



## D2.1 Plan for targeting SMEs Version 1.0

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## Change Log

Version	Author	Description of Change
V0.1	Craig Lucas	Initial Draft.
V0.2	Craig Lucas	Changes after NAG internal review.
V0.3	Craig Lucas	Acronyms and references added. Feedback from IT4I incorporated.
V1.0	Craig Lucas	Changes after POP internal review by Juelich.



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## Executive Summary

This document outlines how the POP project plans to identify and attract small and medium enterprises (SMEs) as customers of its services. The project has a KPI to undertake services for at least 30 SME users.

We identify the methods we will use to research the market, locate possible SME users and describe the material we will produce targeted to them.

## 1. Introduction

The plan involves three interleaved phases. For the first, using knowledge from the initial POP project phase which started in October 2015 (referred to herein as POP 1), the experience the partners bring to the project and additional research we will establish the landscape in which SMEs operate. We will identify the issues they face and the domain specific terminology they use to describe their computing. This will inform the following phases.

In the second phase we will identify leads, i.e. SMEs that would potentially benefit from POP services, by market research methods, attending events and engagement with various organizations.

In the final phase we will produce a variety of resources such as marketing material, webinars and blog posts that will communicate to the SME leads what the POP services are and their potential benefits in order to motivate them to become POP users.

Throughout the whole process POP will not simply be restricting itself to lead generation to meet our KPIs but rather thinking of how we establish the POP brand and embed ourselves in the wider HPC community. In other words, the sustainability of POP is at the heart of our activities in finding SME users.

Below we identify a number of tasks and targets.

## 2. Phase 1: Understanding the SME Landscape

Looking back at POP 1, we undertook 44 services (audits, performance plans and proof-of-concepts (PoC)) for 24 unique SMEs. Of these services 36 were for ISVs. It is not surprising that software vendors see the attraction of improving the performance of their product, of course. However, we clearly have work to do in attracting those SMEs who develop software for their own use.

The breakdown by sector of the 24 unique SME users was as follows. 8 worked in computational fluid dynamics (CFD), 4 were from non-CFD engineering, 3 were from the pharmaceutical industry, 3 from energy, 2 from



health and the remaining 4 were from other industries including oil & gas and data science.

SMEs required more interactions with POP staff before they committed to a service. There was an average of 4.4 interactions with SMEs versus 2.9 for the remaining category of POP user. SMEs were also much more likely to continue with further POP services, once an initial audit had been undertaken, than other POP users from academia, research and larger enterprises. Out of 165 audits done in POP 1, 29 (18%) were for SMEs. However, out of 50 performance plans and PoCs that were produced, 15 were for SMEs, some 30%.

Whilst having ISV POP users is highly desirable, given the potential impact of improving a commercial code, we would like to ensure we are reaching all potential SMEs. One aspect that we need to consider is the terminology we use in our communication. For example, SMEs don't necessarily relate to the term "high performance computing" to describe their large-scale compute. They see what they do as, for example, "simulation", "modelling", "big data", "high throughput computing" etc. even though traditional HPC may think of these terms as something entirely different. SMEs are also not necessarily taking advantage of extreme scale computing. This was evident throughout POP 1, and indeed POP is evolving its metrics to better describe codes run in a shared memory or GPU environment. Our approach to communicating with SMEs should reflect these aspects and we will use language that both speaks to SMEs and doesn't alienate the smaller scale user. These aspects will be explored further: our existing knowledge will be bolstered by further research of sector specific SME language.

## **2.1 SME Specific Concerns**

The investment of time that an SME makes while engaging with POP could be a significant proportion of their technical staff time. Thus, we must make it very clear from the outset that the benefit of our services to SMEs warrants the investment. We should communicate explicitly in our marketing material what is required so as not to put off anyone before we have communicated directly with them. We will be considering ways to minimise the effort they need to expend, such as the planned improvements to the tools for those who are undertaking their own code measurements.

Some SMEs have concerns around their intellectual property and confidentiality. We need to address this at an early stage in their engagement with POP. There are two procedures in place to assist them that we will communicate. Firstly, we can sign nondisclosure agreements, which we made use of during POP 1. Secondly, we don't need access to the source code in order to produce a POP assessment. This was understood early in POP 1 and it removed a barrier for SMEs once we provided more clarity. Users need to be made aware that not providing access to source code may increase the amount of work they have to do, or it would limit the amount of detail we can provide in our report.



## 2.2 Cost Savings

Whilst being able to run your parallel code quicker or solve larger problems is often a motivator in academic circles, SMEs prefer financial benefits to motivate investment in performance improvements.

Cloud computing continues to see significant growth. We anticipate cloud users becoming an increasing proportion of POP users. There is an easy argument to make to these users as performance gains means real and immediate cost savings. There are interesting European initiatives that POP can interact with like the Horizon 2020 funded Cloudifactory<sup>i</sup> which one partner is already engaged with.

If commercial companies operate their own data centres, then energy consumption is a significant operational cost. POP is considering a new kind of analysis, thanks to a new partner. IT4Innovations was a member of the READEX project<sup>ii</sup> that developed a suite of tools designed for real time tuning of HPC applications. The goal of this tuning is to find the optimal system configuration of compute nodes, i.e. CPU frequencies, number of active cores, etc. to minimize the energy consumption of the HPC system. Cost savings of 5-25% can be made.

The Customer Advocacy Work Package (WP3) of POP, that solicits feedback from POP users, will feed in to the cost saving argument. We already publish success stories via the POP website which make a convincing argument if a code runs twice as fast, for example. However, we are seeking to obtain data on the real monetary return on investment that users have enjoyed from using POP.

## 3. Phase 2: Identifying Potential SME POP Users

Our experience during POP 1 was that around 10% of leads became POP users and, of those users, 20% left the process before a service was completed. Thus, we require around 380 leads in total to convert them to be the 30 SME POP users we seek. We expect some SME users in POP 2 to be returning users from POP 1, however we have not taken this into account with the targets for different sources of leads that follow.

Reaching new SMEs will be achieved by a combination of market research, lead generation and providing opportunities for them to find POP through events and a web presence. However successful our sustainability efforts are, we will need to directly market to them, recognising that potential users could be unaware of the need for performance optimisation, let alone POP.

### 3.1 Market Research

When searching for or attracting SMEs we first consider the different sectors in which they work. The science they are doing and the problems they are



solving are often sector dependent and so should the material we produce for each. This will help us achieve a broad demographic.

The sectors we will consider will include, amongst others:

- Oil & Gas
- Pharmaceutical
- Finance
- CAE (CFD, automotive, acoustics, aeronautical engineering, smart cities...)
- Food technology
- High Performance Data Analysis

Industries like oil & gas, pharmaceutical and automotive involve large corporations but it is their supply chain that consists of dozens of SMEs. Some companies publish lists of their partners which make rich sources of leads.

During POP 1 we successfully built lists of leads using a variety of internet sources. SMEs can be identified in various ways, including:

- Lists of companies are often published, with additional information and contacts available to purchase.
- Lists of HPC codes, their users and forum contributors.
- Specific scientific or sectoral pages.
- Job advertisements can provide a way to see which skills companies have.
- LinkedIn: Groups, pay-per-click adverts.

**TARGET: Using a variety of internet-based sources identify 280 new leads<sup>iii</sup>.**

These basic search activities will supplement our other structured activities.

### **3.2 Digital Presence**

The POP website will be updated to have SME and sector specific material. We will consider search engine optimisation (SEO) so the website ranks highly when people search for code optimisation services, etc. The website most likely will not provide an initial point of contact for potential POP users but may convince them to sign up for a service.

We have a goal to double the number of Twitter followers to ensure we have reach there. Social media offers a cost-effective way to engage with the community and promote the POP brand so we will increase our activity there. We will take part in sector and event-specific hashtags, for example #simulationFriday. We will tweet marketing material focused at specific sectors and SMEs, with well chosen images to show off project results and ROI. We won't restrict ourselves to marketing material but will also break news, give opinion on hot topics and debate.

**TASK: Update the POP website with specialist material aimed at SMEs.**



**TARGET: Increase POP Twitter followers from 500 to 1000.**  
**TARGET: Acquire 2 new SME users<sup>iv</sup> through our improved digital presence.**

### 3.3 Events

Attending events is beneficial for both business development and dissemination of POP outcomes. Our experience from POP 1 was that we best reached SMEs at specialist sectorial events, rather than more general ones. Thus, we will attend sectorial events for lead generation but will continue to attend general meetings, like ISC, for project dissemination. The specialist events should be chosen to meet technical staff rather than visit exhibitions staffed by commercial people. We should aim to give a talk, have a poster or a booth for maximum reach (although the latter can be prohibitively expensive).

Specific attention will be paid to events that are not just sectorial but aimed at SMEs. For these audiences we will consider investing significant POP resources to provide a workshop activity. Some events that we have identified include the 2019 International Conference on High Performance Computing & Simulation<sup>v</sup> and the International CAE Conference and Exhibition 2019<sup>vi</sup>. We attended the latter in 2017 with a stand where we ran demos of some of the POP tools and found 2 SME POP users through that activity.

**TASK: Attend 6 sectorial events in the first 15 months of the project.**  
**TARGET: Acquire 40 new SME leads from events by the end of the project.**

### 3.4 Professional Bodies

There are a vast number of organizations that oversee and support the activities of different professions. They vary widely in both the geographies that they cover and the activities that they undertake. Many industries will have general bodies and a range of specialist ones also. For example, the Europe-wide European Molecular Biology Laboratory<sup>vii</sup> has an SME Bioinformatics Forum, and the UK-based Advanced Propulsion Centre<sup>viii</sup> support SMEs with a variety of initiatives. Each partner will be able to reach out to local chambers of commerce.

We will concentrate our effort initially with those organizations that specifically support SMEs through meetings, forums and other initiatives. We will attempt to form mutually beneficial partnerships. For example, POP could help fulfil a body's remit to promote computing innovation.

**TASK: Identify and contact 20 professional bodies spanning the entire EU by month 12 of the project.**  
**TARGET: Attract 30 new SME leads through our engagement with professional bodies.**



### 3.5 Commercial Partnerships

POP partner NAG has very well established partnerships with HPC vendors, integrators and cloud providers. These sorts of partnerships could be very valuable to POP. Firstly, some of the smaller companies won't have the capacity to provide CSE support to their users. Thus, POP is attractive for these vendors to be able to offer services competitively, or for free, to their users. Secondly, for POP it is a clear avenue to increase awareness of POP and a potential contributor to our sustainability.

These partnerships were attempted in POP 1, and unfortunately, we were unsuccessful in this endeavour. However, we believe this is worth revisiting as the HPC space will have evolved, particularly in cloud computing, since POP 1.

**TASK: Investigate the potential of strategic partnerships with at least one each of HPC vendors, integrators and cloud providers.**

**TARGET: Form one formal partnership with an HPC cloud provider by the end of the project.**

### 3.6 European Organizations

POP is involved in a wide range of collaborations with organizations across the EU. POP is a member of SESAME NET<sup>ix</sup>, a network of HPC centres and research institutes which in mutual cooperation support small and medium-sized enterprises in exploitation of HPC. IT4I are involved with InnoHPC<sup>x</sup>, a project establishing collaboration of HPC centres, research institutions and business support organisations in the Danube region to create a transnational HPC laboratory. Their ambition is to be one-stop-shop for SMEs in this region.

POP will engage with FocusCoE, who support all the Centres of Excellence, and has a remit to promote the CoEs with industry and coordinate with HPC SME initiatives, including SHAPE. At the time of writing it is not clear how they intend to approach this but the lead for Work Package 2 will be at their first workshop in February 2019 to pursue this.

**TARGET: Acquire 5 new SME users through engagement with European organizations.**

A future deliverable will look at how POP will engage with the other Horizon 2020 Centres of Excellence.

## 4. Phase 3: Generating Collateral aimed at SMEs

Once we have identified potential SME users of POP, we will provide them with marketing as well as informational material.

We will produce new and very specific marketing material aimed at SMEs. The language will be sector specific with eye catching imagery that clearly



represents our target reader. Each item will be clear as to its audience. That is, we will produce material aimed at a technical person but also use a different approach for less technical managers.

We will consider advertising POP in print media like Scientific Computing World or a more industry specific one like NAFEM's BENCHMARK Magazine. We will also consider digital media such as Inside HPC. A full survey will be undertaken to establish reach and cost-effectiveness.

As well as advertising, POP's training, webinar and blog activities will promote the project.

**TASK: Produce marketing material aimed at code developers working in specific sectors to include at least Oil & Gas, Pharma and CAE.**

**TASK: Produce marketing material aimed at managers in sectors to include at least Oil & Gas, Pharma and CAE.**

**TASK Produce marketing material to highlight the new energy saving profiling which will be introduced by POP 2.**

**TASK: Investigate what print and digital media would provide cost-effective advertising for POP.**

## 4.1 Training

The POP partners have successfully provided training at several events, often jointly with academic institutions, PRACE, etc. Being able to engage with people face to face is clearly very effective. We can give specific advice and "hands-on" sessions help people learn POP tools quickly and thoroughly. We will continue to do this and promote more general HPC training, online and in person, available through PRACE, HPC Carpentry and other CoEs, in cooperation with FocusCoE.

It is tempting to ascertain what training would be useful specifically for SMEs and deliver that. POP attempted to deliver, jointly with EoCoE, a standalone hands-on workshop on HPC benchmarking and performance analysis aimed at SMEs. Unfortunately, the event had to be cancelled due to lack of registrations. However, E-CAM CoE has been successful, being able to sponsor SMEs to attend events.

Therefore, we think that our in-person SME training activities should be at SME events, as discussed earlier. We will consider what online courses, either live or recorded, built around the activity and tools of POP, could be delivered to help SMEs. If successful, this would give us good reach and offer something unique in the HPC training arena. This kind of training is very similar to our webinar series.

**TASK: Investigate opportunities for SME training at events.**

**TASK: Produce 1 online training course by month 12 of the project.**



## 4.2 Webinars

Webinars have already been a good way for POP to reach out to the community of those using or interested in HPC. The benefits are twofold. Firstly, they reinforce POP's place in the HPC community and secondly provide, via attendee registrations, an avenue for promoting POP. We gave 7 webinars during POP 1 receiving over 840 registrations with around 500 people watching the 30 minute webcasts live. 20% of registrants watched more than one webinar and 4 out of 5 viewers rated it as useful.

This general webinar series is, of course, of no more or less interest to SMEs than anyone else. Examples of the webinars given are:

- Understand the Performance of your Application with just Three Numbers: A webinar that introduces the POP methodology by asking: "Is it possible to compute a very limited number of metrics for a parallel MPI application that explains its behaviour in terms of fundamental properties?"
- Getting Performance from OpenMP Programs on NUMA Architectures: A webinar discussing the approaches to getting the best performance from OpenMP applications on non-uniform memory access (NUMA).

The webinars remain available on YouTube online. POP 2 plans to deliver twice as many webinars looking at solutions to user problems where there is most engagement.

However, we are considering a different sort of on-demand webinar aimed at not just technical people but managers in SMEs who need to understand aspects of HPC. The marketing is to be determined but we think that there is appeal in a "coffee break" length duration. Topics for these pre-recorded webinars could be:

- MPI for Managers: A jargon busting guide to cluster-based, distributed memory programming aimed at those who manage users of HPC.
- Saving Money on Cloud Computing: An introduction to performance analysis and how tuning an application run in the cloud reduces cost or allows more simulation to be done for the same investment.

The emphasis here would not be to include POP direct marketing, but rather to simply present useful information. They would promote POP by association.

**TASK: Produce 3 on-demand short webinars aimed at managers in SMEs by month 18 of the project.**

**TARGET: Acquire 30 new SME leads from webinar registrations.**

## 4.3 Blog Posts

Nearly 80 blog entries have been posted so far on the POP website. They cover the activities of the POP partners, "success stories" showing the impact of POP code tuning work and promotion for events and webinars. As they are searchable on the internet they are a good promotion tool.



We could extend the type of blog post to cover informal, even light-hearted, discussions on topics of interest to SMEs or any potential POP user. They should be accessible and link not just to other POP resources but also to those of our fellow Horizon 2020 CoEs and other sources of more detailed material. Blog post topics could include:

- Cloud: The pros and cons! A summary post bringing together good resources for SMEs considering using cloud services.
- Does my SME need HPC? An informal discussion about graduating to large scale computing.

**TASK: Produce 6 blog posts that would be interesting to a variety of SME readers in the first year of the project.**



## Acronyms and Abbreviations

- CAE – Computer-Aided Engineering
- CFD – Computational Fluid Dynamics
- CoE – Centre of Excellence
- CPU – Central Processing Unit
- CSE – Computational Science and Engineering
- GPU – Graphics Processing Unit
- HPC – High Performance Computing
- IP – Intellectual Property
- IT4I – Vysoka Skola Banska - Technicka Univerzita Ostrava
- ISV – Independent Software Vendor
- Juelich – Forschungszentrum Juelich GmbH
- KPI – Key Performance Indicator
- MPI – Message Passing Interface
- NAG – The Numerical Algorithms Group
- NUMA – Non-Uniform Memory Access
- PoC – Proof of Concept
- POP – Performance Optimisation and Productivity
- ROI – Return on Investment
- SEO – Search Engine Optimisation
- SME – Small and Medium-sized Enterprise
- WP – Work Package

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<sup>i</sup> CloudiFacturing Project <https://www.cloudifactoring.eu/>

<sup>ii</sup> READEX Project <https://www.readex.eu/>

<sup>iii</sup> Targets for further leads are given in later sections.

<sup>iv</sup> Anyone signing up directly would not be considered a lead first.

<sup>v</sup> HPCS 2019 <http://hpcs2019.cisedu.info/>

<sup>vi</sup> International CAE Conference and Exhibition 2019 <https://www.caeconference.com/>

<sup>vii</sup> EMBL <https://www.embl.org/>

<sup>viii</sup> Advanced Propulsion Centre <https://www.apcuk.co.uk/>

<sup>ix</sup> SESAME NET <https://sesamenet.eu/>

<sup>x</sup> InnoHPC <http://www.interreg-danube.eu/approved-projects/innohpc>