SUPPLY CHAIN: BACK IN THE LIMELIGHT

The new (AI and data-driven) supply chain is all set to become a competitive differentiator again. pg 08

AMAZON LOGISTICS: A DETAILED TEARDOWN

by Sangeet Paul Choudary
pg. 14
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Till a few months back, ‘disruption’ was essentially a biztech jargon that everyone used liberally, to talk about even some small changes in a business process.

And then... we got to taste what real disruption is like. First, it was a battle. Now, it is a full-fledged war. Not just against COVID-19. But against our assumptions, our understandings, our beliefs, our inertia.

One of the definite proofs that the pandemic has impacted enterprise IT drastically is that it is redefining the functions that were the first ones to be transformed by technology.

One, of course, which all of us would relate to is: individual productivity and collaboration. Even those businesses that were quite used to some people working remotely are discovering newer challenges. For example, the support team too works from home. A person works from another geography where he/she is stuck. Hardware is not available in time.

The second, less discussed in public domain, is, supply chain. The pandemic has tested global supply chains thoroughly. While we have passed with an average score—that itself is not a mean achievement—some of the widely-held beliefs have been thrown out of the window. In many cases, local supply chains, with significant manual processes have performed better than more automated supply chains. The efficiency that technology was delivering at a certain scale was lacking when the scale got drastically reduced during the lockdowns.

Call it rationalization or realization, but this has had positive side too.

Many of the small digital gaps that existed are being closed on a war-footing. While the more volatile marketing, customer service and risk management had seen better applications of emerging technologies like Artificial Intelligence, the ‘stable’ supply chain had little tryst with these technologies. Now, organizations are experimenting with some of these technologies.

Now, supply chain is a becoming a competitive differentiator again. That is what our cover story focuses on, this time. We refrain from making forecasts but show some of the changes that ‘could’ happen.

Platform Guru Sangeet Paul Choudary has done an analysis of Amazon’s supply chain and how it is well-suited to tackle the new challenges. It is a very good case study of application of newer technologies.

We still don’t know for how much more time the current situation will continue. Maybe, we will use this as an opportunity as well.

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In A Time Of Crisis, A Global Lockdown Needs A Digital Unlocking

Future Of Workspaces—Substantial Changes Might Not Take Place

Tech It Or Leave It

By Akash Jain

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By Dipanjan Mitra

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By Naveen Kumar

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Automated Killer Machines Could Be The Future Of Military

Have you imagined a future where machines get a free run in battlefields, drown enemy ship or down a fighter jet? As armed forces across the world adopt more advanced technology, giving more freedom to machines, it would not be too far-fetched to imagine a force with fast and furious kill machines.

For now, in militaries, human intelligence has not found a substitute. While machines are being employed, it is also acknowledged that human involvement in critical decisions is essential. Machines can malfunction and interpret data wrongly; automated systems can mistake a friendly fire as the real thing and such tactical errors can be costly. It will be long before artificial intelligence begins to understand context, apply judgment, and be able to react to unique situations. Machines are also yet to understand the machinations of the human mind. Hence, tactical warfare for now is best left to human soldiers.

However, machines are faster and in a war speed kills. Being able to fire first or torpedo and enemy tanker has distinct advantages. Hence, experts fear that the competitive pressure on militaries may just force them to enlist automated kill chains in a race for survival. It will just take one major power to adopt fully automated kill machines for others to follow suit.

Imagine an army of terminators attacking a human army. The outcome of such a battle is anybody’s guess. So, if one country goes for the terminator, many rival powers will raise their own terminator battalions.

While these kill machines are still to be mass produced, what is making experts apprehensive is that each technological innovation is bringing us closer to such a future.

In the heightened global tensions, such a probability is dangerous. While we could hold bioweapon and nuclear warfare in abeyance through global policy measures, fully autonomous weapons are a grey area. According to reports, around 30 countries support a total ban on these; unfortunately none of them are actually a world military power or leader in robotics technology. Automated weapons figure in annual debates at the UN but all major powers have shot down any efforts to ban it. Many global NGOs are running campaigns to stop killer robots from overtaking armies, but to no avail.

There are also policy challenges as it is difficult to regulate autonomous weapons given their unique nature. Meanwhile as the powers slug it out, there is no stopping the march to automation.
Making headlines

By The Book

Mindf*ck: Cambridge Analytica and the Plot to Break America is the inside story of the data mining and psychological manipulation behind the election of Donald Trump and the Brexit referendum, connecting Facebook, WikiLeaks, Russian intelligence, and international hackers right from the mouth of the Cambridge Analytica whistleblower. An unputdownable thriller that takes the reader deep into the entrails of the “American operations” which was driven by Steve Bannon’s vision to remake America and fueled by mysterious billionaire Robert Mercer’s money.

It packs all the intrigue and thrills you could ask for as it unveils how the executors of the plot weaponized and wielded the massive store of data harvested by Cambridge Analytica — more than 87 million. The plot was sinister — to disunite the United States by setting Americans against each other.

The 24-year-old protagonist of this fast-paced real-life thriller is Christopher Wylie – an unlikely hero – who was at the center of this operation and decided to turn a whistleblower, unleashing the largest data-crime investigation in history.

This biography reads like a spy thriller exposing the weak foundation of powerful democracies. Gripping!

Nearly half of Twitter accounts pushing to reopen America may be bots

For the Twitter bot armies, the coronavirus pandemic became a fertile ground for medical disinformation campaign, political slugfest and for building a groundswell of influencer opinion to pressure governments. According to a study, in any politicized events, bot involvement is anywhere between 10 and 20%. But a new study found bots may account for between 45 and 60% of Twitter accounts discussing COVID-19. Many of these accounts were created in February and since then have indulged in amplifying misinformation. They have mounted well-coordinated influence campaigns leading to hot debates and political polarization, mudslinging and smear campaigns among the Tweeple. The purpose seems to be to capitalize on the crisis to push political agendas. With professional actors directing the bot activities these influence campaigns have become highly sophisticated and powerful. Scary, isn’t it?

Innovation and entrepreneurship have no glass ceiling and Deesha Vora, an entrepreneur, has proved it. She has brought in tech innovation to the construction industry to streamline its operations. Her B2B startup SuperWise founded in 2016 offers real-time construction management software. Keeping in mind the mid-level players, the company offers the software on a monthly or yearly subscription basis. A construction project is challenging, lengthy, tiring and with on-ground issues like misreporting, theft, misalignment of project with initial plans, etc. Moved by these issues being faced by a civil engineer friend, Vohra, a keen programmer and technologist, teamed-up with co-founders Ruchik Vora, Smit Sanghavi, and Mitul Mehra, to launch SuperWise. The team enables construction companies to control and manage projects through its SaaS platform that leverages the internet of things (IoT). The SaaS platform makes complex project management tools like MS Project and Oracle Primavera redundant. Way to go girl!
Folks the workplace has changed. I am not talking about the transition we made to remote workplaces to beat the lockdown. It’s time for many of us to return to our brick and mortar offices, but there’s no rewinding the clock. We have to follow stringent guidelines and companies are enforcing these rigorously. You may have to take coronavirus tests, report if any symptoms, wear masks at all times, stay away from the watercooler, forget those lunchbreaks and tea breaks, wear dongles, and what’s more be ready to work under the hawk eyes of corona managers human or electronic. Businesses are setting up elaborate protocols to ensure that the return to work does not jeopardise the health of the employees. From doing away with biometric attendance to making Aarogya Setu app compulsory, they are taking a number of steps. This is the new normal and it will be up to each individual to ensure that workplace experiments are successful, for the revival of the economy depends on success of the ‘unlockdown. Employee privacy? We will come to that later.

**COVID-19 cloud cause historic drop in CARBON EMISSIONS**

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<th>Year</th>
<th>Cause</th>
<th>Emissions (in million tons)</th>
</tr>
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<tbody>
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<td>1945</td>
<td>(End of WW2)</td>
<td>750</td>
</tr>
<tr>
<td>1975</td>
<td>(Global recession)</td>
<td>100</td>
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<tr>
<td>1983</td>
<td>(Global recession)</td>
<td>1,000</td>
</tr>
<tr>
<td>2009</td>
<td>(Global recession)</td>
<td>300</td>
</tr>
<tr>
<td>2020</td>
<td>(Global pandemic)</td>
<td>2,500*</td>
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*Projection based on current restrictions on travel, work and industry
Sources: The Guardian, Global Carbon Project, Statista
Livestreaming has found new use cases, and China is showing the way. Rural farmers whose farm products were in danger of rotting to brand-name retailers who were left with huge unsold stocks due to the coronavirus lockdown – many have found a solution to the current economic logjam through livestreaming platforms.

As sellers discover livestreaming is a perfect platform to sell their wares, they are hawking everything from flowers to lipstick on their shows. The reach of the platform is such that products are sold out within minutes. For instance, with just 10 minutes into an hour-long broadcast, farmers in the Dazhuangke township on the outskirts of Beijing sold out 564 kg of xiangchun, a spring vegetable considered a delicacy. This prized seasonal vegetable would have otherwise rotted in the absence of physical sales during the lockdown. Similarly, a flower grower was saved from ruin when JD.com, one of China’s largest online retailers, began offering help to farmers to use livestreaming to reach consumers. The farmers could broadcast on its app, JD Live, to hawk their products and answer queries from prospective buyers. The company also offered access to its delivery networks at a small percentage of sales.

Though Chinese farmers sell their products on online platforms using their smartphones, but most relied heavily on physical markets, which the lockdown had brought to a standstill. Across China now, this is the new norm for selling products and produce. The trend has had experts predicting that livestreaming – once a niche sales channel – will become a larger part of the consumer market in China’s post-COVID-19 new normal. E-commerce giants too have found an opportunity in this crisis with farmers desperate for sales channels, and consumers being forced to shop online. An entirely new industry was hence just waiting to be snapped up. This had both JD.com and Alibaba-owned Taobao quickly launching rural live-streaming initiatives that were engagement-centric formats. The popularity of the medium has skyrocketed. Though rural livestreaming had existed its use was limited. It took the pandemic to make it go viral. Lessons for India?
The new normal will have significant focus back on supply chain. The earliest function in manufacturing industries to go through a technology-led transformation is ready to get top management attention, yet again.

By Shyamanuja Das
After national governments announced lockdowns to prevent the spread of novel Coronavirus, it became increasingly challenging for organizations providing essential goods and services to continue their operations. Yet, they had to overcome those challenges to keep the business—and economy—running.

Two of the business processes had to be severely altered—one was to do with the movement of bits and the other to do with the movement of atoms, to use Negroponte’s terminology. The first involved changing the way people work, and second, the way goods are moved.

The first one, remote working or WFH (Work From Home) has now become common lingo. Along with social distancing, PPE and the like—it has come to be known as a defining characteristic of the times.

Ensuring that essential goods moved and reached the people who needed it, as effectively as possible, by significantly tweaking supply chain dynamics was the other big change organizations had to undertake quickly. Just that common people know little about those stellar efforts.

While few bothered to figure out what made them get their essential grocery, medicines and other essential goods, without much hiccups, despite everything seemingly closed, extraordinary performers did get noticed.

In normal times, it is difficult for a company to significantly alter business practice without the fear of disruption and/or cannibalization. But an external disruptor provides an opportunity for agile and forward-looking companies to seize the opportunities and establish new rules of competition.

TCS has already announced moving to a predominantly remote working model, which promises to be the next big milestone in the services outsourcing arena, which, after offshoring and automation, had not seen such a big disruptor.

In supply chain, Amazon impressed with living up to the challenge and has established new standards. In the other article of our cover story section, platform guru Sangeet Paul Choudary does a detailed teardown of Amazon logistics.
It is a no-brainer that any major change at this time will be technology-led. Supply Chain, which was one of the first areas to see significant business transformation in manufacturing, will be no exception.

But what exactly are the contours of the New Supply Chain? The story is an exploration of that question, starting with the genesis of the change, in the wake of the pandemic. It does not provide—does not even try to—all answers.

The Pandemic Shock
The COVID-19 pandemic came as a huge shock for supply chains across industries. However, the impact on different industries were different. Like Coronavirus itself, the impact on different industries had a strong positive correlation with the degree of globalization of the various industries.

Technology and electronics businesses were the first to panic. Even before there was any impact on the day-to-day life in their respective countries, these industries, which depend heavily on China for manufacturing and sourcing, saw the danger coming. When it had still not become a global pandemic, there were still concerns about the impact on global supply chains because of China. But before the demand could significantly outstrip supply, the disease spread to other countries, forcing governments in many countries to impose lockdowns. India, for example, shut up all shops other than those selling essential items such as food and medicines. It also disallowed deliveries of anything other than essential items forcing the e-commerce sites also to stop taking orders. So, the demand for most such items did not rise to outstrip supply. Since it was not the typical festive season (October-November in India and December-January in many countries), there was no severe gap.

However, in anticipation of the imminent lockdown, there was spike in demand for food items including grocery, fruits and vegetables, for a few days. But that lasted for not more than 3-4 days, as people were assured about supplies. Apart from a little tweaking in the lockdown rules, localization of sourcing, and some intelligent on-the-ground insights, helped.

Food supply chains are more local, diversified and flexible. And since, in India, local Kirana stores still have the major share, there was no major disruption. In fact, for many, they saved the day. Even as large supermarkets and online retailers, after postponing delivery dates multiple times, cancelled—Kirana stores managed to meet the demand quite effectively.

Amazon was the first to get its acts ready. Realizing that last mile was the challenge, the company announced hiring of 50,000 temp staff in India. Since then, it has announced getting into food delivery business.

While large-scale discreet manufacturing companies like automotive, which has one of the most complex supply chain set-ups, saw a huge drop in demand because of overall economic conditions, the process manufacturing companies like steel and aluminum had to keep operating their plants, even though with much lower capacity. Many of these have a mix of supplies—from captive mines, national suppliers and international suppliers—and they had to optimize based on the ground reality in terms of logistics and availability. At the time of writing, many are still figuring it out.

Realization & Response
COVID-19 was the first real shock-test after supply chains got large-scale automation in the late 90s to late 2000s. Did they pass the test?

It is difficult to answer that in a single word – Yes or No.

But some common observations are as follows:

1. The more local the supply chain, the better they adjusted to the new needs. This is the reason why the normal consumer did not see much disruptions. If anything, the larger and more automated supply chains like those that organized retail depended, was not as agile as the more manual, diversified and gut-driven smaller supply chains relied upon by the local sellers.
2. The global supply chains were more impacted. Global supply chains like technology, heavy industries, steel and aluminum were impacted.
3. Many supply chains were not even tested. For some businesses, there was the bigger question of business downturn. Take automobile. The economic slowdown had already hit them. The pandemic almost brought the industry to standstill. It was a shutdown. So, beyond some basic adjustments, supply chains were not even tested.

Now, as businesses are waiting for the revival, there are key lessons.

First, like many other business excellence initiatives, supply chain is a journey. There is nothing called steady state. Many had significantly auto-
mated their supply chains. They still suffered.

A chain is as strong as its weakest link. Areas people had not even thought about – need for paper approvals for example – brought the entire supply chain to its knees in some cases.

Also, supply chains had not evolved in sync with other business changes. So, some manual processes that linked the two remained. So, the business situation changes and the corresponding responses did not automatically take care of supply chain adjustments.

As they get back to normalcy, there are some learnings.

First is the fear of what is called ‘bluewhip effect’—inaccurate forecasts when the business bounces back. That is especially true in such an uncertain situation like this. AI has been there for a while and many companies who have applied AI to decision-making in many areas have not yet applied it to supply chain. This should be a priority.

Second is the need to have a planned end-to-end resilience plan for supply chain. Now, this exists in silos for certain components. It does not help in an extraordinary situation like this.

While most are new realizing the importance of building resilience, smart supply chain managers and CIOs realize that today, technology should be able to help them in optimizing and building flexibility and resilience is not necessarily redundancy. Some short-term plans have already been initiated in response to the new situation. Some of them continue and get perfected as even now,

there is no visibility about the future.

Some of them include:

- Turning paperless approvals to digital approvals
- Closing other tactical automation gaps that are easy to do
- Contactless operations as much as possible
- Do something about the cash flow and partner credit using IT

While there are many other responses, the above are some of the most common ones.

**Big Changes**

In the last two decades, most discreet manufacturing organizations had been driven by one narrative—that theirs was not just a ‘manufacturing’ business but a ‘consumer’ business as well. From car makers to FMCG companies, from white goods brands to tyre manufacturers, all competed with one another to better their customer experience. Since front end areas like sales, marketing
and customer service were common functions across industries (including more technology savvy businesses like banking, insurance, and online businesses), technology evolution, application of emerging technologies like AI and big data, as well as vendor marketing decibel levels were much higher. So, most manufacturing top managers got influenced by the narrative. Four years back, the World Economic Forum started talking about manufacturing automation in a big way, coining the phrase Fourth Industrial Revolution or Industry 4.0, which were further amplified by makers of sensor technologies like IoT. That made some manufacturing companies turn their attention to manufacturing processes, but supply chain still remained where it was. In fact, it is the online retail companies like Amazon (and Flipkart in India too) that did most of the innovations on supply chain.

That is till COVID-19 happened.

The extraordinary disruption has made manufacturing organizations wake up from sleep and relook at their supply chain afresh. Supply chain was one of the first major automation projects in most manufacturing organizations and some sort of complacency had crept in, as the efficiency gains had been significant.

In the wake of the new reality, companies are looking at supply chain with some fundamental questions—now taking all technologies available into consideration. It will be an understatement to say that the new supply chain would be digital first.

At this point, organizations are still not sure about specific initiatives, though there are certain common threads. Before we get into some of those, it is probably apt to look at their drivers.

The digitalization initiatives can be broken up into four categories based on their objective and origin. They are:

- Digitalization in anticipation of the new normal (the stated long-term rehaul)
- Digitalization already planned but not progressed due to lack of enough buy-in at the top, which has now changed
- Digitalization that would be possible with a little incremental effort after the first set of initiatives are undertaken
- Leverage of the new information generated to integrate it better with manufacturing (call it Supply Chain 4.0, a component of Industry 4.0)

Each of the specific possible changes that are being discussed by manufacturing companies can fall into one or more of the above areas.
#1 Seamless Integration
Supply chain sits between enterprise decision-making system and manufacturing. To achieve Industry 4.0 status, it is important that organizations—in addition to their enterprise IT and plant automation, modernize their supply chains too. While Industry 4.0, as an idea, was always considered a solution for the West, which does not have enough labor. But China’s use of automated manufacturing post recovery has shown its potential to manufacturing sector in India too, which now wants to take advantage of the geopolitical situation to pose a serious competition to China. Without better digitalization of supply chain, this is not possible.

#2 Risk Management of Supply Chain
Organizations in Europe have started focusing on supply chain risk management as a separate functional activity. Business continuity planning, data-driven risk forecasting using AI and effective response mechanism are part of this plan.

#3 Supply Chain as a Service
Outsourcing has been a time-tested risk management strategy. Many companies have outsourced their logistics. Many more, post COVID, are looking at outsourcing more. Third party logistics is likely to see major boom, not just in terms of efficiency but in terms of capability that they build it, including intelligent features. Beyond logistics, companies have outsourced in silos. There may be a tighter integration among all those components.

#4 Better Forecasting
If you take a look at the AI startup ecosystem, you will find companies in all spheres of business and economy—heathcare, marketing, education, sales, customer service, financial analytics, insurance processes...but very few in supply chain. That will change. We expect this to be the most common initiative across industries. Companies like Amazon, who have mastered the art, and have even gone for what is called predictive shipping—shipping even before an order is placed—are revolutionizing the supply chain. This may be the next battle front among organizations.

#5 Platformization of Supply Chain Components
This is a long shot. In short, it means Uber-like model of using crowdsourcing in supply chain stages, especially the last mile. The Amazon model of aggregating offline retail chains is the most basic step in that direction.

#6 Increasing Use of Human-less Operations
Be it using contactless sensor technologies or IoT-based tracking of consignments—or even drone delivery, organizations will automate more and more—and will be less dependent on human beings. While this has always been considered as it enhances efficiency, many logistics companies used it in the pandemic era to compensate for lesser human beings available and provide safe working to those who were working. Since this is a low-hanging fruit, we will see a lot of action on this front.

#7 Micro Segmentation or Mass Customization of Services
Micro segmentation in the distribution and delivery model is something that has been talked about for years. Situations like this have forced companies to have a relook at them.

#8 Digitalization of Partner Ecosystems
One area that finds mention from almost all the CIOs that we spoke to is the gaps remaining in the partner ecosystem. Better digitalization of partner ecosystem is something that the industry wants to do something about but does not know how to proceed. Maybe, the next frontier for collaboration. While companies talk about API-based integration to blockchain, no one is sure what form it will take on. The immediate priority will be, however, to close the bottlenecks, such as digital approvals, credit flow, and automated updates. As cash flow will be a big issue for smaller suppliers, companies will have to do something about this urgently.

While these are some pointers based on discussions with manufacturing CIOs and secondary research, few know for sure what would be the exact contours of the change.

As one of the CIOs put cryptically, ‘while it is good to talk about supply chain revamp, a lot of these problems are essentially not supply chain problems and more importantly, many of the supply chain problems may not have supply chain solutions.”

In short, you can close certain gaps by tweaking the supply chain, but there is no alternative to a large-scale digital transformation with supply chain being an essential part of that transformation.
Supply chains globally have been disrupted on account of COVID-19. Yet, platform players like Amazon and Alibaba have demonstrated how their approach to logistics and supply chain management is not only scalable but also responsive and resilient to such disruptions.

This issue takes a peek under the hood of Amazon’s logistics capabilities and its potential in a post-COVID world.

In particular, a few insights before we get started:

1. Amazon’s logistics playbook involves two mutually reinforcing flywheels: an asset infrastructure flywheel (increase asset base and offer as-a-service) and a data-driven predictions flywheel (gather data and improve predictions).

2. Mapping capabilities will be a key source of competitive advantage in logistics. Outdoor mapping for deliveries and indoor mapping for warehouse optimization. Amazon is well set up for both.

3. Amazon’s integration into demand-side data, not just as a retailer, but as a platform, is its key strength in managing utilization of its logistics infrastructure.

First…some framing

Amazon’s approach to logistics is a masterclass in balancing vertical integration vs openness. Amazon demonstrates that platforms don’t have to be asset-light, they just have to be strategic about asset ownership. Amazon increases asset ownership where such assets increase ecosystem dependence, and opens itself at other parts of the value chain where it needs third par-
ties to bring in niche capabilities to complement its own.

Amazon stands to be among the biggest beneficiaries of the ongoing lockdown. Orders are up, boosting the company’s revenues an additional USD 800 million per month. Amazon manages the delivery of the majority of this e-commerce volume without relying on 3PL service providers. It estimates a decrease of approximately USD 2-USD 4 in cost per package shipping using its internal network versus utilizing legacy carriers.

Let’s look at the key capabilities that uniquely position Amazon for a play in logistics.

**In the age of AI, Prediction is king**

Amazon’s integration into demand is one of its strongest control points in logistics.

Why is demand integration such a big deal?

To answer that, let’s look at a simpler example from another company: Netflix.

You could argue that there were many things that drove Netflix’s success in the DVD rental business. But the one thing that Blockbuster could never compete with was the integration of demand-side queueing data (users would add movies that they wanted to watch next into a queue) with a national-scale logistics system. All this queueing data, aggregated at a national scale, informed Netflix on upcoming demand for DVDs across the country.

Blockbuster could only serve users based on DVD inventory available at a local store. This resulted in:

1) low availability of some titles (local demand > local supply), and
2) low utilization of other titles (local supply > local demand).

Netflix, on the other hand, could move DVDs to different parts of the US based on where users were queueing those titles. This resulted in higher availability while also having fewer titles idle at any point.

Queueing data improved stocking and resulted in higher utilization and higher availability. It allowed Netflix to serve local demand using national inventory.

Traditional supply chains need to manage the trade-off between utilization and availability. The ability to predict demand solves this trade-off and informs stocking and logistics.

**Amazon’s prediction powerhouse**

Amazon is well-positioned here, with multiple weapons in its arsenal.

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Sangeet Paul Choudary, known as the platform guru, is a management thinker and author of business bestseller, Platform Revolution and co-author of Platform Scale. He is a working group chair at the WEF’s Global Future Council on Platforms and Systems and an expert on the advisory council for the WEF’s initiative on the Digital Transformation of Industries. His work on platforms was selected by the Harvard Business Review as one of the top 10 management ideas globally for the year 2016-17.

Sangeet is the co-chair of the MIT Platform Strategy Summit at the MIT Media Labs, an Entrepreneur-in-residence at INSEAD Business School.

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1. **E-commerce analytics**

Amazon uses collaborative filtering and other data analytics to build deep customer profiles. These profiles include behavior data, interest graphs, affinity scores, etc. Amazon uses these profiles to predict, suggest, and drive purchases on its platform but also uses this to inform its stocking.

2. **Anticipatory shipping**

Amazon’s patented anticipatory shipping model predicts precisely where, when, and how much of a particular SKU is to be made available at any of its fulfilment centers, so they are ready to ship when ordered. Thus, Amazon can scale operations while ensuring high availability and high utilization.

3. **Store analytics**

Amazon uses in-store data to decide on product pricing, inventory management, store layout at Whole Foods, and Amazon Go stores. Sensors placed across the store not only detect the products that shoppers buy but also their interactions with the store layout. These stores will also double up as local collection points for Amazon’s delivery network, especially for essentials in a post-COVID world.
4. Extra-fast shipping
Amazon also regularly tests what new products people might want with extra-fast shipping, and uses this to inform its stocking better.

5. SKU optimization
Amazon constantly decides what to stock by looking at every product detail. For instance, it would stock a shirt based on data about color, length, silhouette, sleeve length and purchase history for similar clothing inventory.

Prediction at ecosystem scale
Here’s where this gets more interesting. Amazon doesn’t merely act as the most data-aware store in the world. It also extends this capability to the rest of its ecosystem.

6. Seller analytics as-a-service
Amazon also packages some of these insights for its 3rd party resellers, enabling them to anticipate and plan for customer behavior. Planning for any customer behavior provides a significant advantage to merchants who usually rely only on post-sales data. To ensure better delivery, Amazon collaborates with its suppliers and manu-

facturers and tracks their inventory and provides recommendations on inventory management.

7. Store analytics as-a-service
Amazon has a history of doing something really well, developing scale (in assets and/or data), and then packaging that capability as a service to third parties. It does this with AWS (tech infrastructure) and with FBA (warehousing infrastructure). It could do the same thing with store analytics by eventually offering store analytics to third party stores as-a-service.

8. Supply chain management as-a-service
As manufacturers move towards leaner operations, and as supplier audits increase in a post-pandemic world, Amazon is well positioned to provide end-to-end logistics and supply chain management as-a-service. Such a system would potentially analyze supplier data (for example, delivery performance, audits, evaluations, credit scoring, etc.) and create a reputation system for suppliers, enabling manufacturers to make better supplier decisions and reconfigure their supplier network. It would also allow suppliers and manufacturers to plug into Amazon’s logistics and
delivery infrastructure seamlessly, removing the need for complex procurement.

All of these as-a-service models ensure that Amazon’s capabilities are used at industry-scale and all the resultant data constantly trains Amazon’s prediction models, enabling it to develop the long tail of predictions.

**Optimizing package interactions inside the warehouse**

Amazon has built a massive warehousing and fulfilment footprint across the US, which now includes:

1) Smaller warehouses closer to city centers where Prime Now promotes super-fast delivery options
2) Whole Foods locations for faster access to groceries and essentials

Amazon constantly invests in optimizing package interactions within the warehouses. This includes robots moving shipments inside the warehouses, gesture recognition to identify when a worker has placed a package on a shelf, automatic scanning of items that workers hold in their hands – all geared toward minimizing the click-to-ship cycle time. Future patents suggest the use of UAVs for warehouse management and augmented reality-enabled eyewear to increase warehouse worker's efficiency.

**The rise of indoor mapping**

In its bid to maximize warehousing efficiency, Amazon has developed strong indoor mapping capabilities. These indoor mapping capabilities may be eventually rolled out into stores as well. Indoor mapping, as a capability, will likely become more important in a post-COVID world, where contact tracing will require tracking of movement inside indoor spaces.

**Amazon's last mile play**

Controlling the last mile is critical for control over customer experience. The last mile makes up ~30% of overall logistics expenses.

Amazon has a host of logistics services in the last mile, including crowdsourced deliveries from external contractors (Amazon Flex and Amazon Logistics), fresh food delivery (Amazon Fresh), Amazon Key, allowing deliveries into your home, deliveries to car trunks, remote door access to Amazon couriers, Amazon lockers and apartment hubs (Amazon hubs), and distribution by drone (Prime Air), ensuring customer convenience.

Again, data is the reason Amazon gets these right:

**Route optimization:** Optimal routes for delivery drivers are derived from the data aggregated across customers, drivers, connected vehicles, weather forecasts, traffic monitoring systems, digital and satellite maps.

**Fleet planning:** Amazon’s fleet management system calculates how many drivers are needed at any given time. It evaluates the weight and number of packages headed to the same destination and matches packages and destinations to fleet availability. This includes determining the order of packing boxes into a vehicle to enable the most effective unloading based on delivery address.

Mapping metadata: Amazon is gathering delivery metadata that puts mapping features into context. For instance, one big challenge for Amazon Flex delivery personnel is parking. Amazon constantly analyzes late deliveries and identifies patterns and correlations with:

1) Building type (single address vs multi-address)
2) Access (Deliver at door vs at reception vs in mailroom)
3) Parking facilities (at building vs not)

By correlating delivery times and delays with these variables, Amazon is creating a new layer of delivery intelligence on top of mapping data. This prediction capability can again be opened as-a-service for third party logistics firms.

**Amazon's logistics playbook**

Amazon's logistics play follows a common playbook that we’ve seen in other parts of Amazon's business:

1. Gain asset scale through supply-side integration
2. Gain data scale through demand-side integration
3. Leverage supply-side scale to open out asset-as-a-service to ecosystem partners
4. Leverage data across the ecosystem to constantly improve prediction models
5. The more asset-as-a-service scales, the larger the ecosystem using Amazon’s logistics infrastructure and the greater the data capture for Amazon to constantly improve its prediction models

This virtuous cycle constantly strengthens Amazon's logistics play.
A lot of us (almost derisively) call technology a toy; and one does sometimes see techies running around with stars in their eyes. We will discount them and the opinions on them for the current purpose. We will instead focus on the real fear of “losing out” on technology; and with specific reference to business. This fear is real, and gives countless sleepless nights to business technology executives.

Even if one is not a bleeding-edge-technologist, one worries about missing out on what could be relevant, important or meaningful. And this worry is not entirely misplaced. Before we delve a little more into this, let us also look at the other extreme. The extreme of “if it is working, why fix it”; sometimes expressing itself in the arrogance of market leadership. This extreme has been the death knell of not just many a technical teams, but also of business themselves. Some near death examples exist in telecom, computer hardware and fizzy drinks. So the problem definition now is: How to determine if the new technology is worth the investment without being excitable or cynical.

There are simple commonsensical criteria for this; they are almost too obvious. Any one or more of the following criteria should get us to look at a new technology a little more closely. The following is in no particular order of importance. The first one is Security. The perpetual cat and mouse game makes it almost mandatory to look seriously at any new security development. One must however be cautious about the relevance of new development; as an example, a “foolproof” method to track movement of goods in transit may not be relevant for an educational institution unless it
is into distance learning.

The second criterion should be customer service. If one’s competitor adopts a new technology and provides better customer service and one gets “left behind”, the business might get left behind. This can also manifest itself in reduced cost of providing “hygiene” customer service (using the 80/20 rule). Examples of the latter are full-service ATM machines instead of human tellers and chatbots instead of a live service representative. Yet another manifestation of this is in additional services; an example being the ATM machine (again) that can now provide bill payment and upsell financial services.

The third criterion would be market reach. Without explaining this ad nauseum, we will just mention e-commerce. The current pandemic is seeing the death of many apparel retailers around the world. The shelter-in-place orders have not reduced the need for apparel; just how they are (increasingly) bought. One does not have to do more than pick a newsmagazine to see some global marquee name filing for bankruptcy, primarily because they missed the e-commerce bus or its next step, the online marketplace.

The fourth criterion is negation of competitive advantage. This is the true “fear” factor: If one does not keep up, one will fall behind. The examples of global leaders in telecom, computer hardware and fizzy drinks mentioned above fall into this category; all of whom saw competitors overtake them using better technology (and marketing). As a side note, Forbes magazine had once called these businesses that will never ever lose their number one position.

The fifth criterion is of regulation and compliance, especially when they change dramatically or have a tendency to change continually.

There are more criteria that are specific to industry or geography that tell us to take it or leave it. And one could argue that there are more generic ones. We are here ONLY looking at what must always be looked at as a context for new technology evaluation. We will conclude that by saying that COBOL (a language that came into vogue before perhaps any one of us was born and can find no coders today) is still around and continues to have a significant presence; not because of “why fix it” syndrome or because no “improvement” came along. But because the large businesses adopted new technologies in parts where one of the above criteria was applicable, without going overboard. So today, you have many globally leading retailers and banks with e-commerce, advanced logistical tracking, InfoSec departments, and more, that still uses COBOL; in fact as this columnist can say with first-hand experience, even Assembler.
Media and entertainment industry are continuously transforming with new types of content being created, new subscription models in vogue as well as new ways to fund entertainment projects. For consumers as well, what is changing is the way we consume entertainment, the way we share it and the modes in which we pay for it.

At the epicenter of this disruption are a set of digital technologies including Big Data Analytics, Mobile Apps, Artificial Intelligence (AI) and User Experience which are helping media and entertainment enterprises reinvent themselves and provide a wide range of media products for consumers to examine and consume. According to the PwC Global Entertainment & Media Outlook for 2019-23, the revenues for the industry is expected to grow from USD 2.2 trillion to 2.6 trillion in this period.

Transforming the Media and Entertainment with Digital Technologies

In today’s digital world, media and entertainment companies leverage the power of digital technologies in engaging with customers and
Traditionally, media houses sold newspapers and magazines. Now, they are moving to digital subscriptions of online newspapers. When cable television started, the consumer had to purchase the entire range of channels even though they may not be watching them. Now, the advent of digital providers like Amazon Prime or Netflix provide more curated content and advertise based on consumer behavior.

4) Smarter Advertising

Media and entertainment companies are leveraging Big Data Analytics and AI to make advertising smarter and not just make traditional product placements. Previous buying history and changing demographic trends are used to make advertising savvy by placing products and services that a consumer is most likely to be interested in and buy. LinkedIn tailors training offering placements based on a person’s professional profile, interests also tie up with other training providers to provide curated content that is relevant and provides professional value.

5) Rise of Digital Channel

With the proliferation of smart phones, and other devices like tabs, the opportunities for digital content has been rising continuously. Marketers are observing this trend, and this reflects in the advertising spend; by 2023, it is expected that marketers will spend more than 50% of budgets on digital advertising. This is also reflected in the use of mobile devices in engaging with media and entertainment which has risen from 1.6 hours a day in 2012 to 3.3 hours in 2018.

The key disrupting technologies that are reshaping the way media and entertainment providers are making a difference to citizens are as follows:

- **Machine Learning** – Machine learning algorithms are used to understand consumer consumptions trends as well as assess impact of changing trends in consumption patterns across demographic groups. Curated content can be pushed on digital platforms based on this analysis. Movie plots are now based on insights from Machine Learning algorithms that help studios predict customer likes and a higher probability to generate revenues and deliver hits.

- **AI and Big Data Analytics** – AI and Big Data Analytics are crucial differentiators for media and entertainment companies to assess the impact of new business models, analyze effectiveness of advertising spends across multiple channels as well as provide curated content across multiple channels.

- **Mobile Apps** – Mobile apps are...
Personalization and curation are key to success and survival for the media and entertainment industry. And personalization is about providing unique experiences

increasingly used to provide content on mobile devices. With the proliferation of smartphones and increasing device usage by consumers, all content providers irrespective of business (LinkedIn) or entertainment (Netflix) or social media (Instagram, Facebook), all have mobile apps. A lot of content is consumed on Mobile Apps and results in revenues from subscriptions.

As is evident from the transformational impact of digital technologies in the digital transformation of media and entertainment, there are key benefits that can be derived as well, including:

- **Cost Optimization** – Digital channels have helped optimize the cost of advertising. The rising trends of more digital content consumption has led to more advertising spend on digital channels which have reduced the cost of advertising as compared to traditional channels. Big Data Analytics and Machine Learning enable media companies to provide curated advertisements to target consumers that results in more efficient spend of advertising budgets.

- **Transparency and Customer Experience** – Armed with digital technologies and enhanced customer service capabilities, media and entertainment providers can provide a more transparent and customized experience to customers. Emphasis of user experience design and curated content makes the customer experience richer and increases customer appetite for more content.

- **Revenue Models** – With customer centricity at its focus, media and entertainment enterprises look to create curated content and provide custom products and services for customers to consume. The rise of digital subscriptions and multiple product bundles has resulted in new revenue streams. The ability to merge multiple data sets and generate insights creates new revenue generating models and opportunities. Digital transformation in media and entertainment industry is a growing trend worldwide as it is not just a differentiator but a provider of competitive advantage. Yet challenges remain in parts of the industry, for instance the news industry is in decline as there is only a small increase in the number of readers paying for online news.

Personalization and curation are key to success and survival for the media and entertainment industry. And personalization is about providing unique experiences to millions of customers which can only happen when 1) you have deep insights of your customer’s interests and changing tastes 2) being nimble and flexible – keep enhancing the content and end-user experience on websites and mobile apps 3) provide compelling content that can be shared by customers using hashtags and links to social media platforms. The rise of crowdfunding option is another disruptor that cannot be ignored anymore—around 16% of crowdfunding is for music, film and other entertainment initiatives.
डिजिट
अब हिंदी में

देश का सबसे लोकप्रिय और विश्वसनीय टेक्नोलॉजी वेबसाइट
डिजिट अब हिंदी में उपलब्ध है। नयी हिंदी वेबसाइट आपको
टेक्नोलॉजी से जुड़े हर छोटी बड़ी घटनाओं से अवगत रखेगी। साथ
में नए हिंदी वेबसाइट पर आपको डिजिट टेस्ट लैब से विस्तृत गैजेट
रिव्यू से लेकर टेक सूचनाओं मिलेंगे। डिजिट जल्द ही और भी अन्य
भारतीय भाषाओं में उपलब्ध होगा।

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Adaptability Is The Key To Face This Challenging Situation

These challenging times will help you separate partners—who can stand with you in this lean period—from vendors that you can quickly adapt to new situations.

So, it didn’t take long for most CIOs to respond to the unique, unprecedented challenging situation in the wake of COVID-19.

It was a question of survival for many businesses. More importantly, it was a question of survival of our lives, our economy. Imagine if the logistics companies or pharma companies or essential goods manufacturers would have stopped their operations! It is technology that kept them—and the country—running.

Getting everyone remotely connected was the first basic challenge and various options of collaboration platforms like MS Teams, Zoom, Google Meet and WebEx were put to use. Security is the key issue once everyone is connected. Remote monitoring, filtering, restricted access management were all part

There is no denying that the COVID-19 pandemic—the way it came and impacted our daily lives, business and economy—is unprecedented; we have never seen something like that in our lifetime.

But responding effectively to a challenge is not necessarily dependent on how big or new the challenge is or whether you have successfully anticipated how it would impact you. Rather, it depends on how adaptive you are.

As Darwin said, it is not the most powerful—but those who can adapt to change effectively—would survive.

Adaptability is in the DNA of the CIOs. Experienced CIOs have seen and faced many such challenges in the past, whether it was Y2K or natural disasters.

You cannot foresee and plan exact details for each such possible scenario, but you can make yourself so adaptive that you can quickly adapt to new situations.

The author is CIO at Luminous Power Technologies
of the CIOs’ plans to ensure smooth transition of work from office to work from home.

There is much discussion around if CIOs’ roles have changed post-COVID. I don’t think the role per se has changed but challenges have surely increased. Value of digitization is realized now across sectors and expectation is for faster solutions. The main challenge which CIOs have is to do more with lesser budgets as all industries are facing challenges of business growth. So smarter CIOs like a smart housewife have to make a dish with whatever is available in the kitchen. Cloud and remote connectivity are two pillars for any ongoing digital journey which has to be planned by IT departments.

Today, we see many vendors claiming to have all the solutions for Business Continuity Planning (BCP), post-COVID world and so on. But I feel it is time to test the commitment. Most vendors have called themselves partners.

The word partner will be put to test now. You will realize in this situation who are your vendors and who are your partners. Companies invested in technologies and in view of expected growth, platforms were ramped up. Now the challenge is: are your partners/vendors ready to support you in ramping down for the lean period?

Now, the challenge is that most of the partners will try to offer freebies but the task for all CIOs across industries is to help in reducing operating cost presently. Hopefully, good sense will prevail in large ERP, Cloud, Connectivity providers to ensure they have long-term strategic relationships as part of their vision.
Rising Bot Attacks: Why Are Organizations Failing To Deal With Them

Bots are being used to take over user accounts, perform DDoS attacks, abuse APIs, scrape unique content and pricing information and more

By Nikhil Taneja
The need for bot management is fueled by the rise in automated attacks. In the early days, the use of bots was limited to small scraping attempts or spamming. Today, things are vastly different. Bots are being used to take over user accounts, perform DDoS attacks, abuse APIs, scrape unique content and pricing information and more. In its “Hype Cycle for Application Security 2018,” Gartner mentioned bot management at the peak of inflated expectations under the high benefit category.

Despite serious threats, are enterprise businesses adopting bot management solutions? The answer is NO. Many are still in denial. These businesses are trying to restrain bots using in-house resources/solutions, putting user security at risk. In a recent study, Development of In-house Bot Management Solutions and their Pitfalls, security researchers from Shield Square found that managing bots through in-house resources is doing more harm than the good.

Against 22.39% of actual bad bot traffic, advanced in-house bot management solutions detected only 11.54% of bad bots. Not only did these solutions fail at detecting most of the bad bots, but nearly 50% of the 11.54% detected were also false positives.

So why do in-house bot management solutions fail? Before we dive deeper into finding out the reasons behind the failure of in-house bot management solutions, let’s look at a few critical factors.

More Than Half of Bad Bots Originate from the U.S.
56.4% of bad bots originated from the U.S. in Q1 2019. Bot herders know that the U.S. is the epicenter of business and showing their origin from the U.S. helps them in escaping geography-based traffic filtration.

For example, many organizations that leverage in-house resources to restrain bots often block the countries where they don’t have any business. Or, they block countries such as Russia, suspecting that’s where most of the bad bots originate. The fact is contrary: Only 2.6% of total bad bots originated from Russia in Q1 2019.

Cyber attackers now leverage advanced technologies to sift through thousands of IPs and evade geography-based traffic filtration. When bots emanate from diverse geographical locations, solutions based on IP-based or geographical filtering heuristics are becoming useless. Detection requires understanding the intent of your visitors to nab the suspected ones.

One-Third of Bad Bots Can Mimic Human Behavior
In Q1 2019 alone, 37% of bad bots were human-like. These bots can mimic human behavior (such as mouse movements and keystrokes) to evade existing security systems (Generation 3 and Generation 4 bad bots).

Sophisticated bots are distributed over thousands of IP addresses or device IDs and can connect through random IPs to evade detection. These stealthy detection-avoiding actions don’t stop there. The programs of these sophisticated bots understand the measures that you can take to stop them. They know that apart from random IP addresses, geographical location is another area that they can exploit. Bots leverage different combinations of user agents to evade in-house security measures.

In-house solutions don’t have visibility into different types of bots, and that’s where they fail. These solutions work based on the data collected from internal resources and lack global threat intelligence. Bot management is a niche space and requires a comprehensive understanding and continuous research to keep up with notorious cyber-criminals.

Organizations that are working across various industries deploy in-house measures as their first mitigation step when facing bad bots. To their dismay, in-house solutions often fail to recognize sophisticated bot patterns.

”The author is Managing Director - India, SAARC & Middle East, Radware"
Can Lawyers Be Automated?

AI does not threaten to replace legal professionals but promises to improve their efficiency

By Karan Kalia
The first most talked about use of AI perhaps was when IBM developed a chess playing computer named Deep Blue which beat the then reigning world champion Gary Kasparov in its second attempt, way back in 1997. In the year 2005, Stanford robot won the DARPA Grand challenge by driving autonomously for 131 miles along a desert trail thanks to tedious engineering application and increased speed and capacity of the computer. AI was soon used throughout the technology industry in fields like data mining, industrial robotics, logistics, speech recognition, banking software and medical diagnosis. Not to forget Google’s search engine.

In the legal industry too, AI is becoming increasingly crucial in enhancing legal research and analysis, helping in law practice management as well as providing easily accessible legal customer service. Many people are actively wondering whether Artificial Intelligence will gradually eat into the jobs of legal professionals or will it eventually lead to the creation of automated lawyers? The answer lies somewhere in between.

**Increasing role of AI in the Legal domain**

When it comes to legal research, AI-enabled systems are assisting lawyers in finding relevant material pertaining to their case by quickly filtering through related documents and sites. These systems also help law firms prepare for big cases with immediate court dates quickly as well as help them cut costs on manpower required to analyse large amounts of data in a short span of time. Law firms are also reaping the benefits of AI’s predictive power that allows them to examine years’ worth of legal data and predict the outcome of these cases. The systems are so advanced that they can even use court docket databases and other key sources of information to give lawyers valuable insights into how a judge may rule in a particular case.

Artificial Intelligence software is also being used as a second set of eyes to recheck important contracts and look for any incorrect, missing or improper clauses. Contract intelligence systems are able to sift through thousands of credit agreements and analyse them for consistency in a few seconds, saving weeks of manual work. Moreover, intelligent document management systems enabled with machine learning can rapidly confirm facts and find background information which in turn helps accelerate arbitration and litigation proceedings.

Lawyers can also easily access intellectual property information with AI’s assistance and search huge quantities of patent filings, existing claims, pending or granted trademarks and copyright filings to know if an existing filing, claim or trademark infringes on an existing intellectual property claim.

AI capabilities employed in legal practice management software also help lawyers as well as law firms keep track of billable hours of each client and automatically generate invoices. More importantly machine learning AI applications help in document classification as well as text summarization by digesting and examining enormous quantities of legal documents from contracts to court notices. This reduces the need of junior legal assistants by simplifying law practice management.

Customer Service is another area that has got an AI boost with AI-enabled tools and chatbots providing quick legal support to consumers with the help of an online interface.

**Will AI make lawyers redundant?**

Coming to the moot point; while AI-based technology is making a series of manual legal jobs automated, it will certainly not make lawyers and judges redundant. What it is doing is increasing the efficiency of legal professionals, significantly reducing time and energy spent on a series of mundane jobs and allowing lawyers more time to bolster their practice.

Law firms that enrol AI-based technology in a major way will certainly save a few positions of researchers and legal professionals. However, this is how Artificial Intelligence has been impacting all industries across the board by refining processes and adding value. Much like the advent of computers did eat into a series of manual jobs but also created entire new avenues of work, AI is also unleashing greater specializations and better avenues for early adapters.

The freedom from hours of research based drudgery will allow lawyers and prosecutors more time to interview clients, derive deeper insight from their investigation and focus on improving legal processes and outcomes. This will also serve to accelerate the judicial process and help the courts dispose off cases faster.

However, if you are envisioning a courtroom where chatbots or intelligent robots will replace lawyers, you are stretching your imagination a bit too far. Artificial Intelligence is not here to automate lawyers, it is here to automate their manual tedious work and allow them more time to improve their work outcome. Lawyers and judges are not becoming redundant any time soon.

—The author is Founder, LegitQuest
Leap Into The Future: COVID-19 Crisis Is Forcing Organizations To Reinvent Themselves

Adaptability remains the key to survival and organizations that display quick adaptability are the ones that will succeed in staying afloat over the long term

By Dr. Vivek Bindra
The sudden turn of events unleashed by a global disease outbreak has forced organizations to hit a pause and reset button. While uncertainty prevails over what the future would entail, what is clear is that it would be starkly different from the world we have known.

Shift in Mindset
- These tectonic changes have forced a major churning in organizations across industries. The need to stay relevant in the changing times is propelling a major transformation.
- Companies are preparing for the new normal by challenging and changing their core organizational behavior, their hierarchies and their offerings.
- Come to think of it, organizations that were extremely wary of allowing work from home to their employees have suddenly devised functional strategies to make remote working and remote client servicing a reality.
- Companies that were conventionally slow in adopting automation are now vying for co-opting the latest available technologies.

Shifting Business Models
- With most economic activity on hold, many companies have found their products and services staring at a near zero demand. With their offerings rendered irrelevant, many startups and established companies have been forced to quickly reconfigure their product offerings and transform their business models.
- Given the fact that the current demand comprises only essential items and Coronavirus-related equipment, many organizations have shifted to manufacturing PPEs, masks, sanitizers and essential grocery items.

To cite just one example, Wow! Momo Foods, an organization that runs two Quick Service Restaurant brands has quickly announced the launch of its grocery service ‘Wow! Momo Essential Services’. Such business decisions are being made everywhere to stay relevant during the time and keep earning revenues.

- Adaptability remains the key to survival and organizations that display quick adaptability will succeed in staying afloat over the long term.

Technological Automation and Robotics come to the fore
- As organizations look to increase efficiency, improve outcomes and optimize costs, they are proactively considering increased adoption of technological automation and robotics. Increased automation helps organizations tide over the shortage of skilled labor while helping decrease manufacturing costs and keep up the cost advantage.
- According to a market research, the global traditional industrial robotics market size is expected to grow from USD 44.6 billion in 2020 to USD 73 billion by 2025. Greater use of automation also allows manufacturers to maintain the norms of social distancing for their workers, paving the way for safer and unhindered production.

- Going forward, we will witness an increase in the adoption of Artificial Intelligence and cloud-based solutions not only in large organizations but also in small and medium-scale enterprises. Increasingly, SaaS, IaaS, and PaaS solutions would be used to improve customer relationship management and enterprise resource management, among other functions.

Remote working to be the New Normal
- The pandemic has also revolutionized the way we work as it ushers in a series of behavioral shifts. IT giant, Tata Consultancy Services has announced that it is working on a plan to allow as much as 75% of its workforce to work from home by 2025. This implies that the organization will need just 25% of its workforce to work from the office.
- With the pandemic normalizing work from home, we are likely to witness a greater acceptance of this practice going forward. Organizations will also realize that this arrangement saves costs by reducing the need for office space and other office infrastructure. This will also help reduce the drop-out rate of women from the workforce.
- Remote working is further expanding the scope of remote access to everything and greater security against cyber crimes.
- Increasingly office-less organizations will become common as businesses starting up over the next year will find such a working model viable. We have realized that remote working can be as effective as the conventional mode which was practiced before Corona. It can even be more effective as it increases employee productivity by eliminating the time and hassle of travelling to work daily.

Flattening Hierarchies
- A non-conventional work setting where a bulk of the workforce is operating from home and is connected remotely, will give way to a more democratic work culture than the traditional style of reporting to a manager.
- As employees take collective responsibility of managing the crisis, the need for micro management has evaporated and the managers are assuming the role of coordinators and partners. This flattening of hierarchies is another cultural shift that is likely to stay. Within the catastrophe perhaps lies an opportunity and businesses need to rise to this challenge.

—The author is Founder & CEO, Bada Business
In A Time Of Crisis, A Global Lockdown Needs A Digital Unlocking

Digital applications that enable communication and collaboration are key to enduring the current crisis

By Ivo Ivanov
Insight

We are at a very special moment in history right now. Never before in modern times have we seen such a global impact and a global response to a crisis, which largely ignores geopolitical borders. The COVID-19 outbreak and its repercussions have put cities, countries, entire regions on hold. The news each day brings new stories of economic hardship, of fear, and grief, peppered with signs of hope – hope for a cure, for a vaccine, for ways to work and earn a living whilst facing lockdown, hope for the time after the coronavirus has lost its capacity for destruction.

One saving grace of this crisis is that the global digital infrastructure – the terrestrial and mobile networks, the data centers, the undersea cables and the satellite connections that support the global internet – is by now well enough developed for people in most countries to stay in constant contact despite isolation.

Lockdown does not mean shut-down
This means that, today, lockdown does not necessarily need to mean shut-down.

Where possible, people are finding ways to make the best they can of the situation. Companies that have sent their workforce into home office, keeping their staff in employment and their operations running. Logistics are being maintained, and retailers have been quick to offer delivery services for those unable to leave their homes. Freelancers are seeking creative new ways to make ends meet using digital tools, and communities are looking for ways to support local initiatives.

Digitalization – and therefore reliable digital infrastructure – is the only answer
Therefore, one answer to some of the challenges posed by the COVID-19 pandemic – and the modern world in general – is sophisticated digital infrastructure, because this allows the use of smart digital applications and solutions which will make people’s lives better. In a globalized world, economic growth and the development of societies in most regions is now based on digital communication and digital services, and these in turn depend on the underlying digital infrastructure.

As a result, the interconnection community – more than ever before – must deliver continuous and high-performance connectivity: everywhere, for everybody, and for everything. This community, and the infrastructure that they build and care for, is just as critical as other critical services in a crisis. It is essential that this digital infrastructure is as global, open (neutral), resilient, scalable and secure as possible, in order to deliver the many and varied services needed by people, institutions, and businesses.

As an element of this crucial digital infrastructure, Internet Exchange Points like DE-CIX are key to improving the quality of performance of digital applications and digital communication – for businesses, for medical facilities, for education, recreation/entertainment and for news and media outlets – for all users, wherever they are. Interconnection services need to allow communication to occur along the shortest route and in the most secure way.

Digital communication on the rise
These times of global lockdown are having a strong impact on how we interact with each other and how we behave, how we work and how we communicate with each other. As a global operator, DE-CIX’s Internet Exchanges on four continents are all recording the same trend: Internet traf-
ics is growing, together with demand for quality. While different regions are at different stages of development, depending on when the COVID-19 infections began to take off in their locality, the trend is valid from North America to Europe, to the Middle East, and on to the Indian sub-continent.

Three types of internet traffic in particular have risen substantially: traffic from collaborative communications tools has doubled since the crisis began, as has traffic from streaming services. This is significant of both enterprises and the education sector migrating their activities online. Added to this, we see around a 50% increase in traffic from online gaming. Everywhere, we see a similar demand for reliable digital infrastructure.

**Communication behavior will significantly change in the long-term**

Even before the current crisis, we were seeing huge investments in new streaming services. But what’s happening now, in response to lockdowns around the world, will change the game in many areas of activity. The current transformation of attitudes, processes and systems will continue to echo through the post-Corona era. People are taking the time to keep in touch with their loved-ones on a more regular basis. To value the time they have together, despite the distance.

Many employers are looking into how remote working benefits business continuity and supports their employees to master challenges. But beyond this, decision makers are also beginning to recognize the long-term benefits of a more profound digital transformation. Companies are taking a long, hard look at how they manage their offices, how staff interact, how teams collaborate, what business travel is actually essential, whether meetings can be reconceived to be more productive. They are becoming aware of how the move online can unlock the potential to save money and increase revenues.

This won’t only have an effect in the short-term – it will be a game changer for business and private communications behavior, and is likely to lead to even higher usage of digital applications than we would have forecast in the pre-COVID-19 world. This is not to suggest that now everything will be digital only. Rather, that we need to recognize that we have options; processes should be reviewed, and we should learn from the times of crisis how to make our life better in general.

While the virus itself currently remains a serious threat, we are all doing what we can towards minimizing its impact, stopping its spread, flattening the curve, and finding a cure. But this crisis can also offer us a chance to re-evaluate, to see things differently. Right now, we are being forced to do that. Let’s also take the time to learn to manage tasks more efficiently, operate more prosperously, discover successful modes of behavior in terms of business and private communication, which we can apply now and in the future.

**Meaningful investment decisions should be made in the future**

We have to learn out of this so we can make meaningful investment decisions in the future. Digital infrastructure is the enabler of this long-term transformation, and it helps to ease the pain of today’s lockdown. The Corona crisis throws into stark relief the regions that have solid, reliable digital infrastructure, and those regions of the globe that remain underserved. The digital divide must be eliminated so that all communities can in future have access to information, access to digital communication tools, and access to digital continent. The internet industry must take as their mandate the goal of a minimum level of digital infrastructure everywhere.

Nothing will be the same after COVID-19. Not for humankind itself, not for how we do business or how we (inter)connect in this new decade. This century, like last century, is presenting us with global challenges. However, these challenges – though of a different nature – can also be transformed by people and businesses. The current global crisis will change our life going forward, and to survive in the present and prepare for the post-Corona future, this global lockdown needs a full digital unlocking.

—The author is CEO at DE-CIX International
Organizations Will Need To Stay Focused On Improving IT Security In 2020

With the influx of non-traditional workers and their many remote devices, companies will need to make security a priority, as well as implementing solutions to help track and monitor these devices

By Rajesh Ganesan
Thanks to new technologies and new applications of established technologies, the way people work will continue to change in 2020. However, securing these technologies will be high among the list of priorities for organizations. Read on for the security-related trends that will dominate the year ahead.

**End Point Protection Will Assume Significance**
As the number and types of end point devices rapidly proliferate and become 'smart powered' by software and connectivity, they become critical targets and vectors for external attacks. As the threat landscape evolves to exploit sophisticated capabilities in the endpoints, so must the protection techniques. In 2020, we’ll see techniques such as data loss prevention (DLP), which prevents users from leaking critical information intentionally or otherwise, and endpoint detection & response (EDR), which continuously monitors events, detects threats, performs investigation and initiates response all within the endpoint gain prominence.

**AI Security Will Be An Important Investment**
While AI is all set to grow in adoption across the enterprise, it also brings new threat vectors that can be exploited to cause significant damages. Enterprises would have to understand the AI security trends and the types of possible attacks, besides ensuring that the AI models are free from algorithmic biases. This requires them to make sufficient additional investments to make AI work optimally for them.

**Privileged Accounts Users Need Better Education**
With the ever-changing IT landscape, those with privileged access credentials are also among those with the highest risk of cyberattacks. In 2020, IT departments and organizations as a whole will need to implement a more proactive stance on compliance and understanding of these privileged accounts, as the people with the most credentials and access, often are not the most tuned in or compliant, due to lack of pure understanding or training resources provided by the company’s experts – their IT.

**Mobile Applications Must Be Guarded Against Threats**
The RSA Quarterly Fraud Report reported that there was a “300% increase in fraud attacks attributed to rogue mobile applications in quarter one of 2019” and in 2020, with the continued increase of mobile and remote devices for both work and personal usage interchangeably, this will be a major concern for businesses, especially for their IT departments. This will become especially apparent when a large application exposes a vulnerability. With the influx of non-traditional workers and their many remote devices, companies will need to make security a priority, as well as implementing solutions to help track and monitor these devices.

—The author is Vice President at ManageEngine
We are comfortable working from home only because we feel certain that it is only a temporary substitute. How comfortable would you be even imagining working remotely forever?

By Rami Reddy
Every humanitarian crisis disruptions the way certain things are carried over and sets precendence for a new order. The COVID-19 public health emergency has changed the way we greet each other, interact with others, learn and work. Working from Home has become the new order during the lockdown. Dining tables turned workstations and we are reinventing ways of managing teams, scheduling the work, using e-infrastructure, ensuring data privacy, etc.

While there are some associated benefits, some challenges could mean that remote working will not be the future of workspaces in India and that the activity returns to normal.

In a webinar snap poll conducted by Gartner, 91% of the attending HR leaders from the Asia/Pacific have reported that lack of technology infrastructure and lack of comfort with new ways of working are the biggest challenges of working remotely. Based on some articles and research work I have come across recently and from my personal experience. I’m highlighting the key challenges to working from home:

The Human Nature: We are social beings. In a research titled Does working from home work? Evidence from an experiment, 2/3rd of the control group, who had earlier opted for working from home, has decided to return to office citing concerns over the loneliness of working remotely. Workplaces are more than just working on the spreadsheets. It’s the entire culture and values of people we work together with. Zoom interactions cannot replace face-to-face conversations, complex team dynamics and collaboration which make work more exciting. Popular journalist Henry Grabar made a point about “Psychological Safety” in ‘The Future of Work’ webinar. He says that we feel more comfortable while expressing ideas to our co-workers and that the remote communication reduces the psychological safety.

Building strong relationships, maintaining company culture and motivating employees are hard to achieve without physical presence. We are comfortable working from home only because we feel certain that it is only a temporary substitute. How comfortable would you be even imagining working remotely forever?

The struggle with unplugging: Working from home changes the daily schedules drastically among the majority. As per a survey conducted by Buffer, most remote workers struggle with unplugging from their work. Staying logged in way beyond routine work hours has become common. Working for considerably longer hours in isolation can affect the health of an individual. A research report titled Working anytime, anywhere: The effects on the world of work by the ILO (International Labour Organization) has data from 15 countries including India and sheds light on risks associated with working remotely. It lists longer working hours, higher work intensity and work-home interference as some of the major concerns. 41% of remote workers felt high stress levels while it was just 25% among those who work from offices. 42% of people who work remotely suffered from insomnia as compared to 29% of people who work from offices.

The Infrastructure: It is true that majority of the young Indian employees have migrated to cities and live in hostels and other paying guest accommodations. These shared living spaces don’t provide a quiet workplace environment and the challenges pertaining to high-speed internet, availability of power-backup, etc. will hamper the productivity.

Data Privacy: Several Indian IT companies deal with sensitive data of their clients varying from financials to health records. These operations are carried out in highly secure workplaces. Working remotely and having access to this data will only increase the data security risk.

Productivity: As per results from the Gartner snap poll, top employee complaint was about their managers concern over the productivity. A research says that face-to-face work teams perform better than virtual ones on creative assignments. Moreover, as stated earlier, distractions and infrastructure challenges could reduce the productivity of many employees while working from home.

Though working remotely has benefits like lower commuting stress, reduced costs of maintaining office spaces, decreased pollution levels, and reduced travel, the challenges listed above might not let the future of workspaces change significantly for many of us.

—The author is Head - IT, Dr. Reddy’s Foundation and NEXT100 Winner 2018
4 Pitfalls That Could Stop Your Endpoint Backup Solution From Being Truly Good Enough

As backup risks and challenges continue to increase, it is important that organizations are mindful of data protection and management.

By Bakshish Dutta
As backup risks and challenges continue to increase, it is important that organizations need to ask certain questions with regards to data protection and management. Is your business-critical data fully restored and protected across devices if ransomware strikes? How quickly can you recover the data in case of a device theft? Do you have control over the sensitive data if an employee departs the company? Are you mistakenly relying on cloud-syncing services as your only backup tool? Answers to these questions may help you recognize that your endpoint backup solution might not be truly “good enough.”

While there are some associated benefits, some challenges could mean that remote working will not be the future of workspaces in India and that the activity returns to normal.

Let us look at the four main pitfalls that will help you better evaluate your endpoint backup solution.

1. **Overlooking risks to business-critical data during employee departures:** There have been several instances when employees leaving an organization may delete, hide, or tamper with important data. Often these risks are overlooked, especially for those who work remotely for the company. If these corrupt activities could have started months prior to the departure, then without a proper backup solution, there is no way to provide comprehensive data protection or conduct thorough data investigations.

2. **Neglecting data protection best practices for remote workforces:** During any type of emergency, your organization needs a way to recover the data while keeping productivity on the move. During the current unforeseen situations like the outbreak of the COVID-19 pandemic, more employees are working remotely and using new platforms without understanding remote working best practices around data protection. For instance, someone may accidentally download ransomware on their laptops and unknowingly infect the entire organization, inadvertently expose confidential enterprise or customer data, and unintentionally lose or damage their devices.

3. **Undervaluing the impact of ransomware:** Now-a-days, ransomware attacks are getting more sophisticated by the minute and can impact all of your employee devices (across multiple locations) that are left vulnerable without proper endpoint backup. With hackers constantly employing new social engineering strategies and turning this form of intrusion into its own mature industry, endpoints are particularly at risk. It is important that companies start thinking about incorporating ransomware recovery into your endpoint backup strategy. This way, they will be fully prepared for ransomware — and avoid spending billions.

4. **Relying on cloud-syncing services alone for endpoint backup:** Many organizations have a risky misconception that cloud-syncing services provide sufficient endpoint backup and restore capabilities for their enterprise data. However, it exposes the organization to multiple risks like ransomware, device loss, data corruption, insider threats, and liability exposure of not meeting legal hold, eDiscovery, and compliance requirements. Rather than relying on cloud-syncing services alone, a good place to start would be to consider partnering with a third-party endpoint backup solution.

**What should be the way forward?**

Being mindful of the key pitfalls outlined above has several other benefits besides preparing your organization for the risks and challenges. First, it will help you to satisfy larger business initiatives, such as readiness for eDiscovery and data governance — which will ultimately lead to increased organizational agility and efficiency. Second, partnering with an industry leader to help your IT organization close the gaps in endpoint backup. And third, your business-critical data will be protected no matter where your devices go, without impeding user productivity.

—The author is Country Manager - India & SAARC, Druva
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