

RePCI-PROJECT

WORK PACKAGE 4: Resource alliance

Deliverable D4.3 Report on analyzing of expertise, facilities and related activities

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1. THE AIM OF THE WP 4

The general objectives of and their indicators in the RePCI project have been presented as follows:

1. **Business line driven and strategy based cooperation management.** Indicators:
 - (1a) number of strategic partnership agreements
 - (1b) feedback from companies and HEIs
2. **Development of staff of companies is continuous and based on the strategic choices relative to the competitiveness.** Indicators:
 - (2a) number of trained Coaches and other company staff
 - (2b) feedback from stakeholders of the Competency Coaching –training and
3. **Easily accessible international resource pool to improve the competitiveness of companies.** Indicators:
 - (3a) number of services in the supply of the resource pool
 - (3b) feedback from companies and HEIs
4. **Real life problem solving in company-student-staff of HEI triangle.** Indicators:
 - (4a) number of staff of companies and HEIs and students participating in processes
 - (4b) feedback from staff of companies and HEIs and students.

The aim of the WP 4 is to form an **international resource pool** with the participation of enterprises and HEIs, which is easily available and it helps to improve the competitiveness of companies.

WP 4 includes following Tasks:

- Task 4.1 Report on the identified needs of companies for cooperation
- Task 4.2 Report on the identified fields of expertise in HEIs
- Task 4.3 Report on the identified entities on the selected fields of expertise
- Task 4.4 Report of taxonomy of enterprise-university cooperation

- Task 4.5 Supply of resource alliance - pilots
- Task 4.6 Resource map of resource alliance
- Task 4.7 Report on the evaluation of service implementation

This is a report of Task 4.3 analyzing the expertise, facilities and related activities.

2. TASK 4.3 REPORT ON ANALYZING THE EXPERTISE, FACILITIES AND RELATED ACTIVITIES

Description of Task 4.3:

Analyzing the expertise, facilities and related activities

Universities establish entities of expertise including the experts/professors, related research and testing instruments, laboratories and other facilities. All universities verify their expertise fields and entities in order to connect their potential supply together. These entities form the basis for the international supply of the support activities for industry. By this way the universities resources can be utilized more efficiently than operating only nationally.

2.1. JAMK (Finland)

Current situation of Mechanical engineering at JAMK

JAMK's plan is to change in the future Mechanical Engineering department to Industrial Engineering department. Educational responsibility will include programs for Mechanical engineering, Civil engineering, Electric/automation engineering and Energy engineering. There is a proposal for the special competencies offered for all programs including: Life cycle/maintenance management, User-friendly/HSE engineering and Resource efficiency. Paper machine technology and Wellness Technology programs have no intake after this year. This is because of the changes in Applied Science Universities re-structuring. They will stay as specialization areas in the future.

There is a wide collection of services that Mechanical Engineering unit has been offering and providing to companies in Finland and abroad. World wide economic slowdowns and technological development have changed and re-structured global business environment. This has also had a major impact on the development of our services. Previously Paper machine technology was in major role when providing educational services in Finland but also in Europe and China. We also had many projects for example in the fields of sheet metal design and development of supplier networks.

JAMK's new focus area is energy technology mainly due to the fact that the role of paper machine technology at JAMK has decreased. In this area we already arrange a lot of education and the aim in the future is also to provide high quality projects and consultancy services to our customers.

Identified entities on the selected fields of expertise

Our customers have been using actively following laboratories in their product development projects. We recognize the future potential of these laboratories and

we'll continue to develop them.

1. Loading frame (dynamic loading of structures):

- dynamic loading
- corrosion testing
- machine design (Catia)
- FEM analysis

2. Building automation laboratory

- Studies of energy efficiency and in-door conditions
- Education

3. Machine vision laboratory

- Feasibility studies
- System design
- Education

Elomatic/JAMK action plan in the RePCI-project

In the first phase of developing services and facilities at Mechanical Engineering unit is to identify needs of the customer. Elomatic and JAMK Technology have long traditions in cooperation. Elomatic and JAMK have been discussing about the cooperation projects in work package 2 and the following areas were selected as proposals:

1. Product development of SME companies
2. Virtual Reality engineering applications.

1. SME companies in Central Finland are mostly sub-suppliers for bigger companies without own products. In current situation need for own products is important.

Weaknesses of sub-contracting companies are:

- No or very little own engineering or product development
- No distribution network
- No marketing

Common target for Elomatic and JAMK is to help with the challenges. For JAMK the “beef” is requirement of participation of area development of SME sector. For Elomatic the possibility of having involvement of engineering for SME companies and productivity is possibility for new business.

2. JAMK Technology has been playing an important role in 3D engineering education in Central Finland. Elomatic has been using same engineering programs.

For Elomatic demand for Virtual Reality applications from 3D engineering applications is increasing. JAMK has competence in both ITC and 3D Engineering.

Common target is to increase the competence of Virtual Reality applications.

2.2. Hochschule Esslingen (Germany)

Clear and unambiguous description of expertise is necessary that the management of needs in companies and HEIs will be possible.

We have also to consider the financing. Neither HEIs nor companies will deliver services without compensation.

Facilities in the laboratories on HEIs are used to educate students. So a problem could be the disposability. Also the experts are full-time lecturers and their priorities are education and research. So the organization and management of facilities and experts is important and not easy. But it is possible to employ staff only to conduct special projects. But in this case the financing must be cleared up.

Another point we have to think of is that personal change. We do not know if the expert from today is available next year. That means permanent updates are necessary.

2.3. Technical University Cluj (Romania)

In task 4.2 the main fields of expertise, from partner P2:TUCluj, that could contribute to the goals of our project were defined. Based on this list the human and material resources were evaluated in order to integrate them in the international resource pool. As a result of this evaluation a number of 27 researchers and 7 research laboratories were identified. The research laboratories from P2:TUCLUJ are:

- Mechatronics and Energy Laboratory
- Intelligent Reconfigurable Systems Laboratory
- Laboratory of Precision Mechanical Systems and Machine Dynamics
- Mobile robots Laboratory
- Thermal Engineering Laboratory
- Rehabilitation Engineering Laboratory
- Laboratory for mechanical tests and numerical methods in solid mechanics

For all the laboratories the main equipment's were recorded and the responsible person for each laboratory is nominated. Also the services/training opportunities that a laboratory can provide were outlined. For each research laboratory the research interests' fields were centralized.

2.4. Miskolci Egyetem (Hungary)

During the RePCI project we have collected the laboratory background relevant to the research and development projects together with companies involved in the project or connected to the university with other research projects. The main resources such as laboratories, testing equipments etc., which facilitate the research projects with SMEs are the following:

- Wind tunnel laboratory
- Motor diagnostic test system laboratory
- Acoustic laboratory
- Shaker laboratory
- Measurement laboratory
- 3D measurement laboratory
- Shape, position and profile measurement laboratory
- Quality Control Laboratory
- Structure-diagnostic laboratory
- Integrated logistics and product identification laboratory
- CNC Machine Laboratory
- Hydraulics, pneumatics laboratory
- PLC and Mechatronics Laboratory
- Conversion technology laboratory
- Material technology CAD/CAM laboratory
- Surface testing system laboratory
- Heat and surface treatment Laboratory
- Thermomechanical physical simulation Laboratory
- Welding Laboratory
- Mechanical material testing laboratory
- Chemical Safety Laboratory

Climate chamber laboratory

We have to mention that from the company side there are also laboratories, which are used in the research:

at Konecranes in laboratory of *Lifting devices*:

- Wire rope measurement

- Rail measurement

- Complete crane with radio control

- traveling inverter simulator with motor

- hoisting inverter simulator with motor

- Crane condition monitoring device simulators with load cell stands

- Chain hoist trolley with inverter travelling

- Radio controlled chain hoist trolley with inverter travelling

- Wire rope trolley with pendant

at FUX in *Laboratory of wire and cable diagnostics*:

- tensile test of thin steel ropes

- tensile test of wires

- resistivity measurements of wires, and conductors

- tensile test of ropes and conductors

- room temperature creep test of bare conductors

- vibration diagnostics of overhead conductors

- ampacity measurement at different conductor temperature, measurement of AC or

- DC resistivity of conductor

- standard fatigue test of elevator ropes

3. Summary

The university partners have explored their resources in the company cooperation not only personal resources (professors and experts) but facilities, laboratories, equipment, devices and services, moreover, the related activities.

It will help

- to improve scientific capabilities,
- significant improvement in research and innovation performance,
- constructive partnership.