



Industry 4.0 Challenges: University and Union agenda

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ABSTRACT: The research aims to investigate Industry 4.0 Challenges to raise a University and Union agenda based on government experts, academics, consultants and inputs from trade union leaders related to Industry 4.0 implementation. Webinars were carried out. Two conclusions were pointed out: a fragmented understanding of the concept and the low participation of workers in the implementation process.

BACKGROUND: We propose a university-union research partnership between São Paulo State University (UNESP), University of Birmingham (UoB) and Brazilian Industrial Unions to better grasp the process of technological innovation and I4.0 implementation and its impacts on the workers. Thus, two sets of webinars (nine in total) were carried out in 2020-2021.

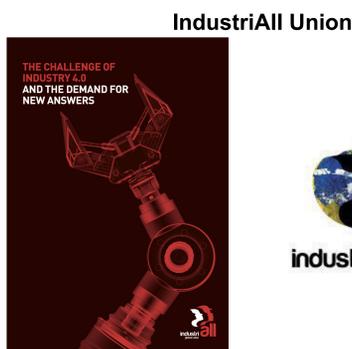
- The 1st. set (5) was led by UNESP and IndustriALL Brazil, including the following topics: Industry 4.0 – an introduction; International comparison (Brazil, Germany, China); Public initiatives; Internet of Things (smart cities); Workers' skills; Union Actions in Europe. The speakers were policy makers, academics, consultants, and union leaders.
- The 2nd. set (4) was hosted by the 'Social Systems for Future Manufacturing' (SSFM) Research Group (Unesp and UoB) discussing, from an international and interdisciplinary perspective, the following topics: Competencies and Skills for Industry 4.0 Preparedness; Labour Perspectives on the Future of Manufacturing; The Policy Challenges of Industry 4.0; Computing sciences for future manufacturing.

Among the debaters were: government experts, academics, consultants and union leaders, including the Secretary General of IndustriALL Global Union (2016-2021). These webinars raised the following research question: What is the perspective of workers and their managers on the implementation of I4.0?



Figure 1: Webinars invitation

PROBLEM: The diffusion of new digital technologies ('industrie 4.0') into workplaces has raised the prospect of a widespread and profound transformation of innovation and production systems. I4.0 is expected to transform the production and distribution of goods and services and to have far-reaching consequences for productivity, skills, the environment, income distribution and social well-being. Given the potentially profound societal ramifications, we are concerned about what appears to be an absence of robust employee voice mechanisms at the level of technological innovation. Drawing on evidence from the IndustriAll Global Union (note), we observe that, while I4.0 creates opportunities for workers (provided they have access to requalification and specialised training), there are still concerns about a lack of suitable qualifications among the existing workforce.



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METHODS : Field research based on qualitative research with the application of questionnaire with (12) union leaders, and interview with the President of IndustriALL Brasil and a leader of the ABC Metalworkers Union to discuss and validate the findings. These industrial respondents are related to workers from Sao Paulo State, which is considered one of the most industrialized region in Brazil. The research method can be characterized as empirical-descriptive.

FINDINGS: We have 2 set of findings raised from the Union leaders, and webinars to support a Agenda.

Brazilian Union Leaders indicate:

- Problems related to lack of knowledge on the I4.0, lack of technical training, systematic error in implementation, reduction of jobs and adaptation of employees;
- Industry 4.0 has not been received the necessary treatment by companies and unions;
- Cases indicates a simplification of their understanding about I4.0 impacts;
- Lack of workers' participation in implantation decisions. However, workers have contributed with suggestions for improvement during use;
- HRs actions of the companies are vaguely mentioned, and linked with courses, lectures and training.
- Need an integrated perspective (Framework).

Research Opportunities from webinars indicate:

- Identify the worker competencies/skill for I4.0 (Castro, Fernández, & Colsa, 2021; Malik et al, 2021);
- Analyze the worker perspective on I4.0 implementation (Wilkesmann & Wilkesmann, 2018; Song et al., 2021)
- How does knowledge management influence I4.0 (Kipper et al., 2020)?

SOLUTION: The webinars highlighted issues to mitigate some of the potentially adverse impacts of digital transformation, including:

- vocational education, and new work opportunities;
- research issues related to workers competences, worker involvement, policies.
- Comprehensive framework of integrated perspective to I4.0 implementation (Figure 2)

These issues are aligned with the UN Sustainable Development Goals (SDGs), especially: decent work and economic growth (SDG-8); building resilient infrastructures (SDG-9); and quality education (SDG-4).

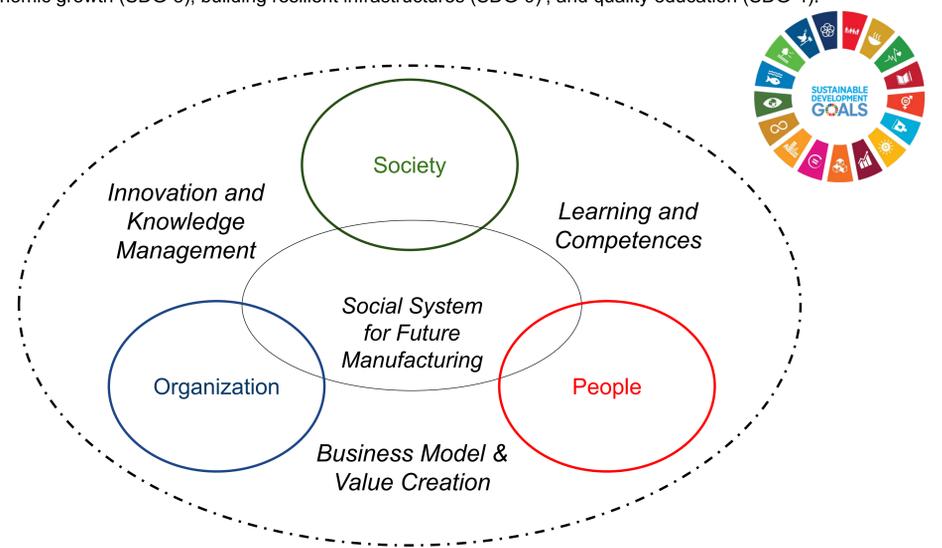


Figure 2: Social Systems for Future Manufacturing (SSFM) - An Overarching View

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Note: IndustriAll is a global union which represents 50 million workers in 140 countries in the mining, energy and manufacturing sectors and is a force in global solidarity taking up the fight for better working conditions and trade union rights around the world.