

Commentary: MIT's Sheffi — a profile in supply chain, innovation and technology

Professor leads MIT Supply Chain & Logistics Excellence network



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6 minute read

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I am very excited to bring readers of FreightWaves a profile of Massachusetts Institute of Technology professor Yossi Sheffi. I first discovered him for myself in 2016, while I was still in the early stages of formulating an investment thesis about early stage technology and supply chain. He has authored 6 books, all of which I own.

Then I saw him speak in April 2018 when I attended Crossroads 2018 at the MIT Center for Transportation & Logistics.

His most recent book, “The New (Ab)Normal: Reshaping Business and Supply Chain Strategy Beyond Covid-19,” was published in October, and that provided the impetus for me to ask if he would agree to be profiled for this article.

Our discussion touches on lessons for corporate executives, technology startup founders and even early-stage supply chain technology venture capitalists. We also touch on themes that regular readers of this column will find familiar.

I hope you enjoy my summary of Sheffi's background and the following interview as much as I have. If his name sounds a bit familiar, perhaps it is because you have come across my reference

to an article he published in The Wall Street Journal in [Commentary: Is 2020 the year of supply chain risk?](#) which ran on FreightWaves on March 5.

More recently, Sheffi was a guest on Fuller Speed Ahead with Craig Fuller, founder and CEO of FreightWaves ([Spotify](#), [YouTube](#)) on Oct. 16. [Sheffi](#) is the director of the Center for Transportation & Logistics at MIT. He is also a faculty member in MIT's Department of Civil and Environmental Engineering, and the Institute for Data, Systems, and Society. He obtained his Ph.D. from MIT in 1978 and his B.Sc. from the Technion in Israel in 1975. Over the years, he has founded or cofounded five companies that have each been acquired. He has won recognition and awards for his work, and leads the MIT Supply Chain & Logistics Excellence network — a global network of academic logistics and supply chain management centers.

I urge you to read the link above to learn much more about his work. If like me you are someone who obsesses enthusiastically over supply chain, innovation and technology, you will find his conversation with Craig fascinating.

Now, on to our conversation.

Aoach: Tell us about your experience building the MIT Center for Transportation & Logistics. What initially gave you the inspiration? What has surprised you as you have built it over the years?

Sheffi: When I took over the center, I was actually the fourth director. However, originally, the center was focused only on passenger transportation and, in particular, public transportation. When I took over the center, in 1992, the interest in these issues was declining and the logistics field was growing by leaps and bounds. I moved the focus of the center's activities to logistics. Shortly thereafter I founded the interdepartmental master's degree program in logistics (now called supply chain management).

One of my reasons for doing this was that I saw that very little of the research I was doing (and many of my colleagues) found its way into practice. However, using the same network optimization and other mathematical tools got carriers and shippers excited because it saved money. This was a lot more fulfilling and was part of the pivot to logistics and freight

transportation. It did not hurt that the demand for this degree was very high and within a short time it became the No. 1 in the world.

Aoafh: You have written extensively over the years. I'd like to take readers of FreightWaves on a tour through your writing. What is the main conclusion that corporate executives who read FreightWaves should take away from each of your books?

Sheffi on “Urban Transportation Networks” (1985): Interestingly, with new software (mapping, navigation, etc.), there is new interest in urban transportation networks. This book is now somewhat dated (1985) but the concepts are still valid. It can help managers in planning last-mile delivery networks.

Sheffi on “The Resilient Enterprise” (2005) and “The Power of Resilience” (2015): These books describe the steps executives should take to protect their supply chains. The books are different in that the first one was written after 9/11 and lamented the fact that many companies were not prepared, arguing what they should do to build resilience. The second book was written 10 years later, following Katrina, the Japan disaster and many other supply chain disruptions. The disruptions and risks were growing but companies were also adopting better systems and processes. The book documents many of those and provides a new framework for thinking and acting about supply chain risks. Both books are based on primary research, working with hundreds of companies and executives.

Sheffi On “Logistics Clusters” (2012): The question in this book is why companies seem to locate next to their competitors. The book looks at industrial clusters in general and logistics clusters, such as Memphis, Singapore, Rotterdam and countless others. It explains why logistics companies in a cluster actually help each other, despite the fact that they are in competition. For example, having many logistics companies in one area means that transportation service in and out will be cheaper and more frequent, making the cluster even more attractive to more logistics providers. Cluster companies also acquire clout with local government to get the regulations and public investment that serve their needs.

Sheffi on “Balancing Green” (2018): “Balancing Green” could be called “The Real Inconvenient Truth.” In this book I show that people are not willing to pay more for sustainable products despite what they tell pollsters. Companies cannot invest if their customers are not going to pay

more, and governments cannot pass laws, like carbon taxes, because they are either voted out of office (like the Australian government) or there are riots in the street (as happened in France). I conclude that changing behavior or forcing people to reduce their standard of living is a losing proposition. Furthermore, half of humanity lives on less than \$5 a day, and when they join the middle-class emissions will grow even further. I argue that the solution is in developing technology that will take carbon out of the air. Such carbon sequestration schemes exist today but are not yet effective at scale. I call for massive investments in these technologies.

Sheffi on “The New (Ab)Normal” (2020): That’s the new book. It is a relatively wide description of many elements of what happened in the last several months and what is likely to happen going forward. The focus is on supply chain and trade, but the book also looks at the future of higher education, urbanization, globalization and other issues.

Aoaeh: Given your vantage point, what do you see as the three or four technological innovations that will contribute most to the transformation of supply chains, especially transportation and logistics, over the next decade or two?

Sheffi:

- A new era of sensors that are much cheaper and much more capable will be coming soon, and they will enable better visibility and tracking of shipments.
- Virtual and augmented reality are on the cusp of getting wider use in warehousing, retail and transportation.
- The use of automated vehicles for last-mile delivery, as well as drone deliveries will change the logistics of getting to the consumer.
- New computation hardware (quantum computing and other innovation) will enable optimizations on a larger scale.
- The use of AI and more computing power hold promise of better forecasting.

Aoah: What advice would you offer entrepreneurs creating new technologies and innovations to solve problems in global supply chains?

Sheffi: The perennial issues are still there: forecasting, visibility, transparency, technologies and processes for fighting global warming.

Aoah: I am currently writing a series on artificial intelligence and machine learning in supply chain. The series started on July 7 and will remain the focus of my weekly columns till the end of 2020, and I am now realizing that it could easily extend well into 2021. Given conversations with your peers at MIT, what observations do you have about the application of artificial intelligence and machine learning within industrial supply chains?

Sheffi: The main current applications are in forecasting (short and long term), and in the advancement of automation including robotics, RPA, drones, autonomous vehicles, etc.

Aoah: What advice would you offer corporate executives seeking new technologies and innovations to solve the problems they have been living with in their supply chains?

Sheffi: The time is right to get quick approvals for anything that will help with meeting customer needs and wants during uncertain times. These applications include forecasting, automation, visibility, supplier management, fast network optimization, fast contracting, etc.

Aoah: What has surprised you most about COVID-19?

Sheffi: How fast supply chain responded in many industries to the changing conditions. Most companies realized how central supply chain management is for their business, and the media realized how important it is for societies to function.

Aoah: My partners and I are building an early stage venture capital fund to invest in technological innovations for supply chain. What advice would you offer us, given your experience?

Sheffi: Hmmmm ... make sure that you have expertise in supply chains. It's not enough to invest in slick PowerPoint presentations — you must understand how supply chains work and how they impact business competitiveness. Make sure that you do a rigorous due diligence.

If you are a team working on innovations that you believe have the potential to significantly refashion global supply chains, we'd love to tell your story in FreightWaves. I am easy to reach on [LinkedIn](#) and [Twitter](#). Alternatively, you can reach out to any member of the editorial team at FreightWaves at media@freightwaves.com.