INNORBIT

CAPACITY & SUPPORT FOR SUSTAINABLE SPACE INNOVATION

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

D3.1: Enhancing the capacity of innovation intermediaries to better support space innovation – First version

This project has received funding from the European Union's Horizon 2020 Framework Programme for Research and Innovation under Grant Agreement no 101004212.

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COORDINATION AND SUPPORT ACTION

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PU	Public	X
PP	Restricted to other programme participants (including the EC Services)	
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Executive summary

This document covers the activities and achievements of task 3.1, the implementation of the Capacity Building Programme (CBP), and the preparation of the Support Initiative Deployment Plans (SIDPs) by InnORBIT's intermediaries, as a roadmap for the future implementation of InnORBIT initiatives. The workflows covered the training, the on-demand support and finally the SIDP aid and consultation, work that lasted from October to December. The methodology and approach were previously defined during D1.4 the Capacity Building Programme and involved the use of regular meetings and the Digital Toolbox, as the hub where the training was deployed.

As a brief summary, the three InnORBIT intermediaries (i.e. ROS, COR, and ALG) have chosen to deploy 5 initiatives during the first pilot round, with a further commitment to participate in the second pilot, depending on the results achieved. The document describes the process, which has been set up as a series of meetings within an agreed timeline during the Kick-Off Workshop (KOW).

Finally, minor flaws and recommendations detected during the implementation are summarised in the conclusions for better execution of the second pilot round and the improvement of the Capacity Building Programme.

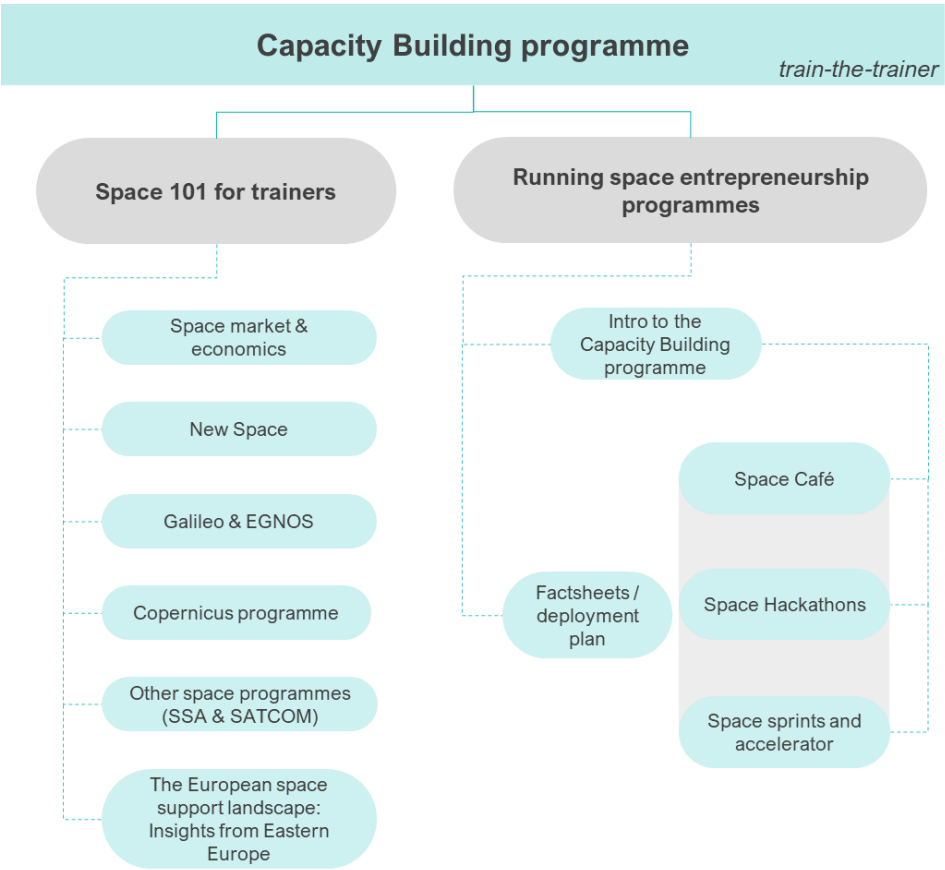
1 Introduction

1.1 Background of the CBP

The Capacity Building Programme (CBP) is the **training and qualification plan for the innovation intermediaries so that they are able to support their entrepreneurs**, start-ups and scale-ups, and innovators in general, in the development of space applications, through the organisation and deployment of local space initiatives. The CBP is made up of two main lines of work from the point of view of the *trainers of the trainers*:

- The support to **space learning**, with the space and business training, called "**Space 101**".
- The support for the **development of initiatives**, known as "**Running space programmes**".

Figure 1: Original plan for the Capacity Building Programme



The **training was improved from the original plan** introduced in D1.4[1], as the lectures were recorded. Thus, "other Space programmes" was subdivided into a couple of **full lectures on SSA and GOVSATCOM (Space Situational Awareness and Governmental Satellite Communication)**, a second **block** on Galileo **was added** as the first lecture is very technical and it was felt appropriate to include some introductory material. Moreover, in Running Space programmes, some **interviews with event organisers and participants have been added** as a complement. All the training material **was created ad hoc for InnORBIT**. It is presented and

[1] D1.4 InnORBIT Capacity Building Programme - First version

described in Chapter 2 - The Capacity Building Programme deployment , and available through the InnORBIT toolbox.

In parallel to the training, the CBP envisages support to the intermediaries to help them plan the initiatives they will implement during the first pilot round. The internal or InnORBIT consortium intermediaries are:

- Algebra University College (**ALG**)
- Corallia (**COR**)
- The Romanian Association for Space Technology and Industry (**ROS**)

This support sought to assist them in developing their SIDPs as a planning guide for their initiatives. The supporting party was SpaceTec Partners (**STP**).

1.2 Rationale and objectives of the CBP deployment

The main objective of the CBP is to support innovation intermediaries to build their capacity to deploy business support initiatives about space innovation**. In short, help them to branch their regular innovation activities into the space sector**. These initiatives shall raise awareness and help to develop their business programmes and value propositions, using tailored incubators, accelerators, hackathons, cafés, info days, etc.

In short, the goal can be defined as to *train the trainer*, since InnORBIT aims to increase the number of local initiatives for start-ups, scale-ups and entrepreneurs in the space downstream and upstream sectors, attending to the European Space Programme and its components such as EGNOS, Galileo, Copernicus and GOVSATCOM.

These objectives justify the logic of the capacity building support in *two dimensions*, firstly **to increase the level of knowledge about the space sector** and secondly **to support the development of local space initiatives**. It is noteworthy that given the high number of intermediaries that it is planned to reach, on-demand training has been chosen and made available in the digital toolbox. The development of local initiatives aims to support them in branching out to the space sector. It should be remembered that intermediaries are experts in mobilising their ecosystems and establishing local support initiatives, so InnORBIT's support aims to cover their gaps and advise insofar as their interest points in the same direction.

The way this service is delivered is through scheduled meetings, in which the detail about space initiatives is increased at each check-in meeting. This ensures that the intermediaries know how to deliver the project's business support programme to entrepreneurs, start-ups and scale-ups.

Finally, this first pilot round has served to **analyse the needs, interests and demands of the intermediaries** during the implementation of the CBP. This analysis will continue during the **implementation of the Business Support Programme (BSP)** and will allow refining both the CBP and the BSP for the second pilot round with external intermediaries, to the consortium, optimising the delivery process.

2 The Capacity Building Programme deployment

2.1 On-demand training

Defined during D1.4 “InnORBIT Capacity Building Programme”, stemming from the study of the European space support landscape[1], the needs and challenges of innovation ecosystems and intermediaries[2] and the co-design of the programmes[3]. The training covers 2 groups of knowledge: space and initiative deployment. This training was **created for InnORBIT** aiming toward innovation intermediaries, and it is **held on the Digital Toolbox**.

The **average lesson is about 20-30 minutes**, with the smallest being around 12 minutes and the largest more than an hour. **The full training programme comprises 25 lessons**. Out of this, **17 are technical** training and **8 are about innovation initiatives** for intermediaries.

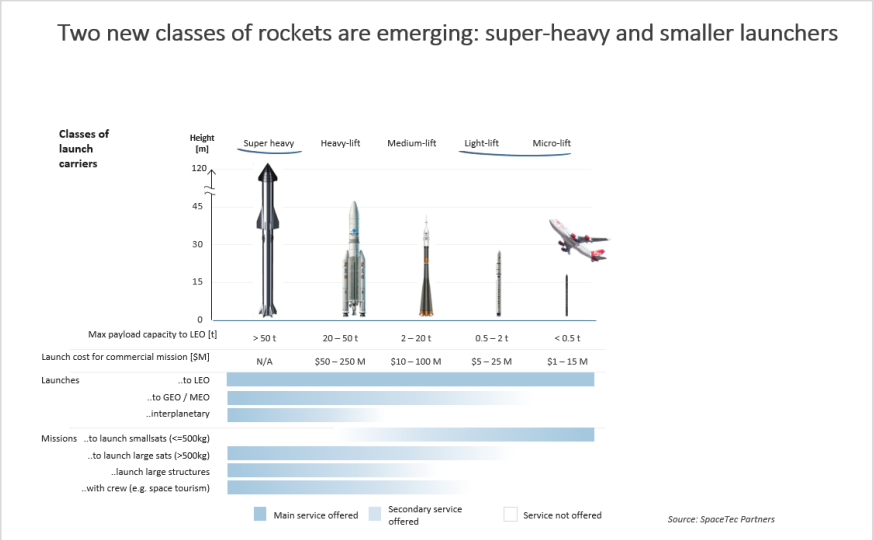
The training is classified by branch (technical, business, innovation) and within this by theme, to facilitate the structure for the trainee. For instance, within the technical, the classification is based on the European Space Programme: Galileo & EGNOS, Copernicus, GOVSATCOM and SSA.

2.1.1 Space 101 for trainers

2.1.1.1 Introduction to the space market & economics

With this lecture, presented by Carla Filotico, we aim to show the coarse numbers of the space sector so that intermediaries and entrepreneurs can get an idea of how much it costs to operate in space and what business models underpin space companies. To illustrate, some of the content in this training deals with the evolution of launchers, as in Figure 2 with the super-heavy and micro-lift classes. This corresponds to the market trend seen with Falcon Heavy or Starship (SpaceX) and a large number of micro-launching start-ups (Rocket Lab, PLDSpace, etc.).

Figure 2: Space market & economics



[1] D1.1 The European space support landscape: Insights from Central Eastern and South Eastern Europe

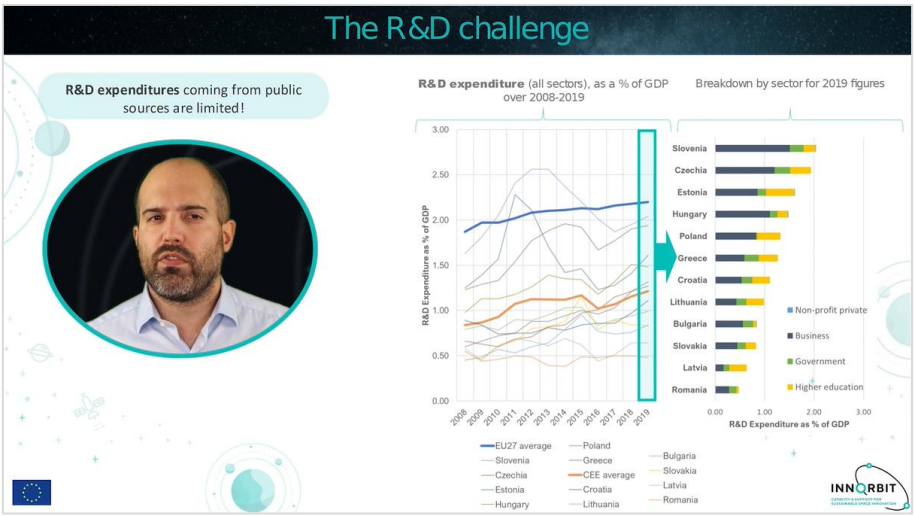
[2] D1.2: Needs and challenges of innovation ecosystems and intermediaries for taking up activity in the EU space sector

[3] D1.3: Co-design of capacity building and business support programmes

2.1.1.2 The European space support landscape: insights from Eastern Europe

Thomas Tanghe summarises the findings made during our research period on the Eastern European innovation support landscape. High-level conclusions and recommendations for further improvement of the regional sector with a focus on how to embark on the opening market.

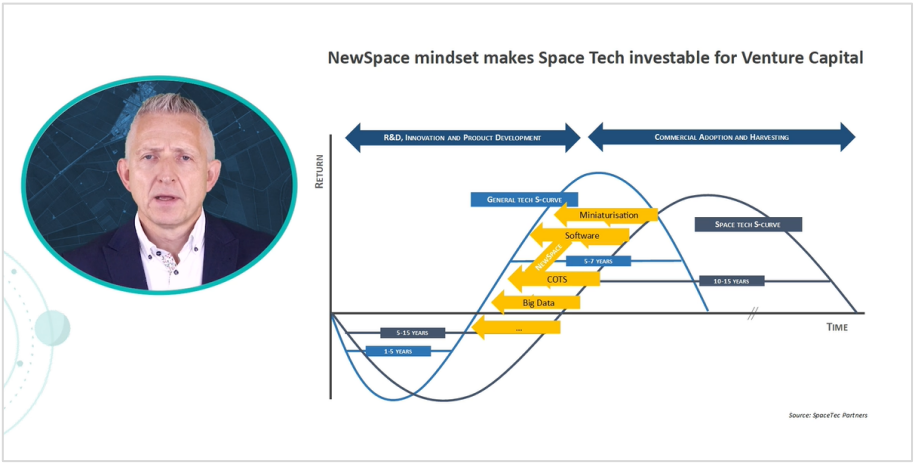
Figure 3: The European space support landscape: insights from Eastern Europe



2.1.1.3 New Space

NewSpace refers to the new and growing sector of the space market which is being coped by private companies in contrast with the traditional state-owned companies. Rainer Horn synthesises the drivers behind and illustrates how the market is changing.

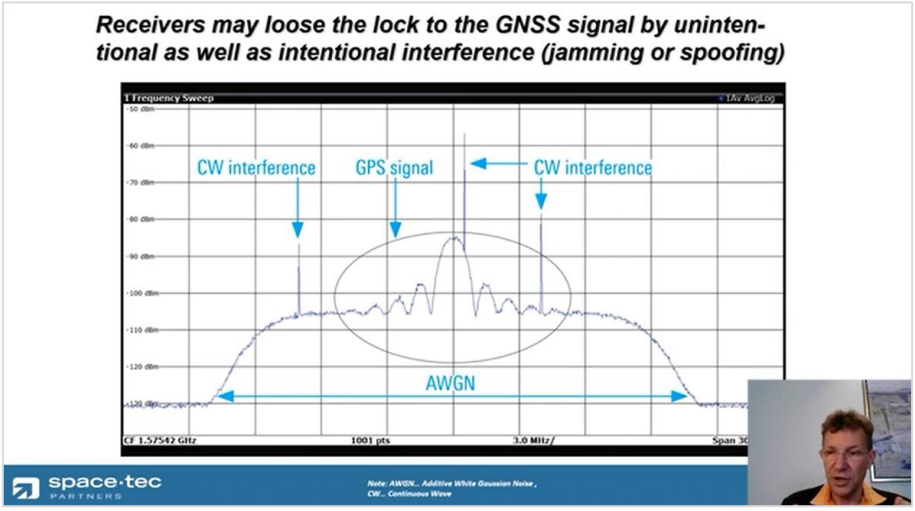
Figure 4: NewSpace



2.1.1.4 Galileo and EGNOS: Two masterpieces for PNT (Position, Navigation and Timing) made in Europe

Galileo is the GNSS (Global Navigation Satellite System) made by the European Union, based on the need to have an independent system. Furthermore, as the Galileo constellation has a higher orbit, which means more visibility in urban canyons and higher latitudes, it improves some of the issues of the GPS. The Galileo SBAS (Satellite Based Augmentation System) is an improved system that increases the accuracy in Europe. The lecture is presented by Norbert Frischauf aiming to cover all the technicalities of the programme.

Figure 5: Galileo and EGNOS: Two masterpieces for PNT made in Europe



2.1.1.5 Galileo Course for Entrepreneurs

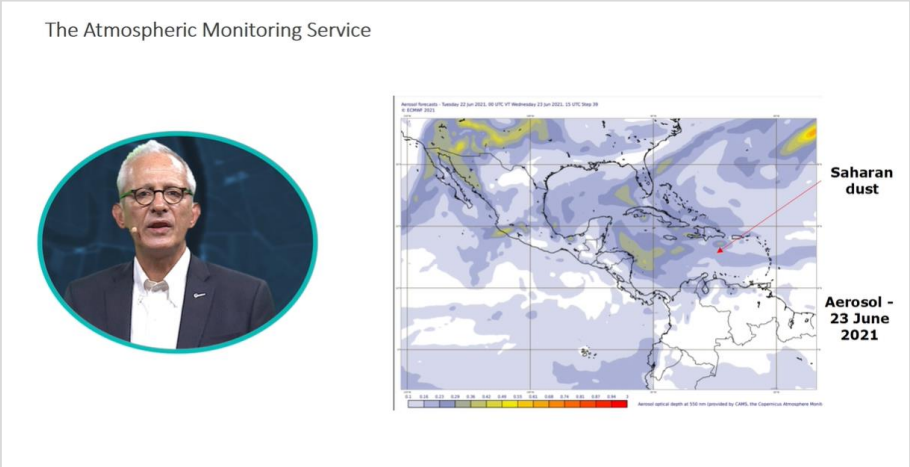
In this video, Rainer Horn lectures on the Galileo programme, with the intention of covering non-technical aspects, and complementing Galileo from a high-level point of view, including the services and application areas.

Figure 6: A Galileo Course

2.1.1.6 The Copernicus programme

Copernicus is Europe's Earth Observation programme. Earth Observation is the science concerned with obtaining information about the planet by means of remote sensing techniques. While in a simplified version this is based on analysing reflectance spectrums and absorptions at each wavelength, there are several possibilities in combination with in-situ data and sensors that are not necessarily optical, such as radar or thermal.. During this lesson, Stéphane Ourevitch presents very briefly the services, products and history of Copernicus, the European Earth Observation programme, with a focus on start-ups.

Figure 7: The Copernicus programme



2.1.1.7 The GOVSATCOM programme

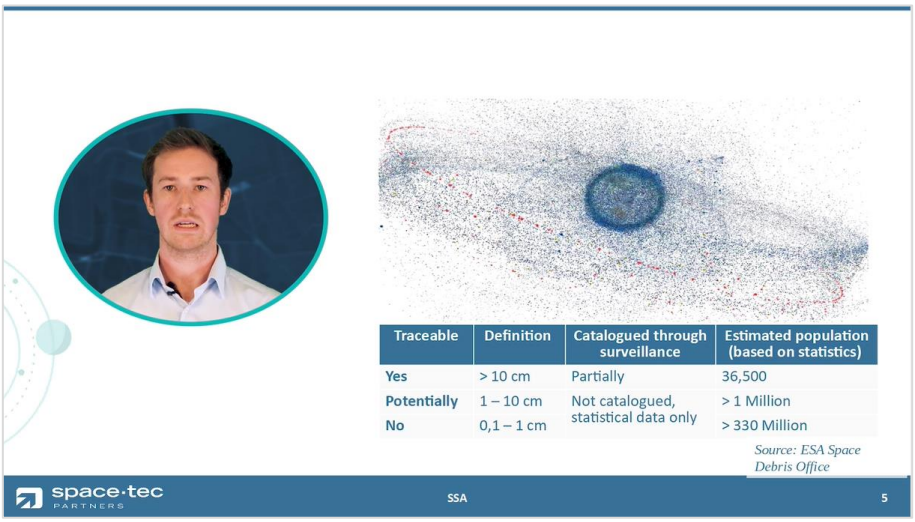
The European Union Governmental Satellite Communications are the communication services for critical operations such as the management of critical infrastructures or areas with no ground infrastructure. Annekatrien Debien introduces GOVSATCOM as one of the main components of Europe's space programme.

Figure 8: The GOVSATCOM programme

2.1.1.8 Space Situational Awareness (SSA)

Space Situational Awareness (SSA) is the programme addressing the monitoring of space hazards for spacecraft and life on the Earth. It encompasses monitoring of the space weather, space bodies and also satellites. The occupation of orbits, with an increasing density of satellites and debris, has led to the development of the current European Space Surveillance & Tracking (SST) programme, which now points to the dawn of Space Traffic Management. In this lesson, Felix Rottman reviews the evolution and requirements of the different systems.

Figure 9: SSA, SST and STM



2.1.2 Running space entrepreneurship programmes

This series of lectures aims to reinforce and enunciate the factors and variables of different innovation initiatives such as hackathons, cafés, springs, incubators and accelerators. Without going into the domain of innovation intermediaries, it offers a short insight into the organisation of different initiatives in the field of entrepreneurship in the space sector. They also have the function of introducing different initiatives to the innovation intermediaries, in which they may not be experts.

2.1.2.1 Space Hackathons

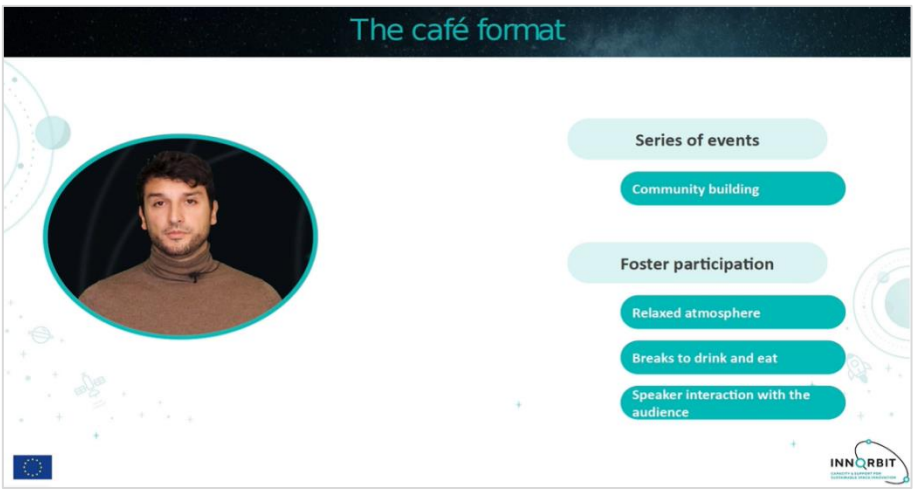
In this lecture, Florentyna Smith (Figure 10) talks in great detail about the organisation of hackathons. Through a comprehensive review of the different logistical aspects, resources and knowledge required, detailed conclusions can be drawn on how to execute this initiative for a space entrepreneur's ecosystem.

Figure 10: Organising hackathons

2.1.2.2 Space Cafés

Cafés are a trendy initiative due to their wide reach and low cost. During this short session, Emilio Crespo (Figure 11) introduces some ways to develop this series of events that focuses on community building around a topic of interest, in a relaxed atmosphere.

Figure 11: The café innovation initiative



2.1.2.3 Space Sprints, Incubators and Accelerators

Finally, the last training talks about the organisation of three of the most popular initiatives, in crescendo in terms of mentoring intensity and capital invested. Here, Thomas Tanghe (Figure 12) masters the peculiarities of organising these events in the entrepreneurial community in the space sector.

Figure 12: Space Sprints, Incubators and Accelerator

2.2 Tailored help & support

Following the work programme, intermediaries were informed during the CBP of STP's readiness to help them clarify their initiatives to develop the Support Initiative Deployment Plan (SIDP) to be deployed during the first pilot round. Since it was not known how much support they might need, an undetermined number of requests for support were expected. After a few days in which no progress was seen, it was decided to frame the support in a scheduled check-in meeting following a calendar as shown in the next chapter. In this way, and by dividing the CBP and the SIDP into short sections, intermediaries could group their questions for the initiative development or in spontaneous emails during and after each meeting, maintaining a constant flow of communication.

In addition, it should be noted that since the intermediaries are experts per se in their fields, the requests for information were discreet and very specific. This was the case for Corallia (COR) and Algebra (ALG) about community building on the Space Cafés, and for ROMSPACE (ROM) about the development, schedule and different possibilities for the space hackathons.

For the second pilot round, it is expected that the number of requests will be lower since the external intermediaries do not have any kind of obligation to organise any initiative. Nor will it be possible to force them to have a specific work plan, so it will be necessary to establish a very summarised, simplified and open communication, always trying to show the benefits of branching out its initiatives towards the space sector. Support to intermediaries was structured with on-demand support along with a timetable of meetings and milestones.

2.2.1 Meetings

2.2.1.1 Kick-off Workshop (KoW)

The KoW had the function of presenting the actions of InnORBIT and its two programmes: the CBP and BSP to the intermediaries, explaining the services, the timeframe and the support that could be developed. Furthermore, the different initiatives, their peculiarities in the space sector, as well as the possibilities of the Toolbox and the material available for its ecosystem were detailed.

The KoW was conducted individually as an intimate working session. It took advantage of a two-way exchange of information, allowing the intermediaries to introduce themselves, and explain what the state of their ecosystems was concerning the space sector and which initiatives could best fit their ambitions. In Figure 13: Agenda for the KoW and SIDP initial table of contents Figure 13, the agenda for the KoW is presented on the left along with the suggested SIDP table of contents.

Figure 13: Agenda for the KoW and SIDP initial table of contents

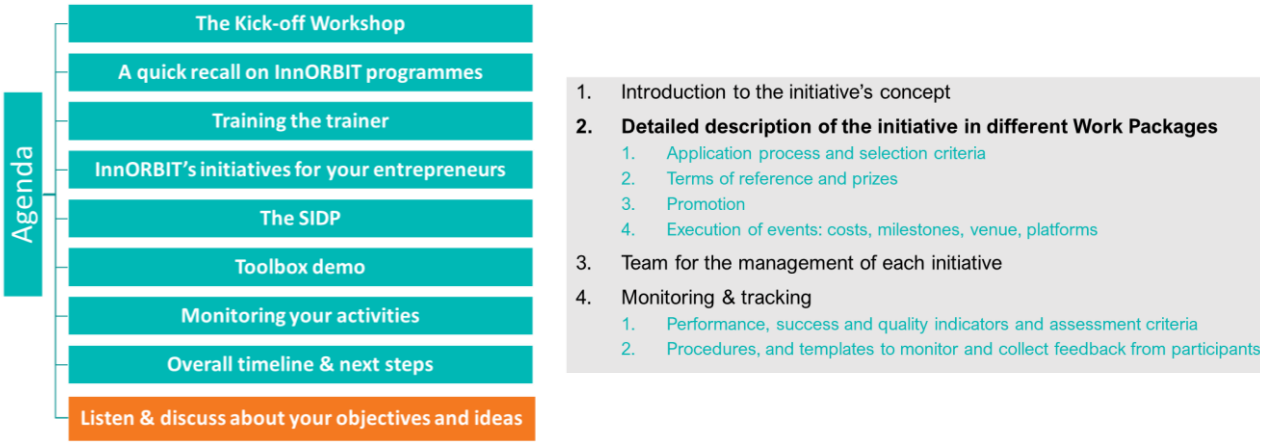
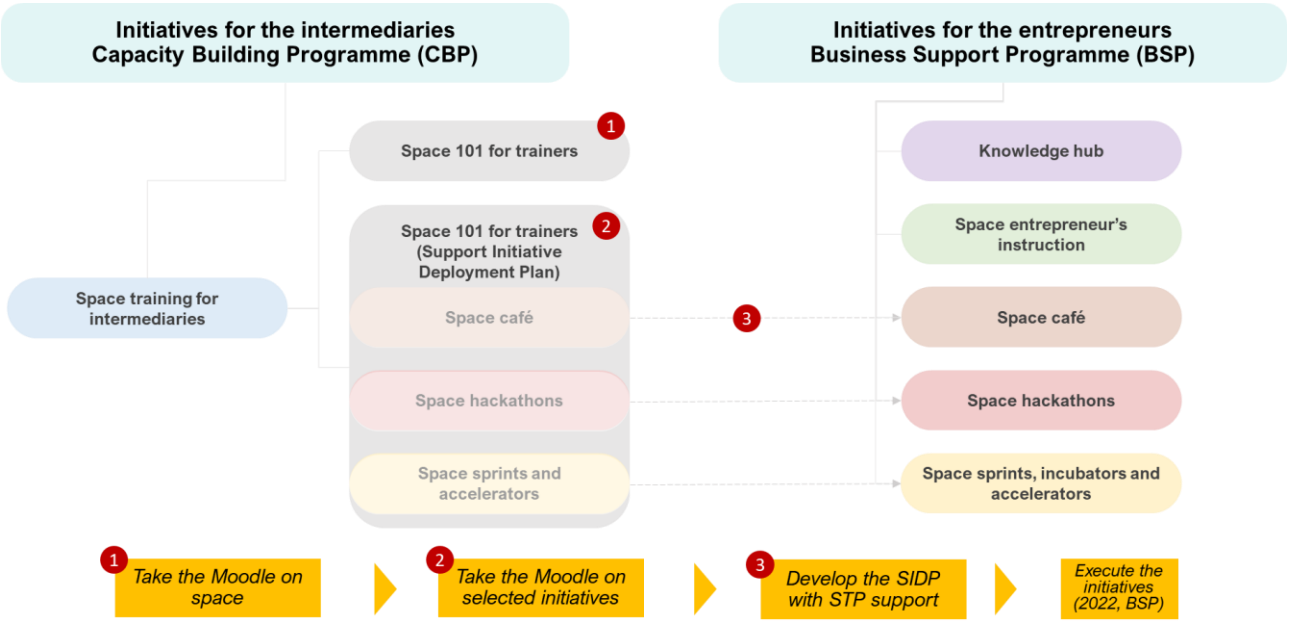


Figure 14: Simplified action tree for the intermediaries during the CBP



2.2.1.2 Check-in meetings

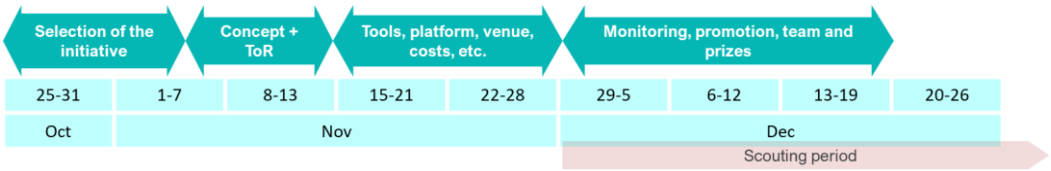
After the KoW, check-in meetings were scheduled to structure the training tasks, initiative plan and development of the plans consolidated in the SIDP. For this purpose, **up to three check-in meetings were held**, each one lasting around **1 hour**. Together with the KoW, **11 meetings were held to support InnORBIT's consortium intermediaries**, approximately 3 per intermediary.

- **1st Check-in Meeting**
  After the KoW, this was the first meeting. At this point, the intermediary will have made some progress in the training on Space and initiatives and will bring a preliminary idea of the initiatives to be developed.
- **2nd Check-in Meeting**
  That sought the crystallisation of the initiatives into more real plans and a first SIDP framework and initiative in the InnORBIT framework.
- **3rd Check-in Meeting**
  Which dealt with the latest questions and concrete issues in reference to each initiative. i.e., the search for speakers, the topics of the events, the timing and the community building around the space sector as potential chaining between events and pilots.

2.2.2 Schedule and milestones

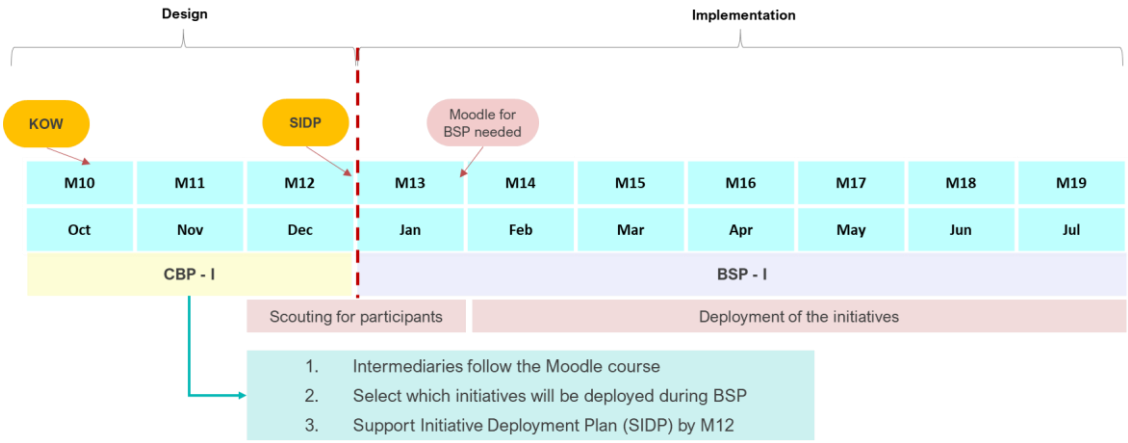
The CBP had three months to be implemented. The most critical part was clustered in the last weeks (Figure 15), as the training was free to select by the intermediaries and there was no strict timeline (i.e., asynchronous training). The consultation of doubts was at their own pace of work.

Figure 15: Proposed work split at the KOW of the SIDP across the CBP weeks



In Figure 16, the design phase fully corresponds to the CBP, whose efforts are condensed on the SIDPs of each intermediary. On the other hand, the deployment phase of the first pilot covers the next 7 months until the summer of 2022 and it is called Business Support Programme (BSP).

Figure 16: Timeline for the first pilot (CBP and BSP)



3 CBP execution

3.1 Corallia (COR)

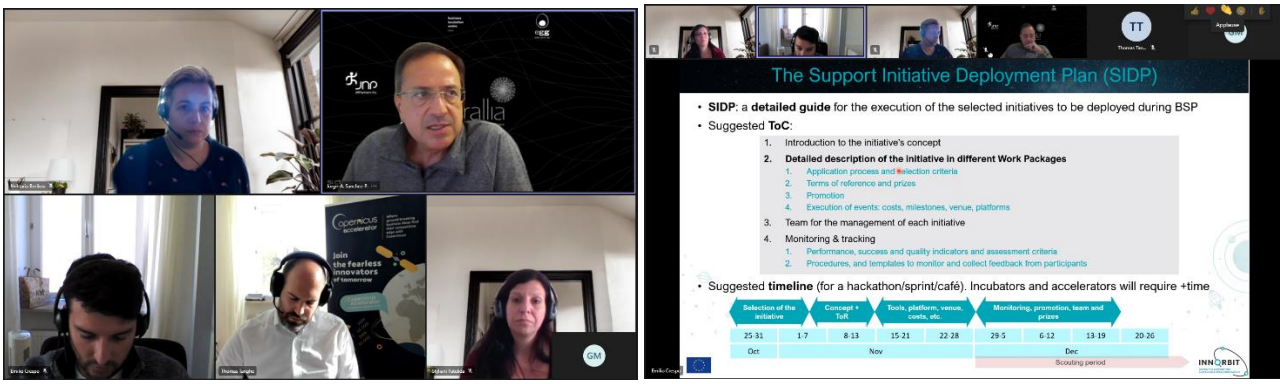
Corallia is InnORBIT's Greek intermediary, with a strong background in entrepreneurship support and innovation initiatives. Corallia has its own incubator, youth entrepreneurship accelerator, and works as a multi-cluster facilitator. Therefore, the most interesting item is to raise awareness and open up a space segment with the aim of populating their entrepreneurial channels on this new theme. During the check-in meetings, Corallia outlined its intentions among the different initiatives. The first session after the KoWs was for Corallia to present preliminary ideas that quickly led to coffees and hackathons during the discussion. There was no need for a third round of check-in meetings with them. The initiatives planned to develop are described in D3.2[1].

Figure 17: Corallia's tentative calendar from D3.2 SIDP for Greece

Milestones	February 2022	March 2022	April 2022
MS1	Confirmation of date, time, location and venue		
MS2	Design of marketing plan		
MS3		Draft event informal agenda & promote available topic for discussion event	
MS4		Communication activities to attract participants	Communication activities to attract participants
MS5		Contributors/Speakers on board	Contributors/Speakers on board
MS6		Organisation of complementary events	Organisation of complementary events
MS7			Implementation of the Space Café

Milestones	February 2022	March 2022	April 2022	May 2022
MS1	Confirmation of date, time, location and venue			
MS2	Design of marketing plan			
MS3		Draft event agenda		
MS4		Communication activities	Communication activities	
MS5		Contributors/Mentors/Judges on board	Contributors/Mentors/Judges on board	
MS6		Hackathon's challenges	Hackathon's challenges	
MS7			Organisation of complementary events	Organisation of complementary events
MS8				Implementation of the hackathon

Figure 18: Corallia check-in meetings during the CBP



3.2 Algebra University College (ALG)

Meetings with Algebra University College during the CBP led to the preparation of the Space café initiative, described in more detail in the D3.3[2]. The plan includes the development of 5 cafés during the first pilot with a

[1] D.3.2 Support Initiative Deployment Plan for Greece

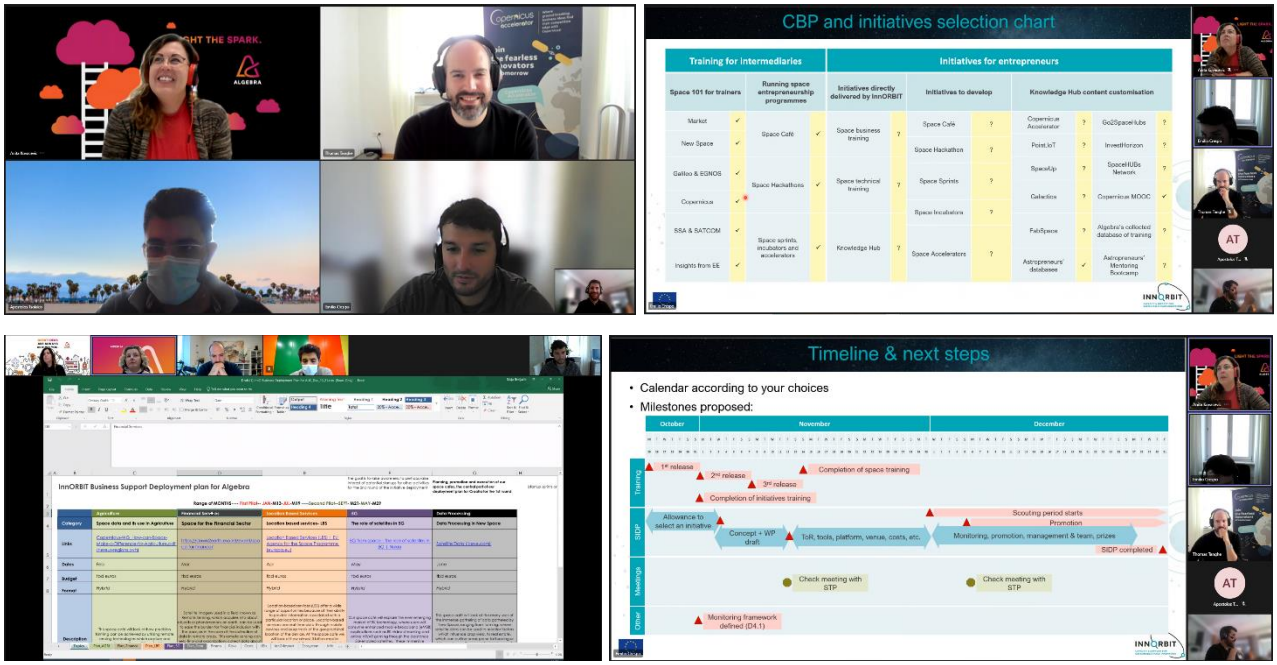
[2] D3.3 Support Initiative Deployment Plan for Croatia

view to potentially launching - depending on the results - an incubator during the second pilot. The rationale is the non-existent segment of space awareness, where it would be interesting to create a community that could push the development of early entrepreneurship. During the check-in meetings, SpaceTec Partners (STP) and ALG discussed the initial potential of ALG's ecosystem, which is strong in ICT and therefore downstream space applications may be worth it for them. Subsequent meetings helped to drop light into the café format; the topics were largely discussed and some ideas to find speakers for each event.

The agenda proposed by ALG:

- Space data and its use in Agriculture
- Space for the Financial Sector
- Location-based services- LBS
- The role of satellites in 5G
- Data Processing in New Space

Figure 19: Algebra check-in meetings during the CBP



3.3 The Romanian Association for Space Technology and Industry (ROM)

ROMSPACE has expressed interest during the CBP in developing community building and awareness initiatives. The CBP meetings started with a lack of definition about what they would like to do, since they are quite involved in their ecosystem. Despite being an industrial association, its audience has wider to start-up rather than SMEs and scale-ups. The great value-added activity was to profile their needs and unveil their need for space awareness. . With a view to achieving success in combination with other stakeholders such as the Romanian Space Agency, members of academia, investors, sponsors and start-up hubs, ROMSPACE foresees

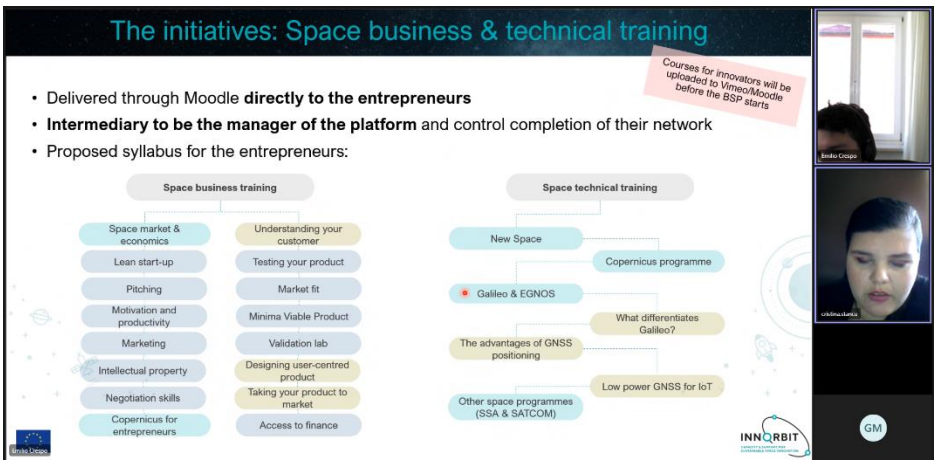
participation in the second InnORBIT pilot depending on the results achieved. The detailed plan has been described in D3.4[1].

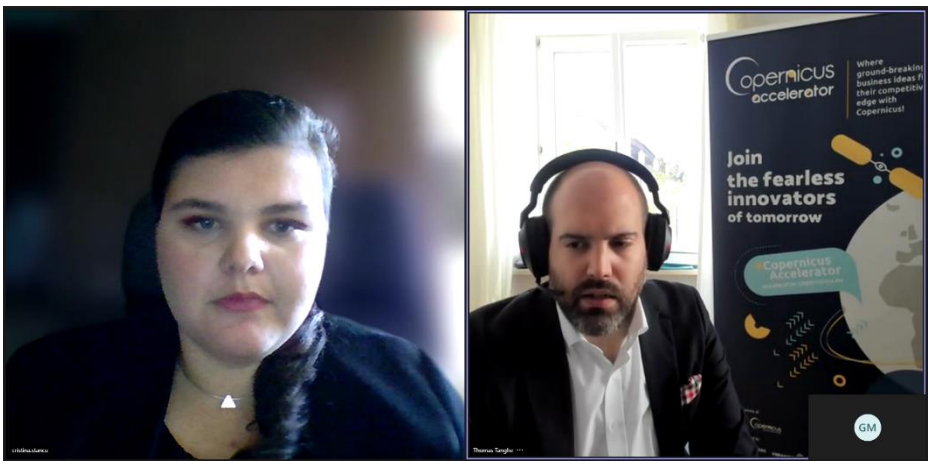
For the Space cafés campaign, ROMSPACE has proposed:

- Life after Covid 19 and the impact of space
- Copernicus Data
- New Space opportunities
- Current Space trends

And for the stated hackathon, “new space” as a broad preliminary theme

Figure 20: ROMSPACE check-in meetings during the CBP





[1] D3.4 Support Initiative Deployment Plan for Romania

4 Conclusions and next steps

This document records the progress made so far from the trainer's perspective. The process has been used to note some shortcomings of the plan and to correct them as far as possible for the second pilot round. Among small feedback, a critical shortcoming was detected lying in the fact that much, if not all, of the workload, is shifted to the external intermediary (for the second pilot round), who does not have the same motivation and objectives as InnORBIT trainers. A proper focus and attractiveness will be important when the first external approaches are made during the second pilot round.

Regarding on-demand training, the most relevant innovation initiatives have been covered together with the technical topics. Despite the vast and comprehensive content offered, no significant lack of knowledge nor need from the intermediaries has been detected. However, there was considerable interest in the case of initiatives they were not familiar with - more exotic ones - such as cafés, which aroused a strong curiosity. Hence, further improvements may include covering a wider spectrum of initiatives, such as maker labs or ideation-stage competitions, as far as possible since there are not so many other use cases.

The importance of structuring the CBP from the intermediary's point of view and workflow has also been crucial, as the motivation to attend it is not so great. It is important to establish a benchmark timetable, which is not too demanding, so as not to overburden the future external intermediaries of the second pilot round.

The next steps for InnORBIT imply the deployment of the BSP by the intermediaries towards their innovators. It is difficult to claim "capacity building is over" since intermediaries will continue to ask questions and learn. They will likely re-use the material held in the Digital Toolbox on demand, and therefore, continue learning about space innovation management.