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1. How COVID-19 and the consequent lockdown has impacted your professional and teaching activities and how have you adapted to the new circumstances?

"The University is closed, but not entirely. I am totally working from home, but at the MIT, which is a technical institution, there are lots of experiments ongoing that cannot be simply left undone. Therefore, some students and researchers are still coming to University every day.

Our students are coming from all over the world. We finished the semester by teaching online and, since the MIT has been running online programs for several years, we know how to do it. We continued research projects working with companies, and in some cases this can become simpler because though virtual meetings it is easier to talk with Executives, ask for data, etc. Everybody is available online almost all the time and it is not a problem getting in contact with people. In that sense our researches are going even better than before.

We all miss the face to face interaction, therefore we do a lot of activities for employees, including weekly virtual meetings and online collective games to keep the spirit up."

2. The coronavirus caused a paradigm shift in how we work and how companies conduct their business, are these big changes here to stay after the COVID-19 period?

In terms of uuniversity, there is a large discussion about going online. In my opinion there is a difference between undergraduate and postgraduate students, and regarding different faculties - e.g. in courses that do not require laboratory work the teaching could be done online. However, we should also consider that for young people going to university is a social experience, hardly replaceable with online platforms. Hence US universities may embrace the idea of having a gap year for students to make experience travelling abroad, similar to what happen already in Europe.

While private universities are doing well, there are many universities going out of business, especially public ones. This educational gap could be filled by prestigious universities offering online courses – at reduced rates - that could accommodate more students."

3. The COVID-19 crisis escalation for being a regional challenge to a global pandemic had a dramatic impact on our globalised economy, disrupting production processes and logistical chains (e.g. temporary factory closures, stricter border controls, staff shortages, new consumers behaviour etc.). What lessons can be learned from this crisis in that respect?

"The real question is: what will happen next?

During the crisis, both in the US and in Europe, we discovered that there was not enough medical equipment for healthcare workers and not enough ventilators for hospital patients. It was a shock to the system. In the US this happened since the strategic stockpile was not duly renewed since 9/11.

I don't think that the production of medical supplies, therapeutics and antibiotics, will be brought back to the US. One solution could be to create inventories for medical supplies. Similar to the strategic petroleum reserves, these inventories

should not be allowed to be used unless there is a crisis. As for the existing strategic reserves, a Presidential approval should be requested to use these medical supplies and equipment to avoid quality and price fluctuation in times of crisis.

People think this will be the end of "just in time" and the end of "Made in China", but both these assumptions are wrong. Low inventory in most products is not a problem (although in medical supplies it is) and leaving China won't happen anytime soon.

China is a huge and a continuing growing market and a way for US companies to expand. Companies that went to China because of low-cost manufacturing are not likely to come back to the US or Europe and many of them are already leaving China because of tariff and increasing costs, moving to south and south-east Asia.

If we speak about more sophisticated products, such as automotive parts, high-tech, avionics, etc. it is very hard to leave China because this is not just the final assembly line but there is a whole ecosystem of suppliers which are all based in China. Moving these ecosystems out of China will require a huge amount of time and economic resources.

Instead, companies should focus on balancing their exposure on different markets, without become too much dependent on a specific region."

4. Will you say that the COVID-19 crisis has highlighted the criticality of sustainability and circular economy even more? How will these topics/objectives fit in a post COVID-9 world? At the EPCA 52nd Annual Meeting, held in October 2018 in Vienna, you discussed about different companies' approaches to sustainability, warning that: "*Consumers say they want more sustainable products and processes, but they won't always pay for them*" Are they now prepared to pay the price for greater sustainability?

"I must say I am very worried.

One thing is fighting a pandemic which, no matter how terrible, will have a peak, a stabilisation phase and at the end we will have therapeutics and vaccine thanks to thousands of scientists searching for the cure and billions of dollars invested at global scale.

But global warming is much worst. There is no peak and there is no vaccine, and there is not nearly as much money invested in trying to find technological solutions (eg carbon sequestration).

In terms of sustainability, the situation coming out of COVID-19 will be worst because people will be poorer and less inclined to pay for sustainability, seen as a luxury. Developing countries will be devastated and it would be easier to go back to traditional solutions to get economic recovery. Moreover, I believe that since the price of oil is dropping, it would be even harder for some to justify investments in renewables.

Talking privately with companies' executives, you quickly realise that their current priorities are cost-cutting, revenue increase, better customers service and risk management, including smart inventory management. The importance of sustainability in the corporate priorities will go down, while the effects of climate change, such as the rising level of seas, are still happening!

The US invested trillions of dollars to help its economy. If we would invest part of this money in finding technological innovation to tackle global warming, involving engineers and scientists all over the world, I am confident that we could find a solution.

I hope that Governments will start spending money to search solutions for global warming, independently of the will of their citizens. However, we see that countries are using energy sources which are cheaper and available (including coal) in order to keep their economies going."

5. What are LSP companies doing to adapt their businesses to the new demand environment? To what extent will this COVID-19 crisis make supply chain less global and more local?

"COVID-19 is accelerating trends that were already ongoing. LSPs are investing in robotics in warehousing, autonomous vehicles, drones, etc. - becoming more efficient in large part by using technology. Most company are updating their IT infrastructure, integrating cloud software that can be implemented remotely.

In contrast to previous logistics disruption – which consisted of lack of supply from a certain area of the world - with COVID-19 both supply and demand disappeared when the pandemic hit a particular region.

In some cases, companies that produce and sell in the same region are less impacted. However, local production means higher prices, with direct consequences on the purchase power of the low-income citizens that could not afford regional-made goods. In the US, some are pushing for more national production without considering the consequences for a large part of the American population."

6. In one of your latest articles , you identified "planning for disruption" as the first and foremost activity to enable the flexibility and quick changes required during an unforeseen challenge. Could you elaborate more on this.

"There is a series of things that companies should do before a crisis.

First thing is mapping the supply chain to make sure to understand where supplies are made and where the manufacturing plants are so, in case of regional disruption, they know which plants will be affected, which products they could not make and who are the customers to alert. Companies can rely on digital alert systems that provide immediate information in case of production or logistic interruption (fire, demonstration, ports closure, etc.).

Secondly, setting an emergency operation centres helps to react quickly by sending the needed goods to distribution centres around the hit areas (eg in case of hurricane). These centres facilitate the decision-making process, by addressing the right person within a company. It is also important to map the ecosystem, to know better your suppliers and the alternative products available during disruption, to identify in advance what people may need in case of disaster and to strengthen the link with local authorities.

Preparing ahead of time allows companies to get quick answers during disruption time, such as how to prioritise customers in time of scarcity, how to ensure that small and more vulnerable suppliers stay in business, etc.

In the US, public authorities and private companies started to pay more attention to risk management and resilience after the Katrina hurricane, and the biggest shock for companies was definitively the Fukushima Daiichi nuclear accident. In the US, some large companies are well prepared and moving in the right direction. Small companies have less resources to prepare comprehensive resilience plans, but they are moving faster and are more adaptable during crisis."

7. Since 2017 EPCA has been working to encourage the digital transition in the Petrochemical supply chain. Digitisation proved to be a means not only to improve efficiency but also to reach sustainability targets. Does technology create an opportunity to build an alternative, more sustainable global supply structure?

"The technological efforts done in the past years helped companies to optimise operations, improve visibility and avoid waste.

Unfortunately, these efforts are not enough, and we are getting into times when people will have difficulties to buy and advocate for sustainable products, unless Governments will enforce some regulations. Renewable sources remain by definition less efficient than fossil fuels and we lost the race for nuclear power, which could have been a solution for the next 10000 years.

After COVID-19, our next fight should be against global warming, which is a worst enemy. We are not moving fast enough, and even if we stop any environmental polluting activities today, the emissions already present in the atmosphere will keep warming the earth. We need to find technical solutions.

I would like to close the interview with a call for Governments, philanthropic foundations and companies to stop paying lip service and put the right amount of resources, comparable to the amount they devote to fight COVID-19, to address global warming. We should look at it as a war, that we must win for the sake of humanity."