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RESEARCH CENTER FOR ASSISTIVE INFORMATION AND COMMUNICATION SOLUTIONS – AICOS

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PROJECT SPEC SHEET (EN)

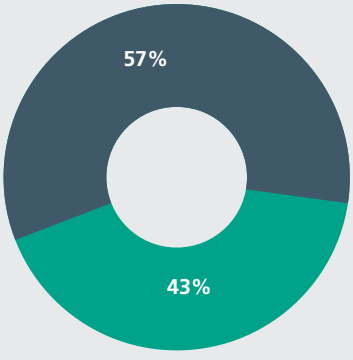
OPERATOR | DIGITAL TRANSFORMATION IN INDUSTRY WITH A FOCUS ON THE OPERATOR 4.0

Project nº: 045910

Supported by: Sistema de Incentivos à Investigação e Desenvolvimento Tecnológico (SI I&DT)

Partners: Zenithwings (Leader) Associação Fraunhofer Portugal Research; FCT NOVA – Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa; NST Apparel (Europe) Lda; Volkswagen Autoeuropa; FPCEUP – Faculdade de Psicologia e Ciências da Educação da Universidade do Porto; Controlconsul – Consultoria, Serviços e Representações, Lda; UM – Universidade do Minho; Institute for Medical Engineering and Science (MIT).

Total eligible cost: 1.879.214,03€
EU Funding: 1.066.939,91€ (FEEI)

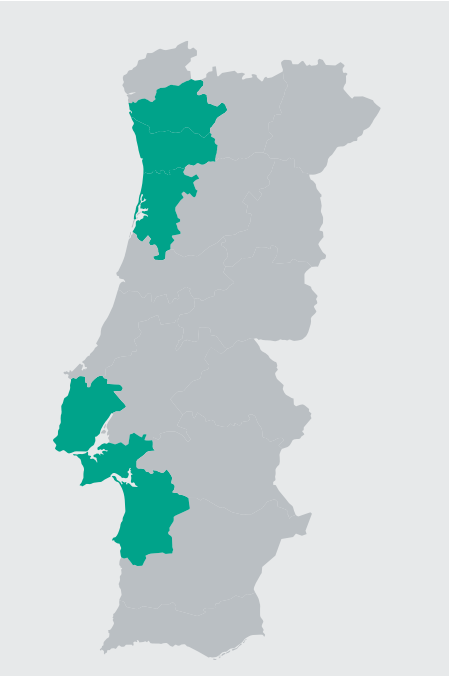


Project Overview

The industrial and service sector in Portugal employs around 23% of active workers, which makes it a highly relevant sector for the National Economy. However, in order to guarantee competitiveness, modernisation and internationalisation strategies are on demand, especially concerning digital transformation in manufacturing. Systems developed for this purpose need to be flexible to assist the shift from mass production to mass customisation, but always keeping workers, their productivity, job satisfaction and health in the centre so that digital transformation enables sustainable operations.

We propose to develop tools for exposure data analysis in the workplace, building on the concepts of Positive Ergonomics, Operator 4.0 and on the Job Quality Indices by the Eurofound, by collecting and visualising data on physical environment, work intensity, working time, social environment, skills and discretion, career prospects, and earnings. In particular, technology components will be able to:

- Perform automatic monitoring of human movements and ubiquitous exposure, with subsequent detailed movement analysis and continuous monitoring of ideal work methods;
- Support mental wellbeing through self-reporting and individual visualisations for worker awareness, education and self-management;



Portugal | Braga, Porto, Aveiro, Lisboa and Setúbal

- Support asset management (Digital Twin) through automated processes.

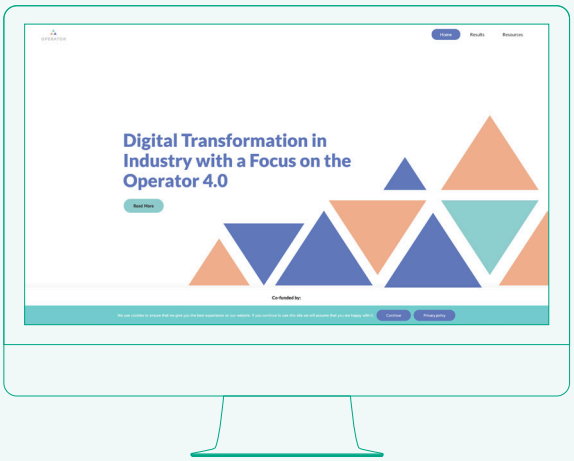
Motivation

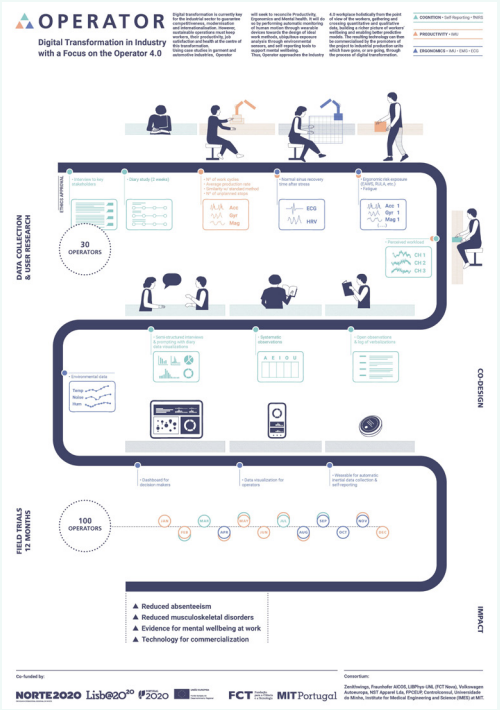
The project's objective is, thus, to approach the Industry 4.0 workplace holistically, but from the point of view of the workers, gathering and crossing quantitative and qualitative data, building a richer picture of the workers' well-being and enabling better predictive models. We will continuously validate our developed solutions and build large data sets through continuous field work, ranging from short contact sessions during technical development, to long-term trials enabling impact assessment.

Outcome

The outcome of the research and development process is a product, in the form of a system of technologies, which can be commercialised by the promoters of the project to industrial production units which have gone or are going through the process of digital transformation.

Dissemination materials





Project website:
http://operator-i40.com

Papers:

Robust Anomaly Detection in Time Series through Variational AutoEncoders and a Local Similarity Score (2021)
https://www.scitepress.org/Papers/2021/103205/

A gesture elicitation study to generate interaction design insights for self-reporting of mental and emotional states using a portable device (2021)
https://www.springerprofessional.de/a-gesture-elicitation-study-to-generate-interaction-design-insig/19345324