HELMHOLTZ SPITZENFORSCHUNG FÜR GROSSE HERAUSFORDERUNGEN

Helmholtz Federated IT Services (HIFIS)

Scientific Advisory Board

Feedback Report

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Feedback Coordination

Christine Kirkpatrick, NDS, SDSC

Feedback on HIFIS

The Scientific Advisory Board (SAB) of the newly established platform "Helmholtz Federated IT Services" (HIFIS) held its constitutive meeting as a virtual conference on April 29, 2020. The HIFIS annual platform report 2019 and platform proposal were provided beforehand, as well as presentation slides and materials on the cloud service selection after the meeting.

During the meeting, Helmholtz representatives and HIFIS members held presentations providing insight on ambitions and actual progress of HIFIS in the context of Helmholtz and the European research landscape. These presentations interchanged with open discussion sessions of all participants. Minutes of the discussion have been provided to the SAB members a few days after the meeting.

The SAB members were given additional opportunity to provide written feedback within approx. one week after the meeting, allowing to assemble this collective feedback report. There were many positive comments and reactions in regard to HIFIS and its progress. Specific points to highlight:

- **Positioning of HIFIS as a platform, not a project.** The presentations were refreshing in that they were from a scientific user's perspective and not overly focused on technical specifications. HIFIS has a flexible architecture that anticipates specific systems being integrated and also decommissioned or replaced. The emphasis is on building a sustainable resource that works well for researchers. This perspective and positioning should continue, although some experts would enjoy additional specifications for review.
- **Integration with other platforms.** HIFIS's utility grows exponentially as it is integrated with other scientific platforms. This work is necessary, needed, and should be prioritized.
- **Integration into the proposal process.** Related to the point above, it is recommended that HIFIS will be given improved visibility and insight in the proposal process of Helmholtz platform projects they hope to integrate with. The benefits of coordination and early knowledge can reap numerous benefits. For example, even without requiring new work, the HIFIS team could factor in the technology and data choices of funded projects on the AI and imaging platforms, so HIFIS is better aligned to serve or integrate in later.
- **Collaboration with international initiatives.** Both HIFIS as a groundbreaking platform and the Helmholtz Association have much to share with the international scientific community. As well, by connecting with international initiatives, especially European ones, HIFIS may find other work to build upon, that will increase capacity for additional work.

Specific feedback given by six experts from the SAB are given in full detail in the following sections.

1 Feedback of Expert 1

The HIFIS collaboration is putting a lot of emphasis on incubation and exploration of new technologies and solutions, but governance aspects should be considered too to make sure that technical developments are supported by a sound governance and business model. These are important in a federated environment to ensure uptake and sustainability.

Governance entails aspects like access policies, security policies, service provisioning processes, roles and responsibilities, and how services and resources like data, compute and storage facilities, scientific applications, and federating services (the “backbone”) will be governed and provided. Coordination with other national initiatives (e.g. GAIA-X) dealing with data federation models and governance, would benefit HIFIS and allow it to develop strong links and potentially leadership.

1.1 KPIs and metrics

KPIs should better show the progress towards strategic goals, current KPIs seem to be metrics tracking progress of implementation activities. Some user centric KPIs would be good (scientific impact of HIFIS, research communities served etc.). Some KPIs seem to indicate progress towards implementation and adoption. More KPIs to indicate value propositions would be good.

The role of the Helmholtz data federation in HIFIS deserves more exploration.

Give enough relevance to scientific applications, that are the best platforms to attract users and enable federated access to services and resources.

Consider the definition of some key pilots, possibly multidisciplinary, that will define the value proposition for key main user communities. The pilots would define development and integration priorities. Define high-level strategic objectives for the HIFIS federation of resources/services/content (data, software etc.) across the Helmoltz centres to properly prioritize technical developments. Make the value proposition of the HIFIS platform clear for the management (with related KPIs).

1.2 EOSC and HIFIS collaboration

Look at the opportunity of making Helmholtz association data and HIFIS scientific applications available to EOSC users for broader exploitation, where federated compute and storage are support services to make the data access and local processing more efficient.

2 Feedback of Expert 2

I am pleased about the progress of the HIFIS project, especially in the area of SSO and the associated positioning of HIFIS as the basic infrastructure of science-related projects.

I see the need for a further focus on general infrastructure offerings for the easy use of cloud resources, as can be purchased in industrial clouds. The use of open standards is unavoidable, an additional openness for industrial protocols seems to me to make sense in addition.

I was able to understand the hesitant attitude in the SAB meeting to present services. The discussion especially in the second part of the meeting confirmed this. Some participants were confused or at least mixed up the levels of infrastructure and application services. Some of them criticized areas that, in my opinion, do not fall within the scope of HIFIS. However, this may have been reinforced by the reports, which went beyond the scope of HIFIS and highlighted aspects of the other areas.

In my opinion, HIFIS should therefore make clearer reference to the infrastructure basis and the services that can be provided in this area and thus distinguish itself more clearly from the application level.

In the context of central infrastructure, international access to the overall system could also be considered and put in relation to the costs of the HIFIS VPN, where it has not become clear what it is to be used for.

The concept of a generous use of HIFIS resources is impressive. However, I recommend that users and connected services get used to policies that enable the infrastructure to make idle resources available to the pool again.

I would like to make a request for the future. As a SAB member, you feel somewhat "lonely" in the HIFIS project. I would like to see a real board here, which would also allow discussion without HIFIS members and, above all, would offer the opportunity to discuss and vote before a particular problem is raised. KPIs that provide qualitative statements would also help in the development of recommendations.

2.1 SSO and ...

I am pleased with the progress of the project in the SSO area. In the first workshop I missed the positioning of HIFIS as a basic infrastructure for the other more science-related projects, which I felt was necessary.

Unfortunately, there was no opportunity during the meeting to talk about details of the implementation. Therefore, I would like to mention an important aspect of role administration, which is especially important for services connected to the SSO:

- Identity Providers (IDPs) naturally have a very strong focus on their own organisation and can provide detailed information about the organisation-specific roles of each person.
- The cited LDAP template (for virtual organisations) offers corresponding fields to store current and previous roles from the organisation of the IDP. This provides a very valuable reference point for the targeted assignment of rights for organization-related applications.
- The service providers of foreign organizations (SP) can usually make very little use of these roles. The SPs of foreign organisations rather need to know which rights a person should have from the point of view of their home organisation and how they must or can deal with them in the service offered.
- Furthermore, it is important for IDPs and SPs to be able to trust each other.

From a purely technical point of view, this means that either each service has to take care of such a role administration together with a position of trust, or the SSO service has to provide reliable role information from the users' logon and indirectly trust the IDP via the SSO service.

The extension of the SSO service seems better, especially because of the uniformity of use (1) and the possibility of policy negotiation (2):

1. The connection of the services to the HIFIS SSO system would offer the possibility of a consistent role definition, administration and use, which could be used by the user side via a uniform interface, as well as allowing each service to connect to only one system. This also applies to all service providers. This would give the HIFIS SSO system the role of an authentication proxy.
2. The resulting central instance would enable policies to be negotiated in a 1:1 ratio for each connected IDP and SP, which would also bring about a decisive simplification both technically and organisationally (at least in relation to the resulting overall system and the integration of external cooperation partners):
    a. The IDPs of all cooperations and HIFIS trust each other (m Policys)!
    b. HIFIS and all connected SPs (n Policies) trust each other as well!
    c. This makes it possible to implement a rather simple concept of a position of trust, instead of having everyone sign policies with all other members (m + n instead of m x n).

I would like to recommend that HFIS takes over this role and offers service-specific role management and the possibility to change roles after indirect authentication at a user's home IP.

A prominent example is Amazon-AWS.I was not impressed by the simplicity of its configuration. However, the simple and intuitive implementation of role changes for the services used is convincing. It is crucial that after authentication and independent of individual services, the user can decide which roles he can take on in a particular service. His organization (IDP) gave him the rights to accept the roles during authentication. Neither the rights nor the roles must have anything in common with the roles and their corresponding rights in the home organization.

2.2 Further Basic infrastructure Offers

The results from the study of the SSO aspect suggest that we should also pay more attention to other infrastructure areas. Here, it is not only the aspect of how to technically offer file storage or compute services, for example, but also which configuration services are needed to enable a user to easily (and quickly) move his calculations to the HIFIS cloud:

- how can HIFIS cloud machines be grouped and connected to other infrastructures via VPN
- How can group-specific authentication (e.g. that of a single Helmholtz center) be accessed in these cloud groups?
- Is it possible to have job schedulers from within the centres manage such HIFIS resource groups?
- Is it possible to create and delete such groups in a process or in a script-controlled manner?
- How can centre resources and HIFIS resources (e.g. file service, backup service, etc.) be linked to such resource groups?

If an infrastructure provider remains at the level of basic infrastructure modules, only those who really understand them will be able to use these resources. The resources would probably only be useful for the data centers themselves.

I would therefore recommend that HIFIS should strive for simplicity of use in and try to offer services in such a way that they are not only usable by IT personnel.

2.3 VPN, International connectivity

The presentation of the VPN switched by DFN for Helmholtz raised the question of what it is actually to be used for, since the success of HIFIS as well as the other projects depends significantly on the quality of the international connectivity. However, using a VPN to handle communication signals an isolation rather than an opening.

Therefore, I think it would be useful to explain the use of the VPN and to show which technical measures guarantee the openness of the entire system.

2.4 Interfaces, protocols and standards, openness to industry

Unfortunately, there was no opportunity during the event to discuss protocols and interfaces.Therefore I would like to recommend "blindly" to support not only open and free interface and protocol standards, which are to be supported without restriction, but also protocols and standards, which allow e.g. interfaces to Microsoft infrastructures but also to industrial clouds like Azure or AWS. In my opinion, a HIFIS that is geared towards cooperation and expansion must be flexible and open in all directions. This is where the capabilities count. Whether you use them and in which way, must be decided later and independently and above all on the application side.

2.5 Resource management, Policies in the Technical Handling of Resources and Data

The type of financing allows the use of services free of charge from the user's perspective. This simplifies their use and is impressive regarding the resulting simplicity of resource allocation. This is in the spirit of HIFIS.

However, in my opinion, there is a lack of policies for releasing unused resources. It is far too easy to book "free" resources and not release them again. The argument that this is a matter of the services and projects that use them is only partially correct. The rules for resource management must come from the infrastructure. The application side must adhere to them.

Based on my own experience, I would therefore like to recommend that both the individual users and the services that use the infrastructure get used to policies that enable the infrastructure to make unused resources available to the pool again. In this context, I am thinking above all about the users' data, possible backups or archives and the legal conditions for dealing with them.

From an organisational point of view, these policies could supplement the policies for identity management when connecting to the HIFIS-SSO proxy.

2.6 Services, distinction of services

In order to avoid discussions like the second part of the event in the future, I think it is important to distinguish between pure HIFIS services and application services based on the HIFIS infrastructure (no matter which amount of infrastructure is used, but depending on who is providing it). Without this distinction, it is difficult to talk about service offerings. Since it seems that many advisers also come from the application layer, I could understand that the presentation was planned without an explicit listing of services. The course of the discussion confirms this.

I therefore recommend differentiating between infrastructure and application services, and thus setting oneself apart from the application layer. This saves HIFIS from being judged poorly because of a lack of insight into application services.

2.7 Pro HIFIS

The project goal of a successful overall system is comprehensible and easy to understand. The same applies to the division into sub-projects that correspond to the major scientific fields of Helmholtz and that also include the infrastructure that interconnects them. However, the structural pictures shown on many slides are misleading. HIFIS does not stand in the circle of scientific projects but as an infrastructure at the core of the overall system.

Moreover, I have not been able to understand how the success of HIFIS can be measured in the context of the overall system, whereas the success of the overall system should rather be measured via the scientific projects and their impact on the research communities.

One possible approach to establish HIFIS independently of the scientific projects would be to position it as an enabler for international scientific projects, e.g. by actively supporting or flanking the EOSC. The recommended opening to other infrastructures could be started from a purely technical point of view, on the one hand to be able to use the elasticity of such infrastructures for scientific projects, and on the other hand to build bridges to other international scientific alliances, such as the EOSC.

In my opinion, however, HIFIS cannot meet some of the requirements expressed during the meeting:

- HIFIS may be able to help scientists to store their data in its cloud. It can also ensure that this data is appropriately protected. However, it cannot define the data policy (keyword: open data) of the overall system. This is the joint task of the scientific projects, which must be oriented towards the customs and needs of Helmholtz and of their communities.
- HIFIS cannot be not responsible for application services and should therefore not be put in the position of deciding on their integration into the overall system. The application services (as well as the handling of their data) are up to the scientific projects.
- HIFIS cannot decide on its own to what extent the infrastructure must provide certain components, especially those that are costly and/or difficult to operate. This requires close feedback to the scientific projects. On the other hand, in order to evaluate fundamentally new groundbreaking technologies and, if necessary, make them available on a limited scale (as a teaser or prove of concept), HIFIS needs dedicated staff and all necessary funding.Within this framework, special technologies such as super-computers and (as yet) extraordinary technologies can be viewed and "learned" so that they can be used to react quickly if needed. In addition to the long-term requirements formulated by the scientific projects, corresponding activities in comparable international scientific communities can also be indications for such projects.

2.8 SAB Board

If you are invited to visit a foreign organization, you will bring along experiences that are strongly influenced by your own environment. One of the experiences you make in the foreign organisation is that the meaning of the arguments resulting from your own experience strongly depends on your environment. Thus, I am regularly faced with a great uncertainty as to whether a fleeting impression during a presentation justifies a possibly harsh judgment - your own environment or even a conclusion drawn from it can all too easily lead to a misunderstanding and thus to a wrong judgment.

For this reason, I feel somewhat "lonely" as a SAB member in the current HIFIS environment. I would like to see a real board that also allows discussion without HIFIS members and, above all, offers the opportunity for a voting before a problem is eventually addressed. This could also counteract the impression that individual SAB members are too critical of the project.

2.9 KPIs

The KPIs shown provided a detailed insight into the size and characteristics of the infrastructure. However, they did not provide any insight into the quality of the infrastructure. For example, there is no information about what has been improved or even made possible by HIFIS. Particularly when the time frame for dealing with the project is as tight as it had to be now, due to the corona crisis, an advisor would have appreciated more KPIs with a focus on quality.

2.10 Conclusion

In summary, I would like to say that I was impressed by the progress made and was also very pleased with the event itself. The external circumstances did not really support this. In spite of the moaning about it, I found the format, possibly with one or two additional breakout sessions for the actual SAB, also very successful in its virtual form. The lectures and presentations won, personal conversations - also to relativize own impressions - unfortunately came too short.

The project is on a good way. The emphasis on SSO has served HIFIS very well. The positioning of the overall project as a service for the scientific community and the desired success more or less force HIFIS to proceed in this way. Another basic prerequisite is a strong commitment to long-term funding and a commitment to a high technical level. In this context, both the funding, which has so far not been limited in time, and the constructive power of the staff from the participating centres are convincing. This makes me very confident that the project will continue to make good progress.

I am glad to be able to participate in it and to be able to express my own thoughts. However, a single head can only contribute very little. I ask that all my comments should be treated with this in mind.

3 Feedback of Expert 3

My main comments for HIFIS are:

I think that their plans and service potential is very admirable - and I see that they are well connected to many European and international initiatives.

3.1 Costs

I would strongly suggest them to keep very clear cost books on all tested pilot service costs. This includes also issues such as staff side costs, electricity, training, etc. Building a long term supported service will require this information, and if they wish to produce these services to EOSC or other external partners, such information is critical - in the case of private sector users, this is even mandated by the state aid laws. Also, it is clear from some of the reports that the financial burden of the service provision is still unclear (and some seem to think it is potentially unfair at the moment). Clear idea of the service costs would also make it very transparent when services are provided across the Helmholz organisations.

4 Feedback of Expert 4

According to the HIFIS Annual Report 2019, the main aim of HIFIS is to build an "excellent federated IT infrastructure of the Helmholtz Association". In practice, HIFIS wants to "combine the capabilities of all Helmholtz centers". The ambition is also to expand not only to all the Helmholtz Centers, but to the national and international scientific community as well, including NFDI and EOSC. For this, HIFIS chose to follow a "federated approach", whose implementation revolves around the two pillars of “a trusted network between the centers” and “a common AAI”. The Annual Report also mentions a “Helmholtz Backbone”.

My first feedback is that these ambitions are excellent, and that substantial effort will be needed to make them concrete, for the very reason that they are difficult to achieve. It is to be recognized the significant amount of work that was already performed e.g. in eliciting requirements and ideas, as well as in setting up of the HIFIS platform. The opportunity to present HIFIS as a concrete implementation of a substantial national (and potentially transnational) federation of services for science is huge and consistent with the stated HIFIS goals.

The first consideration I would like to make is that, if the aim is really to “combine the capabilities of all Helmholtz centers”, one should better clarify what the “Helmholtz backbone” is intended for.

So far, it seems that the backbone is there to support these services:

- Collaborative services.
- Data storage and retrieval.
- High-performance computational clusters.
- Documentation services for HIFIS itself.

And, on top of this, there is a “service center”, which supports “modern and sustainable software engineering methods and infrastructures”, i.e. training activities and software repositories.

However, for the ultimate goal of combining the capabilities of all Helmholtz centers and even more the expansion to NFDI and EOSC, the relationship with these initiatives should be more defined, from both an organizational and technical point of view.

I will focus on some technical points here.

In general, an architectural overview providing substance and technical ground to the statements and ambitions mentioned in the Annual Report would be useful. In other words, how do you intend to back the ambitions with the appropriate technologies?

Then, specifically, I have a few questions or remarks on some HIFIS Work Packages:

WP1 focuses on cloud services, and some services are already provided. Here are observations on some of them:

- An OpenStack compute cluster at FZJ.
    - It is not clear to me how this cluster connects or will connect to other computing resources at FZJ or elsewhere. This is even more important, since it was also said that HIFIS will not have money to purchase “its own hardware” and that as said above a stated ambition is to “combine the capabilities of all Helmholtz centers”. How then will the services offered by the “HIFIS backbone” be valuable for the many thousands of Helmholtz scientists, if there is no clear integration path to at least the other Helmholtz resources? (which clear outnumber HIFIS’).

- A JupyterHub Service at FZJ and KIT.
    - Is it not clear to me if and how the JupyterHub service at FZJ and the equivalent service at KIT are linked, even if they both are “an HIFIS service”. An answer could be “via the common AAI”, but this seems a weak form of integration and certainly it does not combine the capabilities of the two centers. For example:
        - Is there a way to share notebooks among the two services? This would require a common, federated storage system through at least the two sites involved.
        - How would a scientist choose to use one or the other location for the same service? (here we have the case of the JupyterHub Service, but the question holds for any service that HIFIS will eventually offer.)
        - In general, I would say that if the HIFIS ambitions are those stated in the Annual Report, I would avoid an “EOSC portal” type of approach, i.e. just a collection of services or endpoints but with no real service orchestration.
- A dCache storage system for physics at DESY.
    - What about the other disciplines targeted by HIFIS?
    - What is the added value of this dCache space for physics itself? (that is, are not physics communities already served in terms of storage without HIFIS?) See also below.

WP2 focuses on backbone services. Here quite some emphasis was given to the VPN service. However:

- Why is this VPN a pre-condition to run IT services for HIFIS?
- How will VPN connect to the services in the Helmholtz centers? (i.e. the IT resources and services that are not in the HIFIS backbone but are e.g. at FZJ, DESY, KIT, etc.)
- Also, since there is some overlapping in some services offered in the backbone with services offered in the Helmholtz centers (take the dCache service at DESY), how will this VPN and related services connect to e.g. other VPN services used by the same communities? (for example, what is the integration between VPN-based services in the HIFIS backbone and VPN-based services in LHCONE?)

WP3 focuses on software services. I think that training activities and common software repositories are a very good and commendable initiative.

I support the suggestion that was made during the SAB meeting to have focused groups and virtual rooms in future meetings.

For a future meeting, another suggestion is to investigate if and to what extent similar initiatives exist in other countries, especially in Europe, and then provide a report on what can be learned from them.

5 Feedback of Expert 5

5.1 Overall consideration

I consider HIFIS a great initiative to set up a distributed computing software infrastructure. Very well financed with a lot of resources for personnel effort. The added value of such software infrastructure is very high and valuable for the scientific community, especially for those users with limited access to computing facilities. The overall initial setup has worked fine and I congratulate HIFIS for its successful start.

5.2 About the meeting

The initial presentation was very high level, and I would expect that in the next meeting presentations with more detail about the specifics is presented to the SAB. Also, if next meeting is again a virtual one, I suggest that the time devoted to introductory/general talks is limited and the presentations focus on the actual matter of the meeting.

5.3 About the structure of HiFIS

The structure in 3 pillars seem adequate although the amount of information initially given specially for the services was very small (this was clarified in the second session).

The preliminary list of services considered is quite complete. While application-oriented services are not yet there, the set of generic services for the deployment and execution of applications and data management considered right now are appropriate. The criteria for selection of services are sensible.

For the next meeting it would be interesting to have more information about the catalog of services available.

5.4 About the software infrastructure use

As a recommendation, I would suggest to provide to the user community some directives or guides on how to use the software infrastructure, towards homogenous deployment of applications. This does not mean that the best practices of each community is not considered, but some common way of using the software infrastructure will benefit in a better usage of the resources and reutilization of methodologies.

5.5 About EOSC integration

The plan presented on how HiFIS will integrate with the European initiative (EOSC) is considered to be adequate. This will enable the interoperability with the European infrastructure.

5.6 About the implications with the current pandemic situation

Infrastructures like HiFIS are key to enable research on topics such as new epidemies like the COVID-19. While many researchers will benefit of large supercomputers for preforming their research on these topics, also many researchers will benefit on distributed computing, and what is more, on means to store, analyze and curate the results of their computations. In this sense, software infrastructures like the ones provided by HiFIS are key.

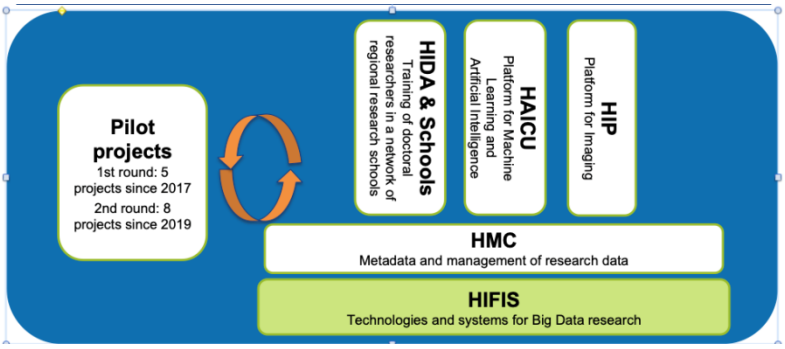
6 Feedback of Expert 6

The creation of thematic platforms in the framework of the "Helmholtz Incubator Information & Data Science" looks like a sensible approach to promote networking activities, and scientific cross-fertilization at the global level for the Helmholtz association.

Similar platforms are being deployed in research performing organizations such as mine, the Spanish National Research Council, with a positive feedback in terms of increasing interaction among research groups from different areas (https://www.csic.es/es/investigacion/plataformas-tematicas-interdisciplinares). However, the provision of computing services to support the open science paradigm is provided by a platform that is horizontal to the thematic ones, depending directly on the unit of Research and Technology.

Facilitating the integration of horizontal services is a key activity from the point of view of innovation. In scientific discovery the difference between standard and excellence science often relies on the possibility of accessing cutting-edge technological IT services.

One of the firsts questions arising (looking at it with the glasses of our experience at CSIC) is if HIFIS is a vertical platform, like the others, or it is rather supposed to act as a service-provisioning platform, and thus horizontal to all the others. In the second case the graphic presented in slide #19 would rather look like this (assuming the HMC would also be kind of horizontal service, as it looks generic enough as well):



The challenge of HIFIS as thematic platform relies in being able to adapt dynamically to the evolution of a fast changing IT landscape, while being able to satisfy the requests of the many (eg. in terms of generic access to computing, storage and basic tools), and also of the requests of the few (i.e. very specialized IT services to support cutting-edge research projects leading to true innovative results). Providing a framework with strong end-user orientation is then fundamental.

In order to satisfy cutting-edge projects, HIFIS should also contemplate activities dedicated to experiment and pilot ongoing developments in IT technologies. Those developments need to be backed by a real demand of researchers trying to solve problems by implementing new IT paradigms. Otherwise the risk is becoming an "advanced testbed" for computer scientist to experiment, (much like Grid5000: www.grid5000.fr), but without multi-domain scientist as end users.

6.1 Key Performance Indicators

The KPIs are defined with different levels of depth.

There should be, in general, a higher user-orientation in the backbone services. As and example, the VPN has no KPIs related to usage (bandwidth employed for example) or number of users enrolled in the AAI that is being proposed.

Binary KPIs are appropriate during the service ramping up phase. However during the service delivery period there should be KPIs that measure the actual usage of the services.

KPIs related to the number of users of the services are included in the Cloud services (C2 KPI). Likely a more precise definition is needed depending on the service, together with base and stretched expected values. The Software related services, have identified KPIs in a sensible way, and now also need some preliminary expectation for values.

6.2 Selection of Services

The process of service selection appears at the moment a bit obscure. Slide #101 indicates the selection criteria as “Overhead”, “Technical” and “Service Provider”.

Service selection should take into account, primarily, the demand side. In that sense a permanent communication channel needs to be open with the research communities, to identify their needs. Perhaps the term “overhead” is not sufficiently transparent.

Regarding technical constraints, such as readiness from the software point of view, those seem to be identified properly, and there is a clear expertise in the consortium to tackle technical issues such as security and service scalability.

The risk is, again, validating the installation of very good technical services, without having a preliminary evaluation on how useful those services are for researchers everyday work (in short, if there is a real request for that service).

Obviously there is a risk associated to a strategy based on simply asking research teams what do would they like to have. This is, notably, the existence of an “IT knowledge gap” among domain scientist. Often domain specific teams are not aware of recently available, more modern and adequate IT services to fulfill the needs of advanced research projects. A possible way forward is HIFIS putting in place a “consulting service” for researchers to fill the IT knowledge gaps across the institution.

In that construction, the researchers would ask for the needs they have, and HIFIS would be able to advise them on which tools are available now, and enter in a dialogue to discuss what is the best option for them.

6.3 Software Services

On the Software services side HIFIS is progressing very nicely. The educational efforts on basic tools are probably being already very useful for many researchers. This is particularly so for the programming courses provided, and usage of tools to handle software repositories.

Looking to future work, the offer needs to be expanded to advanced users, that are already using mainstream tools such as Gitlab, but often lack the “Infrastructure as a Service” support to self-deploy the services they need.

In this respect, the inclusion of tools “as a Service”, such as secured repositories for images enhanced with global AAI, deployment of tools, on top of the HIFIS infrastructure (eg. Gitlab as a Service), Continuous Integration services, etc. would make the HIFIS offer very attractive to advanced users as well.

6.4 Conclusions

In general, with the project being in the ramping up phase, it is particularly important to define now user-oriented a strategy for service onboarding & provisioning

- This strategy should include as a selection criteria in a sensible way (as described in subsection 1.2), the requests from researchers. Also, insisting in “user orientation” in the definition of Key Performance Indicators would be important.
- The procedures to gather requirements from the rest of the platforms of the Incubator would need to be defined and streamlined. Having a more systematic approach there would help understanding the role of HIFIS in the whole Incubator ecosystem, as the platform to support computing needs.

Innovation and added-value will mainly arise if HIFIS is able to grow an ecosystem in which domain scientist and computing technologist are able to experiment with advanced IT services, and provide them in a way, sustainable enough, to solve scientific challenges.

This is an important point, because what makes the difference between being able to approach cutting-edge scientific projects or not, is the possibility access advanced IT services. Such services are often experimental, but in the scientific world, advanced users are often willing to trade a higher performance, or better features, at the costs of a non-perfect reliability.