DISSEMINATION AND EXPLOITATION PLAN

Project Number: 965044

Project Acronym: B-CRATOS

Project Title: Wireless Brain-Connect inteRfAce TO machineS

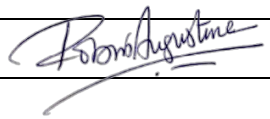
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 965044

Deliverable Information

Project Title:	Wireless Brain-Connect inteRfAce TO machineS (B-CRATOS)
Project Number:	965044
Deliverable Number:	D7.1 Initial Dissemination and Exploitation Plan with Public Communications Channels Set-Up
Responsible Partner:	Blackrock Microsystems Europe GmbH (BRME)
Work Package Number and Title:	WP7 Exploitation, Communication and Dissemination
Version:	1.0
Revision Date:	29-10-2021

Dissemination Level: Public

Approvals

Name, Org.	Role	Signature	Date
Paul Wanda, BRME	Co-Author, WP7 Leader	on behalf of the authors: 	29-10-2021
Pascale Caulier, SINANO	Co-Author		29-10-2021
Robin Augustine, UU	Project Coordinator		29-10-2021

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Executive Summary

The initial Dissemination and Exploitation Plan summarizes the B-CRATOS Partners' early strategy and organisation related to the dissemination, communication, and exploitation of project results and technologies.

This plan outlines the processes that will enable the B-CRATOS consortium to effectively pursue dissemination and exploitation activities, through a combination of broad communication and targeted outreach to the public and key industry stakeholders and intellectual property development and rights management, setting the stage for future development of business plans to guide the consortium towards effective exploitation of project results and translation to a real world societal and health impact through product development and commercialization.

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1 Overview

1.1 Purpose

The B-CRATOS Dissemination and Exploitation Plan (DEP) describes the activities to be performed and the channels to be used to promote and disseminate the project and its outputs, and to exploit the project results for concrete purposes.

The goal of dissemination is to circulate project knowledge and results to those who can make the best use of them, both broadening and strengthening the impact of the project. This document aims to support this goal by developing a Dissemination plan to effectively communicate the results of the B-CRATOS project to the public through multiple mediums.

The goal of exploitation activities is to make effective use of project results to develop new technologies, products, or services by project Partners or by others. This document includes an Exploitation Plan to guide the B-CRATOS Partners in establishing their intellectual property strategies.

This document is developed under the Legal obligations outlined in Articles 28 and 29 of the Horizon 2020 Model Grant Agreement.

1.2 B-CRATOS Partners

Short Name	**Full Name**
UU	Uppsala Universitet
SINANO	SINANO Institute
SSSA	Scuola Superiore di Studi Universitari e di Perfezionamento S'Anna
BRME	Blackrock Microsystems Europe GmbH
LINKS	Fondazione LINKS – Leading Innovation & Knowledge for Society
DPZ	Deutsches Primatenzentrum GmbH
NTNU	Norges Teknisk-Naturvitenskapelige Universitet NTNU

1.3 Responsibilities

BRME is the lead beneficiary responsible for WP7 Exploitation, Communication and Dissemination and is the lead Partner responsible for coordinating exploitation activities.

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SINANO is the beneficiary responsible for internal and external communication and dissemination coordination and activities.

UU is the beneficiary responsible for dissemination through publications validation and coordinating the filing of patents.

Prof. Robin Augustine (UU) is the scientific coordinator assuming overall project, scientific, and technical responsibility of the project. As B-CRATOS coordinator, Prof. Augustine reviews, approves, and submits deliverables and reports.

1.4 Definitions

Term	**Description**
B-CRATOS	the Wireless Brain-Connect inteRfAce TO machineS project
commercialization	the process of bringing new products or services to the market, covering such topics as marketing, sales, production, distribution, and other broad functions
communication	using generalized language to promote the project and its results through engagement with the general public
dissemination	sharing research results with potential users – peers in the research field, industry, other commercial players, and policymakers, often through public disclosure in scientific or technical language
exploitation	the use of results for commercial purposes or in public policymaking
intellectual property	a creation or invention to which one has rights and may apply for a patent or other legal protection/right; also referred to as “IP”
KPI	key performance indicator, a metric used to evaluate progress towards an objective or result
patent	the exclusive legal right to exclude others from exploiting an invention (IP) for a limited period of years, in exchange for public disclosure of the invention (IP)
WP	Work Package

1.5 References

1. Grant Agreement number 965044, B-CRATOS, H2020-FETOPEN-2018-2020 / H2020-FETOPEN-2018-2019-2020-01, Annex 1 (part A), Research and Innovation action, *unpublished*

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2. B-CRATOS Consortium Agreement, version V5, 2021-02-26. *unpublished*

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2 Dissemination and Communication strategy

While communication activities will focus on broadly promoting any action in the project and its achievements to a multitude of audiences, dissemination activities will focus on disclosing only the results of specific actions to the target groups that will make best use of them. Communication and dissemination activities will form the backbone of networking and establishment of credibility with potential research, industry, and entrepreneurial partners to enable more effective exploitation and eventual development of project results into future products with commercial potential.

2.1 Strategy

The B-CRATOS consortium targets specific audiences and groups through different communication and dissemination channels. The following two tables below show the overall strategy, covering different target groups, dissemination channels and the types of information, specific for each target group, which can be shared.

Target Groups	Dissemination channels	Type of information
Policy Makers, European Commission, and stakeholders	Press Releases, Newsletters, Website EU-wide events such as EFECS Social Media Stakeholders' seminar	Impact of B-CRATOS Ethic Committee review report: implications on society and technology Position paper (e.g., clinical economics and societal impact)
Research community (academic and industry)	Press Releases, Newsletters, Website, Flyers, Workshop Social Media engagement via LinkedIn, Twitter, and ResearchGate Presentations at conferences, Webinars Publications, PhD and master's theses	Project results in the different areas of B-CRATOS: neurotechnology, wireless communications, bionics, biomechatronics, materials science, artificial intelligence, and machine learning
Students	Lectures, online courses, tutorials, webinars PhD and master's Theses	Topics: neurotechnology, wireless communications, bionics, biomechatronics, materials science, health care business, artificial intelligence, and machine learning
General Public and citizens	Website, Social Media	Holistic, broad project view and understanding

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	Participation at public events, public talks	Summary of ethic committee review report
End users, General stakeholders: Chamber of commerce, Patient groups, Technology stakeholders	Press Releases, Newsletters, Website Local events with Presentations, Exhibits, Realisations of demos, Videos Targeted meetings in life sciences, Patient organizations, Partners network, Early adoption network	Marketing articles Clinical articles Early customer value Thought leadership articles

Table 1. Dissemination target groups, dissemination channels, and type of information

Dissemination / Communication tool channel	How to measure	Target	Contingency plan if target not being met
Website	Number of monthly visits Duration of time spent on site	300 visits per month Duration: 90 seconds	Promote the web site in social media Publish additional project news and updates Partners will have links from their institutional websites to the B-CRATOS website. Promote the website in public events, talks.
Newsletters	Number of Newsletters Number of downloads viewed per issue	1 newsletter per year 50 downloads per issue	Print the e-Newsletter and bring to workshops and booths. Sent to target groups.
Events organised **1- Workshops /Schools** **2- Webinars**	Number of events Number of attendees per event	**1:** 2 total, at least 25 attendees per event **2:** 2 per year, at least 30 attendees per event	Additional relevant guest lectures Publicise webinars and workshops more extensively through network
Publications	Number	15	Discussions within the consortium at WP7 meetings
Conferences Proceedings	Number	16	Discussions within the consortium at WP7 meetings

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Presentations at conferences	Number	25	Discussions within the consortium at WP7 meetings
Social media: **1- LinkedIn** **2- Twitter** **3- Research Gate**	**1&2:** Number of followers; Number of articles; Number of engagements (views, likes, retweets) **3:** Number of articles; Number of followers	**1&2:** 100 followers per year , 1 article post per month, 200 engagements per post **3:** 15 articles, 30 followers per year	Partners will create and send content for media articles and posts. Partners will foster B-CRATOS project within their social media networks.
Press releases	Number	3	Press releases to include language emphasizing impact, applications, potential of technology.
Videos	Number	6	Emphasize the interest of these videos within the Consortium
Booths at conferences, tradeshows, exhibition	Number	2	
Event for the general public	Number	2	
Thesis	Number	6 Thesis/ dissertations	
1 Stakeholders Seminar	Attendance	25	Position Paper

Table 2. Dissemination & Communication channels and KPIs

2.2 Monitoring

The Planned values for the Key Performance Indicators (KPIs) will be monitored regularly. The Consortium plans to hold monthly Work Package 7 (WP7) meetings between all representatives of the project Partners involved in WP7 with a standing agenda item to routinely check-in on the above channels and plan upcoming activities. In addition, tracking spreadsheets are maintained on a shared drive, to which Partners can access and update their activities.

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In the tracking documentation, colored arrows will indicate the status of each planned KPI: Yellow arrows indicate a neutral situation regarding the plan, green arrows indicate that the objectives are going to be overfulfilled according to the actual projection, and red arrows indicate that the KPIs were not met yet or are in risk of not being achieved according to current planned activities.

Feedback from interested parties will be encouraged through the above interactions, with such information collected, with appropriate consent, and analysed to guide the effectiveness of dissemination and exploitation activities.

2.3 Project identity and public image

The B-CRATOS project identity and the Dissemination instruments, which are very significant for the image of the project, are defined through:

- The creation of an Official Project Logo. The logo was discussed within the Consortium and adopted at the beginning of the project. It is included in well visible positions on all dissemination materials, internal and external documents, and webpages, press releases or other publications as well as on all deliverables, milestones and reports produced during the first period and it will continue to be used during the lifetime of the project.
- An animated version of the logo was additionally created to visually explain the aims of the project.
- The establishment of the project website and project social media accounts.
- The creation and adoption of standard templates for the deliverables, presentations, reports. They will be used by B-CRATOS Partners for every oral or written project communication, and at conference presentations acting as Dissemination instruments.

2.4 Completed communication / dissemination activities

2.4.1 Website

The project website URL is https://www.b-cratos.eu/.

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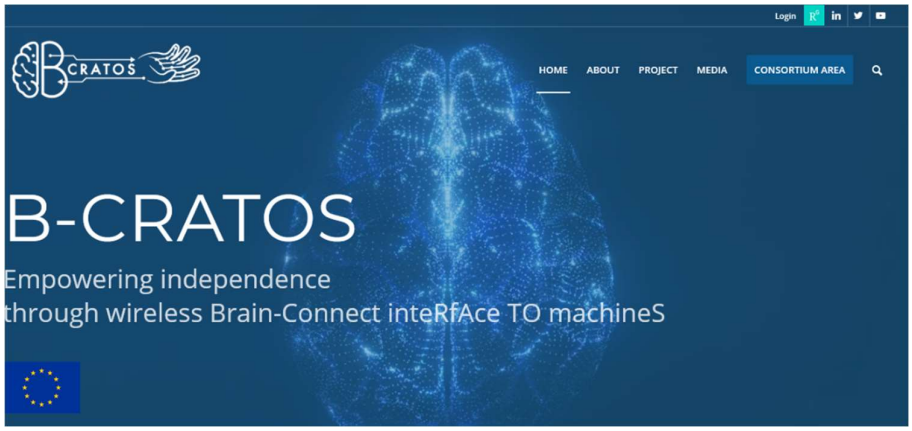

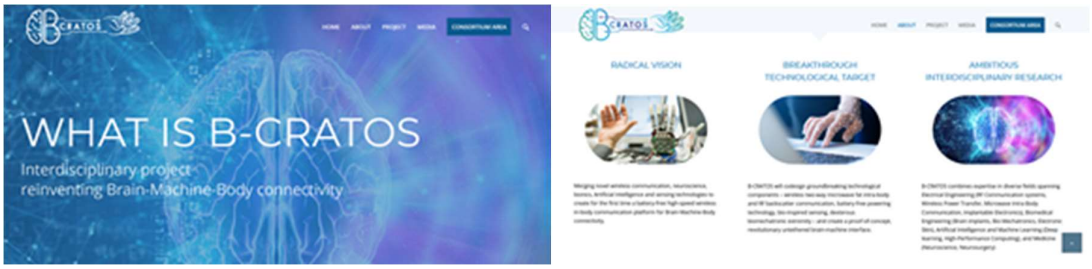

Figure 1. Screenshots from the project website b-cratos.eu.

A dedicated project website was activated on-line two months following project initiation and is regularly updated and expanded. The B-CRATOS website is at the core of ASCENT+ communications, and as such, is a critical hub for both communication and dissemination. It includes a basic description of the project aims, contains general information about the project, B-CRATOS News, and promotional materials, and explains how the public may interact with the project. The website includes a basic description of the project objectives, profiles of the Partners, and a description of the infrastructure. Press releases, news and upcoming events in areas related to the project are also advertised on the website.

Additionally, the website provides both a Public (open access) area for external communication and dissemination and two private, secured and password-protected areas for internal project management and communications.

The **Public website area** will provide a platform for the dissemination of project goals and results, such as Open Access Publications, press releases, links to publicly released datasets, and educational materials.

The Consortium area contains two secured areas:

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1. A first private area is restricted to the **members of the Consortium only**. Here, consortium staff will find all finalized B-CRATOS confidential documents, confidential deliverables, reports, updates, progress indicators, as well as links to critical project management platforms and data hosting services. This area should serve as a guiding hub and primary information source for consortium members.
2. A second private area is intended for the **B-CRATOS Advisory Board** to provide them access to the B-CRATOS Timeline, official confidential documents, and presentations prepared for the AB meetings. This hosted information will be critical to keep the Advisory Board up to date on project progress and enable them to give accurate advice and guidance at Large Consortium Meetings.

2.4.2 Project animation

A B-CRATOS video animation was designed and implemented to better explain the B-CRATOS project and deliver the main project message: the animation is embedded on the project website (https://www.b-cratos.eu/b-cratos-in-1mn/) and was broadcast through the media channels.

2.4.3 Initial Press Release

After the Kick-off meeting of B-CRATOS held by videoconference on March 18, 2021, the official Press Release, which announced the launch of the B-CRATOS project, was drafted, finalized, and widely communicated through B-CRATOS project social media platforms, Partners' institution's websites, social media, and through e-mail the same day.

2.5 Project presentation

2.5.1 Project description

A general project description can be found on the website on the Homepage and in the "What is B-CRATOS" page).

2.5.2 Press Releases

In addition to the initial Press Release already published, the Consortium plans to publish additional Press Releases at the completion of each major milestone and a final Press Release at the end of the project. Each Press Release will be communicated through the project website, project social media, and by the consortium Partners' media platforms as well.

2.5.3 Flyer

An official B-CRATOS flyer is planned to be developed with the purpose to be distributed to interested individuals as a reminder and reference of their contact with the B-CRATOS project at events such as conferences, workshops, at the institutions of the different B-CRATOS

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Partners, and in various meetings. The promotional flyer will provide an introduction and overview of the project, including contact information and other B-CRATOS media channels, and will be updated as needed while the project progresses.

Due to the Covid situation, we plan both printed and digital versions of the flyer. The digital version will be available on the website.

2.5.4 Posters

General Posters explaining the concept of the B-CRATOS project will be prepared to help presenting the project at Public or Stakeholders events.

Topic-specific Posters addressing additional details regarding individual subdomains covered through the B-CRATOS project research activities will be prepared to present the outcomes to target groups at conferences, symposiums, and similar forums.

2.5.5 Newsletters

A yearly Newsletter will be authored to highlight the main outputs of the project as well as their potential applications.

The B-CRATOS Newsletters will cover all aspects of our multi-dimensional project.

Newsletters will be distributed to and through all Partners, available on the website, shared through the mailing lists, and widely disseminated on social media.

2.5.6 Business and Social Networks profiles

Due to the pandemic situation, participations at meetings and conferences were only possible remotely so it was decided to have instead a very active and strong media strategy to reach as many new people as possible. Other e-communication channels included a Twitter account, a LinkedIn page, and a ResearchGate account, are used regularly, to disseminate and highlight scientific and promotional tweets/posts.

The number of B-CRATOS followers is growing and the messages are often re-sent by the Partners' Twitter, LinkedIn, and ResearchGate accounts and, in that way, reach many thousands of followers. Media analytics are analyzed, and the content modified accordingly.

By employing multiple key social media platforms in a multi-pronged approach, the B-CRATOS communication and dissemination activities can reach the broadest audience, both general public and targeted:

- ***B-CRATOS on LinkedIn:***

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B-CRATOS has a LinkedIn presence here: https://www.linkedin.com/company/b-cratos/ (currently 125+ followers). LinkedIn is a social media platform popular and frequented by the business community, corporations, working professionals, and researchers.

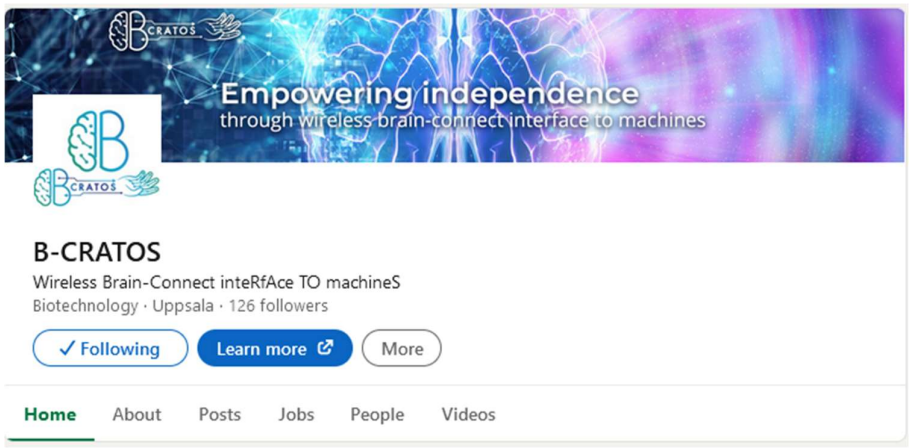

Figure 2. The B-CRATOS LinkedIn homepage.

- ***B-CRATOS on Twitter:***

B-CRATOS has a Twitter account with the following feed: https://twitter.com/b_cratos (currently 36 followers). Twitter is a social media platform with extremely broad reach that is popular in the academic, business, and media communities and often employed for broad dissemination of research findings and technological demonstration videos.

Figure 3. The B-CRATOS Twitter feed.

- ***B-CRATOS on ResearchGate*:**

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B-CRATOS has a ResearchGate account here: https://www.researchgate.net/project/B-CRATOS (currently 6 followers). ResearchGate is a European social networking platform designed for academic researchers to disseminate results and seek collaboration.

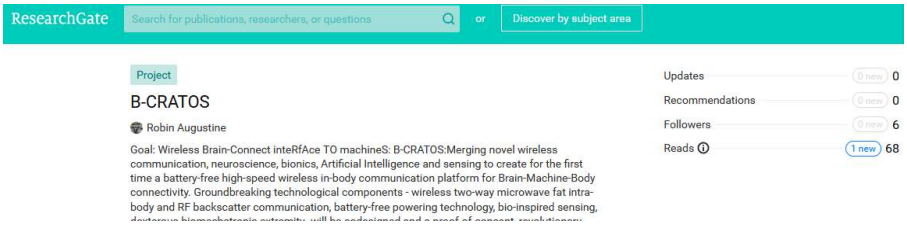

Figure 4. The B-CRATOS ResearchGate homepage.

- ***B-CRATOS on YouTube:***

The B-CRATOS YouTube Channel is found here:

https://www.youtube.com/channel/UClQBt8uMxS9UkX3Pn7b1MDA (currently 4 followers).

The YouTube channel will host publicly released promotional videos that can be embedded into the website and other social media accounts. Aside from hosting public media, YouTube itself has a very broad userbase (the Google user network) that can be leveraged to effectively disseminate B-CRATOS video media such as talks, live webinar recordings, demonstration videos, and educational materials.

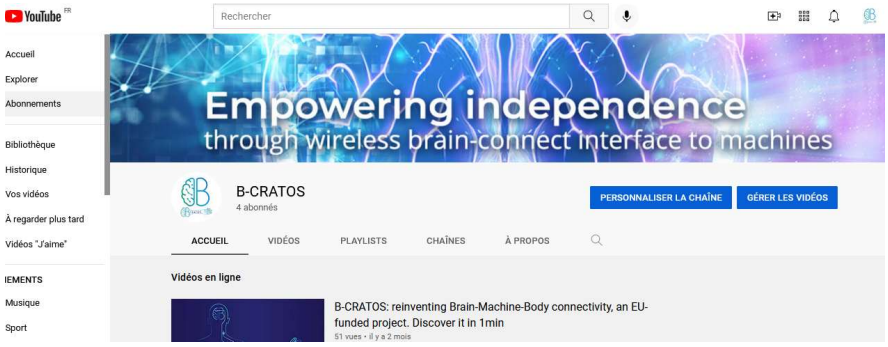

Figure 5. The B-CRATOS YouTube homepage.

All B-CRATOS media channels are accessible directly by the B-CRATOS website.

2.6 Planned dissemination activities

Achievements and knowledge gathered within the B-CRATOS project will be widely disseminated through publications in major international journals and participation of B-

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CRATOS Partners in international conferences and workshops. Only publications and presentations which clearly acknowledged the B-CRATOS project will be listed.

2.6.1 Publications

The scientific findings and technological advances made possible by the B-CRATOS project will be publicly disclosed in peer-reviewed scientific journals. The targeted journals cover a broad range of topics in wireless signalling, prosthetics, physics, neuroengineering, machine learning and computational techniques, and prosthetics, and are listed (non-exhaustive) below:

- IEEE Transactions on Microwave Theory and Techniques
- IEEE Transactions on Antennas and Propagation
- IEEE Transactions on Biomedical Engineering
- MDPI Sensors
- IEEE Access
- Nature: Scientific Reports
- IEEE Open Journal of Antennas and Propagation
- IEEE Transactions on Biomedical Circuits and Systems
- IEEE Transactions on Pattern Analysis and Machine Intelligence
- Future Generation Computer Systems
- ACM Transactions on Architecture and Code Optimization
- Science Robotics
- Journal of Neuroengineering and Rehabilitation
- IEEE Transactions on Neural Systems and Rehabilitation Engineering
- Advanced Electronic Materials
- Nano Energy
- Journal of Neuroengineering (IOP)
- Journal of Neuroscience
- eLife
- Journal of Physics

Open access to publications will be ensured, either by publishing in open-access journals or by choosing the open access option for specific articles in traditional subscription journals. The Consortium will use the “green access” model; creating a self-archived version of any article published by the Partners and the B-CRATOS users in any journal for free public use, in a repository accessed through the FLESSPAG Portal within 6 months of publication.

2.6.2 Project presentations at conferences

B-CRATOS Partners will also regularly attend scientific conferences and give presentations of B-CRATOS results, including the presentation of keynote speeches. Where present as programme committee members, and hence in a position to address this,

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Partners will strive to participate in tutorials or short courses of selected conferences. A selection of targeted conferences that Partners have regularly attended and plan to attend is given below. Other relevant regional and national conferences will also be targeted. Given the COVID pandemic and its possible impact still on the near future, online formats will also be considered.

BRME and LINKS will also leverage their corporate marketing channels and social media presence to promote key highlights of the project.

The main international research conferences, often yearly conferences, in neuroscience, computing, and other relevant B-CRATOS fields targeted by the B-CRATOS Partners are indicated below:

- Conference on Neural Information Processing Systems (NeurIPS, https://nips.cc/)
- Hipeac conference (https://www.hipeac.net/2022/budapest/#/)
- European Conference on Antennas and Propagation (EuCAP, https://www.eucap.org/)
- IEEE Engineering in Medicine and Biology (EMBC, https://embc.embs.org)
- IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting (IEEE AP-S/URSI, https://2022apsursi.org/)
- IEEE European Solid-State Device Research Conference (ESSDERC-ESSCIRC, https://www.esscirc-essderc2022.org/)
- The International Conference on Solid State Sensors, Actuators, and Microsystems (Transducers, https://www.transducers2021.org/)
- Society for Neuroscience meetings (SfN, https://www.sfn.org/meetings)
- Society of the Neural Control of Movement meetings (NCM, https://ncm-society.org/)
- Biomedical Engineering Society (BME) Annual Meeting (BMES, https://www.bmes.org/annualmeeting)
- IEEE International Microwave Biomedical Conference (IMBIOC, http://www.nusri.cn/imbioc2022/)
- International Microwave Symposium (IMS, https://ims-ieee.org/)
- International IEEE EMBS Conference on Neural Engineering (EMBS, https://neuro.embs.org/)Supercomputing (https://sc21.supercomputing.org/)
- IEEE International Conference on Robotics and Automation (ICRA, https://icra2022.org/)
- IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS, https://iros2022.org/call-for-papers/)North American Neuromodulation Society (NANS, https://neuromodulation.org/)
- Federation of European Neuroscience Societies Forum (FENS, https://forum.fens.org/)

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- International European Conference on Parallel and Distributed Computing (EuroPar, https://2021.euro-par.org/)
- International Conference on Artificial Neural Networks (ICANN, https://waset.org/artificial-neural-networks-conference)
- International Conference on Complex, Intelligent and Software Intensive Systems (CISIS, http://voyager.ce.fit.ac.jp/conf/cisis/2022/)
- ACM/SIGAPP Symposium on Applied Computing (SAC, http://www.sigapp.org/sac/sac2022/)
- International Consortium for Rehabilitation Robotics Conference (ICORR, http://icorr-c.org/others/)
- Bernstein Network Computational Neuroscience (https://bernstein-network.de/en/bernstein-conference/)

Additional conference, symposium, and trade show opportunities will be identified as the project progresses and evaluated for suitability for the information to be disseminated or exploitation activities.

2.6.3 Invited Lectures and Talks

Invited lectures and talks are also very important for the visibility of the B-CRATOS project, as, for example, was the presentation by Dr. Robin Augustine from Uppsala University, B-CRATOS coordinator, on "Brain machine interface and the age of cyborgs" at the UppTalk videoconference at the beginning of the project, reaching a large audience.

2.6.4 Booth at conferences

Booths at conference are the best opportunities to give visibility to the B-CRATOS project and to provide networking and dissemination opportunities with interested audiences.

The consortium plans to have a booth in the framework of an EC event (workshop or at the EFECS conference), and a booth in the framework of an industrial conference.

2.6.5 Hosted Conference

A conference presenting the B-CRATOS results will be organized in M30.

2.6.6 Workshops/ Schools

Two Workshops are expected to be planned and held during the B-CRATOS project period.

To strengthen the interaction, they may be organised in the format of an open Summer School and an open Winter School, the duration for each of them being at least 2 half days.

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2.6.7 Satellite Seminar / Webinar

Two webinars per year are planned to explain the different domains of research covered by B-CRATOS, the videoconference format will be envisioned to reach a broader audience. Recordings of the webinars will also be available on the B-CRATOS website.

2.6.8 Dissemination Activity Targets

As described in the above sections, dissemination activities by Partners are being tracked and discussed in the Communication and dissemination monthly meetings. For this purpose, Partners were asked to provide provisional Key Performance Indicators (KPIs) (see Table 3, below), which will be updated as needed during the project duration. The target numbers are of course highly dependent on the outcome of the research activities.

For further detail on planned activities, please relate to the overall KPI on Table 2.

	Dissemination and outreach action					
Partners	**Publications**	**Events / conferences**	**of which Poster**	**of which Oral**	**Patents**	**Thesis**
UU	4	8	2	6	2	2
SSSA	1	2	1	1		1
BRME	Joint	Joint			1	0
LINKS	4	6	0	6	0	2
DPZ	4	8	5	3	0	0
NTNU	2	1			1	1
TOTAL	**15**	**25**	**8**	**16**	**4**	**6**

Table 3. Provisional KPIs per Partner

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3 Exploitation plan

The following section details the preliminary exploitation plan for the B-CRATOS project. In the early stage, the primary goals of the B-CRATOS exploitation activities are to develop a strategy to successfully identify project results requiring protection as intellectual property (IP) and to coordinate the development and submission of patent applications. Following the IP development phase, future exploitation activities will focus on developing IP management, licensing, and business strategies for the B-CRATOS platform and core technologies.

3.1 Purpose

Under Article 28 of the B-CRATOS Grant Agreement, each Partner is obligated to take measures to exploit the results in further research activities, products or processes, services, or standardisation activities for up to 4 years after the project period (48 months from 1 March 2021).

The exploitation plan addresses the following related tasking and deliverables (Appendix A of the B-CRATOS Grant Agreement):

- T7.4 *Filing of patents* for relevant technologies (Months 1-48):
  - Wireless neural interface
  - Fat IBC
  - Robotic arm control and sensation
- T7.5 *B-CRATOS technology exploitation for research* (Months 28-48)
- T7.6 *Licensing agreements for high-bandwidth wireless communication system* (Months 30-48)
- D7.6 *Three PCT patent applications and licensing agreements* (M48)

A major objective of the B-CRATOS project is to develop and execute a strategy to exploit the technology platform in the animal and human research markets, and critically, to apply B-CRATOS technologies to clinical medical device applications through the pursual and formation of partnerships, joint ventures, and licensing agreements. While successful demonstration of project results and dissemination will establish the scientific and technological rigor and validity of the B-CRATOS platform technologies, the exploitation plan established in this document serves to guide the Consortium Partners' actions when pursuing the above goals through careful protection and exploitation of the knowledge developed during the project. Importantly, the exploitation plan presents procedures and plans for action to smooth the transition from research and development to intellectual property protection and to ensure effective coordination, cooperation, and collaboration among the Partners.

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The exploitation plan is a living document and will be expanded and adapted as project needs evolve. The first iteration of the exploitation plan focuses upon the intellectual property development and protection strategy and describes potential applications and market impacts of the technologies, laying a foundation for future development of business plans and eventual commercialization activities as the intellectual property domains are realised.

3.2 Governing agreements

The provisions in the B-CRATOS Grant Agreement and Consortium Agreement are the governing documents laying down the rules for participation and dissemination, specifying and supplementing binding commitments among the Partners.

Critical rules and policies impacting the exploitation process are found in the Grant Agreement especially in (but not limited to) Section 3, Rights and Obligations related to Background and Results:

- Article 23: Management of intellectual property,
- Article 24: Agreement on background,
- Article 25: Access rights to background,
- Article 26: Ownership of results,
- Article 27: Protection of results,
- Article 28: Exploitation of results,
- Article 30: Transfer and licensing of results,
- Article 31: Access rights to results,
- Article 36: Confidentiality,

with additional obligations laid out in the Consortium Agreement in (but not limited to):

- Section 8 (Results): ownership, transfer, dissemination of results,
- Section 9 (Access Rights): access rights to results and background,
- Section 10 (Non-disclosure of information): policies regarding the identification and disclosure of Confidential Information, and
- Section 11 (Miscellaneous): miscellaneous rights and clarifications, settlement of disputes.

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3.3 Exploitation vision and timeline

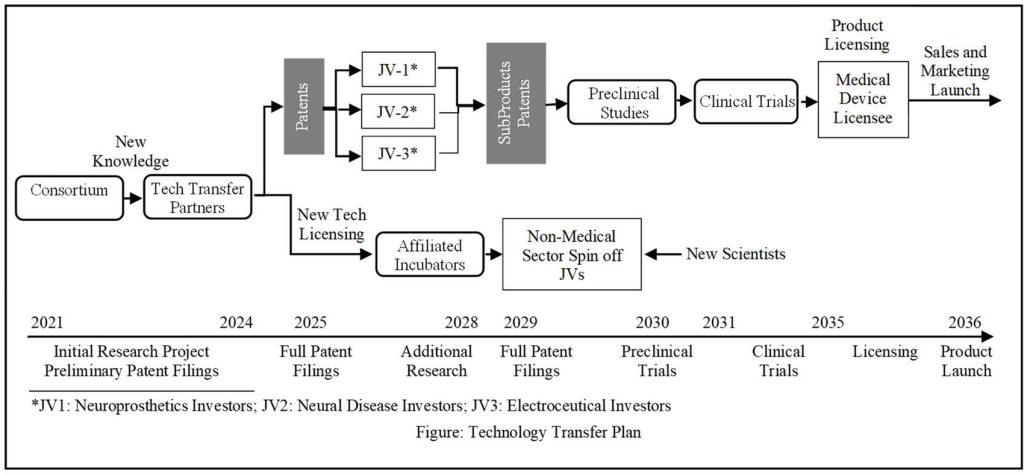

Figure 6. The B-CRATOS long-term exploitation vision.

The B-CRATOS vision for exploitation of results relies upon ensuring the "freedom to operate" and transfer the primary result of an in-body wireless communications platform in medical (and non-medical) devices from bench to bedside through management and protection of project knowledge in the form of **patented intellectual property (IP).** The technology transfer plan is divided into eight primary phases, of which two phases fall within the B-CRATOS project period and are the focus of this initial plan:

1. **Initial Research Project, Preliminary Patent Filings**
2. **Full Patent Filings**
3. Additional Research
4. Additional Full Patent Filings
5. Preclinical Trials
6. Clinical Trials
7. Licensing
8. Product Launch

As new knowledge is developed during the project period, project Partners will author and submit international patent applications. Patent protection will be targeted in key international regions: European, North American, and Asian states with large markets and active biotechnology industries.

Through the acquisition of protected IP, the B-CRATOS Consortium anticipates pursuing technology transfer of the B-CRATOS platform to the biomedical industry through Partner affiliates and new strategic associates encountered through dissemination channels and outreach. Additionally, newly developed IP will be licensed into other non-medical sectors and markets through individual consortium partners and new joint ventures.

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The overall exploitation strategy will be further refined and updated in future versions of this plan, as patentable inventions are developed and clearly identified.

3.4 Identified IP areas

Patent protection is planned to be sought for core technologies and project results developed within and across the three technical work packages that form the basis of the B-CRATOS platform:

- Work Package 2 (WP2): Brain interface: Wireless powering and communications
- Work Package 3 (WP3): Fat-Intra Body Communication
- Work Package 4 (WP4): Design and integration of the biomechatronic prosthetic upper limb

3.5 Potential Markets & Use Cases

The primary product of the B-CRATOS project is an in-body wireless communications subsystem that can enable bidirectional closed-loop control of prosthetics or other medical devices.

The annual cost of treatment for neurological disorders is €1.4B globally with a medical device market of over €335B, expected to more than double in the coming decade.

The technologies developed the B-CRATOS platform are innovative in many regards, but critically offer the following advantages over brain-computer interface (BCI) and brain-machine interface (BMI) products available on the market today:

- High channel count, high bandwidth data
- Novel secure, wireless communication
- Two-way low-latency communication
- Closed-loop control of external devices, prosthetics, robotics

3.6 IP Strategy

3.6.1 Objective

The legal protection of inventions will be sought through patenting core B-CRATOS technologies as intellectual property to enable further development, freedom to operate, and activities such as licensing. The term of patents is typically 20 years from the filing date (EPO, USPTO) with some possibilities for extensions under national laws.

3.6.2 IP Committee

The B-CRATOS Consortium will establish an IP Committee to manage and coordinate the development of intellectual property through patent filings. Additionally, the IP Committee

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will serve an important role in ensuring ownership claims and rights are respected according to the Grant Agreement, Consortium Agreement, and National and EC policies.

The IP Committee will be constituted of a representative from UU as Project Coordinator, a representative from BRME as WP7 leader, and at least one representative from each Partner expecting to author B-CRATOS IP.

The role of the IP Committee:

- Coordinate and monitor Partners through the patent process, including agreements on the scope of each patent, the content of patents including whether they can or should be partitioned, and forming timelines and deadlines for authoring and submission.
- Guide the formation of exploitation agreements for rights management between Partners on IP, expanding upon the Consortium Agreement's requirement of "Fair and Reasonable Compensation". For example, an exploitation agreement between partners jointly owning a patent may establish rules governing the sub-licensing of patents to third parties.
- Act as a notifying body for those Partners planning to publish a public disclosure of B-CRATOS results. The IP Committee will provide guidance to the notifying Partner regarding the presence of any potentially sensitive information and determine and coordinate preparation of patent application development to precede the disclosure.

The IP committee will meet regularly as dictated by the current phase and activities of the project, but no less frequently than once per quarter.

3.6.3 Public disclosure

The ability to protect inventions resulting from the B-CRATOS project with future patents can be limited (barred) by public disclosures the give enough information to someone "of ordinary skill in the art" to duplicate such inventions. Public disclosure is a broad term that includes printed publications or talks. Public disclosure is a critical feature of the B-CRATOS objective and obligation for Communication and Dissemination of results, as described in Section 2 of this Plan. However, care must be taken to protect project results before IP applications are submitted. Especially relevant for B-CRATOS printed public disclosures can include (but are not limited to) the following:

- Research articles
- Popular science articles
- Posters, Abstracts, Conference proceedings
- Grant proposals
- Email

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- Project website

Oral disclosures may include (but are not limited to):

- Conference talks
- Lectures
- Thesis defence presentations
- Department seminars

To mitigate the risk of premature public disclosure threatening patentability, potentially sensitive information should either be excluded, embargoed until relevant patent applications are submitted, or clearly marked as CONFIDENTIAL. However, not all potential disclosures may be protected in these ways, thus, notification and consultation with the General Assembly and IP Committee will provide guidance.

Partners are asked to notify the IP Committee at least 90 days before publication or disclosure.

Rules and procedures for confidentiality are established in the Grant Agreement, Consortium Agreement, and B-CRATOS Data Management Plan.

Once patentable results are protected through patent filings, the B-CRATOS Consortium, in support of the Open Access publication concept and in adherence of relevant policy of the European Commission, will disclose project findings to the general public and scientific community through peer-reviewed publication in high-impact journals. These public disclosures will not only support the overall mission and obligation to the European public, but additionally provide important demonstration and academically rigorous review of B-CRATOS technological claims as the consortium proceeds with commercialization activities.

3.6.4 Patent Cooperation Treaty (PCT) International Filing

B-CRATOS plans to file international patent applications through the World Intellectual Property Office (WIPO) under the PCT, an international treaty with more than 150 Contracting States. This will make it possible to seek patent protection simultaneously across many target regions through a single application. Advantages of this system include that the filings will need to only comply with one set of requirements through the international filing, will have consistent language and claims across all target states and regions, minimizes up-front costs before filing across multiple regions, and affords additional delays before deciding on the overall international strategy while preserving an earlier priority date for protection.

3.6.5 Patent Authorship

Documentation will be maintained in secure storage throughout the B-CRATOS project period (see B-CRATOS Data Management Plan). These project documents will support ownership claims to invention and authorship rights for B-CRATOS developed IP and provide important

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inputs to the listed patent claims. Patentable ideas will be regularly tracked through regular Work Package 7 and IP Committee meetings through a secured "IP Tracker".

3.6.6 Patentability search

Before investing in the development and filing of a patent application, a patentability search will be performed by the authors to guide the development of the patent claims and reduce the risk of conflict with existing prior art. Patentability searches will be performed using tools such as PatSnap (www.patsnap.com/), Google Patents (patents.google.com), and resources such as the Tech Transfer offices and legal consultants of respective partner institutions.

3.6.7 Timeline

The timeline for patent submission is expected to be variable for each individual patent application and development timeline. However, application submissions are expected to follow the same general model and timeline.

Draft Application. Invention development, identification, initial patentability searches, and the drafting of patent applications is anticipated to take place during the first 12-18 months of the B-CRATOS project. During this time, a publishing embargo for sensitive information will be in place to prevent the disclosure of sensitive information (see Section 3.4) relevant to the patent applications.

Local Filing. Starting in Month 18 of the project, it is expected that initial patent application filings will be made with local offices of a member country of the PCT. This will set the *priority date* for the filings. Once a patent application filing is executed, publications and other public disclosures may be made.

PCT Filing. At Month 30, international PCT applications are filed with the WIPO (see www.wipo.int).

International search report and written opinion. At Month 36, an international search report (ISR) and written opinion of the international search authority (WOISA) are received from the PCT. Optionally, amended claims and informal comments may be filed following receipt of the ISR. Two months following (Month 38), the international application and reports are published.

National phase. By Month 48, or at least 30 months following the priority date for a given application, patent filings are made with individual national and regional offices such as the European Patent Office (EPO), United States Patent and Trademark Office (USPTO), and others. Time limits to apply vary across various National/Regional Phase entries under the PCT and may be found here: https://www.wipo.int/pct/en/texts/time_limits.html. For example, the EPO allows 31 months following the initial filing, and the USPTO allows only 30

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months. An accepted language for patent filings in the EPO and USPTO is English, as with the PCT application, but other countries and regions may require translation to file.

Patent pending approval. Following the international phase, the national phase duration is variable until patent approval is granted. Depending upon the nation and region in which the patent is filed, the granting of a patent is followed by periods allowing for validation, opposition, limitation/revocation, and further appeal.

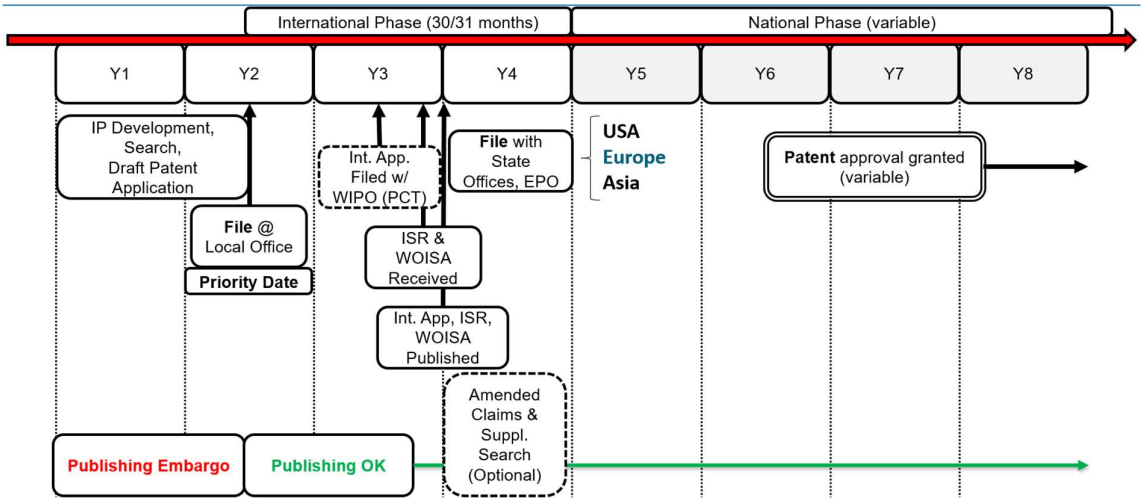

Figure 7. Anticipated patent submission timeline.

3.6.8 Costs

Costs for patent preparation and application fees are anticipated to over €10000 and as much as €30000 or greater, depending upon the countries and regions selected for the National Phase. The Partner author for each patent application will be responsible for funding these fees through their individual project budgets. If multiple Partners collaborate on a single patent application as co-authors, expenses will be negotiated separately between the given Partners.

3.6.9 Strategic partners

The B-CRATOS Consortium has received letters of interest from Intel Corporation (intel.com) and Amazon (amazon.com).

Once specific IP applications are identified and confirmed, additional potential strategic partners will be identified during the technology transfer phase and business plan development, through continuous scanning of the market in the exploitation phase to profile promising new partners.

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3.6.10 Technology transfer phase

Following patent filings, project Partners will then begin to identify the most promising use cases for the B-CRATOS core technologies and collaborate to develop business plans for the primary product of an in-body wireless bidirectional brain computer interface communications platform, to translate the demonstration of the core system to future partnerships and commercial applications, as well as for individual technologies.

One long-term goal is to identify industry partners for joint ventures based on the core B-CRATOS technologies and platform, targeting the medical sector as a novel BCI platform for neurological disease and related indications. A second pathway is collaboration with affiliated incubators and form joint ventures between B-CRATOS Partners and entrepreneurs to license B-CRATOS protected IP in the non-medical sector.

Key components of the business plan will include:

- the identification of target markets and market segmentation, including the relative value and benefit of B-CRATOS technologies to any existing medical solutions
- plans for needed additional pre-clinical and first in-human clinical trials
- an analysis of health care economics, such as insurance reimbursement plans)
- economic feasibility through estimates of market penetration over time and revenues
- identification of medical device companies (potential joint venture distribution partners, competitors) in the target markets

The development of a business plan for the core platform technology along with successful demonstration of the core technologies and public dissemination of results in high-profile journals and conferences will culminate in the creation of investor pitch decks to present the business opportunity to interested external partners and investors. Opportunities will be built and identified through the Partners' networks and through the communication and dissemination activities outlined in the prior section of this plan.

As the development of core B-CRATOS technologies and results progresses, this exploitation plan will be expanded to include additional details regarding industry outreach and business plan development.

4 Revision history

REVISIONS			
Version #	**Date**	**Type of Change**	**Lead Author**
0.1	10-06-2021	Template for project documents created	Paul Wanda

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0.2	06-09-2021	Working draft	Paul Wanda
0.3	21-10-2021	Updated draft	Paul Wanda
0.4	25-10-2021	Consolidated version for review by the Consortium	Paul Wanda
0.9	28-10-2021	Cleaned up text and final edits for final review	Paul Wanda
1.0	29-10-2021	Finalized version for D7.1	Paul Wanda

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