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Invited paper

Science and Technology Park of Montenegro: Center for Innovation and Entrepreneurship Development

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Abstract: The Science and Technology Park of Montenegro (STP MNE) is a key accelerator of innovation, entrepreneurship, and technological progress in the country. As a bridge between the academic community, industry, and the financial sector, STP MNE creates a dynamic environment for startups, small and medium-sized enterprises, and researchers, providing them with access to incubation programs, mentorship, and global innovation ecosystems. Through strategic partnerships and participation in international projects such as HORIZON Europe and Interreg DANUBE, the park fosters technology transfer, the development of circular and blue economies, and the strengthening of Montenegro's innovation capacities. The Technology Transfer Office (TTO) serves as a catalyst for collaboration between science and industry, while programs such as SkillsUp and BoostMeUp empower young entrepreneurs. With 31 established partnerships, 9 international projects, and 22 tenants, STP MNE positions itself as a leader in innovation, advancing a sustainable and competitive economy based on knowledge and advanced technologies.

Keywords: Innovation, Entrepreneurship, Science and Technology Park, Technology transfer, Startups, Research and development

1. Introduction

Science and technology parks play a key role in connecting knowledge, innovation and the economy. Their primary function lies in fostering technological entrepreneurship, developing startup ecosystems, and strengthening cooperation between universities, research centers, and the business sector.

The concept of science and technology parks (STPs) was developed in the 1950s in the United States when the first such park was established at Stanford University. The Stanford Industrial Park, later renamed the

Stanford Research Park, represented the first university business park focused on research and development, with the aim to enhance cooperation between the academic sector, industry, and the local community, as well as to generate additional revenue for the university and the region [1]. This model became the foundation for the development of numerous science and technology parks worldwide. The Cambridge Science Park was the first example of such a park in Europe, established as early as in the 1960s. In Europe, the concept of science and technology parks began to develop more intensively from the 1980s, particularly within the framework of the European Union's innovation development policies [2].

Science parks are situated near or on the campus of a university, functioning as an organisational and legal vehicle for innovative change, as stated in [3]. This proximity enables the park to make effective use of academic resources while facilitating the commercialisation of scientific research.

According to IASP's definition "A science park is an organisation managed by specialised professionals, whose main aim is to increase the wealth of its community by promoting the culture of innovation and the competitiveness of its associated businesses and knowledge-based institutions. To enable these goals to be met, a Science Park stimulates and manages the flow of knowledge and technology amongst universities, R&D institutions, companies and markets; it facilitates the creation and growth of innovation-based companies through incubation and spin-off processes; and provides other value-added services together with high quality space and facilities"[4].

Science parks have proven to be effective instruments for fostering innovation and technological advancement on a global scale. They play a pivotal role in the formation of global innovation networks, facilitate technology transfer, and commercialise scientific research, thereby becoming indispensable participants in the development strategies of regional and national economies, as stated in [3]. The role of science and technology parks is to stimulate domestic industry in order to make it competitive in the era of the globalisation process [5].

UNESCO's definition state that "Science and Technology Parks are physical spaces for interaction between research institutions, universities and private enterprises aiming to encourage innovation, technology transfer and the development of new businesses" [6].

Science parks influence the fact that more attention is given to the realization of the project in laboratory research, all the way through to the commercial exploitation phase of the research results [7]. In many

developing countries, including Montenegro, such institutions are recognized as drivers of economic transformation and the development of a knowledge-based economy.

The Science and Technology Park of Montenegro (STP MNE) was established on September 20, 2019, and its primary goal is to stimulate and enhance the economic growth of Montenegro through support for innovation and development.

In a world where innovation drives the economy and society, the Science and Technology Park of Montenegro (STP MNE) serves as a key engine for the development of high-tech entrepreneurship and research. Established as a strategic project of the Government of Montenegro, with the support of the Ministry of Science and the University of Montenegro, STP MNE has positioned itself as a platform connecting science, industry, and investors.

Its mission is to create a dynamic environment where innovative individuals and companies receive the necessary support for growth and global competitiveness. This text provides an overview of completed activities and future plans, highlighting key initiatives that shape the future of innovation in Montenegro.

The Science and Technology Park of Montenegro (STP MNE) is not just an institution – it is a hub for visionaries, pioneers, and creators of the future. As a fundamental pillar of the innovation and entrepreneurial ecosystem, STP MNE leads the revolution in technology and research, combining knowledge, creativity, and ambition into a powerful force for development.

Established in partnership with the Government of Montenegro, the Ministry of Science, and the University of Montenegro, STP MNE serves as a bridge between the academic community, the business sector, and financial institutions, enabling the creation of innovations that change the world [8]. Through its work, this park becomes a catalyst for change, a platform for transforming ideas into concrete technological and business successes.

2. STP MNE – A Driver of innovation and technological progress in Montenegro

The mission of STP MNE is clear and ambitious – to create a dynamic, stimulating environment that fosters technological innovation, empowers entrepreneurs, and connects science with industry.

Through its programs and resources, STP MNE provides support to innovative startups, small and medium-sized enterprises (SMEs), researchers, and entrepreneurs, giving them access to incubation,

mentorship, education, and global innovation ecosystems. Here, ideas are not only developed – they get the opportunity to conquer the world market.

The vision of STP MNE goes beyond borders – it aims for Montenegro to become recognized as a center of innovation and technological development in the region. Through strong support for researchers and entrepreneurs, STP MNE shapes a sustainable and competitive economy based on knowledge, creativity, and high technology.

STP MNE is not just a place where innovations emerge – it is a space where new rules of the game are created, where dreams transform into reality, and where ideas become drivers of global change. Every entrepreneur, researcher, and innovator who becomes part of this community joins a story that changes the future of Montenegro.

2.1. Infrastructure and functionality: Creating a home for innovation

After years of planning and intensive work, the Science and Technology Park of Montenegro has finally opened its doors to innovators, entrepreneurs, and researchers. With the completion of infrastructure projects, Montenegro has gained a modern space where revolutionary ideas develop and new technological solutions are encouraged. This significant event was marked by an official opening ceremony attended by high-ranking government officials, representatives of the academic community, and the business sector. Panel discussions and presentations of innovative projects further emphasized STP MNE's role as a key player in developing the country's innovation ecosystem. This moment is not just a symbol of the park's operational launch but also a driving force for Montenegro's technological renaissance.

Fig. 1 – *The first science and technology park of Montenegro* [15].

2.2. Technology Transfer Office (TTO): A bridge between science and industry

To ensure that scientific achievements do not remain confined to laboratories but find real-world applications, the Technology Transfer Office (TTO) was established within STP MNE. This office plays a crucial role in connecting the academic community with the business sector, enabling researchers and innovators to turn their ideas into commercial products and services [9].

TTO was founded with the mission of facilitating the transformation of scientific discoveries into marketable innovations, thereby not only increasing the competitiveness of the Montenegrin economy but also fostering the development of new knowledge-based industries.

Key activities of TTO include:

- **Support for researchers and innovators** – Providing expert assistance to researchers in protecting intellectual property, commercializing patents, and developing startups based on scientific research.
- **Connecting science and industry** – Organizing events, workshops, and meetings with business representatives to identify potential innovations with wide market applications.
- **Technology transfer and licensing** – Facilitating the transfer of technology between universities and industries through licensing processes and partnerships with companies ready to implement innovative solutions.
- **Entrepreneurial ecosystem development** – In collaboration with STP MNE and relevant partners, TTO supports the development of startups by helping them define business models, secure financial support, and connect with international investors.
- **Education and mentorship** – Organizing professional training and advisory sessions for researchers and entrepreneurs on key aspects of technology transfer, intellectual property, and market validation of innovations.

In its first year of operation, TTO has established significant partnerships with leading academic institutions and business entities, laying a strong foundation for the long-term sustainability and efficiency of this innovation support model.

2.3. Coworking space as a Creative HUB

One of the most dynamic segments of STP MNE is its modern coworking space, designed as a center of creativity and collaboration. With flexible

work areas, this space provides the perfect environment for researchers, startups, and entrepreneurs. Its open and dynamic structure allows for easy networking between experts from various fields, creating fertile ground for the development of interdisciplinary projects. The coworking space is not just a workplace – it is an innovation center where ideas are exchanged daily, and new solutions to global challenges are born.

2.4. Projects driving change

Through active participation in international projects, STP MNE has significantly contributed to the development of the innovation ecosystem and the strengthening of Montenegro's scientific and technological capacities. The key projects in 2024 include:

- **HORIZON 2020 and HORIZON Europe** – Through participation in these prestigious European Union programs, STP MNE has become part of a broad network of research institutions, technology parks, and entrepreneurial centers across Europe. These projects have enabled access to cutting-edge research, knowledge exchange with leading experts, and the implementation of innovative models for supporting entrepreneurs and startups in Montenegro. Through Horizon projects, STP MNE has helped build a bridge between science and industry, creating opportunities for knowledge and technology transfer. As part of the HORIZON Europe program, STP MNE organized numerous trainings on circular economy, aimed at supporting innovation and sustainable business practices. These trainings focus on the development of environmentally friendly ideas and the application of circular principles, contributing to the creation of a more competitive and sustainable business environment in Montenegro.
- **Circular Innovation Hub (Interreg DANUBE)** – Through the implementation of this project, STP MNE has become a key player in the development of the circular economy in the region [10]. The focus is on encouraging companies to adopt sustainable business models based on more efficient resource use, recycling, and reuse of materials. Through a series of workshops, education, and mentoring, local entrepreneurs have had the opportunity to develop innovative solutions that contribute to waste reduction and optimization of production processes, thus achieving long-term economic and environmental sustainability.
- **STORE MORE (Interreg DANUBE)** – Through its participation in the StoreMore project, STP MNE actively contributes to the development and promotion of innovative energy storage solutions, aimed at

facilitating the transition to renewable energy sources [11]. The developed tools and approaches play a key role in supporting partner countries in the region in integrating renewable sources into energy systems, enabling a long-term shift to sustainable and environmentally friendly energy sources.

- **Adriatic-Ionian Sustainable Blue Economy Alliance for Upscaling SMEs (ABBA)** – This ambitious project is dedicated to the development of the blue economy, with the goal of improving the sustainable use of marine resources and promoting innovation in the sectors of aquaculture, maritime technologies, and coastal ecosystem management [12]. Through cooperation with international partners, STP MNE has enabled the connection of local businesses and researchers with leading institutions in this field, creating a new dimension of economic growth through environmentally sustainable innovations.
- **RuBIO to Boost Innovation and Competitiveness of Entrepreneurs** – Innovations for the Sustainability of Rural Areas – This project aims to strengthen rural communities through the implementation of biotechnological innovations [13]. The focus is on the development of new agricultural production models, the use of sustainable biomaterials, and the digitization of the agricultural sector. Through the RuBIO initiative, agricultural entrepreneurs have the opportunity to improve their businesses, reduce their ecological footprint, and create competitive products that meet the standards of the modern market.

2.5. Entrepreneur empowerment programs

Entrepreneur empowerment programs represent a key component in the development of the innovation community, enabling young entrepreneurs to transform their creativity and ideas into sustainable business models. Through pre-incubation and pre-acceleration programs such as SkillsUp and BoostMeUp, entrepreneurs receive essential support in the early stages of development, including mentorship, access to investors, and education. This enables them to identify and capitalize on market opportunities. Additionally, competitions and innovation workshops provide opportunities for idea exchange and the creation of socially impactful solutions, further fostering the development of both local and global communities.

- **SkillsUp** – A pre-incubation program that gathered dozens of young startups throughout the year, providing them with crucial support

through mentorship, education, and financial resources, helping them develop their ideas and prepare for further growth.

- **BoostMeUp** – A pre-acceleration program that enabled young entrepreneurs to fast-track their startup development through intensive training, mentorship, and access to investors, empowering them for market entry.
- **Hackathons and Innovation Workshops** – Competitions such as "Equal Hack: Code for Equality" brought together young developers, designers, and entrepreneurs who worked on developing solutions with a strong social impact, creating innovations that promote equality and social responsibility.
- **Support for the Academic Community** – Collaboration with the University of Montenegro resulted in a series of programs that allow students and researchers to transform their innovations into concrete business projects, bridging the gap between academia and the business sector.

3. Promotion and networking

Promotion and networking are vital for strengthening the innovation community as they enable the connection of entrepreneurs, investors, and other key stakeholders in the ecosystem. Global visibility and participation in international conferences allow organizations such as STP MNE to position themselves as leaders in regional and global innovations. Through these activities, startups and innovators not only gain new knowledge and contacts but also directly influence the development of their industries. The digital breakthrough, through redesigned websites and social media activity, facilitates easier communication with partners and investors, thus accelerating their growth and internationalization process.

3.1. Key Performance Indicators (KPI) and STP results

In line with its mission and strategic objectives, STP MNE has achieved significant results that are measurable through the following key performance indicators.

Table 1. – *Overview of Key Performance Indicators (KPI) – STP MNE.*

KPI	No	Description
Number of established partnerships	31	Partnerships with domestic and international institutions, universities, research centers, and industrial partners.
Number of domestic and international projects	9	Participation in donor-funded or European projects
Number of support programs	5	Specialized programs like SkillsUp and BoostMeUp offering mentorship, funding, and education.
Total number of employees/engaged associates	15	A team of experts in the fields of technology, business and research.
Total number of tenants	22	Companies and organizations with access to infrastructure, R&D support, and networking opportunities.
Number of Start-up / Spin-off companies	14	Companies created through STP MNE programs, developing disruptive technologies.
Number of legal entities engaged in innovation activities.	4	Number of entities involved in R&D projects within STP MNE.
Number of complementary organizations	4	Organizations that complement STP MNE's resources and expertise in science, technology, and entrepreneurship.

(Source: STP Montenegro, author's internal research, 2024)

- **Number of established partnerships (31)** – Establishing strong partnerships with domestic and international institutions, universities, research centers, and industrial partners has enabled STP MNE to become a central point for connecting science and industry. These partnerships contribute to the development of new projects, knowledge exchange, and technology transfer, creating new opportunities for innovation and entrepreneurship.

- **Number of domestic and international projects (9)** – Participation in nine strategic projects has enabled STP MNE to strengthen its impact in the regional and European innovation ecosystem. Projects such as HORIZON Europe, Interreg DANUBE, and other initiatives bring additional resources and expertise needed for the development of advanced technologies and innovative solutions.
- **Number of support programs (5)** – Through five specialized support programs, STP MNE provides startups, SMEs, and researchers with access to mentorship, financial assistance, and education. Programs like SkillsUp and BoostMeUp offer a platform for the growth and development of innovative businesses, enabling them to position themselves in the market.
- **Total number of employees/engaged associates (15)** – The STP MNE team consists of highly educated professionals with experience in various areas of technology, business, and research. Their role is crucial in implementing programs, supporting startups, and developing strategic initiatives that strengthen the innovation ecosystem in Montenegro.
- **Total number of tenants (22)** – The science and technology park currently hosts 22 companies and organizations operating within its innovative environment. These tenants have access to modern infrastructure, research and development support, as well as networking with global technology leaders. Progressive firms and other industry representatives residing in the science and technology park will contribute to the achievement of most of the park's objectives [14].
- **Number of Start-up/Spin-off companies (14)** – According to the presented key performance indicators, NTP Montenegro has achieved significant results in its initial phase. Start-up and spin-off companies represent 63.64% of the total number of tenants, indicating a strong entrepreneurial orientation and the park's role as a key player in developing innovative technologies. Through its incubation and acceleration programs, STP MNE has helped establish and grow 14 innovative start-ups and spin-off companies, developing disruptive technologies and solutions. This success not only contributes to strengthening the local entrepreneurial ecosystem, but it also plays a vital role in attracting new investments, positively impacting the overall innovation potential of Montenegro.
- **Number of legal entities engaged in innovation activities (4)** – Four legal entities are actively participating in research and development projects within STP MNE, providing expertise and

support in the development of new technologies. Representing 18.18% of the total number of tenants, these entities play a crucial role in the dynamics of the innovation environment, fostering synergy between academia and industry. Their presence not only contributes to the development of new technologies but also strengthens collaboration with the academic and business sectors, further enhancing the innovative infrastructure of STP Montenegro.

- **Number of complementary organizations (4)** – STP MNE collaborates with four key organizations that provide additional resources and expertise in the fields of science, technology, and entrepreneurship. These complementary organizations represent 18.18% of the total number of tenants and play a significant role in enhancing research infrastructure, fostering synergy between academia and industry, and creating new opportunities for the development of innovative projects. Their presence not only strengthens the park's innovative capacity but also contributes to the dynamics of the innovation environment, further supporting the development of new technologies and fostering collaboration across various sectors.

In line with its strategic objectives, the future activities of STP MNE will be directed, through both programmatic and project-based initiatives, towards encouraging the development of digital solutions with a focus on the blue economy, sustainable growth, and environmental protection. In this regard, special emphasis will be placed on strengthening collaboration with key stakeholders of the blue growth sector in Montenegro, fostering synergistic actions among research institutions, businesses, governmental bodies, and civil society organizations. The aim of this approach is to facilitate the creation of innovative technological solutions that contribute to the sustainable management of marine and coastal resources, as well as to the enhancement of the overall innovation ecosystem in Montenegro. This approach will also particularly encourage collaboration with maritime higher education institutions in Montenegro, the region, and beyond, further strengthening the knowledge exchange and innovation capacity in the field of blue growth. The first steps towards encouraging innovative solutions will be supported through the organization of hackathons focused on blue growth. In addition, an Open Call will be announced within the ABBA project, with the aim of supporting and developing ideas that provide advanced solutions in the field of blue growth

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4. Conclusion: STP MNE as a leader in innovation development

The Science and Technology Park of Montenegro (STP MNE) represents much more than just an infrastructure – it is a key driver of innovation, a bridge between the academic and business communities, and the epicentre of the country's technological progress. Through continuous support for young entrepreneurs, startups, and researchers, STP MNE not only strengthens existing capacities but also lays the foundation for the development of new projects and programs that will further stimulate innovative dynamics and economic growth.

STP MNE enhances its services and resources to support tenants and stakeholders, helping entrepreneurs grow and compete globally. Support through pre-incubation and pre-acceleration programs, along with continuous networking and promotion on international platforms, allows startups to recognize opportunities, overcome challenges, and achieve their business goals more quickly.

Special emphasis should be placed on further strengthening the collaboration between the academic and business communities, as this is key to the long-term sustainability of Montenegro's innovation ecosystem. Through initiatives that enable technology transfer, the commercialization of research, and the practical application of academic innovations in the real sector, STP MNE creates a bridge between science and the market, contributing to the development of sustainable business models and the growth of knowledge in the country.

STP MNE, as a leader in innovation, remains dedicated to enhancing its capabilities and developing innovative solutions that address current challenges while also establishing the foundation for Montenegro's future technological and economic progress.

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