



## D6.4: Interim Report Innovation Management Activities

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## 1 Executive summary

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This document reports on Innovation Management Activities during the first half of the VECMA project (from 15 June 2018 to 14 December 2019). It presents the initial setting up of VECMA's innovation management framework and the results of exploitation activities, together with engagement in and involvement with the wider European HPC community through the EuroHPC Joint Undertaking [1] (previously called contractual Public-Private Partnership (cPPP) for High-Performance Computing).

## 2 Introduction

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During the first half of the VECMA project, innovation management focused on the promotion and exploitation of the main objective of the project: the VECMA toolkit – VECMAtk - as a new reference European open source scalable toolkit for Verification, Validation and Uncertainty Quantification (VVUQ) of multiscale, multiphysics applications. In addition to the VECMAtk, we have also been concerned with the innovation management of VECMA's applications, supporting services, associated trainings, and so forth. This work has been done in strong collaboration with the dissemination activity which is reported in deliverable "D6.3 - Interim Dissemination Report".

## 3 Innovation Management

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In VECMA, we use as the definition of Innovation Management as "overall management of all activities related to understanding needs, with the objective of identifying new ideas, and managing them in order to develop new products and services which satisfy these needs". The associated innovation process (detailed in "D6.2 – Innovation Plan" [2]) includes 4 stages as promoted by the European IPR Helpdesk:

1. Securing the foundations;
2. Capture project outputs;
3. Manage and protect project outputs;
4. Disseminate, exploit and communicate project outputs.

A review of each activity is presented in the following sub-paragraphs.

### 3.1 Securing the Foundations

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The first task performed through innovation management was to ensure that all consortium members are suitably aware about the innovation support and training offered in the project. To do so, a special talk to all partners was given during the first All Hands Meeting (5-9 May 2019, Amsterdam).

The next stage was to register the IP background and foreground in the project. For this, a dedicated document has been created and available to all partners on the VECMA internal intranet on the project website and updated on 28 February 2019.

The VECMA foreground IPs are:

IP Title	Ownership	Domain
Multiscale Fusion	MPG	Fusion
Materials application	UCL	Materials Science
BAC	UCL	Biomedicine
HemeLB	UCL	Biomedicine
HMM-HC	UVA	Biomedicine
ISR3D	UVA	Biomedicine
SP-coupler	CWI and NLeSC (Netherlands eScience)	Climate Modelling
MMP	UBRU	Migration
UrbanAir	PSNC	Weather / Air Quality

The VECMA background IPs are:

IP Title	Ownership	Domain
VECMA Toolkit	UCL, UBRU, PSNC, LRZ, BULL (may expand further on)	VVUQ
HTBAC	UCL	Biomedicine
EnsembleMD	UCL	Biomedicine
EasyVVUQ	UCL	VVUQ
FabSim3	UBRU, UCL, LRZ, BULL	HPC
QCG Pilot Job	PSNC	HPC
Flee	UBRU	Migration
Flare	UBRU	Migration
FabFlee	UBRU	Migration
FabUQCampaign	CWI	generic
FabMD	UCL	Materials
QCG Services and Tools	PSNC	HPC
QCG Pilot Job	PSNC	HPC

## 3.2 Capture Project Outputs

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In order to capture project outputs, a repeated agenda point on innovation activities has been placed during the regular WP6 coordination telecons. In addition, during twice-yearly VECMA AHM meetings, an Innovation Management session is being given in order to capture innovation outputs from the consortium. So far, the main results captured are related to VECMAtk releases and associated materials as training, video, workshop, summer school etc. (see dedicated section).

## 3.3 Manage and Protect Project Outputs

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For the first part of the project, the management of the project outputs was mainly done in collaboration with the dissemination tasks. Indeed, the primary focus was to maximise the impact and the visibility of the VECMAtk, but also of VECMA's applications, supporting services, associated trainings, and so forth.

## 3.4 Exploitation of VECMAtk

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The exploitation of VECMAtk has been done through its development teams, including its alpha and beta users and selected application owners. The VECMAtk software has been made widely available to the public through periodical announcements and feature updates. This

has led to a set of videos, each dedicated to a particular application domain, and application tutorials, which have proved essential to show how this toolkit can be exploited.

At the time of writing, a total of 18 alpha users (15 currently active) have been established, used and tested the different VECMAtk and filled a questionnaire to ensure a clear feedback. Note that 2 external alpha users take part in this activity. A number of external organisations in academia and industry have been approached to encourage them to further test the software and exploit through their channels.

To further develop and exploit the VECMAtk, we have been working with the Alan Turing Institute [3] to jointly run the planned event of Reliability and Reproducibility in Computational Science: Implementing Verification, Validation and Uncertainty Quantification in silico. The event will comprise as part of it the first VECMA training workshop in January 2020. Ahead of this event, we have run a VECMA hackathon event in association with VECMAtk in September 2019. These events associated with VECMAtk have seen participation from some of our users from industry and government who use the tools we are developing within supercomputer centres in Europe at this time.

All these activities have been handled with a strong collaboration between different work packages and with the dissemination tasks. More information can be found in “D6.3 - Interim Dissemination Report”.

## 4 Innovation Advisory Board

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The Innovation Advisory Board (IAB) has been set up to provide strategic guidance and support in Innovation Management within the project. Members were present for the first IAB meeting during the All Hands Meeting in Amsterdam in May 2019. The list of attendees is given below. During this first session, the role and composition of IAB and SAB was discussed, and a first feedback following the presentations done by all VECMA partners to report advanced work has been received. In addition, the following points have been discussed:

- Assessment of impact of project activities and outcomes.
- Comments on dissemination & exploitation plans, based on deliverable D6.1 Detailed Dissemination Action Plan.
- Comments on innovation plans, based on deliverable D6.2 Innovation Plan.
- Discussion on research & development.

List of attendees:

- People inside the project:
  - Erwan Raffin [erwan.raffin@atos.net](mailto:erwan.raffin@atos.net) BULL
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- Shantenu Jha [shantenu.jha@rutgers.edu](mailto:shantenu.jha@rutgers.edu) Rutgers University and Brookhaven National Laboratory

The key points from the meeting are summarized below.

1. Regarding the different types of UQ, in order to improve the link between tools from a methodological point of view, it has been advised, for each developed UQP block, to document the method behind and the requirements from applications.
2. Good software development approach: The VECMAtk is developed with a requirement driven approach to ensure the match between requirements and features.
3. Question about the need to use full or part of the toolkit to be considered when presenting and disseminating VECMAtk:
  - a. Should I use the full software stack?
  - b. Can I use part of it, if yes how (API, integration, etc.)?
4. Idea to setup a 2 minutes talk to convince deciders to use the VECMAtk.
5. Be careful when advertising VECMAtk releases to ensure user expectations can be fulfilled and to get useful feedback.

Thanks to this early feedback, certain actions have been taken, for example the setup of alpha users to test and provide feedback on first VECMAtk releases (cf. point 5 above). Another example is the figure below showing that part of the toolkit can be used, with no requirement to use the full stack.

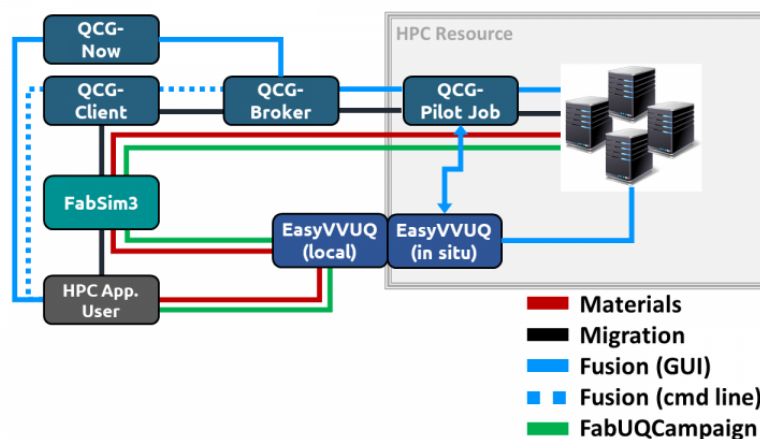


Figure 1 – “Tube map” showing which VECMAtk components are used in the various application tutorials. VECMAtk components are given in boxes, and the application tutorials are indicated using coloured lines. Note that EasyVVUQ can be used both on the local desktop for ease of use, or on a remote HPC resource for improved performance. Source: <https://www.vecma-toolkit.eu/toolkit/>

## 5 Link with EuroHPC Joint Undertaking

The European Technology Platform for High-Performance Computing (ETP4HPC) is an important partner able to promote VECMA activities. ETP4HPC has the mission to promote European HPC research and innovation in order to maximise the economic and societal benefit of HPC for European science, industry and citizens. It is also a partner in the former contractual

Public-Private Partnership (cPPP) for HPC. As of the end of 2018, the cPPP no longer exists, but its work continues in the EuroHPC Joint Undertaking.

VECMA was in close communication with ETP4HPC, so the VECMA project is present in its handbook which was distributed at Supercomputing 2019. We have provided an updated description of VECMA to ETP4HPC for the Handbook 2019 of HPC projects, published in November 2019. In addition, we are in touch in order to identify associated actions in collaboration with the dissemination activity of the project to target industry (users and potentially software providers). The following provides some examples:

- ETP4HPC will link and re-tweet VECMA tweets and posts about VECMA
- VECMA will post its news on the internal forum ETP4HPC (newly created) reserved to ETP4HPC members, particularly in the industrial user thread. This channel will be used to disseminate VECMA activities, but also to look for new associate partners as new members of the IAB.

As was discussed during the first VECMA All Hands Meeting, we have also contacted the H2020 HPC Centres of Excellence Coordination & Support Action 'FocusCoE' in order to conduct concurrent activities following the same objectives, particularly targeting industrial involvement in VECMA events.

## 6 Conclusions

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In the first 18 months of VECMA, we have established an innovation management framework that will aid in maximising the societal, commercial, and scientific impact of VECMA's output. This framework has been put into use, in particular in relation to the VECMA Toolkit, and will continue to be used in the second half of the project. We will continue to adapt our approach to innovation as the needs of the project evolve, and with the input provided by the Innovation Advisory Board.



## References

1. EuroHPC Joint Undertaking, <https://ec.europa.eu/digital-single-market/en/eurohpc-joint-undertaking>
2. VECMA Innovation Plan, <https://www.vecma.eu/d6-2-innovation-plan/>
3. Alan Turing Institute, <https://www.turing.ac.uk/>