment of Centres of Research Excellence is to identify and evaluate researchers and research that are innovative, have the potential of the discovery, that are possible milestones in research and, at the same time, are internationally relevant in terms of quality and vision and in line with the strategic needs and priorities of the Republic of Croatia and objectives of the Strategy Europe 2020 and Strategy for Education, Science and Technology.

Centres of Research Excellence are established for a period of five years. Status of the Centre may be prolonged for the next five years, based on a new evaluation process.

Ten Centres of Excellence were selected as predetermined applicants for public call for the development of centres of excellence in 2017:

1. Centre of excellence for advanced materials and sensing devices – CEMS
2. Centre of excellence for Science and Technology - STIM
3. Scientific Centre of Excellence for Reproductive and Regenerative Medicine - CERRM
4. Center of excellence for Virus Immunology and Vaccines
5. Centre of excellence for Marine Bioprospecting - BioProCro
6. Centre of excellence for Biodiversity and Molecular Plant Breeding
7. Centre of excellence for Quantum and Complex Systems and Representation of Lie Algebras
8. Centre of excellence for Personalised Health Care
9. Centre of excellence for basic, clinical and translational neuroscience
10. Centre of excellence for Data Science and Cooperative Systems

3.3 Competence centres

Centres of competence are industry-led individual (networked) entities designed to provide support in raising capacities of business sector (mainly SME that lack in-house capacities for R&D) to enforce R&D projects (especially those focused on development and applied research and commercialization of results) in line with the thematic areas identified in Croatian S3 Strategy. Their main goal is to raise competitiveness of business sector through R&D investments and increase of business expenditures on research and development.

One of the main instruments of the Ministry of Economy for bridging the gaps in the Croatian innovation value chain will be the establishment of highly focused Centers of Competences (the desirable number is at least one for each of S3 sub-thematic priority area) which will be a reflection of industrial needs and capabilities from one side, and future challenges and need for specific R&D on the other side of spectrum. Their function will be to enhance capacities for innovation of the business sector (especially SMEs) providing RDI infrastructure and services for industrial research and experimental development in areas which do not have adequately developed R&D infrastructure, and/or need a greater concentration of expertise in one or more TPAs. It is envisaged that each CoC will be established on the basis of the sound RDI strategy for specific field of research prepared together by the business community, science sector and/or regional authorities, as well as the framework consortium agreement signed by the stakeholders involved. Important element is the fact that CoC's must provide evidence (consortium agreements) that substantial number of collaborative projects from industry stakeholders is willing to use the requested R&D infrastructure and invest private funds in projects to be conducted under CoC's. It is envisaged 3 models for establishment of CoCs aligned to State Aid Regulations:

1st Model: CoC is consortium between at least two (2) business entities and one or more organizations for research and dissemination of knowledge in order to set up effective cooperation on research and development projects;
2nd Model: CoC is the innovation cluster, which includes at least three (3) business entities and, where appropriate, one or more organizations for research and dissemination of knowledge in order to encourage innovation activities;

3rd Model: CoC is the legal entity that manages the research infrastructure.

An indicative list of the projects[5]

3.4 Research centres

The research centres are institutions aimed at exploring, normally a specified area. Carry out basic and applied research, including using non-traditional techniques. They establish by many universities, with a view to implementing the specific research and educational activities. Most research centres demonstrates the scientific results of their work.

3.5 Technology parks

Technology parks are institutions that provide the concentration of knowledge, high technology, education and interaction with national and global institutions. They connect professionals and entrepreneurs who wish to realize their economic goals, which are based on new technologies. Similar to the business park whose primary objective is to business and production, technology parks, but the focus is on the development and scientific research activities. They set up mainly in the vicinity of higher education institutions and development centres and are attractive for top professionals, but also for young talents who want to improve and educate.

In Table 1. Technology incubators[6] in Croatia are presented.

Table 1: Technology parks

Country	NUTS2	Name	Institution typ	Adress	e-mail	Webpage links
HR	HR04	Tehnološki park Varaždin d.o.o.	Scientific-technology park	Zagrebačka 89, 42000 Varaždin	info@tp-vz.hr	http://www.tp-vz.hr/
HR	HR04	Razvojna agencija Zagreb - TPZ	Scientific-technology park	Dragutina Golika 63, 10000 Zagreb	info@raza.hr	http://www.raza.hr/
HR	HR03	STEP-RI Znanstveno-tehnologijski park Sveučilišta u Rijeci d.o.o.	Scientific-technology park	Radmile Matejčić 10, 51 000 Rijeka	step-ri@uniri.hr	http://www.step.uniri.hr

5 http://europski-fondovi.eu/sites/default/files/dokumenti/Indikativna_lista-znanstveni_projekti_-_lektor-14-6-po_abecednom_redu.pdf
6 Source: https://gov.hr/moja-uprava/poslovanje/pokretanje-poslovanja/poduzetnicka-infrastruktura/1842

3.6 Business Incubators

The primary purpose of the incubators is to increase the potential for growth and survival of young firms by providing modular buildings, common technical infrastructure, managerial support and other support services. Business incubators are support organizations that assist in the creation, speeding up and long-term performance of the companies in that they provide space for the operation, advisory services, and opportunities for networking and collaboration with other companies.

In Table 2**Napaka! Vira sklicevanja ni bilo mogoče najti.** Business incubators[7] in Croatia are resented.

Table 2: Business incubators

Count	NUTS2	Name	Institution typ	Adress	e-mail	Webpage links
HR	HR03	PI "Izazov"	Business incubators	Mletačka 12/IV, 52100 Pula	ida-uprava@ida.hr	
HR	HR03	TI METRIS	Business incubators	Zagrebačka 30, 52100 Pula	ida-uprava@ida.hr	
HR	HR04	Tehnološko-inovacijski centar Međimurje d.o.o.	Business incubators	Bana Josipa Jelačića 22, 40000 Čakovec	info@ticm.hr	
HR	HR04	Poduzetnički inkubator ZIP	Business incubators	Remetinečka cesta 7, 10000 Zagreb	tihana.marelja@gmail.com	
HR	HR04	Cotrugli fond	Business incubators	Ilica 242, 10000 Zagreb	gordana.spisic@cotrugli.eu	
HR	HR03	STARTUP Inkubator Rijeka	Business incubators	Ružićeva 14, 51000 Rijeka	startup@rijeka.hr	
HR	HR04	Poduzetnički park Velika Pisanica d.o.o.	Business incubators	Logorska 4, 43271 Velika Pisanica	park@hi.t-com.hr	
HR	HR04	PODUZETNIČKI INKUBATOR GRUBIŠNO POLJE d.o.o.	Business incubators	Trg bana Josipa Jelačića 1, 43290 Grubišno Polje	gospodarstvo@grubisnopolje.hr	
HR	HR03	CLUSTER ZA EKO DRUŠTVENE INOVACIJE I RAZVOJ - CEDRA SPLIT	Business incubators	Ruđera Boškovića 20, 21000 Split	split@cedra.hr	
HR	HR04	Pokreni ideju j.d.o.o.	Business incubators	Trg Nikole Šubića Zrinskog 6, 10000 Zagreb	zagreb.hosts@impacthub.net	
HR	HR03	PODUZETNIČKI INKUBATOR KLIS d.o.o	Business incubators	Iza grada 4, 21231 Klis	inkubator@pi-klis.hr	
HR	HR03	PODUZETNIČKI IMPULS ZIRCH j.d.o.o.	Business incubators	Ivana Gundulića 30, 43541 Sirač		
HR	HR03	P.A.R. d.o.o.	Business incubators	Trg Riječke rezolucije 4, 51000 Rijeka	bizschoolpar@gmail.com	

[7] Source: https://gov.hr/moja-uprava/poslovanje/pokretanje-poslovanja/poduzetnicka-infrastruktura/1842

#NAM	NUTS2	Name	Institution typ	Adress	e-mail	Webpage links
HR	HR04	KOPRIVNIČKI PODUZETNIK d.o.o.	Business incubators	Dravska 15 (Poduzetnicka zona Dravska), 48000 Koprivnica	tihomir@koprivnički-poduzetnik.hr;	http://www.inkubator.in
HR	HR03	Regionalna razvojna agencija PORIN - Poduzetnički inkubator za proizvodne djelatnosti Rujevica	Business incubators	Lužine 1-4, 51000 Rijeka	rraporin@porin.hr	http://www.porin.hr/
HR	HR03	Regionalna razvojna agencija PORIN - Poduzetnički inkubator za uslužne djelatnosti Torpedo	Business incubators	Milutina Barača 19, 51000 Rijeka	rraporin@porin.hr	
HR	HR04	Poduzetnički centar Pakrac d.o.o. - Podružnica Poduzetnički inkubator	Business incubators	Zona male privrede 5, 34550 Pakrac	zeljko@pc-pakrac.hr	http://www.pc-pakrac.h
HR	HR04	Poduzetnički centar Pleternica	Business incubators	Ante Starčevića 35 2, 34310 Pleternica	info@plink.hr	http://www.plink.hr/
HR	HR04	Poduzetnički inkubator Industrijski park Nova Gradiška	Business incubators	Trg kralja Tomislava 1, 35400 Nova Gradiška	info@ipng.hr	http://www.ipng.hr/
HR	HR04	PODUZETNIČKI INKUBATOR BRODIN d.o.o. za istraživanje, razvoj i ostale poslovne djelatnosti	Business incubators	Dr. Mile Budaka 1, 35000 Slavonski Brod	direktor@pi-brodin.hr	http://www.pi-brodin.hr
HR	HR03	Poduzetnički inkubator Zadar	Business incubators	Grgura Budislavića 99, 23000 Zadar	info@poduzetnicki-inkubator.hr	http://inzad.hr/
HR	HR04	Poduzetnički inkubator BIOS d.o.o.	Business incubators	J.J.Strossmayera 341, 31000 Osijek	uprava@inkubator.hr	http://inkubator.hr/
HR	HR04	TERA TEHNOPOLIS d.o.o.	Business incubators	Trg Ljudevita Gaja 6, 31000 Osijek	ured@tera.hr	http://web.tera.hr/
HR	HR04	OSVIT, PODUZETNIČKA ZADRUGA - PODUZETNIČKI INKUBATOR ZA UPRAVLJANJE POSLOVNIM PROSTOROM	Business incubators	Vukovarska 142, 31540 Donji Miholjac	inkubator@osvit.biz	http://zadruga.obz.hr/os
HR	HR03	Podi Šibenik d.o.o.	Business incubators	Velimira Škorpika 17b, 22000 Šibenik	ivan.pasalic@podi-sibenik.com	
HR	HR03	TEHNOLOŠKI CENTAR SPLIT d.o.o.	Business incubators	Kopilica 5, 21000 Split	tcs@tcs.hr	http://tcs.hr/
HR	HR04	RAZVOJNA AGENCIJA ZAGREB-TPZ d.o.o.	Business incubators	Dragutina Golika 63, 10000 Zagreb	info@raza.hr	
HR	HR04	Poduzetnički inkubator Sisak, PISAK	Business incubators	Capraška ulica 12, 44010 Sisak-Caprag	krunoslava@apceramics.com	
HR	HR04	PODUZETNIČKI INKUBATOR VIROVITIČKO-PODRAVSKE ŽUPANIJE d.o.o.	Business incubators	Ulica Poduzetnička zona II 18, 33000 Virovitica	ured@enkubator.hr	
HR	HR04	Poduzetnički inkubator Donji Čaglić	Business incubators	Roberta Žilija 94, Donji Čaglić, 34551 Lipik	dejan.ilicic@lipik.hr	
HR	HR03	Poduzetnički inkubator Biograd na Moru d.o.o.	Business incubators	Trg kralja Tomislava 5, 23210 Biograd na Moru	info@biogradnamoru.hr	
HR	HR04	PODUZETNIČKI INKUBATOR POLET d.o.o.	Business incubators	Željeznička 10/a, 31551 Belišće	polet.belisce@gmail.com	
HR	HR03	CroNoMar d.o.o.	Business incubators	Velimira Škorpika 6, 22000 Šibenik	ana@cronomar.hr	
HR	HR04	Tehnološki park Vinkovci d.o.o.	Business incubators	Vatrogasna 5, 32100 Vinkovci	info@tp-vk.hr	

4 Smart factory support schemes and programmes

4.1 Financial environment

Financial instruments, guarantees and loans offered by HAMAG-BICRO are not intended for financing of innovative projects, but SMEs can use those instruments for investment in new technologies. Financial instruments specialized for investment in innovative projects are Venture capital funds, Conditional loan, quasi-equity instruments, Seed funds, etc. but currently in Croatia this two are active:

PILOT VENTURE CAPITAL FUND (EUR 15.6 MILLION)

PURPOSE: providing financing, in the form of equity or quasi-equity instruments, to innovative SMEs (including startups) with the locus of activity in Croatia

PLACE OF REGISTRATION: envisaged to be registered in Croatia as a closed-end fund and established as a limited liability company in accordance with the Croatian Alternative Investment Fund Act

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10-YEAR EURO-DENOMINATED FUND, with an option for a two-year extension.

CONSISTED of both public and private financing, in a ratio consistent with EU state aid regulation

Managed by a private fund manager selected through an international competitive selection process, acceptable to the World Bank.

FUNDS ALLOCATED: net amount available for investment by the VC Fund is up to EUR 12 million, amount available for Fund's Management Operating Costs is up to EUR 3.5 million

SEED CO-INVESTMENT FUND (EUR 2.5 MILLION)

Objective is to promote investments in the equity capital of innovative SMEs and startups by eligible Co-investors for the purpose of further development and/or commercialization of an innovative product or service.

SCI fund provides financing to Investees through quasi-loans (EUR 30,000.00- 300,000.00) that will be subordinated to other debt claims, and will not require collateral.

Eligible Applicants are Innovative SME at seed or startup stage, that has at least a functioning prototype of the product, has a locus of activities in Croatia and has a commitment from eligible Co-investor willing to make an equity investment.

Eligible Co-Investors are business angels, incubators and accelerators, corporate investors and VC funds, with less than 25% of Investee's subscribed capital prior to the equity investment made under this Program.

4.2 S3 Support measures

S3 strategy sets out the framework for investments in research and innovation not only from ESIF, but also from other funding sources. For that reason, necessary resources will have to come from various sources: national funds and other public and private resources.

For the 2014-2020 period the Funds supporting cohesion policy (ERDF, ESF and CF) have been brought together with the EAFRD and the EMFF under a common strategic framework in order to maximize their effectiveness and optimize synergies. For S3 Action plan implementation the most relevant investments will be funded under ERDF - OP Competitiveness and Cohesion (OP CC), through two priority axis: Priority axis 1. Strengthening the Economy through Application of Research and Innovation which will focus on research, technological development and innovation; and Priority axis 3. Business Competitiveness which will provide support for small and medium-sized businesses (SMEs). In parallel, through the ESF – OP Efficient Human resources (OP EHR), a significant contribution will be provided to S3 implementation in the field of smart skills.
Total of the ESI funds allocation to S3 is estimated to be 1.042,4 M EUR, whereas EU contribution amounts to 704,5 M EUR, national cofinancing to 53,9 M EUR and private cofinancing to 284 M EUR.

In addition to these funds aimed solely to S3 strategy, further complementary sources of financing will contribute to the implementation of S3 strategy and will include ERDF, ESF, EAFRD, EMFF allocations as well as national budget.

EAFRD will include among its priorities the fostering of knowledge transfer and innovation in agriculture, forestry, and rural areas and enhancing farm viability and competitiveness of all types of agriculture in all regions and promoting innovative farm technologies and sustainable management of forests. Also, the EMFF has among its priorities the fostering of innovative, competitive and knowledge based fisheries and aquaculture including related processing. This includes strengthening technological development, innovation and knowledge transfer.

Supplementary programmes financed from national budget and managed by Croatian Science Foundation will also support S3 strategy through Research project grants and through Career development of young researchers (doctorate and post-doc grants).

European Union programmes could also support the implementation of S3 strategy in Croatia. Horizon 2020 complements ESIF and supports the implementation of the Innovation Union, a Europe 2020 flagship initiative aimed at securing Europe's global competitiveness. This R&I Framework Programme is part of the drive to create new growth and jobs in Europe through 3 main priorities:

1. **Excellent Science** (European Research Council, Future and Emerging Technologies, **Marie Skłodowska-Curie Actions** for researchers' training, mobility and career development; **Research infrastructures** (including e-infrastructures) – support to feasibility study and building (incl. for large infrastructures above EUR 20 million).

2. Industrial Leadership (applied research projects up to Technology Readiness Levels 7-8) - includes Enabling and Industrial Technologies such as: ICT (including two Key Enabling Technologies (KETs) photonics and micro- and nano-electronics) and other KETs: nanotechnologies, advanced materials, biotechnology, advanced manufacturing and processing,

Space, Access to risk finance; and Support for "Innovation in SMEs" (including 'policy actions for better SME support' and the topics addressed by the SME instrument, that provides staged support for feasibility study and an innovation project that is core to realise an ambitious business plan).

3. Tackling societal challenges.

Under horizontal activities "Spreading excellence and widening participation", actions like ERA Chairs, Teaming and Twinning are also relevant for Croatia, because they can facilitate the development of COREs or centres of competence and the improvement of R&I capacities. These actions can easily be combined with ERDF operations thus enabling efficient synergies. Such ESIF support can either be cumulative to the Horizon 2020 grant or subsequent to it once the equipment and infrastructure needs have been identified via the Horizon 2020 project.

COSME focuses on projects strengthening the competitiveness and sustainability of the Union's enterprises, particularly SMEs and encouraging, entrepreneurial culture and promoting the creation and growth of SMEs (no support to individual SME's projects). Creative Europe also offers an interesting potential for synergies to ESIF because technology is often not enough to be a successful innovator. Besides entrepreneurial skills, creative thinking is also central in the innovation process. Cultural and creative activities such as, design related activities and the use of new media can be crucial for innovations to succeed. Creative Europe projects can be crystallization points for this and countries / regions could amplify or carry further these projects to achieve a durable impact on competitiveness, innovation and growth.

4.3 Supporting schemes

The Croatian authorities have defined investment priorities in different regions for the implementation of EU regional funds for a total of € 449.5 million.

For the 2014-2020 programming period, Croatia has been allocated €8.6 billion in total Cohesion Policy funding (2014 prices), including European Territorial Cooperation funding and the allocation for the Youth Employment Initiative). Croatia also receives €2 billion for rural development and €252.6 million for the fisheries and the maritime sector.

Table 3. National support schemes summary

Country	Measure/Call	Objective	Implementation body	Budget (Mio €)	Beneficiary	Financing rate	Eligible costs	Max. grant	Year from:	Year to:
HR	Establishment of Innovation Network for Industry and development of Thematic Innovation Platforms	Institutional set up for Innovation system Increased industry - academic collaboration	Ministry of Economy	9,00					2016	2019
HR	Science and Technology Foresight project	Validation of selection of TPAs and relevant inputs for the revision of S3	Ministry of Science, Education and Sports	1,00					2016	2019
HR	Development of Technology Transfer Offices and Science-Technology Parks	Transfer of technology from ROs to business sector Technology transfer and commercialization of RDI results	Ministry of Science, Education and Sports/DEFCO	7,00	Technology Transfer Officies	100%	staff costs, education,	4.560.000,00	2016	2020
HR	Development of new and the improvement of existing RDI infrastructure in Croatia	Strengthened capacities for RDI of enterprises; their productivity, competitiveness and export activity raised and diversified production and services offer	Ministry of Science, Education and Sports/ CFCA	239,00					2016	2020
HR	Centers of Competence	Strengthened capacities for RDI of enterprises (especially SME's); their productivity, competitiveness and export activity raised and diversified production and services offer	Ministry of Economy/CFCA	150,00	Centers of Competence	25%-100%	R&D infrastructure	112.282.500,00 HRK	2016	

Country	Measure/Call	Objective	Implementation body	Budget (Mio €)	Beneficiary	Financing rate	Eligible costs	Max. grant	Year from:	Year to:
HR	Support to business investment in RDI	Strengthened capacities for RDI of enterprises; their productivity, competitiveness and export activity raised and diversified production and services offer	Ministry of Economy/HAMAG-BICRO	341,00					2016	
HR	Support to SMEs capacities to innovate	Support to SMEs investments in implementation of new solutions in the areas of technology, product, process and organizational innovations, including marketing innovations, design and innovation advisory, IPR and support services as well as non R&D based solutions applied by SMEs.	Ministry of Entrepreneurship and Crafts /HAMAG-BICRO	200,00	SMEs	85%			2016	2020
HR	Strengthening research excellence by supporting national Centers of Research Excellence and enabling synergies with ERC grants	European research area integration through cutting-edge research	Ministry of Science, Education and Sports/DEFCO	38,00					2016	2021
HR	Granting initiatives within the EUREKA initiative (EUREKA&Eurostars)	Co-financing the Croatian part of international R&D projects, approved by EUREKA program.	HAMAG-BICRO	0,80	SMEs and large companies	EUREKA 50% Eurostars 70%	staff costs, overheads, costs of instruments, equipment and external experts	EUREKA 150.000,00 EUR Eurostars 200.000,00 EUR	2016	2019
HR	ESIF Micro credit for micro and small companies	Enable micro and small companies quick and easy access to financing sources for improving operations and investment activities, which will allow faster development and further growth.	HAMAG-BICRO	5,00	all micro and small companies in the Republic of Croatia	Credit	operations and investment activities	Credit from 1.000-25.000 EUR	2016	2017
HR	ESIF Loans	Enable micro and small companies quick and easy access to financing sources for improving operations and investment activities, which will allow faster development and further growth.	HAMAG-BICRO		all micro and small companies in the Republic of Croatia	Credit	operations and investment activities	Credit from 25.000-50.000 EUR	2016	2017

5 Smart factory related projects

This chapter presents relevant national projects in execution by the partner or partnering organizations. More data is included in separate XLS file –sheet "Projects" and we highlight the Innovative Smart Enterprise (INSENT) project (doc in annex).

Table 4 : Smart Factory related projects

Main applicant country	Project name	Programme name	Year from:	Year to:
UK	EIS - Everywhere International SMEs	Interreg Europe	2017	2020
FR	CLIPPER	Interreg Europe	2017	2021
UK	Urban M	Interreg Europe	2017	2021
NL	KISS ME	Interreg Europe	2017	2021
NO	P-IRIS	Interreg Europe	2017	2021
ES	MONITORIS3	Interreg Europe	2017	2021
HU	ATM for SMEs	Interreg Europe	2016	2021
DE	SKILLS+	Interreg Europe	2016	2021
HU	ACCELERATOR	Interreg Danube Transnational Programme	2017	2019
AU	CrowdStream	Interreg Danube Transnational Programme	2016	2019
RO	D-STIR	Interreg Danube Transnational Programme	2017	2019
DE	DA-SPACE	Interreg Danube Transnational Programme	2017	2019
DE	DanuBioValNet	Interreg Danube Transnational Programme	2017	2019
DE	DIGITRANS	Interreg Danube Transnational Programme	2017	2019

Main applicant country	Project name	Programme name	Year from:	Year to:
SK	EcoInn Danube -	Interreg Danube Transnational Programme	2016	2019
AU	Excellence-in-ReSTI	Interreg Danube Transnational Programme	2017	2019
DE	FORESDA	Interreg Danube Transnational Programme	2017	2019
SI	InnoHPC	Interreg Danube Transnational Programme	2017	2019
DE	Made in Danube	Interreg Danube Transnational Programme	2017	2019
SI	MOVECO	Interreg Danube Transnational Programme	2016	2019
AU	ResInfra (at)DR	Interreg Danube Transnational Programme	2017	2019
HU	SENSES	Interreg Danube Transnational Programme	2017	2019
SI	SMART FACTORY HUB	Interreg Danube Transnational Programme	2017	2019
SI	FIDES	Operativni program IPA Slovenija-Hrvatska 2007-2013	2011	2013
SI	INTERINO	Operativni program IPA Slovenija-Hrvatska 2007-2013	2011	2013
HR	BLUE_BOOST	Interreg ADRION	2016	2018
HU	PP2Innovate	Interreg VB Central Europe	2016	2019
SI	CROWD-FUND-PORT	Interreg VB Central Europe	2016	2019
IT	FabLabNet	Interreg VB Central Europe	2016	2019
AU	CERIecon	Interreg VB Central Europe	2016	2019
HR	Innovative Smart Enterprise	Research project Croatian Science Foundation	2014	2018

6 List of regional actors

This chapter presents Smart Factory relevant actors. Production oriented SMEs as potential users of solutions are presented in Table 4. The data is collected in separate XLS file – sheet “Regional actors”.

Table 5: List of regional actors - users

Country	NUTS2	Name	Institution type	Industry sector	Service type 1	Service type 2	Adress	Webpage links
HR	HR04	EKO Međimurje	SME	Materials	Engineering	Production	Ul. Braće Radić 37, 40000, Čakovec	http://www.eko.hr
HR	HR03	HSTec	SME	Mechanical engineering	Production	Engineering	Zagrebačka 100, 23000 Zadar,	http://www.hstec.hr/en
HR	HR04	Yazaki	SME	Electrical and electronic engineering	Consumer Discretionary	Production	Slavonska avenija 6, 10000, Zagreb	https://www.yazaki-europe.com/index.html
HR	HR04	Oprema Ludbreg	SME	Electrical and electronic engineering	Manufacturing		Gospodarska ulica 5 42230 Ludbreg	https://www.oprema.com/?
HR	HR04	HS Produkt	SME	Defence	Manufacturing	Research and dev.	Ul. Mirka Bogovića 7, 47000, Karlovac	http://www.hs-produkt.hr/
HR	HR04	Regionalni centar izvrsnosti za robotske tehnologije (CRTA)	University	Electrical and electronic engineering	Research and dev.	Engineering	Ivana Lučića 5	https://www.fsb.unizg.hr/?poruka_v&id=23826
HR	HR04	Icat	SME	Shipbuilding	Manufacturing	Research and dev.	Našička 8,zagreb	http://icat.hr/
HR	HR03	HS-TEC	SME	Engineering	Manufacturing	Robotic automation	Zagrebačka ulica 100 HR-23000 Zadar	http://www.hstec.hr/

Country	NUTS2	Name	Institution type	Industry sector	Service type 1	Service type 2	Adress	Webpage links
HR	HR04	EKO Međimurje	SME	Materials	Engineering	Production	Ul. Braće Radić 37, 40000, Čakovec	http://www.eko.hr
HR	HR04	Teh-CUT	SME	Manufacturing	Design, manufacture, testing and maintenance of special molds for	design, production and distribution of special metal cutting tools	HR 10090 Zagreb, Samoborska 145	http://www.teh-cut.hr/hr/
HR	HR03	DALSTROJ d.d.	SME	Manufacturing	Machining	Engineering	Mostine 11 A, Split, Croatia	http://www.dalstroj.com/hr/
HR	HR04	DOK-ING d.o.o.	SME	Manufacturing	Robotic	Demining	Kanalski put 1, 10000 Zagreb, Croatia	http://www.dok-ing.hr/
HR	HR04	Rimac Automobili d.o.o.	SME	Electrical and electronic engineering	Electric cars	Engineering	Ljubljanska 7 10431 Sveta Nedelja Croatia	http://www.rimac-automobili.com/en/
HR	HR04	ROCKWOOL ADRIATIC d. o. o.	Large enterprise	Manufacture of other non-metallic mineral	Sales and distribution of rock wool		Radnička cesta 80 HR-10000 Zagreb	http://www.rockwool.hr/
HR	HR04	OMCO CROATIA D.O.O.	Large enterprise	Manufacturing	Engineering	Manufacturing	OMCO INTERNATIONAL NV Venecolaan 10	http://www.omcomould.com/index.html

Potential solution providers for Smart6 Factories are presented in Table 5.

Table 6: List of regional actors – solution providers

Country	NUTS2	Name	Institution type	Industry sector	Service type 1	Service type 2	Adress	Webpage links
HR	HR04	Klimaoprema d.d.	SME	Industrials	Engineering	Electrical Equipment	HR 10430 Samobor Gradna 78A	http://www.klimaoprema.hr/en/home/
HR	HR03	Vargon	SME	Materials	Manufacturing	Services	Kukuljanovo 352, 51227, Kukuljanovo	http://www.vargon.hr/hr/
HR	HR03	HSTec	SME	Mechanical engineering	Production	Engineering	Zagrebačka 100, 23000 Zadar,	http://www.hstec.hr/en
HR	HR04	Yazaki	SME	Electrical and electronic engineering	Consumer Discretionary	Production	Slavonska avenija 6, 10000, Zagreb	https://www.yazaki-europe.com/index.html
HR	HR04	Oprema Ludbreg	SME	Electrical and electronic engineering	Manufacturing		Gospodarska ulica 5 42230 Ludbreg	https://www.oprema.com/?
HR	HR04	HS Produkt	SME	Defence	Manufacturing	Research and dev.	Ul. Mirka Bogovića 7, 47000, Karlovac	http://www.hs-produkt.hr/
HR	HR04	Regionalni centar izvrsnosti za robotske tehnologije (CRTA)	University	Electrical and electronic engineering	Research and dev.	Engineering	Ivana Lučića 5	https://www.fsb.unizg.hr/?poruka_v&id=23826
HR	HR04	ERICSSON NIKOLA TESLA d.d.	Large enterprise	Manufacturing	Communication products	Software	Krapinska 45, P.O. Box 93, HR-10 002 Zagreb	http://www.ericsson.hr/Default.aspx
HR	HR03	SINEL d.o.o.	SME	Manufacturing	Industrial Automation	Machines manufacturing	Rudarska 3 p.p. 101 52220 Labin, Croatia	http://www.sinel.hr/

7 List of annexes

- XLS file “D3.2.1_Regional mapping Database_SFH.xlsx”
  Worksheet in Regional mapping CRO.xlsx

- Doc file: Case Study of Croatian manufacturing industry_Industry 4.0 Providers or Users
  Case Study of Croatian manufacturing industry_Industry 4.0 Providers or Users.doc