



Post pandemic manufacturing trends

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Covid-19 quickly turned into a global crisis, evolving at unprecedented speed and scale, and wreaking havoc over the world economy. It is now the biggest global event and challenge of our lifetimes and is creating a universal imperative for organisations to take immediate action. As such, it is changing our attitudes and behaviours, and forcing businesses to respond. However, the need to respond will not end when the virus's immediate threat eventually recedes. Such a major impact on the daily lives of billions of people will inevitably expand to many other domains, from the way companies organise their processes in general and, particularly in manufacturing, to the role new technologies can play in this overwhelmingly different scenario.

Let's imagine that in a time that is hopefully not so far away from now, things are back to normal. We can meet face to face, travel is again possible and our business routine is restored at least to a certain extent in its old rituals. Nevertheless, things have changed. covid-19 has forever altered the experience of being a customer, worker, citizen and human being. Expect to see behavioural change at scale for some time to come. How will that affect the way we design, communicate, build the things that people need and want? How will their experience in purchasing and using them be transformed?

The answers to these questions will lie in the way people react and how individuals, families and social groups find new ways to live. We are witnessing massive behavioural

changes at a scale and speed that we have never seen before, sparked by fear, aided by social media and encouraged, when not enforced, by governments. Such change, as far as our experience of manufacture is concerned, includes things like frequent hand washing, working from home, adopting new operational schemes and accepting a modification in roles and tasks at a level that could have hardly been imagined only a few months ago.

RESPONDING TO CHANGES

One of the main outcomes therefore of the pandemic that has hit us so badly is that our behaviour has changed, possibly forever. The science of behavioural change had already become a known subject of study and an increasingly important tool over the

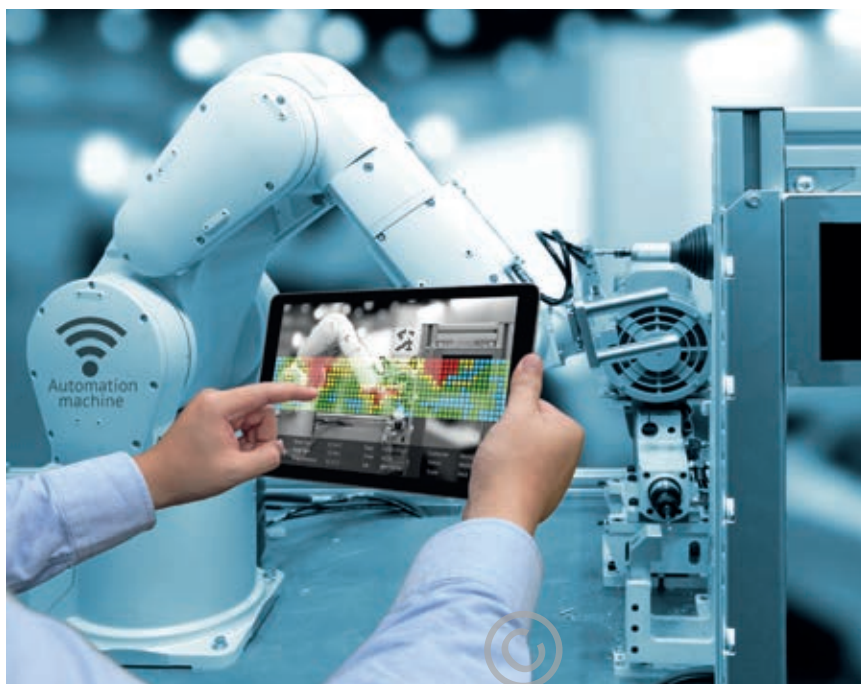
past ten years. Leading companies had already instituted tools and practices to monitor, collect, analyse and act on a mix of digital surveys, behavioural signals, listening and sentiment. Now, the need for these capabilities will become fundamental to experience creation and the speed at which companies can and, increasingly must, respond to them will become sources of competitive advantage. The formula for all companies is capture the signals, learn from the lessons of the disaster and, eventually, reassess business and technological strategies.

Looking at the gloomy forecasts of GDP losses on a world scale and the shrinking of retail business both during and after the lock down phase, we can begin to understand how strong this impact will be on the footwear world in general and on its manufacturing activities in particular. APICCAPS (the Portuguese association of footwear manufacturers) recently published a survey conducted among a panel of experts in various areas of the footwear business (including manufacturing) in March. Most of the respondents believed that in the first half of 2020 the global quantity of footwear sold would fall as would their prices, with a particularly grim outlook for Europe.

When questioned specifically about the impact of the epidemic on consumption as compared to a no-epidemic scenario, the panel members on average were forecasting a 22.5% reduction over the same period. They also believed the epidemic will have lasting consequences for the location of footwear production with firms diversifying their sourcing among multiple countries to reduce risk or bring production closer to consumer markets. So, it is necessary to ask ourselves how shoe manufacturing may change in relation to that and which role old and new technologies will play in such transformation. We have identified seven trends that we want to cover here.

1. MORE AUTOMATION FOR BETTER DISTANCING

The pandemic has forced us to learn to live together in a scenario of 'social distancing' which must also be rigorously extended to the workplace. Such a requirement is not compatible



Automation is a natural solution to reducing the density of operators in a factory environment. CREDIT: ZAPP 2 PHOTO / SHUTTERSTOCK

with labour intensive production schemes and with a high density of workers in confined spaces. This will have an impact on an organisation and lead to a careful analysis of what operations in a production process (for example, simple and low value-added manipulation operations) could be automated. The logical consequence of this statement will be a more urgent use of automation where unnecessary manual operations or those without added value are performed by automatic machines or robots. Automation then becomes a natural solution to reducing the density of operators per square metre in a factory environment.

This is certainly not a new trend. Automation brings together higher efficiency, a more consistent quality and a beneficial transition from labour costs to capital expenditures, all of which are drivers for change that already existed before the pandemic. Robotics was already proved to be a valuable (and usable) technological asset to capture these benefits. However, what used to be an option is now turning into an imperative. This leads us to think that when the acute phase of the epidemic is past and companies have recovered their appetites for investment, the adoption of more automation will have to appear at the top of their action list.

2. SMART TRANSFORMATION OF JOBS

The most logical consequence of the previous trend is that roles and professional profiles on the shop floor will have to change. Presumably there will be a progressive abandonment of non-smart activities in favour of smart activities that will require greater and different professional skills. Less labourers and more brain workers or even better, labourers transformed into brain workers. This may sound over ambitious but it is what the footwear world has always needed and it now needs to attract youngsters with their payload of talents and enthusiasm. The emergency offers a perfect opportunity to trigger this process.

This will in turn call for an important effort in staff training and retraining. A crucial role will be played here by technology suppliers and machinery builders. Their task will be to facilitate this transition by making the operation of their machines and the managing of their plants easier and more intuitive, and by developing self-learning and e-learning tools that become an integral part of the machines themselves. New technologies, such as collaborative robotics that also allow non-skilled users to have an easy way of managing the programming of robots, are eminently suitable to support this transition.

3. SUPPLY CHAIN RE-ENGINEERING AS A RESULT OF RE-GLOBALISATION

If there is a lesson, at both national and production chain level, that everyone is learning at a high price, it is the dependence on fragmented and long distance supply chains both for strategic goods as witnessed by the quarrels between countries over the procurement of face masks and ventilators, as well as for those items more or less essential for the manufacturing of consumer goods in general. Just think of the panicked reactions when China, the factory of the world, was shut down early in January and supply chains everywhere were disrupted only to find out a few weeks later that when China was ready to restart, there was no point in producing shoes that no one could or wanted to buy.

It is foreseeable that this will impose a revision of globalisation models and production chains with a rebalancing in favour of short chains compared to longer ones. This will give greater impetus to those re-shoring phenomena that were already visible before the emergency and which will now be strengthened. It therefore becomes more probable that at least part of the world's footwear production will return to the industrialised countries, a return that can only take place by adopting different production paradigms than those of the past and which once again favour technology and automation. Globalisation is certainly not dead but it does need to be rethought and bootstrapped again on different premises.

4. IMMATERIAL FACTORIES TO MAKE HARD GOODS WITH SOFTWARE

Social and work distancing and smart working will inevitably push towards a digital transformation of manufacturing, accelerating a process already in progress (or on the verge of being implemented) and which now becomes urgent as a consequence of the epidemic. As a result, technologies such as machine and process simulation, virtual prototyping, augmented reality, remote monitoring and assistance will have a strong boost. In fact, they allow a



It is probable that companies will revise and shorten their production chains as a result of covid-19.

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series of activities to be conducted in the digital world and on 'digital twins' of products which, to date, required physical interactions with products and their presence in well-defined places. Physicality will not completely disappear but the importance of 'soft' compared to 'hard' will certainly grow, leading to a progressive 'dematerialisation' of the production processes.

Shoes are without doubt hard goods but companies will nevertheless have to learn how to use digital technologies on a much broader scale in order to cover a higher number of steps of the development cycle in the digital realm and move into the physical world only when it becomes strictly necessary. They will also learn (or possibly they have already) that it is not mandatory to send their technicians to another part of the world to supervise the making of samples or to monitor the setting up of a manufacturing line when these activities can be done digitally, remotely and cooperatively. Think also of the savings in cost and the beneficial impact on the environment which brings us to the next trend.

5. GREEN AND SUSTAINABLE

The drive towards environmentally friendly products with all the complexities the definition carries with

it and towards sustainable production chains and processes was already in place and visible before the pandemic. It is conceivable that this push will become even stronger now. Perhaps not so much in the sense of 'green' products as such, which imply penalties on the final purchase price where it is not known how much consumers will now be willing to accept, but as in that of a highly sustainable manufacturing approach.

This has repercussions in the way machinery must be designed in terms of contained and monitored energy consumption, in the efficient use of raw materials and, ultimately also on the manufacturing model in a broad sense, with a strong push towards 'on demand' schemes whereby only what the consumer has already decided to buy is produced. On the other hand, a reconsideration of globalisation strategies in the direction of less personnel travel, shorter supply distances and a higher level of vertical process integration within factories naturally contributes to the general sustainability cause.

6. WORK FORCE AS A DYNAMIC ASSET

Another consequence of the pandemic and, in particular, of those measures of distancing between people that must necessarily also be adopted in

production environments, will be that the workforce can no longer be considered a constant 'asset' in terms of physical presence in the company and for assigned tasks. Vice versa, assignments and attendances (also in terms of active control of the presence of each individual worker and of their access to the assigned company departments) must be managed dynamically and planned in terms of 'resource allocation' such as with a machine or a raw material, maximising in all instances efficiency and overall productivity. This will require the development of ad hoc software or the adaptation of existing production planning suites to incorporate these new capabilities.

7. CONNECTED MACHINES AND AVATAR MAINTENANCE

Among the many consequences that the coexistence phase with covid-19 will have, will be a strong limitation on mobility both within a country and, above all, towards foreign destinations. It will therefore be much more difficult than before to send technical support staff (both short and long range) for updating and maintenance of machinery and systems. This will give a strong impulse to remote support formulas based on technologies such as augmented reality and others that project the physical presence of the assistance staff in some form of 'avatar' to help and assist in the place where the machine is installed.

Equally vital will be the possibility to remotely monitor the machines themselves, check their operations, anticipate failures and interruptions, and provide predictive maintenance services so as to either reduce to a minimum or completely eliminate the need for physical interventions. Ultimately this is the domain of the Internet of Things/Internet of Machines combined with all modern augmented/mixed reality technologies. The adoption of this paradigm will become essential in order to guarantee sustained manufacturing operations as well as to provide technology suppliers with additional business opportunities that are supplementary or even a substitute for those related to the simple sale of machinery.



It is conceivable that products will become greener as a result of a highly sustainable manufacturing approach. CREDIT: LIGHTSPRING / SHUTTERSTOCK

In conclusion, the dramatic events of the last few months are going to leave a legacy that will change our lives or, at least part of them, forever. At the same time the earthquake that devastated the world's economy, global commerce, retail mechanisms and consumption habits will have permanent effects on the way goods will be designed, manufactured and sold in the years to come. None of these seven trends is radically new in itself; their underlying

technologies belong to the general Industry 4.0 domain and were already part of the implementation checklist of many companies. What the pandemic has brought is a new twist in their relevance and a sense of urgency that did not exist before. As usual, times of crises are also times of opportunities and the trends presented here are meant to provide companies with a compass to navigate in these difficult times. 🚦



The pandemic has changed our behaviour, possibly for ever.

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