

Short communication

Industry 4.0 Artificial Intelligence and Lean Manufacturing

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In my opinion, factories are a precious treasure to protect for our societies. In them,... beyond real estate speculations, manipulations of national currencies, or financial engineering to alter the prices of things... in factories is in REALITY where our societies create real value for themselves and where this value is distributed in the most equitable way that exists in our current economic models.

They are not perfect, but they are the best thing we have to create or distribute wealth and a key factor of social cohesion. If you want to check it out, you only have to visit a neighborhood after a while of having lost a big factory in it and you will understand what I am saying.

For this reason, people who work in them every day to make them more efficient and sustain them in the competitive global market, as well as the training that these people receive, I believe should be practically a matter of state.

This entire world is now in the middle of a tsunami of technological and social change, accelerated by the pandemic that could jeopardize our societies on a global scale.

1. SOCIAL IMPACT OF AN INADEQUATE TRANSITION

As a good software engineer, I am a technology lover. Robotics and artificial intelligence, which I specialized in during my college years, are also two of my great passions. I have always seen with hopeful eyes any technological change that came our way in the past and I don't think this time will be any different in the long run either.

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But ... in the short term I worry that the speed at which all this time changes may occur will overnight leave an entire generation of industrial workers obsolete for employment in "Factory 4.0" but still too young to retire.

If I were right, this would cause extreme social tension in a society already incapable of reabsorbing this large group of obsolete workers in a world also shrinking jobs outside the industrial field, due to the arrival of other robots and artificial intelligence systems, such as autopilots for transporting people and goods, which the U.S. government itself acknowledges could impact

15.5 million jobs in this country alone in the next 10 years.

2. COULD IT BE "A PERFECT STORM"?

This industrial robotics revolution has actually been in the making since the 1980s. Throughout this time, this technological sector has been presenting innovations in automation of all kinds, which have gradually been perfected and their production costs adjusted, just waiting for a process of massive assimilation by the market that other products, such as the PC or personal computer, had previously undergone.

However, industrial robotization, which otherwise would have occurred gradually over these 40 years, was not completed because relocating factories to some areas in Asia during this period was often an easier option, and this same phenomenon was reproduced throughout the West, delaying the incorporation of robotics in its factories, first in Europe and the United States, and later also throughout Latin America and the rest of the industrial world.

Now that this process of factory offshoring has reached the end of its road, with companies like Foxconn announcing 3-year plans to replace 500,000 people with robots at its plants in China, the concern is that all the industrial robotic change that has been building up all this time, boosted by the accelerating effect of the pandemic, could be deployed all at once in 5 to 10

years instead of the 40 it would have taken under normal conditions.

3. WHAT SOLUTIONS DO WE HAVE AS A SOCIETY?

Lately I hear a lot of blaming entrepreneurs or managers for this process, but the truth is that, as an advisor to boards of directors, I often have to sit at tables where it is decided whether a factory is going to restructure, expand, relocate or automate and to what extent ... and I assure you that at these tables the people who sit to make these decisions are in most cases truly passionate about their industrial projects and feel their staff as a big family that accompanies them on their journey. They are certainly not the problem.

However, when the market presses hard and tough decisions have to be taken, the manager has to take them, whatever they may be. And I assure you that even if someone foolishly managed to convince some CEO/COO not to automate his factory even if it was necessary, then another competitor would do that and would end up sweeping them out of the market without remission.

The solution, far from blaming anyone, in my opinion is to merge the Operator with Artificial Intelligence so that factories with human personnel can compete with robotized plants, not because we give them a subsidy for it, but because we make them just as productive and even more flexible. With personnel 100% connected to each other, always coordinated, without wasting time or raw materials and capable of manufacturing high quality products the first time.

If we can achieve this fusion with iA, the extra flexibility that humans have over robots will give us a chance to make the transition to Industry 4.0 smoother, less

disruptive and its employment impact can be spread over a generation to avoid displacement.

On the other hand, if we fail in the coming years to transform our human-staffed factories to this "Lean Manufacturing 4.0" model and the only alternative to a robotic factory is an inefficient and uncoordinated staffed plant, when the time comes to make such decisions, the decision that boards will invariably make will be to automate their processes with the other increasingly cheaper and proven robotics option.

4. HOW CAN WE DO THAT?

I think there are 3 key points to promote a solution to this problem.

1.-The first involves professionals with successful careers done in the industrial technology.

To them I would say that we must seek and lead technological projects that aim to enhance the capabilities of humans in the factory rather than replace them. Of course, I do not judge any

of my colleagues who are involved in replacement robotics projects, as I know that the vast majority of them are driven by engineering curiosity and a passion for robotics that I share with them. But it is no less true that our world needs us in the tech industry to balance our talent both variants of the Industry 4.0.

I myself made that decision a few years ago when I joined the American multinational software company iLEAN, as one of the iconic projects of this division of "Industry 4.0 for Human Empowerment" and I have had the honor of leading an incredible team that has merged all the methodologies of Lean Manufacturing with an artificial intelligence to enhance human capabilities that is able to bring any work center with human operation to previously unthinkable levels of productivity.

2.-The second key point involves young people and the schools that train them.

I believe that we must speak with them about this "elephant in the room" and how it will have a huge impact on the labor market for which they are preparing. A few months ago, a Silicon Valley company released an artificial intelligence system with which you can have a natural language conversation about any legal issue and which write in seconds after that, any legal contract you need, taking into account all the local jurisprudence and criminal codes of each country.

Shouldn't we be explaining that to law students and colleges in the word? Shouldn't we already be adjusting the university curricular contents that our kids are taking at this moment with so much effort from them and their families?

3.-Finally, the third key factor in this solution involves governments and institutions of all kinds.

To them I would say that we are facing a key moment in the history of mankind, and we have two possibilities:

We do nothing and this at some point will explode, leaving out of play that part of society that is most unprotected, with the least resources and training, who could be definitively set aside from that day until the end of their working life with no real option for retraining.

Or, on the contrary, we can take a coordinated action in which Governments, Universities, Training Organizations, Chambers, Business Associations and Experts from all over the world come together to see how we can build a step-by-step Master Plan that will allow us to make this transition in a civilized manner.

It is possible that, after almost 30 years working with factories and artificial intelligence, I have a distorted image of the industrial reality and I am wrong in my diagnosis of the problem. But if you think that we may be right, I would ask you to share this information with as many people as you can to foster a coordinated social movement that could solve it.

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