POLITECNICO DI MILANO

PhD in INGEGNERIA GESTIONALE / MANAGEMENT ENGINEERING - 40th cycle

THEMATIC Research Field: ARTIFICIAL INTELLIGENCE IMPACTS ON ORGANIZATIONAL REALITIES: CO-CONSTITUTION AND CO-EVOLUTION

Monthly net income of PhDscholarship (max 36 months)
€ 1500.0
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	AI technologies are pervasive, and their development is spreading throughout different industries, sectors, organizations, etc. Still socio-technical theory suggests that organizations are open systems, and that the application of technologies is a context-specific fact. Specifically, the organizational context can be critical in influencing the way in which AI technologies are applied, both in influencing the kind of decision-making processes organizations decide to apply AI to, and in swaying the way in which applications are developed.The impacts of digital technologies and algorithmic tools on organizations can occur by automating structured and repetitive work and impacting on means of working. They can also contribute to reshape organizational culture and influence individuals. Balancing automation and augmentation could, however, enable positive cycles of selective deskilling (i.e., humans automate tasks where their abilities are inferior to those of AI technologies) and strategic requalification (i.e., humans invest more in their core skills), thereby gradually augmenting both human and machine abilities. Similar changes affect the way in which organizations operate and thus the way in which they take decisions. However, as algorithms shape organizational worlds, similarly, organizational practices and negotiations shape the role algorithms can play in organizations. This suggests the importance to focus not only on the organizing aspects of algorithms and datafication but also

	on dis-organizing and unanticipated effects and on how humans and algorithms are relationally configured in joint agencies. Within this area of investigation research questions that are interesting to be explored are: •How do AI technologies shape organizational processes, practices and routines? •How do AI technologies reconfigure decision making processes and affect power dynamics? •What is the role of context in shaping digital technologies and algorithms (and vice versa)? •How do digital technologies/algorithms move across organizations and sectors (e.g., service vs. manufacturing, large corporations vs. SMEs)? •How can the balance of automation and augmentation support selective deskilling and strategic requalification? How can this process be supported?
Methods and techniques that will be developed and used to carry out the research	Given the wide area of investigation, several research methodologies are worth to consider, however three main approaches are likely to be central to the development of the research. 1. Case studies. Creating evidence and structuring existing experience on the application of AI solutions in decision making is relevant to nurture the limited empirical evidence on the topic and to explore the area of investigation. Some specific applications are worth to mention: a. Case studies development to identify and address organizational and managerial dilemmas associated with developing, implementing, and using human-centered and responsible exponential technologies at/for work. Dilemmas are useful conditions that allow organizational paradoxes to be identified, creating possibilities to rise critical issues for the development of new knowledge. b. Cases of (ir)responsible uses of AI at/for work in various organizations (e.g., SMEs or multinationals) and sectors (e.g., healthcare, public or private sector companies), to evaluate design issues, accountability

	concerns, problem taxonomies. Significant anecdotical evidence is already available creating an interesting opportunity to address specific areas of investigation (e.g., https://incidentdatabase.ai/) c. Developing quantitative and qualitative approaches to understanding, measuring, and managing the impact of implementing or using exponential technologies on individuals, organizations, and society. Observing how organizations have implemented AI in decision making is useful to investigate effective and dangerous practices. 2. Experiments. The development of field experiments is a powerful method to investigate causal relationships that only recently has been embraced by operations management research. Simulating how the interaction between humans and AI technologies occurs in specific decision-making contexts is extremely useful to evaluate alternative designs, the effect of contextual factor, and accountability concerns. Experiments can also allow the comparison of human and algorithmic decision-making and to explore different ways of interaction between humans and machines.
Educational objectives	The goal of research project is consistent with the PhD program and leverages on the existing learning process that the program implies. In addition, the specific research project will allow to develop specific educational goals related to both the topic and the set of methodologies adopted. Specifically, the research project is likely to develop knowledge and skills concerning the following topics: - How to design experiments within an organizational setting. The program will allow to design and implement experiments concerning the use of technologies in an organizational setting under different scenarios. Th PhD candidate will be able to learn and apply how to use such methodology and how to properly derive findings from its results. - How to develop case studies and how to disseminate results based on qualitative research. The program will

	allow the candidate to develop qualitative research applications- i.e., case studies- and to learn how to design and conduct a case study research project and how to disseminate the research findings- i.e., publish in scientific journals the results of qualitative research. - Main theories adopted to investigate the interaction between technologies and organizations. In order to develop properly the research program, the candidate will have to gain confidence in the key theories that could be adopted to develop the research project. These may include socio-technical theory, paradox theory, institutional theory, technological acceptance model, and others.
Job opportunities	The development of the research project will be done in cooperation with companies and institutions, in particular to develop the empirical analysis. The research program will also aim to gain visibility by disseminating results both to participating companies and to other institutions interested in the field of research. These will allow possibilities to interact with other realities and to develop potential additional experiences that could lead to job opportunities.
Composition of the research group	3 Full Professors 1 Associated Professors 4 Assistant Professors 4 PhD Students
Name of the research directors	Matteo Kalchschmidt

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	750.0 €
By number of months	6

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Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
The candidate will be involved in additional experiences including educational activities linked to international research networks such as the EurOMA Doctoral program. The candidate will be offered the possibility to collaborate within teaching assistantship in management courses. The candidate will be offered with proper facilities to conduct the research: •Involvement in projects: "For the overall development of their capabilities, PhD candidates will work on sinergical projects to favour empiral data collection and network development for their career. Projects will give candidates the opportunity to work in group (peers and other senior professors)". •Teaching and tutoring: "If coherent with the development of their doctoral program, the PhD candidate will have the opportunity to be involved in: teaching activities, tutoring to master students, tutoring to PhD candidates for administrative processes". **Funding for educational activities: 6.100,00 Euros for three years**.