D6.1: Detailed Dissemination Action Plan

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CONTRIBUTORS

- Hugh Martin – Main Author
- Derek Groen – Reviewer
- Erwan Raffin – Reviewer
- Peter Coveney – Reviewer

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1 Executive summary

This deliverable, D6.1: Detailed Dissemination Action Plan, acts as a detailed and comprehensive report on the dissemination actions that are being carried out by the project. This deliverable is linked to VECMA's Task 6.1: Production of a Dissemination Action Plan, and the publication of the plan is also Milestone 2 in the project.

This action plan is a 'living document' that will be updated throughout the project, as required.

2 Introduction

The VECMA consortium strongly believes that innovation can be strengthened with a comprehensive dissemination plan and well-planned knowledge exploitation activities. Thus, dissemination is central to the VECMA project, and is a collaborative effort between the project partners, led by CBK.

Dissemination activities will be run by Work Package 6 (WP6). The main objectives will be to report and describe the project results to stakeholders, be they members of the scientific and high-performance computing communities, user communities, middleware developers, industry, other related international projects, and the general public. We will also ensure that the project creates and implements a strong sense of innovation.

One of the most important activities we shall organise is dissemination, outreach and training associated with releases of the VECMA toolkit. Events will be organised with a focus on either dissemination or training. For those with a dissemination focus, two workshops will be organised, one alongside a major conference, the other targeting innovation through participation of industry, government and NGOs. For those with a training focus, two training events will be organised to encourage uptake of our methods, software, tools and services.

The project's impact objectives will be implemented via dedicated media (including social) work, participation in conferences, preparation and distribution of information material, as well as event organisation.

2.1 Dissemination Reports

Two further deliverables will be produced during the project lifetime that will track and report on the dissemination activity in VECMA:

- D6.3 Interim Dissemination Report (M18)
- D6.5: Final Dissemination and Innovation Report (M36)

Each of these deliverables reports on the dissemination and training material and activity produced by the project, they will also trigger updates to the VECMA dissemination action plan.

3 Target Audiences

Exascale systems offer tremendous opportunities for computational science. They promise to transform computation from a methodology supporting theory and experiment into a predictive simulation science, which incorporates measures of confidence regarding the validity of its predictions, allowing its predictions to be actionable. However, important algorithmic and technological challenges need to be overcome to fully exploit these emerging opportunities, as existing approaches in high performance computing will not directly apply at the exascale to automatically deliver the envisioned step jump to scientific discoveries. VECMA will build on recent and ongoing EU and other funded research work to enable this paradigm shift. This will help to transform high-end simulation science that is reliant on large scale multiscale simulations into a discipline that produces high-fidelity, reliable and reproducible output with predictions that are actionable in the sense of providing instant decision support. Specific outputs of the project, their target audiences, and the possible dissemination measures are outlined in the table below:

Table 1: Project outputs, target audiences, and dissemination measures

VECMA Output	Target Audience	Dissemination Measures
Realisation of automated UQ by applications developers worldwide		
Software release of the VECMA Toolkit	Software and Hardware Developers, Application Developers, Exascale Labs	VECMA Website, social media, conference presentations and demonstrations, learned societies, VECAM, etc.
Reduced Uncertainty in VECMA applications	Software and Hardware Developers, Application Developers, Domain Scientists	Publications, demonstrations
Exascale enabled multiscale UQ	Software and Hardware Developers, Application Developers, Exascale Labs, Industry	Publications, demonstrations
Formalisms for multiscale UQ	Software and Hardware Developers	Publications, demonstrations
VVUQ for external multiscale applications	Application Developers, Domain Scientists	Publications, project website, 1-on-1 meetings, workshops and training events
Realisation of accelerated V&V by application developers worldwide		
Generic multiscale VV primitives	Software and Hardware Developers, Application Developers	Publications, demonstrations
Influencing next generation compute architectures (co-design)		
New primitives for VVUQ for next generation machines	Software and Hardware Developers, Application Developers, Exascale Labs	Publications, demonstrations
Improved understanding of performance bottlenecks for multiscale VVUQ	Software and Hardware Developers, Application Developers, Exascale Labs	Publications, demonstrations
Simulator for exascale architectures	Software and Hardware Developers, Application Developers, Exascale Labs	Publications, demonstrations
Influencing policies of funding organisations and service providers to create the infrastructure needed for exascale deployment and new use cases for HPC		
Position paper on requirements for multiscale VVUQ	Software and Hardware Developers, Application Developers, Exascale Labs	Position paper, project website.

Scientific results arising from improved fidelity of simulations in applications		
Neointima formation: uncertainties and confidence intervals on time dependent neointimal growth patterns; sensitivity analysis and subsequent model pruning	Device industry, in-silico clinical trial designers, software industry active in Biomedical domain (e.g. Ansys), EMA, FDA	Establish collaborations, MoUs with recent EU projects in the health domain on *in-silico* clinical trials (e.g. the INSIST project), industrial partner engagement, engage with the CompBioMed project
Hemocell, and cell-based blood flow modelling, first time ever to do UQ on such detailed models.	Academia (especially in thrombosis research), designers of microfluidic systems for lab-on-a-chip applications, e.g. in the field of diagnostics.	Conferences, workshops, publications. Engagement with relevant projects in e.g. design of microfluidics.
Quantifying the patient-specific distributions of magnetically steered colloids under external magnetic fields applied in the clinic.	Academic and clinical scientists	Direct interactions with clinicians at National Hospital Neurology and Neurosurgery (UK) and Hamad Medical Corporation (Qatar). Wider dissemination via CompBioMed. Publications, conferences, and workshops.
Fusion application: Core temperature profiles with rigorous uncertainty quantification.	Fusion scientists	Publications, conferences and workshops. Presence on the EFDA-Task Force on Integrated Tokamak Modelling.
Automated uncertainty quantification for sampling methods in free energy calculations	Academic and clinical scientists	Publications, conferences and workshops. Outreach and training through CompBioMed and BioExcel centres of excellence and UK CCP BioSim.
Climate application: improved representation of key unresolved processes (such as clouds) and their uncertainties	Academia, in particular atmosphere-climate modelling and parametrization communities	Publications, conferences and workshops. Engage with relevant projects, notably the 3d-SP project (CWI/KNMI/LeSC/Delft)
Industrial and societal impact arising from improved fidelity of simulations in applications		
Input for policy decisions on supporting refugees escaping armed conflict, and identification of shortcomings in current data collection	Policy makers	White papers, publications
Obtaining macroscopic behaviour of nanocomposite materials based on their nanoscopic chemical structure	Nanomaterials industry	Publications, conferences, workshops and industrial collaborations (existing links include BAE Systems, Rolls-Royce, and Hexcel)
Automated measurements of uncertainty for new drug discovery tools	Pharmaceutical industry	Publications, conferences, workshops and industrial collaborations (existing links include pharma – e.g. GSK, Janssen, Pfizer & Evotec)
Enhanced skills in next generation of researchers		
Output to raise awareness of VECMA software and tools to researchers	Academia, Industry	VECMA Workshops, Talks and Posters at Conferences and Other Events, Scientific Publications, Website, Social Media, Dissemination Materials, Promotional Videos
Training in VECMA software and tools	Academia, Industry	VECMA Training Events, Online Training materials, Tutorials
Public understanding of VVUQ and exascale computing		
Output to raise awareness of VECMA to non-researchers	General Public, Medias, Policy Makers, Civil Society	Non-Scientific publications, White Papers, Website, Social Media, Dissemination Materials, Promotional Videos

In Sections 3.1.-3.3 below, we discuss some of the target audiences in more detail.

3.1 Targeting Academics

Targeting academics is naturally a major focus for VECMA. Much of our event activities and dissemination channels are used to target PhD students, postdoctoral research associates, and both junior and senior academics. Such activity often also targets Industry in parallel, wherever possible.

3.2 Targeting Industry

In targeting industry, Table 1: Project outputs, target audiences, and dissemination measures, shows the industrial audiences for VECMA various types of output. In particular, the HPC industry is one of the most important target audiences for VECMA's contributions to improve innovation capacity.

Through their extensive links with industry across many sectors, PSNC and BADW-LRZ are in a unique position to disseminate VECMA know-how as widely as possible within this audience. Industry is not only on our dissemination radar but will also be involved in our conferences and training activities. Through VECMA, it is anticipated that our results will make their way into software and hardware design, thereby shaping the next generation of infrastructure. This will initially impact vendors that have the strongest links to the consortium but will eventually spread to others. We strongly believe that industry inclusion from the project's outset can only enhance our innovation ambitions.

We will also hold an industry targeted event as one of the workshops we hold, this is detailed further in section 6.

3.3 Targeting the General Public

In targeting the public, we are executing several approaches. This involves the production of content for popular science magazines such as New Scientist, newspapers, popular science websites, television programmes and so forth. In addition, we will produce a video that describes VECMA aims in an easy-to-understand format that will be suitable for all audiences including the general public. Uncertainty quantification, along with validation and verification, are hot topics in contemporary scientific debate[1,2]. We will participate in this debate through our various dissemination activities, including presentations, posters, BoFs, roundtable discussions, articles, publications, event organisation, and media activity.

4 Branding and Dissemination Materials

[1] *https://link.springer.com/article/10.1007/s40430-018-1079-7*
[2] *https://pubs.acs.org/doi/10.1021/acs.jctc.7b01143*

The VECMA brand is being used in all of our dissemination materials and channels, be it in the form of leaflets, posters, the project website etc. Templates have been created for each dissemination material type in order to encourage recognition of the VECMA brand and therefore the project and its aims. The templates and brand files are available on the VECMA website's intranet. Task 6.5 is concerned with the production of dissemination materials and runs throughout the 3 years. Below, the dissemination types are described and our plans for each is detailed.

CBK has produced templates for each of these dissemination material types. Consortium members are required to inform CBK of content produced using these templates. Consortium members are permitted to modify the templates, but the final product must contain the VECMA logo, the statement acknowledging the EU funding, and the EU emblem.

4.1 Logo

The VECMA logo has been designed to be clean, clear, and recognisable, with a strong image and style. Rather than attempting to be overly descriptive in itself, which can lead to too much detail and difficulty achieving good aesthetics, the logo aims for simplicity while subtly hinting at VECMA's mission. The logo is shown below:

Figure 1: The VECMA Project Logo

The logo is available in png, ai, pdf, and eps format in various resolutions.

4.2 Leaflets

Leaflets will be produced, and they will be handed out to stakeholders at various events (conferences, workshops, seminars, etc.), with the purpose of making them aware of the project or particular aspects of it. These will contain the following:

- VECMA logo
- A URL to the VECMA website
- A link to the VECMA twitters account
- The funding acknowledgement "This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 800925."
- The EU emblem

- A summary of the VECMA project
- The expected outcomes
- The expected impact
- Images of VECMA research

4.3 Posters

VECMA posters will be made to present at events, such as conferences and workshops. These summarise VECMA research and outcomes and are best served with a VECMA consortium member being present with the poster to explain further what appears on it. The posters contain:

- The VECMA logo
- A URL to the VECMA website
- The funding acknowledgement “This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 800925.”
- The EU emblem
- Images of VECMA research
- Summaries of VECMA research and outcomes

4.4 Presentations

Members of the VECMA consortium will continue to attend and present talks at various conferences, workshops and seminars throughout the project. Where appropriate, the slides for such talks contain a section or slide which summarises the VECMA project, as follows:

- VECMA logo
- A URL to the VECMA website
- The funding acknowledgement “This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 800925.”
- The EU emblem

In other cases, it is appropriate to theme all of the talk slides as VECMA related. In these instances, a template is available that displays the VECMA logo on each page, and the rest of the slide aesthetic has been adjusted to match that of the logo, as shown below:

Figure 2: VECMA Slide Template

A slide template is available in 4:3 and 16:9 aspect ratios in PowerPoint .ppt format. It will also be made available in LaTeX format.

4.5 Scientific Papers

Throughout the project, the VECMA consortium will publish scientific, peer-reviewed papers, conference proceedings, and chapters in books. Such publications contain the following passage:

"This publication has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 800925."

We will publish in a variety of high-impact journals across the domains in the project. Targets include:

- Fusion - *Computer Physics Communications* (CPC), *The Journal of Computational Physics* (JCP), *Nuclear Fusion, Plasma Physics and Controlled Fusion* (PPCF), *Physics of Plasmas* (POP)
- Materials - *Advanced Materials*, *ACS Nano*, *Nano Letters*, *Computer Methods in Applied Mechanics and Engineering, Journal of the Mechanics and Physics of Solids*
- Biomedical - *Journal of Chemical Theory and Computation, Journal of Medicinal Chemistry, PLoS Computational Biology, e-Life, PNAS*
- Refugee Modelling - *Journal of Artificial Societies and Social*
- Climate - *Journal of the Atmospheric Sciences, Journal of Climate, Monthly Weather Review, Quarterly Journal of the Royal Meteorological Society*

We may also publish in a variety of conferences and journals in the HPC domain.

5 Dissemination Channels

In this section the various dissemination channels available to VECMA are described. As a principle of practice, we employ leverage in dissemination wherever we find the opportunity – in engaging channels and mechanisms previously funded by EU investment, and/or already established in the

partner institutions and in professional associations and working groups where the key members of VECMA are already present.

5.1 VECMA Website

The VECMA website is available at URL www.vecma.eu. The website contains information about the project including a description of the project, its research, its partners, and contact information. It also contains a news and events page, a feed of the VECMA Twitter account, and a page listing VECMA events. The website also contains an intranet page, only accessible to consortium members, which acts as a storage service for VECMA related documents such as reports, templates etc. The website will also contain a software hub where we will make all of VECMA-produced software available.

Task 6.3 is concerned with the set up and maintenance of the VECMA website and runs across months 1-36. Milestone 3, in the third month of the project, addresses the construction of the website and mailing lists. Below is an image of the website in its current state (this is currently being improved, therefore subject to change in the future):

Figure 3: The VECMA Project Website

5.2 Social Media Channels

VECMA aims to have an effective social media presence. At the forefront of this is the VECMA Twitter account, which can be found at @VECMA4. We will also create a VECMA YouTube page to expand our social media reach and will create video content to populate it. We have set aside dissemination budget in order to allow for the production of attractive video content in the first half of the project. We will produce animated videos which will be designed to explain aspects of the VECMA project in a manner than can be understood by all audiences, including the general public.

Task 6.3, in addition to the creation and running of the project website, is concerned with maintaining a social media presence and runs across months 1-36.

5.3 Mailing Lists

VECMA mailing lists have been set up to aid communication within the project. These allow communication to everyone in the consortium and to everyone within a particular work package. We will create additional mailing lists as required.

6 Events

To maximise the impact of the project outputs, we will organise a series of events and workshops focused on training and dissemination.

For those events with a dissemination focus, two workshops will be organised. One alongside a major conference such as the International Conference on Computational Science or Supercomputing. The other will be an event that is designed to ensure substantial industry, government, and NGO participation.

For those events with a training focus, two training events will be organised to encourage uptake of our toolkit. We will also use our close links with national and international projects and institutions (such as CompBioMed, BioExcel, etc. as well as the coordination and support FocusCoE as an outreach vehicle) to promote and encourage uptake of the VECMA toolkit and VVUQ more generally. We will focus on our training agenda and organise a Summer School for students and other interested parties. We will also consider holding events for small groups (3-5 people) on how to use the VECMA toolkit on external applications, for this we may harness a webinar format.

A core goal of our dissemination is to ensure uptake not just in academia but also in industry. In addition to our industry workshop we will ensure that all events are made accessible to commercial organisations, starting with the project partners. An additional focus will be on the HPC sector and it is anticipated that our results will make their way to the industry and inform software and hardware

design, thereby shaping the next generation of infrastructure. We will use the direct link of VECMA project partners to ETP4HC to achieve this impact.

VECMA will organise partners' presence at high profile conferences and will consider partaking in the exhibition opportunities they offer. We will target the main European and USA based HPC conferences, the main UQ related conferences, and conferences in the application domains we cover. These include international conferences like Supercomputing, International Supercomputing, International Conference on Computational Science, Teratec, HPC Summit Week, EGI, and TERENA. The consortium will also be represented at domain specific events such as:

- CS - International Conference on Computational Science (ICCS), Platform for Advanced Scientific Computing (PASC)
- UQ - MaxEnt, Society for Industrial and Applied Mathematics (SIAM) Conference on Uncertainty Quantification
- Materials - Materials Research Society meetings
- Biomedical - European Workshop in Drug Design, Biophysical Society Annual Meeting, CCP-BioSim Annual Conference (also training week for a workshop), European Conference on Theoretical and Computational Chemistry BioExcel annual meeting, CompBioMed annual meeting
- Refugee Modelling - The Winter Simulation Conference, International Conference on Computational Science (ICCS), and ad-hoc humanitarian and related events
- Fusion - European Physical Society Conference on Plasma Physics (EPS)
- Climate - Yearly conferences of the European Geosciences Union and the American Geophysical Union

Additionally, the VECMA consortium will leverage its involvement in several key communities, notably the European Research Consortium for Informatics and Mathematics (ERCIM) and the European Mathematical Society, for which CWI is founding member and institutional member respectively, and the yearly International Conference on Computational Science which is co-organised by UvA. These connections will provide excellent channels to infuse VECMA with external scientific feedback on algorithmic and computational topics, as well as to convey VECMA advancements on these topics to the wider European research community. The VECMA Consortium will also actively seek participation in all the relevant activities organised by and for the Commission in the e-infrastructure domain.

Task 6.4 is concerned with the organisation of events and the coordination of event participation. Task 6.4 runs from month 1 to 26 in the project and has 4 milestones associated with it:

- Milestone 4 - First workshop (originally targeted in month 6, now targeted to be held at ICCS 2019 in month 12)
- Milestone 13 - First training event (targeted in month 18)
- Milestone 19 - Second workshop (targeted in month 24)
- Milestone 21 - Second training event (targeted in month 30)

7 Software Releases

Software developed in the project will be given special attention in our dissemination efforts. Software will be given a dedicated hub on the project website to host downloadable versions of the software and related documentation. The release of software will be widely advertised on our dissemination channels and championed at our events, with one of the events we organised being focused on training in VECMA software in the third year of the project. We aim to produce tutorials focused on our tools by the end of the project. Various other dissemination methods will be considered including newsletters, themed events, video content, and video and written interviews.

The VECMA toolkit is scheduled to be released in months 12, 24 and 30 in the project, we aim to have a high impact with each release. We will likely align the month 12 toolkit release alongside the ICCS 2019 conference (and the MMS workshop) in Portugal.

We will use GitHub to store and share VECMA software and tools. GitHub will allow us to track visitors and repository clones for software output measurement purposes. Software will be open-source, made available to academics and industry alike.

Task 6.6 is concerned with the dissemination of software releases and runs from months 12-36 in the project.

8 Reporting

In executing VECMA's dissemination plans there must be regular communication between all of the partners, in particular via CBK, to ensure that activity is correctly recorded. The following points define how this is implemented:

- In the first instance, key achievements, events, publications, media appearances, and any activities that should be disseminated, should be reported to CBK, directly via email to h.martin@cbkscicon.com.
- In order to monitor the above activity, CBK uses the monthly WP Leader Teleconferences to check on any unreported activity, allowing for it to be disseminated adequately.
- The monthly WP Leader Teleconferences is also used by CBK to report all dissemination activity from that month to the principle investigator and project manager of VECMA.
- The annual dissemination reports document all VECMA dissemination activity from that year, and aid in the annual updating of this document, the VECMA Dissemination Action Plan.
- Dedicated WP6 teleconferences will be introduced as required in order to flesh out WP6 activities.

CBK gathers a complete list of dissemination activity ahead of the annual dissemination deliverables. CBK has created a spreadsheet for this purpose and ensures that all activity is reported by the partners

in these deliverables. The spreadsheet includes columns to report the dates, target audience, and estimated audience size.

9 After the Project

Aside from the dissemination activities conducted during the project, we will keep VECMA 'alive' in the community after the project's termination. We will do so by publicising our training material and encouraging participation of the consortium in future educational events. The members of the VECMA consortium will also be encouraged to present work conducted during the project at future conferences. Our publications and software tools will still benefit the community after the project ends, where the results will remain available on the website until 5 years after the project ends. The ICCS Multiscale workshop is already a continuation of a series, we aim to continue this series after the project has ended.

10 Output Measurement

At the end of the project we will want to assess how effective our dissemination output has been. To monitor key performance indicators, we are keeping records of how many events we are participating in, who and how big the audience is, how big the audience is for our posters, how many people take our leaflets, register for our training events, number of downloads of our software and publications, and gauge our influence in social media by tracking followers on the platforms we participate in. We are also able to track progress in attracting attendees to our workshops by benchmarking the second event against the first. The number of publications, their journal's impact factors, and the number of citations received also give a measure of effectiveness. VECMA gathers as much information to measure impact as we can. We continually research published best practice in impact measurement from Horizon 2020 projects and other sources to establish appropriate metrics for this measurement. Here are some types of output measurement we can track:

- Number of events participated in
- Number of attendees at our events
- Feedback from workshops and events, e.g. via surveys
- Number of publications
- Citations from publications
- Publication journal impact factor
- Website stats and social media stats
- Estimated sizes of audiences reached
- GitHub repository clones
- Unique visitors to GitHub pages for our tools

For the events we organise, we survey attendees at the end of the event. We will consider surveying them a second time a certain number of months later, in order to gage the lasting impact of the event. Furthermore, we shall write a report following each event that shows the user benefits.

11 Conclusions

We believe that, through our dissemination activities, expected impacts will be accelerated and strengthened. Through the dissemination of VECMA research findings and the evangelisation of its open-source software to academia and industry alike, we will contribute to the strength and leadership of the EU in HPC technologies, also having an impact on the emerging HPC markets. Through the building of networks between our scientific community and the encouragement of collaboration activities, in addition to our training agenda, we will accelerate European excellence in computing and algorithms in a multi-disciplinary fashion.