Strategy and organisation of a High-Level Support Team (HLST)

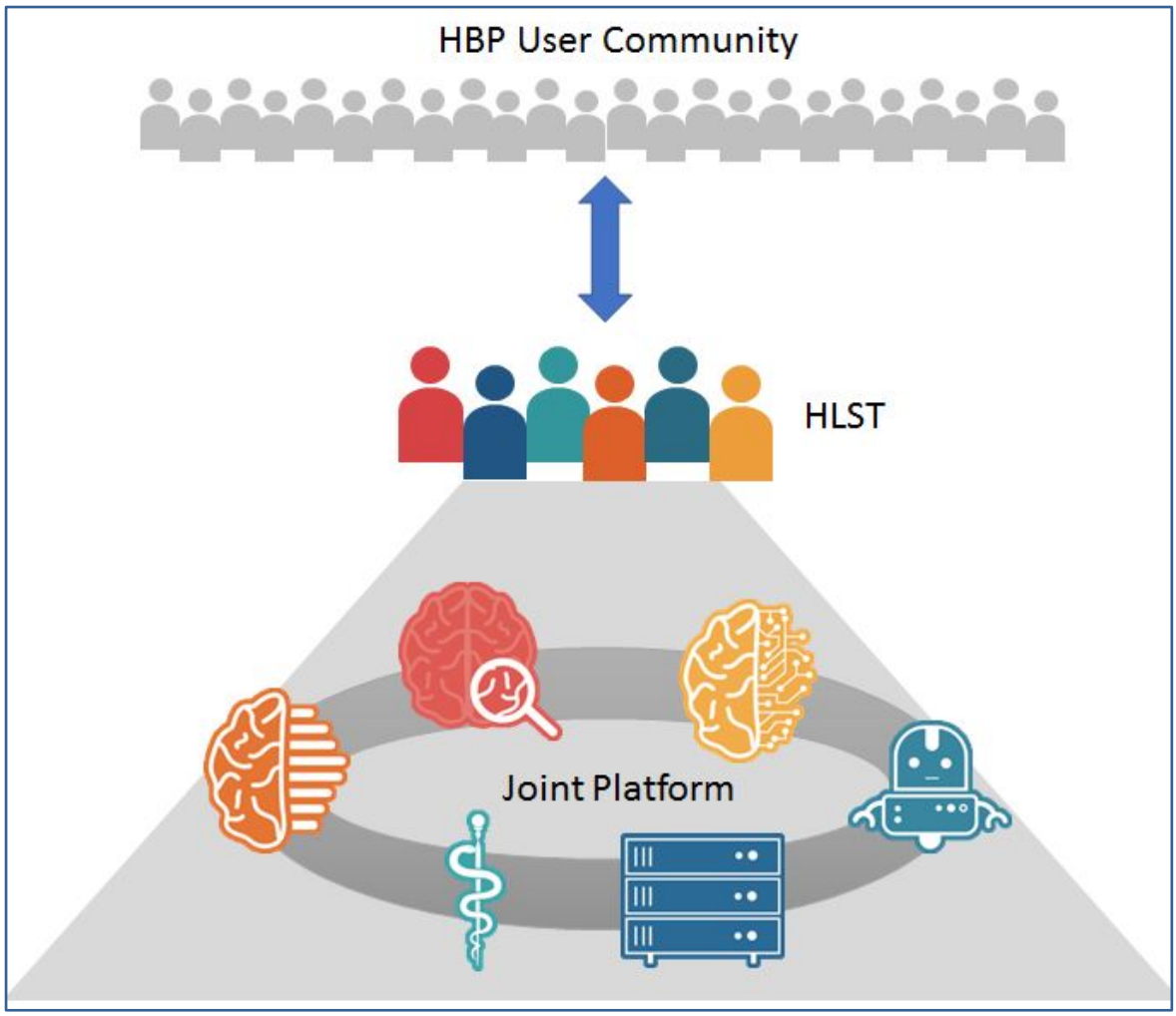

Figure 1: Role of HLST in HBP – bringing the user community to the services developed by the HBP Joint Platform

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Abstract:	This document describes the vision behind the HLST, provides information on the government and establishment of the HLST as well as a description of the responsibilities of various tasks involved in the HLST.
Keywords:	Joint Platform, users, support

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1. HLST: Vision, Mission, Values

1.1 Vision

The HBP Joint Platform (JP) High-Level Support Team (HLST) aspires to foster the uptake of the HBP Joint Platform services by the broader research community by connecting users to the corresponding infrastructure and service developers and providers inside HBP.

1.2 Mission

The mission of the HLST is to help users achieve their research goals through the use and enhancement of the most appropriate tools and services provided by the HBP JP. Through its support, the HLST will increase the user base and advance the development of custom-engineered solutions for users of the HBP JP.

1.3 Values

HLST operates on the following principles:

- Openness: HLST support actions are open to the broader researcher community through transparent prioritisation processes.
- Result orientation: HLST criteria for action are results and deliverables to fulfil the needs of the user community.
- Excellence: HLST benchmarks for all activities are state of the art and best practice based.

2. Establishing the HLST

2.1 HLST Steering Committee

In line with the SGA2 contract, the HLST management team first organised the HLST Steering Committee (HLST-SC) with representatives from each SP, in order to provide input to platform SPs from non-platform SPs as well (Table 1). HLST-SC oversees the work of the HLST.

Table 1: Members of the HLST-SC.

Name	SP
Egidio D'ANGELO	SP1
Jean-Philippe LACHAUX	SP2
Pier Stanislao PAOLUCCI	SP3
André GRÜNING	SP4
Trygve LEERGAARD	SP5
Michele MIGLIORE	SP6
Boris ORTH	SP7
Ludovic CLAUDE	SP8
Andrew DAVISON	SP9
Axel von ARNIM	SP10
Jeff MULLLER	SP11
Lars KLÜVER	SP12
Jan BJAALIE	HLST-SC leader
Roman VOLCHENKOV	HLST manager

2.2 Establishing the HLST

The platforms were invited to provide Special Support Action (SSA) proposals to be selected and approved by the Steering Committee.

In total HLST-SC received 17 SSA proposals from platforms. As the result of an intensive evaluation process by the HLST-SC, both offline and during seven videoconferences (June-August 2018), 9 proposals were endorsed. Further, two proposals were merged into one, resulting in 8 final SSAs. Those eight SSAs have been transformed into Tasks inside WP5.9. (T5.9.4-T5.9.11).

HLST-SC used the following selection criteria for assessment:

- immediate impact potential
- availability and demand of the users (including an emphasis on external users)
- availability of the services offered (not at this point the highest priority for services that would require considerable time to establish).

HLST-SC selected EPFL as the responsible partner for T5.9.2 and T5.9.3 (Front line support and Operations support, respectively), following consultations also involving ETHZ and JUELICH.

2.3 HLST governance and decision-making process

After deployment of HLST (M7 of SGA2) the HLST coordination (T5.9.1) together with HLST-SC will monitor the progress of the HLST work in order to assure that the HLST work supports the HBP JP Infrastructure Objectives:

1) Forge and operate the HBP's Research Infrastructure
2) Build the Scientific Research Infrastructure User Base
3) Assure the continuity and sustainability of the HBP Scientific Research Infrastructure

The monitoring will be done by regular (bi-monthly) meetings between HLST coordination and Tasks T5.9.2-T.5.9.11 and additional ad hoc meetings between HLST coordination and individual Task leaders. Before the bi-monthly meetings, Task leaders will be requested to present a written report describing the status of efforts and KPIs and listing the personnel working on their Tasks. Delays / underspending will be followed up by resource re-allocation to other Tasks at the earliest possible stages.

Further, HLST-SC will evaluate applications for the HBP Vouchers to be allocated to external Use Cases in order to further support the growth of an external user base for the HBP infrastructure.

3. Organisation of the HLST

The HLST is a joint group of experts from the HBP Platforms embedded into SP5 as a separate Work Package – WP5.9. HLST will provide four levels of support:

- Level 1 – User facing support team: Initial contact, initial user support and escalation as needed, provided by Task T5.9.2
- Level 2 – Technical user support, bug assessment, resolution, provided by Platform development teams
- Level 3 – Operations support for HBP Platform developers to maximise economies of scale in crucial operations practices, provided by T5.9.3
- Level 4 – Deep integration and scientific Use Case development support to maximise infrastructure usage by key internal and external users

Levels 2 and 4 are provided by T5.9.4, T5.9.5, T5.9.6, T5.9.7, T5.9.8, T5.9.9, T5.9.10, and T5.9.11.

Detailed overview of each Task is given in Appendix A (WP5.9 work plan, to be integrated into SGA2 contract after amendment).

Annex A: WP5.9 Work Plan

Work package No	WP5.9	Lead beneficiary	UIO	Start month:	M01	End month:	M24
Work package title	HBP Joint Platform High Level Support Team (HLST)						

Participant number	81	01	10	20	12	27	18	63	47	Total
Participant short name	UIO	EPFL	CNRS	JUELICH	CNR	CHUV	ETHZ	UMAN	UHEI	
Person-months	24	86,5	11,5	30	12	17,5	9	7,5	7,5	205,5
Person-years	2	7,2	0,96	2,5	1	1,45	0,75	0,625	0,625	17,11

Objectives and Description

Contributes to SP Objective(s):

SO5.8: Assure the success of the Subproject through coordinating the activities and maintaining an efficient and proactive relationship with other Subprojects and with the broader science community.

The Joint Platform (JP) High Level Support Team (HLST) will deliver a support operation, covering four levels of support.

- Level 1 – Initial contact, initial user support and escalation as needed, provided by Task T5.9.2
- Level 2 – Technical user support, bug assessment, resolution, provided by Platform development teams
- Level 3 – Operations support for HBP Platform developers to maximise economies of scale in crucial operations practices, provided by T5.9.3
- Level 4 – Deep integration and scientific Use Case development support to maximise infrastructure usage by key internal and external users

Levels 2 and 4 are provided by T5.9.4, T5.9.5, T5.9.6, T5.9.7, T5.9.8, T5.9.9, T5.910, and T5.9.11.

The HLST is a joint group of experts from the HBP Platforms. Through the level 1 support (T5.9.2), the HLST presents one single face to the users, helping to tame the complexities of HBP infrastructure access while making the full broadness of activities visible to the researchers.

The HLST will support the users of the HBP JP by helping to analyse and optimise workflows and by providing advice as far as tools, services, hardware etc. are concerned. HLST efforts will be organised as co-design and co-development actions, avoiding parallel development and maximising synergies among the participating partners. Furthermore, the HLST will support applications for resource allocations. The establishment of the HLST represents the first step towards demonstrating the true joint nature of the HBP Platforms, bringing the

different Platform aspects of HBP together, and enabling high-impact scientific Use Cases and immediate adoption of new technology by users in HBP and in the broader community.

The HBP-HLST will carry out a wide range of activities, which may include:

(i) scientific co-development in specific projects
(ii) collaboration on both the scientific and technical aspects of a research project
(iii) collaboration on a technical project that can be used to support one or more scientific projects carried out by the partner thus avoiding the duplication of efforts
(iv) support for modelling and simulation activities
(v) co-publication of scientific and technical aspects
(vi) software co-development on a synergistic basis
(vii) software outsourcing

WP5.9 supports objective SO5.8 by immediate and efficient adoption of new technologies, made available by the HBP Platforms, by a broad range of users.

This WP will contribute to all CDPs.

Description of Work (broken down into tasks)

T5.9.1 Coordination of the High Level Support Team (UIO (12), M01 - M24):

This Task will coordinate the HLST. It is responsible for:

4) Developing and monitoring the progress of the work plan for HLST
5) Assessment of KPIs
6) Coordinating representation of HLST at conferences and events
7) Internal communication and communication with other SPs, HBP STC and the Project Coordination Office
8) Alignment of HLST work with the HBP voucher programme, including organising the evaluation of voucher applications by the HLST-SC
9) Coordination of HLST outreach and communication activities

The activities of T5.9.1 will be overseen by the HLST Steering Committee (HLST-SC), with representation from all SPs.

In addition to Tasks inside WP5.9 this Task will contribute to T5.8.1.

T5.9.2 HBP Joint Platform Front Line Support (EPFL (18), M07 - M24):

This Task will provide a single initial point of support for all Joint Platform users, referred to as Level 1 support. This will provide efficient resolution of minor user issues without distracting developers while providing a managed escalation path for deeper support capabilities in Levels 2-4, as needed, and that will be taken care of by the other Tasks in WP5.9 or the Platform SPs, as appropriate.

In detail, T5.9.2 will be responsible for:

1) Receiving, prioritising, escalating and resolving email support requests in the HBP support queue
2) Managing initial user support interactions to acquire details needed for Level 3 support, which is provided by the Platform SPs themselves
3) Triage and re-allocation of support requests to all HBP Platforms or the High-Level Support Team, as appropriate

4) Setup and maintenance of a Joint Platform-wide support ticketing system including allocation of Platform/service specific queues
5) Maintenance and upgrades of the HBP Forum service (https://forum.humanbrainproject.eu)

T5.9.3 HBP Joint Platform Operations Support (EPFL (27), M07 - M24):

This Task will be responsible for providing a baseline of Level 3 Platform operations support to all Platforms. This will extend activities in T5.5.5 with additional operations, development and support resources and activities to support common HBP-JP operational practices throughout the HBP. In addition, this activity is intended to work with Fenix teams to ensure that this DevOps infrastructure works on multiple Fenix sites, as a basis for HBP Platform developers to develop failover capable, multi-site, highly-available services in a more consistent way. However, it is expected that the DevOps support needs of the HBP Platform development teams will be substantial and that aggressive prioritisation of activities will be required.

The activities of this Task will be prioritised as follows:

1) Development, enhancement and operation of an HBP Gitlab software forge and continuous integration system to improve productivity of HBP Platform developers
2) Development, enhancement and operation of standard deployment support for Platform developers and HLST
3) Development of Platform Developer monitoring tools and architecture support for HBP Platform developers in scaling SaaS applications
4) Joint Platform Security monitoring and security architecture support.

T5.9.4 Extended data curation support (UIO (12), JUELICH (6), CNRS (6), M07 - M24):

This Task will contribute to the building of a user community for the HBP infrastructure by extending the capacity of HBP curation teams to provide curation services to researchers outside HBP.

The curation support will address users who are interested in disseminating their data in the HBP Platform with proper anatomical context and semantic linking, thus increasing the number of multimodal datasets anchored to the anatomical human and rodent brain reference atlases, and made available through the HBP Knowledge Graph.

T5.9.4 will offer the following services:

1) Coordination, communication, and dissemination efforts (UIO): Inform the neuroscience community about HBP services through the HBP website, related channels, and via conferences, journals, and press communications. Coordinate HBP curation services for external users (points 2-4, below) and actively work to attract and engage with potentially interested users and disseminate tutorials and training material. Act as liaison between HBP curator and developer teams on complex curation tasks and coordinate advanced data curation support to HBP data producers.
2) Extended Tier 1 and Tier 2 human data curation services for external users (UIO, JUELICH): Basic data and atlas curation support for external users interested in submitting data to the HBP Knowledge Graph
3) Extended Tier 1 and Tier 2 rodent data for external users (UIO, JUELICH): Basic data and atlas curation support for external users interested in submitting data to the HBP Knowledge Graph

4) Extended Tier 3 curation support for functional rodent and human data (human / rodent) (CNRS): Curation support for external users interested in providing functional rodent or human brain data to the HBP Knowledge Graph

This Task targets the following SOs: SO5.2, SO5.3, SO5.4, SO5.5.

T5.9.5 Support for Jupyter notebook users (EPFL (12), M07 - M24):

This Task will provide advanced developer support for HBP JP users related to The Jupyter notebooks. The Jupyter notebooks in the HBP Collaboratory are a powerful tool for dissemination of reproducible scientific workflows. These shared workflows can then be readily modified and executed by Collaboratory users leveraging python-based tools developed inside and outside HBP. However, the Jupyter notebook environment is complex and development of new Jupyter-based scientific workflows often requires deeper development support for high-priority HBP and non-HBP Use Cases.

Scientific users would get support with the following:

1) Support in accessing other HBP data and services from the Jupyter environment
2) Installation of custom libraries into the default kernel
3) Troubleshooting library versioning issues
4) Support in migrating code developed in local notebooks to the hosted Collaboratory Jupyter notebook environment

This Task primarily targets the following SO: SO5.2, SO5.3, SO5.5, SO5,7

T5.9.6 Enabling workflows for functional data analysis (JUELICH (9), M07 - M24):

This Task will provide support to users in constructing workflows for functional data analysis.

A major focus of the HBP is the development of brain-scale, detailed models of the Human Brain. The output of such simulations are large-scale activity data that typically take form of massively parallel spike trains and population signals on the mesoscopic scale. Subsequent to the simulation, data are analysed and compared, and if possible, validated, against experimental data on the basis of the observed dynamics. The analysis of coordinated activity and the identification of mechanisms to bridge the different scales of observation raises multiple challenges: (i) advanced, HPC-enabled tools implementing different approaches to characterise the observed brain dynamics in experiment and simulation alike, (ii) a flexible, explorative environment to manipulate and analyse data, both interactively and in batch-mode exploiting the availability of HPC resources, and (iii) availability of data and meaningful metadata, accessible in a common framework.

To address the challenges, the HBP supports and develops a number of tools, including the Elephant tool as a repository for implementations of data analysis methods for activity data, the Neo library as a standard data representation of such data types, and the Neuronal Activity Resource (NAR) for integrating neural activity data sets and making them accessible using extended metadata. However, the design of holistic workflows for performing the analysis work in a reproducible and rigorous fashion on the basis of these tools remains a challenge. Emphasis in this Task will therefore be placed on making these workflows efficient and easy to implement for the researcher. This Task will provide support to users in constructing such workflows to address their needs in data analysis by three measures.

T5.9.6 offers the following services:

1) Single point of contact that helps users in using the Elephant and NAR tools, and in devising a strategy for implementing Elephant functionality that is missing for their project, and in contacting relevant analysis experts.
2) Assist scientists in implementing their specific research projects with the help of the appropriate tools (domain-specific and generic), including the user-driven co-design of science Use Cases.
3) Provide interactive tutorials covering the strategies for an overall productive analysis workflow implementation they emerge in the science Use Cases.

This Task enables in particular the scientific Use Cases SGA2-SP3-UC002 and SGA2-SP3-UC003.

This Task primarily targets the following SOs: SO5.1, SO5.5, SO5.7, SO6.3, SO7.1, SO7.2.

T5.9.7 Deep Integration and Support Action for the HBP JP Brain Simulation Functionality (CNR (12), EPFL (12), M07 - M24):

A key offering of the HBP-Joint Platform (JP) is the functionality related to Brain Simulation. This functionality includes educational offerings (MOOCs), modular workflows *for use* of HBP workflows, tools & models as well as functionality for power users inside HBP and specific modelling communities outside of HBP for model development. This Deep Integration and Support Action aims at supporting HBP internal and external users to successfully employ and if necessary extend said functionality of the HBP JP.

In order to address this computational neuroscience and data-driven modelling community, two particular services will be offered:

1) Scientific Modelling Support (HLST Level 4) – This service will provide scientific/scientific engineering support for productive use of the SP6 tools, such as those implemented for trace and morphological analysis, multiscale modelling, and *in silico* experiments. This service will support internal and external users to: *i)* integrate their own experimental data/findings into a new or existing HBP Use Case, to test specific scientific hypotheses, *ii)* improve/update the current release of an existing model or Use Case with new data, *iii)* integrate their own single cell or subcellular model into an existing SP6 model circuit for investigating the emergence of physiological or pathological mechanisms. We will offer support, in the form of an active technical and scientific collaboration, to all the activities needed to create and develop a model aiming at a scientific publication; collaborators will be supported to facilitate the deep integration into new or existing workflows of their data or model. This will be achieved in collaboration with T5.9.3, T5.9.4, and T5.9.5.
2) Tool Modification Support (HLST Level 2) – This service will support the Scientific Modelling Support in cases where tools need to be adjusted or extended to fulfil the specific need of users. This is an extension of existing BSP developments for new models and it may include, for example, guiding users to the right HPC resources (in cooperation with HLST's HPC experts), or coordinating with the HLST Neuroinformatics experts on the deep integration of data required for the model. This type of support can be provided at different levels, from the technical implementation of a relatively simple Use Case (e.g. single cell modelling) to the preliminary work leading to a full co-design of a new brain region.

In all cases, support will also be given to help in getting the appropriate HPC allocation for the project (such as national calls or PRACE) and in deploying and using the appropriate software stack to run, in analysing and visualising the model.

This Task primarily targets the following SOs: SO6.1, SO6.2, SO6.3, SO6.4, SO5.7, SO5.8, SO3.2, SO3.3, SO1.2, SP10.2, SO9.1, SO7.2, SO7.5, SO7.6

T5.9.8 Community manager and Deep Integration for MIP (CHUV (17,5), M07 - M24):

This Task aims at supporting the continuous growth of the MIP and its inclusion into the HBP Joint Platform.

The offered services include:

1) Community and Documentation manager (Level 2 support). The community manager will build a community around MIP and JP services. They will keep user community channels lively (forum, ticketing systems, YouTube), act as a platform expert and ensure fast responses to user requests. They will maintain guidebooks, user manuals and supervise technical documentation produced by developers. They organise user workshops to keep users up to date with latest features and welcome clinicians coming from newly recruited hospitals. This service should coordinate with T5.9.10.
2) Data curation support (Level 4 support). This service will liaise with clinicians from participating hospitals and ensure that the data they provide is properly curated, registered and advertised on the JP Knowledge Graph and related services. This service will coordinate with T5.9.4
3) Clinical Workflow support (Level 4 support) This service will ensure full deployment of MIP pipelines on new hospitals and, based on user requests, adapt pipelines to support novel algorithms, tools or platforms. This service should coordinate with T5.9.6.

This Task primarily targets the following SOs: SO8.1, SO8.2, SO8.3, SO8.4, SO8.5.

T5.9.9 Supporting advanced users of the Neuromorphic Computing Platform (CNRS (5,5), UHEI (7,5), UMAN(7,5), M07 - M24):

In addition to the user support at levels 0-2 already provided by the Neuromorphic Computing Platform, this Task will enable the Platform to provide in-depth support to Platform users.

Both the limitations and the strengths of the two in-production HBP neuromorphic computing systems are different in many ways from software simulators running on traditional computing platforms, and users often require in-depth interaction with Platform developers and/or other people deeply familiar with the specific systems to obtain the maximum value from their projects. This Task will triage support requests, either resolving them directly or passing them on to the most suitable person, and will monitor the status of requests to ensure they are dealt with. The major activity will be the co-development of scientific Use Cases and, where appropriate, co-development of user-requested extensions and improvements to Platform functionality. Support will primarily be offered remotely, but on-site visits for concentrated collaboration can be accommodated.

The Neuromorphic Computing Platform Collaboratory app for requesting compute time allocations with internal peer-review will be extended to support requests for in-depth support for scientific Use Case development.

This Task primarily targets the following SOs: SO9.1, SO9.2

T5.9.10 A Documenter and Community Manager for the Neurorobotics Platform (EPFL (17,5), M07 - M24):

This Task will support users of the services for Neurorobotics. It will be responsible for:

1) maintaining guide books (user manuals) continuously
2) updating video tutorials at every release
3) supervising and monitoring technical and code documentation by developers

4) writing tutorials and advertising them to the community
5) organising user workshops to keep users up to date with latest features
6) keeping user community channels lively (forum, ticketing systems, YouTube, MOOCS)
7) technically helping individual users in using the Platforms, act as Platform experts
8) supervising SP10's ticketing system and making sure that tickets are taken care of. If needed, it will participate in addressing tickets, also technically, to ensure fast response to users' requests
9) staying connected to HBP JP similar roles to coordinate common activities and ensure consistent tools and output

This Task primarily targets the following SOs: S10.1, SO10.5

T5.9.11 Simulation and Data Analytics Workflow Support (JUELICH (15), CSCS (9), M07 - M24):

This Task will provide support for simulation and data analytics workflows, including developments towards a common infrastructure for simulation, data management and analytics pipelines. One goal of such an infrastructure is to reduce costs for level 2 support by minimising "ad hoc" pipeline constructions and thus avoiding duplication of support, debugging and training costs. Therefore, support provided by this Task will primarily fall under level 4 support. Once the integration of these complex workflows has moved from development stage to mature usage by scientists less tightly linked with the software development community, support will be continued as level 2 support. Users will also be supported in applying for infrastructure resource allocations (e.g. ICEI, PRACE).

This Task will offer support in the following areas, in close collaboration with T5.9.3, WP7.5 and the ICEI project for integration and operation. Priorities will be set based on user requests and available resources.

Level 4 support

- Co-development and deployment of a software framework for modular interactive simulation workflows on the HBP-JP and their integration with key HBP applications; supported areas include:
  - Framework for modular pipeline construction
  - Application integration, analytics support and application support
  - Integration with other frameworks (e.g. HBP Collaboratory)
  - Integration with HPC and data infrastructure (e.g. Fenix/ICEI)
  - Simulation codes of the Platform (e.g. Arbor, NEST)
- Co-development and integration of data management, processing and analysis workflows for the Human Brain Atlas; supported areas include:
  - Neuroimaging analytics and machine learning
  - Neuroimaging pipeline standardisation
  - Integration with the Neuroinformatics Platform
  - Integration with HPC and data infrastructure (e.g. Fenix/ICEI)
  - Integration of external provenance tracking mechanisms

Level 2 support

- User (developers, scientists) and application support

- Analysis and systematisation of user enquiries and comments through support channels and online forums to identify recurring or critical issues for NEST

This Task will primarily contribute to the following SOs: SO5.1, SO5.2, SO5.3, SO5.4, SO5.5, SO5.6, SO5.7, SO6.3, SO6.4, SO7.2, SO7.3, SO7.4, SO7.5, SO9.2

Deliverables no.	Deliverables title	Submission date
D5.9.1 (D36.1, D6)	**Strategy and organisation of a High-Level Support Team (HLST)** Plan for decision making on the use of resources to achieve the overall goals of the Joint Platform and organisation and coordination of the operations of the HLST.	M06
Milestone no.	**Expected result**	**Expected date**
MS5.9.1	List of KPIs for internal and external user adoption of Products/services offered by WP5.9	M06