



STRATEGIES FROM A CIO p. 16



INDUSTRY 5.0 ALREADY ON THE HORIZON p. 42



RIDING THE STORM p. 47

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CONTENTS

TALKING POINT



STRATEGIES FROM A CIO

16

—**RAMESH LAKSHMINARAYANAN**
CIO, CRISIL



BANKING ON CLOUD

19

—**DILIPKUMAR KHANDELWAL**
MD & Global Head, Technology Centres, Deutsche Bank



JOURNEY TO THE CLOUD

21

—**SANDIP PATEL**
IBM MD India and South Asia (ISA)



WHERE IS CRYPTOCURRENCY TODAY?

24

—**GARRICK HILEMAN**
Research Head, Blockchain.com



SMART BUILDING

27

—**BALA CHITOOR**
Chief Strategy Officer, Flamenco Tech

08 | COVER STORY

DIGITISATION PARTNERS FOR THE POST-CORONA WORLD

How are the enterprises teaming up to go ahead?



SMART TECH

34 Shift to the New Mode of Learning



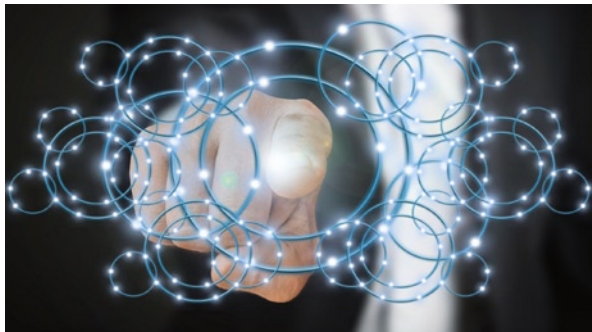
37 Building a Roadmap

39 Flowing into New Structures

DIGITAL ENTERPRISE

45 Connectivity

47 Riding the Storm



52 Data Power

58 Configuring Data



61 Ready?

DIGITAL ENTERPRISE

63 Helping Startups

65 Need to Connect

67 Devising Supply Chain Strategy

70 Re-Thinking Corporate Cyber Security

TALKING POINT



AI AND IoT IN HEALTHCARE

30

—**AMRITA CHOWDHURY**
Director & Co-Founder, Gaia Smart Cities



WIDEN THE RANGE

32

—**CHRISTIAN GOGOLIN**
Expert in Quantum Computing, Covestro



INDUSTRY 5.0 ALREADY ON THE HORIZON

42

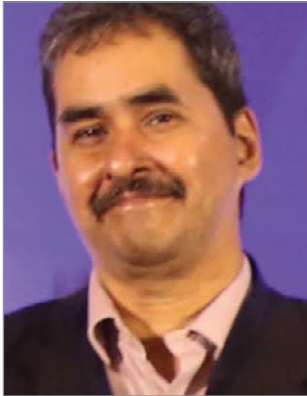
—**S. SRIRAM**
GM, Industry Sales, Factory Automation & Industrial Division, Mitsubishi Electric India

REGULAR

06 Edit

07 DQ Team

73 News



The Business of AI

Greetings Friends!

We are now entering the fifth month of the national lockdown. Nevertheless, we have continued, relentlessly. Today, the digital enterprise is shaping tomorrow's products. Each product is born in the digital world first. We need to first design the electronics, the mechanics and the software, and then, re-design and re-simulate. Once we are able to meet the product requirements, we should design a whole line for the factories. We get the digital twin. Once we have the digital twin complete, we go into the real world.

Now, the above description is about how the developed world generally operates.

In a recent webinar, Rockwell stated that digitisation/smart manufacturing is the opportunity, or, the way ahead. Smart manufacturing and the IoT can foster tremendous business outcomes. Digitally transformed companies are, definitely, better positioned to handle business in the pandemic. Convergence is a necessity.

Today, we have another opportunity of combining software with electronics and hardware. How can we combine these two, and create complete offerings? This is a very good chance for us to be different. We must try to find new ideas and products for each area, where there is some pain. There is no dearth of challenges waiting to be solved.

Enterprises and the other companies need to choose a customer-centric business approach to maximise the impact. There is a need to try out new systems to establish the governance around customer service. Leaders should look at the corresponding data to cleanse and connect different data across the enterprise. Harmonized and cleansed data should be migrated into new systems.

Digital and AI is about scaling and moving from experimentation to transformation. This year, enterprise demands rose for real-time and near real-time analytics at scale. Businesses are eager to have AI making a positive impact on their bottom line. Transform the enterprise, digitally!

So, that concludes DQ Aug 20!

Pradeep Chakraborty

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THE BUSINESS OF INFOTECH

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DIGITISATION PARTNERS FOR THE POST-CORONA WORLD





CEOs are focused on how the companies can partner to take the next step in the digital transformation of the industry. Companies in different industries and regions have encountered challenges over the past few months

What are the technologies helping the enterprises to master the challenges they are facing today? What will they need to achieve flexibly and efficiently to adapt their business and production to changing conditions and demand in the future? Following are some of the discussions that took place at the Siemens Digital Enterprise Virtual Summit.

The participants to the Siemens virtual summit were – Klaus Helmrich, Member, Managing Board, Siemens AG & CEO, Digital Industries, Christos Varsakelis, Senior Manager, Global Data Analytics & Innovation Technical R&D, GlaxoSmithKline, German Wankmiller, Chairman of the Board & CEO, GROB Group; and Dr. Yu Yong, Chairman, HBIS Group.

Opening the session, Klaus Helmrich said that today, the customers are very excited. We expect over 40,000 participants. Customers and partners can view what our experts say. They can see the benefits of digital enterprise technologies.



INDUSTRY HAS NEVER BEEN IN SUCH A CRISIS. WHAT CAN WE DO FROM A PURE SAFETY SITUATION? WE WERE ABLE TO KEEP OUR OPERATIONS RUNNING, AND ALSO FOR OUR CUSTOMERS. WE ARE KEEPING CONTACT AND MAINTAINING DIALOG WITH OUR CUSTOMERS. WE HAVE OPENED ADDITIVE MANUFACTURING FOR HOSPITALS AND HEALTH ORGANISATIONS

— Klaus Helmrich, Member, Managing Board, Siemens AG & CEO, Digital Industries

Christos Varsakelis said, “The challenge had been mitigated. At R&D level, we have been facing unprecedented disruptions.” We are adjusting to the new conditions.” German Wankmiller noted that they were influenced by changes. They had been in crisis for more than a year. Dr. Yu Yong said there were issues, especially with goods delivery.

German Wankmiller said we have been in partnership with Siemens for long. We use Teamcenter for production. We also use quite a lot of Siemens software tools. We have brought more effectiveness into our production.

Christos Varsakelis, added that we talk about innovation. They are now doing an innovation project with Siemens and it lies in the heart of Industry 4.0.

Adapting to conditions

This leads us to the question as to, what the solutions are that can be deployed to help adapt to these conditions.

Dr. Yong said that they have recognised the full potential of digital solutions. It helps us to perform remotely and do transactions online.

Varsakelis added that digitisation in the pharmaceuticals industry is not new. It had started a few years ago. AI will transform the pharmaceuticals industry. We should not unilaterally place all of our investments in drug discovery, but also for process development.

Klaus Helmrich noted that flexibility is the key. So is productivity. The productivity component has been added to the software tools, from the design phase to the production phase. You can also maintain social distancing. We see the inside of our company, where

there are various initiatives going on. We are already having the Industry 4.0 portfolio. We also need to look at the data and see how that can help us improve. We can also predict much better.

New Technologies

In this scenario, the role of new, emerging technologies is key. Varsakelis said that their company is currently evaluating a lot of technologies. A lot of these tools are being evaluated, started and at proof-of-concept stages. We are having a trust-and-verify approach, so that we are sure that the accommodation and deployment of technology can have benefits.

Dr. Yong agreed that there is focus on flexibility. In the metal and steel industry, we also have to meet the customers’ specific needs, including niche customers. Manufacturing enterprises can meet the demands with digital solutions in the 21st century. We also have to talk about how we are to implement big IoT.

Wankmiller added that they are also using the technologies for the future. We are using more simulation software. We are also using edge technology from Siemens. We are exchanging data with customers using cloud computing via Mindsphere, from Siemens. In future, all technologies for design and production are very important for us.

Klaus Helmrich concluded that customers can build up their scales. We are also investing heavily. It definitely means a lot for process industries especially, to focus on digitalization. Flexibility is definitely a key element. This is also the target of our digital enterprise portfolio. We combine the real world with the virtual world.



FOR THE CHINESE INDUSTRY, THERE HAS BEEN IMPACT IN THE SHORT-TERM. CHINA METAL AND STEEL COMPANIES HAVE MADE USE OF TECHNOLOGIES, SUCH AS REMOTE DIAGNOSTICS. AUTOMATION HAS ALSO HELPED AVOID HAVING TOO MANY PEOPLE IN ONE PLACE

— Dr. Yu Yong, Chairman, HBIS Group

Digital Enterprise Shaping the Future

At the Siemens Digital Enterprise Virtual Summit, Dr. Jan Mrosik, COO of Siemens Digital Industries, shared his vision of how cutting-edge technologies are shaping industry's future and why partnering plays a major role in shaping that future.

Siemens is offering the MindSphere, automation and industrial software for process and discrete industries, industrial communications, industrial security and services. MindSphere is an open cloud platform or an IoT operating system developed by Siemens for applications in the context of the IoT.

Mrosik said that each product is born in the digital world first. We design the electronics, mechanics and software, re-design and re-simulate. Once we meet the product

requirements, we next design a whole line for the factories. We then get the digital twin. Once we have the digital twin complete, we go into the real world. The automation and software, in our portfolio, are the core and the backbone. We analyse the data and feed them into the digital twin.

Siemens software offering is for data sharing and collaboration. On the hardware side, there is the PLC automation, CNC automation, PC-based automation, and apps. Siemens enables the horizontal integration of digital twins along the supply chain. We are also driving the vertical integration, based on edge, MindSphere and Mendix low-code app development. There are connectivity devices as well. SAP and Siemens are partnering in the PLM and business fields. We are aiming to create a common thread.



TRUST AND TRANSPARENCY ARE VERY IMPORTANT. WE HAVE DRAFTED A STRATEGY ABOUT HOW WE CAN MOVE FORWARD. WE HAVE A STRATEGY THAT IS AGILE. WE MANAGED TO CONTINUE WORKING

— Christos Varsakelis, Senior Manager, Global Data Analytics & Innovation Technical R&D, GlaxoSmithKline



THE BEST CHANCE IS TO DEVELOP MORE QUICKLY TO MEET DEMANDS OF THE MARKET. THE MACHINE TOOLS BUSINESS IS FOCUSING ON MOBILITY. WE HAVE TO INVESTIGATE ALL THE PROCESSES TO LEAN UP. WE ARE DOING EVERYTHING TO BECOME LEAN AND FAST

— German Wankmiller, Chairman of the Board & CEO, GROB Group

Siemens and SAP Partnership

Speaking via video conferencing, Thomas Saueressig, Executive Board, SAP SE, applauded that Siemens has revolutionised Industry 4.0. We are starting with integrated solutions. Customers can leverage data from across the value chain. It will enable faster development times. We are now having a true digital portfolio.

Together, Siemens and SAP will deliver integrated end-to-end software solutions across product lifecycle, supply chain and asset management. The partnership leverages the expertise and technology of both companies to provide a true digital thread that helps enterprises eliminate process and information siloes, drives digitisation and delivers a comprehensive solution for the 4th industrial revolution (Industry 4.0).

SAP will offer Siemens' Teamcenter software as the core foundation for product lifecycle collaboration and product data management. Siemens will offer SAP Intelligent Asset Management solutions and SAP Portfolio and Project Management applications to maximize business value for customers over the entire product and service lifecycle and enable new collaborative processes between manufacturers and operators.

Mrosik added that Siemens and SAP will jointly install Teamcenter. He said, "We are going to integrate deeply with SAP. There are cutting-edge technologies for shaping the digital future of industries. For example, IIoT, Cloud, additive manufacturing, cognitive engineering, industrial 5G, etc. are some such technologies. Siemens' SIMATIC RTLS, a scalable locating system specifically designed for industrial applications, and SieTrace, which

is for social distancing and contact tracing for industry facilities, are used in the Siemens' Houston factory. The open industrial edge system enables cross-vendor collaboration.

Additive manufacturing

Additive manufacturing and generative engineering have lot of benefits. It allows for designs that have never been thought of. Siemens has invested a lot in additive manufacturing. We cover the full end-to-end workflow -- digital and real. We are providing the Siemens AM network as well. All business processes can be properly handled.

EOS is the leading technology provider worldwide for industrial 3D printing of metals and plastics. Founded as an independent company in 1989, it is a pioneer and innovator for integrated solutions in additive manufacturing.

EOS has been supporting London-based HEXR with its technology and providing expert consultancy since 2015. With the introduction of the HEXR fitting app, the company is now offering a complete scan-to-product-solution for high quality, safe 3D-printed cycling helmets.

An app-based head scan allows customers worldwide to begin the bespoke cycling helmet creation process at home. Next, the helmet is 3D-printed with EOS technology in a 100% plant-based polyamide material produced exclusively by Arkema. It is dyed in black before final inspection for structural integrity and finish quality. All components of the helmet—including the 3D printed inner structure, outer shell, chinstraps, etc., are assembled, custom fit to the cyclist's head and with an optional individual touch (e.g. personal engraving and shell colour).



THERE ARE QUITE A LOT OF PRESSING NEEDS. AVAILABILITY, EFFICIENCY, FLEXIBILITY, QUALITY, SPEED, ETC. ARE THE MOST IMPORTANT. NEW BUSINESS MODELS AND SUSTAINABILITY ARE ALSO THERE. DIGITAL INDUSTRIES CONNECT THE VIRTUAL AND THE REAL WORLDS, OVER THE ENTIRE LIFECYCLE. THIS IS FOR PROCESS AND DISCRETE INDUSTRIES

— Dr. Jan Mrosik, COO, Siemens Digital Industries

Mrosik added that the role of digital thread varies from company to company. We help partners in shaping the future together. Innovations are the lifeblood of the digital industries. The current portfolio needs to be optimized and strengthened. Data coming out of factories and shop floors are being analysed, using AI. AI is the focus, and blockchain, engineering, optimization, etc., are all very important. We are pushing forward heavily.

Mass Customisation

How is mass customisation enabled by industrialised additive manufacturing? This session was a follow-up on the Auditorium Live presentation “From head to helmet – How mass customisation is enabled by industrialised Additive Manufacturing.”

Julian Waldmann, Business Development Manager, Additive Manufacturing, Siemens AG showed a product. There were 13 industrial parts that were connected as one part. There is a digital twin of product. The same software can do all the necessary work preparation and send to the real world. They produce all digital parts. Another product shown had parts made of aluminium. The digital twin enables creating this product.

Dr. Karsten Heuser, VP Additive Manufacturing, Siemens, said it took only two days to commission the machine on the shop floor. One example, if you have been working with CNC, the machine can do CNC and additive. The CNC machine is part of the post-processing.

Waldmann added that we can rethink business and manufacturing. For business, we can do individualisation and personalisation, have zero inventory for on-

demand printing, design anywhere and print anywhere and accelerate innovation. For manufacturing, we can eliminate molding/casting/tooling, eliminate or simplify the assembly process, reduce supply chains and have affordable low volume production. We can have manufacturing transformation and shift from prototyping/experimentation.

Dr. Heuser showed the latest 3D printer. It can significantly improve the performance of the flow. If there is a seamless integrated workflow, it will work. Siemens has over 200 industrial machines working at over 45 locations. Additive is on the journey to further industrialize.

Waldmann said there is the additive manufacturing network. You have to design for AM, do AM design validation, build simulation, build preparation and do generative engineering. Post processing, there is scheduling and execution, intelligent automation, machine connectivity, process monitoring, and machine monitoring. Additive manufacturing is still a young technology. You can play around different machine scenarios. You can predict the optimal setup and layout.

Dr. Heuser added that if you want to invest in additive, you want to be connected to the world of machines. We have the additive manufacturing network that started last year. There are things like engineering consultancy, software vendors, materials vendors, machine vendors, part suppliers, part buyers etc. The platform is designed to streamline and digitise the end-to-end.

Waldmann said there is the additive manufacturing network. You have to design for AM, do AM design



THERE WAS HIGH DEMAND FOR PRODUCTS DURING COVID-19. WE ARE ROLLING OUT COMPONENTS TO MANY COUNTRIES. WE HAVE THE HEXA HELMET PROJECT. THERE ARE INNER HELMETS BEING 3D PRINTED. ALL PROJECTS CAN ONLY WORK IN PARTNERSHIPS

— Mary Langer, CEO, EOS GmbH

validation, build simulation, build preparation and do generative engineering. Post processing, there is scheduling and execution, intelligent automation, machine connectivity, process monitoring, and machine monitoring. Additive manufacturing is still a young technology. You can play around different machine scenarios. You can predict the optimal setup and layout.

He added that you can increase the workflow efficiency by seamless integrated software and data consistency. Printing can be done first time right by the digital twin of the product, production and performance. You can increase the machine quality, efficiency and provide worldwide service by the TIA portfolio. You can accelerate the industrialization with value-add services and digital ecosystem.

Success with Airborne

Service is more than you think. There has been production optimisation at Airborne International B.V., with a holistic approach of consulting, implementation and optimization. There is an optimized output, and efficient and highly-flexible production. There is the best compromise between product performance and manufacturing. Who can not relate to these requirements?

Karen Florschütz, CEO Digital Industries Customer Services, Siemens AG, said that customers come to us with requests for digitisation. With our service experts, we can do all that, and more. This is the crust of digital enterprise services.

Digital transformation is an ongoing process. Customers are looking to become excellent in their processes. You also need to determine the parts within your organisation

that need to be digitised. There are three easy steps for doing this: consulting, implementation and optimisation.

Dr. Daniel Klein, Digital Industries Customer Services, Lead Engineer, Digital Engineering, Siemens AG, said that they had the privilege of working with Airborne, Airborne International, based in The Hague, Netherlands. It is into machine building for composite materials, aerospace, marine, automotive and consumer.

Arno van Mourik, CEO, Airborne, added, “You have to go layer by layer. Machines need to understand what they are doing to the materials. Automation alone can do it. At Airborne, we believe that the innovation in manufacturing through automation, digitalisation and advanced analytics is the catalyst for significant increase in productivity companies need to stay competitive. We understand the complexity, and the cost involved in producing composite components for the demanding applications in highly regulated industries. Siemens has been instrumental in our journey. We had good foundation in controllers and other hardware. We focused on what’s important for us. We can also simulate the result to decide the best value for money.”

Dr. Klein said “We have to do something we had never done before. It is an ongoing project. We developed different projects. We created process stability and quality. In the composite industry, savings of 70-80% is possible.”

On the whole, the summit thrashed out the ideas and technologies that can take the Industry forward on its digital journey. It also threw light on the strategies and the business ideas that were required to make this journey happen.

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—RAMESH LAKSHMINARAYANAN
CIO, CRISIL

Never confuse transformation with technology strategy. For core technology – it is better to go internal. Here’s a CIO’s formula for using technology right. From high-accuracy-oriented NLG to stress-testing platforms, from scalable frameworks to microservices, from reusable modules to machine learning, this CIO rates technology with a distinct report card. Ramesh Lakshminarayanan, CIO, CRISIL discusses some of the CIO strategies



STRATEGIES FROM A CIO

Can you tell us about your technology strategy – how do you choose, invest, build and evolve any area or tool? What goes in your mind during those decisions?

Technology strategy is never a point-in-time activity. We often confuse a transformation exercise with technology strategy. I see technology strategy as a continuous process, wherein the benchmarks and goals keep changing and evolving based on the requirement of your business ecosystem.

We looked at technology strategy from the principles of 5 S – simplify, standardise, sunset, sharpen and service orientation. All our technology decisions were made on the basis of having a fit to these principles.

Give us a peek into each S and how you embraced technology changes at each level

The first part of the strategy was initiated three years back with the need to focus on streamlining of operations (better management of service level agreements, better change management etc). Our initial focus was on creating the right organisational structure and processes, to lay a strong foundation. In this phase, we standardised a lot of our tech processes such as architecture, platform and software programmes to be used.

The second phase was to simplify our app development framework and choose something that can be foundational. We, therefore, chose a technology framework that is scalable (Spark), widely used (Java Spring Boot) and UI/UX friendly (Angular). We also decided early on to focus on building our new apps on micro services architecture so that they are decoupled. This approach helped us make things simple.

The third phase involved scaling up of our AI and ML capabilities. Here too, we focused on specific areas such as data extraction and data mapping as these are core to CRISIL. The idea here was to look at smart automation and focus on use cases that can bring us quick success and direct benefit.

The fourth phase, currently underway, has been very interesting. In this phase, we have invested heavily in adopting a components-based approach and converting our core technical intellectual property (IP) into micro-services-driven reusable modules. This solves multiple problems for us, including duplicity of generic components such as workflow, screen generators, rule engine, web

sourcing, data mapping/dedupe etc. The approach ensures that we sunset unwanted applications and are also very service-oriented when it comes to building new solutions by providing rapid development as per client specification. More importantly, this component-led strategy is built on cloud native technology so that it is future proof.

Do you lean towards internal technology or external solutions for your needs?

There is no right answer here. CRISIL has historically been an internal technology unit and most of its platforms and applications have been self-developed. However, over the past three years, we have looked at this from the following points of view.

First, focus on core technology internally, where you can build an IP and provide a multiplier effect to the business solutions. So, areas such as data, digitisation and analytics-driven BU solutions have been largely built in-house as we use these to take our solutions to the end client. Add to this our domain strength, and we are able to create powerful IPs. For solutions that are generic and used for internal needs, such as CRM, billing, and HRMS, we have now largely moved to SaaS-based cloud platforms.

Can CIOs encourage a start-up climate inside their enterprises?

Yes. We have opened up ourselves to external innovations by working closely with a number of start-ups under the CHI-2 (CRISIL hub for innovation) programme. We have made this agile is by keeping the innovation lab under the direct supervision of the chief information officer (CIO) and also by providing quick sandbox environment for proof-of-concepts. We have engaged with niche financial technology (fintech) firms that are working on cutting edge innovative technologies. Through an incubation lab programme, we have looked at five-six solutions last year and this has also helped in the internal technology units learning on the start-up way of working.

What is going to be the pace and direction of business continuity and revival in the next few months?

Business continuity momentum is a matter of survival and so the pace of adoption of the strategies has to be frenetic.

While there is no one-size-fits-all solution, I do see a pick-up in digitisation in various degrees across corporates. Large and medium corporates will tend to focus on strengthening collaboration and increasing productivity. They will also focus on building security configurations that match the office environments. Small and medium enterprises will try to catch up on digitisation by adopting tools for video conferencing, chats, document sharing etc. They will also look to move their core apps to cloud through software-as-a-service (SaaS) model.

Which sectors have faced the utmost brunt and which ones have gained the most due to the pandemic?

Well, the degree has varied. Sectors that have adopted digitisation and that can have staff working remotely have fared better. Sectors such as banking, financial services and insurance, information technology (IT) and IT-enabled services, telecom and E-commerce have managed to pivot the new way of working, and some of them have also seen uptick in their businesses. At the other end, sectors that depend on physical experience, such as travel, hospitality, and sports, have taken a huge blow. It will be a long haul for these sectors unless the situation comes back to normal soon.

Has technology threatened the role of the human eye and nose when it comes to analytics?

While there has been a lot of debate both in India and globally on the social aspects of ML/AI-based technology and their ability to mimic human eye and nose, our experience has shown that these technologies are still evolving. There are places where these have matured to provide a multiplier effect. For instance, we have seen auto extraction of data from PDFs/images reach high levels of accuracy. But when it comes to financial taxonomy mapping, there is still some way to go.

What we are learning is that we have to constantly move our people from basic processing skills that can be replaced by ML/AI to higher-end analytics and data interpretation skills. This will be a constant theme as we pivot to this new automation world.

Is it complementing human intelligence and intuition? Why or why not?

I must caution that there are many areas wherein they

cannot complement human intelligence. A lot of work at CRISIL involves high-end interpretation of curated data and aggregated numbers. Unless one has the overall context of the environment, economy and other background information, it is just not possible to create a human-like interpretation.

To infer this, we have been working extensively on a few natural language generation (NLG) cases wherein we tried the machine to write an analysis report on industry segments using data and language library. The output produced is nowhere close to the rich context that the human analyst provides in the same use case.

What is the progress and direction of these areas – specially data extraction automation, data mapping and NLG at CRISIL?

We have been working extensively over the last couple of years around these technologies. Our initial foray was into the area of data extraction and we have made very good progress in that. We have been able to achieve high levels of accuracy – of more than 95 per cent. We have been able to automate processes such as web crawling and PDF extraction through ML models.

Post extraction, the next process that we focused on was data mapping. The data points that we need to map range from basic financial taxonomy to more complex ones where we need to map based on the context of the entire sentence and the neighbourhood (notes/summary section of financial statements where one will need to interpret the language).

We have seen a mixed bag here. On pure financial taxonomy mapping that is standardised, we have been able to achieve high degree of accuracy. Extraction and mapping from free text has been difficult. Through continuous experimentation, we have been able to get to accuracies in the range of 85 per cent which, for us, is still a few percentages away from providing multiplier effect.

Our needs on NLG are very complex and, therefore, we will need time to harness and perfect NLG technology. This we intend to do in phases. As initial steps, we have just started using an NLG model to achieve summarisation of analysis that can be published for quick reads. This is an area that needs a lot of attention and investment from our side.

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—DILIPKUMAR KHANDELWAL
MD & Global Head, Technology Centres, Deutsche Bank

International financial institutions look upon India as a lucrative destination. Dilipkumar Khandelwal, MD & Global Head, Technology Centres, Deutsche Bank, tells us more

How is India emerging as the tech hub for evolving banking of the future?

India is an obvious choice for all major banking and financial firms. The important reason is because India is a high value location. Equivalent skills in technology, operations and finance are available here. The technology skills of the future, like cloud technology, artificial intelligence and machine learning, along with enterprise technology platforms knowledge is there as well. This makes the value India brings to the table exponentially higher.

The global banking industry has started setting up their base here from early 2000s. We have nearly 20-year worth of experience in the space. India now has banking technologists who understand the business and also how to build the platforms supporting the business. Over time, the market in



BANKING ON CLOUD

this space has matured even further. Now, various global functions are being run out of India.

The important thing to note here is that along with banking technology presence, there are also businesses, operations and finance teams located here. This makes India a unique value proposition as you can get the whole bank in the setup here. With distances reducing and mind-sets changing, India will continue to rise in this space.

How are you automating critical banking tasks?

Technology is all encompassing. While there are technology strategies, which we are running around modernising our application landscape and data availability, we are also very focused on operational processing and on how we can move away from manual nature of work. A good example is use of modern technologies like Robotics Process Automation (RPA), along with Artificial Intelligence and Machine Learning. The key is to becoming simpler and more efficient.

An example is the solution of the New York technology start-up WorkFusion, which is used in the Corporate Bank. Artificial intelligence combined with high-speed scanners helps the Trust & Agency Services division to analyse and process large volumes of unstructured documents on a daily basis.

Workfusion's AI-driven automation capabilities are also being used to create efficiencies in the time-consuming process of adverse media screening, as part of the bank's know-your-customer screening processes. The software scans news sentiment and context for negative news, rather than looking for rudimentary word associations. Moving into this space provides us quick turnaround times and efficiency gains are quite fast.

With the emergence of new operating models such as alternate work arrangements etc. how are you ensuring data security, cybersecurity and safeguarding customer information?

To protect its information and systems, Deutsche Bank takes a multi-layered, defence-in-depth approach to building information security controls into every layer of technology, including data, devices and applications. This delivers end-to-end protection, while also providing multiple opportunities to detect, prevent, respond and recover from cyber threats. This approach is a key facet of

the group-wide information security strategy to increase the security and stability of the technology platforms.

A range of solutions are in place to handle evolving threats, including the global Cyber Intelligence and Response Centres in Singapore, Germany and the U.S. The centres provide global 24*7 coverage across different time zones and follow-the-sun model that has improved the bank's ability to detect threats and respond to incidents worldwide. Through 24*7 monitoring, the CIRCs handle upwards of 2,500 items of new intelligence every month, including alerts about potential cyberattacks.

Another key pillar for this is awareness. We have a big focus on internal ongoing trainings and a global multichannel awareness campaign, which covers a broad range of information and corporate security topics. The goal of the campaign is to help employees understand common, yet, significant security threats and their individual responsibility and contribution in helping to protect the bank against these threats.

What is your view and strategy about the adoption of Cloud?

Cloud adoption is important as it allows banking application developers to focus on solving business problems and let the infrastructure experts handle infrastructure. Over time, we will see more and more banks moving on to Cloud platforms. Cloud platforms provide the obvious benefits of scaling infrastructure on demand and pay per use. The platforms that can be moved on to cloud should be identified. Such platforms might have to be re-engineered to make the optimum use of Cloud services.

Recently, we announced that we have signed a Letter of Intent with Google Cloud to form a strategic global, multi-year partnership to accelerate our cloud transition and create the next generation of technology-based financial products which will generate considerable value for our clients.

With this partnership, Deutsche Bank will also gain direct access to world-class data science, artificial intelligence and machine learning to better serve customers. Potential use cases include helping treasury clients with day-to-day tasks such as cash flow forecasting, improved risk analytics and advanced security solutions to protect clients' accounts. For the private banking business, digital and intuitive solutions will be the focus, to simplify the interactions between customers and employees.

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—SANDIP PATEL
IBM MD India and South Asia (ISA)

Sandip Patel was recently appointed as IBM MD India and South Asia (ISA). He is responsible for strategic and operational matters related to sales, marketing, services and delivery operations in the region, including Bangladesh, Nepal and Sri Lanka. He will also oversee the centres of excellence and technical garages across India. He interacted with us recently to discuss his organisation's work

What are some of the key steps India now needs to take to power digital transformation across key industries?

We are witnessing a few fundamental shifts in the industry today –

First, we are seeing the acceleration of digital ecosystems touching every aspect of our lives. Secondly, there are new business models emerging driving



JOURNEY TO THE CLOUD

cost efficiency, agility and built on a foundation of trust. Lastly, there is a truly defining shift – the emergence of a network economy that is defining a whole new way of working and interacting with people.

Up until 2019, the standard operating model for businesses, governments and other organisations was location-based: people would go to work, rather than work coming to them. The Covid-19 pandemic has changed all that. Now, work has to come to us, wherever we happen to be. A few organisations have handled this forced “digital transformation” smoothly, and the others, more fitfully.

Going forward, organisations will need to continue modernizing operations to realise the immense benefits of cloud-native capabilities: location independence, talent flexibility, scalability, resilience, interoperability and seamless transition to a virtualised engagement and delivery model, what we call Cloudified delivery.

Wherever an organisation is on the digital transformation path, COOs can find several operational lessons from what we have learned, so far. First, where cloud was once a desired future end state, it is now an indispensable, immediate environment. Second, organisations can move faster than they realised and be nimbler than they believed possible.

Third, earlier rationalisations that prevented successful – and speedy – digital transformation will no longer work. Becoming an agile digital enterprise is essential and it needs to happen now.

How is IBM working on the essential recovery and transformation post Covid-19?

As we emerge from the pandemic, the ultimate outcome is growth and we are absolutely committed to it. A key focus area for growth is to take the lead in the cloud- and AI-based digital transformation journeys of our clients. We already have three strong platforms – mainframe, services and middleware – which serve as the three pillars for success. The fourth is the hybrid cloud, and we have the fundamentals in place for a flexible and cost-effective approach to it.

Clients need deep industry expertise more than just platforms and hence building and managing the hybrid cloud platform that runs the services that clients rely on is a massive opportunity for IBM. IBM along with Red Hat has a unique source of competitive advantage that can be leveraged to win the architectural battle for cloud. In India, clients, including Vodafone Idea, Bharti Airtel etc., have already embarked on this journey with us.

Another area that we have been focusing on has been to mobilise IBM and IBMers to help with the global battle against Covid-19. IBM has made super computing power accessible to the scientists to assist them in finding cures and vaccines. We have donated technologies so that governments can get access to free chatbots to help their customers with knowledge and information about Covid-19.

How is IBM now looking at their customers' journey to the Cloud?

Even before the pandemic, the adoption of cloud has been a central feature in developing new, digitally driven business models. However, some organisations are struggling with harnessing the full capabilities of their cloud environments. Though 90% of companies globally were “on the Cloud” by 2019, only about 20% of their workloads have moved to a Cloud environment.

We believe that the value derived from a full hybrid cloud platform technology and operating model at scale is 2.5 times more than the value derived from a single platform, single cloud vendor approach. In fact, the platform approach accelerates value with scale. IT becomes interoperable and portable when deployed in hybrid cloud environments. It is estimated that 50% of enterprises will have moved to ‘write once, run anywhere’ hybrid cloud environments by 2023. To prepare for transition at scale IBM is working with clients to help them plan their journey to cloud around a couple of areas:

Embrace a Hybrid Cloud Design: Hybrid Cloud design patterns and service brokerage models allow commodity workloads to be delivered by multiple providers. While organisations may enjoy preferred relationships, they should also have options to shift workloads across clouds and cloud providers without hampering performance.

Shift to “as-a-service” strategy to use cloud-based tools, applications and platforms. Many software-as-a-service (SaaS)-based solutions are delivered at scale across the globe, further reducing the risk of service disruption.

Further, the new work-from-home scenarios bring added considerations on security when it relates to application security, data and content security, device security, enhanced access and identity management, and the ability to manage cyber security threats by managing SOC's remotely.

Managing secure access over VPN becomes key, and not only that, protecting our customers against cyber

threats like Covid-19-based phishing emails requires us to work on new and unique use cases.

IBM's security solutions on the cloud provide these capabilities. For example, IBM Cloud clients can rely on security capabilities like Keep Your Own Keys (KYOK), where only they have access to your data. IBM Cloud is resilient with multi-zone regions for high availability, and ready for workloads that run on VMware, x86, IBM Power and z Systems platforms.

How are the IBM Cloud services going right now?

IBM Cloud is providing clients the much-needed resiliency and security that comes from its breadth of deployment options across 60 globally dispersed datacentres, including the one in India and time-tested data protection capabilities.

The demand for cloud services is growing exponentially due to the shift to a digital 'new normal' and most logging in remotely/work-from-home. Initially, as the Covid-19 lockdown commenced, we started providing solutions to the large enterprises for setting up the infrastructure for their employees to WFH, and ensured secure connectivity with help of VDI (desktop on cloud) solutions. These enterprise grade technology-wide applications are secure and enable employees to get online immediately in a matter of hours.

We see growth in disaster recovery on cloud offerings, during these times since enterprises prefer the opex model of managing disaster recovery, instead of investing capex on infrastructure. Most of the applications like CRM, analytics, retail applications, etc., are moving to cloud for flexibility and wider reach to different geographies.

Whatever the "new normal" looks like when the world emerges from this difficult period, we anticipate that our clients will continue to demand cloud solutions to power their operations and drive their businesses forward. Perhaps, more than ever!

How is IBM accelerating the journey towards AI?

Businesses are more eager to have AI making a positive impact on their bottom line. For example, HDFC ERGO and IBM are collaborating to co-create new AI-based solutions on IBM Cloud that will redefine the customer experience. Leveraging IBM Garage, HDFC ERGO and IBM are working together to develop and test new solutions to help better address customer queries, ensure faster turnaround time and draw deeper customer insights for a better omni-channel experience.

For AI to flourish, organisations must adopt and embrace a pre-requisite set of conditions or building blocks. For example, AI requires machine learning; machine learning requires analytics; and analytics requires the right data and information architecture. In other words, there is no AI without IA (information architecture).

These capabilities form the solid rungs of what we call the AI Ladder – the increasing levels of analytic sophistication that lead to a thriving AI environment. A great instance of this is Bestseller, which uses IBM Watson AI capability to mine deeply into big data and predict the right merchandise for the consumer at the right time – to the extent of determining the right assortment plan for each store, predict the next best product to incorporate into its mix, and improve the efficiency of its supply chain.

Further, as a long-time leader in Natural Language Processing, we integrated a new advanced sentiment analysis feature which was defined to identify and analyse idioms and colloquialisms for the first time.

How are you helping enterprises in their asset management?

Assets, be it hardware or software, represents a significant portion of any organizations IT cost and we help our customers in extracting the maximum benefit out of these assets. We manage the end to end lifecycle of the assets from procurement to safe disposal.

Our skilled team tracks the movement of assets and periodically perform the "physical inventory reconciliation" to identify any gaps in the asset database. This information is also used by the client's chief financial officer to update the balance sheet to reflect the correct net worth of the assets available.

We perform "capacity management" of hardware and software assets and provide actionable inputs to the clients' chief information officers to improve the asset utilization, release unutilised/under-utilised hardware or software licenses, thereby, reducing the clients ongoing cost.

Complying to the manufacturer's "Software License Agreement" is extremely important. We provide end-to-end "Software License Compliance" services using IBM's developed tool-set and best practices to pro-actively inform the customer on any potential non-compliance or under-utilized licenses. This allows the clients' chief information officers to take corrective action and avoid any costly litigation from OEMs.



—**GARRICK HILEMAN**
Research Head, Blockchain.com



WHERE IS CRYPTOCURRENCY TODAY?

Cryptocurrency is slowly being accepted in India. Garrick Hileman, Research Head, Blockchain.com, tells us more in this interaction

How has been India's reaction overall, towards cryptocurrency?

The reaction has been positive in terms of demand and interest amongst Indians everyday in cryptocurrency. However, access to cryptocurrency has been limited due to some regulatory uncertainty than in other markets, where there has been more regulatory clarity and more opportunities for entrepreneurs to build bridges to the Indian market.

Can we, in future, see ICO replacing IPO as a mode of raising money? As many companies took a route of having an initial coin offering, rather than IPO?

Well, I don't think the ICO is ready to replace the IPO. The ICO phenomenon is still relatively new. And, not every company or project needs a token, which is generally an important component of the ICO phenomenon.

However, as companies begin to tokenise their equity and other parts of their businesses, we may see more initial token offerings. So, an ICO is a new term that we might start using to reflect, that the digital tokens represent more than just currency for payments, they can represent as an ownership stake in real estate or even a stock, a traditional equity but in a digital token format.

Suppose, if everything works out from RBI and you get a chance to onboard a leading bank, what challenges you might face?

It really varies in terms of the amount of time to onboard a bank, based on the bank, the market, and the regulatory environment. One of the things is, we do not have a payment gateway in India yet ourselves and that's a goal for blockchain.com. We found in our experience, going from different markets is that it's very market dependent in terms of how quickly we are bringing in a payment partner, or making partner -- how long does it take.

Regulations are often very local, and particular to a given market. So, it's hard to generalise about how long it will take and also different institutions have different speeds.

Some banks are prioritizing crypto, and fast-tracking and onboarding new companies. Others are

taking a more cautious approach as they learn more about this new asset class. And, the complexity and challenges with making sure that any banking business is compliant.

How fast can the Indian banking system embrace blockchain and what kind of data will they have?

I think, the Supreme Court rulings certainly helped, and we've seen some progress since then. However, there are still various regulatory bodies and authorities who do not share the view that cryptocurrency is something that the Indian marketplace should embrace. So, there's still more work to be done in India, on clarifying the regulatory environment.

Once that is clear, you'll see a proliferation of business, banking relationships, entrepreneurial activity, investment growth, all the positive things that we've seen associated in marketplaces that have prioritise cryptocurrency innovation.

My worry is that India risks falling behind to other tech hubs that are taking a more positive view about the multiple benefits of cryptocurrency innovation occurring in your backyard.

We do hear the news of wallets getting hacked and that raises the question on legitimacy of security that blockchain claims. As of now, very small amount of money is involved, but when banks get involved, how will it make sure this never happens?

Security is a never-ending struggle and blockchain technology has already improved some areas of security. But, the third parties and intermediary companies that operate in the blockchain technology space have, unfortunately, oftentimes been hacked. It's not so different than what we see in other sectors of the economy, such as traditional banks, other tech platforms that hold our data. These are also getting hacked as well.

So, security is just a huge challenge for society as a whole. One thing that has not been hacked yet are the cryptocurrencies themselves, Bitcoin and Ethereum. Bitcoin has been operating over 11 years now without suffering any kind of hack, which is a remarkable accomplishment.



THE GROWTH RATE IS STILL QUITE PHENOMENAL FOR CRYPTOCURRENCY. IF IT CONTINUES GROWING AT THIS RATE, IT WILL REACH A BILLION USERS IN THE NOT TOO DISTANT FUTURE

It's the most powerful computing network in history and that's never been hacked.

That's the most fundamental reason why we are talking about cryptocurrency and blockchain technology today is because of that security on the protocol layer itself.

We also hear that blockchain technology consumes a lot of energy and power. Is this true?

In some cases, yes, the Bitcoin network does consume a significant amount of energy, while other blockchain protocols take a different approach to security, and consumes substantially less energy.

We believe that a significant portion of bitcoin's energy that is consumed is renewable energy. But, we also know, in China, and some places, coal is still used to power bitcoin computing given its relatively low costs. So, energy consumption is one of the trade-offs for creating a new technology and having it remain secure.

Many people including I; believe that the energy that we are expanding on the advancement of cryptocurrency and blockchain technology is a useful trade off compared to other uses for that energy. But, it's something that hopefully, we can improve on in the years to come, lower carbon footprints, less energy consumption, or even more consumption of renewables than currently takes place.

How are peer-to-peer networks being managed for crypto?

In the case of bitcoin, it's the largest computing network ever created by several orders of magnitude in terms of the computing power. It's far larger than Google or any other computing platform by a massive margin, which is hundreds of times larger. And, it would take an entity that would that possessed or controlled more than 50% of the computing power to half the coin.

Assembling that kind of computing power under the control of a single attacker would cost billions and billions

of dollars. It's quite possible that it would prove very effective and you could assemble the level of computing power due to various counter-measures that can be deployed to halt such an attack. There are massive economic and technical hurdles to attacking bitcoin that so far has remained resilient.

Those hurdles arguably continue to grow. In other words, bitcoin gets stronger. It seems that every year, because the computing network continues to grow and empower substantially.

Developed countries might get fast in accepting this trend, but developing countries will still rely on actual value. How would this be handled, as this gap may result in using the fair value of coin for transaction at developing country's end?

You can look at cryptocurrency as similar to any other technology platform. It needs a network effect and it's always a chicken and egg problem. Facebook started with zero users, Whatsapp started with zero users. And, both have grown to billions of users.

The way that happens is that you create a really compelling 10x better product and service. Cryptocurrency has done that, as well. Already, there are more users of bitcoin, which we estimated over 15 million people around the world in just a little over 11 years than there were in the first 11 years after the first personal computer was invented, or when the Internet was invented. Bitcoin and cryptocurrency are already growing faster than the Internet and the PCs.

That is one of the most positive data points that we can look at, and thinking about will this continue to grow to be billions of users like smartphones, the Internet, and applications like WhatsApp. The growth rate is still quite phenomenal for cryptocurrency. If it continues growing at this rate, it will reach a billion users in the not too distant future.

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—**BALA CHITOOR**
Chief Strategy Officer, Flamenco Tech

The pioneering solutions in IoT and VR will transform, add value and help customers provide an enhanced employee experience and gain better control over workplace investments in a smart building environment. Bala Chitoor, Chief Strategy Officer, Flamenco Tech, tells us more

Elaborate on Flamenco Tech's solutions for the enterprise

Flamenco Tech is an Indian start-up, a true Make in India for the world success story, that provides breakthrough insights and measurable outcomes through smarter infrastructure for global clients.

Flamenco Tech's Digital Blanket Enterprise IoT and Smart Building OS creates a safe, healthy, hygienic and productive workplace with enhanced occupant experience and operating efficiencies. FT was started by serial entrepreneurs post their successful exits from 4 previous product/deep tech start-ups that were sold to global companies including Intel, IBM, Mastercard and Accion Labs.

SMART BUILDING

The impact of the Covid-19 pandemic has been profound and the path to business recovery is evolving and uncertain. Facility and Real Estate Heads are striving for a safe return of the employees to the workplace using technology as an enabler.

Flamenco Tech provides the right solution framework for Enterprises, Factories, Hospitals, Hotels, Warehouses, and other businesses to achieve this objective. Our Covid-19 solutions are built on four pillars, each of which constitute a critical component towards fostering staff and employee wellbeing, safety and assurance.

Digital Blanket is deployed across major banking and financial customers, large IT companies, commercial real estate clients, healthcare companies, etc., to name a few verticals. It is competing with the best-in-class global MNCs in India and across APAC.

How can Di-Fence prevent the spread of the virus and where is it being used?

With workforce back in office, maintaining and tracking social distance within office premises is critical to ensure safety and security of the employees as well as ensuring business continuity.

Di-Fence or Digital fencing is a unique concept for hyper precise and accurate people and asset accountability and indoor contact tracing and auditing. The solution uses patented health tags to trace employees and alert them in real time for any social distancing breach.

When employees wearing health tags come in close contact with each other, an alert is raised through the buzzer. The software is also notified of the event and logged for contact tracing and relevant analytics. Di-Fence is a significantly advanced technology providing precision and accuracy as compared to all other technologies in the market including BLE tags and UWB. The solution also provides multiple other use cases for emergency evacuation, asset tracking, time and attendance, visitor tracking, etc. so the investment is sweated even after the Covid-19 threat is out of our way.

The software allows creation of virtual zones on a floor map to help restrict entry, count the number of occupants in a zone and track utilization of an area. Historical and real-time contact tracing is available for isolating specific employees who may have come in contact with a Covid-19 positive worker.

Di-Fence is now being used at an airport, a multinational pharma company, global IT services and consulting leader,

large manufacturing MNC, and a few enterprises. Several engagements are now on for global deployments, across pharma, manufacturing and BFSI customers.

Where does IoT come in, as far as the solutions are concerned?

Di-Fence uses an IoT devices with IoT edge analytics and an enterprise IoT platform that provides wireless connectivity, alarms, analytics and traceability. The Digital Blanket Enterprise IoT platform correlates this to the data for floor or a meeting room for congestion tracking, occupancy-based HVAC control, way finding, emergency evacuation, sanitisation alerts and more.

How are you using IoE and IoEE for creating smart buildings? How are you faring against competition?

Flamenco Tech leverages the Internet of Everything and Everyone (IoEE) model to define and create a Framework for SMARTer Workplaces. The concept of IoEE provides real-time status and control of devices, information and people. This is implemented using its Digital Blanket IoT platform.

Our Digital Blanket IoT Framework enables SMARTer Workplaces that are efficient, effective, productive, optimised and calibrated in near real-time. The final solution can provide real-time data, data correlation and analysis and actionable insights towards meaningful user experiences with IoT.

Digital Blanket enables a secure, multi-protocol, multi-device IoT connected and self-healing infrastructure layer with analytics and actionable insights. It also provides a suite of workplace applications (like Space Management, Energy Management, Visitor Management, Safety and Security Management etc). Digital Blanket is highly scalable with edge computing and provides a secure user engagement layer on web, mobile and kiosk with an API layer for external data exchange.

We are leveraging IoEE through a Smart Building Network that allows multiple types of wireless and wired sensors and controllers to be seamlessly integrated for a variety of use cases that impact user experiences, efficiency, compliance and safety and security. These include desk and meeting room occupancy sensors, footfall counters, lighting management controllers, indoor air quality sensors, people and asset tracking and much more.

The following are some key Flamenco Tech differentiators as compared to the market:

- Transformational smart building and workplace management platforms (web/mobile/kiosk/wireless smart building sensor) with many out-of-the-box plug and play modules.
- Vendor-agnostic open platform which leverages client's existing infrastructure to best extent possible.
- Transitions data to actionable insights – Unique digital layer that enables and spearheads the digital transformation journey.
- Wide support for protocols, healthy building standards, ML, AI & quality benchmarks (like ASHRAE, WELL, LEED etc.).
- Unique Digital Fencing Solution for people and asset accountability.
- Centralised command and control with multi device accessibility and real-time data visibility across locations, sites and buildings.
- SANS 25 and OWASP10 security compliant and tested framework.
- Wider adoption – longtail of customers. Post-Covid-19 solutions for safe return to workplace.

How can Digital Blanket help in developing a digital infrastructure?

Digital Blanket, Flamenco Tech's enterprise IoT platform, spearheads an organisation's digital transformation journey, linking IoT data with real-time analytics and digital twin to model and automate the digital workplace.

Digital Blanket disintermediates several legacy technologies. We help transform commercial real estate, workspaces, user experiences, centralized command and control, energy and sustainability, safety and security, and compliance to standards such as WELL, ASHRAE, ISHRAE etc. through the integration of legacy OT technologies, such as IoT, ICT and AV. This is very unique in the industry.

Digital Blanket is India's first and only comprehensive suite for SMARTer Workplaces, now operational in several large enterprises globally, successfully proving its value in workplace efficiency, employee productivity, engagement as well as retention.

IoT and mobility are complemented with contextual analytics. Thus, a Digital Twin is enabled, which is helping businesses and employees visualise their workplace and assets in near real-time. This virtual workplace is

synchronised with the real-world scenario and the data is analysed and actions are automated enhancing efficiency, productivity, safety, security and user experiences.

Digital Blanket provides a future-proofed deployment pathway, allowing for integration to other applications and platforms, as well as for future enhancements such as the use of sensors, biometrics, beacons, video, mobile apps and business rule-based analytics.

In the process, we create intelligent infrastructure that impacts your business positively. By selecting the technologies best suited for your business infrastructure, you achieve the flexibility and the freedom to leap frog with minimal cost and effort, when required.

Where are your smart AV solutions being used?

AV systems are typically silo'ed and the user experience is sometimes on the border of frustration. Our Smart AV solution is the integration of IoT with AV to create great user experiences.

We provide contactless mobile app and audio-based control of AV equipment, meeting room HVAC and lighting control, and bring in other IoT elements like meeting room reservation and occupancy control, cafeteria ordering, meeting room occupancy count, usage analysis, and more. The user experiences are improved leading to higher productivity.

What are your plans for the near future?

Flamenco Tech is continuously evolving its offering based on technology changes, user experience needs and global market demands. We have embarked on a partnership drive and we have signed six new reseller partners in Singapore, Japan, UAE and India. We will continue to pursue this partnership model with select partners who believe in our value.

We are aligning with industry leaders like Cisco, Microsoft and Intel, and leveraging their technologies to enable Smarter Workplaces. We are working on several new initiatives, including a pure SaaS offering, smart lighting controls, wireless smart building network, and more. We are working on ML and AI initiatives to help predict energy usage, HVAC fault detection and diagnosis, optimization of HVAC energy, predictive analytics for chiller plants, etc. We are working on vision analytics initiatives and will soon launch a very exciting product for space analytics.

All of our initiatives are planned with an eye on global market play.



—**AMRITA CHOWDHURY**
Director & Co-Founder, Gaia Smart Cities

AI and IoT can be used to manage workforce more efficiently. Amrita Chowdhury, Director & Co-Founder, Gaia Smart Cities tells us more

In terms of technology usage, what are the current challenges and opportunities in India's healthcare system?

Healthcare is a primary and essential segment for both corona and non-corona related medical services. However, healthcare delivery, in India and globally, is poised for disruption. Even before the Covid-19 pandemic, digital transformation of the healthcare segment was being considered to enable digital patient experience management and seamless delivery of services at every patient touchpoint through integrated solutions. The current pandemic, after the immediate term, will only fast track this transformation.

In India, the challenge is slightly greater due to fragmentation of healthcare systems and low current levels of digitalization in the ecosystem, notwithstanding certain early adopters. The challenge gets further exacerbated because any solution needs to be delivered with India-conscious complexity at India-conscious value for money.

The immediate aftermath of the Covid-19 pandemic threw healthcare supply chains in disarray. Countries around the world realized that they were reliant on global supply chains for critical medicines, equipment, and supplies. Furthermore, healthcare providers realized that they need to manage critical resources efficiently at national, city, and healthcare facility levels.

Inside facilities, staff and resources need to be optimized in real time to ensure the right care is given at the right time to



AI AND IoT IN HEALTHCARE

patients. Furthermore, the need for localized access to healthcare services is becoming attractive to patients. There is acute awareness amid service providers and patients that safe practices and spaces are critical.

Covid-19 may fundamentally challenge the culture of organisations - how we distribute work and deploy workforce and how we engage our people and our customers. In the longer term, this situation may present an opportunity to think about how we elevate communications, create a more resilient workforce, build more focus on health and well-being and enable critical trust and engagement between the business and its customers.

How does an interconnected healthcare model help in efficiency, quality and productivity?

Healthcare systems and hospitals are dynamic and complex spaces where medical care needs to be complemented with a seamless orchestration of non-medical staff, assets, processes, and services to deliver quality care.

Following things that we need to ensure include:

- Workforce management to enable seamless delivery of tasks and services
- Real-time location tracking for staff and assets
- IoT-based monitoring of critical systems and spaces
- AI-based optimization for dynamic task allocation
- Dynamic service orchestration for event driven and data driven workflows
- Cognitive workflow automation for data led optimization, alerts, and escalations
- Visual command centre dashboards for data analytics and data driven decision making and service delivery optimization
- Hygiene monitoring to ensure sanitation safety service levels.

Together, these elements improve efficiency of operations, quality of care and productivity of staff and assets. In turn, they help deliver better patient care and over the long term, optimised cost of healthcare delivery.

What are the existing digital adoption barriers to ensure quicker and controlled patient as well as manpower engagement?

Healthcare delivery has relied on manual human-aided orchestration of services and staff to manage healthcare operations and patient care. The biggest barrier to adoption is mindsets and change management, rather than technological. Today, technologies are seamlessly integrated, easy to deploy, and driven by value-conscious principles. Hospitals and healthcare providers need to consider longer term efficiency impact to aid decision-

making and leverage management driven vision to ensure change management, adoption, and capability building at every level within the organization.

From the patient perspective, the reliance on human connection has been important. However, given widespread adoption of digital and social tools, along with the new pandemic led “social distrust” which is already moving many industries towards contactless processes, patients would be open to adopting digital processes and systems. Hospitals need to ensure they implement systems, solutions, and dashboards that will enable them to meet the changing patient requirements and comfort with digital systems.

Several well-known hospitals have been early adopters of Gaia solutions for service orchestration and manpower management, and we expect greater digital transformation in hospitals once the immediate pandemic related considerations subside.

How can analytics be used for more accurate and consistent patient feedback?

Hospitals need to understand patient experience at every care touchpoint from OutPatient Departments to In-Patient Rooms, to the overall Exit Process. Several procedures and illnesses may require follow-ups or the hospital or doctor or nurses to remain in touch with the patient over an extended period of time.

Patient feedback can be used to measure, monitor and manage care metrics at every touch point over time. Comparative analytics can be used to compare performance by shift, by time, by staff, by ward, by service type. Comparative analytics can be used for a single hospital, or compare multiple hospitals in a network. Over time, it can be linked with staff performance and motivation, as well as patient engagement and recovery management.

Several hospitals have adopted patient feedback monitoring as a standalone mechanism or integrated into hospital workflows, and we anticipate more hospitals to consider these in the future. These solutions bring 100% increase in visibility and 30% or higher improvement in productivity almost immediately after deployment.

What are your views on managing facilities better in a social distancing world?

Social distancing is creating the competing pressures of managing facilities with fewer staff and managing facilities to a higher level of hygiene and sanitation safety standards. Given this, workforce and site optimization will be critical. Digital, IoT, and AI based tools will enable hospitals and healthcare systems to manage sites, spaces, equipment, assets, and staff better.



—CHRISTIAN GOGOLIN
Expert in Quantum Computing, Covestro

“ WIDEN THE RANGE

How can quantum computing benefit chemistry?

Quantum computing is an emerging, novel computing paradigm that has the potential to make certain calculations feasible that will remain impossible on classical computing devices. Quantum computers appear to be particularly good at simulating quantum mechanical processes, such as those happening during chemical reactions in molecules.

The discovery of new catalysts, enabling more efficient chemical processes and recycling routes and the design of new chemical products, may all benefit from such enhanced simulation capabilities. Covestro and Google are co-operating on research for novel computer technology. They are expanding on the innovation leadership with quantum computing. Here, Christian Gogolin, Expert in Quantum Computing at Covestro, speaks about the initiative

What are the new, groundbreaking perspectives opening up?

In the future, quantum computing may significantly widen the range of chemical systems that can be accurately simulated, which will open up new possibilities for discovery in chemistry, and thus, for the chemical industry. The discovery of new catalysts, enabling more efficient chemical processes and recycling routes, and the design of new chemical products, may all benefit from such enhanced simulation capabilities.

The anatomy of a superconducting qubit is interesting. Have you broken any new ground?

We are not working on quantum computing hardware, but rather, want to further the development of quantum computing algorithms and software. Here, we have already broken new ground by proposing a new kind of ansatz for so-called variational quantum algorithms, which combines the ideas from quantum computing with such additions from classical computational chemistry.

Amplifiers etc. are still a large research effort. Noise and errors will be there with us for a while. How are you developing algorithms?

That's very correct! Quantum computing hardware is still very limited, but improving at a fast pace. When developing algorithms with the aim of already doing something practically useful with the noisy quantum computers of the medium-term future one needs to take this into account.

Algorithms must be designed such that they have some amount of inherent robustness to noise and mitigation techniques must be employed to correct the outcomes. This means that developing algorithms for quantum computers is quite different from classical algorithm development.

Leveraging CyberMedia Network During Covid-19



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SHIFT to the New Mode of Learning

Excerpts from StackRoute Whitepaper titled, “SHIFT to the new Normal of Learning”

Even as the global economy redefines the new normal, resilience and innovation will define success for the post-pandemic business world. Business leaders now have a great opportunity to see the opportunities that come with adversities and play a pivotal role in making a difference to help

organisations to not only just cope but to also succeed in the long term.

In this fast changing environment, a talented workforce with the ability to learn quickly is the key for competitive advantage. The focus of any learning has to build the ability to continuously adapt, engage with others while retaining



SHIFT
to the new normal of learning

(Dr Vishnupriya Raghavan is the Head of Products & Solutions, StackRoute)

(Dr Yogesh Kumar Bhatt is Executive VP & Business Head, StackRoute)

the core identity and values of oneself. Essentially, this goes beyond just acquiring knowledge. It is about knowing how to learn and help build new ways of thinking.

Sense the Opportunity

This is the time to re-examine, redefine and reimagine how talent can be revitalised. We need to prepare the workforce for agility, innovation and resilience. An “agile” workforce that discards the old ways of thinking and adapts new ones. An “innovative” workforce that create opportunities from adversities – multiplying them as they are seized. A “resilient” workforce that can stay tough, stay prepared and continues to learn.

Harness the Possibility

The world’s best organizations are those in which the leadership is able to instill a sense of intrinsic motivation amongst its employees. While extrinsic motivation such as promotions, enhanced job roles, badges and awards have been around to ensure completion of planned initiatives, it is only when learners become self-driven can organizations transform. Organizations need to harness this possibility by designing learning that is self-driven, yet aligned to various possible scenarios of the future.

Harness the possibility to define

- An approach to repurpose the workforce.
- An approach that is designed to build capabilities.
- An approach that helps organizations shape their collective future

Ideate the Approach

As Albert Einstein said, “*We cannot solve our problems with the same thinking we used when we created them.*” Most existing competence frameworks and individual competencies seem narrow and non-differentiated across roles. These could be a misfit in the less predictable, and complex environments of today. Organisations require a slightly different set of institutional capabilities and individual competencies to build a workforce that is able to meet the needs of the future.

Organisations need a workforce that has the potential to understand, survive and thrive in the new dynamics of the environment and work - a workforce that can anticipate the short term and the long term impact of decisions, apply knowledge in unknown, new and evolving circumstances, survive in harsh situations, create opportunities in any situation, integrate disciplines, embrace new ideas, welcome opposing arguments, develop perspectives, take a stand, create value and drive change. Such abilities especially critical in the post-pandemic world are referred to as the “Transformative Competencies” (OECD Future of Education and Skills, 2030).

It becomes important to question existing frameworks and common practices to reformulate and redefine existing beliefs, approaches and solutions prior to designing new learning interventions.

Ideation will help to identify the institutional capabilities that are necessary to achieve organisational goals and to help examine if the existing workforce competencies align to the same. It should also include a thorough examination



of existing strengths and weaknesses to remove any barriers to change.

Ideation can help to configure the following:

- Do existing competence frameworks provide the right fit to develop the capabilities of tomorrow?
- Do the present approaches to learning help the learners learn effectively and kindle their interest to move to the next level?
- Is the organizational environment supportive of a high-performer and continue to provide a challenging environment to learn and grow?

Foster Focused-Change

Learning designs have to build the ability to innovate, take larger responsibility, create value, and to make ethical judgement that will help to guide towards a better future. They have to challenge the mental models of learners. They force the learners to connect the learnings to their current work, and also to possible opportunities relevant to the learning. This will help learners reflect on their own true potential.

Learning designs have to allow an environment for learning to be converted to action. An organization that is keen on an agile, resilient and an innovative workforce should provide for application-oriented learning supported by mentorship to help the employee deliver in the world after the crisis.

It is important that any learning intervention is spaced out over time. This helps in long term retention as the new knowledge is given a chance to be rehearsed over a duration and revisited often. Unlearning can happen only if the learning design accommodates for the new learning to “stick” by way of actions that allows it to be reinforced and applied.

When the new learning becomes the new normal, the old practices and the ways of working would disappear gradually. Unlearning is an important skill that allows a learner to shed resistance to new ideas, to be ready to face opposing arguments and to take differences of opinion in professional stride.

A three phased approach that **imparts** knowledge and allows comprehension; **immerses** the learner in an environment conducive to experimenting; and encourages learner to **introspect** on oneself.

This will allow learning interventions to be “learner-centred” and bring a foster-focused change to:

- Provide an exceptional learning experience leaving the learners motivated to pursue further learning towards growth opportunities.
- Help learners to demonstrate a difference in the way they bring value to their work.
- Enable the learners with a learning compass - that gives them the confidence to venture into unknown terrains.

Transform Learning

Designing an effective approach to learning is both challenging and complex with varied needs and immediate demands from the business. This requires conscious and deliberate attempts for:

- a SHIFT in focus from *skill building to capability building*
- a SHIFT in mind set from *upskilling to upgrading talent*
- a SHIFT of responsibility from *organization mandated training to employee motivated learning*
- a SHIFT of learning design from *faculty-centred to learner-centred*
- a SHIFT in learning delivery from *passive listening to participatory learning*
- a SHIFT in content from *one size fits all to individualized and differentiated learning*
- a SHIFT in evaluation methods from *assessment of learning to assessment for learning*

Perhaps, the biggest SHIFT has to be in the roles of learning and development professionals. Their role is to go beyond fulfilling the immediate requirements of skill development. They must identify market trends; influence businesses and help build “transformative competencies” (OECD, 2019).

These shifts have the potential to truly transform learning that will:

- Provide an environment that can create seeds of change with the potential to have a transformative impact on each learner
- Encourage new ways of thinking to face and solve problems in uncertain times and ambiguous situations
- Promote the potential of every learner to create impactful solutions to complex problems.

Having an innovative workforce that is agile, resilient, motivated and competent will make the difference between those enterprises that will succeed in the post pandemic world and the ones that do not. Such a workforce will not wait for black swan events or disruptions in the market to come out with new ideas to stay afloat.

Building a Roadmap

Bringing in managed services to augment the customers' capabilities

Dataquest recently organised a webinar titled Building a Roadmap for OT Cybersecurity, with Rockwell Automation. The speakers at the cybersecurity webinar were Sabyasachi Goswami, Connected Services Commercial Leader, Asia Pacific, Rockwell Automation and Moon Eluvangal, OT Cybersecurity Consultant, Asia Pacific, Rockwell Automation.

Goswami said that digitisation/smart manufacturing is the opportunity. Smart manufacturing and the IoT can foster tremendous business outcomes. Digitally-transformed companies are better positioned to handle business in the pandemic. Convergence is a necessity today. There are things that are operational in nature, in real time. You have to deploy ERP, MRP, materials and transport, sensors and actuators, etc., across the enterprise.

There is a debate between IT and OT. The priority is the pervasiveness of data and the confidentiality of such data. Architectures are ubiquitous in nature and consist of the multi-tiered systems to encourage wide accessibility. End points are said to be homogeneous in nature.

Industrial Targets

In the last two years, there have been damages worth \$11.7 billion due to ransomware attacks. Also, 53% of industrial manufacturers have experienced a cyber

security breach in their facility. Industrial companies are targets due to the legacy un-patched infrastructure and a lack of skilled resources to properly manage cyber risk. Companies are struggling to handle this. There are industrial control system or ICS-focused campaigns, attacks etc. There are also things like hactivism, crime, insider threats, espionage, terrorism and warfare.

The ICS threat vectors can be on the IT network and the OT network. More than 40% are possibly from the insider threats. There are reasons, such as flat networks and weak authentication, no encryption, insecure ICS, etc. ICS can be insecure by design. There are things getting increasingly connected, and an active threat landscape.

Holistic approach

Rockwell has taken a holistic approach. A secure application depends on the multiple layers of protection. Industrial security must be implemented as a system. There is defence in depth, openness, flexibility and consistency.

The OT infrastructure best practices involve a robust, secure, scalable OT information infrastructure that is critical to digitalization and business continuity. The digitally-transformed businesses are best positioned to deal with the new normal. You have a converged



THERE IS A DEBATE BETWEEN IT AND OT. THE PRIORITY IS THE PERVASIVENESS OF DATA AND THE CONFIDENTIALITY OF SUCH DATA. ARCHITECTURES ARE UBIQUITOUS IN NATURE AND CONSIST OF THE MULTI-TIERED SYSTEMS TO ENCOURAGE WIDE ACCESSIBILITY. END POINTS ARE SAID TO BE HOMOGENEOUS IN NATURE

— Sabyasachi Goswami, Connected Services Commercial Leader, Asia Pacific, Rockwell Automation



WE ARE ABLE TO BRING IN MANAGED SERVICES TO AUGMENT THE CUSTOMERS' CAPABILITIES. WE CAN GIVE SECURE REMOTE ACCESS TO THE CUSTOMERS, IF NEEDED

— Moon Eluvangal, OT Cybersecurity Consultant,
Asia Pacific, Rockwell Automation

plant-wide Ethernet (CPwE), industrial demilitarized zone, virtual computing or industrial datacentre, industrial cyber security, digital installed base and OT managed services.

There is the ISA/IEC 62443 is a series of standards that define the procedures for implementing the electronically secure industrial automation and control systems. We help to secure the infrastructure, solutions and products. The ISA 95 is part of the ICS network architecture best practices.

Goswami said, "Visibility is the key! You need to know what you have and what its attack surface is. Where is the asset physically located? What is the operational purpose of the attack? Visibility can drive your cyber security approach. You need to identify and protect, detect and respond and recover, before, during and after any cyberattack. You can build a secure, robust, future-ready network for your connected enterprise. Assess, design, implement and monitor."

Rockwell Automation took an example of a global pharmaceutical company having 64 sites. They did network segmentation across 64 sites. There was deployment of threat detection services. There was focus on end-point security strategy. There was another North American oil and gas company, with 17 sites.

The steps taken have definitely improved the global OT cyber hygiene. It minimised the business continuity risk by reducing the probability of downtime due to a cyber security attack. At the webinar, at least 57% participants were said to be working on developing a roadmap for cyber security in the industrial control system.

Approaches to Take

Goswami advised that there is risk management. You need to create your own roadmap and profile. There is a need to streamline the OT security, standardisation and improvement. There is a need to establish the asset visibility, determining the current risk posture, develop a base cyber hygiene programme and have OT network readiness.

The more foundational approach involves reviewing comprehensive installed base, deploy segmentation between the IT and OT environments, secure endpoints, deploy continuous threat detection etc. A better approach involves modernising the installed base, modernising the OT network etc.

Rockwell supports the complete project and system life cycle. It can help you assess the framework, and be a strategic advisor, and an IT/OT security practitioner, etc. Our partner ecosystem consists of security experts to help address the security concerns. Planning the roadmap is the most important thing! You need to do a strategy review, identify opportunity, etc. It is the entire digitisation strategy. Manufacturing companies focus on their job, and not on IT/OT.

According to Eluvangal, Rockwell can manage the network 24/7. We are able to bring in managed services to augment the customers' capabilities. We can give secure remote access to the customers, if needed.

Goswami added that it is the current and the future states. We need to assess your assets. Do I assess the network or the security posture? That is a good starting point. We have the different assessment capabilities.

Flowing into New Structures

Importance of resilient, scalable infrastructure to power business critical apps



Dataquest recently organised a webinar. The participants were Sudharshan Aravamuthan, Technical Expert, Business Critical Apps & Converged, Hitachi Vantara, APAC, Sanjay Agarwal, Technology Head, Hitachi Vantara and Sunil Rajguru, Editor, PC Quest, Cybermedia. Opening the fireside chat of the Hitachi Vantara webinar, Rajguru said that with every crisis comes an opportunity. The human race always overcomes these challenges. We upgrade ourselves and come back strongly. Anticipation is power. World War 2 gave us the Colossus computer, rockets, jet planes and atomic energy.

Covid-19 is strengthening the WFH, collaboration and mobile workforce. There are also no-touch technologies.

There is IoT, Industry 4.0, connected cars and drones. The concept of WFH for 10-15 years. The widespread adoption took place overnight.

Data is still the new oil. Data explosion continues. There are more data centers, cloud operations and devices, etc. The upper limit for IoT devices by 2030 is 500 billion. We have to upgrade ourselves at a very fast pace. Data and digital transformation are the buzzwords of today.

Data-Driven Organisations

Sanjay Agarwal, Hitachi Vantara, pointed out that there was an interesting survey done with the CIOs some time back. About 70% said data. Processes and



CLOUD HAS ALWAYS BEEN A PART OF THE CIO'S IT STRATEGY. THERE ARE SOME CHALLENGES. MANY ORGANISATIONS THAT PLANNED GROWTH ARE NOT ABLE TO DO SO DUE TO THE CURRENT SITUATION. WHEN IT COMES TO DR, THEY DO NOT HAVE THE ABILITY TO TRIGGER SITES. HENCE, CUSTOMERS ARE ACCELERATING CLOUD STRATEGY

— Sanjay Agarwal, Technology Head, Hitachi Vantara

automation are very important. They are looking into data coming in from social media, etc. They are looking at product strategy.

CIOs are looking for a journey into a data-driven organization. This is a challenge that CIOs have. How do they reach there? What can they do to monetise the data etc. You can store, enrich, activate and monetise the data, using the Hitachi SEAM model. The first way is to enrich the data, so it is good for analysis. There will be things like activation, interaction, etc.

Big Data has lot of unstructured data. CIOs have challenges such as do they have the right platform to store data, analyze data, etc.? There are issues such as compliance. From a platform perspective, there are challenges such as scalability. Traditional technologies are not able to answer these questions. This requires a platform change. There are challenges as well. Do they have solutions to meet DataOps? Object storage can be a value addition to the platform.

Cloud has always been a part of the CIO's IT strategy. There are some challenges. Many organisations that planned growth are not able to do so due to the current situation. When it comes to DR, they do not have the ability to trigger sites. Hence, customers are accelerating Cloud strategy. Your requirement for human intervention will also be automatically reduced. CIOs are redefining their cloud strategy. When it comes to management, they are also shifting focus. Can they manage all in a single, unified space?

Sudharshan Aravamuthan, Hitachi Vantara, added that customers are essentially looking at lift-and-shift. They are looking at containerization of workflows, etc.

We will also see a lot of services and apps also getting modernized. It is key for CIOs to ensure non-stop data via apps, etc.

Resilient Infrastructure

Sanjay Agarwal noted that there is talk about resilient infrastructure. We need to ensure the same level of assurance at the data level and the hardware level. When it comes to storage, the entire data is very important. CIOs are expecting multiple controls. This is just a part of the hardware uptimes. They are also asking: can you ensure 10% data availability? We have solutions that can help them. As for business continuity, there can be takeover approach available. This can be without human intervention. The hardware is assured in terms of uptime and availability.

Almost 50% of the CIOs are saying that all three components are important. Customer transactions should be fast. Datacentre consolidation and workload consolidation is also important. Certain digital apps can have full performance. We can also look at optimizing performance of the second- and third-stage apps. Almost 56% are said to be evaluating containers as part of the DevOps journey.

Top Concerns Addressed

Aravamuthan added that CIOs and technology leaders have some top concerns. These are around shifted priorities/perspectives, lean staff, changes what they can deliver on, etc. There is federated collaboration, resilient and scalable architecture and a digital transformation programme during the pandemic.



THERE ARE CHALLENGES THAT COMPANIES ARE FACING DUE TO WFH. COMPANIES ARE ENSURING THE APPS AND DATA ARE KEPT SECURE. THEY ARE ENSURING THE DEVICES ARE PATCHED AND UP-TO-DATE DATA. THEY ARE FIXING AND SCALING THE VDI INFRASTRUCTURE AND ENSURING REMOTE SUPPORT TO THE END USERS

— Sudharshan Aravamuthan, Technical Expert, Business Critical Apps & Converged, Hitachi Vantara

There are challenges that companies are facing due to WFH. Companies are ensuring the apps and data are kept secure. They are ensuring the devices are patched and up-to-date data. They are fixing and scaling the VDI infrastructure and ensuring remote support to the end users.

Unstructured data is much larger. We are trying to modernising it. The IT administration teams also looking at supporting the users. They are ensuring seamless apps are made available, across multiple form factors. Customers also need to adapt as most of their employees have now gone to WFH. This is the new world norm. About 74% of CFOs surveyed by Gartner expect some of their employees to continue working remotely, after the Covid-19 pandemic ends. Hitachi Vantara and VMware solutions portfolios are not just about joint collaboration. We are managing the apps. VMware portfolio contains the vSphere hybrid Cloud, Workspace ONE and Horizon for the private cloud, NSX digital workspace, etc.

Hitachi Vantara has simplified consumption, providing aaS cloud, converged unique compute platform CI, etc. We have helped accelerate the time to production. There is automated provisioning, such as rule-based validation, unified management, including vROPS and vRLI integration, turnkey, such as cloud home drive and advanced analytics, and hybrid cloud, such as VMware Cloud Foundation ready, extend to VMware Cloud on AWS, and support for VSF FC storage. Customers are appreciating the idea of bringing in object storage. VMware Horizon FastTrack Package ensures rapid desktop delivery. There is simplified deployment, minimising risk with turnkey apps, and scaling by additional load balanced appliances.

Intelligent Data Management

Next, intelligent and secure data management is key. Hitachi Vantara has VDI solutions. These over smart data sharing, ransomware protection, on-premise and cloud ready, policy-based analytics, backup-less protection, secure data access, retain full visibility etc.

Hitachi Vantara provides data services, from the edge to the cloud. There is an always-on virtual desktop infrastructure, along with an intelligent cloud home drive. That can help you extend beyond your data centre. There is an always-on infrastructure. Hitachi Vantara has a modern infrastructure portfolio. The VSP ensures the foundation of a modern, enterprise infrastructure. The VSP5000 provides the strong technology foundation, giving the infrastructure agility. You almost have 43% reduction in the TCO.

You can have future-proof ready storage architecture even in your datacentre. You can also have AIOps out-of-the-box. We guarantee 100% data availability. There is replacement equipment credit, should data become unavailable. Hitachi Vantara is redefining business continuity. There is 100% automated business continuity. There is improved performance and assets utilization.

Customers can also eliminate or reduce their dependency on tapes. This approach can be done without human intervention. Hitachi Vantara also has solutions for the containers. The container orchestration engine bridges the traditional with modern IT. You can innovate faster with a container platform, supported by virtual and/or bare metal infrastructure. You can enable scalable apps services with persistent storage (CSI). Customers can deploy IT policies. Hitachi Vantara also has the EverFlex program.



—**S. SRIRAM**
GM, Industry Sales, Factory Automation &
Industrial Division, Mitsubishi Electric India

Industry 4.0 is in the process of settling down in India with automation becoming the norm in everyday activities of the industries. S. Sriram, GM, Industry Sales, Factory Automation & Industrial Division, Mitsubishi Electric India, tells us more about Industry 4.0 and the road to smart transformation

How is Covid-19 affecting Industry 4.0 and future of innovation?

Industry 4.0 was a fascinating subject to explore for most of the manufacturers, be they small, medium or large. Covid-19 has, in a way, accelerated the need to move from exploring to adopting Industry 4.0, more than ever before. While most of



INDUSTRY 5.0 ALREADY ON THE HORIZON

manufacturers are looking inwards to survive the onslaught of Covid-19, those who have adopted technology in their manufacturing environment are more likely to recover faster than the others.

As people consciously quarantine, there is a radical shift towards work from home thereby the need to bring the manufacturing environment and data into their workbenches. This would lead to greater adaption of VR/AR tools, remote monitoring, data analytics – to have a real-time view of business. Such necessity and its adaption will lead to innovation of technologies around it.

Are industries transitioning to either fully lights-out or an automated factory?

Historically, organisations have responded to labour issues by using automation as an alternative, but it has failed to live up to its euphoria, as humans are after all the brain behind the machines. Hence, the organisations that find ways to marry augmentation and automation – to build workflows that improve human performance will be best poised for what comes next. Hence find a mid-way between the full lights-out factory to a well-automated factory, would be the best way to prepare.

We are working towards making day to day operations easier at the factory floors and ensure greater flexibility through our automation capabilities. Major advancements like cobots can be a game-changer for the automation industry. Cobots can support the industry with easy programming, fast set-up, flexible automation in comparison with industrial robots and ensure collaborative efforts and safety.

How are industries bringing the smart transformation to their organisations?

Digital transformation is changing the way business is conducted across every sector of the economy. Businesses will need to transform themselves into digital enterprises to thrive and this transformation will need to be far more profound than merely investing in the latest technology.

Digital transformation/smart transformation like any other begins with strategy that is carried through redesigning talent models, transforming processes, and retooling technology. Leaders screen each decision to confirm that it will contribute to agility, promote digital adaptation and deliver value to customers.

How can smart cities now remain smart and in the future?

Smart cities bring together infrastructure and technology to improve the quality of life of citizens and enhance their interactions with the urban environment.

Created as part of the smart technology movement, the IoT enables various objects and entities to communicate with each other through the internet. By creating a network of objects capable of smart interactions, the door is opened to a wide range of technological innovations that could help improve public transport, give accurate traffic reports or provide real-time energy consumption data thus leading the way for smart cities. A data-driven, decision-making process is apt for the smart cities' development, deployment of IoT devices can enhance the growth and put smart technologies into action.

By using technology to monitor cities, how is data collection helping?

The IoT is an essential technology without which smart city initiatives cannot exist. The “things” of the IoT, such as devices, sensors, applications etc. collect the data that enables the technology solutions to be effective. For example, The Smart Meter System from Mitsubishi Electric are introduced to visualise power usage and automate meter reading. It is helping in maintaining high data collection rate. It gives access to choose optimal communication which yields highest economic efficiency related to the design tool.

Smart city initiatives need big data analytics to function. The IoT generates huge datasets that must be analysed and processed to implement smart city services. Big data platforms, part of the city ICT infrastructure, have to sort, analyse and process the data gathered from the IoT.

With the development of smart cities on the rise, we have powerful solutions like integrated building management system (BMS) framework that brings together separate applications such as security, access, building monitoring and management, and HVAC systems. The application helps to improve comfort, efficiency and reduces overall energy cost. Smart energy solutions turn data and information into building intelligence by integrating with BMS, SCADA and control systems.

The usage of HVAC systems is increasing in commercial and industrial spaces. Mitsubishi Electric HVAC systems have been refined over the years through continued improvement efforts. Through the deployment

of intelligent hardware such as programmable logic controllers (PLC) and direct digital controllers (DDC), fluctuating environmental variables can be managed with pinpoint accuracy.

This technology is controlled by the MC Works64 automation and control software. Where human intervention is required, easy-to-use Graphic Operation Terminals (GOT) allow operators to make changes manually. System safety and integrity is ensured with our eco-friendly circuit breakers and earth-leakage circuit breakers, while redundant PLCs guarantee that undesired interruptions are effectively prevented. This helps our customers by maximising productivity through enhanced operations while delivering ideal climate within buildings.

How are Indian companies becoming digital ready and also, by infrastructure?

India is the prime destination for many investors. It has become one of the world's largest and fastest-growing bases of digital consumers. It is working on to become faster and more competent for the emerging economies. Digitisation can be implemented following a detailed step-by-step approach. We are helping out our customers by implementing the concept of Mitsubishi Electric's E-F@ctoryStarter Package that can help to start your journey of digital transformation.

With our strategic range of innovative factory automation tools, Mitsubishi Electric is playing a key role in mitigating issues like downtime and loss of efficiency across manufacturing firms. The brand's industrial robots in specific are solutions that are designed to make next generation manufacturing a possibility.

Do you see any change to a tech-augmented workforce in future?

The next wave of technology will make our workforce more productive, more creative and more efficient. Smart technology will help us to reach our goals and to fulfil our purpose. AI will probably solve many information overloads and decision-making problems that we have today. But at the same time, it will create issues that we need to solve on ethics and moral level. The cycle never stops!

The advent of augmented reality (AR) and virtual reality (VR) has eased the level of remote communication and

collaboration. Thereby, solving many issues in real-time. AR is helping in the industrial and healthcare fields where assistance can be provided and displayed on to the users' field of vision. Whereas, VR is helping high-quality content and 360-degree imaging which further helps to create depth and space to the designs. The collaboration of AR and VR helps to save time and task can be executed in real-time with proper understanding.

Moving forward, artificial intelligence has also gained importance through consistent improvement over the past few years. The approaches such as deep learning and machine learning helps make day-to-day jobs easier to do. Robots, and AI, will help people perform their tasks better, not take their jobs. It will lead to overall efficiency and will create new possibilities for revenue generation.

Will there be any beginning of Industry 5.0?

It is safe to say that Industry 5.0 is already on the horizon and is set to focus on co-operation between human and the machine. We have already set the mark, we have designed the collaborative robots ensure collaboration with humans at workplace to do efficient operations.

The cobots are made to provide more exact movements, faster delivery in less time and maintaining high precision without compromising with performance or safety of humans. It is expected that demand for the collaborative robot is to increase in the next few years, due features like flexibility, safety and productivity. We are all set to present the advance form of interactivity and collaboration which will lead to driving the long-term market growth.

How will companies use IoT to minimize supply chain stress?

There are many ways that IoT can be useful to minimize the supply chain stress like by selling asset tracking, inventory planning, etc., based on demand analysis, guaranteed performance/uptime is an entirely new business model now made possible by the IoT. It allows traditional asset-based companies to become service companies.

Smart sensors in IoT equipment allow manufacturers to know what variables are involved in a given process and afford them greater control over those variables. Real-time information can lead to pro-active decision-making that can fine-tune operations for greater profitability.

Connectivity

Implications of Industry 4.0 for a connected society

Ericsson and ABB recently hosted a webinar on Industry 4.0 and connectivity. The participants were Dr. Aleks Krotoski, Host of Ericsson UnBoxed Office Social Series, Erik Josefsson, Head of Advanced Industries, Ericsson and Juha Mirsch, Global Cellular Communication (IIoT) Lead, ABB Motion.

Opening the conversation on Industry 4.0, Dr Krotoski said that with automation and intelligent networks, what can the future of hyper-flexible factories look like? What happens when you cut the cables and set your production facilities free? Let's us find out about Industrial IoT.

Erik Josefsson, Ericsson said that there has been no factory that has not been impacted. In the heart of Covid-19, we also opened up a new factory in the USA, in March 2020. We have to also move from physical to digital. That's a clear shift that we are seeing. Juha Mirsch, ABB, said that distancing to machines is our first priority. When data is collected from the assets, we can deploy remote monitoring that increases the distance from the machines.

Dr. Krotoski said that all of this allows the machines to move around a lot. Industry 4.0 allows the ability to roll around equipment, along with cellular. Josefsson noted that the merger between IT and OT is perfect timing. ABB comes from OT and Ericsson comes from

ICT. Cellular brings mobility, eg. collaborative robots. We predict that there will be 2mn AMRs by 2030. Connecting screwdrivers by adding a sensor will give you the intelligence seamlessly. When IT and OT come together with 5G, there will be exciting times. IT is the software layer. OT could be a machine or a tool. So, you can differentiate between the physical and digital. Mirsch added that the industry is connected today. We had lots of cables around the shop floor. We came up with PLC logic. It is a natural step, to make everything wireless and changeable.

What will the future factory, based on cellular, look like? According to Josefsson, you can have local antennae around. You can deploy it, say, around 5,000 sqm. You can even connect screwdrivers. We connect sensors, to the big robots, and to the motors.

Protecting Industry 4.0

Next, there was a question as to what can be done to protect Industry 4.0 with security? To this, Josefsson said that if you use any unlicensed spectrum, anyone can get break in. If you use 4G or 5G, they come with built-in security. There is the E-SIM also coming in. Industry 4.0 unlocks a lot for the manufacturers. You can connect machines and have drones on top of the industrial machines. You can unlock the value worth \$4 million in a year.



THERE HAS BEEN NO FACTORY THAT HAS NOT BEEN IMPACTED. IN THE HEART OF COVID-19, WE ALSO OPENED UP A NEW FACTORY IN THE USA, IN MARCH 2020. WE HAVE TO ALSO MOVE FROM PHYSICAL TO DIGITAL. THAT'S A CLEAR SHIFT THAT WE ARE SEEING

— Erik Josefsson, Head, Advanced Industries, Ericsson



DISTANCING TO MACHINES IS OUR FIRST PRIORITY. WHEN DATA IS COLLECTED FROM THE ASSETS, WE CAN DEPLOY REMOTE MONITORING THAT INCREASES THE DISTANCE FROM THE MACHINES

— Juha Mirsch, Lead, Global Cellular Communication (IIoT),
ABB Motion

According to Mirsch, there are environmental considerations that also come into play. Energy consumption will happen. We will use electricity more judiciously. 10% of electricity can be used for movement. How do we optimize electricity? There is scaling. We can collect the data.

What Do Partners Bring?

What does Ericsson bring to the table? Josefsson said that last year, Ericsson announced at the Hannover Messe that it is going to collaborate with ABB on research and connecting our factories. We are looking at new opportunities. We are looking at communications. We also connected the collaborative robots in Davos, just before the pandemic.

As per Mirsch, there is lot to do for making IIoT more collaborative. We need to also differentiate between the public and private networks. We want to have seamless connectivity. There can be devices that can be part of their own environment.

Effect of 5G and AI

Next, Dr. Krotoski enquired about the key industrial requirements for cellular and how can SMEs be helped. Josefsson said that we can see the beginning of a new era of industrial digitisation. For example, Mercedes, BMW, Vodafone etc., have deployed the IIoT. Mirsch added that the key requirement for 5G to transform industries will be to determine how to collect data and how to use it for IT and OT. We need to connect the whole factory.

Dr. Krotoski noted that once you initiate 5G, it can explode innovation. How will 5G and AI affect Industry 4.0? As per Josefsson, there will be industrial AI as

well. There will be PLC in the cloud. When Ericsson deployed 4G for consumers, they made the best possible communications. We had industrial AI and ML as well.

According to Mirsch, AI is the ICT element. The industry does calculations about TCO. There is cost of purchasing, keeping the machines running etc. Smart sensor is a great way to predict accurately. We need to have data to do all that. We collaborate with customers to optimize and reduce costs.

If there are any risks working without cables, Josefsson added that it is the physical element with cables. There is an underlying uncertainty. It becomes extremely important for a factory to connect wirelessly. We can expand the footprints of 5G and cellular.

Trusting Wireless

Also, there was a question as to what degree will the people give up to trust wireless? According to Mirsch, there is the voice, GPRS and IP over the mobile. When you press the button, the motor will stop. Remote monitoring, connectivity etc., will help people avoid connecting with machines.

There are benefits for the manufacturing industry, as well. Josefsson added that the first thing is to get started and experiment. That will expand on to the shop floor. There is the industrial AI and analytics. You can place a sensor and get communication, without troubling your network. Look at what's in front of you and get started!

According to Mirsch, there is a value in the early adoption. In the future, this standardization will help in integrating the existing 5G standards. Downtime is a cost aspect. The early adoption will help you in understanding how to optimize.

Riding the Storm

A giant SaaS opportunity



Delivering the keynote at the Nasscom SaaS webinar, Ajay P Sawhney, Secretary, Meity, Government of India, said, “We are very happy to launch this report. The crisis has actually made us go back to basics in our own lives. What are the optionals and what are the essentials? Digital worlds, smartphones, tablets, connectivity, were all loved before the crisis. The crisis has allowed us to have continuity, and dream of big things. It’s been clear to us for some time now.

“The Indian government had come out with the National Software Product Policy. We had laid down many initiatives that we need to pursue. Some of these schemes are the Indian software registration scheme, ICT Brand Challenge, to create major software products

within India etc. There is a grand challenge within cyber security. The government also got into video conferencing products. We are also working on a model RFP for software products. HS code for software product is another area that will provide recognition for the software industry. As also does the software product development and startup accelerator programme. This is all part of the national software product policy.

“We also recognise that SaaS should not remain confined to catching up with the rest of the world. Yes, we must catch up with the world. But, we must also try and do something that is very original. Each generation has completely new thoughts. The ones that become huge in 3-5 years, how do we put enough energy into these completely new segments?”



THERE IS A GRAND CHALLENGE WITHIN CYBER SECURITY. THE GOVERNMENT ALSO GOT INTO VIDEO CONFERENCING PRODUCTS. WE ARE ALSO WORKING ON A MODEL RFP FOR SOFTWARE PRODUCTS. HS CODE FOR SOFTWARE PRODUCT IS ANOTHER AREA THAT WILL PROVIDE RECOGNITION FOR THE SOFTWARE INDUSTRY

— Ajay P Sawhney, Secretary, Meity, Government of India



IN THE LAST FEW MONTHS, EVERYTHING HAS COME TOGETHER AND SAYING THAT WE HAVE TO GET TOGETHER. THIS CAN BE GAME CHANGING FOR INNOVATION, ESPECIALLY FOR THE TECH ECOSYSTEM. THIS IS OUR BIGGEST LEGACY TO INDIA

— Debjani Ghosh, President, Nasscom

There are national public digital platforms coming up. The concept of opening up projects and databases to become part of something larger. GSTN, UPI, Aadhar etc., are all part of the national platform. We are now moving forward with digital platforms. For example, there will be national platforms on health, logistics, agriculture, justice, urban management, rural areas, welfare activities and so on. These are huge platforms taking shape. They signify a new way of thinking. There are services provided by the government to the people are given in silos.

On these combined platforms, we create opportunities for companies, startups etc. These are services that will join and enrich the national citizens. The government will be creating a Team India of providing services to the

citizens. You certainly have the opportunity to address a unified market. This is a very different ecosystem. It has got impetus and got accelerated through the crisis. We should make best use of the time available. We have two types of crises – Covid-19 and along the border. The twin crises had created a huge impetus for new thinking, for joining up in a national effort.

He added, “As we move forward with SaaS, there is another opportunity of combining software with electronics and hardware. It is time to look at how do we combine these two, and create complete offerings. This is the best chance for us to be different. Each one area, where there is pain, we must try to find new ideas and products. There is no dearth of challenges waiting to be solved. We will walk along with Nasscom.”



WE ARE FOCUSING ON BUILDING NEXT-GEN SaaS COMPANIES. THERE IS TALENT IN THE COUNTRY THAT IS FOCUSING ON BUILDING SaaS SKILL SETS AND AN EFFECTIVE INDUSTRY MENTORSHIP PROGRAM

— Atul Batra, Chair, NASSCOM Product Council & CTO



SaaS HAS MADE REMOTE A DIGITAL ATMOSPHERE. SaaS MARKET GREW OVER 100% IN THE LAST TWO YEARS. ERP PENETRATION IS ABOUT 30% NOW. SaaS REVENUES ARE AT \$3.5 BILLION, GROWING AT 30% IN FY 2020

— Manav Garg, Founding Member, SaaS Boomi & CEO and Founder, Eka1.com

Focus on Digitisation

Earlier, Debjani Ghosh, President, Nasscom, said, “We are excited to bring the report on SaaS out. The entire ecosystem has collaborated with us, including SaaSBoomi. The entire focus on digitisation has been huge. Companies will get divided into essential and nice-to-have. The latter can get into some problems. Our products should be designed in such a way to cater to the essential needs.”

The opportunity provided to us is very strong. Nasscom works with the government and the industry to make it happen. The timing is absolutely right to have big, bold steps. We have a government that is tremendously pro-innovation. We need to see how we can move on. We have tremendous support from the government. Indian companies tend to be shy. There is need for the government and Nasscom to tell the world about SaaS in India. We should take our work to the world. There should be very strong ecosystem.

In the last few months, everything has come together and saying that we have to get together. This can be game changing for innovation, especially for the tech ecosystem. This is our biggest legacy to India.

Atul Batra, Chair, NASSCOM Product Council & CTO, Manthan Systems, said, “This is the first, truly collaborative report. Key stakeholders have collaborated in creating it. Covid-19 is reshaping the economic priorities and accelerating digital consumption. Public cloud services are growing at 19% and team collaboration software has been growing at 13%. Pure-play SaaS and established product companies have scaled up SaaS offerings. There are 12,000+ SaaS companies. There are 500+ companies across the verticals.”

Analytics, delivery scheduling, telemedicine and healthcare record management, E-learning and classroom management are the key growth areas. We are the third largest startup ecosystem in the world. The government and MSMEs are the adopters as well. This is also a way



YOU HAVE THE CONNECTIVITY WHICH HELPS IN DELIVERY. THERE IS ALTERNATIVE HEALTHCARE AS, WELL. IOT HAS MADE LOT OF DIFFERENCES TO HEALTHCARE. IT IS HOW YOU ADDRESS THE TOTAL ADDRESSABLE MARKET

— Monish Darda, Co-Founder & CTO, ICERTIS



ENTERPRISE SaaS IS PERHAPS, AN AREA. WE HAVE SEEN GOOD ADOPTION FROM THE LARGE ENTERPRISES. IN ITSELF, IT MAY BE A BIT DIFFICULT FOR THE ADDRESSABLE MARKET

— Aneesh Reddy, Co-Founder & CEO, Capillary Tech

to build Brand India. We are focusing on building next-gen SaaS companies. There is talent in the country that is focusing on building SaaS skill sets and an effective industry mentorship program.

Manav Garg, Founding Member, SaaSBoomi & CEO and Founder, Eka1.com, added that SaaS has made remote a digital atmosphere. SaaS market grew over 100% in the last two years. ERP penetration is about 30% now. SaaS revenues are at \$3.5 billion, growing at 30% in FY 2020.

There is a diverse landscape, with at least 6 unicorns. There is strong investor interest, as well. The Indian SaaS industry has 150+ firms with \$1 million+ ARR. There are four each in the \$50-100 million and the \$100-500 million. We have playbooks for enterprise sales. Core verticals such as BFSI, retail, are driven by rise in open banking. The next-gen SaaS is also shaping up well.

Riding the SaaS Storm

There was a panel discussion on riding the SaaS storm.

MonishDarda, Co-Founder & CTO, ICERTIS, said this is the next step in digitisation. 10 years ago, the IT scenario was very different. As a company, we can dream and have the power to execute. There are lot of learnings. Having a mission is important and reachable, is very important.

The crisis has brought healthcare, pharma, education etc., to remote places. They have broken all the rules. Excellent healthcare delivery can happen as the infrastructure grows. You have the connectivity which helps in delivery. There is alternative healthcare as, well. IoT has made lot of differences to healthcare. It is how you address the total addressable market.

Aneesh Reddy, Co-Founder & CEO, Capillary Tech noted that vertical SaaS is focused on a specific vertical. Customers who understand the depth of the product, tend to go with you. This is an advantage against the horizontal vendors. The depth of the application has to come from the user. We have a 7-8% annual churn. Customers have a desire to go live faster. Going digital is super important.



WE HAVE ALL THE DOMAIN EXPERTISE AND THE SKILLSETS. WE CAN BUILD INDIAN SAAS COMPANIES WITH LITERALLY NO FUNDING. LOCATION IN NON-CONSEQUENTIAL. A DISTRIBUTED ECOSYSTEM CAN BE SPREAD ACROSS THE COUNTRY

— Suresh Sambandam, CEO, Kissflow

In India, there are problems regarding contracts and payments. Enterprise SaaS is perhaps, an area. We have seen good adoption from the large enterprises. In itself, it may be a bit difficult for the addressable market. The Indian opportunity is huge.

Suresh Sambandam, CEO, Kissflow, said that India has been a huge IT services provider in the world. Now, it is going forward with SaaS. We are configuring what SaaS can do for the Indian ecosystem. You can build 66 companies with a \$1 billion revenue. That's about two companies per state. India has yet to position itself. Perhaps, it can position itself as a SaaS provider.

We have all the domain expertise and the skillsets. We can build Indian SaaS companies with literally no funding. Location in non-consequential. It can be in Renigunta, Tenkasi, Jalandhar etc. A distributed ecosystem can be spread across the country.

APIs Driving Future Economy

The webinar concluded with a fireside chat between Sameer Verma, MD, Nexus Ventures and Abhinav Asthana, CEO and Founder, Postman. Sameer Verma asked what made him start Postman.

Abhinav Asthana said they found they were working with an API. It could change, and how hard it would be to change systems. They were building APIs for Android and iPhone apps. When teams were working on APIs, they faced lot of friction. He wanted to do things that I understand.

He continued, "We built Postman, which is a collaboration platform for API development. Postman's features simplify each step of building an API and streamline collaboration

so you can create better APIs, faster. It is a helpful assistant sort of a tool. We did a phone test, with simple spelling. A designer built an amazing logo."

It was easy to see whether problems were being solved. I would often seek positive feedback. That was a way of overlooking problems. If APIs are going to be the future, we need to build a lot of APIs. Today, we have institutionalized this process. Newcomers need to build a program and show us.

Verma added that developers are generally considered notorious. How did you go about improving the adoption? Asthana said there was lot of iterative product development. In the beginning, there was no playbook. There were misconceptions that we had to overcome. We built the product, got feedback from people. Developers are easier to talk to. If you go to learn from them, you can do that. People look for APIs when they go for production. When you start building out a product and a company, you talk to a lot of people. Everyone has an opinion on your products. When you are not able to understand, there will be mistakes.

Verma inquired what the road ahead was for Postman from here. Asthana said, "We are still learning. We will be sharing our experiences. More digitization is happening. Every company will go the API route. We want Postman to be the first choice. There should not be too many things that cloud the judgement."

As for the Indian SaaS ecosystem, Postman remains optimistic. Asthana said, "We want people to pay for software. It is amazing to build a SaaS company today. There must be efforts on finding opportunities. Broadening your horizons can certainly help."



WE HAVE A DATA WAREHOUSE. WE ARE SYNCHRONISING THE DATA LAKES AND DATA MARTS. WE CREATE ONE VIEW FOR ALL THESE DATA POINTS. WE LOOK AT HOW WE CAN AUGMENT THIS DATA INTERNALLY AND EXTERNALLY. IT ALSO HELPS IN FUTURE PRICE AND CLAIMS MANAGEMENT. WHEN WE USE DATA ANALYTICS, WE ARE SEEING CUSTOMER RETENTION MUCH BETTER. WE ARE ABLE TO CATCH FRAUDS AS WELL

– Jigar Mehta, Head, Analytics & Financial Controller, Aditya Birla Health Insurance



WE NEED A DATA STRATEGY AND WE NEED TO STORE DATA AS A CORPORATE STRATEGY. THERE ARE ESSENTIAL PARTS SUCH AS DATA GOVERNANCE, WHERE DATA COMPLIANCE REQUIREMENTS HAVE TO BE ENSURED

– Ramanathan Arunachalam, VP, IoT & PED Practice, Inspirisys Solutions

Economic Impact of Bad Data

There is an economic impact of bad data. Average business losses lead to ~30% of revenues. The impact on Indian businesses is \$9.7-14.2 million annually. It costs the US economy at least \$3 trillion per annum, due to lost revenues, poor decisions, inefficiency, legal and non-compliance, and unnecessary technology costs.

The cost of bad data is approximated to \$100 per record. The losses are only going to go upward, if we don't take actions. About 84% of the CEOs are concerned about the quality of data affecting business decisions. Major contributor to the crisis in information trust is due to bad data.

Gartner predicts that by 2023, AI-enabled automation in data management will reduce the need for IT specialists by 20%. By 2021, entrepreneurs using a cohesive strategy,

incorporating data hubs, lakes, and warehouses, will support 30% more use cases than competitors. By 2022, organisations using active meta data to dynamically connect, optimise and automate data integration processes will reduce time to data delivery by 30%.

Four Pillars of Digital Transformation

There are four pillars of digital transformation. Choose a customer-centric business approach to maximise impact. Try out new systems to establish the governance around customer service. Transformation should not necessarily be a big bang.

Leaders must look at corresponding data to quickly cleanse and connect different data across the enterprise. Harmonized and cleansed data should be easily migrated into new systems. Neglecting the flow,



MANAGING THE STAKEHOLDERS IS VERY IMPORTANT. THE ORGANISATION CHANGE MANAGEMENT STRATEGY IS VERY IMPORTANT. ALIGNING THE IT ROADMAP WITH THE OVERALL DIGITAL TRANSFORMATION ROADMAP IS NEXT. FOCUS SHOULD BE ON FUNDAMENTAL BUSINESS VALUES. EVERY STEP SHOULD BE ALIGNED TO THE BIGGER CORE

— Abhay Zarkar, VP, Global Practice Head, Enterprise Solutions, Tata Technologies



DURING THE LAST THREE MONTHS, E-COMMERCE HAS GONE UP TO 35%. IT IS HERE TO STAY AND WILL BE ACCELERATING RAPIDLY. WE KEEP THE CUSTOMER AS THE CENTRAL POINT OF FOCUS. THEN, PERSONALISATION BECOMES KEY AND YOU NEED DATA. WE HAVE THE SIZE OF DATA. WE LOOK AT THE APPS

— Sundar Subramanian, President, Global Delivery, Mphasis

quality and governance of data will inevitably negate any Rol in technology and undermine digital transformation initiatives.

Customer Experience

Speaking about customer experience with digital transformation, Gautam Dutta, Senior Director, Marketing, Siemens Digital Industries Software, said that data should be transparently available to customers. We offer products for all manufacturing verticals. We need to expand data into intelligence. Data in its basic form is not critical to the customers.

When there is intelligent data, we can also contextualise. We should elevate this to the processes that can be realised. Data can be converted to intelligence, on to knowledge. Wrong data is something coming to a user is the data that cannot be used.

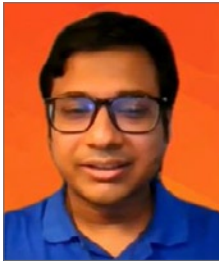
Data can be supported and contextualised. Then, it becomes intelligent. At least 90% of SMBs are reluctant

to get into this area. Most of the SMEs today want more of this aspect. Data goes on to become the single source of truth.

Optimisation of Business Processes

There was a session that looked at how optimisation of business processes has resulted in better customer experience. Jigar Mehta, Head, Analytics & Financial Controller, Aditya Birla Health Insurance, said that they get data from many sources. “We try and create one view and better-quality data. We are looking to improve the customer experience. We digitised the data based on AI-based OCR technique. The impact on business processes and outcomes has also been impacted.

“We have a data warehouse. We are synchronising the data lakes and data marts. We create one view for all these data points. We look at how we can augment this data internally and externally. It also helps in future price and claims management. When we use data analytics, we



YOU HAVE TO MAKE THE PROCESSES DIGITAL IN NATURE. YOU NEED TO CONTEXTUALISE DATA. IN BANKING, IF THE DECISION OF LENDING AND GIVING CREDIT IS NOT TAKEN CORRECTLY, IT HAMPERS THE BANKING STRUCTURE

— Subrata Das, Head of Analytics, U GRO Capital

are seeing customer retention much better. We are able to catch frauds as well.”

Managing Data Transformation

IoT is used to capture data. How do you manage data transformation? Ramanathan Arunachalam, VP, IoT & PED Practice, Inspirisys Solutions, noted that data has become the form for rewriting businesses. Data and analytics are two important aspects, for both internal and external.

We need a data strategy and we need to store data as a corporate strategy. The data is standardised and integrated. There is storage, security, managing, monitoring, usage etc. There are essential parts such as data governance, where data compliance requirements have to be ensured. Spend on digital transformation is going to hit \$2.5 trillion.

Abhay Zarkar, VP, Global Practice Head, Enterprise Solutions, Tata Technologies, added that each customer brings in a fresh new look and characteristics. Tata is working with 15 EV manufacturers. The goal is: why digital transformation? It is not for an individual unit, but for company-wide. The vision of a Chinese EV maker was to be a user-driven company. They wanted digital transformation.

Customer centricity is a large focus area. In aerospace, the goal is to bring in data monetisation, co-development and integration etc. They have all technologies and PLMs. They call it the digital data thread.

Managing the stakeholders is also very important. The organisation change management strategy is very important. Aligning the IT roadmap with the overall digital transformation roadmap is next. Focus should be

on fundamental business values. Every step should be aligned to the bigger core.

Challenging projects

Responding to a question on challenging projects, Sundar Subramanian, President, Global Delivery, Mphasis, said that during the last three months, E-commerce has gone up to 35%. It is here to stay and will be accelerating rapidly. We keep the customer as the central point of focus. Then, personalisation becomes key and you need data. We have the size of data. We look at the apps.

He added: “We start with small, chewable bites. We look at what can derive value for the customer. We go from the front to the back. Different customers are at different maturity levels. There are expectations from data as well. The benefits depend on the data you have.”

Role of data

On the role of data, Subrata Das, Head of Analytics, U GRO Capital, noted that data is a good part of their business. You have to make the processes digital in nature. You need to contextualise data. In banking, if the decision of lending and giving credit is not taken correctly, it hampers the banking structure. You also have lot of transactions happening over the weekend. We are looking at giving loans to SMEs. Some human intervention cannot be done away with.

He added: “We decided to start with a digital platform. The income assessment of any customer is digitised. We also have personal discussions with the customers. We have added further things to our digital platform. We are doing more of the things via video. These also help us in eliminating the bad customers. We have kept data at the center.”

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Configuring Data

Many people have argued about data lakes and/or data warehouses. Here is another one on this never ending debate



All data-driven organisations use data in three ways – to report on the past, to understand the present and to predict the future. Data storage isn't as simple as it once seemed. Intricate machines and technologies now collect an incredible breadth of data – over 2.5 quintillion bytes every day – from equipment sensors, logs, users, consumers and elsewhere.

Considering the volume and variety of data available today, quite a few misconceptions exist about the ways in which data can be stored. The common argument is around the two predominant types of data storage – data lakes and data warehouses. Data warehouses support reporting and analytics on historical data while data lakes support newer use cases that leverage data for machine learning, predictions, and real-time analysis.

These are the typical arguments one hears in favour of either of them:

Argument #1: You need either a data lake or a data warehouse

This gives the impression that data leaders need to choose one over the other. But the reality is that data lakes and

data warehouses serve two different purposes. While both provide storage of data, they do so, using different structures, support different formats and are optimised for different uses. A company may benefit from using a data warehouse as well as a data lake.

Data warehouses best serve businesses looking to analyse operational systems data for business intelligence. Data warehouses work well for this because the stored data is structured, cleaned and prepped for analysis. Alternatively, data lakes allow businesses to store data in any format for virtually any use, including machine learning (ML) models and big data analysis.

Argument #2: Data lakes are niche; data warehouses aren't

Artificial intelligence (AI) and ML represent some of the fastest-growing cloud workloads, and organisations are increasingly turning to data lakes to help ensure the success of these projects. Because data lakes allow you to store virtually any type of data (structured and unstructured) without first prepping or cleansing, you're able to retain as much potential value as possible for future, unspecified



WITH THE PROLIFERATION OF NEW TYPES OF DATA INCLUDING IOT, SOCIAL, GEO-SPATIAL, MULTI-MEDIA, CLICK-STREAM AND LOG DATA, THE NATURE OF DATA THAT WE COLLECT AND USE HAS GREATLY DIVERSIFIED

use. This setup is ideal for more complex workloads like machine learning models where the specific data types and uses have yet to be determined.

Data warehouses may be the more well-known of the two options, but data lakes (and similar types of storage infrastructure) are likely to continue rising in popularity in conjunction with data workload trends. Data warehouses work well for certain types of workloads and use cases and data lakes represent another option that serves other types of workloads.

Argument #3: Data warehouses are easy to use; while data lakes are complex

It's true that data lakes require the specific skills of data engineers and data scientists (or experts with similar skill sets) to sort and make use of the data stored within. The unstructured nature of the data makes it less readily accessible to those without a full understanding of how the data lake works.

However, once data scientists and data engineers build data models or pipelines, business users can often leverage integrations (custom or pre-built) with popular business tools to explore the data. Likewise, most business users access data stored within data warehouses through connected business intelligence (BI) tools like Tableau and Looker. With the help of third-party BI tools, business users should be able to access and analyse data, whether that data is stored in a data warehouse or a data lake.

Both these types of data storage have made a strong move to the cloud. With Cloud data lakes, companies are able to pay for only the data storage and compute they need. This means they are able to scale up or down as their data requires. This scalability has been a huge breakthrough in Big Data's adoption driving the increased popularity of Cloud data lakes.

Argument #4 –Which of the two supports a greater diversity of usages?

In a Cloud data warehouse model, you have to transform

the data into the right structure in order to make it usable. In a Cloud data lake, you can load raw data, unstructured or structured, from various sources. With a Cloud data lake, it's only when you are ready to process the data that it is transformed and structured. Data warehouses are purpose-built and optimized for SQL-based access to support BI but offer limited functionality for streaming analytics and machine learning. This makes it impractical, costly and time-consuming to ingest data in real-time, or streams of data.

• Machine learning

While some data warehouses extend their SQL-based access to offer machine learning functionality, they do not offer native support to run widely available, programmatic data processing frameworks such as Apache Spark, Tensorflow and more.

In contrast, data lakes are ideal for machine learning use cases. They not only provide SQL-based access to data but also provide native support for programmatic distributed data processing frameworks like Apache Spark and Tensorflow through languages such as Python, Scala, Java and more.

• Streaming analytics

Streaming analytics enables the ingestion, processing and analysis of data in real-time without requiring data to be stored prior to analysis. Unlike other forms of data, the value of streaming data diminishes with the passage of time.

Data warehouses require sequential ETL to ingest and transform the data prior to its usage for analytics and hence they are inefficient for streaming analytics. Some data warehouses support “micro-batching” to collect data often and in small increments. This stream to batch conversion increases the time between the arrival of data to its use for analytics making data warehouses inadequate for many forms of streaming analytics.



ONCE DATA SCIENTISTS AND DATA ENGINEERS BUILD DATA MODELS OR PIPELINES, BUSINESS USERS CAN OFTEN LEVERAGE INTEGRATIONS (CUSTOM OR PRE-BUILT) WITH POPULAR BUSINESS TOOLS TO EXPLORE THE DATA

Data lakes support native streaming where streams of data are processed and made available for analytics as it arrives. The data pipelines transform the data as it is received from the data stream and trigger computations required for analytics. The native streaming feature of the data lake makes them highly suitable for streaming analytics.

• Continuous data engineering

Data warehouses support sequential ETL operations, where data flows in a waterfall model from the raw data format to a fully transformed set, optimized for fast performance,

In contrast, data lakes are exceptionally strong for use cases that require continuous data engineering. In data lakes, the waterfall approach of ETL is replaced by iterative and continuous data engineering. The raw data that lands in a data lake can be accessed and transformed iteratively via SQL and programmatic interfaces to meet the changing needs of the use case. This support for continuous data engineering is critical for interactive analytics and machine learning.

Argument #5– Which of the two supports a greater diversity of data types?

With the proliferation of new types of data including IoT, social, geo-spatial, multi-media, click-stream and log data, the nature of data that we collect and use has greatly diversified. The data warehouse, invented in late 1980, was designed for highly structured data generated by business apps. Some newer data warehouses support semi-structured data such as JSON, Parquet and XML files, they provide limited support and diminished performance for such data sets compared to structured data sets. Data warehouses do not support the storage of unstructured data.

Data lakes support native storage of all three data

types – structured, semi-structured and unstructured. Structured data is ideally suited for traditional Business Intelligence, while semi-structured and unstructured data is useful for deeper analytics and machine learning.

Argument #6 –Support for open vs proprietary data formats

The data warehouse stores the data in a proprietary format. Once the data is stored in the data warehouse, access to this data is limited to SQL and any custom drivers provided by the data warehouse. Some data warehouses can store XML, ORC and Parquet files however these files are vendor locked and available through access mechanisms supported by the data warehouse.

In contrast, the data lake stores data in an open and standard format preventing any proprietary lock-in of data. An open data lake ingests data from sources such as applications, databases, data warehouses and real-time streams. It stores this data in an open format, such as ORC and Parquet that is platform-independent, machine-readable, optimised for fast access and analytics and made available to consumers without restrictions that would impede the re-use of the data.

The increase in volume, velocity and variety of data, combined with new types of analytics and machine learning is creating a greater need for data lakes which in many cases can co-exist with data warehouses. Unlike the data warehouse's world of proprietary formats, proprietary SQL extensions, proprietary metadata repository and lack of programmatic access to data, an open data lake prevents vendor lock-in while supporting a diverse range of analytics. The open data lake provides a robust and future-proof data management paradigm to support a wide range of data processing needs including data exploration, interactive analytics, and machine learning.

(The author is VP, Solutions Architecture, Qubole)

Ready?

How can the industry leaders prepare for the future?



Delivering the keynote at the Commvault conference, Sanjay Mirchandani, President & CEO, Commvault, said that CIOs and IT managers need to be ready for anything in the future. Commvault is in the data business. There has never been a more perilous time for those of you managing data. There has been a data journey going on for a while. We are always moving from something to something else. This results in more infrastructure, more apps and more complexity. And, they all should have to be managed.

Cloud-Ready and Enabled

This intensifies with the non-stop security challenges and the rapid change that we have all experienced over the

past few months. My first presentation, back in 2008, as a CIO, was: The journey to the private cloud. A lot has changed since then. Many of the underlying challenges are still there. First, the Cloud is in the question. It is a given. Everything needs to be Cloud-enabled, Cloud-ready etc. The time is to end the journey and start using the Cloud.

Next, it has always been about the people and the skills that they bring. Enterprises also need to reduce complexity and simplify everything that you do. They should be able to easily manage and leverage the skills that they have. Tools and technologies also need to be no-touch now. You should be able to consolidate and work, as promised.

We want to be tomorrow's headlines, but only for the right reasons. We are focused on a digital strategy, and also eliminating risk. This is the time for the tried-and-tested. Finally, data is at the heart of all digital transformation. That needs to be intelligently managed. We are here to help the IT professionals truly become future ready. There must be unmatched data awareness, agility and automation across the organisation.

He said, "Throughout my career, the basis of success has been built on three fundamentals. These are – embracing the best engineered technology, enabling the best IT professionals and leveraging the best partner ecosystem. All three must come together. We believe that product, people and partnership can truly solve problems.

"At Commvault, we try and solve the hard data problems. We have the technical leadership to do that. We try and deliver all of these three fundamentals with no compromises. Over the past 18 months, we have been focused on doing just that!"

New Announcements

Commvault announced a simplified, powerful portfolio of products that brings new thinking to the world of data and Cloud. Cloud has completely changed the landscape. With simplicity as the guiding principle, the announcement truly changes the game. Commvault is announcing the next-generation of the Hyperscale X technology. The



THERE HAS NEVER BEEN A MORE PERILOUS TIME FOR THOSE OF YOU MANAGING DATA. THERE HAS BEEN A DATA JOURNEY GOING ON FOR A WHILE. WE ARE ALWAYS MOVING FROM SOMETHING TO SOMETHING ELSE. THIS RESULTS IN MORE INFRASTRUCTURE, MORE APPS AND MORE COMPLEXITY

— Sanjay Mirchandani, President & CEO, Commvault



IT PROFESSIONALS WANT BUILT-IN SOLUTIONS THAT WORK AS PROMISED. TODAY, THEY HAVE DELIVERED SOLUTIONS THAT ANTICIPATE AND SIMPLIFY THE COMPLEXITY. THEY HAVE SOLUTIONS WITH INTELLIGENT DATA MANAGEMENT TECHNOLOGY THAT IS BUILT-IN. BEST PRACTICES HAVE BEEN BUILT-IN

— Satya Nadella, CEO, Microsoft

Commvault Hyperscale X delivers simple, flexible data management for all workloads. It is the solution to simplify and accelerate the hybrid cloud adoption.

Next, there is a backup and recovery solution. The Commvault Backup and Recovery suite has a new Disaster Recovery product. Of course, you can also get them standalone, if you like. Or, you can also get them as the Commvault Complete Data Protection plan. All of these products can be operated and managed together. I believe that it is the best user interface in the market.

He said, “We are keen to help organisations to look at where they are and where they want to go. We provide help to the customers to develop and run modern apps in any Kubernetes environment. All of this can be done with the ability to seamlessly migrate used data. Containers

and Kubernetes environment are the new frontiers for DevOps. We have taken the Ops out of DevOps.”

It is also about how the products are packaged. It depends on the customers’ flexibility and how they consume. Ask us about cloud-like subscription pricing for Commvault software. Behind every digital and IT transformation are the unsung heroes.

Satya Nadella, CEO, Microsoft said that they have seen two years’ worth of digital transformation in two months. They are trying to make everyone’s life easier. IT professionals want built-in solutions that work as promised. Today, they have delivered solutions that anticipate and simplify the complexity. They have solutions with intelligent data management technology that is built-in. Best practices have been built-in.

Helping Startups

Embracing a new virtual world, an accelerator programme had six start ups and audience from all over the world

With the sixth cohort graduating, 35 startups are now part of this startup accelerator programme called Excellerator that is focused on Cloud and data related technologies. NetApp responded to the Covid-19 lockdown with a quick transition to an online curriculum. It selected six deep tech startups, Aikaan Labs, Cyborgintell, IQLECT, Koinearth, Kubesafe, and Myelin Foundry, for the sixth cohort, virtually.

Through a four-month remote networking and mentoring period, these startups strengthened their business during a global crisis situation. Inspired by this opportunity, they even contributed to finding solutions in navigating this tough time.

For instance, Myelin Foundry, a deep tech AI start-up that develops AI algorithms on video, voice and sensor data for edge devices, is revolutionising the video streaming space, which is seeing a huge uptake during the pandemic. Similarly, AiKaan Labs, a startup that provides a deep view into edge computing and IoT devices, is helping accelerate digital adoption.

Welcoming the guests, Aanandita Bhatnagar, Director Corporate Communications at NetApp, said a pandemic should not stall innovation. They should accelerate it, as every crisis brings us an opportunity.

Data is changing world

Ravi Chhabria, VP & MD, NetApp India said that data is changing the world. We are one of the many players. The arc from customer to customer is a very wide. There is also a very vast ecosystem. Today, data is applied in many innovative ways. We are hearing about data that is creating new insights for customers. We are talking

about connected devices and IoT. We are also talking about agility. That agility and speed is the new way of doing business.

Some of the customers are sitting on very modern IT infrastructure. As we look at all the innovation, it spans across the entire infrastructure. What's the best way forward? The answer is: all of the above.

NetApp is providing mentorship to the startups. We are providing them with PoCs. It is all about helping the startups to operate a global business. Engagement is also very important. This is our sixth cohort. There are new ways for approaching the ecosystem. We are helping the customers change the world. Partners are seeing opportunities in this ecosystem.

Better, Faster, Stronger

Madhurima Agarwal, Director for Engineering Programme, NetApp, said the theme selected for this year's cohort





THE ARC FROM CUSTOMER TO CUSTOMER IS A VERY WIDE. THERE IS ALSO A VERY VAST ECOSYSTEM. TODAY, DATA IS APPLIED IN MANY INNOVATIVE WAYS

— Ravi Chhabria, VP & MD, NetApp India



THE THEME SELECTED FOR THIS YEAR'S COHORT WAS BETTER, FASTER, STRONGER. THE COHORT JOURNEY STARTED FROM MARCH 2020. WE HAVE WORKED WITH THE STARTUPS

— Madhurima Agarwal, Director, Engineering Programme, NetApp

was Better, Faster, Stronger. The cohort journey started from March 2020. We have worked with the startups.

AiKaan is a device management and application orchestration system for IoT Edge. It's a software solution to monitor, securely access, and upgrade IoT Edge devices. It was established in 2018. Cyborgintell is an enterprise AI company for organizations to rapidly develop, deploy and operationalize AI applications at scale. It was established in 2019.

Kubesafe provides business continuity for cloud-native applications. It was also established in 2019. Iqlect is a converged NoSql data platform for predictive and real-time analytics for operational intelligence. It was established in 2015.

Koinearth's markets is a blockchain and AI-based, ERP-compatible solution for organisations to integrate their supply chains. It was established in 2019. Myelin Foundry is a deep tech AI start-up working on video, voice, and sensor data on consumer edge devices. It was established in 2019.

There are several startups that have adapted in the Covid-19 era. These include CardioTrack, Senseforth.ai, Myelin Foundry, Curl Analytics etc. All the startups are adapting well.

NetApp has had 1,600 startups so far, who had applied. Now, 35 startups have since graduated and there have been nine successful PoCs. Three have had successful exits. About 70% of the startups have raised funding. There are participants across the globe, from India, Singapore, UK, Israel, and USA.

There is a white paper on AI efficiency solution co-authored by NetApp and Curl Analytics, a cohort five startup. She announced that NetApp also has the NetApp ExcellerateHER programme that is focused on women entrepreneurs. There is not enough funding happening for them. We want to fill that gap and provide extra support.

We have had increased focus on AI. Roughly half of them are in ML. Curl Analytics and Cyborgintell have been successful. In healthcare, we have seen lot of need for ML coming in.

Need to Connect

Connected enterprise solutions are providing opportunities for high product utilisation, new functionalities, enhanced capabilities and greater reliabilities that exceed the conventional product boundaries



The current focus for most of the organisations today is to build an intelligent system and be ahead of curve. The global connected enterprise market size was estimated at US\$90.10 billion in 2015. The surge in technological advancements such as big data, analytics, and cloud computing is triggering investments in this market.

Speaking on this, Prakash Kumar, IT Head, BMW Group India and DevOps Hub (APAC Region), says that Covid-19 has hastened the digital revolution. Organisations, which were lagging behind, have to step up the efforts to create enterprise, which is connected with every device and component, be it human or a robot.

The four requirements of engaging customers, employee empowerment, optimising operations, transforming

product and services in a true digital enterprise are built over four enablers. These are – capture data from every possible source, take it to unlimited cloud, connect with mobility from anywhere and have the most powerful engine to get the insights and respond without losing time. This is possible only if we take all the four components together.

Most of the organisations' current focus is to build an intelligent system and be ahead of curve. He concluded: "We are in an interesting time where anyone lagging behind would become a history in a short span of time if they don't catch the Industry 4.0 wave."

Information-Intelligence-Empathy Model

Speaking about the importance of data in digital transformation, Ipininder Singh, Head, Digital



CORONA HAS HASTENED THE DIGITAL REVOLUTION. ORGANISATIONS, WHICH WERE LAGGING BEHIND, HAVE TO STEP UP THE EFFORTS TO CREATE ENTERPRISE, WHICH IS CONNECTED WITH EVERY DEVICE AND COMPONENT, BE IT HUMAN OR A ROBOT

— Prakash Kumar, IT Head, BMW Group India and DevOps Hub, APAC Region



AT THE INFORMATION LAYER, WE HAVE INITIATIVES TO CONSOLIDATE OUR DISPARATE SOURCES BY IMPLEMENTING DATA LAKE AND DATA WAREHOUSE. OUR ENDEAVOUR IS TO DRAW A 360-DEGREE VIEW OF OUR KEY STAKEHOLDERS, BE IT OUT DEALERS, SUB-DEALERS OR OUR EMPLOYEES

— Ipininder Singh, Head, Digital Transformation, Dalmia Cement (Bharat)

Transformation, Dalmia Cement (Bharat), said that at Dalmia Cement (Bharat), when we talk about a digital transformation journey using data, we focus on three layers – information, intelligence and empathy.

“At the intelligence layer, we are building an entire AI/ML platform to throw predictive and prescriptive analytics. For example, how do we help our sales representatives meet their numbers. When we talk about empathy, we want to give personality or a human touch to our algorithms. How do we have our customers communicate to our algorithms in their vernacular languages and draw insights?”

Customer Journey Approach

Ipininder Singh further added that digital transformation is not about digitising a channel, but building an omnichannel experience for our customers. So instead of just automating individual touch points, we are taking the customer journey approach.

“We acknowledge that every interaction that our dealers or consumers have with our organisation are moments of

truth for us and we want to give them a stellar experience. And thus, we are making data visible across functions. For example, serviceability is the key that customers ask for our industry. We worked across core systems of Sales, ERP, plants and logistics to build a unified data view and thus spot and drive areas of improvement.”

Market of One

Dalmia Cement (Bharat) has customers, even those in the B2B space, who are used to a customer experience being offered by Amazon and Netflix. “They are demanding the same level of personalisation, simplicity, intuitiveness and speed from us. Apart from competing on core products and services with our competition, we are also competing against these customer experiences.

“We are thus, focussing on our analytic engines to create that personalised experience for our customers. So, developing suggestive order algorithms for our dealers and developing personalised schemes for individual dealers is true north that we are working on.”

Devising Supply Chain Strategy

Supply chain resilience is the capacity of the supply chains to resist disruption by safeguarding itself through avoidance or containment as well as to recover from such disruptions with minimum impact or even gain advantage from disruptions. Here is a discussion on this

Supply chain resilience has been a subject of keen interest for most organisations today. As the global pandemic continues to manifest itself into its potential size, it must be noted that the aftereffects of the same shall be seen for much longer than anticipated. On one hand, it is forcing organisations to embrace digital technologies and on the other, it has created severe cash-flow challenges.

Supply chain resilience is the capacity of the supply chains to resist disruption by safeguarding itself through avoidance or containment as well as to recover from such disruptions with minimum impact or even gain advantage from disruptions. A highly resilient supply chain has a well-defined risk mitigation strategy and recovery capability for both internal and external risks. It is often misunderstood that organisations have to consider a trade-off between efficiency and resiliency when they plan their supply chains. However, in long-run, these two factors complement each other and provide significant cost savings while protecting top top-line erosion.

Supply chains, which form the core of all business and value creation operations in any organisation are perpetually vulnerable to risks and disruptions- both from internal or external factors. While most mature organisations already have robust risk mitigation strategies for supply chains risks, global pandemics like COVID-19, are one-off, black swan events that expose the vulnerability of the most robust and well-designed supply chains.

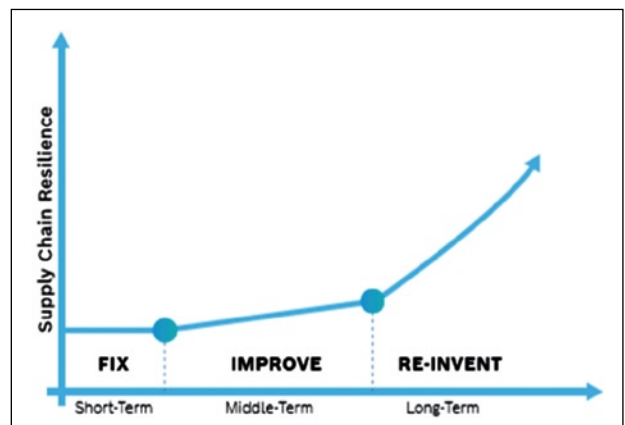
Global supply chains have never been under more stress and the current situation has exposed multiple challenges in the existing supply chains like visibility, trust & transparency and lack of diversification- vulnerabilities which have always been procrastinated by organisations. As a result, more than 90% of fortune 1000 companies have experienced severe supply chain disruptions due to COVID-19[1].

The following is a strategy that can help organisations plan for supply chain resilience in the long term while solving immediate and most pressing cash flow issues. As always, the superiority of the solution depends on the clarity of the problem and the same comes by performing a detailed study of the problems and classifying them based on their impact and duration. It is important to note that, while the recovery scenarios would depend on the industry, the region of operations and other factors there is no better time than today, to re-assess the health of organisation's supply chain through short, medium and long terms strategies. That can help organizations to make their supply chains more robust and resilient.

Fix-Improve-Reinvent

An organization's supply chain challenges due to COVID-19, as revealed during the impact assessment study may be bucketed into three broad categories based on their impact and duration: Short, Medium and Long-term impact.

Short-term problems are temporary and continue for a fixed period- (in current case: for the duration of the





IT IS OFTEN MISUNDERSTOOD THAT ORGANISATIONS HAVE TO CONSIDER A TRADE-OFF BETWEEN EFFICIENCY AND RESILIENCY. HOWEVER, IN THE LONG-RUN, THESE TWO FACTORS COMPLEMENT EACH OTHER AND PROVIDE SIGNIFICANT COST SAVINGS WHILE PROTECTING TOP TOP-LINE EROSION

pandemic) and are therefore reversible. It could be one of your supplier being unable to uphold the delivery commitment, logistics or freight carrier being unable to deliver the products to you, unavailability of the workforce or government and regulatory changes as a response to the ongoing situation.

Due to diminishing demand and surge in logistics and transportation cost, most short-term supply chain challenges during COVID-19 were also accompanied by severe cash-flow challenges. Depending on the industry outlook and severity of the situation, the short term supply chain challenges may take 4 to 12 months for complete recovery. The Focus of solving problems with short term impact should be on ensuring business continuity. Data-driven decision making for fixing these problems can help reduce risks. Some examples being: Dashboards that use the existing supply chain data with an overlay of COVID-19 information can help build supply chain intelligence by identifying potential disruptions in the supply chain, finding alternate suppliers (local sourcing) and determining the potential delays for shipments due to lockdown. Customized analytical models on the data can help perform scenario analysis for the impact on supply chain finance (inventory holding cost, logistics cost etc.) and augment the existing IT systems (like ERP, CRM etc.) to improve contingency planning for production, inventory holding, distribution etc. and thereby reduce the risk of stock-outs or over-production.

Tackle Mid-Term Challenges

Medium-term problems are those that have been exposed by COVID-19 disruptions but also have the potential to outlive the immediate supply chain disruptions due to the current pandemic. The duration of the impact of such issues may vary from 6 to 18 months depending on industry and region of operation. Problems with

medium-term impact are mostly driven from the demand side. Some examples of medium-term problems include an increase in supply chain inventory holding, “Just-in-Time” inventory models put under stricter scrutiny with increased inventory cushions etc. Solving medium-term problems can help “IMPROVE” supply chain finances and cash flows. Such problems call for strategies that create more demand for the product and at the same time improve or digitize the existing supply chains to bring about efficiency and cost reduction. Advanced analytical models that can help predict demand signals better, point automation (leveraging IoT and AI) to bring about autonomy in supply chains and reduce human effort and cost would help ease the impact are some examples of such solutions. The supply chain digitisation brought about to address medium-term challenges should be strategic and well planned as they set the foundation to address the long-term impact and build resilience in the supply chains.

Re-Invent

Finally, the problems with long-term impact are those that will form the basis of the “New-Normal”. These are the problems that bring about a long-term behavioral change in the supply chain and therefore should be approached with the mindset to “Re-Invent” or completely transform the existing business models and service delivery models. Such problems having a long term impact may be driven either from the supply or demand side and require organisations to re-invent their supply chains. Organisations should focus on building resilience in the supply chain through trust and transparency, automating customer journeys, identifying new order fulfilment models like “Zero-Touch” service delivery etc. Long term supply chain resilience aim at making the supply chains more A.C.T.I.V.E (i.e. Automated, Connected, Transparent,



ORGANISATIONS SHOULD FOCUS ON BUILDING RESILIENCE THROUGH TRUST AND TRANSPARENCY, AUTOMATING CUSTOMER JOURNEYS, IDENTIFYING NEW ORDER FULFILMENT MODELS LIKE “ZERO-TOUCH” SERVICE DELIVERY ETC.

Intelligent, Velocious and Efficient). The A.C.T.I.V.E model to build supply chain resilience relies on re-inventing supply chains by solving problems at the convergence of multiple new-age and emerging technologies (like AI, IoT, DLT etc.). A.C.T.I.V.E supply chains are more than digital supply chains, they are cornerstones for ensuring high supply chain autonomy.

(Track & Trace for drugs and pharmaceutical products) can help organizations in their journey towards creating more A.C.T.I.V.E supply chains. These solutions operate on the concept of “Economy of Things” and solve the supply chain problems at the convergence of IoT, AI and DLT thereby providing significant cost efficiencies through automation of shared business processes.

Focus on Resilience

Bosch’s Business continuity Dashboards offer a robust decision support system that uses data from the existing IT systems like ERP, vendor portal etc. with an overlay of COVID-19 data to identify potential supply chain risks. The dashboard also allows identification of alternate suppliers from supplier networks to ensure business continuity.

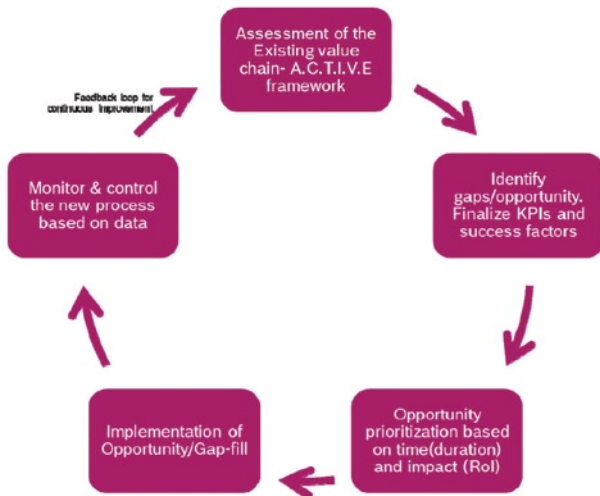
Bosch’s block chain-based solutions like TrueFood+ (Farm-to-Form track & trace and provenance for food), AutoTrace (automotive track & trace) and PharmaTrace

The Way Forward

Building supply chain resilience shall continue to remain as a core need for organizations to operate and ensure growth. There has been an undeniable push for resilience from the disruptions caused during the pandemic, but the impact for the same would be long-lived.

Those at the helm of driving digitization for large organizations should align the short and medium-term strategies and actions performed during these times with the long-term objectives and goal. The framework defined above can help organisations map their investments in supply chain modernization and ensure that every step (no matter how small) is taken in the direction of building supply chain resilience. Businesses with global supply chains should focus on resilience even more because that is the only way they can future-proof themselves from such unprecedented events.

The actions of today can help create a strong foundation for building the supply chains of the future, where resilience to such unprecedented events is built into the business models more efficiently.



Building supply chain resilience

*(Raghavendra Ramakrishna Kulkarni is GM, Innovation Market Strategies and Business Ecosystems, Robert Bosch Engineering and Business Solutions)
(Chandan Trehan is Lead, Innovation Market Strategies and Business Ecosystems, Robert Bosch Engineering and Business Solutions)*

Re-Thinking Corporate Cyber Security

Changing the system to meet the needs of the business is important

The Bombay Stock Exchange (BSE) recently organised a webinar titled Corporate Cyber Risk Landscape. The participants to the BSE webinar were, Khushboo Jain, Advocate, Supreme Court, Ashishkumar Chauhan, MD & CEO, BSE, Lt. Gen. Rajesh Pant, National Cybersecurity Co-ordinator, Brijesh Singh, Inspector General, Maharashtra, Prof. Yuval Shavitt, Cybersecurity expert, Tel Aviv University, Israel and Shivkumar Pandey, CISO, BSE.

Khushboo Jain, Advocate, Supreme Court, said we have to now connect, convert and reboot. When we talk about cyberattacks, we need a solid foundation. Maharashtra has a nodal agency for cyber security. Cyber criminals have become business savvy.

Ashishkumar Chauhan, MD & CEO, BSE, talked about the challenge of how to secure remote working practices needs to be looked at. With the steady increase in cybercrimes, lots of organisations are at risk. For example, Garmin was attacked. Such kind of breaches can lead to degradation and changes in consumer behaviour. Personal data also continues to be an effective target in the pandemic. Although it is impossible to be 100% secure, there needs to be some action to secure networks. BSE is fully compliant with the regulations provided by

SEBI. Endpoint protection, training and protection etc., are being provided.

Banking Industry Key Target

Lt. Gen. Rajesh Pant, National Cybersecurity Co-ordinator, said that the banking industry has been the key target of the cyberattacks. We are wondering where the perimeter has gone. It has even extended to the homes of the people. We are looking at risks at the endpoint, identity level etc. We cannot trust the other person at the other end, online.

Combined with geolocation, there needs to be better identification of cyberattacks. Enterprises also need to ensure that the identity of the person is the same that he or she is. There are about 15 areas for cyberattacks, within mobile phones. There are also laptops, PCs etc.

When you come to the network, you need to see the root of trust. You need to see where there is encryption. Behaviour analysis and AI will play a major role in blocking out cyberattacks. There are talks of zero and sub-zero trust. You have to go down to a new level beyond that. Cyberattacks are getting more sophisticated. There was a Twitter attack on July 15. A number of bitcoins were being provided, if you gave some amount. Accounts of



BREACHES CAN LEAD TO DEGRADATION AND CHANGES IN CONSUMER BEHAVIOUR. PERSONAL DATA ALSO CONTINUES TO BE AN EFFECTIVE TARGET IN THE PANDEMIC. ALTHOUGH IT IS IMPOSSIBLE TO BE 100% SECURE, THERE NEEDS TO BE SOME ACTION TO SECURE NETWORKS

— Ashishkumar Chauhan, MD & CEO, BSE



TODAY, THE CREATIVITY OF THE CYBER CRIMINALS IS SIMPLY AMAZING. THEY ARE GETTING SMARTER BY EACH PASSING DAY. THERE ARE ALSO MAFIAS, NATIONS ETC. THESE FRAUDSTERS HAVE A SENSE OF FOLLOWING THE MONEY TRAIL. IT IS A VERY DANGEROUS GAME BEING PLAYED AGAINST THE FINANCE COMPANIES. VULNERABILITIES WILL ALWAYS BE THERE. WE NEED TO MAKE SURE THAT THE NETWORKS SAFE AND SECURE

— Lt. Gen. Rajesh Pant, National Cybersecurity Co-ordinator



THE ESSENTIAL THING IS TO DETECT AND RESPOND TO THESE ATTACKS. THERE HAVE BEEN EXAMPLES OF DATA BREACHES. YEAR 2019 HAD 8 BILLION DATA BREACHES. MAY OF 2020 HAS ALREADY SEEN 8.8 BILLION DATA BREACHES. TODAY, RANSOMWARE CAN ALSO BE A DATA STAGING ATTACK. THEY CAN ALSO BE USED FOR BLACKMAILING

— Brijesh Singh, Inspector General, Maharashtra

Bill Gates, Obama etc., were also compromised. Many people fell for it.

Businesses at Constant Threat

Brijesh Singh, Inspector General, Maharashtra, said there used to be talk about bringing your office home. Devices have also started to come home. This has opened up a huge, surface area for the malicious actors. The adversarial landscape is very interesting. There are well researched crime states. Your businesses are now at a constant threat.

There was a write-up on the fabric of security. The essential thing is to detect and respond to these attacks. There have been examples of data breaches. Year 2019 had 8 billion data breaches. May of 2020 has already seen 8.8 billion data breaches. Today, ransomware can also be a data staging attack. They can also be used for blackmailing. Data theft is also very important. People are trying to steal data. It is like a Tsunami.

There are businesses that are also getting compromised. These need continued surveillance. Cyber security is a leadership and core issue. There can be situations where all trails get wiped out. Hacking is evolving by the second. The attacker begins, where you end! It is important that you understand your risk. There can be risks across education, pharma, smart cities etc.

You have to understand your business well. Earlier, attacks were on the accounts. Next, there were attacks on the infrastructure. Next, they will be sitting inside your technology. The greatest risk is phishing. Malicious attackers understand who you are and what your passwords are. It is essential to understand the modus operandi of these attacks. You also need to be smart about taking backups. You should also make your staff aware. You can apply your own document to your own systems. There are latest cyber threats that are masquerading. BSE has one of the best systems ever seen. We need to reiterate that cyber risk is existing.



YOU MUST HAVE A TEAM TO HANDLE THE BREACH. YOU NEED TO PREPARE FOR DAMAGE CONTROL AND CRISIS MANAGEMENT. YOU NEED TO UNDERSTAND THE KIND OF DATA THAT HAS BEEN BREACHED, AND WHO ARE THE CUSTOMERS IMPACTED, AND HOW. YOU ALSO NEED TO UNDERSTAND THE NATURE OF DATA THAT IS BREACHED E.G., CRITICAL DATA

— Khusboo Jain, Advocate, Supreme Court

BGP Attacks

Prof. Yuval Shavitt, Cyber security expert, Tel Aviv University, Israel added that today, the attacker detects the traffic to its network. IP hijack attacks are the first stage of any advanced persistent threats (APTs). Mitigating attacks early will stop the APT before it manages to do harm. It can be used to break encryption (DROWN) attacks. In the past, Border Gateway Protocol (BGP) was used for IP hijack attacks. There is a recent trend to move to stealthier attacks, such as data-plane manipulation and stealth BGP attacks. There were 14,000 incidents in 2017.

Current solutions monitor only BGP and there is limited path analysis. BGProtect solution do active monitoring. There is a global BGProtect SaaS solution. The BGProtect SOC and customer management systems get alerts. There are unique AI rule engines with novel deep learning engine. There are unique databases. There is also a need to deploy advanced deep learning technology.

An example was the hijack of traffic from Canada to a Korean government network that was done using China Telecom PoP in Maryland, USA. There was a stealth hijack from the OVH Cloud in France through to Kiev to NYC. There is also bad configuration of DNS. Traffic from DNS traffic to the K root server was directed to Iran by Tata. BGProtect notified the Indian embassy in Tel Aviv. The problem was solved within hours.

A last example was when over 3,500 APs were directed to Bangladesh. All these routes suffered tremendous delays. IP hijack is a significant risk. Infrastructures, government entities, financial entities, and valuable data holders are all at risk. We need to understand the geography of the attacks.

Legal Aspects

In her talk, Khusboo Jain touched upon the legal aspects of a cyberattack. There are legal aspects and parts of the cyber threats. You need to understand how you will be impacted when a cyberattack occurs. For example, you hear that there is a data breach on your company. One has to understand how to handle the legal part. You must have a team to handle the breach. You need to prepare for damage control and crisis management. You need to understand the kind of data that has been breached, and who are the customers impacted, and how. You also need to understand the nature of data that is breached, e.g., critical data.

What kind of safety measures do you need to follow? Let's take GDPR. GDPR (General Data Protection Regulation) sets a maximum fine of €20 million (about £17.8 million) or 4% of annual global turnover – whichever is greater – for infringements. However, not all GDPR infringements lead to data protection fines.

The kind of safety measures applied has to be exact. You have to prepare, prior to an attack. However, one cannot avoid a cyberattack. The kinds of audits, systems, compliance etc., have to be in place. There may be specific, industry-wide standards later. Right now, we have to comply with the ISO/IEC 27000-series. There is need to have a proper SOP in place. There is a need to understand the data principles, data breach principles, etc.

Shivkumar Pandey, CISO, BSE, delivered the vote of thanks. He said that changing the system to meet the needs of the business is important. There should be better understanding between finance, technology and law.

Skill Monks Promotes Skill Financing through Partnerships with ZestMoney, Propelld and Credit Fair

Skill Monks, an integrated marketplace for training and skilling announces its strategic partnership with three leading financing companies including ZestMoney, Propelled and Credit Fair. This association provides flexible payment options to skill seekers (Students, Graduates and Working professionals) to reduce financial strain while choosing quality training and skilling programs. Through skill financing option, skill seekers can avail collateral-free loan with 100% online disbursements that can be paid in easy installments over a period of time. Skill Monks is extremely delighted to ensure continuity of training through digital enrolment process and alleviate financial burdens that are faced by skill seekers in India, currently.

With the growing reluctance amongst students availing loans due to high interest rates and tight repayment schedules, there was a need for a simple, flexible mode of financial support to reduce the burden and ensure seamless learning, paving way for growth and tap emerging job opportunities. Skill Monks identified this gap in the market place to provide the much needed skill financing provision to address concerns of skill seekers by facilitating faster disbursement of loans with minimal interest rates along with easy repayment options through their finance partnerships.

Commenting on this announcement Rameswar Mandali, CEO and Founder, Skill Monks said, “We are witnessing a surge of job opportunities in tech specific areas like Cyber Security, Data Science, AWS and Digital marketing, to name a few, but quality skilling programs for these streams can be expensive. This results in increased financial distress that limits skill seekers in choosing the right course at the right time. Therefore, partnerships like these are the need of the hour to not only fuel the growth of the Indian skilling and training sector but also allow aspiring learners to become valued contributors to society. Our association with our financing partners was a priority since we identified the financial challenges faced by the skill seekers to enroll for programs, during the initial phase of Skill Monks. We assisted close to INR 1.8 million of loan amount across programs starting from INR 6,000 to INR 3,50,000.”

Commenting on the association with Skill Monks, Abhishek Sharma, Head of Growth, ZestMoney stated,

“Skill Monks is bringing a very interesting product to the ever-growing EdTech ecosystem, in the form of a one-stop marketplace that enables students & professionals to discover courses across domains. We are super-excited to bring ZestMoney’s fully-digital and fully-automated EMI offering to the platform, to make these courses accessible to all.”

“A platform like Skill Monks can optimize substantial revenue expenditures for customer acquisition of Educational institutes through demand aggregation. Such demand aggregation in turn helps service providers like financial, technology, etc to cater to a large number of fragmented institutes through a single window, thus further reducing costs for the institutes. Propelld has been fortunate to partner with Skill Monks in this early part of their journey and we see a great potential going forward” said Bibhu Prasad Das, CEO and Co-founder, Propelld.

In India, there are approximately 40 million students in higher education, 7 million students in universities that have graduated this year and 5 million IT workforce. This 5 million IT workforce is on the lookout for reskilling/upskilling to enhance their career prospects. In addition, an estimated number of 18 million working professionals lost employment due to COVID-19, as per the April 2020 CMIE report. Loss of jobs coupled with a focused shift to digitization and automation has led both students, graduates and working professionals to pursue upskilling and reskilling programs in search of better opportunities or in many cases stay relevant in their current jobs. Skill Monks helps such individuals meet their career aspirations by helping in career discovery, connecting them to the right training companies and most importantly enabling them through quick, easy and affordable loans to pursue the right training programs.

During these unprecedented times, a flexible and affordable payment option is really the need of the hour for students and professionals. Therefore, Skill Monks will continue to work closely with its partners to extend skill financing facilities across training and skilling programs to impact a larger cross section of the society. Going forward to broad base training and skilling needs, EdTech leaders should come forward and take responsibility in making training more affordable and aid digital transition.

Telefónica Deutschland Selects Tech Mahindra for Network and Services Operations

Telecommunications provider Telefónica Deutschland and Tech Mahindra Ltd, a leading provider of digital transformation, consulting and business re-engineering services and solutions, have agreed on a strategic cooperation in the network and services operations segment. Telefónica Deutschland selected Tech Mahindra for its network and services operations in addition to further develop 5G, artificial intelligence and machine learning use cases.

Mallik Rao, Chief Technology & Information Officer of Telefónica Deutschland, explains: "We are pleased to announce this partnership with Tech Mahindra. We are supported by a globally experienced service provider to consistently drive forward the development of our network and services operations, thus leading to further enhancement of 5G, artificial intelligence and data analysis use cases".

Vikram Nair, President, Europe, Middle East and Africa (EMEA) of Tech Mahindra, said: "This strategic partnership strengthens our long-standing relationship with Telefónica,



in which we support the company in realizing its vision of becoming the 'Mobile Customer and Digital Champion' by 2022. As part of our TechMNxt charter, Tech Mahindra is strongly committed to 5G, the network of the future, and focuses on technology-driven innovation for digital transformation. We look forward to working together to drive innovation and deliver real value and quality to our customers."

Web Werks Launches its 4th Datacentre

WebWerks, a national datacentre provider, has announced the launch of its 4th datacentre in the country and the 2nd in Hinjewadi-Pune. This new standalone 35,000 sq.ft. structure is a well-equipped, next-generation Tier 3, Uptime designed datacentre with 5MW of power and rich interconnectivity. The newly constructed first phase of the Pune datacentre establishes Web Werks position among the top 3 datacentre providers in Pune. With a total capacity of 10MW, the facility will benefit from Web Werks being SAP Certified and also Carbon Neutral contributing to Global Go-Green concepts.

The Pune datacentre, built and designed to Tier 3 standards, offers interconnection platforms for cloud adoption with multi-homing cloud solutions, and are thus geared to meet the growing demand of 'Cloud Infrastructure' needs of customers from Pune and outside. It also features state of the art Honeywell and Spectra Security Systems making it highly secured along with a 24x7 NOC. It will also act as a disaster recovery zone for the existing Web Werks datacentres based in

Mumbai and Delhi NCR and vice versa.

Speaking about the launch, Mr. Nikhil Rathi, CEO, Web Werks datacentres said, "We are pleased to announce the Phase 1 launch of our new datacentre facility. This puts us in the Top 3 DC Players in Pune. Despite all the odds that surfaced due to the COVID-19 pandemic, the subsequent lockdown, and limited manpower to deploy, the construction work has been completed. Web Werks is geared to meet the growing demand for datacentres in Pune to serve the needs of both customers in and outside Pune. We thank our current customers, vendors, and partners who have supported us throughout. We look forward to welcoming our first set of customers in the coming months."

Since the inception of its first large datacentre in Mumbai in 2015, Web Werks has established itself as the leading, high availability, network dense, carrier-neutral colocation provider. Web Werks datacentres are strategically located in Mumbai, Delhi NCR, and Pune-cities home to critical IT infrastructure of numerous Indian and global organisations.

25 Years of Mobile Telephony in India

Collector's Edition

On 31 July this year, India celebrates 25 Years of Mobile Telephony in India. To commemorate this fantastic journey, Voice&Data brings you Collector's Edition that features perspectives and views of who's who of the Indian Telecom Fraternity and reflects upon the 25 Years of the Mobility in India.



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