

Regulating for Globalization

Trade, Labor and EU Law Perspectives

From Industry 1.0 to 4.0

David Mangan (Maynooth University (Ireland)) · Monday, November 18th, 2019



The ‘digital agricultural revolution’ and ambitions for technology in the workplace

Industry 4.0. This is the name used by the European Parliament in 2015 to describe the convergence of changes in a variety of areas, including ‘the design, manufacture, operation and service of manufacturing systems and products.’ The 4.0 in Industry 4.0 denotes the ‘fourth industrial revolution’ (as Klaus Schwab has called it) which Chancellor Angela Merkel described as ‘a comprehensive transformation of the whole sphere of industrial production through the merging of digital technology and the Internet with conventional industry.’ Without being uncharitable to the German Chancellor, while the description focuses upon the technological advances which have characterised the start of the 21st century, it undervalues the continuity within the title Industry 4.0. The idea of leaving older times behind is implicit in the quotation. And yet,

Industry 4.0 should not be perceived in this way. Has technology reinvented industry? Has Industry 1.0 been relegated to the past? [These are queries and challenges for employment relations.](#)

The digital agricultural revolution

The prospect of a ‘[digital agricultural revolution](#)’ may be an emblem of the larger digital transformation that has been underway since around the turn of the 21st century. Advances in agriculture by way of technological innovation may help meet the food requirements of the global population in the future. Further underscoring its continued necessity, the agriculture sector supports other areas which form elements of the innovation economy such as pharma, as well as the biological applications in each of economics, technology and, energy. However, this does not mean that there will be commensurate increases in agricultural work. The trend over time suggests a decrease in the number of human agricultural workers, especially insofar as technologies may perform routine and repetitive work. As one example, [Irish farmers’ uptake of new technologies has been low](#). Still, there are many government and industry documents that promote more widespread adoption as both a necessity and an opportunity.

Necessary transformation

Consider the following statement from a [UN Organization regarding technological innovation in agriculture](#): ‘The potential benefits of digitalizing the agrifood sector are convincing but it will require major transformations of farming systems, rural economies, communities and natural resource management. This will be a challenge and requires a systematic and holistic approach to achieve the full potential benefits.’ This quotation encapsulates the philosophical underpinning regarding widespread adoption of digitalization in agriculture: the transformation will be challenging, yet necessary. [Focusing upon the impact of digitalization, robotization and new technologies on agricultural work, this workforce will likely face job losses; one aspect of the challenge faced by the digitalization of the agriculture industry.](#) Since the 1990s, [employment in Irish agriculture has declined from about 140,000 to 108,000 workers in 2017](#). While arguments will be made that these workers may find work elsewhere, the nature, sustainability and prospects for these displaced workers remain unknown.

Ambition and capacity

Much of the digitalization discussion has been prospective. This contrasts with the present use of information technology in agriculture more generally. The most used form of new technology recently has been [social media \(as a subset of information communications technologies\)](#), such as Twitter, which facilitate information sharing and personal connections. Social media are not the types of new technologies that are more widely referenced in assessments of digital farming. Rather, data collection, assessment and intelligent oversight technologies are the ones which are more commonly cited as technologies that will improve the efficiency and output of agriculture. The more widespread current use of social media likely suggests not just the fledgling stage of technology in agriculture, but it also symbolises the slow adoption of these new technologies.

The next stage of digitalization

Arguably we sit at an early stage in the digitalization of industry and influence of technology on the agriculture sector provides a good example. There are different reasons for this ranging from cost to capacity to use these technologies. The smart phone has been an entry point for

digitalization in agriculture because it is a cheaper and more accessible form of technology. Looking longer term, there would need to be a more integrated strategy to more fully realise the often-discussed transformational potential of digitalization.

Two terms overarch discussion of digitalization in agricultural work, digital farming and precision farming where the former evolved from the latter. Precision farming developed from the widespread use of global position signal (GPS) technology which facilitated more specific monitoring. GPS has been coupled with other innovations (such as data collection and management) to improve output by optimising the means of meeting needs (that is, the needs of plants and/or animals) in a more particularized manner. Digital farming builds upon precision farming by adding intelligent networks and data management/analysis tools. And so, ‘data is no longer sourced merely from the farm equipment used, but new services are being offered with new algorithms to transform data into actionable intelligence.’

The technological infrastructure required for the ambitions collected in the term digital farming is varied. It involves the means to connect rural areas with not only network coverage but also access that is reliable (including dependable electricity supply) and affordable. This ‘vital piece of infrastructure’ is necessary to ensuring ‘the balanced development of [the] country and economy’, as well as the ‘survival’ of business and services throughout countries.

Data intermediaries

Aside from infrastructural needs, with the internet of farm things (IoFT), the prospect of further interconnections stands out. What this means is that there will likely be growth in intermediaries that facilitate a data connection between food producers and consumers. Wearable technologies that allow individuals to more precisely track food consumption (data including what is consumed, when and in what quantity). Data intermediaries will be well-positioned to collect food consumption data that can then be sold to food producers. This raises a significant concern regarding the ‘gatekeeper’ status of these intermediaries since they control access. The potential would be available to track worker behaviour in real time and intervene using mobile and other devices to nudge people. And so, data collection is not likely to be a divisible matter because data chains will connect two data points as well as points in between.

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