THIRD THEMATIC CALL WITHIN THE RESEARCH, DEVELOPMENT AND INNOVATION PROGRAMME ICT 2023: Methods and applications for management and analysis of big data and open data.

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 Tekes, the Finnish Funding Agency for Innovation. The aim of the programme is to further improve Finland's scientific expertise in computer science and to promote the application of ICT. The programme is based on the report *21 Paths to a Frictionless Finland*[1] by the ICT 2015 Working Group. At least EUR 10 million of the Academy's budget authority for 2015 will be used to implement the ICT 2023 programme.

The significance of data-based research methods is constantly growing in a number of scientific disciplines and applications. This is because advanced methods of measurement and registration can contribute to producing huge amounts of new data. There has been a considerable increase in data volume, showing great application potential. A new field of research has emerged, data science, in which the management and analysis of "big data" is a major topic. Big data is a term describing datasets so large that traditional analysis and processing methods are inadequate.

Data science is a complex field employing methods drawn from, for instance, parallel and distributed computing and data management, data visualisation, statistics, probability modelling, data mining, machine learning and pattern recognition, and signal processing.

The aim of this thematic call is to advance data science methodology and promote the innovative use of such methodology in science and engineering as well as for practical applications and new data sources. The call also covers research into various perspectives regarding "open data" which is data that is produced by different private and public parties and can be freely used and reused for various purposes.

Thematic areas

The key areas of this thematic call are:

- Management of real-time data flows
- Real-time analysis and visualisation of data
- Crowdsourcing in the production and application of data
- Production of open data; legal and commercial issues related to open data
- Applications in the fields of science, engineering, business and production; possible application areas include for example energy engineering, interactive technology, biomedical research, environmental research, health and welfare, transport, media and communications, digital business and industrial internet

Review of applications

The applications will be reviewed and the decisions will be made following the Academy's general review criteria for research programmes. In addition, special attention will also be paid to the following issues:

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[1] https://www.tem.fi/files/36671/TEMjul_18_2013_web_15052013.pdf

- international engagement
  - attracting young, high-level and promising 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 international universities and research institutes
- business cooperation
  - 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 in the research
  - use of resources of the site of research and the partners
  - level of commitment and contribution of funding by the site of research.

The call has two stages.

Based on the letters of intent submitted at the first stage, the Academy will decide which projects will proceed to the second stage. Projects selected to the second stage will be invited to submit full applications. The non-negotiable deadline for full applications in the Academy's online services is 17 September 2015 at 16.15. Applicants may be invited to interviews during the review process.

A panel composed of members of the Academy's Research Council for Natural Sciences and Engineering and possibly other experts will be responsible for the review of the letters of intent. The full applications will be reviewed by an international expert panel.

The funding is granted for two years. As a rule, the funding period starts on 1 January 2016.

Consortium applications

If the applicant is a consortium, see detailed guidelines on our website under Guidelines for consortium application. **However, please note the nonstandard procedure. At the first stage (letters of intent), the applications of all consortium subprojects must be submitted by the deadline.** The consortium application will be processed only if the applications of all subprojects have been submitted by the deadline. The composition of the consortium cannot be changed after the first-stage deadline.

Intersectoral consortia

Applicants must clearly indicate in their research plan if the consortium involves parties applying for funding from both the Academy of Finland and Tekes. In addition, the application must include a collaboration plan as a separate appendix.

Collaboration plan (no more than three pages):

- List all parties and specify which parties are applying for Academy funding and which for Tekes funding.
- Describe the collaboration and management included in the project.
- Describe the management and research duties within 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 research team's expertise is necessary in order to achieve the project's objectives.
- Describe the complementary roles of the companies in the consortium, and explain which research results can be jointly utilised by the 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 only those consortium parties who are applying for funding from the Academy. Within this call, Tekes is prepared to fund only such projects by companies that are parallel with the proposed research projects.

Funding from Tekes is applied for in line with Tekes' guidelines. The deadline for letters of intent addressed to Tekes is 29 April 2015 at 16.15. The letters of intent are submitted via Tekes' service at www.tekes.fi/en/funding/could-your-company-be-a-tekes-customer. Click on *Test your idea* and proceed to fill out the form. Enter the code "ICT 2023 Big Data and CPS" under *This contact is related to*.