



# PhD in INGEGNERIA GESTIONALE / MANAGEMENT ENGINEERING - 38th cycle

**PARTENARIATO PNRR Research Field: DEVELOPING A NEW APPROACH TO DATA  
GATHERING AND ANALYSIS FOR SUSTAINABLE OPERATIONS EXPLOITING INTERNET  
OF THINGS**

**Monthly net income of PhDscholarship (max 36 months)**

**€ 1450.0**

In case of a change of the welfare rates during the three-year period, the amount could be modified.

## Context of the research activity

**Motivation and objectives of the research  
in this field**

In the last years, more and more attention has been devoted to sustainability. Operations is the area of the company that has the greatest impact on sustainability due to its intense use of resources (energy, material, water) and people. A large portion of resources is wasted in processes (e.g. 17% of food produced every year in the world is wasted). At the same time, digitalization allows each resource to gather a huge amount of information. Unfortunately, the set of information gathered is rigid, fixed in the machine, robot, and in general in a resource. In order to dramatically increase the capabilities of a company to improve its manufacturing system and increase its sustainability, a new system for data gathering is necessary. A flexible system that allows to collect different data according to the specific need of the moment and of the specific resource, to pursue a specific goal.

The research aims to develop such a system, that allows to gather the data needed to implement Operational Excellence methodologies and tools. And will have three different areas of action:

- Analysis of present processes and to define the minimum set of measures to make.
- Identify the different alternative to gather those measures (e.g. through sensors)



	<ul style="list-style-type: none"> <li>•Design a comprehensive system that allows to collect a subset of such measures depending on the situation, resource, goals of the study/monitoring</li> </ul> <p>This will allow to quickly monitor the performance of a system or a sub part of a system, and identify causes of problems/opportunities to improve, in particular in the sustainability area.</p>
<b>Methods and techniques that will be developed and used to carry out the research</b>	<p>The following methodologies will be applied in the research project:</p> <ul style="list-style-type: none"> <li>- Literature analysis in order to map the situation of research at international level;</li> <li>- Case studies, in order to analyze the best practices of problem solving and innovation management of companies that have already developed new good practices;</li> <li>- Action research project to work on tools for process analysis to identify improvement opportunities.</li> </ul> <p>The project will be carried out within the Extended Partnership "3A-Italy", funded by the PNRR.</p>
<b>Educational objectives</b>	<p>The research is multidisciplinary in nature: the candidate will develop advanced research skills in the areas of Sustainability, Operational excellence, and Internet of things, data analytics. She/he will learn how to design and conduct a research project, adopting the proper methodologies for conducting a literature review, data collection and analysis (survey, structured interviews), to validate results, and to present and publish results in both academic and practitioner outlets. Such learnings are extremely useful in all the further development of the professional career of the PhD candidate. And introducing people with such a higher level of education in the economic system gives a strong contribution to increase its competitiveness and degree of innovation.</p>
<b>Job opportunities</b>	<p>Because the subject is at the center of the attention of virtually any company, job opportunities are easily available in any manufacturing company. In addition, consulting companies also value the specific competences on the subject, and also the methodologies</p>



	competences on the subject, and also the methodologies learned.
<b>Composition of the research group</b>	1 Full Professors 0 Associated Professors 2 Assistant Professors 3 PhD Students
<b>Name of the research directors</b>	Prof. Alberto Portioli

<b>Contacts</b>
alberto.portioli@polimi.it

<b>Additional support - Financial aid per PhD student per year (gross amount)</b>	
<b>Housing - Foreign Students</b>	--
<b>Housing - Out-of-town residents (more than 80Km out of Milano)</b>	--

<b>Scholarship Increase for a period abroad</b>	
<b>Amount monthly</b>	725.0 €
<b>By number of months</b>	6

<b>Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information</b>
<p>The PhD candidate will have the opportunity to attend courses on Management Engineering research methods and manufacturing research at Politecnico di Milano and other Universities and research centers. He/she will be supervised by the research director through meetings and will receive feedbacks on his/her intermediate results during regular meetings with the Doctorate board and scientific conferences. The candidate will be involved in some teaching and communication activities, which are seen as a major opportunity to practice with dissemination of own and other relevant research results. He/she will be offered a desk and office facilities at the department building.</p> <p>CUP: D43C22003120001</p> <p>Decreto Direttoriale Avviso: D.D. 341 del 15/03/2022 Avviso pubblico per la presentazione di Proposte di intervento per la creazione di Partenariati estesi alle università, ai centri di ricerca, alle aziende per il finanziamento di progetti di ricerca di base nell'ambito del Piano Nazionale di Ripresa e Resilienza, Missione 4 Istruzione e ricerca - Componente 2 Dalla ricerca all'impresa - Investimento 1.3, finanziato dall'Unione europea - NextGenerationEU</p>



Decreto di concessione: D.D. 1551 del 11/10/2022