POLITECNICO DI MILANO

PhD in INGEGNERIA GESTIONALE / MANAGEMENT ENGINEERING - 39th cycle

THEMATIC Research Field: INCREASING RESILIENCY OF VALUE NETWORKS USING MANUFACTURING AS A SERVICE

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	Traditional value chains are facing challenges due to the fast-moving markets, customer demands, and unpredictable manufacturing and logistics. To address these challenges, Manufacturing as a Service (MaaS) is introduced as a concept that utilizes existing resources in a value network by connecting manufacturers to service providers on demand through a connected network. Manufacturing as a Service (MaaS) is a recent business model that gives customers, including B2B customers, access to manufacturing capacity and manufacturing capability on demand, without having to make massive investments in manufacturing equipment and infrastructure. MaaS is part of a greater trend where anything can be offered as a service, referred to as Everything as a Service, or XaaS (including, for example, Software as a Service, Infrastructure as a Service and Platform as a Service).The PhD will contribute to the European project ?Manufacturing As A Service To Increase Resilience In Value Networks? (MAASive), recently founded under the Next Generation EU Framework. The MAASive project aims to develop models of value networks that enable companies to recover from unforeseen external events by connecting to new services and reconfiguring value networks utilizing internal and external manufacturing services. MAASive will provide a toolkit for industry, which will consist of a blend of existing methods and technology applied in the MaaS context, and new models and technology developed as part of the

	project. Four distinct aspects are addressed in the MAASive project to increase resilience in value networks: network building, impact assessment, reorchestration of networks, and value network operation. The overall aim of MAASive is to increase value network resilience by enabling manufacturers to rapidly respond to unforeseen external events or sudden changes in supply or demand, utilizing manufacturing as a service. The project aims to propose solutions addressing the following levels of decisions: value network building, network orchestration, and operations execution. In this project, the PhD objectives will be to develop a state-of-the-art of the models for value network, to define the model requirements for supporting value network decisions to respond to disruption leveraging on MaaS, and to develop and test the model.
Methods and techniques that will be developed and used to carry out the research	To reach the objectives, the following methodologies are adequate: •Literature Review on methodologies and strategies for value network (re)design for resiliency. •Interview study/Focus groups with Italian/European companies in to collect hurdles, trade-offs and solution for building resiliency along the value chain. •Development of the model. •Case study development/action research for method validation and simulation.
Educational objectives	The Ph.D. candidate at the end of the program will possess adequate research skills in the field of value network (re)design and modelling In particular, the Ph.D. candidate will: •be able to perform a structured literature review •be able to use qualitative and quantitative research methods •be able to analyze qualitative and quantitative data to develop insights and methods/tools •be able to conduct design science research •be able to present and publish her/his research results
Job opportunities	Academia, international institutions, manufacturing companies, multinational organizations, consulting firms.

Composition of the research group	2 Full Professors 0 Associated Professors 0 Assistant Professors 1 PhD Students
Name of the research directors	Margherita Pero, Sergio Terzi

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

Scholarship Increase for a period abroad	
Amount monthly	725.0 €
By number of months	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
The candidate might be involved as research associate in additional research projects and as teaching assistant in courses in the area of Operations and Supply Chain Management. A desk will be provided in the Department of Management, Economics and Industrial Engineering. This research is performed in collaboration with Aalborg University and TUHH (Hamburg). During the PhD the candidate will be required to have regular meetings in other European countries (partners of the EU project).