Trade unions' responses to Industry 4.0 amid corporatism and resistance

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The research project

Research project coordinated by Claudio Sabattini Foundation, commissioned by FIOM-CGIL (Bologna)

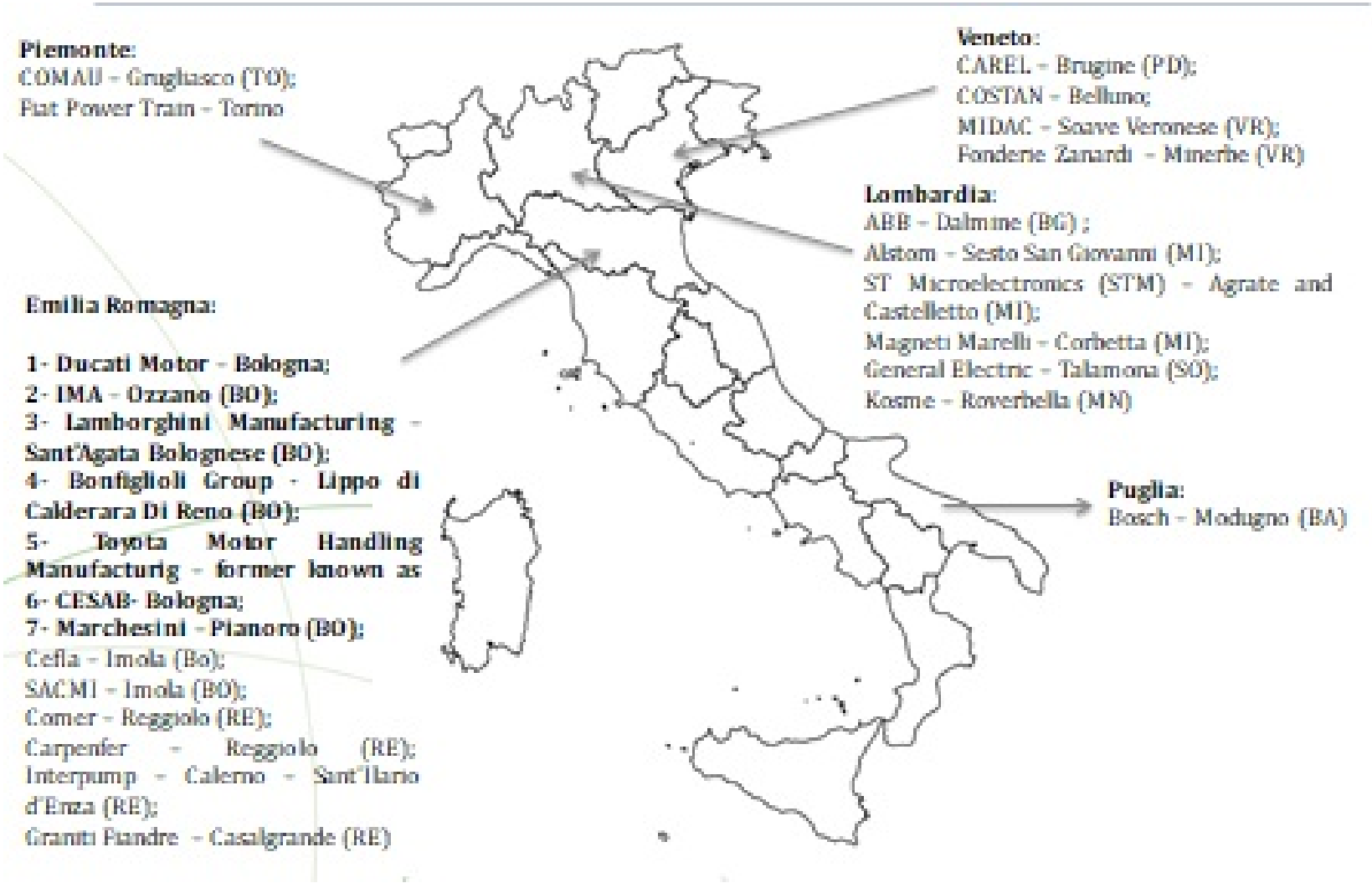
Gaddi et al. (2019) Industry 4.0 and its consequences for work and labour. Field research report on the implementation of Industry 4.0 in a sample of Italian companies

http://www.fondazionesabattini.it/ricerche-1/ricerca-europea-industria-4-0

- Interviews within the establishments in areas made available by the company or by the union delegates;
- Focus groups with firm-level union delegates;
- *Visits* to the different areas and departments of the production plants;
- Interviews with the management of the companies and other technical figures;
- Collection of business documents and other publications;

Main research question: Consequences of Industry 4.0 on work and labour

Field Research: one year of semi-structured interviews



Field Research: a sample of Italian manufacturing firms

- Case studies articulated by industrial sectors
  1. Machinery and equipment for industry and trade:
     IMA, Cesab-Toyota, Cefla, Costan, Sacmi, Kosme;
  2. Parts and electromechanical components:
     Carel, Bonfiglioli, Midac, ABB Bergamo, Magneti Marelli Milan, STM Milan;
  3. Consumer Products:
     Ducati, Lamborghini;
- Research carried out interviewing both the management and the workers of the companies
- Methodology based on semi-structured interviews (about 45 minutes face-to-face anonymous interviews)

Field Research: the themes

1. The working condition;
2. Recruitment and Training;
3. Work career and Skills development;
4. Incentives;
5. Work organization;
6. Technology and Industry 4.0;
7. Workers' satisfaction at the workplace;
8. Industrial relations, voice, unionization;
9. The company's production network and Global Value Chain.

What emerged from the field work activity?

- No reorganization –> no automation/no digitization:
  1. None of the companies interviewed developed digitization processes without performing reorganization processes;
  2. Strong correlation in many companies on the introduction of Industry 4.0 and the existence of Lean Production and WCM experiences (organizational innovation for an integrated production flow flexible and "tense");
- Industry 4.0, a business opportunity for selling services for digitized machines
  1. I4.0 not necessarily the process of digitalization is the dominus of change;
  2. Some managers say that "competition is played on selling the machines even at their production cost and recovering the margins on the services that the digitized machine allows";

What emerged from the field work activity? (I)

- Technological continuity
  1. The rhetoric about radically innovative/disruptive transformations had to be scaled down, not denying real technological leaps, but inserted on a line of technological continuity;
  2. Pictures of "dual factories";
- Process of digitalization of the production process leads to work reorganization;
- Compressing all not-added-value time activities;
- Increasing of the saturation of working time;
- The digital infrastructure of digitalization allow a level of transparency of the activity of each employee;
- Control on workers' performance;

Impacts on employment

- At the time of the research, the strategy of these companies focused on increasing production and productivity without the need of new hires;
- In many cases, automation implied moving workers previously in charge of automated tasks to other departments or duties;
- Workers went from operating one single machine to operating several ones (versatility);
- The most relevant consequences on employment take place in logistic services (i.e.: supplies lines are automatically supplied by electronic Kanban);
- Even if many of the companies involved in the research implemented a high degree of automotion, (at that time) it seems unlikely that this replaces human labour.

Research paper: focus

- Cirillo V., Rinaldini M., Staccioli J., Virgillito M. E. (2023), "Trade unions' responses to Industry 4.0 amid corporatism and resistance", PSL Quarterly Review, 76 (305):91-120. DOI: https://doi.org/10.13133/2037-3643/18083

The research questions

Trade unions and I4.0

1. What is TUs' role into current technological and organizational changes?
2. What is TUs' ability to represent workers and which are the opportunity, challenges and threats of the so called Fourth Industrial Revolution?

The current discourse: Mainstream (functionalist) approach

Industry 4.0 is both a challenge and opportunity for TU

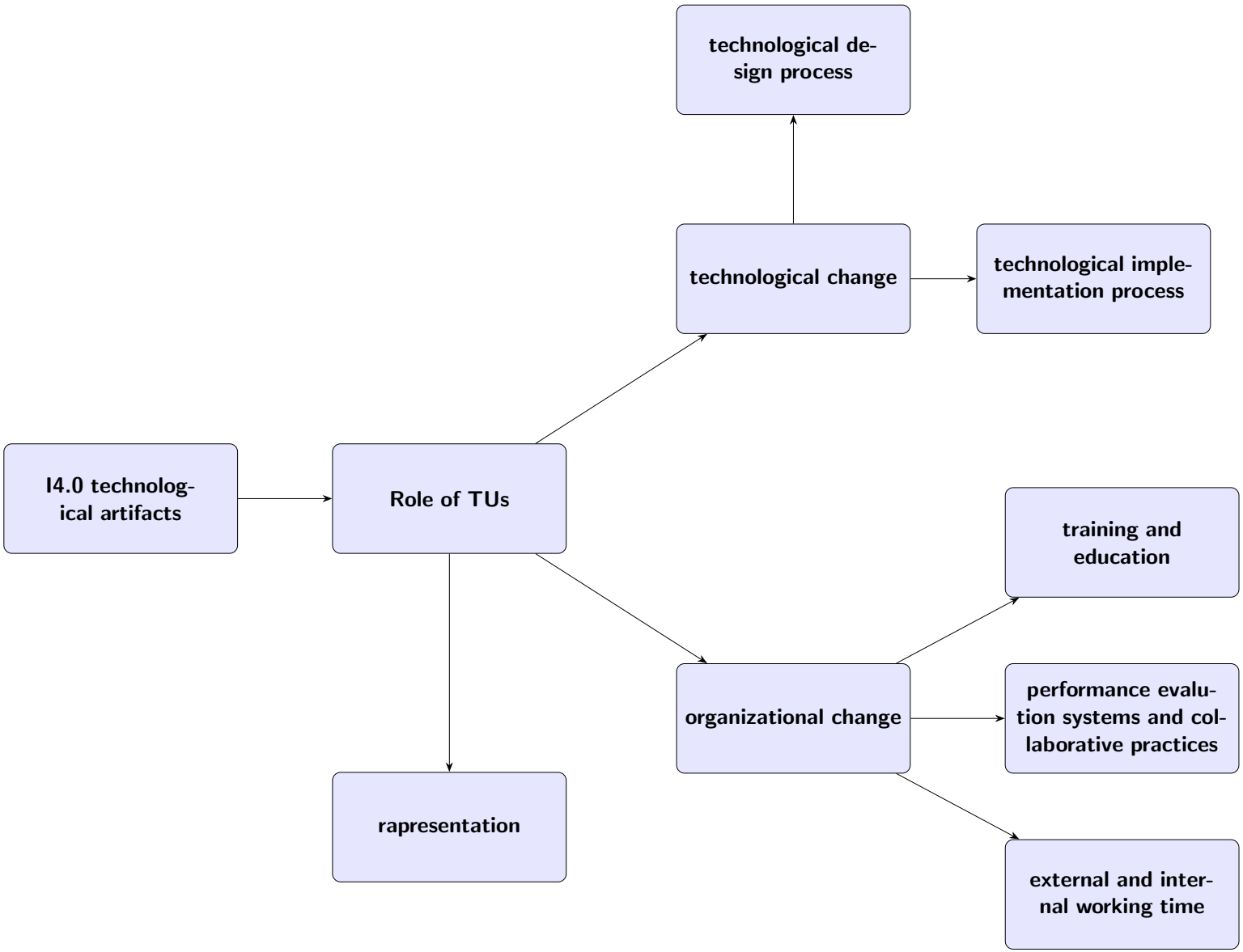
- **Challenges**: emphasis on threatening pressures arising from market/competitive environment, new technologies, lean organization, cultural changes, etc ...
- **Opportunities**: opportunities for TUs' revitalization in manufacturing industries
  - Changing TUs' conflicting approach
  - Participative/collaborative role
  - Informative role
  - TU as a sort of workers' consensus maker
  - Leaving TUs' ambition for general representation: Company level is the main (only?) level for representation (corporative orientation)

The current discourse: Critical approach

Industry 4.0 as a threat for TUs' power and the necessity to react

- **Challenges**: emphasis on threatening pressures arising from technological unemployment, skills intensification and/or deskilling, working time restructuration, organizational changes, manufacturing fragmentation, market pressures, change in class identity ...
- **Pre-conditions to react**:
  - Resisting to new forms of exploitation: Bargaining the algorithm
  - Rebuilding the general representation: Recomposing the new and diverse workforce
  - Rethinking TUs' strategy: Negotiation of work organization, technological design and implementation

The research design flow



Four firms characterised by the adoption of I4.0 artifacts

Cesab-Toyota	**Ducati**	**Lamborghini**	**Bonfiglioli**
◇ digital utensils (e.g. torque wrenches) and their data analytics ◇ digital internal communication via tablet computers ◇ 3D printers for prototyping ◇ ERP software	◇ digital utensils (e.g. torque wrenches) and their data analytics ◇ partial paperless factory ◇ 3D printers ◇ pick-to-light ◇ virtual configurators ◇ AGvs ◇ collaborative robots	◇ IoT and machine-to-machine connections ◇ big-data analytics (early phase) ◇ MES software ◇ AGvs ◇ collaborative robots	◇ MES software ◇ AGvs ◇ collaborative robots

The firms under study

Different organizational practices, but all lean oriented with strong establishment-level union culture.

From less to more digitalized and robotised firms:

- Cesab-Toyota $\Rightarrow$ Japanese Toyotism
- Bonfiglioli $\Rightarrow$ Italian highlighted family-owned property and management
- Ducati $\Rightarrow$ mix of Taylorism and co-determination
- Lamborghini $\Rightarrow$ German *'Mitbestimmung'*

The field work activity

- 84 interviews were conducted within the establishments in areas made available by the company or by the union delegates.
- 7 focus group with firm-level union delegates
- 2 focus group with provincial-level union delegates (responsible for the contractual agreement)
- The interview activity was preceded by a *visit* to the different areas and departments of the production plant.
- A number of other interviews (6) were conducted with the management of the companies and other technical figures.
- Analysis of the last firm-level contracts
- Collection of business documents and other publications that were of interest for the issues of this research.

Findings I: technological change

- **Design phase**
  - ◇ Wide acceptance of technological innovation by TU
  - ◇ Poor role in the design phase (e.g. no interaction with the R&D department)
  - ◇ But, TUs have been rather important in promoting technological innovation asking for investments (in all firms but Cesab-Toyota)
- **Implementation phase**
  - ◇ Stronger role in technological implementation phase rather than in technological design one
  - ◇ Bargaining ability on technological implementation
  - ◇ Heterogeneity between firms but in all is present **a technical bilateral committee**

Findings II: organizational changes

- **Significant role in organizational changes**

  ◇ Active bargaining processes and contractual agreements on formal education (more), on-the-job training systems (less), evaluation committees (more), acknowledgement of multi-functionality

- **Significant role in influencing the bargaining of the external working time**

  ◇ Work shifts are negotiated: in general workers prefer to have individually voluntary overtime, rather than collective equal increase of working hours (and so wages)

- **No role in influencing internal working time. If anything, TU has agreed with contractual agreement in reducing the takt-time (Lamborghini)**

  ◇ The saturation has increased in all firms under study, although with strong between firms heterogeneity in the takt-time.

Findings III: responses

- **Two alternative responses:**
  - ◇ **Reactive role [Cesab-Toyota/Bonfiglioli[1]]**:
    TU does what it is possible about work organization and technologies. Its power is high, but limited. It can resist, but it is more and more difficult [Bonfiglioli's provincial union delegate]
  - ◇ **Proactive role [Ducati/Lamborghini]**:
    Without TU here nothing could happen, none organizational change, none technological change [Lamborghini worker]

[1] Up to now Bonfiglioli is the only firm having contractualized that the MES cannot be used for surveillance and control.

Findings IV: dualistic tendencies

- **Coexistence of old and new dualities [Cesab-Toyota/Bonfiglioli]**

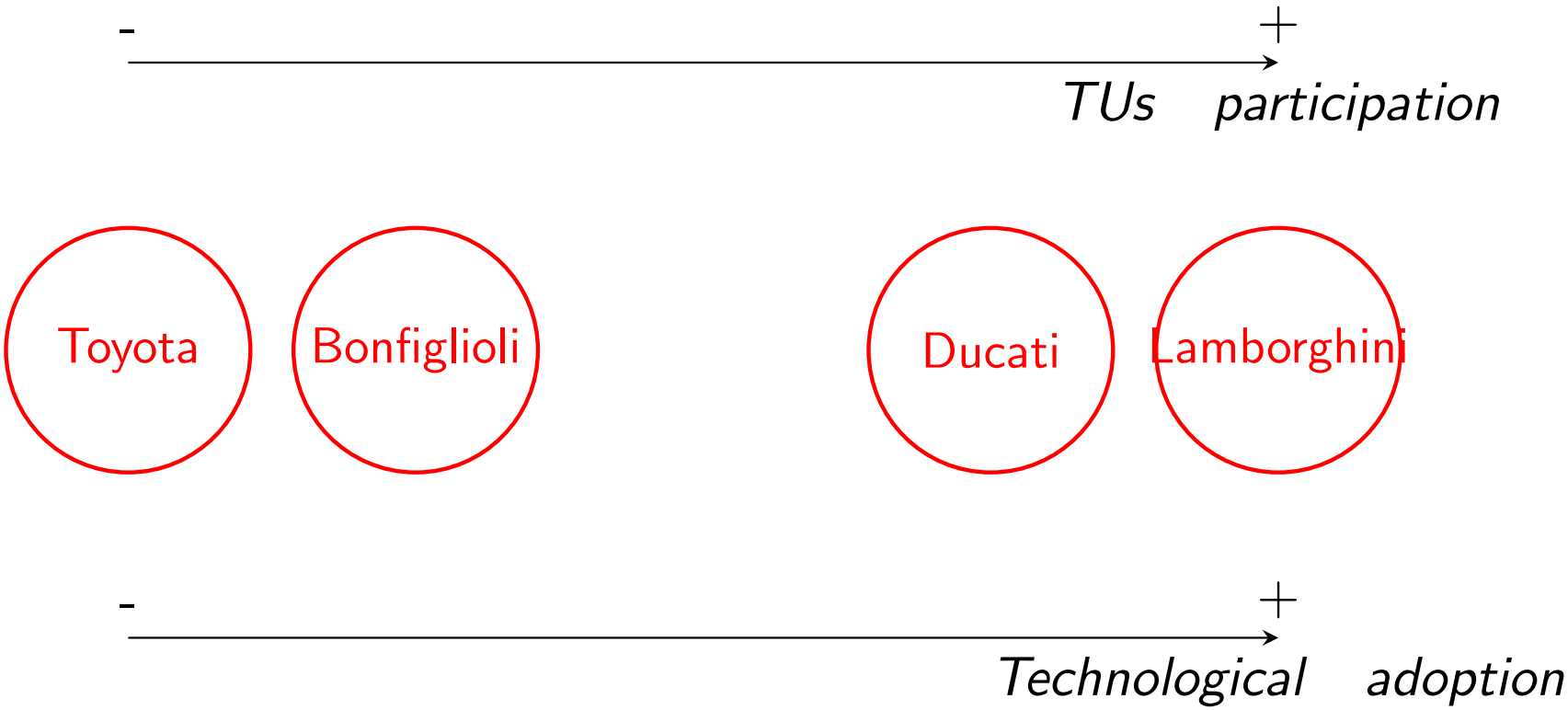
  ◇ The old duality – *white collars vs blue collars* – is more pronounced rather than new dualities – *temporary vs permanent workers/focal company vs supplier company workers*.

- **Softening of old duality and emergence of new ones [Ducati/Lamborghini]**

  ◇ A recomposition between white and blue collars is occurring (also at the level of delegates). Contractual agreements become more focussed on white-collars request (smart-working), while new dualities – temporary vs permanent workers/focal company vs supplier company workers – are more pronounced.

Final considerations I

The higher the level of technological adoption, the higher the degree of unions' participation in the different phases.



Final consideration II - Limits and threats

- The **technological design phase** is outside from TUs' power
- **Internal working time** is poorly bargained and it is firmly in the hand of the company
- When unions action is strongly successful there is a risk of **corporative closure**

Referencees I

Cirillo, V., M. Rinaldini, J. Staccioli, and M. E. Virgillito (2018). Workers' awareness context in italian 4.0 factories. Technical report, GLO Discussion Paper.

Gaddi, M., N. Garbellini, and F. E. Garibaldo (2019). Industry 4.0 and its consequences for work and labour. field research report on the implementation of industry 4.0 in a sample of italian companies. Technical report, Fondazione Claudio Sabattini e Associazione Culturale Punto Rosso.

Glaser, B. G. and A. L. Strauss (1967). The discovery ofgrounded theory: Strategiesfor qualitative research. *Chicago: Aldire*.

Moro, A., M. Rinaldini, J. Staccioli, M. E. Virgillito, et al. (2019). Control in the era of surveillance capitalism: an empirical investigation of italian industry 4.0 factories. Technical report, Laboratory of Economics and Management (LEM), Sant'Anna School of Advanced Studies.

Thank you

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