

Research, Development and Innovation Programme ICT 2023: ICT Technologies for the Digital Transformation of Industry

Research, development and innovation programme ICT 2023

The research, development and innovation programme ICT 2023 is jointly coordinated and funded by the Academy of Finland and Business Finland with a view to further improving Finland's scientific expertise in computer science and promoting the extensive application of ICT. The programme is based on the report [21 Paths to a Frictionless Finland \(PDF\)](#) by the ICT 2015 Working Group.

At least 10 million euros of the Academy's budget authority for 2020 will be used to implement the ICT 2023 programme. Business Finland will not open a parallel call for business-related projects, but funding is available under this topic through Business Finland's normal application process ([see Business Finland, Funding services](#)).

ICT Technologies for the Digital Transformation of Industry

The ongoing industrial revolution will take advantage of the opportunities offered by digitalisation to create significant added value for industrial systems, processes and manufacturing as well as construction. It also opens up opportunities for the creation of completely new industrial systems. Digitalisation affects every element, process and actor in the industrial value chain, including business models, innovation ecosystems, product development, production, logistics, distribution and maintenance.

Future industrial systems will process much larger amounts of data, and data will be utilised in different parts of the systems in completely new ways. The management and sharing of data between different system parts has become a major research challenge and a source of innovations.



Digitalisation facilitates, for example, the collection of vast amounts of data to enable timely guidance and decision-making at all stages of the production chain. The digital transformation can be divided into digital products and services, digitalised integrated value chains, digital customer systems and digital business plans. An even more detailed breakdown takes us to smart sensors, big data analysis, customer service and customer profiles, augmented reality, cloud computing, mobile devices, IoT platforms, positioning technologies, human-machine user interfaces, authentication and counterfeit detection, and 3D and 4D printing.

The aim of the ‘ICT Technologies for the Digital Transformation of Industry’ call is to support the creation of new techniques and technologies to enhance the digital transformation of industry. The call targets research that is aimed at achieving significant leaps in existing industrial processes and at creating completely new types of processes, methods and technologies that yield superior benefits compared to current activities. Key to this is the development and utilisation of ICT technologies in new ways. Examples of research topics:

- advanced robotics
- learning and hyper-flexible automation
- AI optimisation
- 3D and 4D printing
- Internet of Things (IoT)
- self-organising production equipment and systems
- large-scale decentralised and autonomous systems
- distributed cloud services and edge and fog computing
- wireless systems for industry
- virtual environments, integration of the virtual and physical world
- sensors and actuators
- digital twins.

Projects must also take into account the demonstration or validation of research objectives at least at concept level.

How the application is reviewed

The applications will be reviewed by a panel of international experts. Read the review questions that will be used in the review: ICT 2023 review form (PDF). Two threshold values will be used in the review:

- The threshold rating for the ‘Project’s relevance to the programme/call’ item is 4 on a scale from 1 to 6. If an application fails to meet this rating, the review will be discontinued and the applicant will only receive feedback on that item.
- The threshold rating for the ‘Scientific quality, novelty and innovativeness of the research’ item is 4 on a scale from 1 to 6. If an application fails to meet this rating, the review will be discontinued and the applicant will only receive feedback on two items: ‘Project’s relevance to the programme/call’ and ‘Scientific quality, novelty and innovativeness of the research’.

In addition to the general review criteria of Academy research programmes, particular attention will be paid to the following issues:

- International engagement
 - attracting top-level young, talented researchers from abroad to Finland or hiring researchers who have recently come to Finland to work on the project
 - research visits by Finnish researchers to leading-edge foreign universities and research institutes
- Business collaboration
 - cooperation between universities, research institutes and business companies
 - problem-setting in research
 - application potential of results
- Intersectoral mobility of leading-edge researchers
 - mobility from universities to business companies
 - mobility from business companies to universities

- Use of universities' and research institutes' own resources to carry out research
 - use of resources of the site of research and the partners
 - level of commitment and funding contribution by the site of research.

Consortium applications

If the funding is applied for by a consortium, read the guidelines for consortium applications. The consortium application is submitted by the consortium PI only after all subprojects have completed their applications. The non-negotiable deadline also applies to consortia. Consortium compositions cannot be changed after the call deadline has expired. If the project involves business collaboration, see the detailed guidelines below.

Business collaboration

If the project involves business collaboration, that collaboration must be clearly indicated in the research plan. In addition, your application must also include a business collaboration plan as a separate appendix.

Business collaboration plan (only one plan regardless of the number of companies, no more than 3 pages):

- List all project parties.
- Describe the collaboration as well as the management and research duties included in the project.
- Describe the mechanisms by which the project will integrate all participating organisations and individual researchers.
- Describe, if relevant, the implementation of intersectoral researcher exchange.
- Define each PI's required input to the project and justify why each party's expertise is necessary to achieve the project's objectives.
- Describe the complementary roles of the parties involved and explain which research results can be jointly utilised by the participating companies.
- Describe the application potential of the results.
- Make sure that the collaboration plan's length and details are proportional to the size of the project. The plan should be extensive enough to ensure that the project

parties will work together as one whole.

In the Academy's online services, enter as consortium parties only parties that are applying for funding from the Academy.

If the project involves business collaboration, also read item 10.1 in the Academy of Finland's funding terms and conditions.

Programme coordination

The PIs of the projects are required to

- assume responsibility for and report on the scientific progress of the project and on the use of the funds in accordance with the Academy's instructions
- ensure that the whole research team attends all events organised by the programme coordinators, and facilitate exchange and cooperation between research teams in the programme
- take part in producing reviews, syntheses and information material around the programme, and actively disseminate information about the programme's progress and results on public and scientific forums.