

Creativity vs. Corona: How Innovative Minds Enlist to Save Humanity

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Abstract

Flexibility; agility; resilience. These three essential qualities of innovators have come to the fore, during the current pandemic. I will recount how Israeli scientists and engineers have responded to pressing needs, by asking, what do I know that could help meet current unmet wants and needs, and how can I use what exists at hand, to generate solutions in a very short period of time? As a small embattled nation, Israel has skill at improvising embedded in its national DNA and culture, and this has been evident in the current pandemic. In this 30 minute webcast, I will recount a number of stories about innovation under pressure. I am certain many such stories exist in India as well; I focus on Israel, simply because I live and work here and the local stories are what I am familiar with.

Introduction:

The entire world is facing a social, medical, economic and political crisis of proportions greater than that of the Great Depression, 1930-39. What are the skills and qualities that can best help each of us, as individuals, heads of families, managers, workers, educators and leaders, to endure and to prevail? What are the key elements, in the head-to-head matchup between creativity and corona?

In this short essay, based on a webcast, I propose three such key qualities (See Figure 1):

- Flexibility – the quality of bending without breaking
- Agility – the ability to think, understand, adapt and move quickly in response to challenge; ability to pivot (change direction)
- Resilience – the capacity to recover quickly from failure and decline.

Yes – we *all* can go F A R, despite the crisis, if we can learn to acquire and cultivate those qualities.

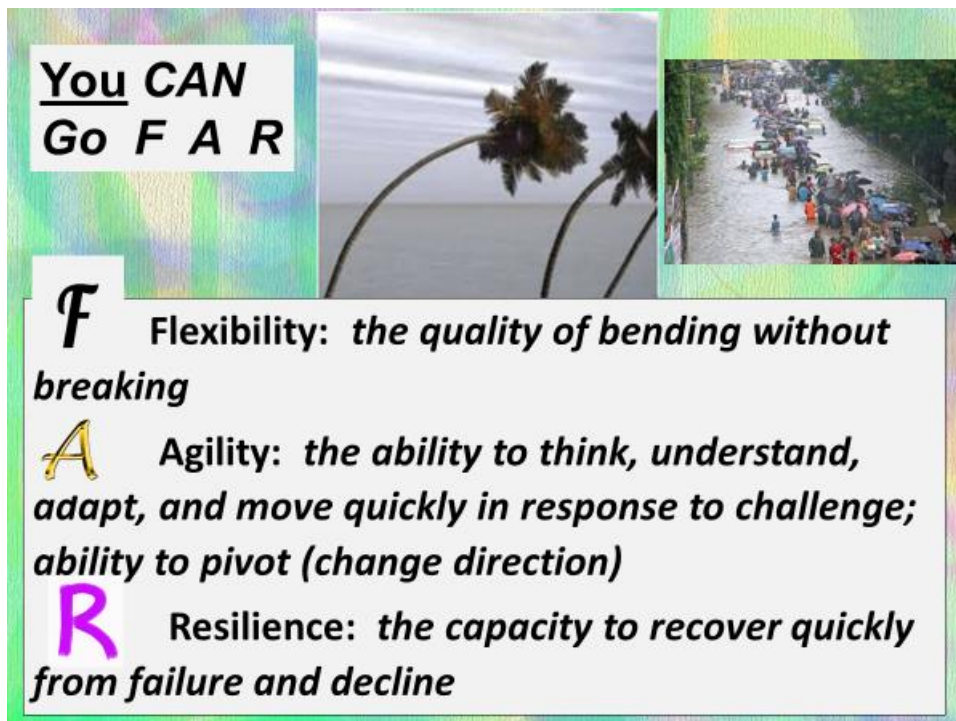


Figure 1. The Three Qualities To Cultivate During a Crisis

The top right photograph shows the office workers of Mumbai, India, walking home from work, after monsoon floods in 2017, when public transportation was shut down. The people of India have known hardship and have over the years developed considerable

resilience – like the elegantly-dressed people of downtown Mumbai, walking home in waist-deep water.

The top left photograph shows palm trees during a typhoon. Palm trees, unlike other trees, are rarely uprooted during a severe storm. They have the ability, developed by Nature through evolution over the years, to bend, almost to the ground, without breaking. This flexibility enables them to survive. We all can emulate palm trees.

Around the world, massive numbers of workers have lost their jobs and source of livelihood. This has happened virtually overnight, and dealt an enormous shock to those who until February felt they were secure and doing well. Will their job return, post-plague? Will their skills be needed? Will they need to acquire new skills? In all this, resilience will be vital.

In this essay, also given as a Zoom webcast on May 26, I will expand on the three key qualities that can help individuals and organizations absorb the crisis, retrench, reorganize and bounce back: Flexibility, Agility, Resilience. I will illustrate these qualities, with stories mostly based in Israel, and on Israeli entrepreneurs, simply because I am most familiar with them, as I live and work in Israel. Press reports note that over 150 Israeli startups are actively working on COVID-19 solutions of various kinds.

We begin with Flexibility.



Flexibility: *the quality of bending without breaking (absorb the blow, and....bounce back)*



Figure 2. Diagnostic Robotics founders Yonatan Amir, Dr. Kira Radinsky, Prof. Moshe Shoham

Case Study: Diagnostic Robotics

Diagnostic Robotics is an Israeli startup founded by Dr. Kira Radinsky, Yonatan Amir, both Technion alums, and Technion Professor Moshe Shoham.

Radinsky is remarkable. She emigrated to Israel as a child from Ukraine, studied computer science at Technion when she was 15, won the Israel Defense Prize at age 19, earned a black belt in karate, earned 10 patents, married, finished her Ph.D., and launched a promising startup – all by the age of 27.

The latest startup she has co-founded is called Diagnostic Robotics. Its original goal was to tackle embattled emergency rooms in hospitals. The company used artificial intelligence to predict the patient load in advance and to prepare the hospital in advance in order to ease or manage the load. It does this by supporting doctors in assigning priorities to patients and deciding about the possible medical diagnosis.

According to press reports, “The Diagnostic Robotics leadership team quickly realized that, with just a few tweaks, the same platform could be used to triage patients possibly infected with the novel coronavirus.... The system, , is now integrated with the Ministry of Health, all four of Israel’s HMOs and the Magen David Adom system – in startup language, this was a turn-on-a-dime ‘pivot’ – adapting an existing product or service for a different use.

A company spokesperson told me: “Last week (early May) we launched our platform in partnership with the State of Rhode Island. We are in advanced conversations with other states, leading healthcare providers and some of the top hospital systems in the US. There will be some big announcements in the coming days. In addition to the US, we have entered into a global partnership with Salesforce (online customer relationship management) and Deloitte (global consultancy) on the COVID360 platform and have implemented the first manifestations of this partnership in the state of Odisha in India -- our technology is available to the 50 million residents there.”



Agility: the ability to think, understand, adapt, and move quickly in response to challenge; ability to pivot (change direction)

Case Study: Alibaba

Chinese entrepreneur Jack Ma founded Alibaba in 1999, to sell Chinese products worldwide online, despite the fact that he had no technical skills or knowledge at all. (See Figure 3).



Figure 3. Jack Ma and the Taobao.com platform

When Alibaba was just four years old, an Alibaba employee was diagnosed with SARS, in the spring of 2003. The entire Alibaba office was placed under quarantine. Some 400 staff members lugged their computers home and worked from there. It was a lonely time. And the viability of the Alibaba startup was threatened.

“We’ve discovered one of our staff might have been infected by SARS. ... Someone from the government is going to come by to lock your door from the outside,” founder Ma noted. “I realized I was about to be quarantined.”

Jack Ma decided to use the crisis to take on what he perceived was Alibaba’s biggest threat: the giant eBay, headed by CEO Meg Whitman. eBay, founded by Pierre Omidyar, was a \$40 billion company, with 147 million users worldwide, in 150 countries and 33 different markets. If eBay users were a country, they would comprise the world’s seventh largest nation. eBay operated widely already in China. It seemed like a hopeless mismatch, between a giant with deep pockets and a fledgling opportunistic startup under quarantine lockdown.¹

Ma told his workers: “eBay is a shark in the ocean. We are a crocodile in the Yangtze River. If we fight in the ocean, we will lose. But if we fight in the river, we will win.” He meant that taking eBay on, in the Chinese market, gave Alibaba a good chance, because eBay was not fully familiar with the Chinese culture and markets. And he was right.

¹ See my case study, *Open, Sesame! The Story of Alibaba and Taobao – 25 Insights for Building Startups Into Global Market Leaders*: Case Study By Shlomo Maital. S. Neaman Institute for National Policy Research Technion-Israel Institute of Technology, Haifa ISRAEL July 2015.

See also the award-winning film about Alibaba, by Porter Erisman and Guiseppe de Angelis, *Crocodiles in the Yangtze* and Erisman’s book *Alibaba’s World: How a Remarkable Chinese Company is Changing the Face of Global Business* (Palgrave Macmillan, 2015).

The Taobao online sales platform was a hit. Taobao (Chinese: 淘宝网), means “seeking treasure” and is headquartered in Hangzhou; it is the world's biggest e-commerce website and the eighth most visited website. There are many Taobao villages in China, where residents make a living by using the Taobao platform to sell online; millions of jobs have been created. ²

Case study: Surfactant



Figure 4. Prof. Josué Sznitman & Dr. Yan Ostrovski

Two Technion Biomedical Engineering Faculty researchers, Dr. Josué Sznitman and Dr. Yan Ostrovski have been working for years on a way to help babies born prematurely, who have ARDS (acute respiratory distress syndrome), to breathe better and recover. The preemies’ problem? Lack of surfactant, crucial for the lungs’ functioning.

Sznitman notes that for 30 years now, we have known that injecting surfactant directly into neonates’ (preemies’) lungs “greatly helps their lungs function”. The success rate, he notes, is as high as 98%! So, Sznitman wondered, why not inject surfactant into the lungs of suffering COVID-19 patients? Not so simple. “Instillations in larger lungs quickly gather in pools, drowning some parts of the lungs and depriving others of the surfactant”, he explained to Haaretz reporter Asaf Ronel.

Solution? Turn the liquid surfactant into foam. “Foam has more volume than liquid, and is less affected by gravity. So it can be spread in a uniform manner throughout the lungs and restore the ‘facelift’ to the epithelial cells that [lungs] need to function properly”, he explained. Tests with rats have been highly successful. Next month preclinical trials begin with pigs. This innovation is particularly important, because a distressingly small percentage of COVID-19 patients (in some countries, as low as one in five) put on ventilators survive.

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² See my Case Study: Junpu “Taobao” Village – a validation of Porter’s Diamond Model. 2015. Available from the author.

There is considerable research showing that market leadership and market share change far more during economic downturns, than during economic booms. It is likely that this will also be the case with the current pandemic. Many organizations, especially large ones, fasten their seat belts and 'hunker down', slashing spending and waiting for the good times to return. This leaves opportunities and openings for flexible, agile smaller companies to take some risks, invest in R&D, pivot their focus and try to meet unmet wants and needs based on their unique technologies and innovations.

Case Study: Pluristem

Israeli-based Pluristem has treated its first American patient suffering from COVID-19 complications under the country's compassionate use program. The news comes days after a report by the company showed that six critically ill coronavirus patients in Israel who are considered high-risk for mortality were treated with Pluristem's placenta-based cell-therapy product and survived, according to preliminary data provided by the Haifa-based company.

Some background. Researchers report: "When it comes to COVID-19, recent research has suggested about 20% of people get the severe form of the disease. Many in this group become critically ill because of their advanced age or underlying health conditions. But those who were previously healthy and are in their 30s, 40s, 50s are very likely experiencing a cytokine storm."

A small but significant fraction of COVID-19 patients, mainly younger ones, die not from the ravages of the virus on their lungs, but because their body over-reacts, as their immune system kicks in violently and creates this "cytokine storm". It turns out that an overly strong immune reaction is just as bad, or worse, than a weak reaction.

How does Pluristem's drug work? Here is how founder and CEO Yaky Yanay explains it:

"Patients who are in severe condition and dying are actually dying from a severe respiratory condition. What is actually happening is -- there is a very high level of inflammation and at a certain point the immune system of the patient will attack [the patient], mostly in the lungs. Until now, Pluristem's technology has been largely used to treat people suffering from poor blood flow to the legs, but the company's scientists were able to quickly repurpose the cells to treat coronavirus patients. "We take cells from the placenta after full-term delivery and we have developed technology to expand the cells to very large numbers, in an environment that mimics the human body," Yanay said. "The technology allows us to treat more than 20,000 people from a single placenta."

His team "programs" the cells, which then have a wide range of proteins they can secrete. The cells don't just deliver the proteins but also "adjust the level of secretion based on signals they receive from the body."

The US FDA allows using the drug on compassionate grounds for very seriously ill patients. But for widespread use, full-scale three-phase clinical trials are necessary, and are already well underway.



Resilience: *the capacity to recover quickly from failure and decline*

Both Israel and India are nations that have experienced many crises, natural disasters, and even wars; the people of both countries have developed resilience – the ability to recover quickly -- in part in an evolutionary manner, in the same way Nature helps plants and animals to adapt to threats and changing environments.

Social resilience is defined as the capacity of a society to prepare, contain and manage major national crises, and to bounce back expeditiously to an enhanced functioning. ‘Enhanced’ is a key word. When emerging from a failure, setback, crisis or disaster, the aspiration should always be to achieve a higher level of wellbeing and performance, not just to return to the old benchmark.

Research by Dr. Reuven Gal, former Chief Psychologist for the Israel Defense Forces, focused on the 1973 Yom Kippur War and the post trauma among tank crews. He found that tank crews which previously had NOT served together suffered far more post trauma, compared with little or none among tank crews who were ‘organic’ and had served together for years. The reason: Support of those we love and trust is vital during a crisis.

Individual and social resilience is dependent in part on ‘finding meaning in crisis’ and ‘finding hope for a resolution’. A crucial role in this is played by those who lead. How leaders provide information, guide people, and establish ‘meaning’ plays a vital role.

The British people proved astonishingly resilient, during the terrible early years of World War II, when London was massively bombed by the Nazi Luftwaffe and some 45,000 civilians were killed as a result. A new book about this period, and about Prime Minister Winston Churchill’s leadership during this period can perhaps provide a benchmark, against which today’s leaders can be judged and measured.

Case Study: London, 1940.

In days of crisis, people everywhere look to leadership. Many of our leaders have alas fallen short. Perhaps they each should read Erik Larson’s new book, *The Splendid and the Vile*, about the leadership of British Prime Minister Winston Churchill, during the terrifying days of the blitz, when the German Luftwaffe bombed London daily, for 57 days and nights, including a huge daylight raid on Sept. 15, 1940.

The damage was enormous. Historians note: “More than 40,000 civilians were killed by Luftwaffe bombing during the war, almost half of them in the capital [London], where more than a million houses were destroyed or damaged. A million houses! Luftwaffe head Hermann Goring was ordered by Hitler to begin bombing London, on Sept. 6/7. The goal was to terrify London citizens and draw the sparse Royal Air Force into a battle, where, outnumbered, RAF plans would be destroyed, leaving Britain open for invasion.”

What did Churchill do to show leadership?

First, he was there. He regularly went out to sites that had been bombed, spoke to those who had lost their homes, and showed empathy.

Second, he condensed his message to two simple qualities; Truth. Defiance. Truth, to recognize the desperate situation. He told the people the truth – how the RAF was far outnumbered. Defiance, to spark the British people’s morale and fighting spirit. Churchill regularly watched the bombing at night from the roof of 10 Downing St., exposed and unafraid.

Churchill understood his people. British anti-aircraft guns were silent in early September, because the nighttime raids meant you could not see the Nazi bombers. No point in wasting ammunition. But Churchill understood – he ordered the anti-aircraft guns to fire anyway – and the Londoners cheered and were cheered and buoyed.

Churchill’s speeches are legendary. The structure was always the same. First, tell the truth. Churchill reviewed the situation, without sugar coating or euphemisms, and told the people just how desperate the situation was. Second, he explained clearly what actions were being taken. And third, he offered hope – Reasons for optimism, for believing that with appropriate action, things will improve. In doing so, he helped Londoners find meaning in the crisis, find a reason for their defiance and endurance, and to remain resilient in the face of great danger and death.

Enemy bombers are a different enemy than a silent killer virus. But leadership remains similar. Truth. Defiance. Hope.

Tell the truth – something some leaders fail to do, such as the criminal behavior of the President of Brazil. Defiance -- Fierce determination to defeat the virus, by telling people what to do and how to do it, even if it means sacrifice. Hope – there is light at the end of the tunnel. And credibility. Those together will foster strong resilience.

Case Study: The Paradox of Rule Making & Rule Breaking:

There is a paradox that is related to social resilience among nations. In her important new book, sociologist Michelle Gelfand divides the world into “rule breakers” and “rule makers”.³ Rule breaker countries, like Israel, Brazil, and perhaps India, have cultures in which people drive rather insanely, and find creative ways to circumvent rules. This is perhaps one of the drivers of Israel’s Startup Nation Phenomena, because entrepreneurship is in part built on breaking the existing rules.

³ Michelle Gelfand. Rule makers, rule breakers. How tight and loose cultures wire our world. 2020.

During the pandemic, Israel and other nations imposed strict lockdown quarantine rules. They were largely observed, in Israel, despite the rule breaker culture, because people understood the reason and the need.

Rule maker countries, like China and Singapore, are nations where rules are comprehensive, strictly enforced and observed by a disciplined obedient populace. Singapore, for instance, explains its rule making culture by the ethnic diversity among Malay, Chinese and Indian populations and the need to maintain social order and social discipline. Rule making nations, like China, have been able to impose stringent lockdown systems that were meticulously observed.

So, will rule breaker or rule maker cultures do best during and after the crisis? Rule breakers are flexible and agile. But they are also undisciplined. Can nations be rule makers during the pandemic, and then rule makers following it? Such a shift in culture and behavior is somewhat unprecedented; cultures change very slowly. But the pandemic has been a major shock worldwide.

Nature has offered us a major natural experiment in the impact of culture on resilience. It will be very interesting to observe, over the coming few years, the results.

Conclusion:

Figure 5 shows a comparison of two periods: the Great Depression, 1930-39, and its aftermath, and the boom in world trade and GDP following the fall of the Berlin Wall, Nov. 9 1989 and ensuing growth in the global economy.

From 1930-39, we learn that very high rates of unemployment in the US, and other countries, persisted throughout the Depression, for a decade, until the boom in government defense spending at the onset of WWII put an end to the downturn. Governments failed to understand that in the absence of the demand created by private spending and business investment, governments need to fill the gap; there is no other alternative. Disastrous mutual impositions of tariffs, beginning with the US Smoot-Hawley tariff of 1932/3 virtually destroyed world trade.

If nations pursue "Me First" strategies, of the sort pursued in 1930-39, the pandemic downturn will be prolonged and severe and the recovery will be slow.

The bottom figure in Figure 5 shows how world trade was the engine of economic prosperity, among developed and emerging nations, from 1989. The pandemic has severely disrupted world trade. Can the remarkable global system, that generated jobs, wealth, production and income at a torrid pace, be restored? Or will countries pursue egoistic selfish policies that in the end prove self-defeating? Will other countries follow the Trump "America First" insanity? Or will the other nations band together to restore global collaboration?

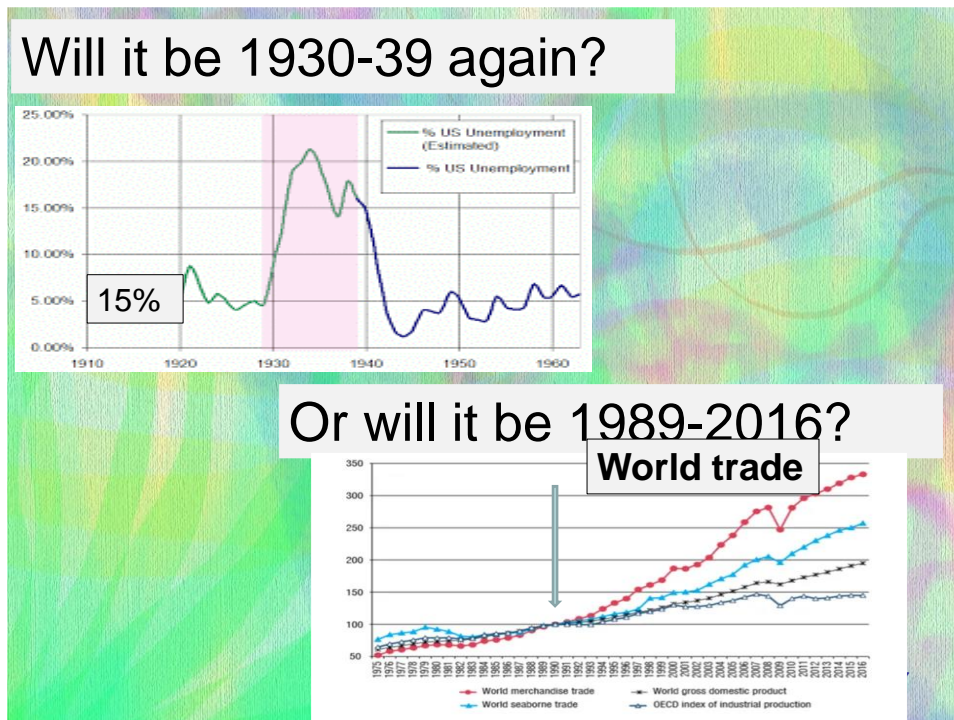


Figure 5. Unemployment, Trade and GDP: 1930-39 and 1989-2016

The depth of the pandemic Depression has been horrendous. (See Figure 6). And the decline continues, even as countries emerge from lockdown.

Some nations will do better than others, just as some organizations will do far better than others. Those who prosper, are those who will go FAR – who martial flexibility, agility and resilience.

Perhaps there is hope in the fact that even when our leaders fall short, in dealing with a crisis that was a total Black Swan and in facing an enemy that is invisible, insidious and deadly, individuals and organizations can take up the slack and fill the vacuum.

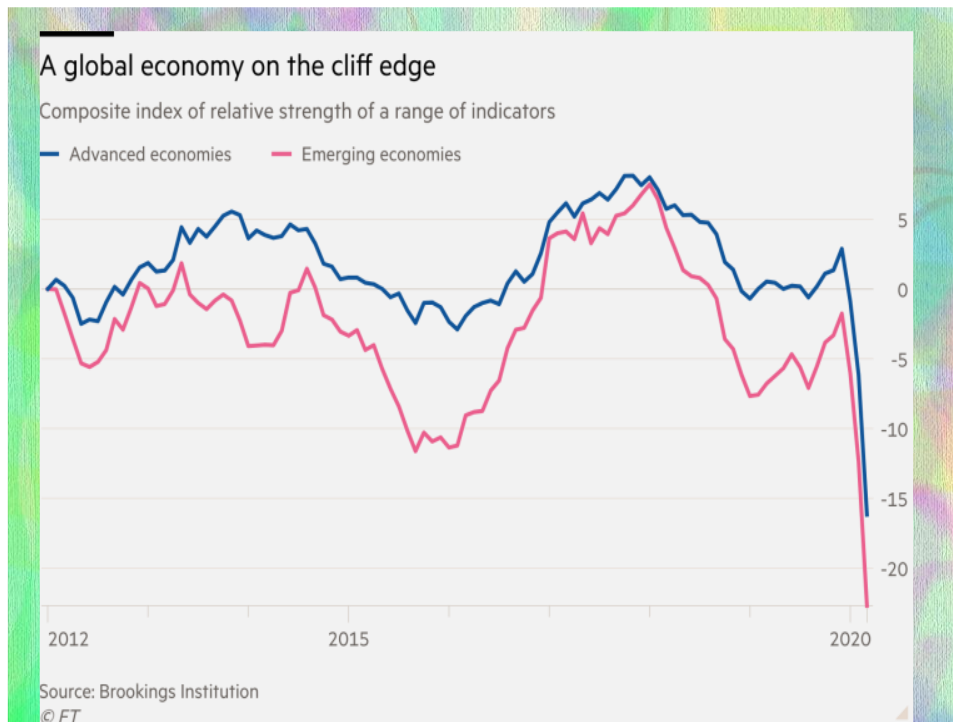


Figure 6. Composite index of economic indicators: Advanced & Emerging Economies