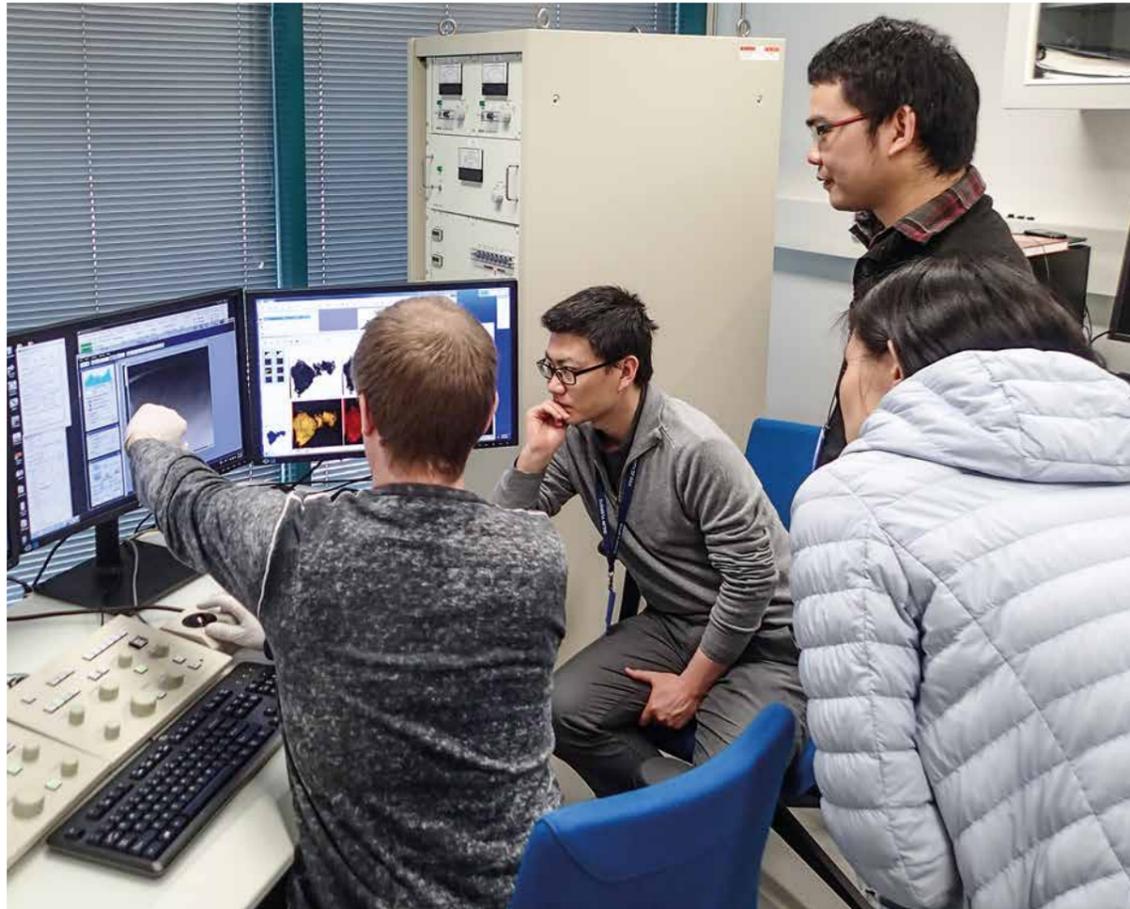
A large, complex transmission electron microscope (TEM) is shown in a laboratory setting. The machine is primarily white and grey, with a prominent vertical column. It is surrounded by various cables and components. A metal frame with a ladder is visible on the left side. The background shows a typical laboratory environment with white walls and ceiling lights.

STEMMA

Investment into high resolution imaging and material analysis

The STEMMA project by the University of Oulu entailed the procurement of a new transmission electron microscope (TEM) for material analysis and the development of user skills for the machinery. The results serve the needs of the university and businesses. An analysis service that utilises the procured TEM machinery was created, which supports R&D&I activities of business involved in material analysis.



High quality procurement creates future success

The mission of the STEMMA project was to procure a new transmission electron microscope (TEM) for the Centre of Microscopy and Nanotechnology (CMNT) in the University of Oulu. The procured device replaced the old TEM machinery used for material analysis in the university, the capacity of which could no longer meet the growing demands of research groups and industry.

The transmission electron microscope is a versatile research instrument, which can be utilised in various fields of science and technology. The TEM machinery enables the studying of samples with sub-nanometre imaging resolution and the study of their crystal structure and chemical composition. Transmission electron microscopy can be applied to metallurgy, biocomposite materials, ceramics, thin films, nanoparticles and nanofibers, polymers, and the analysis of nanoparticles harmful to people and the environment.

The project was prepared with a broad survey of the needs for new TEM machinery. During the preparation stage, discussions were held with research groups from the university, businesses and other research institutions. The interest of various actors was engaged and numerous businesses committed themselves to the project.

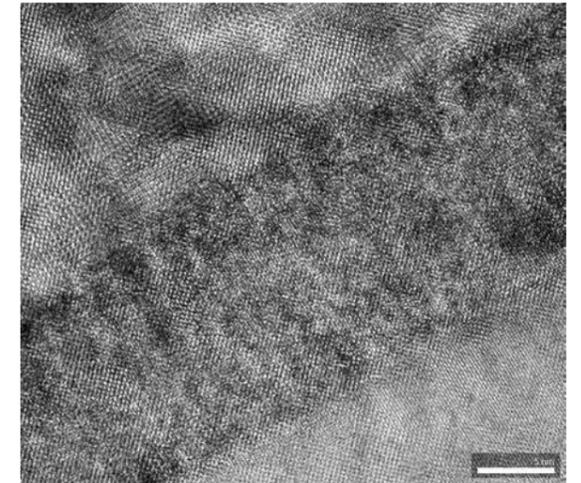
Procurement expertise enabling regional development

As the result of a successful procurement process, a modern, competent and diversely equipped transmission electron microscope was procured. The machinery is well-equipped to respond to the analysis needs of researchers and businesses.

“There has been clear demand for the new TEM machinery. After deployment, its use for research has been constantly increasing,” describes Sami Saukko, the control engineer for the microscope.

The research instrument investment and the expertise attained during the project have significantly improved the operational capabilities of research groups in the University of Oulu. The research infrastructure for electron microscopy and material analysis has been greatly strengthened. After the end of the project, the use of transmission electron microscopy as an active part of the CMNT has been further developed.

“The performance level of the new microscope is far superior compared to the previous one. This instrument has enabled entirely new kinds of material analysis. This is beneficial to many users, e.g. steel research and education, which is one of the university’s areas of focus,” Saukko elaborates.



The availability of high quality research infrastructure and personnel is an important factor when considering the R&D&I operations of businesses. Conditions for the birth of new high technology companies have been improved by this direct investment into high quality research infrastructure. At the same time, the project has advanced the collaboration between businesses and the university.

STEMMA – Investment into high resolution imaging and material analysis

Project code: A70147

University of Oulu

1.2.2015–30.9.2016

Budget: 89 800 €

ERDF funding from the Council of Oulu Region: 62 860 €

STEMMA – Investment into high resolution imaging and material analysis (investments)

Project code: A70150

University of Oulu

1.2.2015–30.9.2016

Budget: 1 060 200 €

ERDF funding from the Council of Oulu Region: 742 140 €

Objectives

The objective of the project was to procure a transmission electron microscope for material analysis and to develop competences that will serve the analysis needs of research groups and businesses as efficiently as possible.

Results

The versatile transmission electron microscope procured for the University of Oulu has met expectations successfully. The needed competences for using the TEM have been developed and the device is being used efficiently. The microscope has served the analysis needs of user groups splendidly, which is evidenced by a high rate of use and an increase in related research. Since the end of the project, the field of transmission electron microscopy related to material analysis is being actively advanced.

Oulu Regional Council allocates funding for regional development from the ERDF

Oulu Regional Council is a Managing Authority for the Sustainable growth and jobs 2014–2020 – Finland’s Structural Funds Programme in Northern Ostrobothnia.

European Regional Development Fund’s (ERDF) main objectives are to improve the competitiveness of SMEs and produce and use the latest information and knowledge.

‘Sustainable growth and jobs 2014–2020 – Finland’s structural funds programme’ has two priority axes and seven specific objectives for ERDF. Each project must deliver at least one of these specific objectives.

ERDF priority axes and specific objectives:

1. Competitiveness of SMEs
 - Generating new business
 - Improving transport and logistic connections that are important to SMEs (Eastern and Northern Finland)
 - Promoting growth and internationalisation of enterprises
 - Promoting energy efficiency in SMEs
2. Producing and using the latest information and knowledge
 - Development of the centres of research, expertise and innovation on the basis of regional strengths
 - Strengthening innovation in enterprises
 - Developing solutions based on renewable energy and energy-efficient solutions

More information on Structural Funds in Finland from the dedicated website www.rakennerahastot.fi