AMable Open Call 3

Call Identifier	AMable OC3
Document	Guide for Applicants
Version	1.2

Contents

1 Abstract

This document collates the rules and conditions to be applied for the Financial Support to Third Parties (FSTP) funding scheme to support Experiments through the competitive calls within the AMable project. The document is addressed to potential applicants and aims at being a practical guideline for successful application.

The aim of AMable project is to accelerate the uptake of additive manufacturing technologies; from design to manufacture for functional parts throughout the European Union. AMable is creating a digital framework to provide impartial access to the best European AM knowledge to support this adoption. This knowledge will be offered as advanced and tailored services to assist SMEs in the adoption of AM and include technological, business and training services.

To build a truly pan European initiative, there are several renown research institutes and best-of-breed consulting companies involved in AMable project, from Germany, the UK, the Netherlands, Belgium, Spain, Greece, Finland, Italy, Poland, Denmark and Cyprus, among other countries. These partners will provide the technological backbone for guidance and support in transferring ideas to production in a profitable way and will manage the “AMable service arena”.

Further information about the AMable project is available through project website and Cordis portal. AMable is co-funded from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 768775, foresees as an eligible activity the provision of financial support to third parties, as a means to achieve its own objectives. The types of activities to perform that qualify for receiving financial support are detailed in the guide for applicants.

https://www.amable.eu/

http://cordis.europa.eu/project/rcn/211557_en.html

2 Call Aim and Topic

AMable aims to conduct so called “application experiments” to support European SME’s and mid-caps to develop their idea of an additively manufactured functional product (also called “product idea” in the following sections). The AMable project provides support through services across all development steps from design to finish. The initiative runs under the umbrella of European Commission’s initiative “Innovation for manufacturing SMEs (I4MS)”.

The applicants need to provide the following to be selected for support.

- An innovative idea for an additively manufactured functional product (product idea) where the successful realisation would be economically and technologically viable. The proposal needs to describe the product idea, its innovation and a strong business case for the European market (revenue, labour, societal impact).
- Challenges connected to the product idea, which the proposing entity intends to resolve with the help of AMable services. The proposal needs to describe these challenges and how they are expected to be resolved by the selected services.
- List of expected effort to conduct the experiment. These expenses need to be split into cost for labour to execute work and prepare deliverables and cost for external goods and services (consumables, printing, testing).

AMable foresees two experimentation modes that are detailed below, Feasibility Study (FS) Experiments and Best Practice (BP) Experiments. The criteria for selection are:

1) Impact of the experiment and the anticipated result
2) Excellence of the idea and approach
3) Quality and efficiency of the implementation

Please find an explanation of the criteria in one of the next sections.

2.1 Services

AMable offers AM related services through its Services Arena. These services aim to support the Experimentation Teams to increase their knowledge and competence so that the Experimentation Team is able to come to a state where the product idea has a design that is additively manufacturable.

Each experimentation team needs to describe its lack in knowledge, the selected services and how the selected services are expected to close these knowledge gaps. The proposal template provides the section “Experimentation Plan” for this and the table in section 3.1.3 gives the number of services that is expected.

The services are explained in more detail in the Annex of this document and at www.amable.eu/services.

2.2 Mentors

AMable uses mentors to lead the Experimentation Teams through their experiments and to guide them through the AMable Services Arena. While these mentors are assigned after selection of the proposals, proposers may request a specific mentor from AMable’s technology competence centres. Requests can be sent by e-mail to mentors@amable.eu

Technology Competence Centers that are available to provide a mentor for this call are: AIMEN, DTI, Fraunhofer ILT, Frederick, Inspire, LMS, IK4-LORTEK, The MTC, SIRRIS, SUPSI, Politechnico di Torino, TNO, TWI, Politechnika Wroclawska, VTT.

Data Protection and Privacy: Information sent to the mail address mentors@amable.eu is forwarded to a mail distribution service which will transfer the content to employees of the above named competence centres. A copy of the mail is stored in the mail box to manage and track the requests.

2.3 Business Case

The proposal needs to describe the business case that drives the experiment. The analysis needs to be based on actual market data and needs to cover the product life cycle from idea through development to market penetration with the expected production ramp up scenario. The corresponding economic and technological feasibility needs to be explained and the risk factors need to be identified.

2.4 Reporting

The Experimentation Teams need to provide information on the execution and achievements though AMable reporting and controlling tools. Feasibility Study Experiments (FS) need to deliver Initialisation Report and Validation report, Best Practice (BP) Experiments need to deliver an additional Implementation report. The three major reports with a public and a confidential part are

1) Initialisation Report (FS & BP) – As a result of the first collaboration of the Experiment Team with its mentor and the service providers, a report of the initial situation and the actual planning needs to be filed. It includes the business case analysis, implementation plan, risk register and progress indicators.
2) Implementation Report (only BP) – A deliverable that reports on the implementation of the planned service execution. It includes activity reports, achievements descriptions, risk register update and an explanation on the progress indicators. The business case analysis needs to cover most recent changes at that time.
3) Validation Report (FS & BP) – A deliverable that reports and demonstrates the result of the executed work with respect to the business case and the implemented product. It includes a risk report, exploitable results and a comparison of planned progress against achieved results.

On a regular basis, status updates need to be provided to the mentor of the Experimentation Team for monitoring of progress and risks. Periodically, members of the experimentation team will be asked to provide feedback on the usability of the controlling tools and suitability of the services. The result of the questionnaires are part of the above deliverables.

2.5 Dissemination

The Experimentation Teams need to provide a publishable story, pictures and video footage about their product idea and their experimentation work. Media files need to be of high resolution but do not need to disclose IP. Story, pictures and video footage are part of the deliverables.

Each Experimentation Team will need to visit at least one public event that takes place within the European Union to present achievements and results of the

initialisation experiment, or to collaborate on skills development. The cost for travel and subsistence are eligible and need to be included in the proposed budget.

The final result of the experiment needs to be described so that the evolution of the product idea, the achievement and the effort that was invested becomes publically visible while the underlying IP remains confidential.

3 Conditions and Eligibility

3.1 Eligibility requirements and financial limitations

Applicable requirements and limitations are in line with Grant Agreement n°768775 signed by the AMable partners and the European Commission. The actual support is provided on the basis of Annex K of the H2020 Model Grant Agreement through Financial Support to Third Parties (FSTP).

3.1.1 Persons or categories of persons which may receive financial support (FSTP)

A legal entity that applies for financial support needs to be legally recognised (have 'legal personality') and needs to have the right legal status to qualify for H2020 funding. Research and technology development organisations are not eligible, nor consortium members.

3.1.1.1 Experimentation teams for Feasibility Study (FS) Experiments

A FS-Experimentation Team consists of at least one legal entity of SME or mid-cap type in the SUPPLIER role that aims to bring the product idea into the market.

3.1.1.2 Experimentation teams for Best Practice (BP) Experiments

Each BP-Experimentation Team consists of at least one supplier (third party) and at least one user (third party). The maximum number of third parties in a BP-Experimentation Team is three.

The legal entity in the supplier role is a SME or a mid-cap, which supplies parts or services to other parties such as consumers or industry.

The legal entity in the user role is a company that intends to use the envisioned product in a market relevant context.

3.1.2 Activities for which a third party may receive financial support

3.1.2.1 Third parties that participate in Best Practice (BP) Experiments in the "USER" role

SMEs, midcaps and large companies which are in the "USER" role may receive funding for personnel resources to define the manufacturing challenge, to discuss the implementation options and to validate the result of the experiment. Expenses for consumables, travel and subsistence are financially supported to enable meetings and validation. The user's overall budget share needs to be less than 20% of the financial support to the experiment.

3.1.2.2 Third parties in the "SUPPLIER" Role

SMEs or mid-caps in the role of the "SUPPLIER" may receive funding for personnel and consumable resources to develop and propose the innovative design approach, to design and construct the prototype and to implement the solution so that the user can validate its fit for purpose. The financial support also covers expenses for consumables, travel and subsistence which are needed to enable the execution of the experiment.

3.1.3 Experiment Aims and Type

The experiment needs to have an impact on European business and employment thus achieving an economic benefit. It needs to address at least one societal challenge: Environment, Energy, Mobility, Health and Well-being, Security.

Each Experiment Team needs to select the type of experiment

- Feasibility Study Experiment: short-term experiments (3-6 months) which are focused to analyse and demonstrate the feasibility of developing new additively manufactured products
- Best Practice Experiments: application experiments towards specific product performance and robust manufacturability (4-12 months) which are conceived for benchmarking, testing, validation and improvement of new AM products, services and standards.

Experiments	3rd Party involved in experiment		Proposal length / pages	TRL	Number of services used per experiment	Duration / months	Cost* / Euro
	Supplier	User					
Feasibility Study Experiments (FS)	X		4	3-5	1-3	3-6	5k-25k
Best Practice Experiments (BP)	X	X	10	4-8	2-X	4-12	10k-60k

*Cost for the entire action of third parties including all eligible cost such as personnel, consumables and travel. Subcontracting should be minimal, more than 15% subcontracting of the cost of the entire action is considered to be an inefficient implementation of the action. Cost for equipment (depreciation) will not be funded.

3.1.4 Criteria for calculating the exact amount of the financial support

The exact amount of the maximum financial support will be calculated on the basis of the cost that are specified by the third parties. Each party has to provide personnel direct cost (w/o overhead) and the planned effort. Each party has to specify other cost such as consumables and travel cost. Equipment (depreciation) will not be funded. Based on the appropriateness of the given cost that is judged by the evaluators and the consortium, a lump sum for the support is being calculated from 70% of the direct cost plus 25% flat rate to cover overhead cost. This lump sum will be paid in separate instalments that are connected to the acceptance of deliverables as defined in the guide for applicants.

3.1.5 Maximum amount to be granted to each third party

No single party may receive more than 60k€ from the AMable consortium per call unless it is necessary to achieve the objectives of the action.

3.2 Criteria for awarding financial support to Experiments

The proposals will be evaluated against four criteria.

#	Name and Explanation	Weight / Threshold

1	Impact of the experiment and the anticipated result: Potential impacts of the proposed products or businesses cases must be based on actual and realistic scenarios. The anticipated solution must address a potential market that leverages the requested financial support. The experiment must provide information for communication to the public so that the community can follow its progress.	Weight 1 Threshold 3/5
2	Excellence of the idea and approach: The objectives of the application experiments must be SMART (specific, measurable, assigned, realistic, time-bound) and must demonstrate a clear vision from the defined start to finish. The use of services needs to suit the objectives and needs to support the path towards the final solution.	Weight 1 Threshold 3/5
3	Quality and efficiency of the implementation: The selected services and the approach must address the AM digital design and manufacturing challenge. The Experimentation Team needs a clear lack of knowledge in the area where support is requested and sufficient basic competence to learn and adopt. The resource allocation needs to be appropriate.	Weight 1 Threshold 3/5

The selection of the open call proposals will be realised in a two-step process. Step one will involve external evaluation to assess the proposal according to the criteria. All proposals that receive sufficiently high marks in all of the three criteria will go to the second step. Step two will involve the consortium to prioritise the proposals based on the external evaluation result, the expected impact, the project resources and coverage of the objectives of the project in general.

In step 1, the proposals are evaluated externally according to the criteria set out above. Each criterion will be scored with the following scale:

- 0: The proposal fails to address the criterion under examination or cannot be judged due to missing or incomplete information
- 1 (Poor): The criterion is addressed in an inadequate manner, or there are serious inherent weaknesses
- 2 (Fair): While the proposal broadly addresses the criterion, there are significant weaknesses;
- 3 (Good): The proposal addresses the criterion well, although improvements would be necessary
- 4 (Very good): The proposal addresses the criterion very well, although certain improvements are still possible
- 5 (Excellent): The proposal successfully addresses all relevant aspects of the criterion in question.

Proposals which fail to achieve a score of at least 3 for any of the criteria cannot be funded (score threshold), all other proposals are taken to step 2.

In step 2, the consortium will further prioritise the proposals to balance service resources and to cover call objectives such as European impact and cross border innovation best.

Funding is then awarded to the most highly prioritised proposals, provided that the following condition does not apply to any of the legal entities involved in the proposal or if the cost of that legal entity is excluded from the financial support:

- Funding will not be awarded to legal entities that have already been granted more than 100.000 Euro via open calls (FSTP) in the H2020 ICT programme.

3.3 Publication

The call for proposals / open call will be published on the AMable website. It will be communicated through social media, through the I4MS CSA project and on the web page of the Commission. The primary source for documents remains at the URL of the AMable web site (www.amable.eu).

3.4 Reimbursement of proposal preparation

Expenses incurred in the preparation and dispatch of the proposals will not be reimbursed.

4 Proposal Submission

Project Acronym	AMable
Project GA#	768775
Project full name	AdditiveManufacturABLE
Call Identifier	AMable OC3
Call Title	AMable Call 3 for proposals on innovative products that need additive manufacturing to become alive
Publication Date	01. August 2019
Deadline	01. November 2019 17:00 Brussels Local Time
Expected Duration	6-12 months for best practice (BP) experiments 4-6 months for feasibility study (FS) experiments
Total Budget	450.000 Euros
Maximum amount of financial support for a third party	60.000 Euros
Eligibility	see guide for applicants
Proposal language	English (UK or US)
Proposal content	One proposal per experiment with a clearly identified lead partner. Content and structure should be based on the template addressing the topics detailed in this guide for applicants
Proposal length	The cover page and administrative data like partner details and proposal name should not exceed three pages. The maximum length of the proposal for Feasibility Study Experiments is 4 pages, for Best Practice Experiments 10 pages. Any additional content may be truncated before evaluation (pages with signatures only do not count against the maximum length of the main proposal)
Submission format	PDF file with less than 10Mbyte in size
Submissions & Questions	oc3@amable.eu
Further information	www.amable.eu

4.1 Communications and Data Processing

The mail account is handled by the project's office team. The identity of the sender and the content of the proposal will be treated confidentially within the consortium. The proposal document will be stored on a collaboration platform where only consortium members have access. The proposals will be evaluated by external experts under confidentiality regulation. The data that is needed for the evaluation will be exchanged with the experts by e-mail. Such data includes the name of the proposing entities per Experimentation Team to achieve a

declaration of non-conflict of interest with the evaluator(s). After that, the proposal is being transferred and the evaluation returned. The result again will be filed on the collaboration platform of the AMable consortium.

Any questions concerning this call shall be submitted in writing not later than 3 days before the closing date to call-for-proposals@amable.eu. Questions shall make specific reference to the appropriate section(s) of this document. Questions received via call-for-proposals@amable.eu may be published on the AMable web site.

4.2 Submission and evaluation

In order to apply for this call, applicants need to submit a proposal based on the proposal template (provided separately at www.amable.eu/calls for download), according to the requirements listed in this guide for applicants. The responsibility for a successful and timely reception remains with the applicants. Tenders arriving after the closing date and time will not be taken into consideration. After evaluation, the lead partner of each Experimentation Team will be informed of the result of their proposal's evaluation by e-mail.

4.3 Contractual conditions

The Experimentation Teams of each selected proposal consist of multiple legal entities. One of these entities is the lead entity and responsible for communication and reporting. All legal entities will sign one contract per Experimentation Team with the coordinator, Fraunhofer ILT. Legal entities that are selected for funding become a Third Party of the consortium using Cascade Funding (also known as sub-granting).

Subgrantees have to comply with the rules and the principles mentioned in Section I, Article 6 (Eligible and ineligible costs) of the Grant Agreement (for information see H2020 AMGA – Annotated Model Grant Agreement see http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/amga/h2020-amga_en.pdf), in the same way as the beneficiaries of the AMable project. The rules concerning eligibility of costs, identification of direct and indirect costs and upper funding limits can be found in Section I, Article 22 of the H2020 AMGA.

The beneficiary of the EU grant must ensure that the recipients of the financial support allow the Commission, the European Anti-fraud Office (OLAF) and the Court of Auditors to exercise their powers of control on documents, information, even stored on electronic media, or on the final recipient's premises (AMGA Articles 22 and 23).

Beneficiaries need to declare their lack of any conflict of interest with AMable partners. This will ensure to prevent any situation where the impartial and objective of the awarding action is compromised for reasons involving economic interest, political or national affinity, family or emotional ties or any other shared interest ("conflict of interest"). Applicants who cannot declare this will be not be awarded.

The IP of the experiment's results generated by the Subgrantee will be owned by it. Subgrantees grant the AMable consortium partners access to the results, for the pursuance of the objectives of the Project and the exploitation of the Project results in accordance with the GA.

Payment scheme for best practice experiments:

- 30% after approval of the initialisation report
- 30% after approval of the implementation report
- 40% after approval of the validation report deliverable and approval of the experiment outcomes by the commission

Payment scheme for feasibility study experiments:

- 60% after approval of the initialisation report
- 40% after approval of the validation report deliverable and approval of the experiment outcomes by the commission

For detailed reference consult the template contract.

5 Annex – Services Description

This services description is given for reference. Please consult www.amable.eu/services for the most up to date list of services.

ID 303
Service name
Implementation Roadmap Design
Service description
This service offers a structured and customized approach to ensure SMEs seamlessly uptake AM.
Service offering
• The service distils the different aspects of AM uptake into modules and guides the SME through each module for their individual uptake. • Each module contains a set of guides and/or check-lists etc. This is a set of practical tools to help SMEs in the uptake of AM in their organization. • The modularity of the service makes sure the SME can tailor the service to its individual uptake, specific industry, material, technology, organizational impact/change, business modelling etc. • The SME creates/uses their profile to set-up their own modules. These are interactive and cloud based guides, meaning they can be shared and accesses by several stakeholders from many platforms at any time and they will have access to the up-to-date information on the platform. • A wizard educates the SME and helps them tailor their implementation roadmap (set-up the modules) to their needs. • The service can be accessed by several stakeholders at the SME. • The service main format is guides and checklists but more formats can be added if needed. • The implementation roadmap can be tailored and changed at any time by the SME as their needs and abilities change.
Service key benefits
• Helping the SME to a structured and qualified (by experts) uptake of AM. Increasing the confidence of leadership to a successful uptake, increasing the conversion to AM, and aiding employees at the SME in their processes and decisions to implement AM. • Reducing the risk of errors and mistakes. Our experienced experts will provide a set of qualified processes ensuring that the SME avoids pitfalls and common mistakes. Greatly reducing the time and cost of uptake. • Making the process more productive due to the efficient design of the service. Helping the SME focus their resources and attention on a narrow set of processes and decisions reducing the cost of arbitrary exploration.

ID 305
Service name
AM Decision support / AM Wizard
Service description
This service supports the process to decide whether AM is a valid option for manufacturing of a product or not. It comprises both technical and economic evaluation steps.
Service offering
Decision support for AM uptake: does AM make sense for manufacturing this particular product by my enterprise? This decision must be made per individual part and based on technical and economic viability. This service offers a method/model/tool which can assist in making this decision on a fact-based level. The AM decision support model service offered comprises various entry points, branches and outcomes, and is dictated by knockout criteria. Criteria include considerations on engineering design, material, process, product quality and economy (cost and time). A questionnaire is used which operates in an FMEA manner providing weight factors related to the answers in terms of probability and confidence. It is distinguished in three different levels, based on the user experience. ***First level /non-expert approach:*** • Are part dimensions compatible to AM technologies today? • Do AM materials meet the required product quality? • Are constraints in the way of using AM as a manufacturing route? If all three can be assessed OK (first order estimation), then stage two, high level approach can be offered. ***Second / high- level approach:*** Initial design evaluation is not enough for convincingly applying AM technology. To be confident about utilizing AM in a certain application, a high-level approach has been drafted, consisting of five criteria: • engineering constraints • material constraints • process constraints • economic constraints • product quality constraints Each criterion consists of an extensive questionnaire addressing issues to be answered by different types of experts within the company (technologists, purchase officer, marketing, etc.) If one of these experts yields a knock-out, then AM is considered not feasible for that specific application. ***Third level/ high accuracy metrics quantification:*** This level is supposed to aid users already confident towards using AM by identifying the exact processes/machines capable of manufacturing the specific

part. In addition, this level will be providing highly accurate manufacturing time and cost estimation, based on the different types of AM processes available.
Service key benefits
• Expert-based assessment of the viability of using AM as a manufacturing technology for a specific product. • If AM is assessed as feasible, calculation of a confidence indicator of manufacturability (probability as well as a confidence level). • Support for selection of suitable AM process and machine. • Estimation of associated performance indicators (manufacturing time and cost).

ID 306
Service name
Design for AM
Service description
This service will provide the knowledge to enable the creation of an AM-buildable product, while integrating incoming design data (customer scan or other input data) and creating the required instructions (file for build, post-processing, inspection instructions) to ensure the final product matches the design requirement. The design process may include a part consolidation exercise, structural optimisation, design concepts, customisation, reverse engineering or simply the redesign of a component for build-ability through AM processes.
Service offering
This service offers to provide working knowledge of how to design products for manufacture by AM in different applications (e.g. topology optimisation, tooling improvement, Part consolidation to improve lead times and Customer-led product design). Customers will be able to access design tools (hardware and software) and resources through this service, and the service will help them through their first AM design process. This will empower SMEs to do functional design, part consolidation and design based on customer input either through scan data or requirements capture.
Service key benefits
• Cost effective designs • De-risking the build • Accessing design guidelines/tools/resources

ID 307
Service name

Visualization/Immersive design
Service description
Immersive design and connection with CAD packages will be developed to enable the user to experiment with variants, allowing quick and affordable pre-assessment of product design.
Service offering
The service focuses at providing the user with a realistic representation of the end result of the AM process through an immersive design environment. The ambition is to create a software module able to directly generate a realistic visualization of a certain part after being Additively Manufactured directly from a CAD file. The tool should be able to take into account surface texture/roughness based on the selected material, process/machine type and/or machine settings (such as layer thickness) and generate an appropriate texture to be mapped on the surface of the CAD model so that the user can have a realistic view on how the part will look right after production. The user should be able to modify selected production parameters as well as the CAD file, to understand how these affect the way the part looks. In addition, coupling with the modelling & simulation stage would enable the visualization tool to use the distorted “as manufactured” 3D model instead of the user-provided CAD file, so that a “virtual prototype” will be available for the user to decide if his requirements are met or if any further redesign and/or optimization is required.
Service key benefits
• Ability to realistically visualize product • Direct involvement of customers for feedback during the design phase • Ability to fully grasp part surface roughness and/or finishing, as AM surfaces usually are not smooth • Ability to fully comprehend distortion magnitude and effects without redesigning the part, as well as effects of a potential redesign to minimization of distortion • Enabling product customization

ID 308
Service name
Modelling, Simulation and HPC
Service description
Computer based solutions of thermo-mechanical effects in AM processes will be implemented to reduce expensive and time consuming “trial and error” experimentation.
Service offering

- Weld pool shape prediction by means of analytical high performance models (almost real time) vs. real macrographs.
- Thermo-mechanical models for shape distortion computation (HPC required)
- Use pre-deformed (negative) CAD geometries resulting after thermo-mechanical simulation to limit shape inaccuracies during build-up process
- Path planning optimization to reduce processing times and heat input suitable for processes with larger weld pool geometry, e.g. WAAM or LMD.
- Simulation of post-processing operations (i.e. cutting, machining) and final shape comparison with real manufactured components
- Further specific modelling and simulation aspects under the umbrella of Integrated Computational Materials Engineering (ICME)

Service key benefits

- Estimation and optimization of KPIs:
  - Build time optimization and energy saving suitable for LMD or WAAM
- Selection of appropriate process parameters (power, feed speed) including powder pre-heating temperature
- Secure part quality:
  - Minimization of the process induced residual stresses and shape distortions, compensation of distortion, analyse the effects of post-processes (e.g. cutting, machining etc.) by means of simulation models, analyse shape accuracy by comparing real components with simulation models and ideal CAD geometries by means of CAx tools based on 3D scanning techniques
- First-time-right manufacturing by reducing time consuming and costly experimentation
- Aid the process design by providing feedback from simulation results in the design phase to optimize the AM process (i.e. facilitate pre-heating or path planning optimization to reduce temperature gradients and, thus, excessive and undesirable residual stresses and/or shape distortions)
- Integrated the related CAx tools in an easy to use platform

ID 309

Service name

Data Analytics for AM

Service description

This service supports the deployment of data analytics solutions applied to AM. Data from different sources are processed via dedicated software, apps and tools, with the aim of extracting and visualizing manufacturing, product and business related KPIs that are useful as decision support tools for SMEs.

Service offering

- **Extraction of meaningful knowledge as KPIs** from structured or non-structured information associated with AM manufacturing processes that can help on decision making such as selection of providers, machine

certification/approval, selection and optimization of AM parameters, product approval, design approval or benchmarking.
- Provide **access to different types of data** originated from different sources during and around AM processes: AM machine data (embedded sensors, machine communication), quality control equipment, design data, modelling data, cost data, delivery time data, multi-machine data.
- Implementation of existing and new **data pre-processing** (filtering) and **data analysis** (clustering, dimensionality reduction, feature extraction) solutions as software, apps, tools, cloud services etc.
- Access to **data visualization** wizards (summary statistics, historical data, trends, patterns etc.)
- Implementation of analytics approaches (multivariable analysis, learning algorithms)

Service key benefits

- Adoption of data-driven strategies tailored to the SME needs to take business, AM technology and process/product quality related decisions better and faster.
- Tele-assistance for machine diagnostics and optimization of AM parameters.
- Process data retrieval and storage based on KPIs allowing optimization of value chain performance and overall product quality management.

ID 310

Service name

Data acquisition (Build)

Service description

Measurement and consolidation of data throughout the AM process chain with build monitoring systems& metrology data collection.

Service offering

With this service customers can assess the quality of the final product and make sure that the component fulfils desired specifications, requirements and standards. The service also provides information and knowledge to improve the consistency of the AM process and part quality repeatability.

To offer quick and meaningful advice to customers with part quality related issues, participants will be able to fall back onto a continuously expanding repository. This repository contains known issues and solutions with regard to different machines, materials, geometries, etc. As work is carried out through experiments and competitive calls, the repository will be constantly updated with new data. Additional insights from large quantities of data can be gained through the Data Analytics service. Specific work that can be provided through this service includes:

- Quality control consultancy – implementation of (AM) standards and best practices
- Process development for QM purposes

• Metrology services • NDT services • Mechanical testing • Failure investigation • Real-time build monitoring system integration
Service key benefits
• Stability of the AM process and practices for the best operation • Increased understanding of the complete chain of AM and the possible factors causing the flaw • Links to related services within Service Arena

ID 311
Service name
Robotics in AM
Service description
Integration and handling issues of robotics in additive manufacturing. Including Industry 4.0 concept development.
Service offering
• Manufacturing systems integration / Production support. • Independent process and product review leading to a technology gap analysis (Digital maturity model assessment) • Independent design for automated systems • Digital automation, big data, analytics, connectivity and cloud computing • Data security and robust networking systems.
Service key benefits
• Consultancy on the use of robotics in AM • Integration and production support of robotic manipulators in AM (directing energy deposition) • Programming and file transfer protocols

ID 312
Service name
Industrialization of AM
Service description
Industrialization of AM encompasses the transition from building a few prototypes to full-scale series production of end-use parts. Key concepts of

industrialization are establishment of a comprehensive quality management system and seamless integration into existing production lines.
Service offering
This service provides customers with expertise to bridge the gap between prototyping and production through consulting, training, and testing. The primary focus areas for industrialization of AM are enhanced productivity, process repeatability and predictability, and customer relations and support. • AM best practices documents and technical guidelines can be provided to customers with the aim of defining fully approved AM processes and products. • Trainings to implement and work according to industrial standards (ISO, ASTM, EN, etc.), best practices and guidelines are offered • Testing is carried out to ensure desired part quality and production speed can be achieved, specifically with regard to workflows and operational management • AM production chain automation and integration where Additive and Subtractive technologies are integrated in a (semi-) automated chain • Consultancy on ICT services which enable industrialization of AM (CAx, M2M and reconfigurable MES, data analytics and closed loop monitoring tools to be integrated in production infrastructure) • Industrialization pilot trials both at RTD and customer
Service key benefits
• AM parts manufactured according to industrial standards and compliance with regulatory requirements. • Balanced and optimized AM production flow with optimal production speed and quality • Integration of AM processes into existing process chains allowing seamless production flows

ID 313
Service name
Quality assurance and certification
Service description
Guidance on quality assurance and certification of parts manufacture by metal AM
Service offering
The offering will be to provide SME's and midcaps with goal based certification guidelines on the materials and manufacturing development processes for metal parts produced by AM.
Service key benefits
• A route to certification of a metal AM part

- Alignment to regulations, codes, and standards.
- Suitability of the manufacturing process for an identified part

ID 314
Service name
Post-processing
Service description
Guidance on post processing possibilities of parts manufacture by metal and plastic AM. The post processing services will at this stage only consider technologies around the AM manufacturing, traditional techniques as CNC; PVD and all other technologies that are standard will not be considered.
Service offering
The service will bring the AM parts closer to the specifications from the customers. Depending of the technology, guidelines will be delivered to SME accordantly with their processes and methodology.
Service key benefits
• Mechanical Proprieties (with the help of Thermal treatment) • Surface smoothness • Cosmetic surface treatment for general aspect.