



## Jay Walker

Executive Chair

### PERSONAL PROFILE

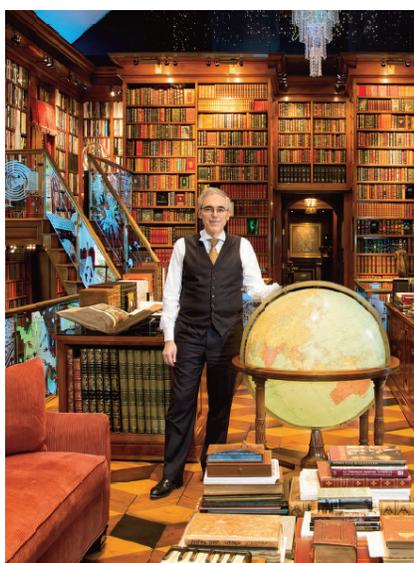
Jay Walker, the Chair of ApiJect Systems Corp. and Executive Chair of ApiJect Systems Corp., heads up business and technology activities for both organizations.

Jay has been a thought leader in the world of health and medicine for some years now. Beginning in 2011, he has served as Curator of TEDMED, the health and medicine edition of the world-famous TED conference.

He also serves on the Presidents' Circle for the U.S. National Academies of Sciences, Engineering and Medicine. In addition, he was the founder of LabTV, a startup that turned more than 1,000 medical researchers at 80 top U.S. universities into role models for younger students.

"I am a passionate student and practitioner of human imagination," Jay says. "Imagination is often underrated or overlooked, yet it is our greatest resource for problem-solving and progress."

His own imagination has led him to a career as both an inventor and a serial entrepreneur. Jay has founded dozens of companies, three of which serve more than 50 million customers. Among them is Priceline (Booking.com), one of the world's most successful travel



**"Understandably, the medical community values careful, gradual evolution. But the urgency of COVID-19 is driving change at a highly accelerated pace."**

— Jay Walker —

companies. Jay is the world's 10th most patented living inventor, with more than 950 issued U.S. and international patents. His current business activities include leading Upside, a three-year-old company that he cofounded to serve business travelers.

Jay's focus on imagination is embodied in the Library of the History of Human Imagination, which he founded and curates. As the repository for some 30,000 volumes and hundreds of museum-quality artworks and artifacts, the institution was described by *Wired* magazine as "the most amazing private library in the world."

Assessing COVID-19 in terms of a challenge to imagination, Jay sees the pandemic accelerating a number of powerful trends that have been underway for several years.

"A revolution has been in the making, driven by 10 super-forces that range from synthetic biology to 3D printing," he says. "These super-forces were already sweeping the world before the novel coronavirus arrived."

Now COVID-19 is clearly increasing the impetus across government, business and science to innovate, to think anew —and to imagine and create a better future."

# “Every scientific revolution demands imagination.”

The ability to foresee future problems, and solve them before they arrive, requires applied imagination. Einstein called imagination “a real factor in scientific research.”

In 2015, Jay Walker delivered a landmark address to the National Academies of the Sciences, Engineering and Medicine, forecasting that another global super-pandemic was inevitable and suggesting preparations the world should make.

Today Jay leads ApiJect Systems Corp. as Executive Chairman, working with the U.S. Government to support timely, effective response to COVID-19 and any future bio-emergencies.

**INTERVIEWER:** Jay, you are a passionate advocate for imagination, including in the sciences and in the world of health and medicine. Does imagination have a role to play in combatting COVID-19?

Yes. To begin with, it takes a certain amount of imagination to even realize just how small the novel coronavirus is. As one of the world’s top virologists, Peter Piot, Director of the London School of Hygiene & Tropical Medicine, told us at TEDMED this year: “Even with a regular microscope, you can’t see a virus. 100 million viral particles of the novel coronavirus can fit on a pinhead.”

**Why is the small size of the virus significant?**



A passionate student and practitioner of imagination, Jay is the Founder and Curator of The Walker Library of the History of Human Imagination. It is home to more than 30,000 volumes and collection of unique historical artifacts,

Smaller particles are more transmissible. Billions of virus particles can float on tiny droplets in the air from just one cough. They pass more easily through barriers such as cloth facial coverings, for example.

**What other role is there for imagination in the battle against the pandemic?**

It takes imagination to research and develop new tests, new vaccines and new therapeutics. Scientists in government, universities and pharmaceutical companies are demonstrating that kind of imagination right now.

It also takes imagination to envision what could happen, for example, if a highly virulent, highly lethal virus were to suddenly appear – and the entire population of a country wanted to be vaccinated at once. We’re not set up for that in the U.S.; no country in the world is. It takes imagination to recognize the problem, understand its significance and to embrace an innovative approach to solving it.

**Were the leaders at the U.S. Department of Health and Human Services and the Department of Defense demonstrating that kind of**

**“We live in an era of permanent scientific revolution. To constructively harness the forces being unleashed, we need new ways to think about change.”**

— Jay Walker —

**imagination in the fall of 2019? That’s when they began talking to you and Marc Koska about a partnership between ApiJect and the U.S. Government.**

Very much so, and they deserve full credit for that. As many recall, after the terrorist attacks of September 11, 2001, a blue-ribbon commission famously concluded that America’s vulnerability on that day—and the price we paid for it—were due to, quote, “a failure of imagination.” Responsible parties had failed to connect the dots and foresee what was coming.

But the leaders of HHS, DOD, the U.S. Centers for Disease Control and the Strategic National Stockpile did connect the dots. They have been warning Congress, the White House and the public for decades.

They not only imagined the potential scope and impact of a global pandemic; they also imagined a bold new way to prepare for it.

### How?

By strengthening the U.S. supply chain so it can quickly get drugs and vaccines to the public in an injectable format. HHS and DOD leaders saw that the ApiJect BFS Prefilled Injector could be manufactured on U.S. soil and if so, it would greatly increase America’s preparedness and resiliency in case of a bio-emergency.

Instead of waiting six months, nine months, a year or even two years to go get all the vials and syringes you need to vaccinate 330 million Americans with multiple injections per patient, you could produce the needed supplies in much less time.

**ApiJect’s founder is your fellow inventor, Marc Koska. He also brought imagination to bear in designing the ApiJect BFS Prefilled Injector in the first place.**

Marc has showed imagination in many dimensions—most recently with ApiJect, but also throughout his career as a self-taught medical device engineer. To begin with, he imagined that it would be possible to eliminate two million needless deaths a year, and prevent 20

million life-changing infections, that result worldwide from medical injections using cross-contaminated syringes and glass vials.

**How did Marc imagine ending this giant problem?**

He visualized a future where it would be impossible to contaminate a syringe, because it would be impossible to reuse that syringe on a second patient. Auto-Disable syringes were already in existence, but they weren’t widely used due to cost.

So Marc imagined that an AD syringe could be manufactured with cost efficiency that was superior to traditional syringes. The result was his K1 model, which has saved 12 million lives to date—and counting.

**But Marc was not satisfied with that.**

Most people would have said, “Okay, I’ve fought for 25 years and accomplished my goal. I can retire now.” But Marc envisioned a world where all unsafe medical injections are eliminated, because all the glass vials are eliminated. This would finally remove any possibility of cross-contamination from that source.



Jay is Director and Curator of TEDMED, the health and medicine edition of the famous TED Conference. Among the distinguished speakers on the TEDMED stage: Dr. Francis Collins (left), Director of the National Institutes of Health.

**That is a bold vision. How do you displace 165-year-old entrenched technology?**

Marc realized there was only one way to make this happen. He would have to invent a high-quality prefilled injector that could be produced using high-speed, high-volume, ultra-low-cost production methods. Eventually he found Blow-Fill-Seal, or BFS.

**For those who are not familiar with it, what is BFS?**

It's an aseptic plastics manufacturing technology from a German company called Rommelag. By the way, Rommelag's invention of BFS back in the 1960s was itself an act of considerable imagination.

**Why hadn't anyone used BFS to make prefilled injectors before?**

Because it was assumed you must attach the needle as part of the seamless BFS process of creating, filling and sealing the container. Marc realized there was another, better way: use a pen-style Needle Hub.

**How does that work?**

The Needle Hub is prefabricated before the aseptic BFS container is formed, filled and sealed. You ship the Needle Hub separately from the prefilled BFS container. Then it's a simple push-twist motion to manually attach the Hub at the point of care.

Marc's Needle Hub is an ingenious solution to the problem. It is the imaginative combination of two well-established technologies: BFS aseptic manufacturing and pen-style Needle Hubs. Both are already used billions of times per year in the medical space.

**In addition, the BFS Prefilled Injector offers an imaginative way to strengthen the supply chain for U.S. bio-emergency response.**

ApiJect is focused on a small part of the medical supply chain, but we think it's a vital part. As Walt Orenstein, former Director of the CDC National Immunization Project, used to say: "Vaccines don't save lives. Vaccinations do." Providing a fast, reliable, efficient way to get injectable vaccines to the entire U.S. population must be the goal.

**Why is that goal so difficult to reach using traditional technology?**

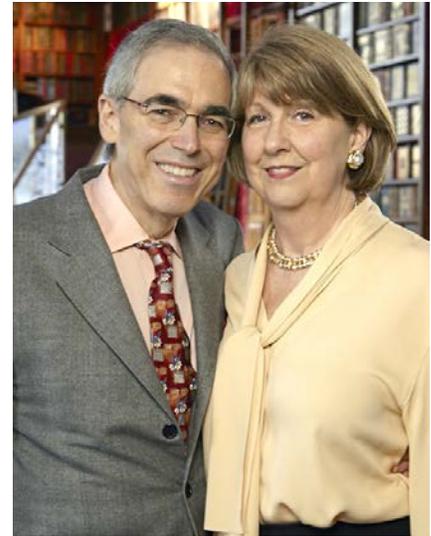
Most supply chains, whether they are designed for food or shoes or automobiles, work on a "Just-In-Time" basis. They bring just the right amount of product to market, at just the right time to satisfy demand. As a result, they don't need to spend a lot of money on warehousing, stale merchandise and long-term inventory control. The advantage of "Just-In-Time" production is lower cost for both the manufacturer and the end user. The disadvantage is that there is no "surge capacity."

**Why not?**

When a "Just-In-Time" supply chain is geared to making millions of units every year, you can't simply throw a switch and increase production to billions of units overnight. This applies to medical supply chains like everything else. The good news is that BFS technology is designed for population-scale production in a very short time frame.

**You have said that COVID-19 is accelerating the pace of change in health and medicine. One obvious example is the U.S. Government's accelerated endorsement and support of BFS single-dose injectors, leading to planned deployment beginning by the end of this year.**

The speed with which vaccine candidates for COVID-19 are being developed, and may be approved by the



Jay with his wife Eileen, Chair of the TEDMED Foundation and a Trustee for Cornell University.

FDA or other regulatory bodies, is another example. The U.S. Government and much of society realize that we can't wait years to develop new mechanisms, new policies, new technologies, and new forms of prevention and response, while schools remain closed, families are under severe stress, the economy melts down, and other ripple effects continue to get worse.

**You have said that we live in an era of ongoing scientific revolution, and therefore we need new ways to think about change. Can you point to some broad-based examples?**

We need new models of collaboration. The ability of one person alone to imagine the future is limited. The solution is to recognize the power of teams. This ongoing revolution in health and medicine, demands ongoing social, commercial and policy adaptation. Both the revolution and these creative responses will be driven by multi-disciplinary teams of people who have the imagination and understanding to cope with constant disruptive change.

**Thank you, Jay.**