AMable Open Call
Supporting SMEs in the uptake of Additive Manufacturing

Call for Proposals
Identifier: AMable OC3
Deadline: November 2019

AMable Services Arena

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AMable – Digital Additive Manufacturing Innovation Hub
Functional Parts that need AM to come alive

Motorbike Fork as a sample use case for AMable

This use case of K-Tech, GRM and the MTC shows how AMable services can support all stakeholders in the uptake of additive manufacturing (AM). Parts that enhance performance in the use of the final product can profit from AM based manufacturing. See inside and learn how to approach the solution.

Optimised Motorbike Fork End

Challenge

Motorbike in action at the new course © MTC
Motorbikes challenge technology with drivers that strive for an agile and controllable performance on steering and handling – especially on the race track. One core component is the fork end which holds the front wheel and influences the suspension dynamics. The goal is to provide a part with high stiffness at low weight – a driver for additive with some challenges.

Solution

Mechanical model of the fork end which shows the result of a sim.

The team took on the challenge to create a new part with reduced weight. To ensure that the design would match the mechanical analyses were performed on the optimized design was optimised and simulated towards its robust process in mind. These simulations enabled the team to develop manufacturing aware and objectives driven.

At that time, the partners reported:

- Working with GRM using TrueForm topology optimisation to optimise the motorbike fork
- Two motorbike forks were manufactured in Ti6Al-
  -4V(a) by MTC
- The MTC performed geometric evaluation via
  - STR for shape conformance testing, and non-destructive for defect detection

Benefit

Image of the fork end as it comes from the machine. It shows the part and the support structures that are needed to achieve a geometrically conformant part © MTC.

Clearly, the driver of the motorbike was delighted by the performance of the new fork end. The main benefit however was twofold:

- A part that increased the sales value of the motorbike
- A technology demonstration that initiated new ideas where AM could benefit.

The part was 50% lighter at increased fracture toughness with full quality assurance of the part's integrity. The process of developing a part that was ready for deployment entailed three main benefits for the customer:

- Fast iteration and design change implementation throughout project
- Product and process knowledge captured for use in future GRM and K-Tech programmes
- Transferable capability and knowledge obtained as a result

Overall, the benefit of running through design, optimisation, print and post-process relied on services like topology optimisation, simulation, print and finish - services that AMable will offer to companies that have similar innovative ideas.
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Functional Parts that need AM to come alive

Vinyl Disk Cartridge as a sample use case for AMable

This use case of DTI and ORTOFON shows how AMable services can support stakeholders in the uptake of additive manufacturing (AM). Printing of vinyl disk cartridges is an innovative idea that brings individualisation and performance to a new level. Have a closer look at it!

Enhanced Cartridge

Challenge

Lineup of Ortofon Cartridges © Ortofon

Vinyl record players provide high fidelity audio signals for music lovers all over the world. The phono cartridge still challenges engineers because of its key role in transferring the structure of the vinyl disc into electrical signals, which then are amplified to acoustic waves. The housing is one of the many important parts in a phono cartridge. In order to achieve best possible sound, the housing must be very stiff and at the same time damped to reduce unwanted vibrations.

To enhance these properties for the housing, DTI and Ortofon A/S defined the following challenges:

- Reduction of production time from 4-6 months to a few weeks
- Increase in freedom of design choices
- Achieve knowledge of the AM manufacturing process to take full advantage of

Solution

AM Construction of the new Ortofon Cartridge © DTI

DTI and Ortofon took these challenges to create a product this day is one of most advanced cartridges in the market. Transmission of the cartridge, the design was optimised in a manner. AM was able to speed up this iterative process on faster development flow. The team implemented the following:

- The design of the cartridge was highly optimized to dampening effect, which is not producable by traditional technologies
- CT scanning was applied to optimize the AM process production phase
- Coordinate Measurements was applied during the production phase to assess geometrical conformance
- The AM production chain was designed to meet a final production time of a few weeks

Benefit

Reconstruction of Ortofon Cartridge by 3D Vision © DTI

By optimising this part towards a production by AM technologies, DTI and Ortofon A/S have been able to produce a first high quality phone cartridge with a new level of audio performance. During this project, different solutions have been created and implemented to obtain a high level of quality across the complete production process. Following this initial experiment, six new cartridges (HIC A90, SPU A90th, Xpression, HIC Anna, HIC A95 and SPU A95) have been developed, leading to rich portfolio of high-quality products. We are launching the 100 years anniversary this year as well as two new pick-up (Mc Century and SPU Century)

Overall, the benefit of running through design, optimisation, print and post-process relied on services like visualisation, simulation, topology optimisation and quality assurance - services that AMable will offer to companies that have similar innovative ideas.
Digital Services for SMEs and midcaps
- Three distinct platforms provide offerings for business, technology and training
- On demand access to individual services
- Entry from any starting point into suitable development stage
- Guide leads you through the AMable Services Arena
AMable Open Call OC3

Your Opportunity

1. Do you have an innovative idea for a functional product that needs AM to become alive? You can tell & sell its story publicly but you cannot achieve the implementation yourself?

2. You can get support from European Additive Manufacturing Competence Centers through services for design, testing, simulation, scale up, etc.

3. You can get funding for your development activities if you are an SME or a mid-cap, eligible under Horizon2020 rules.
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Your ToDo’s

1. Write up your story
   what is your idea; what is your AM starting
   point; how does the idea relate to the state of
   the art;

2. Present your business case
   where will you sell; how will you produce;
   what will be your return of invest?

3. Describe your development plan
   what are the risks; which success factors; define the AMable services you
   need; download and follow the guide for applicants; submit your proposal;
AMable – Digital Additive Manufacturing Innovation Hub Experiment – Structure and Type

- Experiments targeted at market needs
- Feasibility Study Experiments
  - Short term, low TRL, small budget
- Best Practice Experiments
  - Longer duration, higher TRL, more budget

<table>
<thead>
<tr>
<th>Experiments</th>
<th>3rd Party involved in experiment</th>
<th>Proposal length / pages</th>
<th>TRL</th>
<th>Number of services used per experiment</th>
<th>Duration / months</th>
<th>Cost* / Euro</th>
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<tbody>
<tr>
<td>Feasibility Study Experiments (FS)</td>
<td>X</td>
<td>4</td>
<td>3-5</td>
<td>1-3</td>
<td>3-6</td>
<td>5k-25k</td>
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<tr>
<td>Best Practice Experiments (BP)</td>
<td>X</td>
<td>X</td>
<td>10</td>
<td>2-3</td>
<td>4-12</td>
<td>10k-60k</td>
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*Cost for the entire action of third parties including all eligible cost such as personnel, consumables and travel. Any form of subcontracting needs to be justified. Equipment (depreciation) will not be funded.
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Proposal Evaluation

- Evaluation Process
  - External experts (see call for evaluators)
  - Internal listing according to rules set out in the guide for applicants

- Proposal Evaluation Criteria

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<tr>
<th>#</th>
<th>Name</th>
<th>Weight / Threshold</th>
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<tbody>
<tr>
<td>1</td>
<td>Impact of the experiment and the anticipated result</td>
<td>Weight 1 / Threshold 3/5</td>
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<tr>
<td>2</td>
<td>Excellence of the idea and approach</td>
<td>Weight 1 / Threshold 3/5</td>
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<tr>
<td>3</td>
<td>Quality and efficiency of the implementation</td>
<td>Weight 1 / Threshold 3/5</td>
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Proposal Implementation

What is Financial Support to Third Parties (FSTP)?
- Mechanism to collaborate in projects funded by the European Commission in Horizon 2020
- The project coordinator acts on behalf of the European Commission

What happens if my proposal is selected?
- You participate in the project as a “third party” (H2020 rules)
- You sign a contract with the coordinator (Fraunhofer ILT) on behalf of the Commission
- You collaborate with consortium partners to deliver the planned work
- You report to the consortium which reports to the Commission
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Conditions

- Call identifier: AMable OC3
- Deadline: November 1st, 2019 17:00 Brussels Time
- Total budget: 450,000 Euros
- Funding rate: 70% of eligible cost
- Type of Experiments:
  - Feasibility Study TRL 3-5 (3-6 months)
  - Best Practice TRL 4-8 (4-12 months)
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Information and Contact Points

- Feasibility Study Experiment
  - SME with an innovative AM product idea (supplier role)
- Best Practice Experiment
  - SME with an innovative AM product idea (supplier role)
  - SME / mid-cap as first user of the product (user role)
- Call documents
  - https://www.amable.eu/calls/
- Contact to Mentors
  - mentors@amable.eu
- Submission & Inquiries
  - oc3@amable.eu
Digital Design for Additive Competence Centres

Data Management

Business Analysis and Consultancy

Innovation

Training