



Empowering
innovation intermediaries
to generate sustainable
initiatives to incentivise
and accelerate
the commercialisation
of space innovation

D5.4 Business models for local
initiatives supporting space
innovation



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COORDINATION AND SUPPORT ACTION

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Executive Summary

The present report is focused on the creation of a concrete business case for the local space initiatives of InnORBIT, established by the consortium partners ALG, COR and ROS in their respective countries, Croatia, Greece and Romania. InnORBIT's local space initiatives will be managed by the innovation intermediaries with an aim to support space entrepreneurship and the local ecosystem of innovators. Having completed their training and consultations through the Capacity Building Programme, overseen and supported by STP, ALG will set up a series of space café events, COR will organise a series of space café events and, in parallel, a space hackathon in spring 2022. Finally, ROS will organise a space café and a space hackathon in Romania. The three pilot partners have expressed their interest to participate in the 2nd pilot round of InnORBIT, however the official announcement will be made after the 1st pilot round has progressed sufficiently.

We **extended the scope** of this exercise to also create business models for the core InnORBIT assets, such as the Capacity Building Programme, the Digital Toolbox / Knowledge Hub, as well as the rest of the local space initiatives that the three partners will not implement during the 1st pilot round. This extended approach is expected to provide multiple benefits for the project such as: (i) accommodate the potential participation of the three pilot partners in the 2nd pilot round, (ii) the business planning exercise for the digital toolbox and (iii) support the commercial exploitation of the InnORBIT's key exploitable assets. Then, **the scope was reverted back to its original direction using a general-to-specific-approach**, that is to support the business case for the established space initiatives of the three consortium innovation intermediaries in Greece, Croatia and Romania, in the context of the 1st pilot round.

Methodology

In this report, we have employed a wide collection of methodological tools to perform a comprehensive **market analysis** for the general market of InnORBIT, and in particular for the markets of Greece, Croatia and Romania where the 1st pilot round of local space initiatives will be deployed by InnORBIT partners COR, ALG and ROS. The 5 C's of marketing methodology was used to study the five core dimensions of our target markets: Customers, Company, Competitors, Collaborators and Context. The Company dimension was further analysed through a SWOT analysis and the external Context through a PEST analysis.

The business models for InnORBIT's core assets (Capacity Building Programme and the Digital Toolbox) as well as for the 4 types of local space initiatives designed by InnORBIT (space cafés, space incubators, space accelerators and space hackathons) were elaborated using the Business Model Canvas (BMC) and the Value Proposition Canvas (VPC), two trustworthy and well-established methodologies of business modelling. Variations of the business models were created where necessary, changing the concept, format and assumptions of the BMC such as online space initiatives or customer segments.

Subsequently, a business model ranking exercise was employed, comprising a set of 7 business models evaluation questions of Strategyzer (the same team that created the BMC and VPC) with a weighting exercise, which we adapted to the needs of InnORBIT to develop a decision-making tool for assessing business model designs for space innovation. Finally, a custom questionnaire was designed for pilot partners to qualitatively assess the relevance of the InnORBIT business models to their organisations' strategy, interests and needs along with the sustainability and scalability of local initiatives.

Market analysis

The target market of InnORBIT is the commercial space sector in Eastern European countries and more specifically we address the train-the-trainers and the business support service provision as our market segments. Our market analysis identified the current size of the market, the needs that our services aim to cover, the key customer segments, potential allies, and collaborators as well as the assessment of the inherent

particularities of InnORBIT and the three pilot partners. The political, socioeconomic and technological factor at play in each market were identified.

Business models and variations

A set of business models were developed for InnORBIT's core assets and local space initiatives along with their potential variations, creating an arsenal of business models that cover the whole value chain of InnORBIT. The business models for the CBP and digital toolbox were developed for the InnORBIT consortium, while the models of local space initiatives were developed for the benefit of innovation intermediaries receiving our services. As a result, 13 business models have been developed using the Business Model Canvas: Capacity Building Programme, 2 BMs for the Digital Toolbox, 2 models for space incubators, 2 models for space accelerators, 2 models for space cafés and 3 models for Space Hackathons. For each case, a Value Proposition Canvas was developed for each customer segment.

Business models ranking

The business models ranking exercise was conducted among the consortium partners of InnORBIT in their capacity as business and/or space experts, with a view to testing a decision-support methodology for the selection of the most promising business models in the context of InnORBIT. First, the relative importance of the 7 questions asked for business models evaluation was assessed, to evaluate which questions constitute the most important factors in selecting the most promising business models. The results indicate that the two most important questions at this stage of the project are:

- *" Does your business model provide built-in protection from competition?"*
- *" How scalable is your business model?"*

As for the actual ranking of InnORBIT's business models, it is evident that the Capacity Building Programme and the digital toolbox, as the core assets of InnORBIT have the strongest business case. Among the local space initiatives that are part of the Business Support Programme (BSP), the most valued business model is the hybrid version of the Space Café(s), followed by physical Accelerators and Hackathons.

Business models evaluation

The three pilot partners (ALG, COR, ROS) participating in the 1st pilot of InnORBIT have selected which local space initiative they will implement in their countries, in consultations with our partner STP, as part of WP3 activities. ALG, COR and ROS based on their selection, were asked to evaluate the degree to which the designed business models for the selected space initiatives match their organisations' strategy, plans, interests and needs. The results reflect a positive reception of the business models developed for their space initiatives.

Next steps

The project is still at a relatively early stage of implementation, as the 1st pilot round has only recently started. The business modelling insights only reflect assumptions and hypotheses about the commercial prospects of soon-to-be-established local space initiatives of Greece, Croatia, and Romania, as well as of the core InnORBIT assets. During the 1st pilot round, the assumptions of our business models will be put into the test, through consultations with the actual end-users of our services (local space ecosystems) as well as the evidence collected for the performance and impact of our solutions. Financial analyses and investment needs will be further researched upon, to create sustainable business plans for the local space initiatives established in Greece, Croatia, and Romania. The methodology employed will be applicable to a diverse set of contexts and customer segments, to develop a business planning guide that will be made publicly available as part of InnORBIT's Replication Guide.

1 Introduction

The aim of this report is to identify and present the most promising business models that InnORBIT and innovation intermediaries can adopt during and after the end of the project, enhancing its prospects for commercial viability and sustainability. To this end, it provides a detailed market analysis for InnORBIT's programmes and services, with a special focus on local initiatives. The report concludes with the most promising business models selected for the successful and sustainable commercial exploitation of InnORBIT as a whole, during and beyond the end of the project, the successful and sustainable deployment of local space initiatives, considering the two pilot rounds.

The needs and interests of the potential customers, as well as the interests of the project partners are specifically accounted for in the framework of these models, aiming to increase the prospects for market success and long-term sustainability for the InnORBIT Capacity Building and Business Support Programmes. A collective business modelling exercise was driven by co-design and co-evaluation processes including all consortium members, with the purpose to source and assess a wealth of views and possible options for the InnORBIT business models, in parallel with the capacity building activities under T3.1 and the selection of initiatives to be deployed from the InnORBIT intermediaries (i.e., ROS, COR, and ALG).

With the above in mind, the present report is structured as follows:

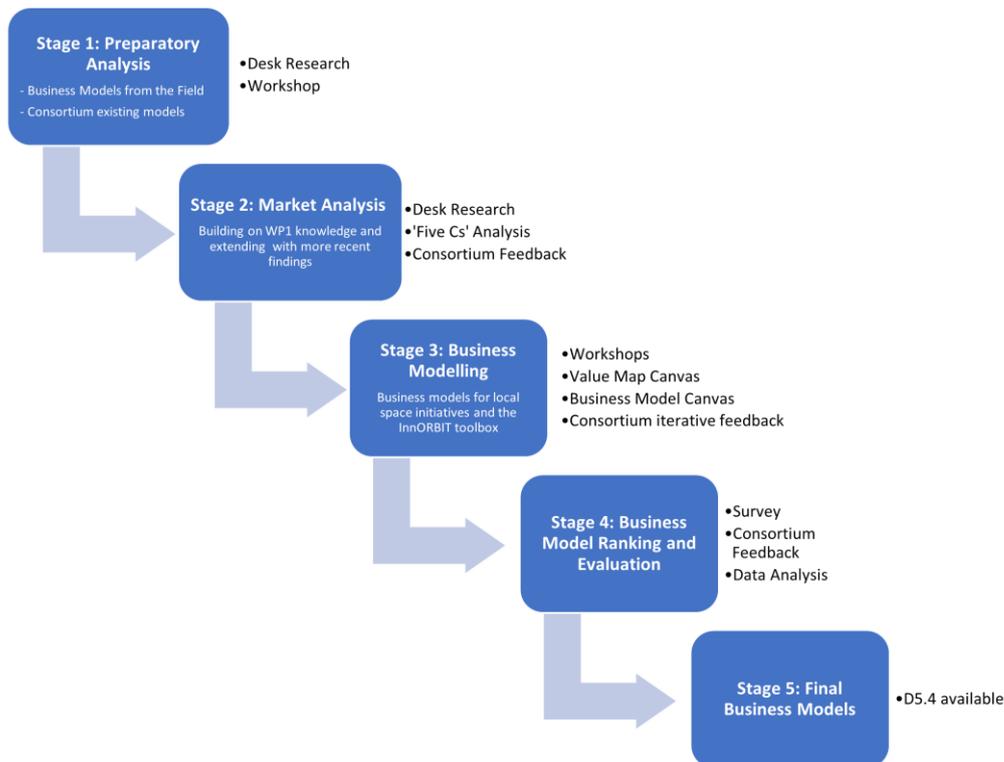
- **Chapter 1** concisely introduces this report, as well as the context within which it
- **Chapter 2** outlines the approach that was followed in order to implement the project objectives related to this deliverable.
- **Chapter 3** introduces the services provided via InnORBIT, with a focus on the digital toolbox and local space initiatives
- **Chapter 4** presents the market analysis that took place in order to map the market for InnORBIT's programmes
- **Chapter 5** presents the business models that were developed for InnORBIT. More particularly it describes the business modelling methodology that was adopted, the identified potential business models for InnORBIT's local space initiatives and digital toolbox, and the co-designed most prominent ones, along with slight differentiating aspects.
- **Chapter 6** elaborates on the ranking results on all 13 Business Models drafted for the InnORBIT local space initiatives and the digital toolbox.
- **Chapter 7** focuses more on the evaluation of the local space initiatives of the Business Support Programme, in the context of the InnORBIT pilots, with key insights from the InnORBIT intermediaries.
- **Chapter 8** presents the conclusions arising from the work done and describes the next steps that need to be made in the following tasks related with the commercial viability of InnORBIT after the end of the project.

Finally, the **Annexes** of this report include the theoretical models of the 'Five Cs' Market Analysis, the Value Proposition Canvas and Business Model Canvas (Annex I), the methodologies followed for ranking and evaluating the InnORBIT Business Models (Annex II), information on partners' business model co-design online workshops, along with photos (Annex III), and the presentations and the MIRO boards that were used for the purposes of the workshops (Annex IV).

2 Methodology / Approach

The approach of the present deliverable is featured in Figure 1 (below). Our approach consists of five distinct stages, that fed each other progressively, each of which was conducted with the usage of specifically selected tools that reflect current thinking about market analysis and business model innovation and contribute to a sustainable vision for supporting space innovation in Europe.

Figure 1 Stages of work feeding this deliverable, including the specific tools used in each stage.



In particular, the work undertaken was initiated by considering the already existing business knowledge and market experience of the InnORBIT consortium partners. Hence, in **Stage 1** we conducted a preparatory analysis of existing business models currently in practice throughout the InnORBIT consortium, but also openly available through other best practices. These models, acted as reference material for an introductory online workshop on the 19th of October 2021, with all consortium partners, towards elaborating on preliminary findings and presenting the methodology for the next steps, namely the remaining four steps/stages of the analysis covered at this point.

Subsequently, **Stage 2** was initiated going deeper into the market analysis presented in the DoA, and further elaborated under T1.1, updating previous findings with additional information and more recent results about the market characteristics and operating environment for the InnORBIT's local space initiatives and digital toolbox. In this stage, the so called 'Five Cs' marketing analysis tool was used, allowing us to systematically analyse the Customers, Company, Competitors, Collaborators and Context for the InnORBIT assets. The insights from this tool allow us to make more informed decisions and consequently enable us to better understand the market and construct well-defined business models. This knowledge will also contribute significantly for the business planning and strategy that will follow closer to the end of the project when the exploitation roadmap beyond the project's duration will be drafted.

In **Stage 3**, we started once more from the overarching business model presented in the DoA, and based on the previous market analysis and the identified market trends, gaps and opportunities identified on the two previous stages we expanded our approach, utilising also key additional knowledge from WP1, WP2 and WP3 to develop concrete business models and examine alternative assumptions, using the Value Proposition and Business Model Canvas – Annex I. Focusing on the later, during this stage an iterative communication with the consortium was established, with bilateral and joint workshops, as well as offline feedback collection towards carefully working digitally together in the elaboration of the critical aspects for each business model. Following the introductory workshop of the first stage, Q-PLAN proceeded in bilateral communication (short business modelling online sessions) with most of the partners, based on their expertise and services’ portfolio, to validate and fine-tune the initial models. The table below shows the meetings and the Business Modelling sessions per InnORBIT partner.

Table 1 – Business modelling consultation rounds

Topic of business modelling session	Partners involved	Date	Comments
Digital toolbox	QPL, TTG	November 5 th , 2021	TTG is experienced in the development of digital platforms and tools as well as the lead partner developing the Digital Toolbox.
Space incubators, accelerators and hackathons	QPL, ALG	November 8 th , 2021	ALG manages a successful incubator, Algebra LAB and has experience in other initiatives.
Space incubators, accelerators, hackathons	QPL, COR	November 12 th , 2021	COR, has operated various technology and space-themed incubators and accelerators (e.g. enter-grow-go, Be Your Own Boss, ESA BIC Greece) and has recently organised the 1 st CASSINI Hackathon.
Capacity Building Programme and Space cafés	QPL, STP	November 15 th , 2021	STP is the lead partner creating the InnORBIT’s programmes and has implemented several initiatives, while being the only consortium partner experienced in the organisation of space cafés or breweries.

After all business models have been refined, including a lot of meaningful differentiating factors, a second workshop was organised on the 19th of November 2021, with all InnORBIT partners, towards presenting the final 13 business models, and discussing in more detail their impact on the identified markets, as well as their deployment within the InnORBIT pilot rounds. This facilitated the design of demand-driven business models for the InnORBIT local space initiatives and digital toolbox, which is also vital for their post-project rollout and sustainability.

Within the second part of this workshop, guidelines for the next stage have been presented (see Annex III.B), as a novel ranking and evaluation methodology has been introduced, aiming towards extracting more domain-driven knowledge from the InnORBIT experts.

Stage 4 covers the ranking and evaluation of the refined business models. For the ranking, a hybrid methodology that combines an existing ranking approach (i.e., the *7 Questions to Assess Your Business Model Design*¹ from Strategyzer – the creators of the Business Model Canvas) with some novel elements (i.e., rank only the three business models, that best respond to each question, while assessing the importance of each question with a weighting factor). This exercise was distributed in the form of an online survey (see Annex II) to all InnORBIT partners and aimed to identify from all available business models the one(s) that have the most generally accepted market value for supporting (local) space innovation.

Focusing a bit more on the local space initiative of the Business Support Programme, the InnORBIT intermediaries were asked to evaluate the respective Business Models, in the context of their deployment during the InnORBIT pilot rounds. The intermediaries were asked to assess certain aspects of the business models through an online questionnaire (see Annex II), identify the ones that hold the most interesting potential for their organisation, and once more refine certain aspects that are closer to their operational procedures. The selected business models are the ones that will be deployed from the InnORBIT intermediaries during the two pilot rounds, allowing for meaningful feedback for robust evaluation and validation, during the respective validation workshops with external stakeholders.

¹ <https://www.strategyzer.com/blog/7-questions-to-assess-your-business-model-design>

3 Introduction to InnORBIT services

3.1 Overview of InnORBIT's services

The mission of InnORBIT is to develop a set of programmes, tools and services to support space entrepreneurship across Eastern Europe. First, InnORBIT trains the trainers (innovation intermediaries) through a **Capacity Building Programme** to help them build skills on how to **organise local space initiatives (incubators, accelerators, hackathons, space cafés, sprints)** to support local entrepreneurs in developing commercial activity in the space and non-space sectors using space technology, data and infrastructure.

The actual setting up and customization of local space initiatives by trained innovation intermediaries are supported through the **Business Support Programme**. Finally, a Digital Toolbox is in place to facilitate the delivery of both programmes, with tools and material such as training, networking, matchmaking, investment readiness assessment etc.

The rest of this section elaborates on the core services of InnORBIT (Capacity Building Programme, Business Support Programme and local space initiatives, Digital Toolbox) and on the rest of identified exploitable assets.

3.2 InnORBIT Capacity Building Programme (CBP)

The train-the-trainers / Capacity Building Programme of InnORBIT focuses on the provision of services to innovation intermediaries with a view to re-skill them or enhance their capabilities to operate in the space and space-related sectors. The programme offers trainers a collection of self-paced online courses in topics such as the space market and space economics basics, New Space, the flagship EU space programmes and services (Copernicus, Galileo, EGNOS) and other space programmes (SSA, GOVSATCOM). Moreover, trainers are trained on the essentials to organise and sustainably operate space initiatives – including space incubators, accelerators, hackathons, cafés and sprints in their local innovation ecosystems. All materials are available through the InnORBIT's digital toolbox and are customisable to innovation intermediaries' specific needs and individualities of their local ecosystems. Trainers are supported by the experts of InnORBIT to customise the programme to their needs, perform concrete planning, monitor their progress and seek assistance and support.

3.3 InnORBIT Business Support Programme (BSP) and designed local space initiatives

Innovation intermediaries having received the services and training of the CBP, are capable of organising and operating local space initiatives, supporting innovators, start-ups, SMEs and entrepreneurs as well as other enabling stakeholders within the local ecosystems to develop or scale-up their activities in the space sector. Innovation intermediaries receive personalised support and customisable material to organise one or more out of the five local space initiatives designed by InnORBIT's experts at this stage of the project: (i) space incubators, (ii) space accelerators, (iii) space hackathons, (iv) space cafés.

3.3.1 Space incubators

Space incubators focus on the business development of early-stage start-ups, through mentoring and training sessions where start-ups identify and improve the gaps associated with their business development. Incubators gather start-ups in a single location to enhance cross-fertilisation of ideas and encourage peer-supported learning among entrepreneurs. As the focus is placed mostly on the business aspects of start-up development, incubators do not rely on intensive sectoral knowledge in space and space-related technology. Space incubators are generally resource-intensive and time-consuming in their organisation and operation and have a long-term span. Thus, public support and funding are needed for their organisation.

3.3.2 Space accelerators

Space accelerators are initiatives focusing on the development of start-up ecosystems focusing on the provision of support to start-ups for the development of new programmes, services and perform market validation. Space accelerators are strongly thematic (in contrast to incubators), spatially concentrated and may provide start-ups with mentoring, training and funding – depending on choice. Some accelerators may fund themselves by obtaining equity in exchange for service provision and therefore, are more involved in the business development of companies. Space accelerators are resource and knowledge intensive, operating in the long-term and thus external (public) support is commonly needed.

3.3.3 Space hackathons

Space hackathons are intensive competition-based initiatives, involving local students and fresh talents to develop solutions for specified space-related challenges competing for a prize. Challenges might vary greatly in complexity and needs for resources, depending on data availability and other necessary infrastructure and expertise. Space hackathons offer a great opportunity for the emergence of innovative ideas, solutions and products, talent attraction and student engagement in the space and space-related sectors. Hackathons, however, are quite labour-, time- and infrastructure-intensive.

3.3.4 Space cafés

Space cafés are a series of events involving groups of space enthusiasts – including students and professionals in space and non-space sectors – who meet and discuss space-related topics. The tone adopted in this event setting is relaxed, informal and straightforward and is strongly focused on community building and networking. A café is a series of regular events where a keynote speaker begins with a presentation, followed by a Q&A session by other participants in a panel format. Several repetitions of this cycle might take place in each event. The final session is usually devoted to networking among participants. Space cafés are simple to organise with low needs for resources and thus offer an inexpensive tool for community building.

3.4 InnORBIT Digital Toolbox and Knowledge Hub

The Digital Toolbox is a set of practical tools for both innovation intermediaries and innovators that can either be used as a standalone set of services or even as a complement to the CBP and the BSP. The digital toolbox encompasses 7 tools/functionalities gathered in a single space: (i) project website, (ii) Registration tools, (iii) Investment Readiness Level – IRL self-assessment for innovators, (iv) a Community Forum, (v) Find partners (vi) Find funding and (vii) a customisable e-learning / knowledge repository platform. The Knowledge Hub is referring to the collection of materials, market knowledge and information, templates and training material populating the digital toolbox and its constituent tools.

InnORBIT's services, programmes and tools will be implemented, tested and validated in two pilot rounds. Three consortium partners (ROS in Romania, COR in Greece and ALG in Croatia) under their capacity as innovation intermediaries are currently participating in the 1st pilot round, currently receiving training through the Capacity Building Programme with the support by the consortium space consultancy expert, STP and have been guided to choose among the provided options the local space initiatives, as elaborated in section 3.3, the ones most appropriate to their organisation and local space ecosystem needs.

The three pilot partners have announced their selection during the 3rd InnORBIT project meeting (on December 8th, 2021), as follows:

- **ALG, Croatia:** Space café events
- **COR, Greece:** Space café events and Space Hackathon
- **ROS, Romania:** Space café events, Info Day events and Space Hackathon

The three pilot partners at the moment of writing of this report, were preparing their Support Initiative Deployment Plans (SIDPs), describing in more detail the implementation plan of their local space initiatives in the context of the Business Support Programme. The SIDP for Greece (COR) is documented in D3.2, the SIDP for Croatia (ALG) in D3.3 and the SIDP for Romania in D3.4, submitted in M12. Starting from M13 (January 2022) and up to M20 (August 2022), the deployment, testing and validation activities of the 1st pilot round will take place.

A second iteration (2nd pilot round) will commence on M18 (June 2022) with participation of external innovation intermediaries across Eastern Europe, to put our services to the test in a wider set of real-life conditions.

3.5 InnORBIT’s exploitable assets

In parallel with the InnORBIT Business Modelling, the IPR management strategy has been elaborated as part of **D5.3 Exploitation and Sustainability Plan – First version**. The outcomes related to the initial definition of InnORBIT’s exploitable assets have fed into the design of business models while the reverse also holds true. The two activities were aligned in such a way to ensure that internal consistency is preserved between the Exploitation Plan and the Business Plans of the project. In this context, the first full list of InnORBIT’s exploitable assets has been defined – containing 11 assets, reflecting the knowledge of the consortium at this stage of the project (up to M12). This list of assets will be further fine-tuned and adjusted to the exploitation needs of the project for the rest of its duration and its final version will be reported in D5.7 Exploitation and Sustainability Plan, in M30 of the project. The following table contains the identified exploitable assets of InnORBIT, up to the moment of writing of this report along with a short description of each.

Table 2: Initial list of InnORBIT exploitable assets

Title	Brief description
<p>Capacity Building Programme</p>	<p>The end-to-end approach, methodology, services and support employed by InnORBIT experts to train the trainers - i.e., innovation intermediaries - to build capacity and skills to set up and run local space initiatives to benefit their ecosystem. The CBP includes content for business and technical training (e.g., videos, handbooks, webinars etc.) offered to innovation intermediaries and innovators in the frame of the CBP and BSP respectively as an introduction to the commercial space sector (NewSpace), space technologies, space data and their applications in space and non-space sectors for the development of new products and services.</p>
<p>Business Support Programme</p>	<p>The methodology, approach and know-how for the provision of support to innovation intermediaries during the implementation of local space initiative types, after the completion of the CBP. Useful materials and know-how for the set-up of five local space initiative types are included: (i) space cafes, (ii) space incubators, (iii) space accelerators, (iv) space hackathons and (v) sprints.</p>

<p>Digital toolbox</p>	<p>The digital toolbox is a set of practical tools for both innovation intermediaries and innovators that can either be used as a standalone set of services or even as a complement to the CBP/BSP/trainings. The digital toolbox encompasses 7 tools/functionalities gathered in a single space: (i) project website, (ii) Registration tools, (iii) Investment Readiness Level – IRL self-assessment for innovators, (iv) a Community Forum, (v) Find partners (vi) Find funding and (vii) a customisable e-learning / knowledge repository platform.</p>
<p>Local space initiatives established in Romania</p>	<p>The local space initiative (Space café, info days and Space Hackathon) of ROS that will be established and tested during the 1st pilot round. The local space initiative along with the business models and plans for sustainability is an asset of major importance both for the development of the Romanian space ecosystem but for the service portfolio and position of ROS in the local market as well.</p> <p>Note: ROS has tentatively expressed interest to participate in the 2nd pilot round with additional initiatives.</p>
<p>Local space initiatives established in Greece</p>	<p>The local space initiative of COR (Space café and Space Hackathon) that will be established and tested during the 1st pilot round. Along with the business models and plans for sustainability, this is an asset that will expand COR's portfolio of services targeting entrepreneurs from the very early stages of business development (e.g., pre-incubation), in connection to other significant initiatives run by COR such as the ESA BIC Greece, CASSINI Hackathons and the si-cluster, that will strengthen the position of COR as a major space player in Greece even more.</p> <p>Note: COR has tentatively expressed interest to participate in the 2nd pilot round with additional initiatives</p>
<p>Local space initiatives established in Croatia</p>	<p>The local space initiative of ALG (Space café – A series of five thematically-focused events) that will be established and tested during the 1st pilot round. Along with the business models and plans for sustainability, this is an asset that could mobilise the largely underdeveloped space industry in Croatia, putting Algebra at the forefront of this venture. ALG's extended experience in business, software / data and the creative industries is ripe for the development of new services and curricula in the future, targeting the space industry.</p> <p>Note: ALG has tentatively expressed interest to participate in the 2nd pilot round with additional initiatives</p>
<p>Pool of established local space initiatives of the 2nd pilot round</p>	<p>The public profiles of (external) innovation intermediaries as well as the type of involvement in the project (e.g., local space initiatives implementation, news, events, results and achievements, as well as good practices stemming from participation. Private data will be as well collected that will be handled as confidential information (financial and other resources, infrastructure, business strategies) that are deemed necessary for the provision of meaningful support by the InnORBIT consortium during the 2nd pilot round implementation.</p>

<p>InnORBIT's brand, community, synergies, and reputation</p>	<p>InnORBIT's community and networks including synergies with other EU initiatives, projects and organisations as well as local initiatives sustainably established and run by innovation intermediaries (e.g. clusters, innovation hubs, etc.) during the project with a view to systematically and effectively supporting space innovation. The InnORBIT brand, data collected, and stakeholder community initially comprised of local and international stakeholders (intermediaries, start-ups, etc.), facilitating the dissemination and exploitation of InnORBIT's outcomes.</p>
<p>InnORBIT's studies, market intelligence, and know-how</p>	<p>Project studies, experience gained, and lessons learnt from the implementation of InnORBIT project. Studies included: (i) "The European space support landscape: Insights from CEE and SEE", (ii) "Training needs of innovation intermediaries and business support needs of innovators", (iii) "Co-design of capacity building and business support".</p>
<p>Replication guide</p>	<p>The InnORBIT replication guide offered as printable as well as interactive tool that aims to help innovation intermediaries to set-up and run sustainable initiatives and replicate the project's results.</p>
<p>Policy recommendations</p>	<p>InnORBIT's Policy Recommendations is a set of guidelines and advice for policymakers aimed at fostering more informed design of policies, promoting support through business services and enabling financial frameworks for the development and uptake of space-enabled solutions. Policy recommendations will be a set of thoughtful ideas, based on the experience of the InnORBIT consortium, which will seek to foster space innovation, maximising resources and seeking to create synergies between the initiatives set up.</p>

4 Updated Market Analysis

In this Section, a thorough market analysis is presented for the market of InnORBIT's services and programmes in general, followed by specific market analyses for the local space initiatives that will be implemented by the three innovation intermediaries of the consortium during the 1st pilot round implementation of the Capacity Building Programme and the Business Support Programme.

The market research done at this stage of the project, builds largely upon the findings of WP1 research activities of InnORBIT and especially D1.1 “The European space support landscape: Insights from Central Eastern and South Eastern Europe” and was complemented by the latest market data and information to the best degree possible. The approach and methodology employed for the market research are elaborated in more depth in Annex I.

This section is organised in subsections devoted to key aspects of professional market analysis and progressing geographically from the general InnORBIT market to the country-specific markets of COR (Greece), ALG (Croatia) and ROS (Romania) within each subsection. Where necessary, information from the global and EU market are provided, either due to the lack of disaggregated data for the Eastern European countries and/or the countries participating in the 1st pilot round or because the analysis of policies, programmes and market data at higher level provide the necessary context to facilitate understanding of target markets.

4.1 Target market and size

InnORBIT's methodology, services and solutions focus on the **commercial space sector** (New Space) as well as linked sectors, that either can benefit from the application of space technologies and data (e.g., energy, transport, smart cities, etc.) or can benefit the space sector through technology transfer (e.g., Artificial Intelligence) for the development of new space technologies, services, and infrastructure. The primary geographical focus of InnORBIT extends to the countries of the Central-Eastern, Southern-Eastern Europe and North-Eastern Europe.

More specifically, InnORBIT targets **two market segments** within the space sector, related to the advancement of space entrepreneurship:

- (i) **the market of business support service provision for space innovators** including consultancy, coaching, mentoring and training in business and technical training, commercialisation of concepts and ideas into sustainable leading to sustainable development of products and services within the space sector through space initiatives and
- (ii) **the “train-the-trainers” segment** involving qualified organisations, networks, clusters and associations – i.e., innovation intermediaries to build the necessary skills and knowledge to offer business support services for space innovators within their proximate innovation ecosystems through the establishment of sustainable local space initiatives such as space incubators, accelerators, hackathons, sprints and space cafés.

InnORBIT's programmes and services will be initially tested during the first pilot round in Greece, Croatia, and Romania by three InnORBIT consortium partners and innovation intermediaries, COR, ALG and ROS respectively, followed by 17 other innovation intermediaries across the CEE/SEE area in the second pilot round of the project. The market analysis and business modelling exercise are done first and foremost for the benefit of the three pilot partners. However, the market analysis has been performed on a general to specific sequence to provide a better framework for the understanding of InnORBIT's position to the market and ultimately to develop a strong business case for the three local space initiatives set-up by the three pilot partners of InnORBIT.

4.1.1 Global space economy

The most recent estimates about the value of Space Economy ranged from \$298 billion - \$424 billion for 2020. An exact estimation of the space sector value is quite challenging as space is not recognised as a category in international standards of industrial classification². PwC estimates that the value of the global space industry was \$371 billion in 2020, and more specifically the *upstream segment* – including launch services, and satellite manufacturing, at \$23 billion, the *midstream segment* – including ground infrastructure and operations, fleet operations among others, to reach a size of \$40 billion, the *downstream segment* at \$226 billion, covering space services and consumer equipment and finally institutional budgets standing at \$86 billion for research and science, space exploration and military applications. The value of the upstream space segment in 2016 was estimated at EUR 92 billion with a compound average growth rate (CAGR) of 1% during the previous 5 years, the midstream sector was valued at EUR 28 billion with a CAGR of 2% and finally, the downstream segment was valued at EUR 187 billion with a five-year CAGR of 2%.³

The SpaceTech economy is considered to contribute about 0.5% of the global GDP in 2020 and is estimated to grow approximately to \$460 billion by 2030 and to \$10 trillion by 2030⁴.

Market segments within the downstream space sector show tremendous potential for growth. The global downstream Earth Observation (EO) market with an estimated value of EUR 2.6 - 2.8 billion is expected to grow with a 7% CAGR up to 2022⁵. The Global Navigation Satellite System (GNSS) downstream market revenues from devices and services almost reached EUR 150 billion in 2019 and are expected to reach 325 billion by 2029⁶.

In 2021, there were at least 10,000 companies, 5,000 investors, more than 150 R&D Hubs and Associations and approximately 130 governmental organisations active in the global space sector. The US is by far the dominant player in the space sector, with at least half (53.1%) of the 10,000 SpaceTech companies globally based there in 2021, with the second country – the UK having only 5.7% of the total share.⁷ The US leads in terms of established SpaceTech companies in virtually all the categories of the market (ranging from manufacturing to spacecraft development, satellite and software).⁸

The space industry is a traditionally institutional sector with government investment and commercial activities being the main driving forces. However, the commercial space sector or NewSpace has gained much ground over the last decade with 76% of global space economic activity in 2016 being in the commercial space sector.⁹

In terms of investments to SpaceTech companies, the US leads in terms of capital raised and a number of firms invested in with an enormous margin from the rest of the countries.¹⁰

² PwC (2020), Main trends and challenges in the space sector, p.7

³ PwC (2019), Main trends and challenges in the space sector, p.6

⁴ SpaceTech Analytics (2021), SpaceTech Industry 2021 / Q2 – Landscape Overview, p. 20

⁵ EUSPA, The Earth Observation market, URL: <https://www.euspa.europa.eu/european-space/euspace-market/earth-observation-market>

⁶ EUSPA, GNSS Downstream Market, URL: <https://www.euspa.europa.eu/european-space/euspace-market/gnss-market>

⁷ SpaceTech Analytics (2021), SpaceTech Industry 2021 / Q2 – Landscape Overview, p. 18

⁸ SpaceTech Analytics (2021), SpaceTech Industry 2021 / Q2 – Landscape Overview, p. 19

⁹ The future of the European Space Sectors, EIB, 2019, p. 19

¹⁰ SpaceTech Analytics (2021), SpaceTech Industry 2021 / Q2 – Landscape Overview, p. 26

4.1.2 The EU and Eastern European space economy

Europe's space industry has an estimated value of EUR 53-62 billion, employing more than 230,000 professionals – being the 2nd largest space industry in the world. Europe has a strong global presence in the GNSS market with 40% Galileo-enabled GNSS units out of 1.7 billion shipped in 2019¹¹, in the second position of GNSS augmentation and added-value service providers (e.g., EGNOS) with 31% of the global market in 2017¹², while the European EO market represented approximately 25% of the global EO economy in the same year¹³.

The EU space economy has a strong multiplier in the internal market, with every euro invested in the space sector, generating approximately 6 euros of added-value and benefits for the economy¹⁴. Based on the latest Copernicus Market Report¹⁵, an overall economic benefit between 16 and 21 billion euro was expected to be generated by the Copernicus programme from 2008 to 2020. Innovation also plays a key role in driving economic growth and sustainability in the European Union. In this context, the European space program offers huge potential for the EU, as an engine of innovative growth in a number of different sectors including Location-Based Services, transport, surveying, agriculture, and timing and synchronisation.¹⁶ As of 2021, 570 EO companies were active in Europe – out of which more than 90% use Copernicus data as part of their business¹⁷.

An exact estimation of the space sector in Eastern Europe is not known. Space has started to take off in the latest period. The fact that seven countries in the area are included in the list of PwC's Emerging space nations - including Greece, Croatia, Romania, Hungary, Poland, Latvia, and Lithuania¹⁸, is quite demonstrative of this fact. As opposed to established space nations, the definition refers to countries that either are “embracing space activities for the first time” and invested heavily in the space sector during the last few years or countries that “currently resurge into the space sector and rebuilding their capacities and programmes following a long pause and now capitalising on space activities they have previously initiated”¹⁹. The classification of countries as such is based on their ranking based on the following criteria: space launch capacity, industry maturity, capacity building for human capital or industries, existence / success of national space programmes.²⁰

¹¹ EUSPA, The EU Space Market, URL: <https://www.euspa.europa.eu/european-space/euspace-market>

¹² EUSPA, The EU Space Market, URL: <https://www.euspa.europa.eu/european-space/euspace-market>

¹³ EUSPA, Earth Observation Market, URL: <https://www.euspa.europa.eu/european-space/euspace-market/earth-observation-market>

¹⁴ European Commission, EU in space infographic, URL: <https://www.consilium.europa.eu/en/infographics/eu-in-space/>

¹⁵ Copernicus Market Report, February 2019, URL: https://www.copernicus.eu/sites/default/files/2019-02/PwC_Copernicus_Market_Report_2019_PDF_version.pdf

¹⁶ EUSPA, The EU Space Market, URL: <https://www.euspa.europa.eu/european-space/euspace-market>

¹⁷ EUSPA, Earth Observation Market, URL: <https://www.euspa.europa.eu/european-space/euspace-market/earth-observation-market>

¹⁸ PwC (2020), The role of emerging space nations in supporting sustainable development and economic growth, p.5

¹⁹ PwC (2020), The role of emerging space nations in supporting sustainable development and economic growth, p.4

²⁰ PwC (2020), The role of emerging space nations in supporting sustainable development and economic growth, p.5

4.1.2.1 Croatia

No recent data were found to estimate the exact value of the space economy in Croatia. However, the national space industry is still in a relatively early stage. Although space-related research takes place in the country, the majority of space actors are from within the academia and only a few companies are active in space, mostly in the field of satellite software development²¹. The Croatian government has signed a Cooperation Agreement with the European Space Agency in 2018, however the country is still far from having a comprehensive national strategy for space. The Adriatic Aerospace Association (A3) is the most prominent actor in the Croatian space ecosystem, promoting the growth of the national space industry through advanced awareness and research, a supportive entrepreneurship ecosystem, international cooperation and ultimately a full-fledged national space programme²².

4.1.2.2 Greece

The Greek space sector is an emerging industry covering a wide range of upstream, midstream, and downstream technologies, such as EO, navigation, satellite communications, operations, microelectronics, robotics, materials, structures, etc. Reportedly, the estimated size of the Greek space sector in 2020 was approximately EUR 200 million²³. Several SMEs operate in the national space sector with considerable activity, quality products and a good reputation on their field. More than 40 companies active in the space sector are members of the Hellenic Association of Space Industry (HASI), employing over 2000 employees. HASI along with Corallia have created the si-Cluster (Hellenic Space Technologies and Applications Cluster) in 2013, counting more than 75 members in 2021. HASI and the si-Cluster maintain a catalogue of space-related companies, research institutions and other market players²⁴.

4.1.2.3 Romania

No public information about the size of the Romanian space industry were found during our research. However, the country has a tradition in space and has gained experience in various fields and applications such as satellite communication, remote sensing / EO, geographic information systems (GIS) and global navigation, positioning and navigation systems, as well as in the manufacturing of more than 20 aircraft types²⁵. The leading organisation active in space is the Romanian Space Agency (ROSA), a public institution supporting space research programmes, such as the Space Technology and Advanced Research (STAR) Research, Development and Innovation Programme for the 2012-2019 period, and international cooperation activities such as the accession to ESA. According to data provided by ROMSPACE, there are almost 180 entities present in the Romanian space sector, most of them active in the development of products and services in the downstream sector. For the period spanning from 2019 up to June 2021, only 56 entities showed signs of activity in the space domain, having a contract with ESA. Out of these entities, approximately 60% are SMEs, 9% universities and circa 1% NGOs.

²¹ European Space Agency, News Article: Croatia Signs Cooperation Agreement, URL: https://www.esa.int/About_Us/Corporate_news/Croatia_signs_Cooperation_Agreement

²² Adriatic Aerospace Association (A3) website, URL: https://a3space.org/?page_id=2502

²³ This information was stated by several Greek space stakeholders during Task 1.1 interviews.

²⁴ HASI (2019), Greek space catalogue, URL: <https://www.hellenic-asi.org/files/si-cluster.pdf>

²⁵ Wikipedia, Article: Romanian Space Agency, URL: https://en.wikipedia.org/wiki/Romanian_Space_Agency

4.2 Customer segments

4.2.1 InnORBIT's customer segments

This section elaborates on the customer segmentation of InnORBIT and the ways added-value is offered to these stakeholders. InnORBIT's services and programmes target a diverse set of stakeholder groups as customer segments, either directly or indirectly. Innovation intermediaries are the core source of direct demand for InnORBIT's train-the-train services offered via the Capacity Building Programme as well as for the material and know-how for the implementation of local space initiatives and provision of support to local stakeholders in space innovation ecosystems offered through the Business Support Programme. InnORBIT offers value to other customer services indirectly via the local space initiatives offered by InnORBIT-trained innovation intermediaries for innovators in space and space-related sectors, private investors, large corporates, academia and research institutions and governmental agencies.

Innovation intermediaries are organisations of central importance for local technological innovation ecosystems that act as enablers, coordinators or brokers that contribute to the performance of essential functions within the scope of the local innovation system by involved stakeholders, such as knowledge development and diffusion, entrepreneurship, system infrastructure creation, resource mobilisation, attraction of external actors to the local ecosystems, market identification and formation, facilitation and creation of synergies, among others²⁶. Innovation intermediaries might offer such services as part of their primary business activity or as a by-product of other activities, such as consultancy companies. Innovation intermediaries might act as superstructure organisations that are focused neither on the generation nor the implementation of innovations, but on enabling other organisations to innovate. This although need not be the only case.

InnORBIT targets innovation intermediaries, such as clusters, digital innovation hubs, industry and SME associations, active either in the space or in non-space sectors. It aims to train them towards (i) strengthening the skills of their personnel, so that they can provide more effective technical and / or business services for entrepreneurs to innovate in space and space-related sectors and (ii) upscaling their significance as agents of change and innovation for the local space ecosystem through the establishment of local space initiatives.

Innovators in space and space-related industries are the leading indirect customer segment of InnORBIT and include companies that engage in commercial activity across the whole value chain of the downstream, midstream, and upstream space sectors as well as in other industries that might benefit from and make use of space-enabled technologies, data, and applications such as energy, transport, agriculture, mobility and transport, smart cities, and governance among other.

- **Start-ups** are companies that are in the early stages of development, focusing on the determination of product-market fit and experimentation with their business models and customer segmentation.
- **Scale-ups** are more mature companies than start-ups that have validated their product within the respective market and proven the economic sustainability of their products.
- **SMEs** with a developed product or service that focus on its market uptake and the access to additional funding sources.
- **Entrepreneurs** interested in forming new teams and companies to develop commercial activity in the sectors and markets related to space.

²⁶ Nilsson and Sia-Ljungström (2013), The Role of Innovation Intermediaries in Innovation Systems, Conference paper on Proceedings in System Dynamics and Innovation in Food Networks 2013, URL:

https://www.researchgate.net/publication/316991045_The_Role_of_Innovation_Intermediaries_in_Innovation_Systems

InnORBIT's services are flexible enough to be applicable to innovators with diverse profiles in terms of product and market maturity, funding status, technical and business competencies in the space sector as well as support needs. This is animated by fact that the business support programme is tailored by innovation intermediaries with intimate knowledge of these parameters while making use of the expertise of InnORBIT's professionals.

Students and young researchers are a major driving force for the development of the commercial space sector, as the pool of future space innovators lies within the academia. In most CEE/SEE countries, students and researchers are not aware of the vast entrepreneurial opportunities available from the exploitation of space technologies and do not receive proper business training and guidance to develop their entrepreneurial drive. On the other hand, students outside the fields of science, technology, engineering and mathematics (STEM) think that the space sector is intangible without having specialised technical training and miss out on opportunities to innovate using space technology, applications, data and software.

InnORBIT's business support programme and established local space initiatives encompass awareness raising activities that aim to inspire the pool of future entrepreneurs and innovators to develop interest in space and explore opportunities for the development of products, services, and technologies having in their disposal evidence, information, and practical examples / cases about what it takes to venture into this market.

Private investors may find promising potential for expanding their portfolio in space ventures as there is an ever-increasing demand for space-enabled technologies, data, and applications within and outside the space sector. Even among investors there is a misconception that investment in space entrepreneurship is risky, capital-intensive and has long-payoff period – especially with respect to the upstream sector. Investment in space companies, especially in the downstream sector is largely similar to investing in other technology sectors, such as software development, both in terms of risk and expected returns. InnORBIT's local space initiatives aim to bring space ventures, start-ups, and scale-ups to the attention of private investors and enable them to make fast and well-informed investment decisions to invest successfully in the space sector.

- **Business Angels**
- **Venture Capitals**
- **Private Equity Firms**

Large corporates may find value in InnORBIT's local space initiatives as they might gain easier access to a pool of promising start-ups, scale-ups, and entrepreneurs in their local space ecosystem to partner with, as a method to outsource research and development activities, or even to exploit opportunities for spinning-in.

Research and academic institutions play an integral part in the development of the space sector, as it is traditionally a knowledge-intensive industry. The development of a commercial space industry and ecosystems is needed to incentivise more researchers to focus on space-related research not for the sake of research alone but for the tangible benefits that might lie in the commercial exploitation of space research, such as increased public funding and participation in funded projects, expansion of the scope of research, knowledge diffusion and spill over effects, promoting technology transfer.

National public bodies and governmental agencies are an important source of demand for the space market since its inception. Before the advent of the NewSpace era, the space sector was highly institutionalised – a trend that has not yet subsided in Eastern European countries. In recent years, public governance has been increasingly reliant on digital and space technologies (e.g., satellite data), making commercial products and services in the space sector and space-related sector highly relevant for public procurement. A strong commercial space ecosystem locally, could shift the attention of public procurement processes towards internal supply rather than external, thus creating a multiplier effect for the local economy, the development of

new markets and the creation of new jobs. Innovation intermediaries managing strong local space ecosystems would be able to engage in partnerships with the local and national governments, making strategic space programmes and initiatives increasingly relevant making them a driving force towards the development of a strong space sector in the region.

4.3 Market needs

InnORBIT's study on the current situation in the space support landscape in Central-Eastern and South-Eastern European countries²⁷ uncovered the key challenges inhibiting its growth and development. The insights collected could be a good proxy expressing the needs of InnORBIT's customers. In this section we dissect these needs to further solidify the value propositions offered by InnORBIT's services.

4.3.1 CEE / SEE and NEE countries

Most countries lack space-related networks with only a few market players present to create meaningful networks. The very nature of the space sector requires the establishment and operation of networks engaging the whole spectrum of innovation stakeholders at a local level to engage in the local development of space as well to connect with neighbouring ecosystems and the broader EU and international space ecosystems for the space industry to thrive. In most cases the available resources are not enough to build space networks from scratch and thus the interdisciplinary and cross-industry linkages of the space sector need to be exploited. There is a need for an approach that builds upon the current infrastructure, knowledge and expertise of established technology innovation ecosystems operated or facilitated by innovation intermediaries to be utilised as a foundation for the emergence of a network of space agents locally and nationally.

There is a lack of funding for space research in most countries and low investment rates in R&D activities. A strong academic sector and solid technical research is the bedrock of a thriving entrepreneurship landscape. However, awareness raising and the development of a favourable framework for the commercialisation of space research in space and non-space industries is needed to highlight opportunities for young talent to make a career out of space and choose the sector to venture on is needed to create demand for space-related studies and attract young talent to develop skills in space research. This would lead to the production of quality research in the field and cross-cutting innovation, that could create opportunities for funding by the private and public sector, as well as the initiation of new collaborative projects that would create value for the academic sector and would create stronger academia-business linkages to effectively support local space innovation ecosystems.

Little presence of large aerospace companies. Space innovation ecosystems, similarly to other high-tech ecosystems, cluster around a few strong market players or “champions” creating new opportunities for start-ups and drive the growth of local entrepreneurial ecosystems. Such companies have a lot of technical expertise in multiple domains and are able to offer technical support and expertise to local start-ups often through incubators. Large capitalisation allows these companies to invest considerable amounts in projects and ventures with a small amount of risk. Lastly, such companies enjoy international visibility and act a pole of attraction for foreign talent. However, this works in reverse during the infancy stages of the space sector at local level. Large companies would choose to be present in ecosystems displaying high potential for innovation thus making their presence there a profitable investment.

The space sector is misunderstood. The space sector is still largely seen in its traditional form, that is of a highly technical domain, with need for heavy infrastructure and capital-intensive investment. The space sector is associated with the exertion of geopolitical power, a concern of the public sphere, rather than as an investment in itself. While this might be partially true, NewSpace offers new opportunities in the space and non-

²⁷ D1.1 “The European space support landscape: Insights from Central Eastern and South Eastern Europe”

space economy through applications of technology, services, infrastructure, and data in a vast collection of other use cases other than security and defence. Awareness on the space sector, among others, should focus on the advantages of a well-developed space economy and the realistic evidence-based assessment of its value-added and inherent risks targeting both the general public and specialists in various domains (academia, business, finance, policy etc.) as well.

There is a lack of early-stage private funding in the countries of the area. Access to early-stage funding is sparse in CEE/SEE countries and start-ups are forced to expatriate when seeking for series B+ rounds. In parallel, commercial banks, important players in the financial landscape of the EU, provide marginal support to start-ups. Start-ups usually rely on ESA and other EU funding programmes, such as Horizon 2020. Only a few instruments are available for investment and funding to space-focused start-ups and ventures, while the existing ones usually tend to view investment in space as risky and pay-off periods too long to bear. Through the building of their business case and enhancement of their investment readiness, space ventures may possess the necessary tools to raise awareness of private investors to consider commercial space as a worthwhile investment and exploit its opportunities. On another note, space innovators face extreme difficulties to navigate the EU and local landscapes for public and private funding opportunities, or lack the experience to understand the applicable rules, thus being in much need of support in this direction.

4.3.1.1 Croatia

Space is largely unexplored in Croatia. Although several initiatives and programmes exist across the country for general entrepreneurship, with over 90 incubators and accelerators in operation, only a few initiatives and actors exist that mostly focus on space research and have no particular focus on space entrepreneurship. Funding opportunities are not available for the space sector, as most funds are not targeting the space industry, adopting an industry-agnostic orientation. A general lack of awareness characterises the space ecosystem in Croatia that inhibits its potential and growth. Most importantly, the Croatian government does not recognise and treat the space sector as of strategic importance and therefore a lack of motivation to explore its possibilities for the economic and technology development of the country.

The general entrepreneurship and innovation ecosystem is fragmented, limiting possibilities to leverage on “low hanging-fruits” to expand on the space sector. The public and private domain experience difficulties to support start-up entrepreneurship, due to lack of resources, misconceptions and work-culture conflicts among traditional industry players and start-up entrepreneurs. The connection of academia and research to industry is hard to navigate due to the complexity of decision making when it comes, for instance, to issues of Intellectual Property of researchers within the institution and potential commercialisation of research. A strong ecosystem player driving space awareness and space entrepreneurship in Croatia is clearly needed to bring together stakeholders across the quadruple helix and foster collaborative relationships for the advancement of the local space industry.

The Croatian entrepreneurship ecosystem is quite introverted and does not promote international cooperation. Local research and educational institutions are not open towards the attraction of international talent and researchers and the local legislative framework is rigid in terms of ease-of-doing-business as well as exit strategies in case of failure. Start-ups usually perform poorly when it comes to scaling up their activities beyond the local and regional market.

Lack of space events and conferences. Except for one annual conference, the Adria Space Conference organised by the Adriatic Aerospace Association (A3) in 2019 and 2020, there are no other industry-specific events in the Croatian space ecosystem. Events, conferences, competitions and other activities focusing on start-up entrepreneurship and investment are scarce and with a limited duration (mostly one-time events) and have a generic orientation.

4.3.1.2 Greece

Greece has an emerging space industry with activity in a wide range of upstream, midstream and downstream technologies for space. During the last 20 years, a space ecosystem and support networks have been formed with the catalytic involvement of Corallia and other private and public organisations across the quadruple helix. Still, the Greek space market faces challenges and needs to be addressed.

There is a need for systematic connections and coordinated actions among industry, business, academic / research, and public stakeholders in the space sector. Apart from central political action, several activities in space sector would facilitate the better connection of local stakeholders to come together and establish frameworks for collaboration to advance the Greek space sector. Awareness is needed on the current issues inhibiting the space sector, knowledge exchange, identification of opportunities and analysis /of good and bad practices. An open communication channel or forum and related activities would support towards this need.

Better academia-business linkages through collaboration of research institutes with large corporates and start-ups, internship programmes and commercialisation of space research needs to be sought after in the Greek space sector. On one hand, young researchers and students should be informed on the opportunities that the space industry holds for them and research institutions to get to know the local industry better, through events, challenges and trainings. On the other hand, the local space industry needs a platform to communicate better their needs on key expertise and skills they demand for their growth. A facilitator to strengthen the linkages from education to workforce and the industry could catalyse this process for the benefit of the local innovation ecosystem. Support with IPR issues and fundamental business training could be an extremely helpful service to alleviate barriers in the transfer of research to the industry.

Promotion of Greek space talent and expertise internationally to develop a space branding for the country. Greece has a large pool of talented workforce and researchers in many fields and more specifically in STEM fields. Several companies in the space sector have developed quality products and services and have formed collaborations with reputable space industries and organisations / agencies abroad, creating a precedent for others to follow. The potential of the Greek space industry and its branding needs to be further exploited in the international space sector through awareness, promotion and collaborations abroad.

New funding instruments for the space sector. The Greek financial system due to a prolonged economic crisis has shifted towards extreme risk-aversion, inhibiting the growth of the space sector which is considered as a high-risk and low-return investment due to misconceptions. Although several financial instruments and initiatives have been developed for supporting general entrepreneurship, there is a low risk tolerance towards space ventures, explaining the lack of specialised instruments for space. Investors within the Greek innovation ecosystem need to be better informed about the benefits of investing in space start-ups, while at the same time, preparation and training of innovators in funding search should be intense, to clarify investors' doubts on the risks associated with space entrepreneurship, such as evidence-based pitching with professional standards.

Lack of space events and conferences. Although a few high-profile space conferences have taken place in Greece in the past, there is no particular systematic presence of space events in the country to bring together local space actors and to attract the attention of the international community towards the work being done in the Greece space industry.

4.3.1.3 Romania

Support for specialised incubators and accelerators in Romania to provide relevant services to start-ups including events and business support programmes is needed. Although Romania is a full ESA member and the discussions about the establishment of an ESA Business Incubation Center (BIC) are quite

advanced at political level, there is no official date for its launch. This has put the Romanian space ecosystem in hibernation for a long time, waiting for an official announcement. The establishment of new, sustainable, space entrepreneurship initiatives could mobilise the Romanian space sector in other ways, as there are several existing initiatives in place but only with a limited scope in terms of space entrepreneurship and lacking essential financial resources to operate.

Improvement and centralization of information about the Romanian space ecosystem players.

Knowledge about the active space actors (e.g., start-ups, investors, VCs, technology transfer offices, incubators, accelerators etc.) in Romania is dispersed in multiple information sources, inhibiting the development of a strong network for space innovation – making connections hard to achieve. There is a need for a concentrated database / repository of local space actors to facilitate collaboration, which is feasible through awareness raising activities that make not only the space sector more relatable but bring stakeholders to the forefront making them visible.

Lack of awareness in non-space applications of the space sector and of technology transfer. Local initiatives that bring together stakeholders from diverse sectors whose services are applicable to the space industry and vice versa, could intensify cross-sector interaction, boosting industrial cooperation and business partnerships.

4.4 Inherent particularities based on a SWOT analysis

Table 3: SWOT analysis for InnORBIT and the three pilot partners

	Strengths	Weaknesses	Opportunities	Threats
InnORBIT	<ul style="list-style-type: none"> • End-to-end approach of programmes (train-the-trainers and business support provision) • Complementarity of consortium partners expertise in space and business domains • Wide collective network of consortium 	<ul style="list-style-type: none"> • No direct financial support is provided to implement InnORBIT's programmes • Limited resources 	<ul style="list-style-type: none"> • Development of the space industry in Eastern European countries • InnORBIT could become a trusted train-the-trainers provider for space innovation intermediaries across Europe 	<ul style="list-style-type: none"> • Unfavourable economic situation (e.g. COVID-19 impact) might inhibit innovation intermediaries from devoting resources to participate in pilot rounds • IP conflicts among consortium partners leading to the segmentation of the project's value proposition
ALG, Croatia	<ul style="list-style-type: none"> • Strong experience in education – useful for awareness raising • Strong brand and respectable institution in Croatia • Experienced in-house team • Strong marketing base • Experience in incubation services provision – Algebra LAB incubator 	<ul style="list-style-type: none"> • Lack of experience in space technology • Limited time and resources for flexible planning and intense marketing 	<ul style="list-style-type: none"> • Awareness raising on space within the student community • Development of space lectures, seminars and other training / inspirational material for the creation of start-ups in space • Some adjacencies of ALG's expertise with technologies with exploitation potential for space (creative industries, software development, data science, business management) 	<ul style="list-style-type: none"> • Space awareness is limited in Croatia • Lack of key experts as speakers in space cafés • Lack of access to recent space-related knowledge • Risk-averse attitude and reluctance of start-ups, SMEs and innovators to devote resources due to the COVID-19 pandemic.

	Strengths	Weaknesses	Opportunities	Threats
COR, Greece	<ul style="list-style-type: none"> Existing supportive networks in the space sector and si-cluster members Expertise and networks established through the ESA BIC Greece management Experts' networks accessed through the ESA BIC Greece and ESA Space Solutions Experience in provision of incubation (enter-grow-go “egg” incubator, Be your own boss), acceleration services and hackathon organisation (CASSINI Hackathons) 	<ul style="list-style-type: none"> Lack of sponsorship 	<ul style="list-style-type: none"> Awareness raising on the latest updates of the space sector Upgrade COR's role as the main contact / reference point for the Greek space sector Space community building and expansion of network connections among local stakeholders 	<ul style="list-style-type: none"> Lack of sponsors and funding Lack of key experts as speakers in space cafés Risk-averse attitude and reluctancy of start-ups, SMEs and innovators to devote resources due to the COVID-19 pandemic.
ROS, Romania	<ul style="list-style-type: none"> Strong network and connection with experts in different sectors, institutes, universities, and the space industry – Market visibility Strong ties with the Romanian Space Agency Significant experience in multidisciplinary studies for space and strong understanding of the national space sector Experience with ESA-funded projects 	<ul style="list-style-type: none"> No previous experience in the setting up and operation of initiatives for space entrepreneurship 	<ul style="list-style-type: none"> Expansion of professional networks Portfolio expansion in the business development and entrepreneurship domains Cross-sectoral talent attraction to space Talent repatriation Awareness raising on space and its applications for the public Awareness raising to public authorities to attract investments in space 	<ul style="list-style-type: none"> Small target audience Lack of key experts as speakers in space cafés Misconceptions about the space sector, its applications and space entrepreneurship by local stakeholders Lack of sponsors and funding Risk-averse attitude and reluctancy of start-ups, SMEs, and innovators to devote resources due to the COVID-19 pandemic.

*The SWOT analysis of innovation intermediaries is based on a self-assessment made by COR, ALG, and ROS. Please see Annex II for the market research related questions asked to innovation intermediaries.

4.5 Competition

The analysis of competition for InnORBIT’s services and programmes has been done in accordance to the market segments defined for their exploitation. The inclusion of specific organisations and initiatives as competitors, does not imply

- **Market Segment #1** – Train-the-trainers programmes for innovation intermediaries to deliver business support services to space entrepreneurship. The market for **Capacity Building Programmes to train innovation intermediaries in the space sectors** could be considered as a niche market due to its high specificity and the competition
- **Market Segment #2** – This market segment corresponds to the **business support programme services** and **the local space initiatives** established in the frame of InnORBIT by innovation intermediaries to support space start-ups and innovators. As this market segment is related to the standard activities of programmes already offered, the focus will be on the competition at global, EU and CEE/SEE/NEE level.

The analysis of competition on the country level focuses only on Greece, Romania and Croatia and is targeting specifically the set of local space initiatives established by COR, ROS and ALG in their respective regions during the 1st pilot round - i.e. a series of Space Café events in Croatia, a series of Space Cafés and info days followed by a hackathon in Romania, and a series of Space Cafés followed by a Space Hackathon in Greece.

4.5.1 InnORBIT

The following table summarizes information about potential competitors of InnORBIT’s services per market segment and service offered. The geographical coverage of InnORBIT’s markets and the number of markets adjacent to the space industry are particularly broad and thus the identification of competition is an ongoing process that will extend throughout the course of the project.

Table 4: InnORBIT's potential competitors

Name	Type	Offerings	Market segment	Strengths	Coverage	Pricing model
Market segment #1: Train-the-trainers programmes for innovation intermediaries in space sector						
No direct competition found at this point. No consolidated train-the-trainers programmes were found, containing courses, trainings and customised support for innovation intermediaries in a single place or by a single provider. Training content is available in various sources, up to the organisations to seek them out.						

Name	Type	Offerings	Market segment	Strengths	Coverage	Pricing model
Market Segment #2 - Organisations offering business support consultancy and networking services for space						
Market Segment #2A - Large consultancy companies offering business support for space and related industries						
McKinsey & Company	Consultancy company	Business services including Capacity Building and Skills development	Aerospace and Defence, semiconductors and photonics, energy, construction, materials, engineering, digital / IT technologies etc.	Large company with global presence and availability of resources. A wide spectrum of business support and consultancy services is offered.	Global / presence in multiple EU countries and 8+ CEE/SEE countries	Unknown – Pricing available upon contact
Accenture	Consultancy company	<ul style="list-style-type: none"> • Consultancy • Business strategy • Ecosystem services • Technology, IT services • Supply chain management • Etc. 	Industry agnostic – Defence and aerospace segment	Large global company with availability of resources and infrastructure. Wide spectrum of business, technical and other services is offered.	Global presence / EU presence / 7+ Eastern European countries	Unknown – Pricing available upon contact

Name	Type	Offerings	Market segment	Strengths	Coverage	Pricing model
PwC Paris ²⁸	Consultancy company	<ul style="list-style-type: none"> • Strategy consulting • Data analytics • Impact assessments • Governance and operations (policy analysis, funding schemes identification, auditing) • Regulatory analysis and support (space legislation, IPR, Data protection etc.) 	Space sector (communications, navigation, SSA, space exploration and in-orbit economy, EO, launchers, market insights)	<p>One of the most prominent space practices in Europe</p> <p>Big 4 company</p> <p>Strong expertise and data collection for space</p>	Global	Unknown – Pricing available upon contact
BryceTech ²⁹	Analytics and engineering firm	<ul style="list-style-type: none"> • Business consulting • Programme support • Technology portfolio management 	Space Security and defence R&D Cybersecurity	<p>Large global company with availability of resources and infrastructure. Wide spectrum of business, technical and other services is offered.</p> <p>Strong collection of market insights and reports.</p>	US / UK	Unknown – Pricing available upon contact

²⁸ PwC France, URL: <https://www.pwc.fr/en/industrie/secteur-spatial.html>

²⁹ BryceTech, company website, URL: <https://brycetek.com/>

Name	Type	Offerings	Market segment	Strengths	Coverage	Pricing model
Deloitte ³⁰	Consultancy company	Business and technology consultancy services in government and commercial activities in space, space-related and other technology industries.	Space, defence, security	Large global company (Big4) with availability of resources and infrastructure. Wide spectrum of business, technical and other services is offered.	Global presence / EU presence	Unknown – Pricing available upon contact
Bain and Company	Consultancy company	Business and technology consultancy services.	Advanced manufacturing – aviation, aerospace, mobility, etc.	Wide spectrum of services and industries	Global presence / CEE only Poland	Unknown – Pricing available upon contact
Innovation intermediaries – locally	Many innovation intermediaries operate in the business support landscape, offering training, mentoring, networking services on an ad hoc basis to their members. The demographics and types of innovation intermediaries that could potentially compete InnORBIT’s innovation intermediaries is very large and diverse to map exhaustively at this stage of the project. During the 1 st and 2 nd pilot round, more data about competition in this front will be available. This type of competition concerns mostly the innovation intermediaries implementing the InnORBIT’s programmes and will be assessed on a case-to -case basis.					

³⁰ Deloitte, Space Industry: Government and commercial services, URL: <https://www2.deloitte.com/us/en/pages/public-sector/solutions/commercial-space-industry-services.html>

Name	Type	Offerings	Market segment	Strengths	Coverage	Pricing model
Market Segment #2B - Training on space entrepreneurship (MOOCs, platforms and on-site)						
Space For Business ³¹	Business Programme for Space entrepreneurs	6-month on-site training in topics related to business and network development of space ventures and completion of one project, familiarisation with 3 advanced space ecosystems and the EU Space Technology and Research Centre. Further training provided online after the 6-month programme.	Business Space training for entrepreneurs	ESA and top European business schools' collaboration Comprehensive business training for start-ups in space	EU – physical locations in Switzerland, Portugal and the Netherlands	Unknown
MOOC platforms – e.g., Udemy, edX	Space entrepreneurship and space technology courses	A collection of various courses in space technical training topics and space entrepreneurship offered by renowned institutions such as TU Delft, Polytechnical School of Lausanne, and others	Space training and education – General audience	The expertise of the institutions and instructors of these courses	Global – Online	Depending on platform – Udemy requires to purchase course before attendance and edX offers for-free audit mode without certification with an option for purchasing with certification

³¹ Space For Business website, URL: <https://spaceforbusiness.eu/>

Name	Type	Offerings	Market segment	Strengths	Coverage	Pricing model
Market Segment #2C - Space Hackathons						
CASSINI Hackathons ³²	Hackathons	Challenges for innovators (student teams, start-ups, entrepreneurs) in the space industry and financing of the best solutions and ideas with prizes	EU space data applications – Copernicus, Galileo and EGNOS	<ul style="list-style-type: none"> • EU/ESA endorsed competitions • High visibility • Large pool of experts and large inside knowledge • Uniform design 	<p>20 EU / EEA countries, including³³</p> <p>Cyprus, Czech Rep., Estonia, Greece, and Slovenia in the 1st Hackathon</p> <p>Croatia, Latvia, Romania and Slovakia in the 2nd Hackathon</p>	No charge for participation and data access
Copernicus Hackathons ³⁴	Hackathons	Challenges for innovators (student teams, start-ups, entrepreneurs) in the space industry and financing of the best solutions and ideas with prizes	EU earth observation and space data	<ul style="list-style-type: none"> • EU/ESA endorsed • High visibility • Easy access to data and experts • Recurring event in many locations 	Multiple EU / EEA countries including several countries and location in EE Greece, Poland, Czech Rep. Bulgaria, Latvia, Croatia, Greece	No charge for participation and data access (not explicitly stated)

³² CASSINI Hackathons info page, URL: <https://hackathons.cassini.eu/>

³³ CASSINI Hackathons, Meet the 10 local organisers of the 1st CASSINI Hackathon, URL: <https://hackathons.cassini.eu/local-organisers-june-2021>

³⁴ Copernicus Hackathons, website, URL: <https://hackathons.copernicus.eu/>

Name	Type	Offerings	Market segment	Strengths	Coverage	Pricing model
SPACETECH EUROPE Online Hackathon ³⁵	Hackathon	Participation in the development of solution for space-related challenges with prizes, mentoring, pre-incubation services and project analysis services by experts	Space satellites Non-space applications of space tech Satellite imagery Other topics	<ul style="list-style-type: none"> Participation of high-profile mentors and experts (NASA recognised) High geographical coverage due to online format 	Online event	No charge for participation – according to open call
ActInSpace ³⁶	Innovation competition (hackathon-type event)	Provision of patents, technologies and satellite data for challenge resolution and start-ups development with the main award being a flight in a zero-gravity Airbus aircraft	A large set of market segments of the space industry (more than 50 challenges defined)	<ul style="list-style-type: none"> Event with worldwide recognition Participation of large market players (ESA Space solutions, Airbus etc.) 	Worldwide / Presence mostly in Western Europe and in Bulgaria, Cyprus and the Baltics	No charge for participation (not explicitly stated)

³⁵ Eventornado, SPACETECH EUROPE Online Hackathon, URL: <https://eventornado.com/event/spacetech-europe#home>

³⁶ ActInSpace website, URL: <https://actinspace.org/>

Name	Type	Offerings	Market segment	Strengths	Coverage	Pricing model
NASA Space Apps Challenge ³⁷	Hackathon	Participants across the globe participate in challenges to define services, products and solutions for specified challenges	A broad set of challenges is defined, covering many space industry and market segments (EO, space exploration, environmental sciences etc.)	<ul style="list-style-type: none"> NASA-enabled Worldwide presence – often in more than one locations per country Systematic (annual) organisation since 2012 	Worldwide, including Greece, Romania, Kosovo, Poland, Cyprus, Albania, Latvia, Bulgaria	No charge for participation (not explicitly stated)
Market Segment #2D - Space cafés						
No general competition found yet for InnORBIT's space cafés.						
Market Segment #2E - Space incubators and Space accelerators						
ESA Business Incubation Centers	Space incubator	Mentoring, training and coaching services in technical space, business and IP management issues for start-ups. Zero-equity funding provided for selected start-ups for incubation.	All space market segments – focus on business side	<ul style="list-style-type: none"> Official business support instrument of the EU / ESA 	22 ESA BICs established in 60 locations across 17 European countries – including 7 EE	No pricing applicable for participating innovators

³⁷ NASA Space Apps Challenge website, URL: <https://2021.spaceappschallenge.org/>

Name	Type	Offerings	Market segment	Strengths	Coverage	Pricing model
(BICs) network ³⁸		Incubation procedure is specific per BIC		<ul style="list-style-type: none"> • Long-term experience and a wide collective network • Availability of financial resources • Common branding and recognisability 	countries: Estonia, Greece, Hungary, Czech Rep..	
Galileo Incubation Programme ³⁹ (former E-GNSS accelerator)	Space incubator	The 6 winners of Galileo Masters competitions receive business incubation services to move their idea to the market. Incubation and acceleration prizes are offered to each participant (up to 62000 EUR – individual basis)	Satellite Navigation	<ul style="list-style-type: none"> • EU funded instrument • Direct connection to competitive procedures (Galileo Masters) • Multiple challenges offered • Pan-EU incubation network 	EU coverage – more than 50 locations (exact locations unknown)	No pricing applicable

³⁸ European Space Agency, ESA business Incubation Centres, URL: https://www.esa.int/Applications/Telecommunications_Integrated_Applications/Business_Incubation/ESA_Business_Incubation_Centres12

³⁹ Galileo Masters website, Galileo Incubation Programme, URL: <https://galileo-masters.eu/incubation/#>

Name	Type	Offerings	Market segment	Strengths	Coverage	Pricing model
Various EU-project activities (Space Hubs Network, Astropreneurs GALACTICA, Go2SpaceHubs, etc.) ⁴⁰	Space incubation, pre-incubation, acceleration and post-acceleration programmes	Similar or related to InnORBIT Business Support Programme offerings - Business incubation for start-ups, training, mentoring, access to funding, events etc.	Space sector or specific segments	N/A: Case-specific	EU	Depending on exploitation and IPR
Various local incubators and accelerators in active in space and space-related domains	Incubators and accelerators	Local competition is, at the moment, the concern of innovation intermediaries implementing local space initiatives (incubators and accelerators), depending on the specificities of pilot implementation and thus detailed analysis of the competition would be of low value added. See country analysis for Romania, Croatia and Greece in the resto of this subsection.				

⁴⁰ The initiatives implemented by other EU-funded projects, especially in the SPACE-BIZ topics, offer services potentially competitive to those of InnORBIT, thus methodologically they should be included as competition. However, at this point, the project consortium strategy is to create synergies and collaborations with these actions. For example, various projects of the SPACE-BIZ calls have provided access and permission to the InnORBIT consortium for re-use training materials for the enrichment of InnORBIT's Capacity Building and Business Support Programmes' training curricula. Competition on this front will be revised, after synergy-oriented communications have sufficiently progressed.

4.5.2 Croatia

No potential competitors were identified in Croatia at this point, as the type of space initiative (space café) offered to the Croatian space ecosystem is unprecedented and thus to the best of ALG's knowledge is the first of its kind.

4.5.3 Romania

At this point, no direct competitors were identified by ROS in the Romanian space ecosystem for its local space initiative.

4.5.4 Greece

COR at this stage, identified two main competitors for its local space initiatives in Greece: (i) The 44th Scientific Assembly of the Committee on Space Research (COSPAR)⁴¹, organised in Athens in July 2022, which is a highly respected event in the global space community, bringing together high-profile experts from across the globe and (ii) various open space meetings organised by universities across Greece. To the best of COR's knowledge, the exact business models employed by these initiatives are not publicly available – thus, further research might be needed in this respect.

4.6 Potential Collaborators

In this section, potential collaborations that could benefit and promote the marketability of InnORBIT's assets in general, as well as of the local space initiatives established by COR, ALG and ROS in their respective regions are described. The networks, organisations and initiatives referred to as potential collaborators of InnORBIT, are identified at the EU and Eastern Europe level, with potential for local collaborations; while potential collaborations within the context of the Greek, Romanian and Croatian local space support ecosystems are directed towards the local level.

4.6.1 Collaborators of InnORBIT

- **National and European space agencies and programmes:** InnORBIT seeks potential collaborations with national space agencies as well as the European Space Agency (ESA) to link the Capacity Building Programme and Business Support Programme to the existing value chain of business support provision for space entrepreneurship. For instance, a high-potential collaboration would be to link the InnORBIT's Capacity Building Programme to ESA BICs across CEE / SEE countries with a view to train the trainers and establish a framework to keep local experts' skills up to date and relevant to the latest trends of space innovation. Pilot partners and external innovation intermediaries will serve as agents for change in the name of InnORBIT, through their established local space initiatives to lobby for more supportive legal and financial frameworks as well as for the creation of support structures to promote the space sector nationally and locally.
- **2nd pilot Innovation intermediaries:** InnORBIT partners, in the context of the 2nd pilot round, will approach and recruit at least 17 innovation intermediaries across the CEE/SEE area and beyond, with a view to train them to establish local space support initiatives for the benefit of their local ecosystems. Apart from their function as end-users of InnORBIT's services, the pool of 2nd pilot round (external) innovation intermediaries will be the seed for the further expansion of InnORBIT's reputation as a provider of support services and programmes to establish space entrepreneurship structures and attract more organisations through collaborations and "word-of-mouth" dissemination of the project services based on experience.
- **EU projects and initiatives:** InnORBIT actively seeks collaborations with relevant EU projects and initiatives on several dimensions including but not limited to (i) the creation of value for InnORBIT's services

⁴¹ COSPAR 44th Scientific Committee Assembly on Athens website , URL: <https://www.cosparathens2022.org/>

through the reuse of materials and trainings for the coverage of a broader set of training topics related to technical space issues as well as for space entrepreneurship, (ii) create multiplier effects through joint actions and dissemination activities to promote awareness of InnORBIT's services, programmes and tools, (iii) to create long-term collaborations and agreements for the exploitation of novel services with value-added for the commercial space sector across Europe.

- **Business support and investment networks:** Well-established networks for business support and investment networks are of particular interest for InnORBIT, as the Capacity Building and Business Support Programmes apart from training and awareness raising for innovation intermediaries and innovators on space and space-related industries, strive to provide space innovators access to investment networks to raise funds and commercialise their ideas and products. Innovators will be supported to hone their pitching skills and build their investment readiness, on one hand, but access to these networks is essential to support access to finding space entrepreneurs in a meaningful way.

4.6.2 *Potential collaborations of the Croatian space initiatives*

ALG, during the implementation of their local space initiative, aims to seek collaboration with the consortia of other funded projects, as well as with established start-up incubators, accelerators, laboratories and research and development divisions of technology companies in Croatia. Initiatives run by the Croatian government are of interest as well. Of course, ALG will heavily collaborate with its existing network of professionals in various fields, building on its ongoing external relations.

4.6.3 *Potential collaborations of the Greek space initiatives*

COR, already having an established network of space actors in several Greek regions, many being members of the si-Cluster (managed by COR) will use the established local space initiatives as a means to build upon existing long-term relations to establish a community partners network. At the same time, the academic sector will be approached such as universities and laboratories.

4.6.4 *Potential collaborations of the Romanian space initiatives*

ROS will seek opportunities for collaboration with the Romanian Space Agency (ROSA), the most prominent space organisation in Romania and a long-standing ally of ROS for the implementation and better outreach of its local space initiative. Moreover, ROS will reach out to already established start-up incubators and accelerators in the country and other local stakeholders with activity or interest in the development of the space sector in the country, such as academics, experts, policymakers, business and finance, start-ups and entrepreneurs.

4.7 External Context based on a PEST analysis

4.7.1 *Political environment*

4.7.1.1 *EU and Eastern European countries*

The space sector in the EU is considered an industry of strategic importance. The European Commission supports and invests in the space industry through a variety of services, initiatives, programmes and funding instruments.

The new EU space programme 2021 – 2027 received a budget of EUR 14.88 billion in the Frame of the Multiannual Financial Framework (MFF) of the EC for 2021-2027 allocated in its three flagship programmes: (i) Satellite navigation systems such as **Galileo** and the **European Geostationary Navigation Overlay Service (EGNOS)**, receiving EUR 9.02 billion, (ii) Earth Observation through the **Copernicus programme** with a budget of EUR 5.42 billion and (iii) security components, including the **Space and Situational Awareness (SSA)**

Programme and the **Governmental Satellite Communication (GOVSATCOM) initiative**, with a budget of EUR 440 million⁴².

The European Space Agency (ESA) is an intergovernmental organisation was established in 1975, now counting 22 member states financing its space activities in across the whole value chain of the industry such as Earth Observation, Global Navigation, spacecraft, space exploration, with strong international cooperation with the global space industry and governmental space agencies across (NASA, JAXA, etc.). ESA is financed independently from the EU space programme through contributions by Member States. ESA is gaining rising support, as the agency's budget during the latest ESA Ministerial Space+19 council, ESA's budget reached EUR 14.4 billion for the period 2020-2024 distributed across the following activities⁴³:

- Earth Observation – EUR 2.54 billion
- Space transportation – EUR 2.24 billion
- Space exploration – EUR 1.95 billion
- Space science – EUR 1.67 billion
- Telecom – EUR 1.51 billion
- Basic activities – EUR 0.8 billion
- Other (space safety, navigation, technology, etc.) – EUR 3.69 billion

CASSINI⁴⁴ is the EU's space entrepreneurship initiative announced in January 2021 with a view to support start-ups and space innovation covering the whole innovation cycle – from business ideas to industry growth. The CASSINI space fund has a budget of EUR 1 billion, covering ventures developing new space technology and its application to non-space markets, from the seed to mid-cap growth stages. The CASSINI initiative also supports early-stage entrepreneurship through its Hackathons and the CASSINI myEUspace competition.

The **Horizon 2020 / Horizon Europe Framework Programme for Research and Innovation** of the EU has launched several calls for actions to support the space industry.

ESA Business Incubation Centers (BICs) is a network of space incubators established by the ESA Technology Transfer and Business Incubation Office to support entrepreneurs in turning their space-connected business ideas into commercial start-ups. The ESA BIC network is a key tool for the development of space entrepreneurship across Europe, that counts 20 incubators in 17 countries and spread over than 60 cities, has so far provided support to over 700 start-ups. ESA BICs offer mentoring, coaching and training in various business and IP aspects, as well as financial support for incubated companies (EUR 50,000).

The analysis of space policy frameworks **in the countries of Eastern Europe** showed several trends concerning the progress towards the definition of a coherent national space strategy, with several countries having no particular space strategy defined nor an intention to focus on space as a strategic sector. Most countries in the region have placed their priorities towards establishing a stronger collaboration with ESA and eventually full membership, as the main driver of their national strategic approach for space.

Most Eastern European countries spend considerably lower in both absolute (amounts invested) and relative (GDP percentage) terms for national space funding and ESA budget contributions in relation to the Western European countries with advanced space industry such as Italy, Germany, France and Luxembourg. However, the “geo-return” policy of ESA member states participation in ESA-funded programmes requires larger

⁴² <https://www.consilium.europa.eu/en/infographics/eu-in-space/>

⁴³ PwC (2020), Main trends and challenges in the space sector, p.13

⁴⁴ CASSINI, URL: https://ec.europa.eu/defence-industry-space/eu-space-policy/space-research-and-innovation/cassini-space-entrepreneurship-initiative_en

contribution of CEE, SEE and NEE countries in the agency to start receiving benefits in their local space industries⁴⁵. Countries such as Romania, Greece, Poland, Hungary, Estonia and the Czech Republic have reached to this point and, reportedly, many of them have put in motion the process to define a concrete plan for the development of their space industry.

The countries of Eastern Europe perform very differently in terms of general entrepreneurship support policies, with the “average” trend leaning towards cumbersome regulations and tax burdens for setting up and operating a start-up, with the extreme positive exception of the Baltic countries, having very vibrant tech start-up support ecosystems and several funding instruments in place. Other countries, such as Greece are in a transitory stage, having a positive attitude towards entrepreneurship and the development of funding opportunities, incubation and acceleration programmes but still have a long way towards the development of a fully supportive and coherent legislative framework.

Entrepreneurship incentives and funding schemes - specialised in space start-ups and SMEs are in a general lack across Eastern Europe at a national institutional point of view. The ESA BIC network is still not quite expanded yet in the region, with only a few countries having an ESA BIC initiative running.

4.7.1.2 Croatia

Even though Croatia has signed a Cooperation Agreement with ESA in 2018 to create a cooperation framework with the Agency, no decisive steps towards its actualisation have been taken yet. The Croatian government has not promoted the development of a national space strategy or a national space programme and has not characterised the space industry as of strategic importance yet. The Adriatic Aerospace Association (A3), an association of organisations in the Croatian aerospace industry, has performed several activities to pursue the goal of a national space strategy instead.

Croatia has a quite advanced ecosystem for general innovation and entrepreneurship, however ease-of-doing-business is not particularly supported, due to high taxation rates for newly established start-ups, driving up operation costs thus disincentivising their formal establishment process, combined with a rigid regulatory and policy framework governing this aspect. Complex regulations and instability inhibit the development of an entrepreneurial system, as businesses usually have a hard time to navigate the policy and regulatory landscape when it comes to their entry to or exit from the market. Finally, academia to market / industry connection is not supported by the local policy framework, as students are not able to fund their ideas and move them to the market while pursuing a degree.

4.7.1.3 Greece

The Greek space industry is considered as a market of strategic importance and has generally adopted a supportive stance towards its development. Greece has been a full ESA member since 2005, however, an official national space strategy has not yet been developed in Greece. Steps forward in this direction have been taken by the Hellenic Ministry of Digital Governance in collaboration with the Hellenic Space Center to draft a Greek Space Strategy along with a plan of related activities. The Greek government shows increasing interest in the space sector, evident by its latest contribution to ESA’s budget for the period 2020-2024 and support through the national microsatellites programme. Finally, the procurement of the Greek ESA Business Incubation Center, launched in 2021 and managed by InnORBIT’s partner COR, is a decisive step towards supporting space entrepreneurship in the country.

The government also supports general entrepreneurship, through the use of various initiatives, tax incentives and the simplification of the establishment framework for new businesses. However, to the best of our

⁴⁵ D1.1 The European space support landscape: Insights from Central Eastern and South Eastern Europe, p.13-14

knowledge, no specialized instruments for space entrepreneurship, other than the ESA BIC Greece, are in place at this point.

4.7.1.4 Romania

Romania is a country with a relatively long tradition in the space sector, has maintained this traction by becoming the 19th full ESA member since 2011. The leading institutional space organisation in the country is the Romanian Space Agency (ROSA). Various strategic documents frame the immediate and long-term objectives of the space domain and provide a development framework defined by the means of the Research, Development and Innovation Strategy 2014-2020, resulting in policies with effects on both academia and industry encompassing the “3 S’s”: science and technology, services and security. ROSA is the interface of the Romanian Space industry with ESA and the international space landscape. The agency has cultivated important international relations with space institutions in Europe and globally, such as ESA, EURISY, Copernicus and the UN-SPIDER)⁴⁶ and has supported the implementation of numerous projects at national and international level pertaining to space science, technology and applications. ROSA has been in discussions with ESA for the establishment of an ESA BIC in Romania at an advanced level, however, no official announcements or movements have been made yet towards its actualisation.

4.7.2 Socioeconomic environment

4.7.2.1 EU and Eastern European countries

The following figure illustrates the per capita GDP of CEE, SEE and NEE countries in 2012, 2015 and 2019. The analysis does not extend to 2020, as credible statistics for this variable are not yet available for the EU. It is clear that all countries of the region lag behind the EU average in terms of economic development, especially Bulgaria, Romania and western Balkan countries (especially North Macedonia, Montenegro and Serbia) with per capita GDP close to EUR 5000. Cyprus is by far the most advanced country in the region with its per capita GDP surpassing the threshold of EUR 25000. Followed by Slovenia and Slovakia. Finally, it is evident that all countries in the focal region have achieved an improvement of their economic conditions throughout the period 2012-2019. The data from North Macedonia in 2019 are not available to make such a judgement.

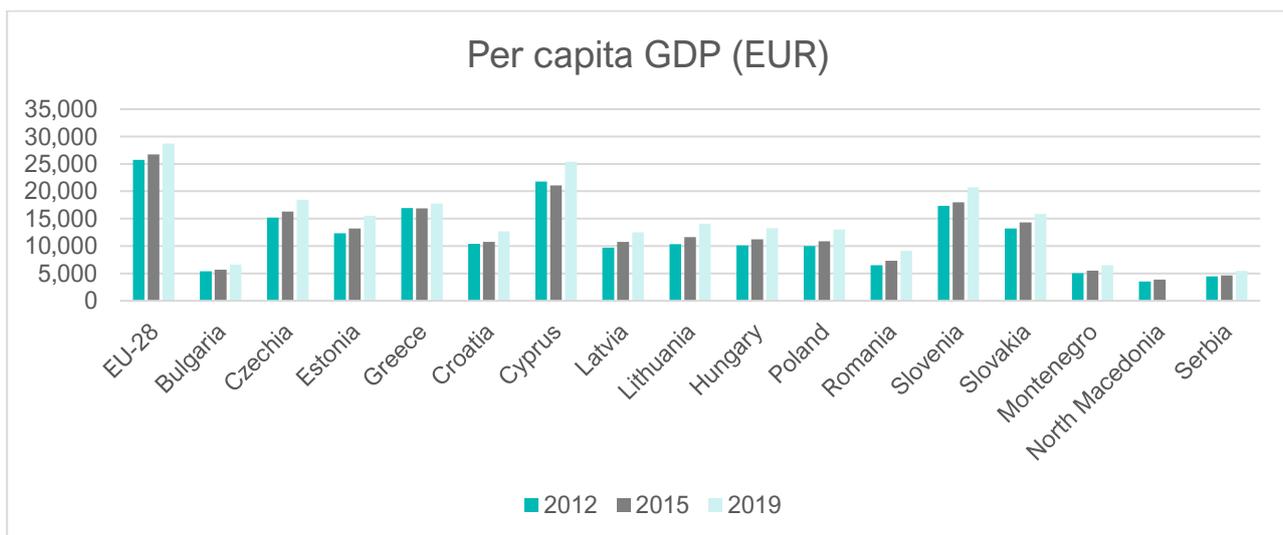


Figure 2: GDP per capita in CEE, SEE and NEE countries Source: Eurostat

⁴⁶ Romanian Space Agency (ROSA), URL: <http://www.rosa.ro/index.php/en/cooperare>

After the 2009 financial crisis, which affected most countries in the CEE, SEE and NEE regions except for Poland and Kosovo, all countries followed a trajectory of recovery over the next decade. All countries of the region achieved a sustained real GDP growth rate of more than 2%, and in some cases up to 6% after 2015 -

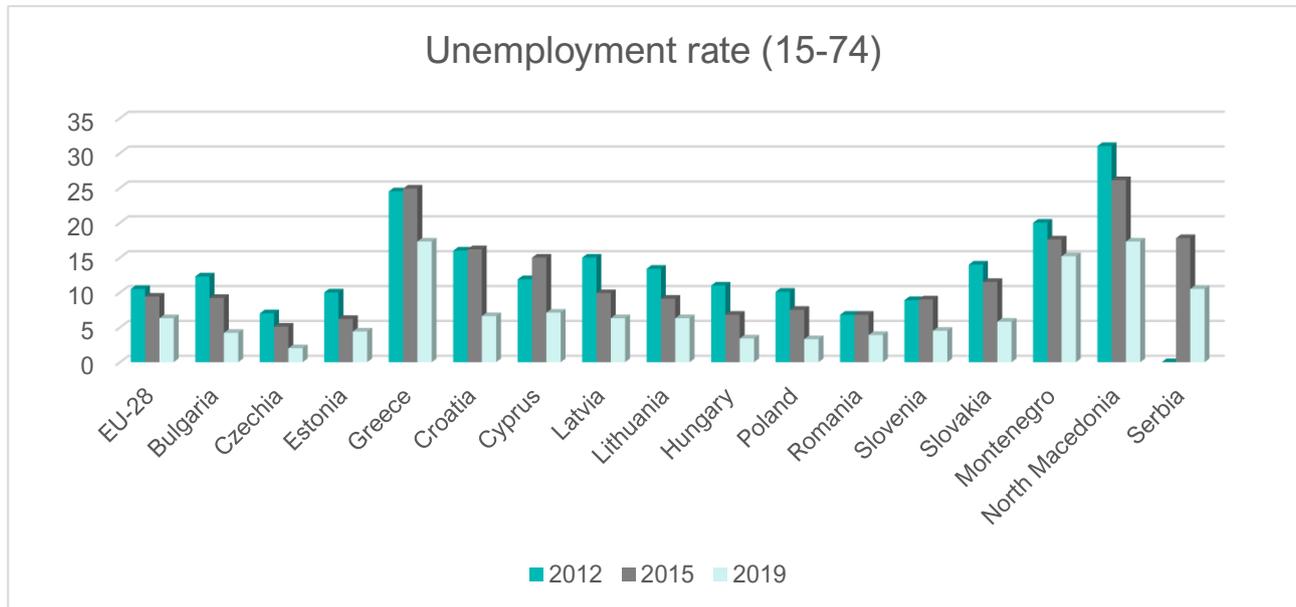


Figure 4: Unemployment rate of CEE, SEE and NEE countries | Source: Eurostat

- | | | |
|-----------------|----------|------------------------|
| Hungary | Poland | Romania |
| Slovenia | Slovakia | Montenegro |
| North Macedonia | Serbia | Bosnia and Herzegovina |

Figure 3: GDP growth rate of the CEE / SEE / NEE countries | Source: Eurostat

except for Greece which followed this positive trend two years later. Most countries during this period, achieved significantly higher GDP growth rates compared to the EU-28⁴⁷ average growth rate, showing signs of convergence in terms of economic activity to the developed member states of the EU. The effect of COVID-19 is evident in year 2020, which largely disrupted virtually all CEE, SEE and NEE economies, following a global recession.

Unemployment in most CEE, SEE and NEE countries was rampant during the last decade with unemployment rates higher than 10% in the age group 15-74. Greece is a notable instance of this case, with persistent labour market stagnation and staggering unemployment rates exceeding 20% and close to 25% for the better part of the last decade, due to a prolonged economic crisis hitting the country. Some countries exhibit great performance in terms of employment such as Poland, Romania, Slovenia, Czech Republic and Estonia – having unemployment rates significantly lower than the EU-28 average and still showing signs of an improving situation in their labour market, having reached unemployment rates of 2-3% in 2019. Overall, in all countries of the region the market is following an upward trend, as illustrated in the figure. In terms of gender balance in unemployment rates, the majority of CEE, SEE and NEE countries perform very well, having comparable female and male unemployment rates in the age group 15-74. Greece is the only country that breaks this trend, in which the unemployment of women was 21.5% in 2019, 7 percentage points higher than male unemployment, showing a quite unbalanced labour market in terms of gender.

⁴⁷ UK was still part of the European Union until 31st of December 2020

4.7.2.2 Croatia

Croatia is a country of approximately 4 million people, located in the North-Western Balkans. The Croatian economy was valued at approximately EUR 55.6 billion in 2019. Croatia entered a period of constant growth 5-6 years after the 2008-2009 global financial crisis maintaining real DGP growth rates in the range of 2 – 3.5% each year during the period 2015-2019⁴⁸. In Croatia the labour market has been quite stagnant during the last decade having unemployment rates in the range of 16-17% in the period 2012-2015, followed by a drastic reduction to 6.6 % in 2019, showing signs of promising market mobility, only to be disrupted by the recent pandemic in 2020⁴⁹.

Croatia was one of the countries that suffered considerable economic losses in 2020, due to the COVID-19 pandemic, with an estimated loss of 8.1% of its economic output. Following a general trend of recovery, in 2021 Croatia is forecasted to compensate most of its losses with 8.1% GDP growth⁵⁰.

Croatia is one of the countries stricken by a recurring brain-drain phenomenon. According to the EU statistic's office, at least 300,000 people have left the country since 2013, with economic reasons being the leading cause for immigration. Having lost approximately 15% of its working-age population, Croatian businesses face a serious shortage of workforce, creating friction in the labour market and impeding Croatian economy growth⁵¹.

4.7.2.3 Greece

Greece is a developed nation with a population of 10.7 million people and a GDP of EUR 165 billion for 2020 according to recent estimates and gross GDP per capita standing at EUR 15,420⁵². Greece has faced a long economic recession that persistence during almost the whole past decade, resulting in cumulative loss of over 25% of GDP compared to the period preceding the 2008 crisis, a long-term debt crisis with gross public debt reaching 206.3% of GDP in 2020 and rampant unemployment, affecting mostly the youngest generations and resulting in a brain-drain effect with severe consequences for the national economy. Although, in the past 2-3 years the Greek economy had returned in a trajectory of growth and reversing trends in unemployment and work conditions, the recent COVID-19 pandemic disrupted this trend and as result, in the last year the Greek economy lost 9% of its annual output. Recent estimations show a positive outlook for the Greek economy in 2021 and improved macroeconomic indicators⁵³.

In a social context, Greece has a large pool of talent and long tradition in STEM studies which has migrated abroad during the past years. Recently, the growth of the technological sector and the creation of new high-tech positions providing competitive wages and contribution to quality products and outputs, resulted in the

⁴⁸ Eurostat, Real GDP growth rates, URL: <https://ec.europa.eu/eurostat/databrowser/view/tec00115/default/table?lang=en>

⁴⁹ Eurostat, Unemployment statistics, URL: https://ec.europa.eu/eurostat/databrowser/view/une_rt_a_h/default/table?lang=en

⁵⁰ EC (2021), Economic forecast for Croatia, URL: https://ec.europa.eu/info/business-economy-euro/economic-performance-and-forecasts/economic-performance-country/croatia/economic-forecast-croatia_en

⁵¹ Euractiv (2020), News Article: "Fairer research funding needed to halt brain drain: Croatia Minister", URL: <https://www.euractiv.com/section/economy-jobs/news/fairer-eu-funding-needed-to-halt-brain-drain-croatia-minister/>

⁵² Eurostat, Gross Domestic Product statistics, URL: <https://ec.europa.eu/eurostat/databrowser/view/tec00001/default/table?lang=en>

⁵³ EC (2021), Economic forecast for Greece, URL: https://ec.europa.eu/info/business-economy-euro/economic-performance-and-forecasts/economic-performance-country/greece/economic-forecast-greece_en

attraction of the Greek diaspora of the recent years as well as international talent to work in the Greek technology sector.⁵⁴

4.7.2.4 Romania

Romania is a country of approximately 19.3 million people, which was first classified as “high-income” by the World Bank for the first time in 2020 (based on 2019 fiscal data)⁵⁵ having a GDP of EUR 218 billion in 2020. Romania’s labour market is quite mobilised, a consistently diminishing unemployment rate that reached a low of only 3.9% in 2019. Romania, following the global financial recession of 2008-2009, has achieved strong economic recovery with remarkable growth rates even exceeding 7% in 2017.

Romania, as the rest of the global economy was hard-hit by the recent global COVID-19 pandemic, which shrunked the country’s output by 3.9% in 2020⁵⁶ and increased unemployment by 1.1%⁵⁷. Notably, the Romanian economy was not affected as much as those of other countries in the area, such as Greece. According to European Commission forecasts, the country is expected to rebound quickly in terms of economic activity with a projected GDP growth rate of 7% in 2021.

Romania, as many other Eastern European countries, suffers from a persistent trend of immigration of its highly educated workforce with 64% migrating towards the high-income countries abroad. Romania was the country with the second-highest international migration rates worldwide, during 2000-2015 and the highest-ranking EU member state within the EU for the period 1990-2017, affecting key sectors of the economy due to a constant shortage of highly skilled workforce. Romania had 371,000 registered migrants in 2017, compared to 127,000 in 2000 according to the United Nations⁵⁸. In contrast to the brain-drain phenomenon and when it comes to space, several communities are active in Romania engaging in various activities that incentivise and support young people, women and highly educated people to develop an interest in physics, astronomy, aerospace and other technical fields, that could serve as meaningful for the reversal of the migration trends in Romania⁵⁹.

4.7.3 Technological environment

4.7.3.1 EU and Eastern European countries

The analysis of the space support landscape in Eastern European countries (D1.1) revealed several interesting trends in the research and development front of the region. It seems that the countries of Eastern Europe do not converge with the EU average (close to 2.25%) in terms of R&D activity as a percentage of GDP, with Eastern European countries have significantly lower expenditures in R&D than Western European countries, while in 2019 no country exceeded the EU-28 average. Romania performs the lowest having only 0.5% of its GDP dedicated to its R&D activities.

⁵⁴ D1.1 The European space support landscape: Insights from Central Eastern and South Eastern Europe, p. 23

⁵⁵ World Bank, Romania Overview, URL: <https://www.worldbank.org/en/country/romania/overview#1>

⁵⁶ Eurostat (2021), Economic Forecast for Romania, URL: https://ec.europa.eu/info/business-economy-euro/economic-performance-and-forecasts/economic-performance-country/romania/economic-forecast-romania_en

⁵⁷ Eurostat, Unemployment statistics, URL: https://ec.europa.eu/eurostat/databrowser/view/une_rt_a_h/default/table?lang=en

⁵⁸ Iacob, Raluca (2018). *Brain Drain Phenomenon in Romania: What Comes in Line after Corruption? A Quantitative Analysis of the Determinant Causes of Romanian Skilled Migration*, Romanian Journal of Communication and Public Relations, vol.20, No. 2 (44), URL: <https://journalofcommunication.ro/index.php/journalofcommunication/article/view/259/252>

⁵⁹ Space Generation Advisory Council, URL: <https://spacegeneration.org/regions/europe/romania>

In terms of patents filed, a key proxy indicator of technical and scientific progress, Eastern European countries perform quite poorly compared to the rest of the EU and the lead innovators of the world. To put the figures into perspective, South Korea, Japan and Switzerland filed 3,148, 2,005 and 1,081 patents respectively in 2018, while the top performing country in EE – Poland having filed slightly more than 350 patents and most countries having registered less than 100 patents. To correct for population, in terms of per capita patents filed, Slovenia outperforms by a large margin the rest of Eastern European countries with 60 patents filed per million inhabitants, while Germany had 886 patents per million in 2018.

4.7.3.2 Croatia

Space technology research and development is being done by several important players within the Croatian ecosystem, in academia, research institutes and industrial players as well. There are several important players active in the Croatian ecosystem. Croatian universities like the University of Zagreb engage in space-research but no space-related education programmes are known to be offered. Several companies and organisations dedicated to the advancement of space technology are engaged as consortium members of the Adriatic Aerospace Association. Some notable cases include Institute Ruđer Bošković, the Institute of Physics in Zagreb and universities or departments like the Faculty of Chemical Engineering and Technology, University of Zagreb. Aerospace companies such as Amphinicy Technologies contribute to the work of A3⁶⁰.

The existing framework for the valorisation of research to the market needs much improvement. Private universities, like Algebra, are also very active in connecting and engaging stakeholders in the ecosystem and many academic institutions have their start-up support programs and incubators, as well. Most universities have their own technology transfer offices, which often lack funding. In terms of spin-offs, there is often a conflict on who owns the intellectual property and the equity. There are many examples of quality projects and spin-offs coming out of Croatian universities, however, there is a lack of promotion and awareness that many of these exist. Often, the process of spinning out is rather heavy, due to the difficulty of decision making from the higher end within universities.

4.7.3.3 Greece

In Greece, the majority of space-related research is being produced within academia and research centers such as the National Observatory of Athens (NOA) which operates three research institutes promoting basic research (a) the Institute for Astronomy, Astrophysics, Space Applications and Remote Sensing (IAASARS), specializing in the fields of astronomy, astrophysics, space science and remote sensing; (b) the Institute for Environmental Research and Sustainable Development (IERSD) specializing in the fields of air quality, environmental monitoring, meteorology, climate and climate change; and (c) the Geodynamic Institute (GI) specializing in physics of the Earth's interior and Earth surface deformation monitoring using remote sensing methods, in seismology, geophysics, volcanology, satellite geodesy and marine seismology⁶¹. NOA is active also in applied research and in the development of research infrastructure across the country (such as measuring stations). Research and education in aerospace and aeronautics as well as other fields of space technologies and applications are supported through three graduate interfaculty programmes offered by Greek academic institutions.⁶²

⁶⁰ Adriatic Aerospace Association (A3), URL: https://a3space.org/?page_id=2371

⁶¹ National Observatory of Athens, URL: http://www.gsrt.gr/central.aspx?sId=12614911114813231517700&oIID=661&neID=662&neTa=1_160_EPOP&ncID=0&neHC=0&tbid=0&lrID=2&oldUIID=al6611011261491111481012&actionID=load

⁶² D1.1. The European space support landscape: Insights from Central Eastern and South Eastern Europe, p. 23

Companies active in the space sector contribute significantly to the output of space-related knowledge and expertise through commercial and research activities. Notably, the members of the Hellenic Association of Space Industry (HASI), have participated in over 50 space technology and space applications project with a combined budget of more than EUR 170 million, up to 2019. Most Greek space companies have also considerable activity in the EU's research and innovation framework programmes, such as FP7, Horizon2020, as well as in several ESA-funded projects and tenders.⁶³

4.7.3.4 Romania

In Romania, space research and technology advances are guided by several research centers and universities with the Polytechnic University of Bucharest being the most important player in space research in Romania. Its Faculty of Aerospace Engineering (FAE) is an important part of the national aerospace scientific research system with a mission to advance education and scientific research in generating knowledge and innovation as the main objectives of a knowledge-based society and economy. The Aeronautics and Space Research Centre at the Polytechnic University Bucharest is another important participant in the ecosystem that balances the theoretical and applied research in space technology. The Centre develops a close relationship with major companies in the field, start-ups, research institutes, educational and industrial units for the exploitation of new space technologies, improving the human research potential in the field⁶⁴.

The Romanian Space Agency (ROSA) Research Center contributing to the development of several fields in science and technology, such as space dynamics and small satellites, the retrieval, processing, algorithms and software development of earth observation satellite data, global navigation satellite systems, spatial information systems integration – among others. ROSA has participated in several international, ESA-funded and national projects in space technology and applications.^{65,66}

⁶³Hellenic Association of Space Industry (2019), Greek Space Catalogue, URL: <https://www.hellenic-asi.org/files/si-cluster.pdf>

⁶⁴ D1.1. The European space support landscape: Insights from Central Eastern and South Eastern Europe, p. 23

⁶⁵ Romanian Space Agency (ROSA), URL: <http://www.rosa.ro/index.php/en/cercetare/proiecte-internationale>

⁶⁶ Romanian Space Agency (ROSA), URL: <http://www.rosa.ro/index.php/en/cercetare/proiecte-nationale>

5 Business modelling

Going beyond the implementation and testing of the InnORBIT’s programmes, services, and tools, we develop a concrete business case for the project’s CBP, BSP, digital toolbox as well as for the local space initiatives established in the frame of the 1st pilot round, in Croatia, Greece and Romania by our pilot partners.

To this end, building upon the preliminary business model developed for InnORBIT, during the project proposal preparation phase, we employed information and findings from WP1 studies and leveraged the expertise of our consortium to build business models and business model variations for the most important assets of the project:

- Capacity Building Programme
- Digital Toolbox / Knowledge Hub
- Local space initiatives:
 - Space Incubators
 - Space Accelerators
 - Space Hackathons
 - Space Cafés

The business models were developed using the Business Model Canvas (BMC) tool complemented by a Value Proposition Canvas to formulate hypotheses. The business model tools used are elaborated in more depth in Annex I.

Figure 5: Preliminary business model definition for InnORBIT



To keep the business modelling approach agile and flexible, we developed general and customizable business models instead of going straight into making any country-specific assumptions, thus taking the chance to make good use of this additional step to create business models for the local space initiatives of InnORBIT, that are easily replicable by virtually any innovation intermediary involved in InnORBIT with only minor effort required.

After developing a baseline business model for each case, we consulted with our partners, in bilateral discussions, to ask them to validate and assist in the finetuning of the business models. The partners selected

to discuss each model with, were selected on the basis of their general expertise in the organisation of one or more initiative types, be it in space or non-space sectors. For instance, COR has organised the 1st CASSINI Hackathon in Athens and manages the Greek ESA BIC, ALG has great experience in incubation through its Algebra LAB incubator, TTG has significant experience in platform exploitation due to its involvement in InvestHorizon, and STP has a broad knowledge of the space sector and has experience in organising or supporting all types of local space initiatives offered within InnORBIT.

The fine-tuned business models were then presented to the whole consortium, during the 2nd Business Modelling Workshop with whom we had an additional round of discussions, involving this time the whole consortium. During this workshop, variations for the business models were proposed for discussion.

The business models along with their proposed variations, in the form of Business Model Canvas and Value Proposition Canvas elements, are presented in the rest of Chapter 5.

5.1 Alternative business models developed for the CBP and the Digital Toolbox

The first two sets of business models – for (i) the Digital Toolbox / Knowledge Hub and (ii) the Capacity Building Programme, are offered directly by InnORBIT to its customer segments that might include innovation intermediaries, innovators (start-ups, scale-ups, SMEs, etc.), investors and other stakeholders. Geographically, the following business models focus on the general market area that InnORBIT targets, i.e., SEE, CEE and NEE countries.

5.1.1 InnORBIT Digital Toolbox and Knowledge Hub

The digital toolbox of InnORBIT targets two core customer segments that would generate two parallel income streams to sustain its operation. The first customer segment includes the innovation intermediaries that utilise the digital toolbox to receive training through online courses, as well as to make use of other functionalities to set up the digital footprint of their established local space initiative in a single place. Innovators are the second customer segment of the digital toolbox, expected to use most of the digital tools included.

The two customer segments have differences in expected behaviour and interaction with the InnORBIT consortium, thus two business model canvases and value proposition canvases were developed – one for each segment.

Table 5: Components of the VPC for customer segments of the InnORBIT digital toolbox / knowledge hub

Customer profile	Innovation intermediaries	Innovators
Customer jobs	<ul style="list-style-type: none"> Innovation ecosystem building and management on trusting relationships Strengthen strategic position in the local industry and market Sectoral knowledge diffusion Community-driven growth of sector Successful implementation of local projects, actions and initiatives 	<ul style="list-style-type: none"> Exploit available pathways to bring business ideas to market Find customers and generate revenue streams Find partners and collaborators to expand capacity of product and service provision Access to infrastructure and knowledge Find funding and investors
Gains	<ul style="list-style-type: none"> Create a vibrant online space community Build awareness on the local space industry Build reputation as a reliable source of information and local contact point 	<ul style="list-style-type: none"> Understanding of business strengths and weaknesses to assess potential reception by investors Understanding the space sector and its possibilities / applications for commercialisation

	<ul style="list-style-type: none"> Easily communicate opportunities in space Stakeholder engagement and mobilisation 	<ul style="list-style-type: none"> Promote own work and find collaborators Engage in discussions with other stakeholders to understand the market situation and needs Participate and/or lead new projects Find funding opportunities and build pitching skills
Pains	<ul style="list-style-type: none"> Fragmentation of local ecosystems, information asymmetries and unexploited potential 	<ul style="list-style-type: none"> Funding and investment opportunities are hard to navigate in the EU Space industry information at local level is hard to access Lack of communication channels with active players in the space ecosystem
Value map	Innovation intermediaries	Innovators
Products and services	<ul style="list-style-type: none"> Community forum E-learning Find partners Application to local space initiatives functionality 	<ul style="list-style-type: none"> Community Forum E-learning Find partners Find funding Investment Readiness Level self-assessment Application to local space initiatives functionality
Gain Creators	<ul style="list-style-type: none"> Online forum functionality to create a communication channel and an online working/brainstorming space for local stakeholders An online database of space stakeholders, events, funding opportunities and news 	<ul style="list-style-type: none"> Investment Readiness Level self-assessment helps businesses to understand their strengths and improvement areas simply and quickly Opportunity to apply to local space initiatives for business development and other benefits Communication channels and partnering opportunities with other market players (academia, policy, business etc.)
Pain Relievers	<ul style="list-style-type: none"> The InnORBIT digital tools offer multiple functionalities in a single place, making useful information about the local space sector easily accessible 	<ul style="list-style-type: none"> Consolidated information for the local space sector

The following table elaborates on the business model canvas elements for the two-customer segments of InnORBIT digital toolbox and knowledge hub.

Table 6: Components of the BMC for innovation intermediaries & innovators

Customer Segments	<ul style="list-style-type: none"> Innovation intermediaries 	<ul style="list-style-type: none"> Innovators
Value Proposition	<ul style="list-style-type: none"> Community building and networking Better knowledge of the space sector for service provision to innovators 	<ul style="list-style-type: none"> Online community for ideas exchange, networking & partnership opportunities One-stop-shop for funding opportunities in space and space-related sectors

	<ul style="list-style-type: none"> • Training material to build capacity for setting up local space initiatives • Available repository of training materials, templates for space innovators • Repository of knowledge and market intelligence on the space sector • News and information aggregator for the space sector 	<ul style="list-style-type: none"> • One-stop-shop for events, trainings and webinars in the space sector • Knowledge repository of training materials, templates, fresh market insights and intelligence, etc. • Training material on technical and business topics for space entrepreneurship • Self-assessment tools for business / market, technical and investment readiness (IRL self-assessment tool already available) • News and information aggregator for the space sector
Customer relationships	<ul style="list-style-type: none"> • Toolbox promotion and communication campaigns • FAQ, users guide and toolbox tutorials • Endorsement of the toolbox by large networks (ESA, EBN, EBAN, EEN, EARSC, etc.), other organisations • Recommendation of the toolbox by peers / past users • Personalised support and consultation for content and training selection • User feedback reception • Technical user support 	<ul style="list-style-type: none"> • Toolbox promotion and communication campaigns • FAQ, users guide and toolbox tutorials • Recommendation of the toolbox by peers / past users • Recommendation of the toolbox by innovation intermediaries • Personalised support and consultation for content and training selection • User feedback reception • Technical user support
Channels	<ul style="list-style-type: none"> • InnORBIT social media and website • InnORBIT Community / Forum (general channel) • EU initiatives, networks and EU-funded projects • User feedback collection tools (e.g., satisfaction surveys) • Direct contacts and networking 	<ul style="list-style-type: none"> • InnORBIT social media and website • InnORBIT local space initiatives • InnORBIT Community / Forum (general channel) • User feedback collection tools (e.g., satisfaction surveys) • Direct contacts and networking
Revenue Streams	<ul style="list-style-type: none"> • Custom pricing – TBD 	<ul style="list-style-type: none"> • Custom pricing – TBD
Key Activities	<ul style="list-style-type: none"> • Development and maintenance of content (e-learning, news, events, research items) • Technical maintenance and update of the digital toolbox • Provision of technical support • Seek and recruit external experts, mentors etc. • Scouting for external content from EU networks, initiatives, projects etc. 	
Key Resources	<ul style="list-style-type: none"> • Content and materials created through InnORBIT (courses, CBP, BSP, replication guide etc.) • External content for reuse in e-learning, knowledge hub etc. • Development team • Personnel for toolbox administration, content update / creation and activities management • Third-party software for digital tools and CMS (Drupal, AWS, F6S, Leadspicker, HumHub, etc.) • Reputation and credibility of the digital toolbox 	
Key partners	<ul style="list-style-type: none"> • EU-funded projects and initiatives • EU space and entrepreneurship networks (ESA, EBAN, EEN, etc.) 	

	<ul style="list-style-type: none"> • Networks of experts, trainers and mentors • InnORBIT CBP/BSP owner(s) – TBD • Other InnORBIT consortium partners
Cost Structure	<ul style="list-style-type: none"> • Personnel costs for technical maintenance and update • Personnel costs for content creation, scouting of key partners • Costs associated with promotional, communication and marketing actions (ads, social media promotion, communication materials, etc.) • Costs associated with the permission to use of external materials – TBD

5.1.2 InnORBIT’s Capacity Building Programme / train-the-trainers initiative

The table below summarizes the key elements of the Value Proposition Canvas of InnORBIT’s Capacity Building Programme for the core customer segment, which are the innovation intermediaries.

Table 7: Components of the InnORBIT’s Capacity Building Programme VPC

Customer profile	
Customer jobs	<ul style="list-style-type: none"> • Establish, manage and expand local space innovation ecosystem • Design and implement initiatives for space - activities, events and support frameworks • Participate in projects of strategic importance • Establish position as the central point of contact for the space sector (locally, regionally, or nationally) • Portfolio expansion and diversification
Gains	<ul style="list-style-type: none"> • Develop expertise in business, IP management, funding and technical issues in space to support local stakeholders • Networking, collaboration and synergies with various organisations
Pains	<ul style="list-style-type: none"> • Lack of resources - time, money, equipment and personnel • Lack of expertise on the space sector, its current status and trends • Vast and scattered sources of technical and business information in space that could overwhelm inexperienced innovation intermediaries
Value map	
Products and services	<ul style="list-style-type: none"> • General business and technical space training for personnel • Guidelines and templates for local initiative planning and resource allocation • Customisable catalogue of local space initiatives and implementation roadmaps • Consultancy and tailored advice by space experts based on needs assessment • Business support programme services and local space initiatives catalogue
Gain Creators	<ul style="list-style-type: none"> • Tailored advice and consultancy that builds upon existing strengths and skills for a quick start in space • Customisable training curriculum based on competencies and needs • Tested and improved methodologies to mitigate risks and avoid common mistakes
Pain Relievers	<ul style="list-style-type: none"> • State-of-the-art knowledge in commercial space to reduce research time and risks related to incomplete knowledge of the space sector • Available material, trainings and tools that save development and research time

Table 8: Components of the InnORBIT's Capacity Building Programme BMC for innovation intermediaries

BMC Part I – Customer Value Generation	
Customer Segments	<ul style="list-style-type: none"> • Innovation intermediaries (three types) <ul style="list-style-type: none"> * Standalone innovation intermediaries such as clusters, industry associations, incubators etc. * Spin-offs of academic and research institutions such as RTOs, ESA BICs etc. * Government-backed innovation intermediaries such as ESA BICs
Value Proposition	<ul style="list-style-type: none"> • Support to access space industry and related markets • Capacity building and personnel training to set up space-related business support initiatives for local innovators – i.e., start-ups, scale-ups, SMEs, entrepreneurs etc. • Space innovation networks and ecosystem development as an asset for the innovation intermediaries • Diversification of service/sector portfolio - generation of new revenue streams • Access to the InnORBIT Business Support Programme to offer services to their end-users • Access to the knowledge and tools of the Digital Toolbox and Knowledge Hub
Customer relationships	<ul style="list-style-type: none"> • Tailoring according to innovation intermediaries' needs, capabilities and strategy • Implementation of the BSP by innovation intermediaries with guidance by experts • Progress assessment, support and planning ahead with support from mentors/experts • Setup of user communities and local space initiative communities • Automated services – access to the toolbox (elearning, tools, self-assessment)
Channels	<ul style="list-style-type: none"> • Awareness phase: <ul style="list-style-type: none"> * InnORBIT social media and website * Open calls * Direct contacts and networking * Recommendations by peers and established networks/initiatives (e.g., ESA) • Evaluation of value proposition phase: <ul style="list-style-type: none"> * Dedicated pitching calls with InnORBIT experts * Customisation of programme with support from InnORBIT experts • Purchase / onboarding phase: <ul style="list-style-type: none"> * Terms of reference and letter of acceptance • Delivery of value and after-sales phase: <ul style="list-style-type: none"> * Technical support * Implementation guidance by experts and mentors through coaching and mentoring * Regular follow up in progress and troubleshooting * User feedback reception for improvement of the CBP/BSP (satisfaction and impact surveys)
Revenue Streams	<ul style="list-style-type: none"> • Potential revenue streams (TBD – exploitation plan) <ul style="list-style-type: none"> * Community-supported through user contributions * Consultation fees charges to innovation intermediaries * Sponsorships and/or public funding

	<ul style="list-style-type: none"> * Tiered pricing (based on functionalities offered in conjunction with the toolbox/repository)
Key Activities	<ul style="list-style-type: none"> • Provision of consultation services (before, during the CBP implementation) • Technical and business space training design and production • Technical and business space training provision • Design and provision of training on the use of digital toolbox (as students and trainers) - optional • Support for setting up local space initiatives, financial and activity planning (during BSP) • Promotional, communication and marketing activities • Pitching of the programme and sales • Scouting for alliances and synergies with large players/networks
Key Resources	<ul style="list-style-type: none"> • InnORBIT Digital Toolbox – Knowledge Hub • InnORBIT Business Support Programme / local space initiatives set-up instructions • Training material and online courses • External contents and materials (other projects, Copernicus Academy etc.) • In-house space experts and personnel • Administrative personnel • Communication experts and sales • InnORBIT Digital Toolbox – Knowledge Hub • InnORBIT Business Support Programme / local space initiatives
Key partners	<ul style="list-style-type: none"> • EU-funded projects and initiatives, ESA etc. • EU space and entrepreneurship networks (EBAN, EEN, etc.) • Networks of experts, trainers and mentors • InnORBIT Digital Toolbox – Knowledge Hub owners (TBD – exploitation plan) • Other InnORBIT consortium partners (TBD – exploitation plan)
Cost Structure (value-driven approach)	<ul style="list-style-type: none"> • Fixed costs: <ul style="list-style-type: none"> * Costs associated to the use of internal and external training materials (TBD – exploitation plan) * Licensing or other costs for the use of the digital toolbox (TBD – exploitation plan) • Variable costs: <ul style="list-style-type: none"> * Personnel costs for administration and resource management * Costs associated with promotional, communication and marketing actions (ads, social media promotion, communication materials, etc.) * Fees and wages of experts (internal and external)

5.2 Alternative Business Models for the local space initiatives

The second set of business models refers to the 4 types of local space initiatives designed by InnORBIT for supporting space entrepreneurship: (i) space incubators, (ii) space accelerators, (iii) space cafés and (iv) space hackathons. Although InnORBIT experts support the innovation intermediaries to design, plan and operate their local space initiatives which they own, and not InnORBIT. Business modelling in this section puts the innovation intermediaries in the center of the value chain, created in the context of their established local space initiatives.

For each initiative, the elements of the Value Proposition Canvas and the Business Model Canvas are presented in tabular form for the baseline model and its potential variations.

5.2.1 Space Incubators

The table below summarizes the key elements of the Value Proposition Canvas of space incubators for the core customer segment, space innovators and early-stage space start-ups.

Table 9: Components of the InnORBIT’s Space Incubators VPC

Customer profile	
Customer jobs	<ul style="list-style-type: none"> • Monetisation of business ideas (Product-market fit) • Support to find initial resources to establish venture (office space, funding etc.) • Support to access funding • Support to access customers and partners • Team building
Gains	<ul style="list-style-type: none"> • Develop business knowledge and skills (space-related and general) • Create business models and plans, develop business growth strategy • Develop marketing and pitching skills to sell product to potential customers and investors
Pains	<ul style="list-style-type: none"> • Innovators face extreme instability and uncertainty during their first steps
Value map	
Products and services	<ul style="list-style-type: none"> • Space incubator <ul style="list-style-type: none"> * Mentoring and training / coaching services * Business space provision * Events for networking and investment
Gain Creators	<ul style="list-style-type: none"> • Mentoring and training sessions on technical and business topics of space • Participate in networking, matchmaking and investment events to find partners, customers and investors • Official establishment of the start-ups, Support for registration as a company
Pain Relievers	<ul style="list-style-type: none"> • Creation of a safe space for business development, with various market risks mitigated and controlled failure.

The following table summarizes the key elements of the Business Model Canvas for the two envisioned variations of the Space incubator, physical and hybrid version. The two versions of the BMC for Space incubators are presented on a comparative basis.

Table 10: Components of the InnORBIT Space Incubators BMC

	BMC Variation #1 – Physical incubators	BMC Variation #2 – Hybrid incubators
Customer Segments	<ul style="list-style-type: none"> • Pre-start-up stage innovators: e.g., students’ teams and spin-offs • Early-stage start-ups: including those recently received pre-seed funding • Scale-ups: mature or late-stage start-ups with product development completed 	Same as in the physical incubator
Value Proposition	<ul style="list-style-type: none"> • Monetisation of ideas into operational business • Definition and streamlining of core business goals • Access to infrastructure and office / business spaces • Development of technical and business skills • Access to market information and sectoral knowledge • Access to talent pools and teambuilding • Access to networks of stakeholders in the local and broader space sector • Access to financial support and funding – VC funds, BAs, grants • Utilisation of incubator’s branding and prestige (if applicable) 	Same as in the physical incubator
Customer relationships	<ul style="list-style-type: none"> • Customer acquisition: <ul style="list-style-type: none"> * Social media and awareness raising campaigns * Info days and pitching of initiative in external events * Design of open calls and application assessment * Other activities (e.g. student projects) • Customer retention: <ul style="list-style-type: none"> * Mentor-mentee interaction and training * Inclusion in a start-ups network (cohort-based or other) * Technical and administration support * Showcasing of teams’ work and promotion * Events of different thematic areas (networking, pitching, matchmaking, info days, etc.) * Other benefits – in-kind or intangible * User feedback and improvement of services * Inclusion in alumni networks and continuous communication 	Same as in the physical incubator

	BMC Variation #1 – Physical incubators	BMC Variation #2 – Hybrid incubators
Channels	<ul style="list-style-type: none"> • Awareness phase: <ul style="list-style-type: none"> * InnORBIT and innovation intermediaries' social media and website - campaigns * Internal and external networks of students, start-ups etc. * Internal and external events * News channels and newsletters * Open calls with cut-off dates * Recommendations by alumni * Recommendations by local experts/networks/initiatives • Evaluation and onboarding phase: <ul style="list-style-type: none"> * Selection criteria and process for inclusion * Info days and other events * Guidelines and terms of participation • Delivery of value and “after-sales” phase: <ul style="list-style-type: none"> * Technical and administrative support * Mentoring and training sessions * Regular progress follow-ups with mentors/coaches * Training and info / networking or thematic events * User feedback reception for improvement of the initiative * Team relationships and alliances 	<p>The same channels are applicable to the hybrid version of space incubators as well, although the format of some channels might be converted to an online/hybrid version while the rest might remain physical. The exact format of each channel depends on the selection made by the innovation intermediary organising such an initiative as well as from circumstantial events that are not entirely under innovation intermediaries' control (e.g., external events).</p>
Revenue Streams	<p>In principle, no revenue streams are generated by the core customer segments</p> <ul style="list-style-type: none"> • Membership or participation fees (optional) • Success fees received by start-ups achieving large turnovers (optional) 	<p>Same as in the physical incubator</p>
Key Activities	<ul style="list-style-type: none"> • Identification, organisation and equipment of venue/ business space • Mentoring and training curriculum and materials design • Recruitment of expert trainers and mentors • Organisation and delivery of mentoring and training sessions • Research and application for funding of the initiative? • Promotional, communication and marketing activities organisation and management • Scouting for teams and start-ups, open call design and launch 	<p>The main activities of a hybrid incubator are very similar to its traditional (physical) form. A key difference is the extended geographical scope of mentors and experts, teams and other partners involved, as there is no travel involved for physical training and mentoring delivered by experts outside the region or other key functions of the incubator. While a hybrid format offers many benefits, it comes with its trade-offs, as for some activities an online/hybrid approach it is an imperfect substitute of the traditional method.</p>
Key Resources	<ul style="list-style-type: none"> • Infrastructure: <ul style="list-style-type: none"> * Venue / Business space • Personnel: 	<p>Hybrid incubators exhibit similar needs in terms of resources although, in different mixtures. For instance, for</p>

	BMC Variation #1 – Physical incubators	BMC Variation #2 – Hybrid incubators
	<ul style="list-style-type: none"> * Pool of mentors and trainers * Administrative personnel * Communications and PR, graphic design * Technical personnel • ICT, software and other material: <ul style="list-style-type: none"> * Event planning equipment, materials * Training content and material * Visual and communication material, printable and digital • Financial resources: <ul style="list-style-type: none"> * Public national, local and/or EU funding * Sponsorships * Redistribution of revenue from other internal activities and departments (self-funding) * Other fundraising • InnORBIT Digital Toolbox – Knowledge Hub • InnORBIT Capacity Building Programme • InnORBIT Business Support Programme / local space initiatives 	<p>hybrid incubators software and ICT equipment should be of higher importance while more traditional technology equipment might be in higher demand for physical incubators. Another instance is the accommodation and business space needs differences.</p>
Key partners	<ul style="list-style-type: none"> • Internal and external networks of experts, trainers and mentors • Academic institutions and researchers • Public institutions and government • Private investors • Large corporates (on-demand incubators) • InnORBIT Digital Toolbox – Knowledge Hub owners • InnORBIT CBP/ BSP owners • Technology providers 	<p>Same as in the physical incubator</p>
Cost Structure	<ul style="list-style-type: none"> • Office space / venue rental or depreciation costs • Maintenance costs and utilities • Personnel costs for administration and communications • In-house and external space experts', trainers' and mentors' wages (pro bono also an option – on selective basis) • Travel, accommodation and subsistence costs for visiting experts and mentors • Costs associated with promotional, communication and marketing actions (ads, social media promotion, etc.) • Software license costs • Costs of technical equipment • Graphic design and printing costs of communication material, training and events organization – reduced costs for the use of the 	<p>The main cost categories are similar for a hybrid incubator although costs might be shifted across categories due to the transition towards online or hybrid alternatives for several functions.</p> <p>The following hypotheses made:</p> <ul style="list-style-type: none"> • Lower costs for office space and maintenance / utilities • Same or higher costs for software • Same or higher cost of technical equipment (for employees) • Same or lower cost of technical equipment (for teams) • Lower or zero costs for travel and subsistence of visiting experts

	BMC Variation #1 – Physical incubators	BMC Variation #2 – Hybrid incubators
	InnORBIT brand (obligatory in the project duration) <ul style="list-style-type: none"> Licensing or other costs for the use of the InnORBIT digital toolbox (zero costs during the project) Licensing or other costs for the CBP/BSP (zero costs during the project) 	<ul style="list-style-type: none"> Lower or zero costs for printable material Higher personnel costs associated to overhead and communications

5.2.2 Space Cafés

The business models for the space café initiative are presented in this section. The main customer segment for this initiative is the general space ecosystem (including innovators), treated uniformly by innovation intermediaries as participants and contributors to local space awareness activities.

The table below summarizes the key elements of the Value Proposition Canvas for Space cafés.

Table 11: Components of the InnORBIT’s Space Cafés VPC

Customer profile	
Customer jobs	<ul style="list-style-type: none"> Become aware of the local space market, its state-of-the-art, opportunities and the active players in the local ecosystems.
Gains	<ul style="list-style-type: none"> Learn about the key and latest trends of the space markets Learn about ongoing activities, projects and challenges faced by peers and other ecosystem players Self-promotion of work Networking and discussions with space enthusiasts
Pains	<ul style="list-style-type: none"> Lack of awareness about and communication with the local space ecosystem players
Value map	
Products and services	<ul style="list-style-type: none"> Space café events organised in an unofficial tone, with keynote speeches by experts on interesting space topics and networking sessions
Gain Creators	<ul style="list-style-type: none"> Informative character of keynote speeches on current space industry topics Discussions could spark the generation of new product ideas and foster potential collaborations with diverse market actors Regular events create the sense of community and open communication channels with peers, experts and other stakeholders
Pain Relievers	<ul style="list-style-type: none"> The vary nature of this initiative supports the creation of awareness about the local space sector and innovation ecosystem

The table below summarizes the key elements of the Business Model Canvas for two variations of the space café initiatives, (i) physical and (ii) online or hybrid. As the business model variations, have many commonalities between them and to avoid repetition, the BMC elements are presented on a comparative basis.

Table 12: Components of the InnORBIT's Space Cafés BMC

	BMC Variation #1 – Physical events	BMC Variation #2 – Hybrid or fully online
Customer Segments	<ul style="list-style-type: none"> Innovators – entrepreneurs, SMEs, start-ups, scale-ups, students Local space ecosystem (diverse stakeholders) 	<p>Same groups as in physical events – Expanded geographical region of stakeholders</p>
Value Proposition	<ul style="list-style-type: none"> Access to the local space community and understanding of the role of stakeholders Networking opportunities Awareness on contemporary issues, topics, technologies, and ideas of the local and wider space sector Access to a local point of reference for space (innovation intermediary) Self-promotion of work and expertise through keynote speeches 	<p>Same as in physical event</p>
Customer relationships	<ul style="list-style-type: none"> Attendees – participants who simply attend the events <ul style="list-style-type: none"> * Networking events and sessions * Participation in discussions Keynote speakers – participants who actively contribute to the agenda of events <ul style="list-style-type: none"> * Preparation of material and speeches related to a topic on the space sector 	<p>Same as in physical event</p>
Channels	<ul style="list-style-type: none"> Awareness and onboarding stage: <ul style="list-style-type: none"> * Communication campaigns run through social media * Promotion of space café in internal and external events * Direct networking * Scouting and invitations to keynote speakers Delivery of value phase: <ul style="list-style-type: none"> * Participation in informal regular meetups * Attendance of keynote speeches * Networking among participants * Brainstorming and discussions * Community fora and continuous communication channels “After-sales” phase: <ul style="list-style-type: none"> * Connection to complementary initiatives / actions and programmes for space 	<p>Same as in physical event</p>
Revenue Streams	<ul style="list-style-type: none"> Entrance fees or food and drink costs - optional 	<ul style="list-style-type: none"> Registration fee - optional

BMC Part I – Customer Value Generation		
Key Activities	<ul style="list-style-type: none"> ● Space café organisation: <ul style="list-style-type: none"> * Event logistics (space, date and format) * Topics of interest – agenda definition * Keynote speakers’ identification and “recruitment” ● Space café promotion: <ul style="list-style-type: none"> * Event promotion to prospective attendees * Awareness and promotion campaigns management * Collaborations and synergies for reputation building 	<p>The nature of activities is similar to the physical event. Effort needed might differ – e.g., effort required for event organisation in terms of space configuration is higher for hybrid events and zero for fully online events</p>
Key Resources	<ul style="list-style-type: none"> ● Infrastructure: <ul style="list-style-type: none"> * Space for meetings – local café, bar, pub, or university cafeteria etc. ● Personnel: <ul style="list-style-type: none"> * Personnel for event organisation and moderation / Alternative: collective organisation by participants * PR and communications experts ● ICT, software and other material: <ul style="list-style-type: none"> * Technical equipment (projectors, computers, microphones etc.) * Online conferencing software - optional ● Financial resources: <ul style="list-style-type: none"> * Self-funding * Sponsorships (well established and highly regarded initiatives) ● Other: <ul style="list-style-type: none"> * Hospitality (food, drinks, etc.) * Travel costs for guest speakers outside the region - optional * Keynote speakers and attendees ● InnORBIT Digital Toolbox – Knowledge Hub ● InnORBIT Capacity Building Programme ● InnORBIT Business Support Programme / local space initiatives 	<p>The key resources exhibit differences for hybrid / online events:</p> <ul style="list-style-type: none"> ● Event space is not needed in online events but required in hybrid format ● Online software is mandatory ● Needs for technical equipment might be higher or lower depending on choice (AR/VR/XR solutions might be applicable in hybrid / online format) ● Need for hospitality and travel / accommodation arrangements are reduced or zero
Key partners	<ul style="list-style-type: none"> ● Local community of stakeholders and space enthusiasts ● Experts and stakeholders for keynote speeches ● Sponsors ● Local cafes, bars, or other event spaces 	<p>Categories of key partners remain the same although the geographic scope might be extended</p>
Cost Structure	<ul style="list-style-type: none"> ● Cost of event space and maintenance – depending on choice, might be zero ● Personnel costs for organisation, promotion ● Technical equipment costs ● Licensing costs for online software - optional 	<p>The cost structure for hybrid / online events is based on the same premise as in physical events but with some differences:</p>

	<ul style="list-style-type: none"> • Keynote speaker fees – usually zero • Other promotion and communication costs • Catering and hospitality costs – might be zero 	<ul style="list-style-type: none"> • Costs associated with the acquisition and maintenance of event space is zero in online events / For hybrid format costs are the same or higher • Online software costs are higher • Cost of technical equipment might be higher or lower depending on choice (AR/VR/XR solutions might be applicable in hybrid / online format) • Hospitality and travel / accommodation costs are reduced or zero
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5.2.3 Space Accelerators

In this section, the business models for Space accelerators are presented. Three main customer segments were identified for this initiative, (i) innovators and start-ups, (ii) large corporates and (iii) public institutions. The table below contains the elements of the value proposition canvas of the space accelerators for innovators as the main customer segment.

Table 13: Components of the InnORBIT's Space Accelerators VPC

Customer profile	
Customer jobs	<ul style="list-style-type: none"> • Scale-up businesses to the point that they sustainably reach the market • Find funding
Gains	<ul style="list-style-type: none"> • Receive seed funding to scale-up during acceleration • Access networks of experts and mentors • Access to investors to achieve further rounds of funding
Pains	<ul style="list-style-type: none"> • Lack of business knowledge to scale-up (finance, team building, management, legal, IPR, funding etc.) • Lack of time and resources to scale-up
Value map	
Products and services	<ul style="list-style-type: none"> • Accelerator and acceleration services
Gain Creators	<ul style="list-style-type: none"> • Most accelerators provide an initial funding to the cohort participating in the accelerator to follow the programme • Pitching events and demo days mark the end of the programme where start-ups receive investors' attention for funding requests
Pain Relievers	<ul style="list-style-type: none"> • Accelerated business development with intensive training and effort that saves valuable time for entrepreneurs in bringing their ideas to the market

The table below summarises the elements of the business model canvas for space accelerators, provided for the different envisioned variations of the initiative, (i) accelerators in physical form and (ii) accelerators in a hybrid and purely online format. The basic functions of space accelerators remain the same, therefore any differences between the two business models are comparatively presented with the physical accelerator business model as used a point of reference.

Table 14: Components of the InnORBIT's Accelerators BMC

	BMC Variation #1 – Physical Accelerator	BMC Variation #2 – Hybrid / Online
Customer Segments	<ul style="list-style-type: none"> • Customer Segment #1: <ul style="list-style-type: none"> * Defined start-ups with good market potential • Customer Segment #2: <ul style="list-style-type: none"> * Medium-to-large corporates facing low labour supply * Large corporates • Customer Segment #3: <ul style="list-style-type: none"> * Public institutions 	Same as in physical accelerators
Value Proposition	<ul style="list-style-type: none"> • Customer Segment #1 – Start-ups: <ul style="list-style-type: none"> * Support start-ups to enter the market * First wave of partners and customers and public relations building * Find funding • Customer Segment #2 – Medium-to-large and large corporates: <ul style="list-style-type: none"> * Outsourcing of R&D activities to start-ups (for corporates) * Rebranding and brand revitalisation for talent attraction * Opportunity for ownership and acquisition of start-ups, partnerships and acquisition of departments 	Same as in physical accelerators
Customer relationships	<ul style="list-style-type: none"> • Awareness phase and onboarding: <ul style="list-style-type: none"> * Open calls with cut-off dates * Application guidelines, info days for inclusion in the incubator * Promotional and outreach campaigns • Value delivery phase: <ul style="list-style-type: none"> * Networking and collaboration with peers and other partners * Mentorship and trainings * Pitching events and matchmaking * Technical and administrative support • Next steps: <ul style="list-style-type: none"> * Connection to investors, funds, collaborators 	Same as in physical accelerators
Channels	<ul style="list-style-type: none"> • InnORBIT social media and website • InnORBIT Community / Forum (general channel) • Mentoring, training and coaching sessions • User feedback collection tools (e.g., satisfaction and impact surveys) • Direct contacts and networking with local space community • Internal student / entrepreneurship networks • Newsletters and news channels 	Same as in physical accelerators

	<ul style="list-style-type: none"> • Recommendations by peers / alumni • Recommendations by established networks/initiatives (e.g., ESA) 	
<p>Revenue Streams</p>	<ul style="list-style-type: none"> • Customer Segment #1 – Start-ups: <ul style="list-style-type: none"> * Participation fees - optional • Customer Segment #2 – Medium-to-large and large corporates: <ul style="list-style-type: none"> * Funding • Customer Segment #3 – Public authorities and EU institutions: <ul style="list-style-type: none"> * Funding * Grants 	<p>Same as in physical accelerators</p>
<p>Key Activities</p>	<ul style="list-style-type: none"> • Customer Segment #1 – Start-ups: <ul style="list-style-type: none"> * Accelerator design, objectives, curriculum and open call / criteria development * Identification, organisation and equipment of venue for events * Mentoring and training curriculum and materials design * Recruitment of expert trainers and mentors * Scouting for teams and start-ups, open call design and launch * PR and Branding – Graphic design * Administrative support to personnel, experts and teams/start-ups • Customer Segment #2 – Medium-to-large and large corporates: <ul style="list-style-type: none"> * Application for funding and granting processes * Participation and bidding in tendering processes to win accelerator contract • Customer Segment #3 – Public authorities and EU institutions: <ul style="list-style-type: none"> * Application for funding and granting processes * Participation and bidding in tendering processes to win accelerator contract 	<p>Key differences with physical version:</p> <ul style="list-style-type: none"> • Planning of online events instead of physical ones • Expanded geographic region
<p>Key Resources</p>	<ul style="list-style-type: none"> • Venue – owned or rental (for events – business space not required/preferred) • Training material • Communication and promotional material • Pool of mentors and trainers • Event planning equipment, materials, personnel • Administrative and communications personnel • Legal advisory services • InnORBIT Digital Toolbox – Knowledge Hub • InnORBIT Capacity Building Programme 	<p>Key differences with physical accelerators:</p> <ul style="list-style-type: none"> • Venue is used optionally for hybrid events and not necessary for online events. • Reduced personnel effort for venue organisation activities • Higher needs for technical equipment and software for customer management and administration • Higher needs for customer relations management platforms, communication,

	<ul style="list-style-type: none"> InnORBIT Business Support Programme / local space initiatives 	<p>training (e-learning: self-paced or remote)</p> <ul style="list-style-type: none"> Lower or zero hospitality and travel costs Financial resources needed in proportion to other (non-financial) resources
Key partners	<ul style="list-style-type: none"> Internal and external networks of experts, trainers and mentors Private investors (incl. VCs, BAs and others) Public institutions and government InnORBIT Digital Toolbox – Knowledge Hub owners InnORBIT CBP and BSP owners 	Same as in physical accelerators
Cost Structure	<ul style="list-style-type: none"> Seed funding for start-ups (optional) Personnel costs In-house and external space experts', trainers' and mentors' fees (pro bono also an option – on selective basis) Costs associated with promotional, communication and marketing actions (non-personnel, ads, social media promotion, communication materials, graphic design etc.) Legal advisory services procurement costs / Personnel costs of in-house legal consultants Personnel costs associated with bidding to tenders / Consultancy services procurement costs Costs associated with the permission to use of external materials – TBD, subject to IPR agreement with BSP/CBP owners Costs associated with the permission to use the digital toolbox – subject to IPR agreement Other operational costs (e.g. utilities) 	<p>Key differences with physical accelerators:</p> <ul style="list-style-type: none"> Reduced or zero venue costs Reduced costs for equipment provided to teams Same or increased costs for equipment provided to personnel and experts Zero printing costs Lower or zero hospitality costs Lower event-planning costs

5.2.4 Space Hackathons

In this section, the final space initiative of InnORBIT is presented, space hackathons. The two main customer segments of this initiative include (i) innovators, as participants and beneficiaries of the hackathons, and (ii) the sponsors of hackathons. The table below illustrates the key elements of the Value Proposition Canvas for the customer segment of innovators.

Table 15: Components of the InnORBIT’s Space Hackathons VPC

Customer profile	
Customer jobs	<ul style="list-style-type: none"> Teams that need to create a business idea and compete to receive prizes and funding
Gains	<ul style="list-style-type: none"> Put team skills into motion to develop a concrete idea with market potential and find potential team members with complementary skills Awareness on the possibilities and applications of space in space and non-space sectors Visibility of team in the local space sector
Pains	<ul style="list-style-type: none"> Complete lack of awareness in space or difficulty to enter the market
Value map	
Products and services	<ul style="list-style-type: none"> Challenge-based competitions for the development of viable solutions offering prizes to best team ideas
Gain Creators	<ul style="list-style-type: none"> Potential prizes in monetary form or in the form of incubation, acceleration and mentoring/training services Benefit from the promotional campaign of the hackathon to meet stakeholders, potential collaborators and clients to venture into space Preparation for the participation in further programmes for business support such as incubators and accelerators
Pain Relievers	<ul style="list-style-type: none"> Space hackathons offer a great opportunity for talents (not necessarily in the space sectors) to get to know the space sector and its challenges and to apply their skills in space and develop marketable business ideas through competitive project development.

The table below presents the elements of the Business model Canvas for the InnORBIT’s Space Hackathons. Two variations for the space hackathon initiative have been elaborated, (i) Physical Hackathons and (ii) Online and Hybrid Space Hackathons. The business models have key differences in some processes and functions, however, the core principles remain virtually the same among variations. Thus, the business models are presented on a comparative basis, with the physical hackathon being the frame of reference.

Table 16: Components of the InnORBIT’s Space Hackathons BMC

	BMC Variation #1 – Physical Hackathon	BMC Variation #2 – Hybrid / Online
Customer Segments	<ul style="list-style-type: none"> Customer Segment #1: Beneficiaries <ul style="list-style-type: none"> * Young entrepreneurs * Students * Start-ups Customer Segment #2: Sponsors <ul style="list-style-type: none"> * Large corporates * Public authorities / EU institutions 	Same as in physical hackathons
Value Proposition	<ul style="list-style-type: none"> Start-ups: <ul style="list-style-type: none"> * Matchmaking and teambuilding 	Same as in physical hackathons

	<ul style="list-style-type: none"> * Prizes – monetary and in-kind (extra mentoring) * Fun and challenging activities • Large corporates: <ul style="list-style-type: none"> * Ideas and innovation generation • Public institutions: <ul style="list-style-type: none"> * Awareness raising * Attraction of young talent to into the space sector * Ecosystem development 	
Customer relationships	<ul style="list-style-type: none"> • Start-ups: <ul style="list-style-type: none"> * Online and offline promotional campaigns * Open call and application to the hackathon * Info days and warmup events for instructions and team building * Team coaching and guidance provision * Core challenge workload - project/solution development * Technical and administrative support • Large corporates: <ul style="list-style-type: none"> * Tender specifications / proposal • Public authorities: <ul style="list-style-type: none"> * Tender specifications / proposal 	<p>The core principles are same as in physical hackathons. Due to the utilisation of online communications, most activities are asynchronous.</p>
Channels	<ul style="list-style-type: none"> • Start-ups: <ul style="list-style-type: none"> * Social media and web promotional campaigns * Open call and application to the hackathon * Info days and warmup events for instructions and team building * Coaches and instructors * Challenge specifications and instructions * Support channels and communications • Large corporates: <ul style="list-style-type: none"> * Tender application * Reporting of progress and results • Public authorities: <ul style="list-style-type: none"> * Tender application * Reporting of progress and results 	<p>The core principles are same as in physical hackathons. The utilisation of offline channels become less likely, due to the conversion of events into online format.</p>
Revenue Streams	<ul style="list-style-type: none"> • Start-ups: <ul style="list-style-type: none"> * No revenue streams • Large corporates: <ul style="list-style-type: none"> * Contract-based funding • Public authorities / EU institutions: 	<p>Same as in physical hackathons</p>

	<ul style="list-style-type: none"> * Contract-based funding * Grants * Other 	
Key Activities	<ul style="list-style-type: none"> • Start-ups: <ul style="list-style-type: none"> * Open call and requirements, selection process design * Recruitment of volunteers and experts and work allocation * Scouting for sponsorships * Promotional campaign and outreach activities organisation – marketing support and communications * Technical equipment acquisition * Configuration of online tools / platforms * Provision of technical and administrative support to teams and experts/personnel * Legal support for data and IPR issues * Events planning • Large corporates: <ul style="list-style-type: none"> * Tender / funding proposal writing * Hackathon organisation * Challenge definition * Jury composition, role definition and recruitment * Monitoring and evaluation process design * Reporting of results and financials • Public authorities / EU institutions: <ul style="list-style-type: none"> * Tender / funding proposal writing * Hackathon organisation * Challenge definition * Jury composition, role definition and recruitment * Monitoring and evaluation process design * Reporting of results and financials 	<p>Key differences with the physical events:</p> <ul style="list-style-type: none"> • Planning of online events instead of physical ones • Flexible competition organisation (more extended deadlines, experts management etc.) • Online platforms necessary for competition management (e.g., platform for submission of ideas / solutions, online communication channels, teleconferencing etc.) • Venue acquisition and set-up is not required for online hackathons • Expanded geographic region of participating teams, experts, volunteers and other collaborators
Key Resources	<ul style="list-style-type: none"> • Infrastructure: <ul style="list-style-type: none"> * Venue * Furniture and workspace essentials • Personnel: <ul style="list-style-type: none"> * Administrative personnel * PR and communications experts * In-house technical experts * Volunteers and external experts * Legal experts • ICT, software and other material: <ul style="list-style-type: none"> * Technical equipment 	<p>Key differences with physical hackathons:</p> <ul style="list-style-type: none"> • Venue is optional for hybrid version and not required for online version • Reduced personnel effort for venue organisation activities • Higher needs for technical equipment and software for customer management and administration • Higher needs for hackathon management platforms (submission of proposals), expert guidance and other communications • Lower or zero hospitality and travel costs

	<ul style="list-style-type: none"> * Online software and platforms - optional • Financial resources: <ul style="list-style-type: none"> * Prizes and gifts * External funding (contract, grants etc.) * Sponsorships (monetary – in-kind) * Product placement revenue • Other: <ul style="list-style-type: none"> * Hospitality (food, drinks, etc.) * Travel costs for guest experts outside the region – optional • InnORBIT Digital Toolbox – Knowledge Hub • InnORBIT Capacity Building Programme • InnORBIT Business Support Programme / local space initiatives 	<ul style="list-style-type: none"> • Financial resources needed in proportion to other (non-financial) resources
Key partners	<ul style="list-style-type: none"> • Venue providers – optional • Equipment and software providers • External experts and volunteers • Sponsors • Local stakeholder community • Academia and research 	<p>Same as in physical hackathons – Extended geographical coverage</p>
Cost Structure	<ul style="list-style-type: none"> • Hackathon prizes and gifts • Venue costs, maintenance, and utilities • Furniture costs • Technical equipment costs • Personnel and outsourcing costs • External technical support costs • Graphic design and printing costs • PR and promotion costs (advertising etc.) • Hospitality costs (food, drinks, etc.) • Other event planning costs 	<p>Key differences with physical hackathons:</p> <ul style="list-style-type: none"> • Reduced or zero costs related to the acquisition and maintenance of a physical space / venue • Reduced costs for equipment provided to teams • Same or increased costs for equipment provided to personnel and experts • Zero printing costs • Lower or zero hospitality costs • Lower event-planning costs

The collection of business models presented in Section 5.2, could serve as the basis for a catalogue of customizable business models, not only for the innovation intermediaries of the consortium (COR, ALG, ROS) but also for any other innovation intermediary that is interested in implementing the methodology of InnORBIT to create value for their local space ecosystem. Combined with our custom-made ranking methodology conducted internally within the consortium, the results of which are reported in the next Chapter, a tool to guide innovation intermediaries into selecting the most sustainable business models for the local space initiatives could be developed. Such a tool would make InnORBIT’s programmes a key asset for the development of local space innovation ecosystems that is also aligned with the strategic development plan of their organisation.

Important remark on business models for the local space initiatives:

For the design of the InnORBIT local space initiative types offered by innovation intermediaries, we assumed that innovation intermediaries establish and operate them, relying only on internal capacities and resources, without any specific external support or funding. However, this does not reflect the fact that in most cases when establishing incubators, accelerators and organising hackathons, sustainability is achieved with considerable influx of external private or public / state support and funding.

In our analysis, this simplification was made to focus mostly on the operational aspects of organising such initiatives and to crystallise out value propositions, while leaving a degree of freedom to innovation intermediaries to select their own funding schemes or even fund the initiatives completely on their own, following their own business practices and strategic plan. Moreover, this choice was made to make InnORBIT's business models easily customisable and replicable across diverse settings and organisations.

6 Business model ranking

6.1 Purpose and approach of this activity

As demonstrated in the previous section, there are a lot of different business approaches that innovation intermediaries can take in order to efficiently support innovators into joining space innovation endeavours. In this context, the aim of this activity is to identify the Business Model design that's closer to the market and serves the InnORBIT objectives.

The methodology that was adopted, as well as the way it was delivered, have been briefly explained in Section 2, and specific details are available in Annex II, as well. This section will focus mainly on the results of the survey that was contacted within the InnORBIT consortium, that are considered experts for the needs of this study.

The ranking methodology employed at this stage of InnORBIT's business modelling approach aimed to facilitate the decision-making process for the selection and implementation of local space initiatives by InnORBIT's supported innovation intermediaries. The contribution of this exercise is three-fold to the development of such a methodology:

- **Define the most relevant questions that cover the broadest possible spectrum of dimensions pertinent to the evaluation and prioritization of potentially conflicting business models.** At this stage of the project, we employed and tested a set of questions created by the founders of Strategyzer, as a trustworthy source of expertise in business development
- **Rank the importance of the questions for the parameterisation of the business model selection process.** We asked partners to perform a ranking of the importance of each dimension of business model evaluation to find out which are the most relevant within InnORBIT's context.
- **Rank the most promising models for each business model selection dimension,** among the alternatives presented in Chapter 5. The outcomes of this ranking exercise are expected to support COR, ALG, and ROS in their 1st pilot round implementation of local space initiatives, inform the exploitation strategy of the project in general and finally, uncover potential improvements to be made in the methodology for its future use in other cases (e.g., external innovation intermediaries).

For easier reference, the questions included in the business models ranking questionnaire are provided in the coloured frame below.

Q1: How much does switching costs prevent your customers from churning?

Q2: How scalable is your business model?

Q3: Does your business model produce recurring revenues?

Q4: Do you earn before you spend?

Q5: How much do you get the other to do the work?

Q6: Does your business model provide built-in protection from competition?

Q7: Is your business model based on a game-changing cost structure?

The next section presents the results of the ranking exercise, on the basis of a questionnaire developed in Google Forms (available in Annex II). In subsection 6.2.1, the results of the ranking of questions' relative importance in business model selection are presented and in subsection 6.2.2, the ranking results of InnORBIT business models are presented.

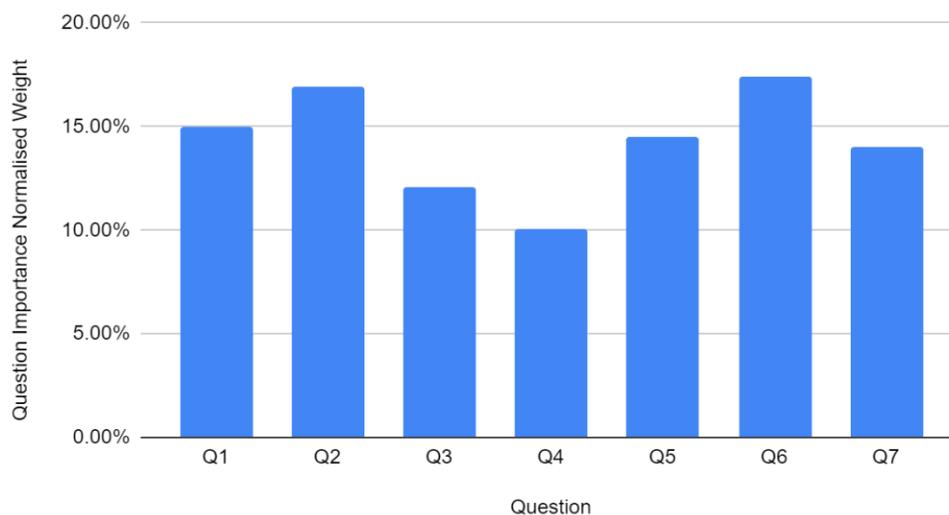
6.2 Ranking results

The BMC ranking questionnaire was circulated to the InnORBIT consortium partners for completion. All partners responded to the questionnaire at organisational level (one answer each). As QPL is involved in the development of the methodology, the questionnaire was completed internally by parties with good knowledge of the project but not directly involved in its implementation, to avoid bias.

6.2.1 Ranking of questions' relative importance

Starting with the importance of each question to the assessment of each BM by the InnORBIT experts, the average of the responses collected has been normalized and is presented in the below figure.

Figure 6: Importance of each of the seven Strategyzer questions for assessment of the InnORBIT Business Models



As presented in Annex II, the importance of each question was assessed on a Likert scale of 1 – 10⁶⁷ (with 10 signifying the highest possible importance), while the possibility of not answering was left as a choice to partners. Plain averages of responses for each question were calculated and then weighting coefficients were calculated, corresponding to the relative contribution of each question to the business model evaluation process (coefficients are expressed in percentages, ranging from 0-100% and their total sum is 100%).

From the results, we observe that the most important question, as perceived by our experts, is Q6 (*"Does your business model provide built-in protection from competition?"*) followed by Q2 (*"How scalable is your business model?"*). Combined these two questions allow for the assumption that the scalability in view of the existing competition is critical when designing the deployment of local space initiatives for space innovation. This fits with our market findings that suggest an erupting and highly volatile market that has started to shape. However, it remains to be seen how these concerns will actually materialize, as the necessary skills for delivering and scaling up such initiatives are currently absent (or at neonatal levels) from the respective market actors.

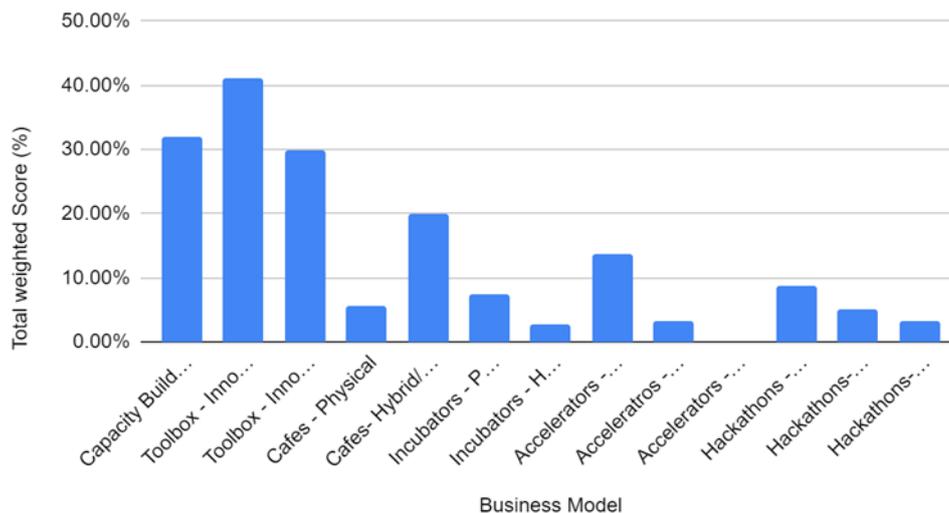
Another interesting finding from the above analysis is the fact that the least important question is Q4 (*"Do you earn before you spend?"*), which leads to the assumption that the specific business direction requires investments and comes with marginal profits at the first steps of such local space initiatives. Nevertheless, as

⁶⁷ The '0' value was also included, but was suggested only in case the interviewee was not in a position to rate the question(s)

described in the respective business models, upon successful deployment, the revenue streams of some of the business models presented have the potential of becoming quite lucrative.

After determining the importance of each question, we proceeded to the ranking of the business models following the steps explained in Annex II. The results are presented in the following figure.

Figure 7: Ranking of the InnORBIT Business Models



Based on our analysis, the most promising InnORBIT business model is the one referring to the InnORBIT Toolbox and in particular the version that targets (and offers services to) innovation intermediaries with a total weighted score of 41.02%. If we consider also the second-best result, which is the Capacity Building / Train the trainers initiative with 32.04%, it is apparent that in the current space innovation landscape, business models that target the upskilling or re-skilling of innovation intermediaries, either directly (i.e., through the CBP) or indirectly (i.e., through the Toolbox) hold the highest market value, as always perceived by InnORBIT experts.

Following, with 29.89%, the Toolbox for Innovators reveals a clear need for this target group to gain access to aggregated knowledge, supported by asynchronous training, and access to key information for networking either in terms of events (including local space initiatives) or funding opportunities.

Focusing more on the initiatives that are part of the Business Support Programme (BSP), the most valued business model is the hybrid version of the Space Café(s) with 20%, followed by physical Accelerators (13.68%) and Hackathons (8.8%). This order leads to the assumption that there is a high market request for raising awareness on space innovation and transferring knowledge to the innovators through casual activities / events that are more compact, brief, and easy to attend either physically or remotely. This fact is also supported by the fact that all three InnORBIT intermediaries (i.e., ROS, COR, ALG) have selected to commence their activities in the 1st pilot round with a Space Café initiative, which will effectively introduce the project to their ecosystems, and pave the path to other local space initiatives, such as Hackathons and Accelerators.

It needs to be noted that, even though other hybrid or online versions of initiatives such as Incubators, Accelerators, and Hackathons have been ranked with the lowest scores, they are still considered as viable options, especially under the restrictions imposed due to the COVID-19 pandemic (and the most recent *omicron* version).

6.2.2 Experts' feedback on the ranking questionnaire

To assess further potential uses of this methodology for other end-users of InnORBIT's programmes and services, we asked the consortium partners to provide a qualitative assessment of the questionnaire through a comments' section in the end. The implementation of this methodology had some shortcomings that could be addressed for its further improvement.

7 Business model evaluation for local space initiatives

To failproof our methodology, in parallel with the ranking exercise, we asked the three consortium innovation intermediaries (i.e., ROS, COR, and ALG) to directly evaluate the business models that correspond to the local space initiatives they have planned for the 1st pilot round, through a qualitative assessment. Thus, a second questionnaire was deployed in parallel with the one circulated for the ranking of business models. This questionnaire contained questions that aim to investigate the level of appropriateness of the developed business models to the specificities of each of the 3 pilot partners.

As the selection of business models was not final at the moment of performing this survey, the three pilot partners responded using the available knowledge they had about their local space initiatives to the best of their abilities.

The first table presents the qualitative evaluation of the business models created, for the Croatian space initiatives.

Table 17: Evaluation of the Business models for the Croatian pilot

Evaluation Question / Criteria	Innovation Intermediary Response
Which Initiative / Business Model have you selected for deployment?	<i>Cafes- Hybrid/Online*</i>
Is the Initiative aligned with your Business Strategy?	<i>It is very nicely as it will help educate our local network about the potential related to space research. We are at a very early stage of knowledge regarding initiatives in general. Space cafes are a great introductory methodology.</i>
Is the customer segment identified aligned with your current customers or with a segment you want to expand to?	<i>Yes, it is aligned as we want to tap into our current network and also consider the potential wider marketing can bring.</i>
Can you provide tangible benefits to your customers & portfolio of innovators through such an Initiative / Business model?	<i>We absolutely can as want to create a knowledge hub where there is currently very little available. Benefits will be coming as soon as we hold cafes and garner interest from those who attend the information sessions and are keen to continue learning and will potentially look at what space research can offer to them in their own capacities, either as students, or business entrepreneurs, etc.</i>
Is there a market big enough to ensure sustainability and replicability for the selected initiative?	<i>At this point, we hope that even through our own student enrolment and the wider network we currently have, that that market alone can provide a good base for interest for years to come.</i>
Do you have the resources and channels required to support the deployment of the initiative (during and after the project has ended)?	<i>Yes, we have channels to some extent-- we have social media networking, etc., but the resources in terms of the actual information is what we look for through the project. As for resources in terms of</i>

	<i>planning and holding the actual events, we are experts of doing those sorts of things. We have a very strong in-house team of people for event planning and execution.</i>
Please provide anything else that you believe it's important for your selection.	<i>We would like as much support as possible with the types of themes we would like to present through Space Cafes, in the forms of speakers and potential seminars that can be adapted to a hybrid model.</i>
What would you change in the selected BMC to best suit your organisation?	<i>I would add that revenue streams can also include the cost of participation itself to one of the cafes. As we also have heard, we need to build in the costs related to any food or beverages, etc. so that is considered a revenue stream also (although with expenditures nearing profits to zero)</i>
Do you think you will be able to successfully deliver your local space initiative towards achieving the project's KPIs in case of a worsening COVID situation? What types of mitigation measures do you foresee to implement in such case?	<i>Yes, I believe so, as the hybrid format allows for it to go fully online, which the university has had to have been using for the past school year due to the pandemic.</i>

**This is the final selection of local space initiatives deployed by ALG in the 1st pilot round.*

The next table presents the responses provided by COR for the alignment of the developed business models to the Greek case.

Table 18: Evaluation of the business models for the Greek pilot

Evaluation Question / Criteria	Innovation Intermediary Response
Which Initiative / Business Model have you selected for deployment?	<i>Cafes- Hybrid/Online</i>
Is the Initiative aligned with your Business Strategy?	<i>Space cafes are aligned with our Business Strategy in order to support the space ecosystem</i>
Is the customer segment identified aligned with your current customers or with a segment you want to expand to?	<i>Local and external space ecosystems, innovators, SMEs, entrepreneurs, and organisations related to space are aligned to our current networking.</i>
Can you provide tangible benefits to your customers & portfolio of innovators through such an Initiative / Business model?	<i>Space Community Building and networking are strong benefits for all the stakeholders of the space cafe initiative. Awareness of the updates of the space sector will be achieved. The role of the innovation intermediary to be a contact point for all issues related to space in Greece will be upgraded.</i>

Is there a market big enough to ensure sustainability and replicability for the selected initiative?	<i>The initiative of space cafe will not only be focused on Greek space sector but also on European space ecosystem</i>
Do you have the resources and channels required to support the deployment of the initiative (during and after the project has ended)?	<i>Existed channels will support the deployment of the initiative.</i>
Please provide anything else that you believe it's important for your selection.	<i>The awareness of and the discussion on key and new space topics, connecting experts, SMEs and academic sector</i>
What would you change in the selected BMC to best suit your organisation?	<i>Nothing for now. During the implementation aspects may change.</i>
Do you think you will be able to successfully deliver your local space initiative towards achieving the project's KPIs in case of a worsening COVID situation? What types of mitigation measures do you foresee to implement in such case?	<i>The initiative will be implemented as a digital event.</i>

*COR announced after the implementation of this survey that beyond their space café initiative, also a space hackathon will be deployed in Greece.

The next and final table presents the responses provided by ROS as part of the evaluation of business models to the Romanian case.

Table 19: Evaluation of the business models for the Romanian pilot

Evaluation Question / Criteria	Innovation Intermediary Response
Which Initiative / Business Model have you selected for deployment?	<i>Cafes- Physical*</i>
Is the Initiative aligned with your Business Strategy?	<i>Yes, ROS seeks to encourage participation in national and international programs and projects of national scientific and industrial entities by promoting conditions to optimize their participation.</i>
Is the customer segment identified aligned with your current customers or with a segment you want to expand to?	<i>The customer segment that we would like to address is comprised of existing "customers" space entities that we already have an established connection, but we do not exclude the expansion in other segments such as University students and young professionals that are not associated with the space field and would like to open a start-up.</i>

<p>Can you provide tangible benefits to your customers & portfolio of innovators through such an Initiative / Business model?</p>	<p><i>A space cafe is by nature a networking event, by expanding the network and promoting awareness we increase the possibility of a viable variety of possible associations that may lead to the creation of new start-ups or ideas for product emergence.</i></p>
<p>Is there a market big enough to ensure sustainability and replicability for the selected initiative?</p>	<p><i>The market is restricted to a few start-up initiatives that gather professionals not necessarily in the space field. By bringing InnORBIT and deploying a new initiative we would increase the knowledge and the potential of creating a new market.</i></p> <p><i>The networking events in Romania are rare and mostly comprised of efforts geared toward the IT community but we have not seen many branching into space. Our proposal would be to bring together people from different domains that have not yet taken into consideration a branch out into space or see space as a viable business avenue in the near future.</i></p>
<p>Do you have the resources and channels required to support the deployment of the initiative (during and after the project has ended)?</p>	<p><i>We have a network of space professionals that would be willing to join such an initiative, as for resources we have a small team that will handle the event planning and execution. We are also keen to expand and engage different other channels of communication with growth potential. We expect to get from InnORBIT guidance and expertise on how to guide the events and potential tips and tricks in order to create memorable and enjoyable events that spark interest and contribute to expanding the network.</i></p>
<p>Please provide anything else that you believe it's important for your selection.</p>	<p><i>I think a common brainstorming session in terms of subjects and themes would be beneficial and if it is possible to maybe create a shared topic pool. Of course support is key.</i></p>
<p>What would you change in the selected BMC to best suit your organisation?</p>	<p><i>In terms of organizing the cafes we would like to also gather some sponsors to help with the costs for beverages and location fees. Also, we could negotiate with the venues and somehow have an entrance fee (ex: for the duration of the space cafe you are expected to purchase a coffee and a cake from the bar, etc)</i></p>

Do you think you will be able to successfully deliver your local space initiative towards achieving the project's KPIs in case of a worsening COVID situation? What types of mitigation measures do you foresee to implement in such case?

We would add as a backup going hybrid or online. It should not be a problem.

**ROS announced after the implementation of this survey that beyond their space café initiative, a series of info days and a space hackathon will be deployed in Romania.*

8 Conclusions and next steps

InnORBIT’s **D5.4 “Business models for local initiatives supporting space innovation”**, incorporated a comprehensive analysis of InnORBIT’s broader market (commercial space industry of Eastern Europe) and the markets in which our 3 consortium partners COR (Greece), ALG (Croatia), and ROS (Romania) will deploy their local space initiatives, building upon the latest market insights and InnORBIT’s studies.

Business models were developed for the project’s main assets and the local space initiatives with a view to creating a network of value around InnORBIT that will not only benefit the 3 pilot partners, but hopefully other innovation intermediaries interesting in employing InnORBIT’s programmes to support space entrepreneurs, while this exercise will provide valuable insights for the exploitation strategy of the project throughout its course. For the development of business models as well as their variations, we relied heavily on the expertise of the InnORBIT consortium through one-to-one discussions as well as through 2 thematic workshops.

The business model variations were assessed through a custom-made business model ranking exercise to find out the most promising models for the three pilot partners as well as for the whole project. As a final step, the developed business models corresponding to the local space initiatives implemented in Greece, Croatia and Romania have been evaluated by the pilot partners to ensure that the business models are well-defined and aligned to their organisations’ strategic development plans, interests and needs.

The **key outcomes** of this report are summarised in the table below:

InnORBIT’s target market
<ul style="list-style-type: none"> • The target market of InnORBIT is the commercial space industry with a focus on training the trainers (innovation intermediaries) and providing business support services to space and non-space entrepreneurs. • The geographic scope of InnORBIT extends across the whole Eastern European area with special focus in Greece, Croatia, and Romania where the three consortium partners (COR, ALG and ROS) piloting InnORBIT’s programmes and services are located.
InnORBIT’s services and exploitable assets
<p>The core InnORBIT services were well-defined for better marketability. More specifically the list of InnORBIT’s services includes:</p> <ul style="list-style-type: none"> • Digital Toolbox and Knowledge Hub • Capacity Building Programme • Local Space initiatives supported through the Business Support Programme <ul style="list-style-type: none"> ○ Space Incubators ○ Space Accelerators ○ Space Hackathons ○ Space Cafés <p>The commercialisation of these services will be continuously supported at broader and local contexts through the Exploitation and IPR management strategy as well as the Business planning of InnORBIT.</p>

Updated market analysis

- Target market size and value:** The space sector is a market that is on the rise at global and EU level, achieving sustainable growth rates creating amazing opportunities for a broad spectrum of space and non-space companies. The EU has long treated space as a sector of strategic importance, evident through the programmes and initiatives in place to drive its growth (ESA, EUSPA, CASSINI, Copernicus, Galileo, EGNOS etc.). While Eastern Europe countries are still far behind compared to the leading EU nations in space, their integration in the EU space ecosystem is in progress. Greece, Romania, and Croatia have an emerging space sector that has a great potential for development.
- Customer segments:** InnORBIT supports virtually the whole spectrum of actors present in space innovation ecosystems at a local level - **innovation intermediaries, companies, policy, academia, investors, etc.** through its services. **Innovation intermediaries are the core customer segment**, receiving training and support through the capacity building programme and being empowered to establish local space initiatives for the benefit of their local ecosystems. The rest of the customer segments are served through participation in the local space initiatives established by innovation intermediaries.
- Market needs:** The market needs in the space sector of Eastern European countries were identified and analysed in previous studies of the project (D1.1, D1.2 and D1.3). InnORBIT's programmes and services are well-adapted to the market needs since their design phase. InnORBIT's value propositions are mapped directly to these needs to further crystallise their customer-oriented character. The core needs that InnORBIT responds to, include but are not limited to: (i) proper awareness of the space market and its underlying opportunities for various non-space industries, (ii) well connected local ecosystems involving actors from the quadruple helix, (iii) orientation of space research to the market and business, (iv) improved funding opportunities.
- SWOT analysis:** The InnORBIT consortium collectively possesses a strong skill set and access to networks to substantially support the delivery of the project's value propositions to its customers / end-users. Risks are present but are well manageable through internal project processes. The three innovation intermediaries (COR, ROS and ALG) have strong teams and are considered experts in their respective field of expertise and are well-respected in their respective ecosystems. The three partners face threats that are common in developing space ecosystems and the InnORBIT consortium to back-up their efforts.
- Competition:** InnORBIT faces competition in various fronts, due to the large collection of programmes, tools and services offered to its end-users. Competition is stronger in the case of some of the services provided such as hackathons, incubators, accelerators and the digital toolbox, while some services are quite uncommon in the target market thus facing moderate or virtually non-existent competition in their value propositions – such as the CBP, the knowledge hub and space cafes. The project has initiated synergies and alliances with organisations and initiatives with some potentially competitive organisations and initiatives to strengthen its positioning in the market. The competition at local level is still largely unexplored, as innovation intermediaries will employ their own strategies to address this issue.
- Collaborations:** InnORBIT has developed a strategy to synergise with prominent organisations in the EU space, finance and entrepreneurship ecosystems to receive support for the improvement of its services, widen their scope, achieve better connection with the market and increase their outreach.

<ul style="list-style-type: none"> • External environment (PEST analysis): The external environment in Eastern European countries and especially in Greece, Romania and Croatia is in general quite conducive for the development of space innovation ecosystems. However, several challenges exist, including the recent COVID-19 pandemic, persistent brain drain phenomena and loss of talent, as well as a peripheral role in space technology advancement.
Business models
<p>Using the Business Model Canvas and the Value Proposition Canvas, 13 business models have been developed. Six baseline models have been developed for the InnORBIT’s Digital Toolbox / knowledge Hub, Capacity Building Programme and Local Space Initiatives (space incubators, accelerators, hackathons and cafes) as well as meaningful variations, either for alternative customer segments or delivery formats (online, hybrid).</p> <p>InnORBIT’s business models focus on the operational aspects of organising and establishing local space initiatives, expanding on business modelling elements that hold true basis in most countries and innovation intermediary types. The establishment of local space initiatives requires in most case considerable external private and public support and funding which is left to the discretion of the innovation intermediaries.</p>
Business models ranking
<p>A business model ranking methodology was employed for the prioritisation of InnORBIT’s business models per type and variation. A questionnaire consisting of 7 questions was employed, adapted from the Strategyzer blog. This methodology is largely quantified to create the basis for the creation of an automated decision-support tool for the consortium as well as innovation intermediaries receiving InnORBIT’s services. The InnORBIT consortium performed the ranking analysis which contributed in two ways:</p> <ul style="list-style-type: none"> • Initial parameterisation of decision-making: The weighting exercise revealed the most important dimensions for the selection among competing business models, among the seven questions provided. <i>“Does your business model provide built-in protection from competition?”</i> and <i>“How scalable is your business model?”</i> were found to be the most important questions at this initial stage. • Business models ranking: The selection of the top-performing business models across each of the 7 dimensions / questions. Taking into account the weights assigned to each dimension, the most important business models were found to be the ones for the Capacity Building Programme and the Digital Toolbox / Knowledge Hub. The local space initiatives that performed the best were: Hybrid Space Cafes, followed by Physical Space Accelerators and Space Hackathons.
Business models evaluation
<p>The business models for InnORBIT’s CBP and Digital Toolbox / Knowledge Hub as well as those for the local space initiatives were created after one-to-one and plenary consultations with the InnORBIT consortium. A business models evaluation questionnaire was circulated among the three pilot partners to reaffirm that the developed business models are well-tailored for the local space initiatives they will establish in the 1st pilot round as well as their regional context/market. The results confirmed that the business models are well placed with respect to COR, ROS and ALG’s:</p> <ul style="list-style-type: none"> • Business strategy of the organisation • Targeted local customer segments

- Expected benefits for the organisation and ecosystem
- Expected resources devoted for implementation
- Sustainability and scalability of local space initiatives
- Unforeseen events (e.g., COVID-19)

As a result of this activity, InnORBIT is considered well positioned to be successful in the commercial space industry and more specifically on the train-the-trainers and business support service provision market segments. At the same time, the consortium innovation intermediaries are well prepared to deploy sustainable initiatives in their respective ecosystems. The value propositions of InnORBIT are well defined with a view to address the current market needs within the space sector in Eastern Europe, as well as the specific needs of market actors in Greece, Romania, and Croatia. Finally, the approach followed for business modelling is finely balanced and flexible enough to be adapted to innovation intermediaries of diverse profiles of Eastern European countries, be they active in space or non-space domains, aiming to fully support intermediaries to be engaged in the 2nd pilot round.

The business modelling methodology employed in this report is only the first step of a more ambitious effort to create business plans for the local space initiatives and the digital toolbox of InnORBIT that will be elaborated in **D5.6 Business plans for InnORBIT's initiatives and digital toolbox** in the end of the project. During the 1st pilot round implementation, the assumptions of the developed business models will be validated by the end-users of InnORBIT's services and local experts. All collected evidence collected on the performance, evaluation and impact of local space initiatives will be used to build concrete business plans for each initiative in Greece, Croatia, and Romania. Along the entire process, we will be conducting thorough financial analyses to shed ample light on further investments that may be required and to produce feasible **financial plans and solutions** that can be employed to support the sustainable post-project operation of the initiatives. In result we will produce a **business planning guide** for innovation intermediaries to serve as a roadmap for establishing sustainable local space support initiatives across EU.

Annexes

Annex I – Conceptual Models and Tools

‘Five Cs’ Market Analysis

The so-called ‘Five Cs’ of Marketing are used to analyse the five key areas that are involved in marketing decisions for a company. They offer guidelines for making the right decisions and constructing a well-defined marketing plan and strategy. 68 The ‘Cs’ included in this tool are:

- **Customers:** Definition of customer segments and their particular needs;
- **Company:** Assessment of the current situation of the project consortium employing a mainstream “SWOT” analysis;
- **Competitors:** Identification and analysis of both actual and potential competition with a view to revealing market gaps and respective opportunities;
- **Collaborators:** Identification of the most suitable partners with which the project partners will have to collaborate for the needs of their commercial endeavour; and
- **Context:** Analysis of the context within which the project partners will operate through a “PEST” analysis.

Value Proposition Canvas

The **Value Proposition Canvas**⁶⁹ is composed of two parts: Customer Profile (Figure 13, right) and Value Map (Figure 13, left).

With the **Customer Profile** we visualise, understand and track the customers we intend to create value for. More particularly, we describe:

- **Customer Jobs**, i.e. that the customers are trying to get done. These jobs may be functional (like getting from A to B), social (like building a good reputation) or emotional (like gaining peace of mind).
- **Customer Pains**, which represent the hurdles that annoy the customers while they are trying to get their job done. They are the negative outcomes that customers hope to avoid, like dissatisfaction about existing solutions and challenges, frustrations, risks or obstacles related to performing a job.
- **Customer Gains** describe how customers measure the success of a job well done, for example through concrete results, benefits and aspirations.

With the **Value Map** we make explicit how our products and services will relieve pains and create gains for customers. We use it to design, test and iterate our value proposition until we come up with a proposition that resonates with the customer profile. More particularly, we describe:

- The **Products and Services** that the value proposition builds on.
- The way these products, services and features act as **Pain Relievers**, how they reduce or eliminate pains customers care about, making their life easier.
- The way these products, services and features act as **Gain Creators**, producing, increasing or maximising the outcomes and benefits customers expect, desire or would be surprised by.

⁶⁸ <https://www.mbaskool.com/business-concepts/marketing-and-strategy-terms/11179-5-cs-of-marketing.html>

⁶⁹ Osterwalder, A., Pigneur, Y., Bernarda, G., Smith, A., Papadakos, T., Kyhna, J., & Nielsen, C. (2015). Value Proposition Design. *Journal of Business*, Vol. 3, No. 1, pp. 81-89.

A fit between **Customer Profile** and the **Value Map** is achieved by creating a clear connection between what matters to customers and how the provided services ease pains and create gains. **Great value propositions target essential customer jobs, pains and gains with clarity and accuracy.**

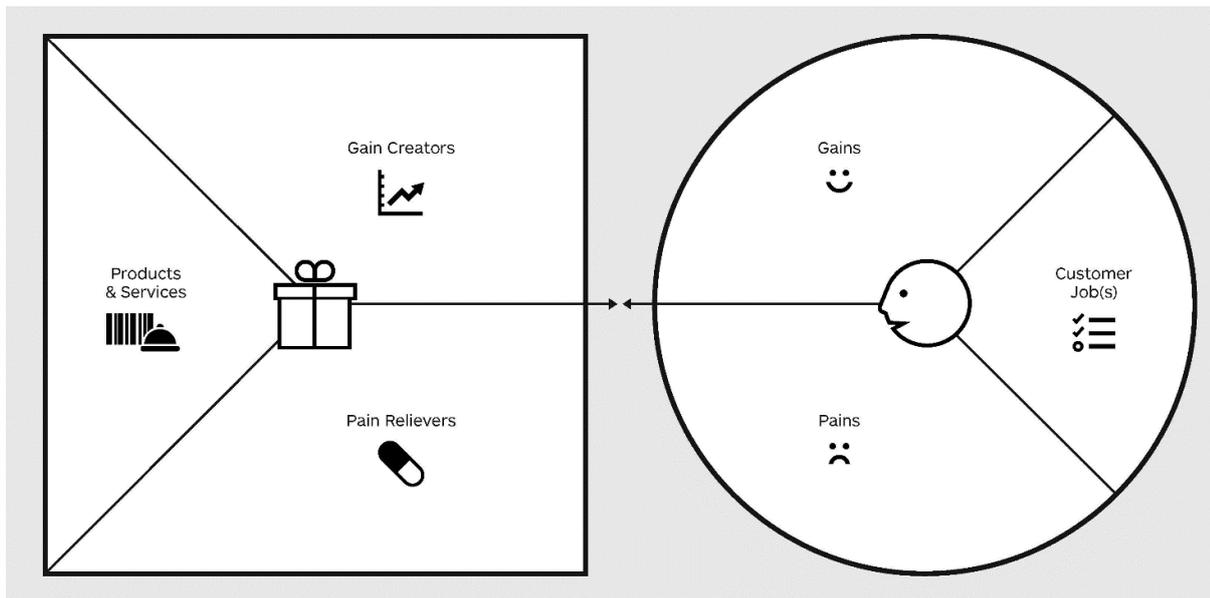


Figure 8: Conceptual representation of the Value Proposition Canvas
(www.strategyzer.com)

Business Model Canvas

The **Business Model Canvas**⁷⁰ represents as clear, concise and easy to implement tool that allows for the development of integrated and sustainable business models for any venture. The BMC methodology introduces nine building blocks (Figure 14). These include:

Table 1: Business Model Canvas building blocks

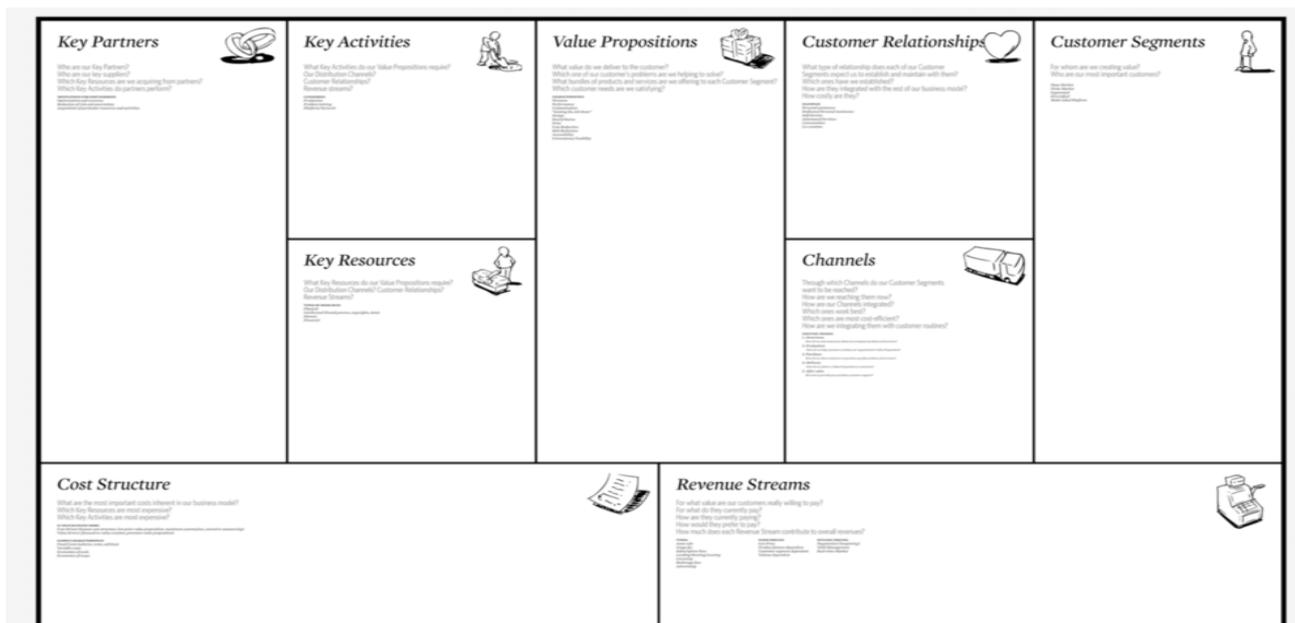
Customer Segments	<p>The Customer Segments building block is generally the first one to fill and defines the different groups of people or organisations an enterprise aims to reach and serve. Customers are grouped into distinct segments according to needs, behaviours, or other attributes. The organisation can choose which segments to serve and which segments to ignore and identifies the ones with the greater potential. When separating customers segments, it is recommended to bear in mind the following distinctive factors:</p> <ul style="list-style-type: none"> • Customer needs require and justify a distinct offer • Customers are reached through different Distribution Channels • Customers require different types of relationships • Customers provide different profits • Customers are willing to pay for different aspects of the product
Value Proposition	<p>The Value Proposition building block describes the bundle of products and services that create value for a specific customer segment. Value Proposition creates value by solving a customer problem and satisfies a customer need. Hence, it represents the key parameter</p>

⁷⁰ Osterwalder, A., & Pigneur, Y. (2010), "Business model generation: a handbook for visionaries, game changers, and challengers", John Wiley & Sons.

	<p>for selecting a certain service or product over another. Generated values may either be quantitative (e.g. price, speed of service), or qualitative (e.g. design, customer experience). A Value Proposition may be an innovative fresh offer to a new market, or it could penetrate an existing market providing modern features and attributes.</p>
<p>Channels</p>	<p>The Channels building block describes how a business communicates with its Customer Segments to deliver a Value Proposition. Communication, distribution and sales Channels comprise a company’s interface with customers. Channels are customer touch points that play an important role in the customer experience. The main distinct functions-phases that channels serve are:</p> <ul style="list-style-type: none"> • Raising awareness among customers about a company’s products and services • Helping customers evaluate a company’s value proposition • Allowing customers to purchase specific products and services • Delivering a Value Proposition to customers • Providing post-purchase customer support <p>Channels can be categorised either as direct, or as indirect, according to the immediacy of contact with customers. Also, a company can choose to reach its customers through its own networks, through partners’ networks, or through a mix of both. The selection of the right mix of channels depends on the cost or the preferable type of contact (e.g. partner channels are sometimes cheaper but less direct).</p>
<p>Customer Relationships</p>	<p>The Customer Relationship building block describes the types of relationships a company establishes with each specific Customer Segment. Relationships can vary from personal to automated. Customer relationships may be driven by the following motivations:</p> <ul style="list-style-type: none"> • Customer acquisition • Customer retention • Boosting sales (up-selling) <p>Usually, customer relationships change as the product cycle evolves (from introduction to maturity).</p>
<p>Revenue Stream</p>	<p>The Revenue Stream building block represents the cash a company generates from each Customer Segment (costs must be subtracted by revenues to create earnings). For what values each Customer Segment is willing to pay? Successfully answering this question allows the generation of one or more respective Revenue Streams. Each Revenue Stream may have alternative pricing mechanisms and may utilise different pricing mechanisms.</p>
<p>Key Resources</p>	<p>Key Resources have to do with the most important assets required to make a business model work. These resources allow a company to create and offer a Value Proposition in order to reach the targeted markets (through Channels), to maintain relationships with Customer Segments and to make revenues. Different Key Resources are needed depending on the type of business model. Key resources can be physical, financial, intellectual or human.</p>
<p>Key Activities</p>	<p>The Key activities Building Block describes the most important things a company must do to make its business model work. Every company calls for a number of Key Activities. Similarly to Key Resources, they are required to create and offer a Value Proposition, reach</p>

Key Partnerships	<p>markets, maintain Customer Relationships and make Revenues. Like Key Resources, Key Activities may differ depending on business model type and the area of activity of the company.</p> <p>The Key Partnership Building Block describes the network of suppliers and partners that make the business model work. Companies forge partnerships of several kinds and create alliances to optimise their business models, reduce risk or acquire resources. Four major different types of partnerships can be distinguished:</p> <ul style="list-style-type: none"> • Strategic alliances between non-competitors • Co-opetition; strategic partnerships between competitors • Joint ventures to develop new businesses • Buyer-supplier relationships to assure reliable supplies
Costs	<p>This building block describes the most important costs incurred while operating under a particular business model. Creating and delivering value, maintaining Customer Relationships, and generating revenue bear costs. Such costs can be calculated after defining Key Resources, Key Activities and Key Partnerships.</p> <p>Although some business models are more cost-driven than others, it is a necessity to consider cost minimisation in every business model. Nevertheless, low-cost structures are more important to some business models than to others. Therefore, it can be useful to distinguish between two broad classes of business model cost structures:</p> <ul style="list-style-type: none"> • Cost-driven business models • Value-driven business models

Figure 9: Conceptual representation of the Business Model Canvas
(www.strategyzer.com)



Annex II – Business Models ranking and evaluation methodologies

Business Model Ranking - Modified Strategyzer approach

For the ranking exercise, a simple questionnaire comprising a set of 7 questions from Strategyzer was circulated to all consortium partners.

Q1: How much does switching costs prevent your customers from churning?

Q2: How scalable is your business model?

Q3: Does your business model produce recurring revenues?

Q4: Do you earn before you spend?

Q5: How much do you get the other to do the work?

Q6: Does your business model provide built-in protection from competition?

Q7: Is your business model based on a game-changing cost structure?

Instead of performing an assessment for each of the proposed business models on an absolute basis, as presented by the initial Strategyzer approach, partners were asked to identify the 3 top business models that best respond to each question. For example, for Q2 the InnORBIT model that is perceived to be the most scalable would-be 1st, followed by the next most scalable model as 2nd, etc. The 1st, 2nd and 3rd models for each question are awarded 5, 3 and 1 point respectively, while the rest BMs gain zero points.

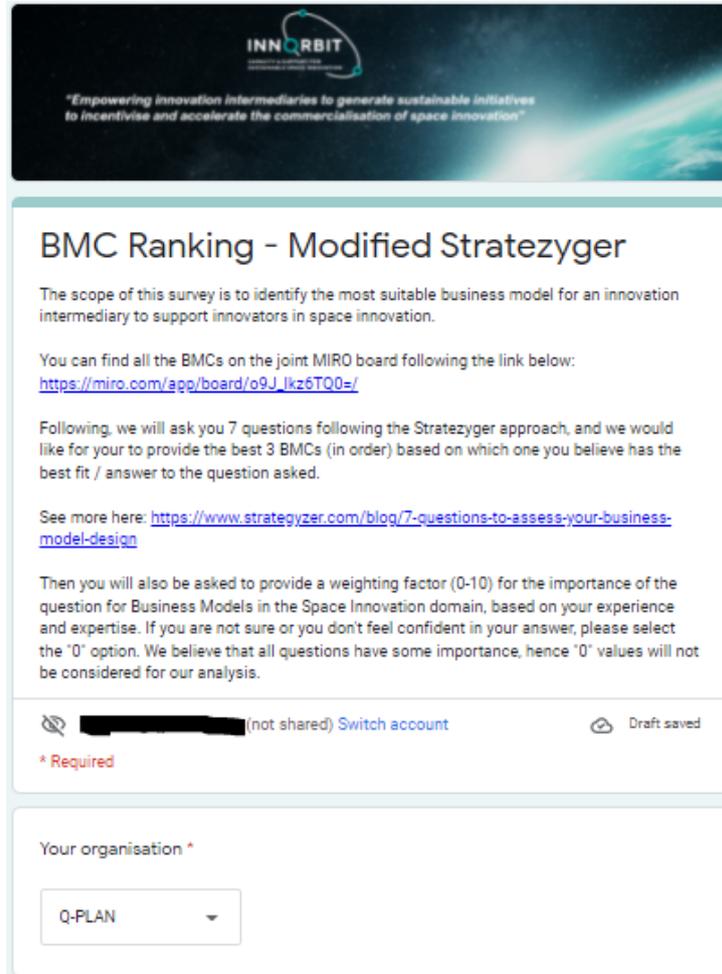
On top of that, partners have been asked to assess the importance of each question having in mind the context of assets and services provided by InnORBIT. For each question, partners were asked to assign a weighting factor ranging from 0 – 10 (where 0 was used in case no rating can be provided). The target of doing so, was to identify the importance of each of these questions from the perspective of experts in the space innovation domain. The weights extracted can be used to further assess future Business Models and rank them accordingly.

The overall score of a business model is determined by multiplying the scoring of each question (5, 3, 1 or 0 points) by the normalised average weighting factor assigned to each question. The business models are then ranked based on their overall scoring across all 7 questions of the questionnaire.

Business Model Ranking – Online Survey

https://docs.google.com/forms/d/e/1FAIpQLSc8dQvH31oF4h3C5iYHpNYIm8AI2GKSif_rDbfXDJS4-wOToQ/viewform

Some indicative screenshots of the online survey are provided below.



The screenshot shows a Google Forms interface for a survey titled "BMC Ranking - Modified Stratezyger". At the top, there is a header banner with the INNORBIT logo and the text: "Empowering innovation intermediaries to generate sustainable initiatives to incentivise and accelerate the commercialisation of space innovation". Below the banner, the survey title "BMC Ranking - Modified Stratezyger" is displayed. The main text of the survey explains its purpose: "The scope of this survey is to identify the most suitable business model for an innovation intermediary to support innovators in space innovation." It provides a link to a Miro board: https://miro.com/app/board/o9J_lkz6T00=/. It then asks the respondent to provide the best 3 BMCs (in order) based on which one they believe has the best fit / answer to the question asked. A link to a blog post is provided: <https://www.strategyzer.com/blog/7-questions-to-assess-your-business-model-design>. The survey also asks for a weighting factor (0-10) for the importance of the question for Business Models in the Space Innovation domain, based on the respondent's experience and expertise. Below the text, there is a user profile section showing a redacted name, "(not shared)", and a "Switch account" link. A "Draft saved" indicator is also present. A red asterisk indicates a required field. The first question is "Your organisation *", with a dropdown menu currently showing "Q-PLAN".

Q1. How much does switching costs prevent your customers from churning? *

	1st	2nd	3rd	N/A
CBP / Train-the-trainers	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Toolbox - Innovation intermediaries	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Toolbox - Innovators	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Cafes- Physical	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Cafes- Hybrid/Online	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Incubators- Physical	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Incubators- Hybrid	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Accelerators- Physical	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Accelerators- Hybrid	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Accelerators- Online	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Hackathons- Physical	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Hackathons- Online	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Hackathons- Hybrid	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

How important do you think Q1 is? *

0 1 2 3 4 5 6 7 8 9 10

Business Model Evaluation – Local Space Initiatives

The scope of the evaluation survey is to identify the business reasons that led the InnORBIT intermediaries (i.e., ROS, COR, and ALG) to the selection of the initiative(s) to be deployed during the InnORBIT's pilots. Once again, a simple questionnaire, comprising a set of several questions regarding the selected initiative's business model, was circulated only to the consortium's innovation intermediaries.

To further assist on the market research and support the evaluation of the business models, this survey also included 7 additional questions (out of which 4 of them were SWOT related) as can be seen below.

BMC Evaluation - Intermediaries' Selection

Q1: Which Initiative / Business Model have you selected for deployment?

Q2: Is the Initiative aligned with your Business Strategy?

Q3: Is the customer segment identified aligned with your current customers or with a segment you want to expand to?

Q4: Can you provide tangible benefits to your customers & portfolio of innovators through such an Initiative / Business model?

Q5: Is there a market big enough to ensure sustainability and replicability for the selected initiative?

Q6: Do you have the resources and channels required to support the deployment of the initiative (during and after the project has ended)?

Q7: Please provide anything else that you believe it's important for your selection?

Q8: What would you change in the selected BMC to best suit your organisation?

Q9: Do you think you will be able to successfully deliver your local space initiative towards achieving the project's KPIs in case of a worsening COVID situation? What types of mitigation measures do you foresee to implement in such case ?

Market research questions

Q1: Please provide a recent estimate of the national space market. Disaggregation in market segments is useful (downstream, upstream etc.). Pinpoint relevant sources if applicable.

Q2: SWOT analysis (1/4) - Please shortly state your organisation's strengths that you aim to capitalise upon for the delivery of your local space initiatives.

Q3: SWOT analysis (2/4) - Please shortly state any weaknesses inherent to your organisation that might affect the delivery of local space initiatives.

Q4: SWOT analysis (3/4) - Please shortly state the opportunities generated for your organisation through the implementation of local space initiatives.

Q5: SWOT analysis (4/4) - Please shortly state any threats your organisation faces in delivering local space initiatives.

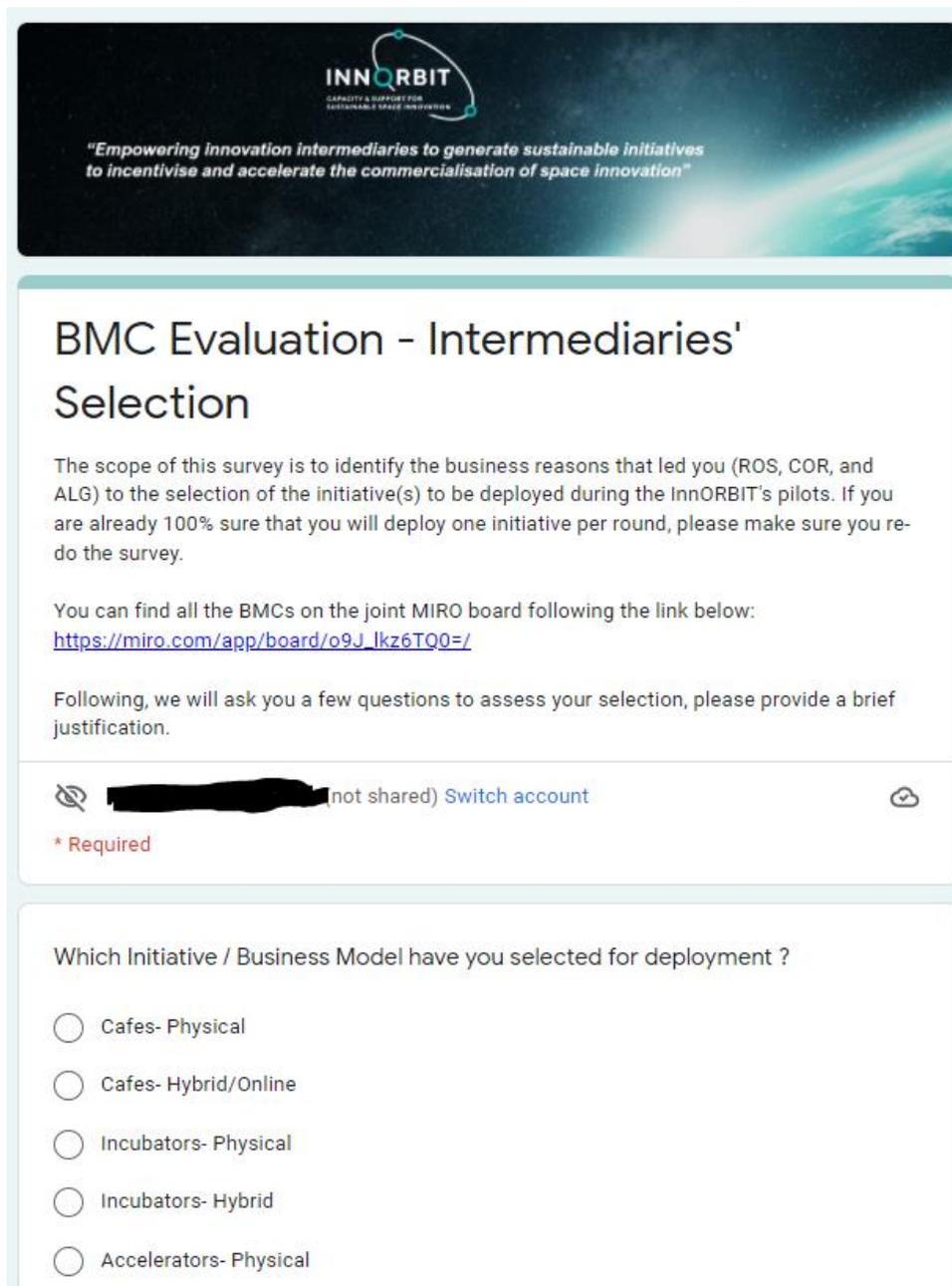
Q6: Which organisations do you think will be the main partners / collaborators in the organisation of your local space initiative? Please shortly describe the type of synergy sought.

Q7: Which organisation(s) do you think will be the main competitors in the delivery of your local space initiatives. If applicable shortly describe products/services, customer types, geographical coverage, pricing models.

Business Model Evaluation – Online Survey

https://docs.google.com/forms/d/e/1FAIpQLSdV8_hVU49vuMwU7IlhMVhn5stlu7sKoGxonZh8LjSaKn6Tvg/viewform

Some indicative screenshots of the online survey are provided below.



The screenshot shows a Google Form titled "BMC Evaluation - Intermediaries' Selection". At the top, there is a header banner with the INNORBIT logo and the text: "Empowering innovation intermediaries to generate sustainable initiatives to incentivise and accelerate the commercialisation of space innovation". Below the banner, the form title "BMC Evaluation - Intermediaries' Selection" is displayed. The main text explains the survey's purpose: "The scope of this survey is to identify the business reasons that led you (ROS, COR, and ALG) to the selection of the initiative(s) to be deployed during the InnORBIT's pilots. If you are already 100% sure that you will deploy one initiative per round, please make sure you re-do the survey." It then provides a link to a Miro board: "You can find all the BMCs on the joint MIRO board following the link below: https://miro.com/app/board/o9J_lkz6TQ0=/". A note follows: "Following, we will ask you a few questions to assess your selection, please provide a brief justification." Below this is a user interface element showing a profile picture (blacked out), the text "(not shared)", and a "Switch account" link. A red asterisk indicates a required field. The question "Which Initiative / Business Model have you selected for deployment ?" is followed by five radio button options: "Cafes- Physical", "Cafes- Hybrid/Online", "Incubators- Physical", "Incubators- Hybrid", and "Accelerators- Physical".

Is the customer segment identified aligned with your current customers or with a segment you want to expand to? *

Your answer

Can you provide tangible benefits to your customers & portfolio of innovators through such an Initiative / Business model? *

Your answer

Is there a market big enough to ensure sustainability and replicability for the selected initiative? *

Your answer

Do you have the resources and channels required to support the deployment of the initiative (during and after the project has ended) *

Your answer

Market research questions

Some questions related to your ecosystem that relate to business modeling, the answers of which we could not yet find in our research. Once again, these questions are addressed to COR, ALG, ROS only.

Please provide a recent estimate of the national space market. Disaggregation in market segments is useful (downstream, upstream etc.). Pinpoint relevant sources if applicable. *

Your answer

SWOT analysis (1/4) - Please shortly state your organisation's strengths that you aim to capitalise upon for the delivery of your local space initiatives. *

Your answer

SWOT analysis (2/4) - Please shortly state any weaknesses inherent to your organisation that might affect the delivery of local space initiatives. *

Your answer

SWOT analysis (3/4) - Please shortly state the opportunities generated for your organisation through the implementation of local space initiatives. *

Your answer

Annex III – Business Modelling workshops

Annex III.A - 1st Business Modelling Workshop – 19th October 2021



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InnORBIT Business Modeling workshop

Q-PLAN INTERNATIONAL
19/10/2021, GoToMeeting

PARTNERS









 This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101004212.

Outline – Objectives of today's workshop

- Introduction to business modeling for InnORBIT
 - Task 5.3 objectives and timeline
 - Business model canvas
 - Preliminary business model from proposal
- Agree on the business modeling approach to be followed
 - Which InnORBIT assets will be modelled?
 - How many BM variants will be developed?
- Agree on the BM ranking approach
 - Which method of ranking will be used?
 - Who participates in ranking?
 - Final output?
- Discuss the timeline towards drafting D5.4
 - Follow up activities in the Task
 - Work allocation and requested input from partners
- Initial brainstorming for business models



Objectives of Task 5.3 (DoA)

To develop business models for the sustainable operation of InnORBIT's tools and services and initiatives in the long term – even after the end of the project .

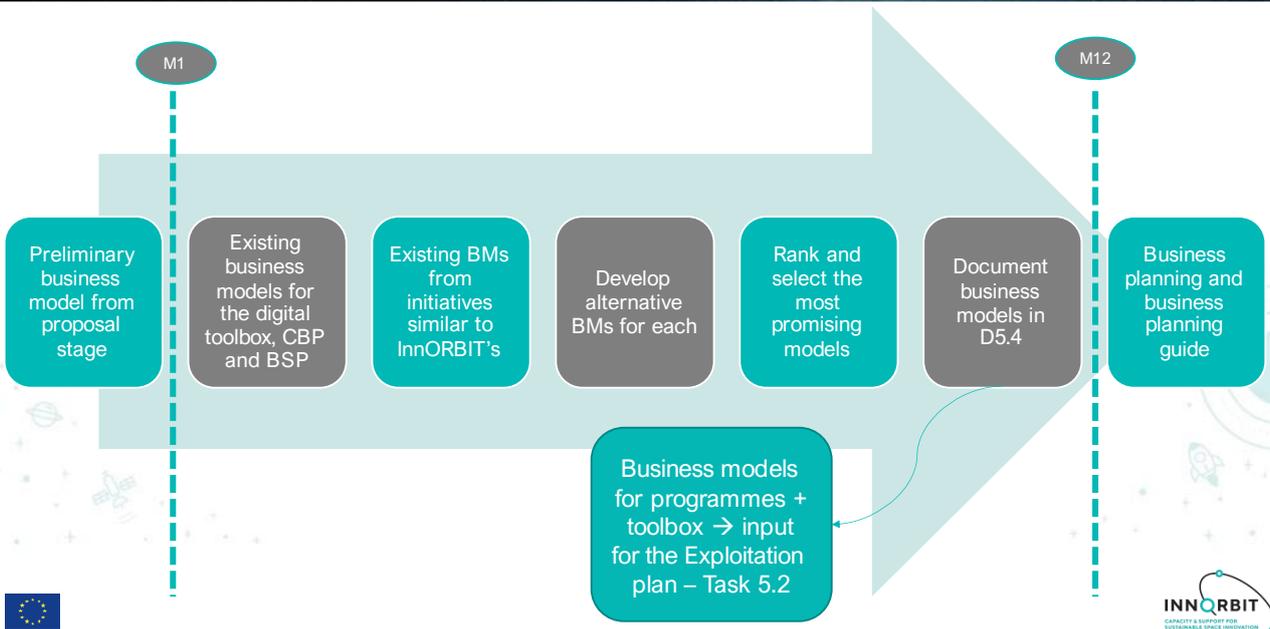
- Business modeling for:
 - Local space initiatives
 - Digital Toolbox
- Business planning for:
 - Local space initiatives
 - Digital Toolbox
 - Capacity Building and Business Support Programmes
- Business planning guide (Replication guide) – M12 to M30

Important for:

- Defining the value proposition for 2nd pilot innovation intermediaries
- Refinements of the programmes and toolbox
- Exploitation strategy and commercialization of project assets
- Business planning
- Replication guide (business planning guide)

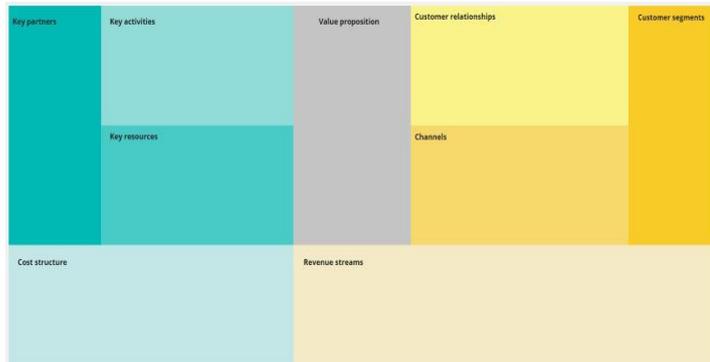


General Task 5.3 timeline

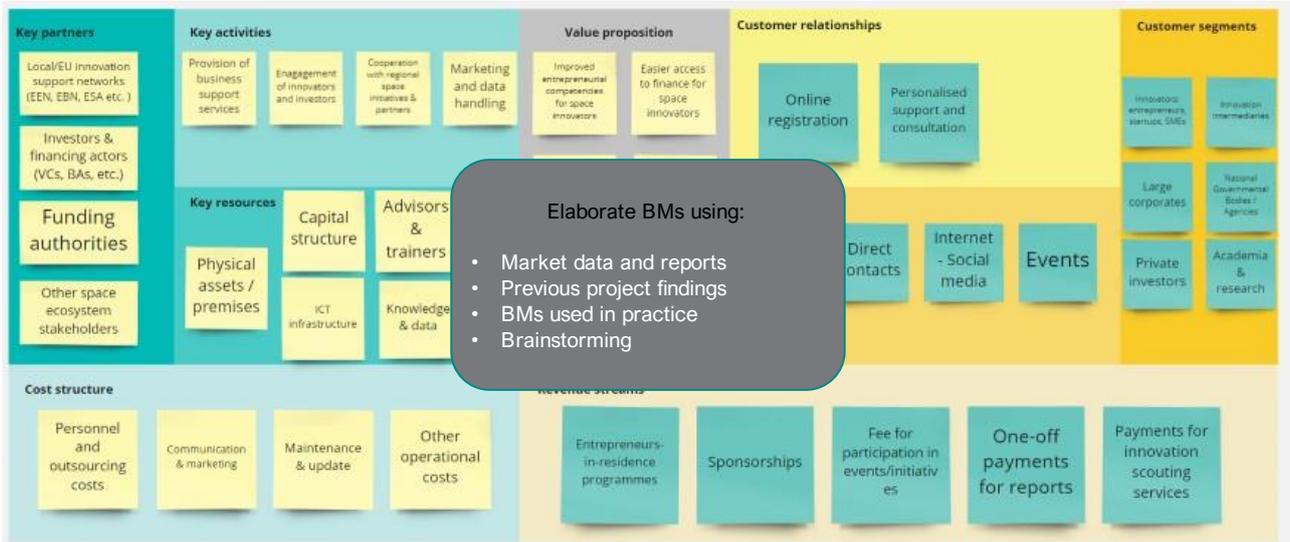


Business model canvas template

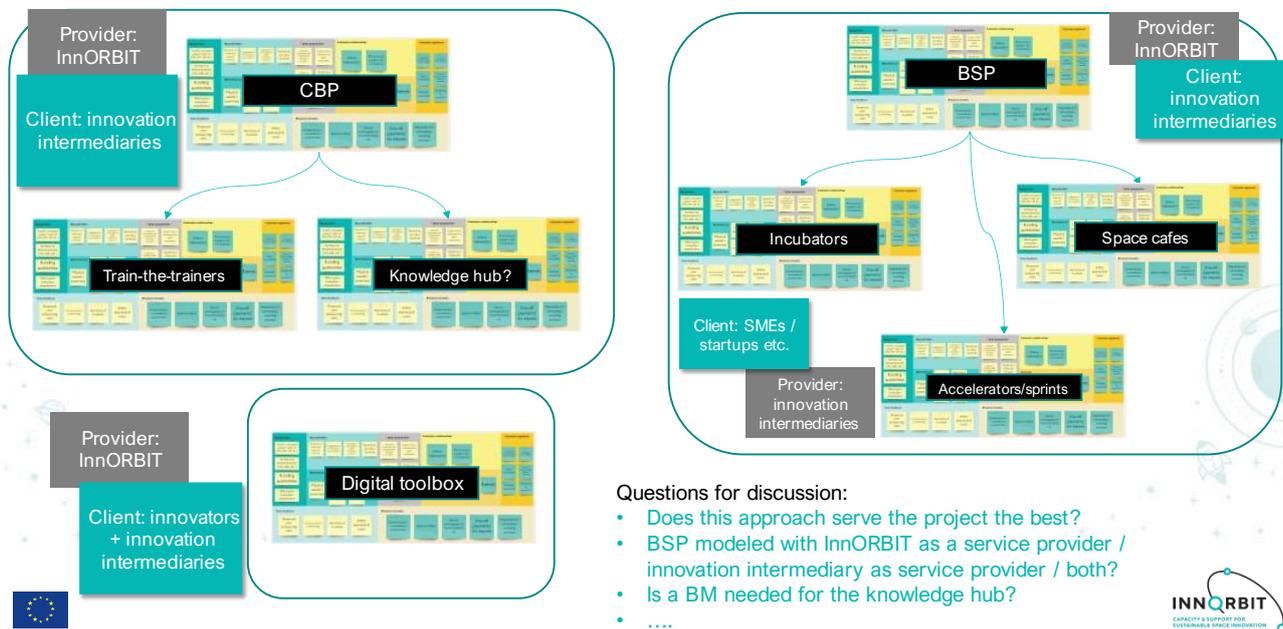
- Business models:
 - The business model canvas (BMC) is used
 - Hypotheses made for each BMC element
 - Alternative hypotheses formed leading to 2-3 BMs
 - Ranking to select the best model



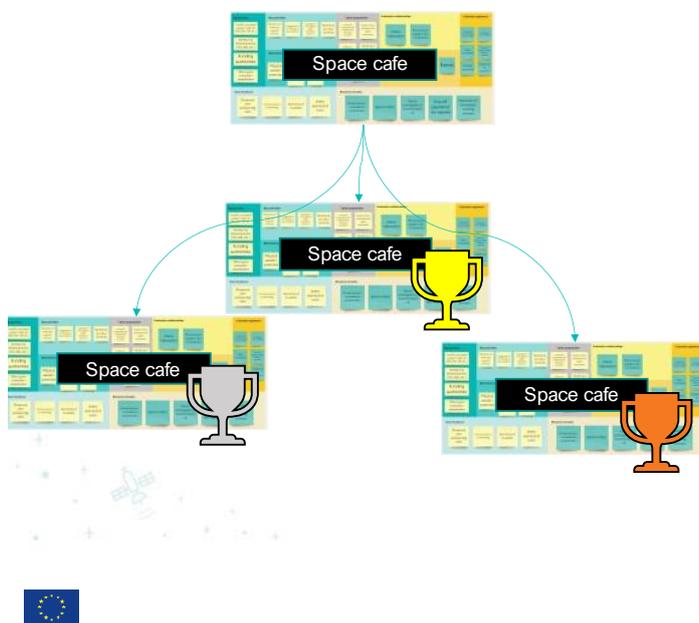
Preliminary business model from the proposal



InnORBIT business modeling approach



InnORBIT business modeling approach (cont'd)



Business model variations:

- Elaboration of 2-3 variations for certain business model types (e.g., initiatives)
- Ranking and selection of the most appropriate BMs – more info on the next slide
- Further refinement and documentation of the highest-ranking models

Topics for discussion:

- Is it meaningful to design model variations for all business models?
- What are the most meaningful variations?
-

InnORBIT business modeling approach (cont'd)

Business model ranking approaches:

- Analytical Hierarchy Process (AHP) – AHP based online tools**
 - Simplified implementation of the AHP
 - All elements imported to the tool
 - Decision made by the tool
 - Weights?
- Survey through questionnaires**
 - Evaluation of BMC elements (1-5 scale)
 - Evaluation of weights – what are the most important elements of the BM?
- Qualitative assessment of BMs**
 - Selection of the best BM from alternatives provided
 - Justification on high-level using free text
 - No metrics/weights used
- Other methodologies**
 - Strategizer
 - Mixed approach
 -



Level 0	AHP Hierarchy Level 1	Level 2	Gr. Pr.
	Stakeholders Commitment [0.688] AHP	Team [0.152] 1.2 %	
		Organizational [0.374] 3.3 %	
		Project Manager [0.751] 3.2 %	
	Financo [0.451] AHP	Return on investment [0.369] 4.1 %	
		Profit (US\$) [0.454] 20.6 %	
		Net Present Value [0.454] 20.6 %	
	Project Selection [AHP]	Ability to compete [0.567] 18.8 %	
	Strategic [0.374] AHP	Internal Processes [0.369] 3.0 %	
		Reputation [0.369] 11.8 %	
		Lower Risk [0.275] 3.8 %	
	Other Criteria [0.144] AHP	Urgency [0.079] 1.0 %	
		Technical Knowledge [0.640] 3.1 %	
			1.0

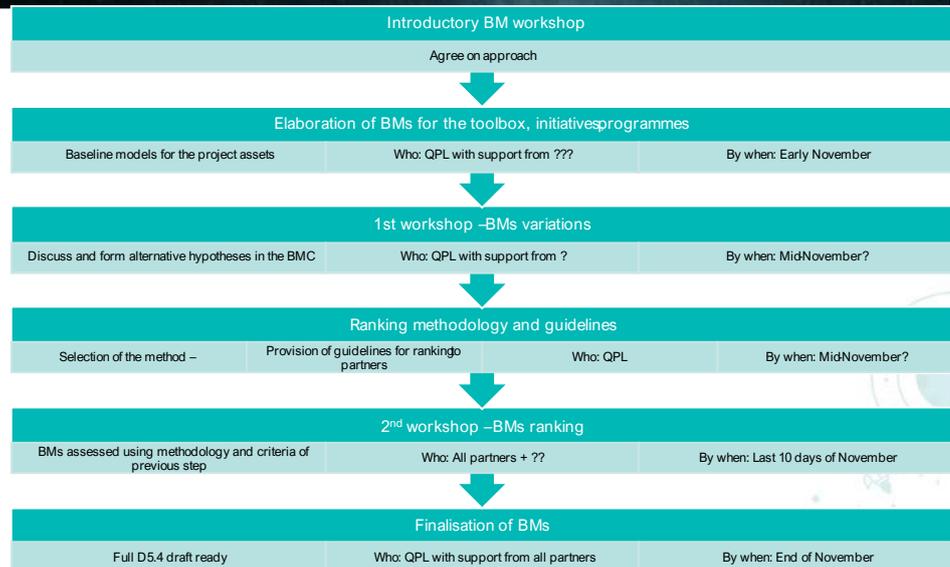
Topics for discussion:

- Thoughts about ranking methodologies? – Any used in practice? Impressions?
- Trade-off between complexity and accuracy
- Is it meaningful to ask external parties to participate in ranking? (e.g., AB members etc.)



Indicative timeline for next steps

- Tight timeline for this Task**
 - Review meeting next week
 - 1st pilot running
 - Agree on a common timeline to avoid bottlenecks
- High importance of this task for the project**
 - Active contribution needed from all partners



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Thank you!

VISIT: innorbit.eu

CONTACT: info@innorbit.eu

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[InnORBIT Project](https://www.youtube.com/channel/UCInnORBITProject)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101004212.

Annex III.B – 2nd Business Modelling Workshop – 19th November 2021

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2nd InnORBIT Business Modeling workshop

Q-PLAN INTERNATIONAL
19/11/2021, GoToMeeting

PARTNERS

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101004212.

Outline – Objectives of today's workshop

- Introduction to business modeling for InnORBIT
 - Task 5.3 objectives and timeline
 - Business model canvas
- Market analysis
- InnORBIT business models
 - Co-defined BMCs Walkthrough
 - Other Variations (i.e. Covid-19)
- Ranking Guidelines
 - General Ranking
 - Intermediary Ranking
 - Validation through pilot activities
- Discuss the timeline towards drafting D5.4
 - Follow up activities in the Task
 - Work allocation and requested input from partners



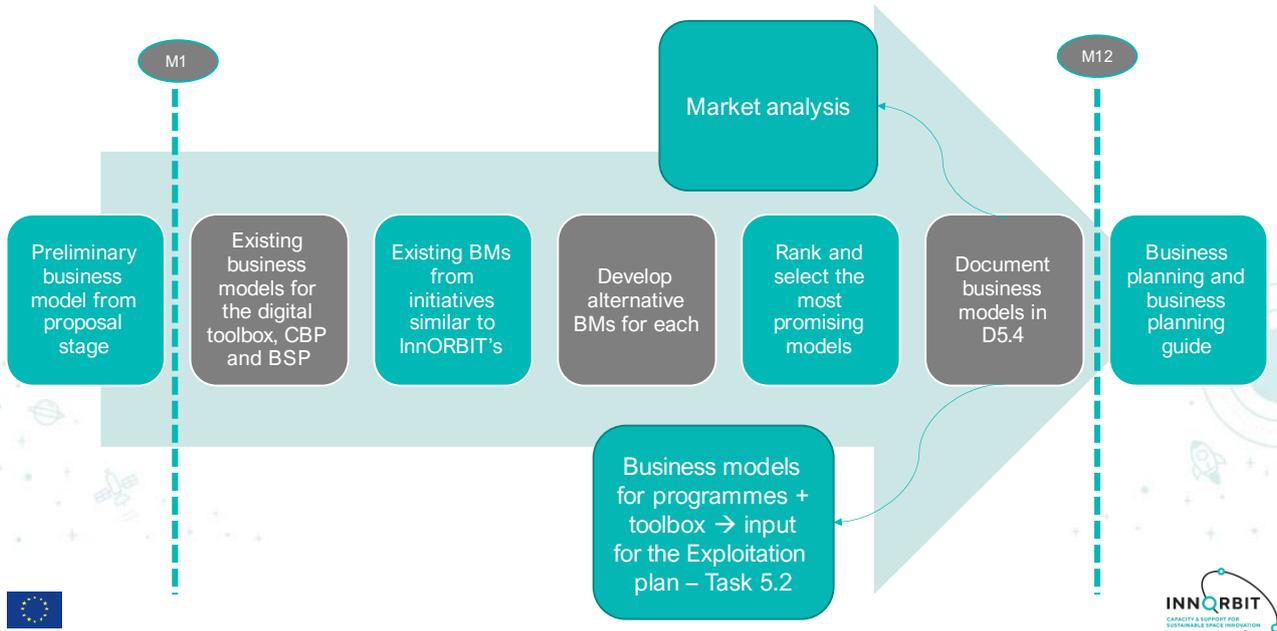


To develop business models for the sustainable operation of InnORBIT’s tools and services and initiatives in the long term – even after the end of the project .

- Market analysis (Greece, Croatia, Romania)
- Business modeling for:
 - Local space initiatives
 - Digital Toolbox
- Business planning for:
 - Local space initiatives
 - Digital Toolbox
- Business planning guide (Replication guide) – M12 to M30

<p>Important for:</p> <ul style="list-style-type: none"> • Defining the value proposition for 2nd pilot innovation intermediaries • Refinements of the programmes and toolbox • Exploitation strategy and commercialization of project assets • Business planning • Replication guide (business planning guide)

General Task 5.3 timeline



InnORBIT Business Models *Market analysis approach*



Market analysis

We follow a general-to-specific approach for the market analysis:

Global → European /EU → CEE/SEE → Greece, Romania, Croatia

Why?

- To understand the whole context of the market InnORBIT operates into
- To assess specificities of the 3 pilot partners' market and place into the context of the wider market

Dimensions addressed in the market analysis

- Target market and size
- Customer segments
- Market needs
- SWOT analysis of InnORBIT, COR, ALG, ROS
- Competition
- Potential collaborators
- External context– PEST analysis

Information sources:

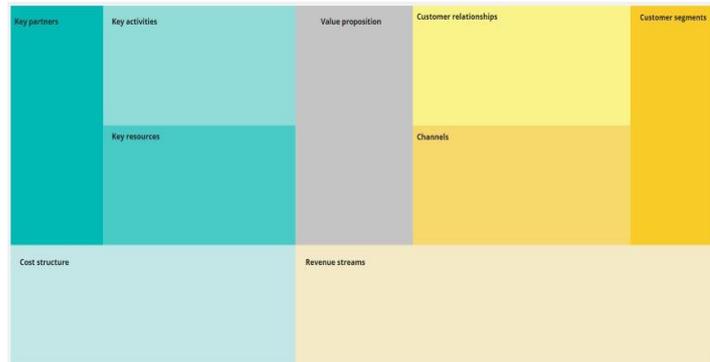
- D1.1 – Macroeconomic environment and ecosystems mapping
- D1.2 – Needs and challenges
- D1.3 – Co-creation workshop results
- Desk research of market intelligence and reports (STP contribution)
- Pilot partners contributions? (potential collaborators in the region, competition)

In progress



Business model canvas template

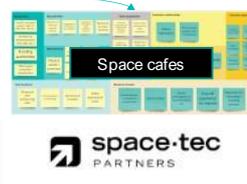
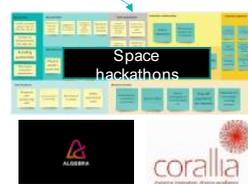
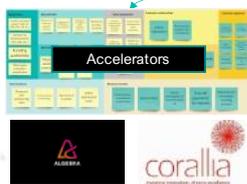
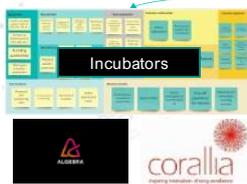
- Business models:
 - The business model canvas (BMC) is used
 - Hypotheses made for each BMC element
 - Alternative hypotheses formed leading to 2-3 BMs
 - Ranking to select the best model



InnORBIT business modeling approach



- Process followed:
1. Draft BMC
 - Preliminary BMC (InnORBIT proposal)
 - Strategy guides
 - D1.4/D1.5 & KoWppts (STP)
 - D2.1/D2.2/D2.3 (TTG)
 - External sources/publications
 - Similar experience from other projects
 2. Bilateral discussions with partners
 - Potential ownership (pending IPR)
 - Practical experience (space initiatives)
 3. Fine-tuned business models- Baseline version for each
 - Using partners insights and further research



+ Value proposition canvas



InnORBIT Business models walkthrough

- All business models were developed using the MIRO tool in the BMC format
- Available in link: https://miro.com/app/board/o9J_lkz6TQ0=
- Finding BM variations for local space initiatives is key for this step!



InnORBIT Business Models *next steps*



InnORBIT BMC Ranking - Methodology

Two ranking pathways to explore

- Which initiative Business Model makes more sense for supporting the selection of the initiatives to be deployed during the InnORBIT pilot rounds
- Which Business Model is the most promising for Innovation Intermediaries in general?



InnORBIT BMC intermediaries' Selection- Methodology

Qualitative selection process to identify the most suitable business model for InnORBIT's local space initiatives in the 1st and 2nd round for ROS, COR, ALG.

- Select the most fitting BMC that will support your initiative selection (M10 -M11)
 - Alignment to your interests, market, portfolio, capability of growing and sustaining the initiative ?
- Refine (if needed) (M11)
- Deploy the model through the initiative (M13 -M20)
- Validate assumptions (~M17)



InnORBIT BMC Intermediaries' Selection- Methodology

Indicative Selection Criteria

- Is the Initiative aligned with your Business Strategy ?
- Is the customer segment identified aligned with your current customers or with a segment you want to expand to?
- Can you provide tangible benefits to your customers through such an Initiative / Business model ?
- Is there a market big enough to ensure sustainability and replicability for the selected initiative ?
- Do you have the resources and channels required to support the deployment of the initiative (during and after the project has ended)
- (what else?)



InnORBIT BMC General Ranking - Methodology

Qualitative ranking process to identify the most viable business model for local space initiatives in general.

Following a slightly adapted [Stratezyser](#) approach

- 7 Questions to Assess Your Business Model Design
- For each question assign the BMCs to the first three positions
 - 1st spot - 5 pts
 - 2nd spot - 3 pts
 - 3rd spot - 1 pt
- For each question provide a weighting factor from 1 -10
 - Understanding the importance of each question (an average of all scores will be selected)



InnORBIT BMC General Ranking - Methodology

1. How much does switching costs prevent your customers from churning?
2. How scalable is your business model?
3. Does your business model produce recurring revenue?
4. Do you earn before you spend?
5. How much do you get others to do the work?
6. Does your business model provide built-in protection from competition?
7. Is your business model based on a game changing cost structure?



InnORBIT BMC General Ranking - Example

Let's say we have 4 BMCs and their ranking & weighting is as follows

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Result
BMC#1	1	2	1	2	-	3	-	10
BMC#2	2	1	-	3	1	2	2	6.6
BMC#3	3	3	2	-	3	-	1	4.1
BMC#4	-	-	3	1	2	1	3	7.2
Weight	0.4	0.5	0.7	0.9	0.1	0.3	0.2	



InnORBIT business model validation (TBD)

The BMC selected from the Intermediaries (ROS, COR, ALG) has to be validated through the pilot round(s).

“... interviews and surveys of stakeholders participating in our pilot activities (advisors, entrepreneurs, industry actors, investors, etc.) both from within and outside of our consortium, ...”

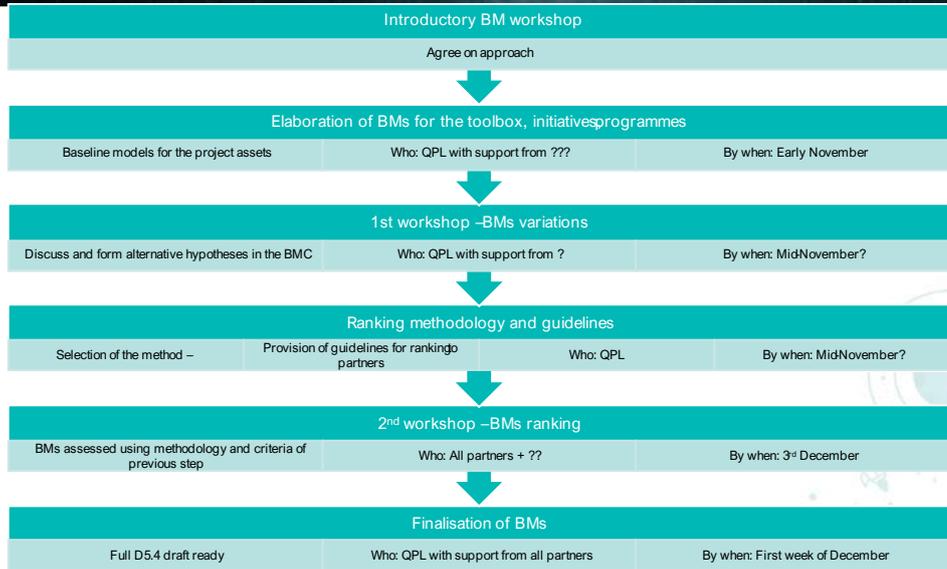


Main components of the business model validation process (Strategyzer StratChat, 2018).



Indicative timeline for next steps

- Tight timeline for this Task
 - Review meeting next week
 - 1st pilot running
 - Agree on a common timeline to avoid bottlenecks
- High importance of this task for the project
 - Active contribution needed from all partners



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Thank you!

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101004212.

George Malliopoulos (Q-PLAN) is presenting

George Malliopoulos (Q-PLAN) is presenting

Annex IV – MIRO Board for supporting Business Modelling

This section presents the Business models created using the MIRO board for demonstrative purposes only. The screenshots do not present the business models in their final version, as improvements have been made since and are reported in Section 5.2.

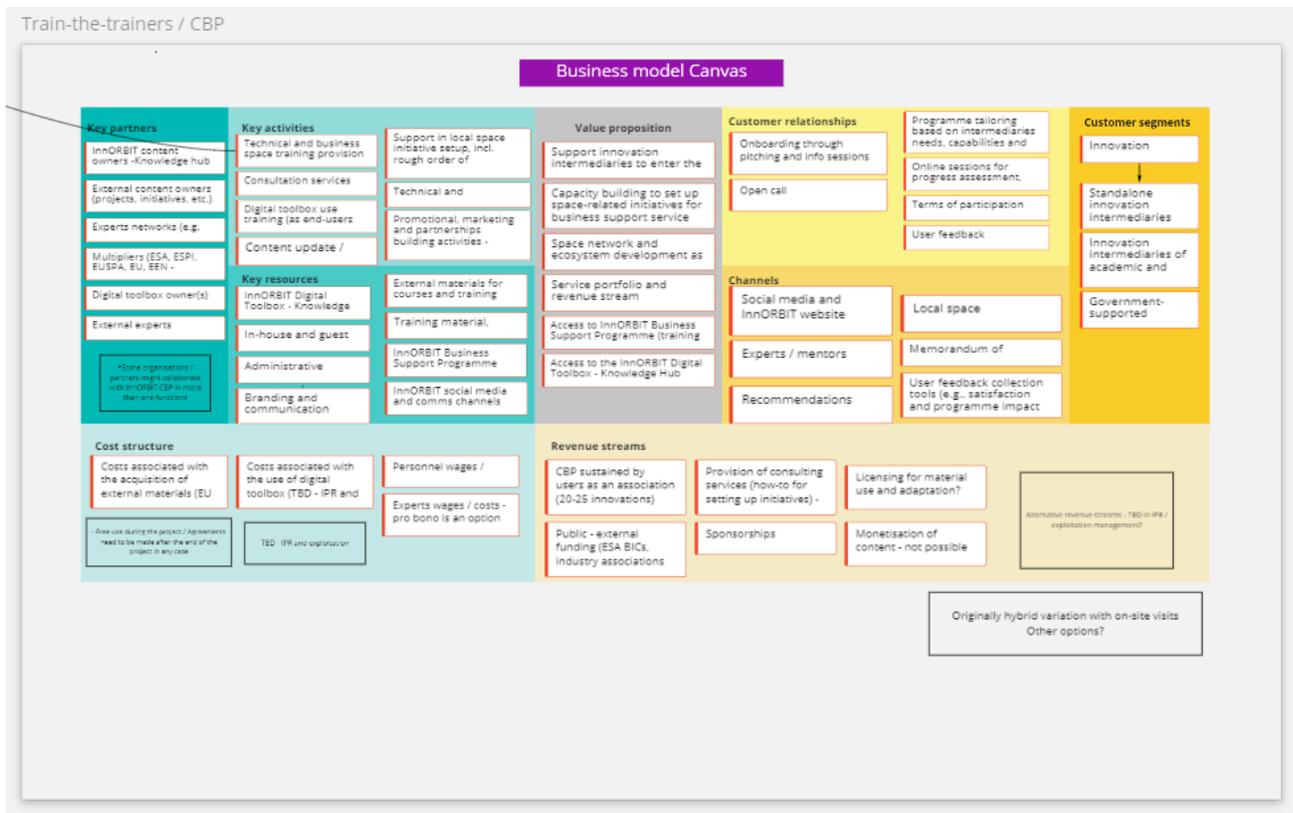


Figure 10: Business model for the Capacity Building Programme

Digital toolbox + Knowledge hub

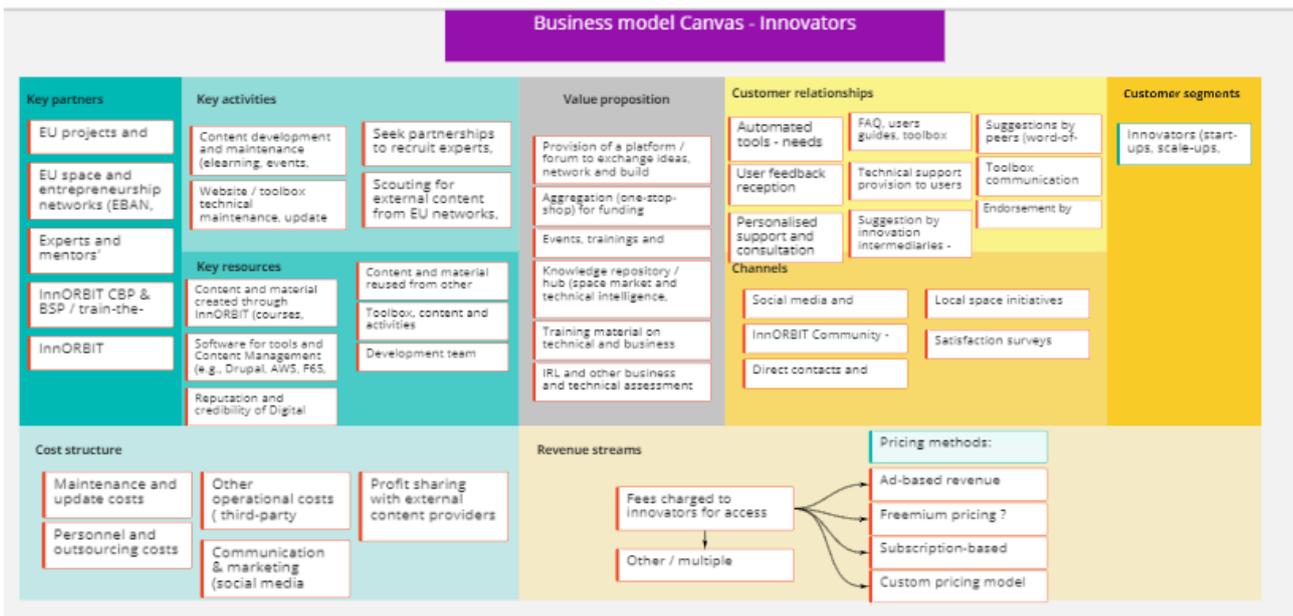
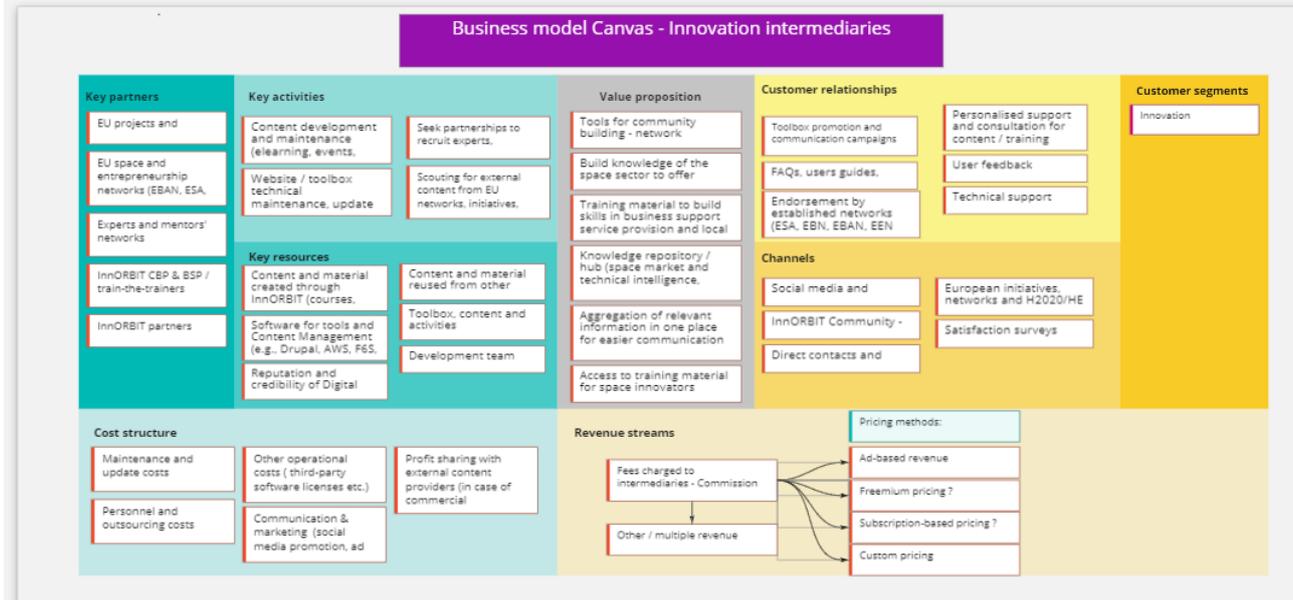


Figure 11: Business models for the digital toolbox / knowledge hubs

Space incubators

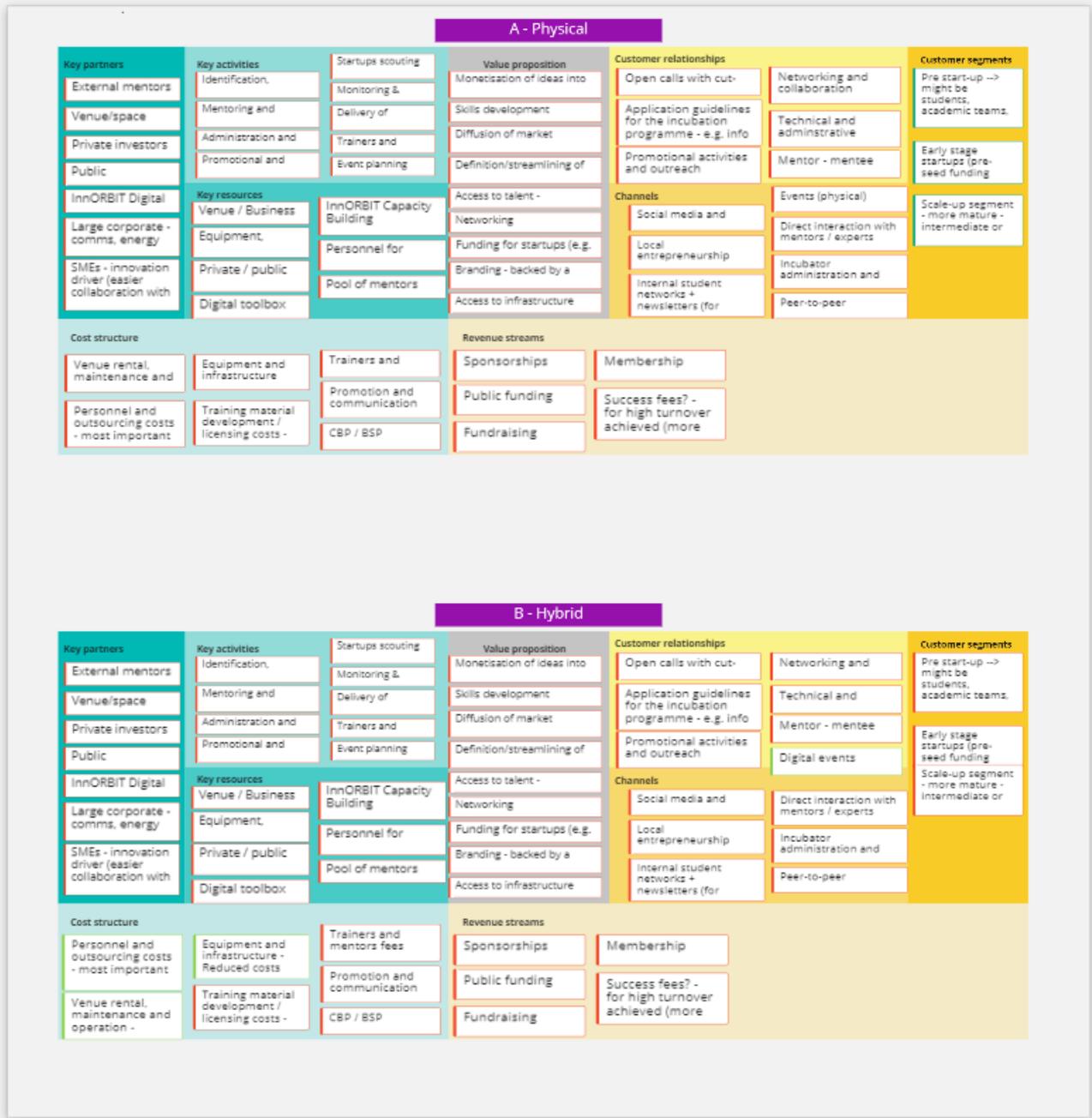


Figure 12: Business models for space incubators

Space cafes

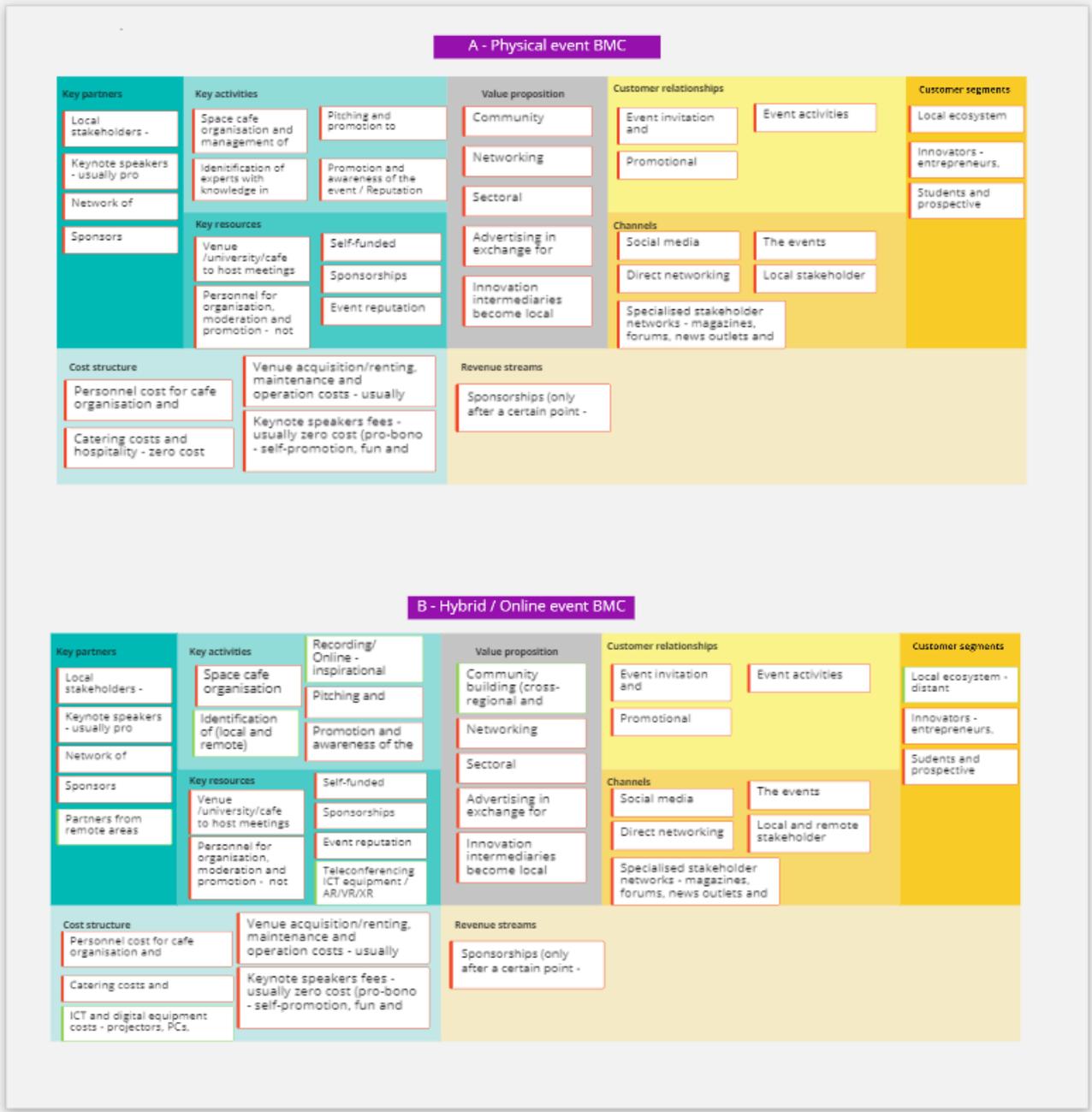


Figure 13: Business models for space café

Space hackathons

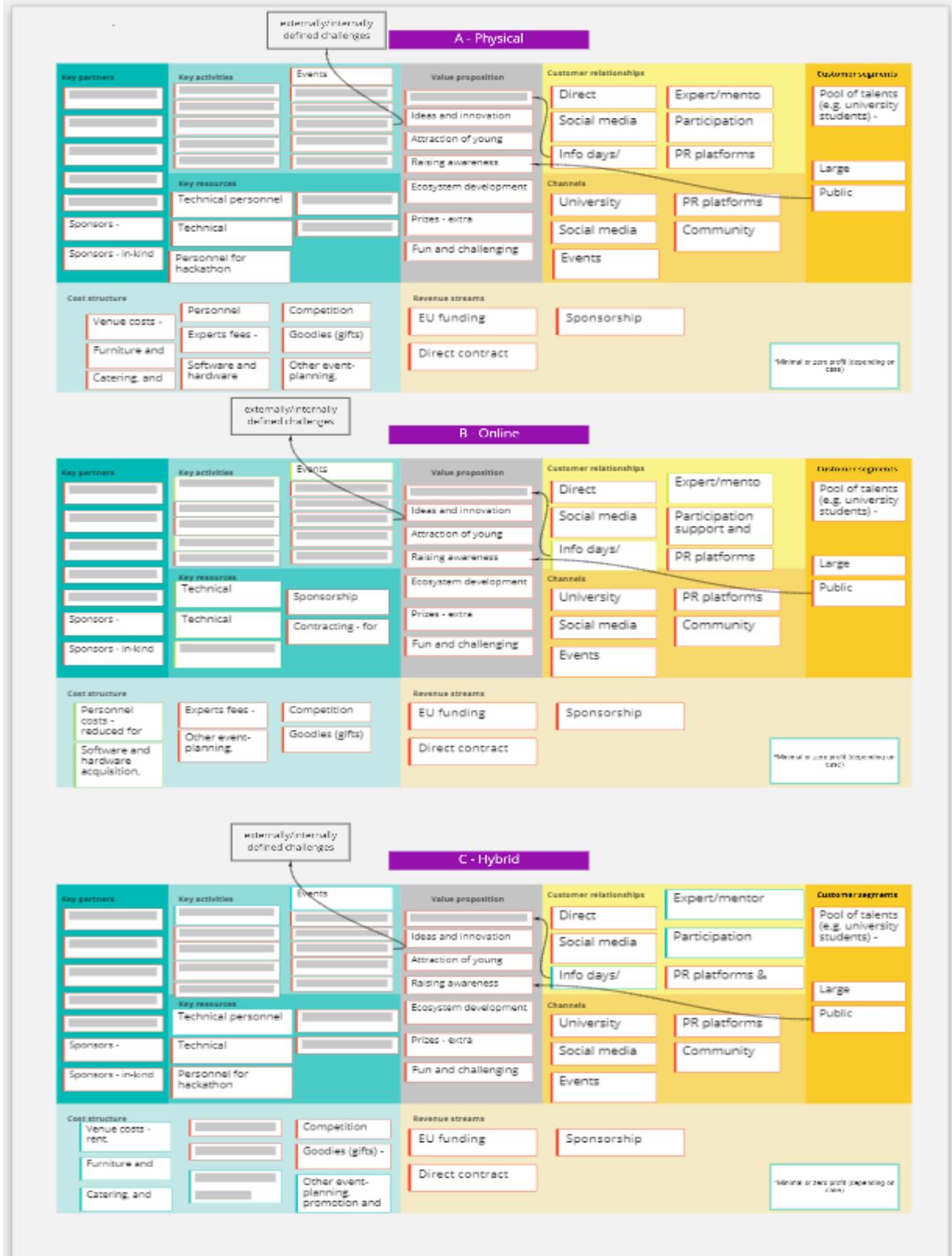


Figure 15: Business models for space hackathons