

**TOPIC NAME: Testing and Experimentation Facility for Agri-Food****General Information****Programme:** [Digital Europe Programme \(DIGITAL\)](#)**Work programme part:** [Digital Europe Work Programme 2021-2022](#)**Call:** [Cloud Data and TEF \(DIGITAL-2022-CLOUD-AI-02\)](#)**Work programme year:** DIGITAL-2021-2022**Type of action:** DIGITAL-SIMPLE DIGITAL Simple Grants**Type of MGA:** DIGITAL Action Grand Budget-Based [DIGITAL-AG]**Deadline model:** single-stage | **Opening date:** 22 February 2022 | **Deadline Date:** 17 May 2022 19:00**Budget:** 30 000 000 €**Topic Description**

**Outcomes and deliverables:** Expected outcomes would include increased higher agri-food sector resilience, mitigation of the environmental impact of agricultural activity to soil, water and biodiversity, greater resource and cost efficiency and competitiveness in agricultural production, helping to optimise the use of natural resources for instance through supporting a decrease in input and the impact of the use of e.g. water, fertilizer or pesticides to the environment.

On the technological solutions side outcomes include reaching long time robotics autonomy levels at a faster pace, boosting the adaption of digital technologies in agriculture, increasing awareness of new digital farming technologies, validation in real conditions of next-generation AI-powered agricultural robotics and AI-based decision-making tools and enabling large-scale data collections. The AI solutions developed should also aim to be tailored to the needs of and affordable for smaller farms.

The selected project will develop and, if necessary, adapt over time, a long-term plan over 60+ months 1) to build up or upgrade facilities with resources and services, 2) offer and extend the use of facilities to promising future AI and robotics solutions providers, and 3) to achieve long-term financial sustainability after EU funding stops.

**Objective:** The principal objective of this measure is to further the development of the agri-food sector by enabling the full benefit of the digital transformation with AI and AI-powered robotics technologies and the move to a Circular Economy for a more sustainable, affordable, efficient and competitive production under high standards.

**Scope:** The selected project will develop reference testing and experimentation facilities with a focus on full integration, testing, validation, demonstration, and where appropriate certification, of advanced AI-based and AI-powered robotics technologies for the agri-food sector. Fields of applications may include, for instance, precision farming solutions, but also other applications from mid- and down-stream such as food processing, wholesale, retail, hospitality and food services. The project may cover the whole value chain of the agri-food sector, but should only cover at least agriculture. Where appropriate demonstration can be done in connection with a specialised demonstration facility, several sub-sector and production types can be considered as well as various variables as it regards crop-livestock types/soils/climatic and environmental conditions/farm structure. The facilities may include a range of use cases in different fields such as – but not limited to - precision weeding/fertilisation/seeding, sensor data management, multifunctional autonomous robotics applications (and its long-time continuous use), and/or in different sub-sectors, such as arable farming, greenhouses, livestock/chicken management. Use cases may also be developed along different topics, such as collaborative robotics, circular economy or reduced food

loss/waste. The use-cases offered should be end-user driven. This will be ensured by closely involving the end-users, e.g. farmers. Smaller farms<sup>[2]</sup> and businesses should be involved in particular to ensure affordability of AI solutions. The project may conduct an analysis of bottlenecks and drivers of uptake of AI-based solutions by end users for its specific use cases, if appropriate in combination with the European Digital Innovation Hubs.

The infrastructure established within this activity will set-up or build on physical and digital resources, which will be available to the facilities users for the testing and experimentation of their hardware and software solutions. These physical and digital resources include high-power-computing, labs, cloud computing, connectivity technologies such as 5G, trusted and secured access to sets of (labelled) high quality data, and AI toolkit solutions. Professional services support in areas such as business, compliance and verification/certification, including for a possible requirement from the future regulatory framework for AI, is also provided directly or via the EDIHs. Regulatory sandboxes may be provided where relevant. The facilities are linked to relevant Digital Europe Programme projects such as other Testing and Experimentation Facilities, EDIHs and data-spaces, especially for agriculture. Facilities are also encouraged to establish links to relevant projects funded by Horizon 2020 or Horizon Europe, whenever feasible and meaningful. Supported activities will also cover validation and demonstration in real application environment, prototyping, pilot manufacturing, business development, standardization, certification, ethics, cybersecurity and data protection where relevant.

**TOPIC NAME: Testing and Experimentation Facility for Health****General Information****Programme:** [Digital Europe Programme \(DIGITAL\)](#)**Work programme part:** [Digital Europe Work Programme 2021-2022](#)**Call:** [Cloud Data and TEF \(DIGITAL-2022-CLOUD-AI-02\)](#)**Work programme year:** DIGITAL-2021-2022**Type of action:** DIGITAL-SIMPLE DIGITAL Simple Grants**Type of MGA:** DIGITAL Action Grand Budget-Based [DIGITAL-AG]**Deadline model:** single-stage | **Opening date:** 22 February 2022 | **Deadline Date:** 17 May 2022 19:00**Budget:** 30 000 000 €**Topic Description**

**Outcomes and deliverables:** The TEF will foster the integration of state-of-the-art AI and robotics technologies in the healthcare domain. It will boost European healthcare industry by focusing on the applicability and facilitate the complex and lengthy process of AI innovation. The project will contribute to positioning the EU as a leader in AI and robotics for healthcare by promoting the generation of new companies, retaining talent, and creating new jobs. Expected outcomes include:

- Validation in real conditions of innovative AI and robotics technologies in healthcare applications,
- Efficiency and safety of treatments,
- Improved operational and clinical workflows,
- Better clinical outcomes,
- Enhanced patient experience,
- Enhanced professional experiences, including education and training opportunities,
- Acceleration of the adoption of AI and robotics technologies in the healthcare sector,
- Innovation capacity and competitiveness improvement in the European healthcare sector,
- Better compliance with relevant regulations that govern the marketing authorisation of healthcare products,
- Improved ageing environment.

**Objective:** The demand for high-quality health and care by European citizens is increasing. At the same time, there is an urgent need for cost-effectiveness in the context of an ageing society and growing numbers of chronically ill patients. Technologies based on Artificial Intelligence (AI) and robotics have the potential to improve the efficiency, security, and quality of the prevention, detection, diagnosis, treatment, care, rehabilitation and monitoring of European citizens' health, as well as to promote a healthy lifestyle. The awarded project will develop the Testing and Experimentation Facility (TEF) with a focus on full integration, testing and validation of advanced AI-based technologies (e.g. IoT, MedIoT, Active and Assisted Living Technologies) and robotics technologies for health and care. The crucial need for a such facility was made obvious during the COVID-19 crisis, as many potential solutions to address the current needs were already prototyped or tested in labs but could not be deployed in emergency situations because of the lack of testing in real-life environments and the lack of certification. The objectives of the TEF are to accelerate the testing by mutualising the infrastructures as well the administrative, medical and ethical procedures and certifications as well as to advance personalised medicine and person-centred care, with the aim to increase the effectiveness, resilience and sustainability of European health and care systems and

reduce healthcare delivery inequalities in Europe, while ensuring compliance with relevant legal, ethical, quality and interoperability requirements.

**Scope:** The TEF will operate as a multidisciplinary setting having a common collaboration framework. It will provide physical and digital access to large resources and will offer support, research partners, clinical expertise, expertise in AI and robotics, data, training and access to high-performance computing. It should be close to where health and care services are provided but also cover multiple health and care processes within the realm of research, innovation and regulation (hospitals, health and care centres, universities, RTOs, innovation ecosystems - like incubators, clusters, accelerators, public health or certification agencies, healthcare companies of any sizes when relevant). The TEF will gather researchers, medical and clinical professionals, patients, industrial developers, innovators and end-users, and they may include regulatory sandboxes. This facility could be centralised or distributed across several locations around a central node in order to reflect the sector diversity, and possibly support some remote operations.

Activities supported by this scheme will cover the demonstration, testing and validation in real-life application environment, possibly with real patients, but also ethical and data protection reviews, certification, market analysis, IP protection, incubation and business development, as well as the contribution to the regulation and standardization effort, when relevant. The infrastructure established within this facility will include both the hardware (e.g. robots, high-performance computers, 3D printing, IoT) and the software, including trusted and secured access to data, necessary to provide the different services. Links to the data space for health should be established, when necessary. The project is encouraged to collaborate with other relevant Digital Europe Programme projects, in particular the edge AI and other sectorial Testing and Experimentation Facilities, to ensure appropriate synergies. The project should allow for large-scale in-silico, in vitro, ex-vivo and in vivo testing, when relevant. Links should be made to existing structures and networks as appropriate.

The facility may include a range of use cases in different fields such as:

- Treatments in various fields including cancer and paediatrics;
- Monitoring the progress of long-term conditions in function of treatment (e.g. diabetes mellitus, neurodegenerative diseases etc.)
- Support to doctors' decision-making, including personalised, predictive and gender-sensitive treatments;
- Detection of tumours from imaging;
- Robotics surgery;
- Robotics assistance and rehabilitation;
- Active and Assisted Living technologies for elderly or disabled persons, including digital solutions in support of the creation of multi-generation living spaces in line with the New European Bauhaus approach<sup>[1]</sup>
- Logistics, management of flows and process efficiency in hospitals.

**TOPIC NAME: Testing and Experimentation Facility for Manufacturing****General Information****Programme:** [Digital Europe Programme \(DIGITAL\)](#)**Work programme part:** [Digital Europe Work Programme 2021-2022](#)**Call:** [Cloud Data and TEF \(DIGITAL-2022-CLOUD-AI-02\)](#)**Work programme year:** DIGITAL-2021-2022**Type of action:** DIGITAL-SIMPLE DIGITAL Simple Grants**Type of MGA:** DIGITAL Action Grand Budget-Based [DIGITAL-AG]**Deadline model:** single-stage | **Opening date:** 22 February 2022 | **Deadline Date:** 17 May 2022 19:00**Budget:** 30 000 000 €**Topic Description**

**Outcomes and deliverables:** The Testing and experimentation Facility for manufacturing will be set up and deployed. The project will focus on factory-level optimisation, collaborative robots, and circular economy. It will give innovators the possibility to test and validate their new AI solutions in real-life manufacturing environments before deploying their solutions to the market.

As a result, new AI and data ecosystems, that are compatible with open frameworks that support data sharing, can be used for the improvement of quality and sustainability of the production.

Pressing technological challenges and effects of an aging workforce can be addressed through the deployment of AI and robotics technologies across the manufacturing domain.

This will contribute to the innovation capacity and competitiveness of the European manufacturing sector.

Furthermore, the training, testing and validation of AI applications that respect European values can become a focal point for certification.

**Objective:** The world-class large-scale reference site for testing and experimentation of AI-powered solutions will enable integrating state-of-the-art AI and robotics technologies in the manufacturing domain, and will foster the deployment of trustworthy, transferable and scalable Industrial AI in Europe. A transition towards a more AI-driven manufacturing industry will improve the quality and sustainability of production.

**Scope:** The manufacturing TEF will provide physical and virtual access to real-life manufacturing resources that can be used for testing and experimenting with AI solutions. Examples of such manufacturing resources are model factories that combine different technologies such as additive manufacturing, machine tools, intelligent conveyor systems, automated warehousing, trusted and secured access to data, IoT infrastructure and more, covering multiple industrial processes.

The manufacturing TEF will address the manufacturing sector's needs for Industrial AI, taking into account domain-specific requirements in terms of time criticality, safety, security and effective interaction and collaboration between robots, AI solutions, and humans who are in control, as well as resource efficiency and environmental performance. The TEF site will offer support and best practices in AI solution implementation, testing and training of algorithms including: full integration, industrial validation and demonstration up to pilot manufacturing in dedicated assembly lines and production cells. The TEF needs to support testing and experimentation of main AI-related services, which cover areas of machine learning,

robotics, planning and scheduling, optimisation, self-configuration, computer vision, formal methods, natural language processing, automated reasoning, game theory, multi-agent systems, complex systems, system verification, bioinformatics and others.

The TEF site will define and establish European test and training data sets in cooperation with manufacturing data spaces. The project is encouraged to collaborate with other relevant Digital Europe Programme projects, in particular the edge AI and other sectorial Testing and Experimentation Facilities, to ensure appropriate synergies.

The scope and resources of the manufacturing TEF will be driven by use cases of significant economic value and will provide adequate coverage of activities allowing the deployment of the latest AI-based technologies in real manufacturing environments. The TEF has to be relevant to all kinds of AI innovators, allowing them to test and demonstrate their new AI solutions and support business development, standardization, certification and benchmarking. Aspects such as ethics, cybersecurity and data protection are taken into account, where appropriate. The manufacturing TEF may include regulatory sandboxes, i.e. areas where regulation is limited or favourable to testing new products and services.

When required by the use cases, the manufacturing TEF also needs to cater for edge computing. In manufacturing context, this means that AI tools are brought to sensors and devices, i.e. there where data is produced. These AI tools need to deal with manufacturing requirements related to latency, throughput, stream processing, etc. High-performance computing should be also offered where needed.

The manufacturing TEF will address the following key areas in an agile setup:

- Factory-level optimization (flexible production in high-throughput and high variety environments, rapid prototyping); testing and assessment of AI technology for autonomous decision making within the real world, i.e. interaction with and decision for humans and other machines; supporting e.g. to rearrange the manufacturing process dynamically (incl. choice of manufacturing techniques and logistics);
- Collaborative robotics (mobile, intelligent AI-powered robots enabling safe human-robot collaboration, also in teams; also in sectors like textiles, tourism or construction);
- Circular economy: minimise resource consumption, optimize supply chains in uncertain environments, use of substitute material, collection, sorting and treatment of products that have become waste (making available secondary raw materials and maximum extraction of value), reverse logistics, remanufacturing.

**TOPIC NAME: Testing and Experimentation Facility for smart cities and communities****General Information****Programme:** [Digital Europe Programme \(DIGITAL\)](#)**Work programme part:** [Digital Europe Work Programme 2021-2022](#)**Call:** [Cloud Data and TEF \(DIGITAL-2022-CLOUD-AI-02\)](#)**Work programme year:** DIGITAL-2021-2022**Type of action:** DIGITAL-SIMPLE DIGITAL Simple Grants**Type of MGA:** DIGITAL Action Grand Budget-Based [DIGITAL-AG]**Deadline model:** single-stage | **Opening date:** 22 February 2022 | **Deadline Date:** 17 May 2022 19:00**Budget:** 20 000 000 €**Topic Description**

**Outcomes and deliverables:** Expected outcomes include increased and faster integration of various AI and robotics systems in smart cities and communities, which will contribute to environmental goals such as carbon neutrality, increased robustness, security, and agility of smart community infrastructure, further increases in efficiency, as well as increased competitiveness of service providers in these communities.

Technological benefits will include validation in real conditions of next-generation AI-powered robotics and AI-based automation, decision-support and decision-making tools, benefitting from large-scale data access, sharing and integration, bringing them to a higher technology readiness level, as well as increased competitiveness of European developers of AI solutions, in particular SMEs, through the support provided by the TEF, to bring their products to market.

**Objective:** To provide a testing and experimentation facility for AI and robotics in cities and communities and make their resources accessible to EU cities, communities and innovative academia and industry stakeholders (including SMEs) that would enable them to validate novel AI-driven services in close-to-real-life environments before their further massive deployment.

The Testing and Experimentation Facility will actively collaborate with the project validating the blueprint for a common European data space for smart cities and communities by making any infrastructure created by the pilots widely accessible on a longer-term basis to other stakeholders in line with the Testing and Experimentation Facility context.

**Scope:** As described in the Coordinated Plan on Artificial Intelligence and in the White Paper on Artificial Intelligence, technology infrastructure is needed to ensure specific expertise and experience of testing mature technology in the smart cities and communities sector, under real or close to real conditions. The Testing and Experimentation Facility may combine European, national and private investments.

The participating communities and cities will create and make physical and digital facilities for testing and experimentation of innovative AI-enabled and robotics-based services and solutions (such as optimisation of traffic flows) widely accessible on a longer-term basis to other stakeholders (and particularly the consortium running the validation pilots below) in close-to-real-life environment. The TEF will offer digital twins of some of the use-case environments, exploiting to the extent possible the LDT (local digital twin) toolbox and, vice-versa, contributing to the LDT toolbox, to the extent possible.

Within the context of smart cities and communities, this facility will be focused on the transport, energy, - construction and environmental protection sectors linked to the action areas of the European Green Deal, and support cross-sector services and applications. The facility will offer both the infrastructure and personnel support to the users of the facility to run the tests and experiments, including access to high-performance computing.

The TEF could also be used for validation and demonstration of AI-based automation and robotisation of physical and administrative processes (such as automated city transport, automated waste collection, inspection and maintenance of infrastructures, etc.), decision-support and decision-making tools; business development; standardisation; certification of products (e.g. for compliance to the MIMPlus specifications), solutions and services; and, compliance to ethical, cybersecurity and data protection norms, as well as to advance through experimentation and sandboxing the EU regulatory framework for AI and robotics.

The project is encouraged to collaborate with other relevant Digital Europe Programme projects, in particular the edge AI and other sectorial Testing and Experimentation Facilities, to ensure appropriate synergies.