



FORTISSIMO

# Modelling and simulation for SME business benefits

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I4MS

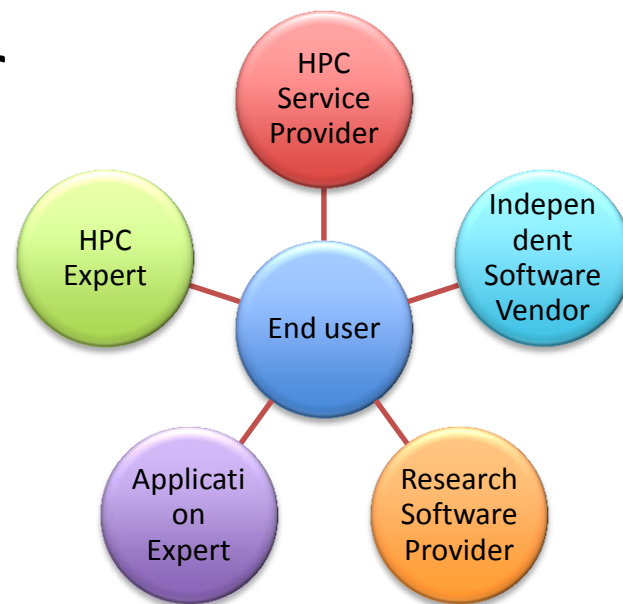
# The Fortissimo Project

- Offering a Cloud of HPC Resources to solve SMEs' business challenges
- One of the I4MS projects within the EC's "Factories of the Future" initiative
- Complementing generic SME initiatives in EC FP7 Programme - specific support to deliver economic growth through modelling and simulation
- Focus on problem solving – not technology development
- Brings together all of the players in a marketplace



# Fortissimo – scale & structure

- €22m costs, €16m EC funding, 45 partners growing to 100+ over the 3 year duration
- 20 initial “Experiments” with SMEs
- Each experiment has 2-4 partners
- Funding of up to €250,000 per experiment
- 2 Open Calls for proposals
- Optimised financial and legal structure to assist SMEs



# Our goal

- To improve company competitiveness through the use of innovative new or improved

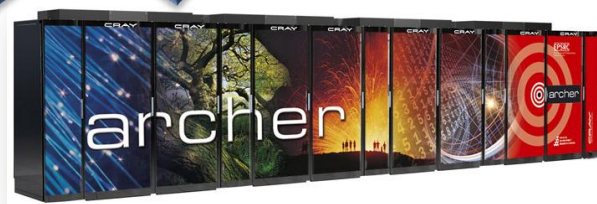
Modelling and Simulation using HPC deployed to competitive edge

Recent IDC report: "Each dollar invested in HPC returned, on average, \$356 in revenue and \$38 in profits or cost savings."

Economic growth for Europe



Europe has world class HPC assets and expertise



IDC study "HPC: ROI You Can't Ignore!", Nov 2013, <http://www.idc.com/getdoc.jsp?containerId=244316>

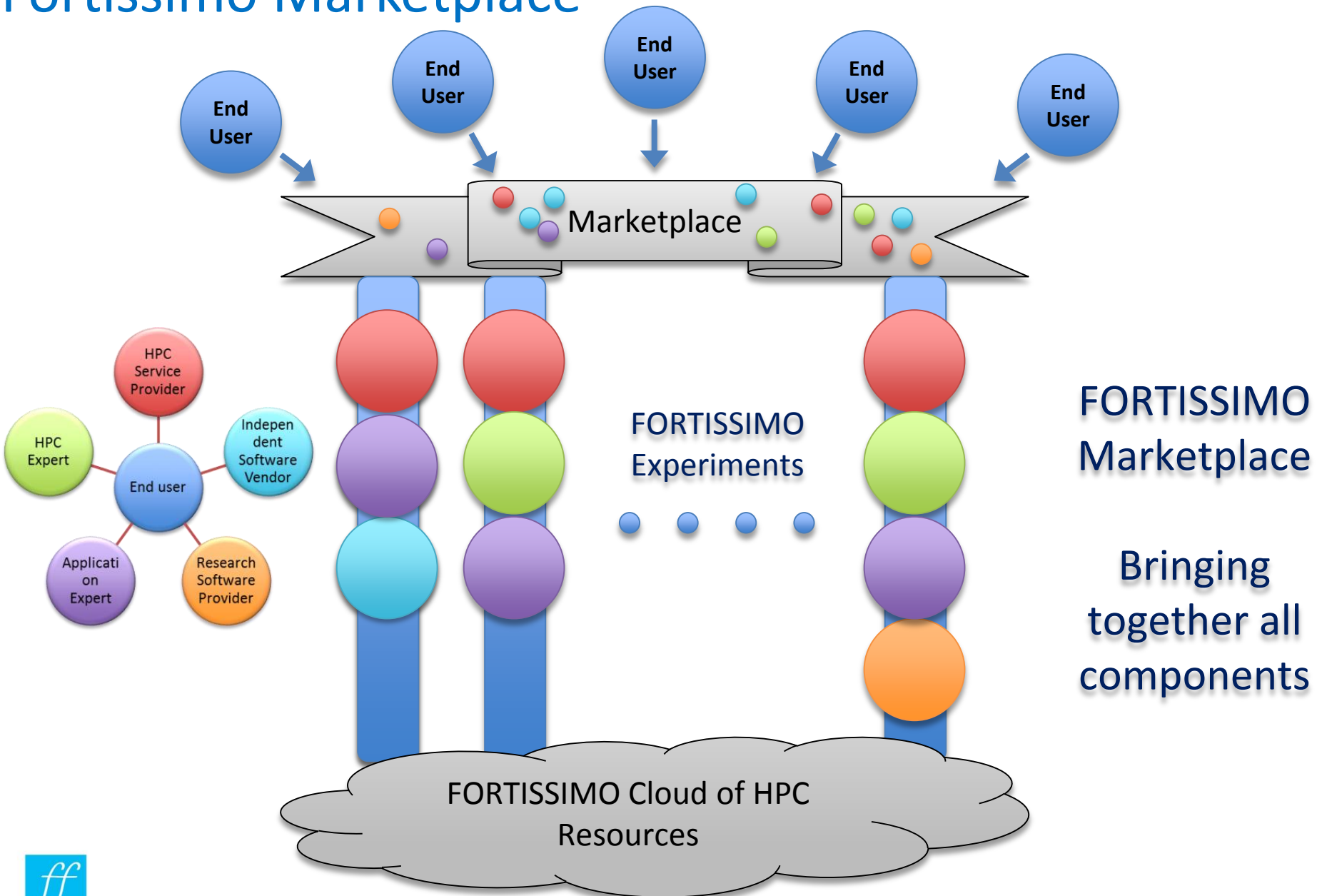


# HPC adoption best practice

- Many companies don't make use of HPC because there is a large hurdle to overcome
- Initial costs are high: modelling, software, skills
- Fortissimo is designed to help companies overcome that hurdle and become regular users of HPC
- Based on existing model best practice for working with SMEs
  - E.g. Supercomputing Scotland



# Fortissimo Marketplace



FORTISSIMO Marketplace

Bringing together all components

# 20 initial experiments

....aerodynamics  
of light aircraft

.. Multiphysics simulation

.. CFD ... automotive design

...continuous casting

... tools for urban  
planning

... routing architecture  
optimisation..

...high pressure  
vessels

.. correlation ..  
simulation & tests for  
mechatronics

... air-quality over cities

..design of metal flanges

.. CO2 emission prediction  
for automotive engines

... molecular simulation  
for industrial chemical  
engineering

... risers, moorings  
and flowlines

... low-pressure  
die-casting ...

... commercial  
computational chemistry

... structural crash tests

... CFD for  
turbomachinery

... eolian snow transport  
for civil engineering ...

Information available at:

[www.fortissimo-project.eu/experiments](http://www.fortissimo-project.eu/experiments)



# Objective of Open Calls

- Competitive calls for Application Experiments for the FORTISSIMO project
- Target: the expansion of the application experiments for engineering and manufacturing simulation services currently being carried out within Fortissimo
- Priority given to proposals complementing existing Fortissimo experiments & which address the needs of engineering and manufacturing SMEs.
- Clear demand
  - Call 1: 65 proposals
  - Call 2: 80+ proposals



# Open Call 1

- During Year 1 we ran Open Call 1
- Added 22 Experiments to Fortissimo ... and 51 new partners (total now 96)
- Open Call 1 – more than  $\frac{1}{4}$  funding (~€5m)
  - Leaving around €2.5m for Open Call 2
- Process of adding these new Experiments to contract has been very slow
  - Major improvements in Horizon 2020

# Final comments

- **Fortissimo is demonstrating significant demand for HPC by SMEs across Europe**
  - It can only meet a small fraction of this demand
  - Direct and immediate economic benefits result
  - To compete globally we have to increase such support for companies across Europe
- **New users driving new applications**
  - With new users of HPC come new problem domains
  - We need to create new applications for new problem spaces
- **People and skills are key**
  - Using modelling and simulation applications on HPC systems is still very complicated
  - Fortissimo focuses on bringing the correct people together to provide solutions to help SMEs get the benefits



**FORTISSIMO**