WP3 - Value Chain Analysis

Allon_I3 Project

Gabrovo, Bulgaria

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Value Chain Analysis

Target region: Gabrovo, Bulgaria

Focus area: **ICT** and Industry 4.0

Develop the analysis in accordance with the guidelines and key points provided.

1. Region Overview

Gabrovo, Bulgaria, is the region under analysis for the integration of ICT and Industry 4.0 technologies. The sector focus includes advanced manufacturing, IoT, artificial intelligence, robotics, and smart factories. Currently, the region is at a developing stage in terms of ICT adoption and is emerging in its readiness for Industry 4.0.

Gabrovo has been actively participating in regional forums and initiatives to promote Industry 4.0. For instance, the Gabrovo Chamber of Commerce and Industry, in collaboration with the municipality and other stakeholders, organized a regional forum titled "Industry 4.0 – Opportunities and Challenges" to discuss the introduction of innovations in SMEs and the public environment. The forum highlighted the development of an urban air monitoring system and the application of 3D technologies in mechanical engineering.

2. Stakeholders

The key players in Gabrovo's ICT and Industry 4.0 ecosystem include local and international tech companies specializing in these technologies. Innovative startups focusing on AI, IoT, and robotics are also significant contributors. Gabrovo Technical University and other regional institutions play a crucial role in education and research. Additionally, research centers dedicated to advanced manufacturing and digitalization are vital stakeholders. Policymakers from local government and EU bodies support the digital transformation efforts in the region.

Suppliers in this ecosystem provide essential hardware, IoT components, software platforms, and cloud services. Producers, including SMEs in manufacturing and logistics firms adopting automation, utilize these technologies to create products and services. Support organizations such as innovation hubs, incubators, and EU-funded research projects enable the ecosystem's growth and development.

The Gabrovo Smart Specialization Strategy (S3) 2021-2027 focuses on high-tech industries and knowledge-intensive services, promoting cooperation between local businesses and educational institutions. The strategy emphasizes mechatronics, informatics and ICT, and clean technologies, aiming to transform Gabrovo into a smart city.

3. Value Chain Stages

The value chain for ICT and Industry 4.0 in Gabrovo begins with input supply, which includes sources like software platforms, cloud services, sensors, and AI algorithms. The production stage involves the development of software and the manufacturing of robotics. Processing activities focus on adapting or customizing solutions to meet local needs, such as the localization of software for regional languages or industries.

Distribution methods include digital platforms, B2B partnerships, and online distribution channels, ensuring that products reach businesses and end-users effectively. The adoption and utilization stage sees the application of these solutions in various industries, such as the use of IoT for agriculture and smart manufacturing.

Gabrovo has implemented pilot training programs through the Career 4.0 project to support the introduction of digitalization in practical training. These programs aim to enhance the skills of the local workforce and prepare them for the demands of Industry 4.0.

4. Challenges & Bottlenecks

Gabrovo faces several challenges and bottlenecks in its ICT and Industry 4.0 value chain. There is a notable skills gap, with a lack of skilled programmers and Industry 4.0 specialists. Infrastructure challenges include limited 5G coverage and the absence of data centers. Policy and regulation hurdles stem from the lack of clear frameworks for data protection and digital innovation incentives. Additionally, investment gaps are evident, with limited access to venture capital or EU funds.

The need for improved technical and business infrastructure to support the region's digital transformation has been identified. Efforts are being made to address these challenges through various initiatives and collaborations with local and international partners.

5. Regional Strengths

Despite these challenges, Gabrovo has several regional strengths. The region boasts ICT talent pools and expertise in renewable energy. The supporting ecosystem includes incubators and universities that foster innovation and development.

Gabrovo's Smart Specialization Strategy highlights the region's focus on machinery and metal products in manufacturing and information technologies and services in the digital area. The strategy aims to leverage these strengths to drive economic growth and innovation.

6. Opportunities

Emerging trends in Gabrovo align with ICT and Industry 4.0, such as smart agriculture and renewable energy digitalization. There is significant potential for collaboration across regions, with opportunities for cross-regional AI R&D projects. Funding opportunities are available through programs like Horizon Europe and the Digital Europe Program.

The Gabrovo municipality has been actively seeking to increase the efficiency of its administration and improve management processes through digital transformation. This includes developing Gabrovo as a smart city and strengthening partnerships with citizens and businesses.

7. Recommendations

To address the skills gap, it is recommended to implement digital literacy programs and advanced robotics training. Policy reforms should include tax incentives for digital innovation to encourage adoption. Infrastructure investments are necessary, particularly the expansion of broadband networks in rural areas. Pilot projects, such as smart manufacturing initiatives and IoT-based logistics solutions, can showcase the improvements in the value chain.

It has been suggested investing in scientific infrastructure and technology transfer to enhance cooperation between public science and technology units and local companies. This will help bridge the gap between research and practical application, fostering innovation and growth.