Application reference: VP/2015/004

AGREEMENT NUMBER – VS/2016/0093

Project: ***Smart Industrial Relations – Smart production in the manufacturing industry and work organisation: new scenarios for Industrial Relations***

Guidelines for the implementation of the action

Introduction

In the last years Europe and Italy have seen the birth of a group of medium and large successful businesses (fourth capitalism), that, through the so-called "smart" production systems, have achieved success on world markets even standing up to the recent economic crisis. Robotics, new materials and advanced devices, virtual prototyping and, generally, applications of digital technologies to manufacturing, are emerging in the production systems of these companies. What is the impact of the smart production on work organization and on the quantitative and qualitative aspects of employment? Of course, the application of digital technologies has required and requires radical changes in the productive and organizational methods.
Developing human and organizational capital, minimizing the environmental impact, using renewable resources, increasing efficiency and flexibility of machineries: these are what characterizes this new phase of the manufacturing system.
Besides, regarding the quality of employment, according to some recent studies in Europe two models of work organization are emerging. Especially in the so-called “smart factories” there is a "collaborative manufacturing": in some companies workers take part in the solution of problems, facing and resolving the unexpected, and in return receive a cooperative atmosphere, training, opportunities for a career advancement and an increase of their employability. Opposed to this model is that of the "constructive manufacturing", a way of production based on the “disposable work", low-skilled competences, precarious forms of work, little opportunity for workers to train.

In Europe, some studies count about 100,000 companies that refer to the production (or fourth capitalism); in Italy we can talk about 4,000 or 5,000 companies, rooted almost entirely in the north and in the center of the country. They are specialized in the typical fields of Made in Italy. In Eastern Europe, as well as in Portugal, these phenomena are linked mainly to the relocation processes launched in recent years by the large multinational companies operating in the industry. Anyway, this is a growing phenomenon both in Italy and in Europe, a result that must be related also to the results of the processes of corporate restructuring that have started during the crisis.
There is still no comprehensive definition of the Smart production.
The terms “Smart Factory,” “Smart Manufacturing,” “Intelligent Factory” and “Factory of the Future” all describe a vision of what industrial production will look like in the future.
Companies started to invest in technologies such as Internet of Things, Big Data e Cloud computing, automated production systems (A*dvanced automation)*, wearable devices and new interface (*Advanced*

Human-Machine Interface) or 3D printing (*Additive manufacturing*).
Producers use the lean production approach and are turning towards the industrial automation to speed up "time to market", reduce total cost, optimize asset utilize and mitigate operational and business' risk.
Some experts point out the transition to smart production could represent a shift from an industrial system built according to very old standards, who did not bother to jeopardize the environmental balance to another mode of production whit a higher working process level and better environmental sustainability.
Effects on employment are still not clear: pursuant to some experts, it could be negatively affected by spread of smart production. Even the interaction between man and machinery is still under studied.
Anyway, in this context, industrial relations are particularly concerned by the emergence of new modes of production.
Facing the advance of technology, which typically involves a less intensive use of labor force, work organization and the participation of the worker to production are undergoing a major conversion (types of contract, protection, incentives and rewards, active involvement of the worker in the production process, training, satisfaction), still not fully understood. The studies that analyze the changes within the labor relations and caused by intelligent production are still not many. There is the need for a better understanding of the phenomena mentioned above and the consequent development of new patterns of reading and industrial relations models. How can the social partners improve industrial relations for the management of these processes?

Plot and Research goals

Research phases are aimed at providing cognitive elements on Smart production to the principal members of Industrial Relations: trade unions, trade associations, workers

Desk analysis and qualitative inquiry will be shown throughout the workshop.
The exchange of experiences will serve to define and further improve the results obtained regarding, in particular, the following issues:
1) smart production definition, 2) identification of good practices with particular reference to quantitative and qualitative employment dynamics, 3) drawing up hints for the elaboration of guidelines aimed to improve industrial relations on smart production background**.**

Desk analysis

With the research desk we will build context analyses.

For each country subject to analysis (see the project and letters of commitment signed by the partners) the study will be oriented towards:

1) Identifying recent trends in the manufacturing sector, the main features of smart production and some positive experiences, with particular attention to collaborative manufacturing

2) Acquiring cognitive fundamentals on norms that rule industrial relations and the labour market in the field of smart production environment with the purpose of bringing in ideas about their appropriateness for the development forms of work organization focused on the development of human capital.

The Desk analysis question:

1) What recent trends characterize the manufacturing sectors of the analyzed countries and what are the main effects of the corporate restructuring occurring in the last 10 years, with particular reference to the mechanics, automotive and chemical sectors?

Information and data on growth or decrease of manufacturing sector (GDP, added value, number of enterprises, agents, enterprises classification by dimension, export prominence), research and development, technological innovation, entrepreneurial and market strategy (fusion or acquisition), outsourcing, growing or declining sectors, employment

2) In the field of Manufacturing, how has Smart production been developed, with specific reference to mechanical, automotive and chemistry sectors?

Data and information on amount and dimension of enterprises, productive sector and sub sector. Production cycle and other distinctive features: robotics, new materials and advanced devices, virtual prototyping and, generally, applications of digital technologies to manufacturing, developing human and organizational capital, minimizing the environmental impact, using renewable resources, increasing efficiency and flexibility of machineries;

3) Based on available documentation, what are the main features of smart production experience ? (employment rate, labour organization, wages, training, workers' participation, industrial relations)

What are the critical points? Is it possible to identify positive experience of "collaborative manufacturing" ? *(In some companies workers take part in the solution of problems, facing and resolving the unexpected, and in return receive a cooperative atmosphere, training, opportunities for career advancement and an increase of their employability)*

4) Relative to smart production experience, which trend can be identified in the labour market legal framework and industrial relationship system? Can weaknesses and strong points be identified?

Proposal of research report index (not definitive , to be improved)

Smart production and Industrial relations in .....

- Recent trends in manufacturing (with specific attention to mechanical, automotive and chemistry sectors) and industrial renovation following the recent economic crisis
- Smart production phenomenon, feature and effects on employment. Weaknesses and strong points.
- Smart Production and Industrial relations

Relevant sources

Official statistics, publications and research reports produced by official sources (National, EU and other international bodies, such as the World Economic Forum), Universities, Professional Associations, companies, trade unions, chambers of commerce, articles in scientific journals and newspapers .

Report Size:

Qualitative Analysis

With the qualitative analysis we will examine in depth the subject matter of Smart production, with the aim of:

- Achieving a better comprehension of most enterprises involved (small/ medium /large enterprises, production sectors) and to what extent the development of these businesses is consistent with the guidelines issued by the EU

- Obtaining details on the effects of new modes of production and organization of work , as regarding in particular the business strategies related to work organization industrial relations, safety, protection of rights, human resources, constant training, forms of contract, workers' participation in the production process, wages and forms of incentives: Weaknesses and strong points.

- Obtaining details of the system of industrial relations involved, their strengths and weaknesses and the prospects for improvement, in line with the EU guidelines

- Identifying experiences which can be classified as "good practices" in the framework of smart production

Qualitative analysis

Qualitative analysis entails :

2.a Small case study

a) Pirelli, Sorin (Italy), Volkswagen (Portugal), Fca (Poland)
The small case study can be carried out by:

a.1) Direct interview (from 3 to 8) with manager (CeO , R&D, Human Resources) , Union Officer, workers
a.2) Data capture and other information on enterprises taking part: business plans, balance sheets, employment development plans (employment, training, etc...), documents on industrial relations, etc...
a.3) Composition of a brief report

Subject matters of case studies.

Entrepreneurial strategies, market placement and development policy, research, technical innovation

Productive process and labour organization inside the enterprise: *Robotics, new materials and advanced devices, virtual prototyping and, generally, applications of digital technologies to manufacturing, developing human and organizational capital, human capital appreciation*
Industrial relations: weaknesses and strong points, improvement perspectives

2.b) Interviews with about 100 "privileged witnesses" (union officials, employer's associations, academic experts, and experts on non-academic subjects) .

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