Publication of Use Cases

This document, available online, has been prepared to present/describe, in compliance with data protection regulations and client confidentiality issues, the use cases identified up to this point within the HPC EDIH HU project, the type of *"test before invest* " services that our clients (SMEs) have benefited from so far and the good practices developed as a development case, where the HPC EDIH project promotes itself and generates collaborations while identifying and exploiting different synergies

I. Test before invest services

Following the clarifications received from DTA, several projects of the same client are considered as several *"test before invest"* services. Therefore, the client needs assessment can be more comprehensive, as the range of services that can be provided in a project is not limited to one case or problem to be solved.

During several face-to-face and e-mail consultations, the background of the clients is clarified, also the exact dust problem we can address in the project and the expected outcome. The designated experts explain the client route (in the process), the conditions of participation in the project and the way of documentation.

As a result of the series of consultations, the experts are able to identify the capacity needs of each consortium members for each service and what the client needs to develop and bargain for a successful cooperation.

I/1. – Short description of the services:

Development of a genomic container, design of the environment, creation of the container. Installation of modules for Java, Python development tasks, provision of package managers to make the appropriate libraries available. Pipeline development, debugging, testing facilities development, support.

- Client's development objective:

The project aims to investigate whether specific somatic lesions such as copy number alterations and short genetic mutations, may predict enhancer signals that distinguish subtypes of SCLC.

- Tasks to be performed by the Service Provider in the framework of the *"test before invest"* service:

Development of an environment to run programs implementing the calculations of whole genome sequencing (WGS), whole transcriptomics (RNA-seq), chromatin immunoprecipitation sequencing (ChIP-seq) techniques, container creation.

Designing the appropriate environment, testing the container, creating environment variables, parameterisation. Hardware requirements, predictions, runs, support.

I/2. – Short description of the services:

Development of an environment for running programs implementing calculations of whole genome sequencing (WGS), whole transcriptomics (RNA-seq), chromatin immunoprecipitation sequencing (ChIP-seq) techniques, creation of a container.

Designing the appropriate environment, testing the container, creating environment variables, parameterisation. Hardware requirements, predictions, runs, support.

- Client's development objective:

The objective of the project is to develop a bioinformatics "pipeline" that processes sequencing data and optimizes the analysis to identify disease-specific genetic data for biomarker identification. These biomarkers are short DNA sequences (around 200 base pairs in length) that allow the differentiation of samples belonging to different patients.

- Tasks to be performed by the Service Provider in the framework of the *"test before invest"* service:

Genomic container development, environment design, container creation. Creation of a container, creation of a repository, development of the container, installation of modules for Java, Python development tasks, provision of package managers to make the appropriate libraries available. Pipeline development, debugging, testing facilities, support.

I/3. – Short description of the services:

Consultancy and IT service for the client to prepare their big data case to run on HPC.

- Client's development objective:

Massive amount of image, PDF file processing, character recognition, text recognition using existing "sensitive" confidential data provided by the client.

- Tasks to be performed by the Service Provider as part of the *"test before invest"* service:

Preparation for running on HPC, environment design. Preparation of hardware, partition demand iterative estimation, testing.

Test container, SLURM scheduling procedure creation, parameterization.

II. Best practice

Unfortunately, the implementation of the marketing campaign has been seriously and still hampered by the delay in the mandatory central licensing and procurement procedures, despite the preparation of the project communication plan under the leadership of the coordinator. This is a major impediment to client involvement activities.

Without a contracted agency in charge of creating online campaigns, organising events, workshops, conferences, printing and publishing any kind of commercial material, the scope for manoeuvre is greatly reduced. Therefore, one of our use cases is the best practice of how to build partnerships linked to existing networks, on a win-win basis, to exploit the desired outcomes for all. Identifying partnerships where the technical and financial resources are given, but the professionalism is represented by the project and its members, thus creating space to promote HPC EDIH HU. Joining HUBs, expert groups will also help clients. We need to make them aware that "if you miss out, you get left behind" and to give the young, skilled generation more room for manoeuvre.

As a result, one of the best practices to exploit these synergies was the professional presence at a series of events organised by the Hungarian Chamber of Commerce and Industry. In the framework of a 9-stop roadshow events were organised in several locations across the country to present HPC as a resource emerged by supercomputer usage and the services built around it, which can be applied and accessed by SMEs. During the events the HPC ecosystem itself also its potential was showcased, as well as the HPC EDIH HU project and the services it offers. Considering that the organiser, MKIK, is essentially the organisation that brings together and coordinates the entire domestic SME sector, this was an utterly win-win situation for all. As for the organisers, the range of opportunities to support and demonstrate the digitalisation and competitiveness of SMEs was extended, and as for HPC EDIH, the number of potential target groups reached by the project was increased.

The HPC EDIH project is therefore continuously looking for such and similar good practices and synergies, and is nurturing the resulting collaborations, constantly promoting to the domestic SME sector the competitive advantages that can be gained from the use of supercomputers and their own digitisation, and the services that can be provided through the HPC EDIH project.