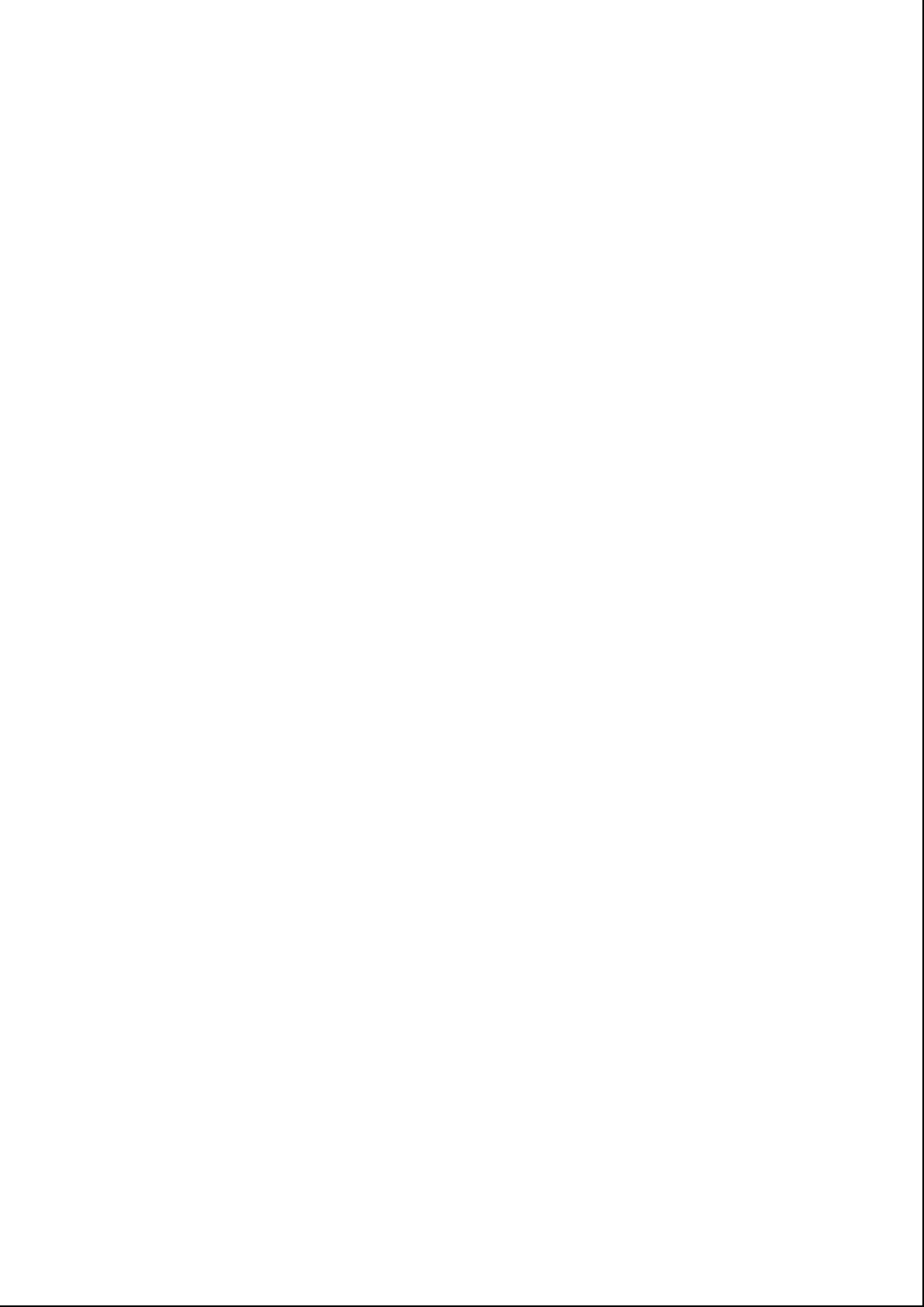


# India Leading the Global Digital Transformation Journey

March 2023





# Editor's Note



**Pooja Ahluwalia**

Assistant Secretary General  
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Issue  
March 2023

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India has been globally recognized for its capacity to innovate in the digital space. The country is also leading the campaign to support various countries around the world, especially the Global South, to learn from each other in tackling the digital and connectivity challenges.

Over the last few years, digital transformation has become a strategic priority for governments and businesses, from being a boardroom buzzword. While India has been long known for its vast IT talent and high technology adoption in industries, the country has also been leading the way in leveraging technology to empower its citizens and strengthen governance. With more than 500 million internet users, the country is among the leading and fastest-growing digital consumer markets. Additionally, being a vibrant start-up market allows India to foster innovation further and standardize new technologies.

The Digital India programme was launched to create a digitally empowered society and a knowledge-based economy, ensuring digital access, inclusion, and empowerment, through initiatives such as Aadhaar, DigiLocker, Digital village, Aarogya Setu App, etc. Additionally, the rise of the FinTech sector has accelerated financial inclusion in the country. Further expansion of digital payments is an important pivot for creating a more equitable, prosperous, and financially inclusive India.

Recent years have led to significant technological advancements, with the improving computing power enabling more people globally to join the digital economy. Further enhancement of digital capabilities is expected to strengthen connectivity, significantly impacting various sectors and the overall economy. There is a rising trend across sectors wherein digital platforms are recasting relationships between customers, employees, and employers.

The pandemic accelerated technological transformation by many years, as technology became the backbone of continuity across various sectors and



ensured financial and social inclusion for the citizens. It also provided an opportunity for India to set global benchmarks for others to follow suit in terms of leveraging technology for enhanced transparency, increased compliance, improved delivery of public services, widened digital payments, and strengthened e-governance.

As India focuses on enhancing its manufacturing prowess and embedding itself as a preferred hub across global value chains, digital transformation on the back of emerging technologies, such as AI, ML, IoT, robotics, blockchain, and cloud computing, will drive economic value. With the advent of the Fourth Industrial Revolution, various emerging technologies are being leveraged at an accelerated rate to enhance competitiveness. Harnessing the full potential of these new technologies to strengthen competitiveness will have to be supported by policy frameworks that ensure such technologies work responsibly for people and the planet.

The software and services industries have strongly driven the past few decades in India, and the country is now positioning itself to leverage the opportunity in semiconductor design and manufacturing. In many ways, almost every industry is now a technology industry, with semiconductors driving innovation and efficiency in the digitized world. As we look to strengthen self-reliance and enhance the share of domestic production in the market, there will have to be consistent efforts toward skilling, research and development, and IP protection.

The G20 presidency is an opportunity for the country to reinforce its role as a global leader in communications and the increasing use of digital technologies. The G20 forum will also allow India to promote investment in digital infrastructure, encourage innovative and agile

governance, enhance digital skills and training, improve data free flow with trust, enforce intellectual property rights (IPR), and boost technology adoption by MSMEs.

ASSOCHAM resonates with the idea that India is reshaping itself in the age of digital globalization. India is experiencing a digital revolution across segments - consumers, investors, workers, businesses and the Government - all use technology to enhance transparency, gain improved access and leverage higher efficiencies. At the same time, technology is triggering transformative developments in e-payments, e-commerce, geographic mapping, digital literacy, financial inclusion, and rural development, among many others.

The country is emerging as an essential growth engine of the world economy and is now at the precipice of a transformative opportunity to gain global leadership. We at ASSOCHAM, under the Bharat@100 initiative, are working towards bringing together the academia, policymakers and industry players to create a tech-led development plan for the country. As the India representative for the QUAD ORAN program, ASSOCHAM has facilitated various interventions to promote the concept, facilitate standards and policy formulation and define an adoption plan.

Together with the ASSOCHAM team, I am excited to share this compendium of industry insights exploring ideas of technological transformation across segments. We recognize that India's digital conversion has helped eliminate bureaucratic red tape, position the country as more investor-friendly and changed the lives of every Indian through strengthened governance. The next era of growth will require the scalability of secure technology to address global problems and drive equitable and inclusive growth.

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# Leveraging digital transformation to empower women



*Creating Opportunities and Advancing Women in India*

## Sumant Sinha

President ASSOCHAM and  
Founder, Chairman and Managing Director, ReNew Power

Women in India have capitalised on the opportunities created by digital transformation to foster economic growth. With the increase of internet and social media access, especially in metropolitan areas, women are leading the way in digital space by innovating and creating new ideas.

Digital transformation has enabled women to move towards greater financial independence. By utilizing e-commerce platforms, female entrepreneurs have launched businesses and accessed global markets. In particular, digital financial services have made it simpler for women to receive financing and begin their own enterprises. Women's involvement with digital transformation touches strategic advising, expert project design, implementation, and management, as well as capacity-building and training initiatives tailored to particular contexts.

Interestingly, Covid-19 inevitably accelerated the remote work trend, opening up opportunities for women previously limited by geographical constraints. During the most

**Women's involvement with digital transformation touches strategic advising, expert project design, implementation, and management, as well as capacity-building and training initiatives tailored to particular contexts.**

strenuous times of the global pandemic, many women became comfortable with technology while conducting business and exploring their talents from the comfort of their homes. Women's inherent qualities of empathy, care, flexibility, and good listening skills enable them to perform successfully during a crisis. Concurrently, the government's push towards digitalisation resulted in several initiatives aimed at increasing digital literacy among women, which translates to better job opportunities.

With their online presence, women can multiply economic opportunities, spark innovative ideas, and act as social change agents. Lately, IT services are shifting to Tier II and Tier III cities, creating numerous job opportunities. Similarly, in the rural belts, women are encouraged to seize opportunities for their own and their families' advancement.

In this endeavour, W2E2 - Wireless Women for Entrepreneurship and Empowerment, a programme designed to create micro-level social enterprises, has enabled women to set up kiosks to provide online services to the local community and become digital literacy trainers to coach local communities. Moreover, its community mentorship programme motivates established women entrepreneurs to help interested women establish their own businesses.

Another noteworthy attempt is ArogyaSakhi, a mobile application that assists rural women entrepreneurs in providing preventive health care at doorsteps. Doctors from anywhere can access the data collected by rural women (from other village women), allowing them to treat patients conveniently.

Nonetheless, women face barriers to accessing and benefiting from these choices. For starters, despite government efforts, there is still a significant gender gap in digital literacy, limiting women's access to job opportunities in the digital sector. At the same time, while digital technologies and digitalisation have the potential to create meaningful new opportunities for women, the existing digital divide risks leaving many vulnerable women behind. According to India's Fifth National Family Health Survey, released in late 2020, only 43% of women have ever used the internet, while only 34% of rural women have net access. Evidently, improving digital literacy and increasing access to digital technologies is critical to closing the digital divide.

Another impediment is that cultural and societal barriers prevent women from entering the

workforce in many parts of India, particularly in male-dominated fields of technology. Unfortunately, the issue of women's online safety can obstruct their participation in (online) forums and social media. Apart from that, the under-representation of women in Science Technology Engineering and Mathematics (STEM) puts them at risk of being displaced by technology. By 2025, India's digital core sectors are expected to generate 60 to 65 million jobs, with many of them requiring functional STEM skills.

Clearly, there is a need for more female digital leaders in India and worldwide. Even though a career in IT has become the most desirable option for women, there are fewer women tech leaders, role models, and tech start-ups run by women today. Skillsoft's 2022 Women in Tech Report polled 1,004 Indian women tech professionals; only 7% held executive-level positions, while 13% held managing director-level positions. However, the current pool of female tech leaders can mentor or train female tech aspirants, preparing them for future leadership roles by honing their business and entrepreneurship skills.

A lot more needs to be done to encourage women to become digital leaders. The Female Entrepreneurship Index ranks India 70th out of 77 countries, and the gender gap in this sector is widening. Women entrepreneurs need assistance in obtaining funding, mentorship, and other resources to start and grow their businesses.

On the whole, while India's digital transformation presents significant opportunities for women, it is crucial to address the challenges they face in accessing and benefiting from these opportunities. It will take a collaborative effort from the government, private sector, and civil society to close the gender gap in digital literacy, support women entrepreneurs and create safe and inclusive digital spaces for females.



# How nimble start-ups are helping India win a global race?



**Ajay Singh**

Sr. Vice President, ASSOCHAM and  
Chairman & Managing Director, Spicejet

A massive global marathon is on. Countries across the world are sprinting and chugging out their best to win an economic race. The ones showcasing reliable use cases leveraging from technologies such as AI, IoT, Blockchain, VR, and Cloud Computing are expected to have an edge in winning the race. The comparison with a marathon race involving countries may seem abstract but the economy is after a marathon. For policymakers the larger output of this race is adding jobs, better socio-economic agenda, increasing export potential, and fuelling development on all cylinders. In simpler words, this is a marathon where everyone is running but only the smartest and innovative survive.

India's sprint in this race gets influenced not by the performance of the big corporates but the vibrant start-up ecosystem. In fact, every country in the world realizes the potential of start-ups. A report by the Kauffman Foundation credits them for nearly all net job creation in the United States. The Global Entrepreneurship Monitor finds that entrepreneurship activity accounted for between 5% and 10% of total employment in many countries. The Singapore government, for instance, has identified the creation of 10,000 new start-ups by 2023 as a key driver of the country's economic growth.

**India's sprint in this race gets influenced not by the performance of the big corporates but the vibrant start-up ecosystem. In fact, every country in the world realizes the potential of start-ups.**

While building a start-up is bound to help countries win a marathon, it may not be a simple proposition.

Until two decades ago, ordering food was limited to visiting a restaurant or perhaps calling them via a landline phone. Today, the scenario for ordering food online or starting a food business has turned simpler with the availability of services such as Zomato and Swiggy. A similar phenomenon is observed in the areas of insurance (Digit), payments (PayTm), education (Byjus), real estate (nobroker), logistics (Shiprocket), Online Games (Games 24X7), urban transportation (Ola), beauty (Purplle), e-commerce (Flipkart),

and even health & medicine (Innovaccer & Curefit). The examples illustrate the significant contributions of start-ups.

India has the potential to add more, but to do so there is a need for active collaboration and mentorship of start-ups. An investment in a budding start-up is often perceived as a viable return on investment, but there is a need to introspect on the significant contribution to the ecosystem. For instance, Zomato is not just a unicorn food service but one that connects an ecosystem of 1.4 million listed restaurants and 12,000 partners.

Governments and big corporations can leverage from start-ups by working with them to drive innovation, gain access to new markets, and stay ahead of the competition. By providing support in the form of business, investment, and even mentorship, start-ups can be leveraged to build a thriving ecosystem of innovation and entrepreneurship that benefits everyone in our big marathon race.

As of 2021, India saw nearly 80 start-ups registered daily and the Department for Promotion of Industry and Internal Trade (DPIIT) estimates the country to soon hit a sweet 100,000 start-ups. Industry body NASSCOM anticipates that by 2025, the start-up ecosystem may be home to 37,000 tech start-ups. And 180-200 unicorns with a cumulative valuation of \$700 billion from the current \$330 billion. In the last five years, the recognition of start-ups has increased with nearly 20x more registrations being reported.

To celebrate and further encourage start-ups, PM Modi has designated them as the “backbone” of New India and declared January

**India has made significant strides to switch its orientation from agriculture to services. Being a renowned IT hub and the capital for business processing outsourcing, the country is fast transforming into a global hub for research and development.**

16th as National Start-ups Day. In the words of the Prime Minister, “We have a million problems, but at the same time we have over a billion minds.”

India has made significant strides to switch its orientation from agriculture to services. Being a renowned IT hub and the capital for business processing outsourcing, the country is fast transforming into a global hub for research and development. Bengaluru, India’s Silicon Valley, is also home to approximately half of the world’s 1200 multinationals who have established an R&D centre here. Metropolitan cities such as Hyderabad, Delhi, Mumbai, Surat, Chennai, and Kolkata are certainly observing a vibrant start-up culture but so are tier-4 cities. A recent trend is how global giants such as GE, Cisco, and Adobe have relocated their R&D business units to India. India’s campaigns such as start-up India, Make-in-India, the ease of doing business, and the renewed culture around appreciating start-ups is encouraging. And this is likely to help India win the marathon of economic growth.

# Why India's digital infrastructure is a dynamo for jobs and economic growth?



**Sanjay Nayar**

Vice President, ASSOCHAM and  
Founder & Chairman, Sorin Investments

**W**e may not realize it, but as consumers, many habits have radically changed in the last twenty years. For instance, the weekly visit to the bank to withdraw cash is a thing of the past. Visits to a government office to update a PPF passbook, ration card, or gas cylinder is an obsolete process. The impact of digital is so ubiquitous that from hard-to-get electronic goods to rare manuscripts, everything is available online.

It is difficult to pinpoint exactly what hyper-accelerated this digital revolution - it could be the Covid-19 pandemic which necessitated remote work. Or it could be attributed to the relentless pursuit of excellence and innovation by our government and e-commerce businesses. Digital technologies have literally pushed the envelope in favor of collaboration and the economy. India's success is best exemplified by digital innovations such as Aadhar, DigiLocker, GeM, and UPI, which are guiding several countries in catalyzing economic growth.

## Scaling economic benefits

Programs such as Aadhar have enabled nearly 135 crore Indians financially. In the case of UPI, an exchange of Rs 12 trillion last month is evidence of just how successful digital infrastructure could be. Government initiatives

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such as DigiLocker, which boasts some 4.5 billion documents, have certainly enabled transparency. But they have also contributed significantly to the growth of digital businesses for aggregator models and other startups. India's economic growth catalyzed by digital initiatives is also a major cue for economies across the world.

According to an RBI paper, the core digital economy increased from 5.4 per cent of GVA in 2014 to 8.5 per cent in 2019. India's digital economy, which is estimated at nearly 22 per

cent of the core economy, grew 2.4 times faster than the traditional economy and has generated employment to the tune of 62.4 million or 11.6 per cent direct jobs.

Across the world, China is focusing on 5G networks and artificial intelligence, while the Biden administration in America has recently proposed a \$65 billion investment in broadband as part of its digital infrastructure. Across the world, policymakers have taken a keen interest in architecting data centers, cloud computing, and smart cities for digital infrastructure. Examples include countries such as South Korea, Singapore, Japan, the UK, Germany, France, and Australia, which are investing in digital infrastructure to support economic growth and innovation.

## Inside the den of Digital Infrastructure (DI)

To the uninitiated, digital infrastructure comprises a range of components that enable digital connectivity, data storage and processing, and cybersecurity. These components include broadband networks, wireless networks, cloud computing, data centers, cybersecurity technologies, and digital skills. Digital infrastructure refers to the underlying technology and systems that enable BOTH digital connectivity and data transfer.

Besides supporting mobile computing, wireless networks support a wide range of applications, including internet of things (IoT) devices, smart cities, and autonomous vehicles. On the enterprise front, Cloud computing enables flexible and scalable IT solutions that can support a wide range of applications. Cloud computing enables businesses and organizations to access computing resources and data storage over the internet rather than relying on physical servers and storage devices. Facilitators in the form of Data centers for reliable storage and processing of data, measures around cybersecurity and digital skills make the DI a competitive and enabling force.

## A digital edge for the common person

The common person is ultimately the winner of this digital ramp-up. A digital mode of life enables several services that improve access to information. On one end, cashless transactions and digital payments offer convenience, while on the other end, telemedicine and remote interventions improve access to healthcare services. Digital programs have also enabled e-learning which the traditional and formal education systems failed to reach. Besides unlocking access to information, digital infrastructure armed with the internet and mobile networks provides faster access to news and information previously unavailable to millions. In addition to the democratization of information, the digital infrastructure ecosystem creates new jobs and career opportunities.

## The new tomorrow

From a corporate perspective, digital tools enable efficiency with their ability to automate manual tasks such as data entry, inventory management, and even invoicing. This not only saves time but also reduces errors and costs associated with physical infrastructure, such as office space and paper-based processes. Additionally, it can help companies identify and eliminate inefficiencies in their operations. For new organizations, a digital ecosystem makes it easy to reach customers irrespective of geographic location.

Better analytics and insights enable enterprises to fine-tune customer offerings and personalize experiences. Technology also enables employees to collaborate and communicate more effectively, regardless of their physical location leading to increased productivity and faster decision-making. Digital infrastructure is hence critical to sectors such as e-commerce, financial services, healthcare, education, manufacturing, transportation, and logistics. Industries such as agriculture are promised greater transparency, faster achieve sustainability.



# India's approach to digital inclusion

*How it impacted social and economic development in India*



**Deepak Sood**

Secretary General, ASSOCHAM

The 1991 economic liberalisation ushered in an epochal scale of change in India's digital technology, propelling the growth of the Indian IT industry and digital infrastructure. The Information Technology Act of 2000, followed by the National e-Governance Plan in 2006, juxtaposed economic and digital reforms in the country and accelerated the process of digital inclusion.

Launched in 2009, the biometric database Aadhaar facilitated citizens' easy access to public subsidies. Reportedly, it stands at 135.9 crore holders as of January 2023. Next, the 2015 Digital India initiative aspired to give all citizens trouble-free access to government services and platforms. Accordingly, digital investments in India's tech-based startup ecosystem, such as fintech platforms, logistics, healthcare services, education technology, e-commerce, and online marketplaces, have been driving growth.

The increase in private sector investments and the startup culture has accelerated India's digital revolution. Due to telecom companies' innovations in expanding the scope of digital services, domestic e-commerce is expected to increase significantly in the coming years. Furthermore, open network for digital commerce (ONDC) is among the government reforms introduced to enhance the digital

**The increase in private sector investments and the startup culture has accelerated India's digital revolution.**

revolution. It is expected to digitise the whole value chain, standardise operations, encourage supplier involvement, improve logistical efficiency, and increase customer value.

To provide affordable and quality internet, the government has invested in the BharatNet Fiber project and is developing 5G and 6G infrastructure. In the next 12-15 years, India's 5G ecosystem is expected to add \$450 billion to the Indian economy. As India accelerates its journey toward becoming a global data centre hub, the country's data centre capacity is expected to increase to 1.3 GW by 2024.

The investments made in digital technology have yielded significant benefits during the pandemic, ensuring that the bottom of the pyramid was shielded from adversities. From the pandemic's start, the government provided US\$5 billion in cash benefits (in less than six



months) to its most vulnerable citizens solely through digital payments. Moreover, cutting-edge technologies such as AarogyaSetu delivered real-time data on active cases, and COWIN pushed India to adopt a fully digital vaccination strategy.

With the lockdown putting enormous strain on household budgets, *JAM (Jan-Dhan-Aadhaar-Mobile)* acted as a safety net, assisting millions needing immediate monetary assistance by directly transferring state benefits to their bank accounts. The state governments further employed technology to manage the demand, availability, and use of equipment such as ventilators and vital medical products, including masks and PPE kits, to handle Covid-19 situations. With the closure of schools, the government promoted the DIKSHA platform for school education to help students continue their education from home.

Post-pandemic, handling aggregator apps, local vendors like vegetable sellers or e-rickshaws operators can now provide door-to-door services while receiving monthly consolidated payments.

The UN 2014 ranked India 118 globally (out of 182 countries) in the e-government rankings. In 2022, India's E-Government Development Index composite score was 0.59; in the same year, India ranked 105 out of 193 countries. Today, India has set a global benchmark in digitisation by laying down standards in payment, identity, health, education, and how compliance requirements are handled.

Emerging technologies will further drive inclusive and equitable growth in the country. The 5G wave will significantly impact the startup ecosystem, encouraging more home-based MSMEs to expand production. Moreover, continuous innovation in emerging technologies will help manufacture high-performing robots and machines to speed up processes. In healthcare applications like autonomous surgical robots, virtual nursing

assistants will lead to advancements in the health sector.

Emerging technologies will drive inclusive and equitable growth by enhancing financial inclusion through access to digital banking services, mobile payments, and e-wallets. IoT can help farmers increase crop yields, reduce wastage, and improve income in agriculture. Already, private-sector CSR activities have linked farmers to initiatives such as E-Choupal (village internet kiosks) to access weather, price discovery, agri know-how, best practices, etc. Crop quality improved, productivity increased, and prices rose as a result. It will also aid in rural development.

Likewise, telemedicine can help connect patients in remote rural areas with doctors in urban areas. Telemedicine and teleconsultations highlighted the incorporation of cutting-edge digital technologies into healthcare services. Notably, Ayushman Bharat Digital Mission linked over 5 million health records in the health sector.

In terms of education, emerging technologies can provide access to education for people who do not have access to traditional schools. Online education platforms and Massive Open Online Courses can help people acquire new skills and improve their employability. What's more, SMEs can access new markets and increase their productivity. For instance, Cloud Computing can help SMEs reduce costs by providing them access to scalable computing resources.

Despite the progress made, there are a few hurdles that India will have to cross before it becomes a truly digitalised economy. Some of these include slow internet speed, data security and privacy, etc. However, the country is committed to adopting digital services as they improve citizens' quality of life, promote financial inclusion, and fuel economic growth. Therefore, it is critical for us to ensure that social, economic, and digital reforms are implemented collectively to be fully inclusive.

# Influence of Digital Revolution on the Logistics Sector



Vineet Agarwal

Immediate Past President, ASSOCHAM and  
Managing Director of Transport Corporation of India

The pandemic accelerated technological advancements like never before. From, 'Unnati, Swasth, ULIP, KrishiNeev, SamShiksha, Kashi, KYC Setu', digital innovation across sectors kept things moving during the time of crisis and is expected to further change the way we do business in Industry 4.0/5.0.

With continued resilience, the logistics sector re-designed its processes & adopted a 'PHYGITAL' approach to working. Transportation & logistics as an activity happens on-ground thus making technology a strong enabler, never a substitute to the physicality of the function. To move goods from one part of the nation to another, a trained driver plays an integral role, however with GPS tracking of the vehicle at the control tower – the efficacy of the movement can be monitored & timely action can be taken in case of any emergency.

Paradigm shift in consumption patterns have been observed over the last few years, giving rise the need for tech-based solutions like:

- Standardized policy to Implement AIS 140 Pan India helped to bring down cost & enhance productivity.
- Adding fields in e-way bill (trip closure, return destination, empty status) enabled

The emergence of technology-based logistics startups has transformed a country's logistics landscape as they actively leverage opportunities to transform supply chain workflows with collaborative partnerships & flexibility.

real time demand & load matching along with resource optimization (fuel, time, driver, road congestion, pollution etc.).

- ULIP aims at enabling paperless processes for logistics in India by facilitating 'one nation- one permit' and leveraging the emerging technologies for data collection, analysis and prediction. It can be India's next UPI-like revolution through public-private partnership & acceptance.
- Development of Freight Index for rate clarity.
- Centralized warehousing data bank for optimum utilization of warehouse capacity.

- Secured logistics document platform & blockchain technology.
- ONDC to standardize list of registered/ authentic partners & to complete commerce transactions.
- GHG emissions calculators (digital) to work towards required carbon off-setting.

At TCI, we keep the customer at the center of everything we do, so providing them with end-to-end customized logistics solutions coupled with technology-based real-time visibility tools has been one of the recent value-adds. To state a case-in-point, customer 'A' used to operate on manual inventory management basis and we provided them with KPI driven system having automatic gate in & out, stuffing, positioning, performance analysis. This enabled them to speed up the decision-making process through an accurate & less time-consuming process.

The emergence of technology-based logistics startups has transformed a country's logistics landscape as they actively leverage opportunities to transform supply chain workflows with collaborative partnerships & flexibility.

Along with providing cost benefits, technology has a significant role to play in promoting

the 'sustainable logistics practices. Through insights from big data analytics and Artificial Intelligence (AI), logistics service providers are employing tools for route optimization and thereby saving energy. Customers today are aware of the consequences of their actions and prefer to associate with vendor partners who are ESG (environmental, social & governance) complaint. Focus is on achieving greener operations with digitization that offer both economic and ecological benefits.

Logistics Data Bank (LDB) project by National Industrial Corridor Development Corporation (NICDC) which is a nation-wide single-window, cloud-based logistics visualization solution achieved 100% tracking of India's EXIM containers. It continues to bring together next-generation infrastructure technologies like RFID, electronic data exchange through integrations with FOIS (railways) and TOS (ports).

The phygital ecosystem will help position India amongst top 25 countries in the Logistics Performance Index (LPI). In turn, enable a sustained economic growth of becoming USD 5 trillion economy coupled with USD 2 trillion exports in the coming few years.



# Does digitalization have a significant impact on the real estate industry?

*Real estate has benefited from the digital revolution in many ways, including online registrations, virtual tours, 24x7 chatbots, and improved search engine results*



## Dr Niranjan Hiranandani

Past President, ASSOCHAM and Co-Founder and Managing Director, Hiranandani Group

**D**igitalisation has become a buzzword today, with almost all industries adopting it to stay relevant and competitive. The real estate industry is no exception, and digitalization has had a significant impact on it, especially in countries like India. In recent years, the real estate industry has undergone substantial changes due to the impact of digitalization. Technology has transformed the way we buy and sell properties, from online listings to virtual tours and digital transactions. As a result, the traditional approach to real estate has been disrupted, and new models are emerging to meet the changing needs of consumers.

Digitalisation has revolutionized the real estate industry by offering numerous benefits, such as the convenience of searching for properties online. In contrast to traditional methods that relied on printed listings or driving around neighbourhoods, real estate websites and apps now enable buyers to search for properties using various criteria, such as location and price, resulting in finding the perfect property with ease. Moreover, virtual

**Technology has transformed the way we buy and sell properties, from online listings to virtual tours and digital transactions.**

tours provided by digitalization, using virtual reality (VR) technology, offer a 360-degree view of properties without physical visits. This innovation has not only saved time and money for buyers and sellers but also helped international clients view properties without travelling. According to Forbes research, 95% of homebuyers start their home-buying journey by engaging with online platforms, and 51% buy properties online.

Digitalisation has also made it possible to conduct transactions online. Electronic signature technology, for example, allows parties to sign documents remotely, making it easier to complete real estate transactions from anywhere in the world. This has been



particularly helpful during the pandemic, where social distancing measures have made in-person transactions difficult.

However, digitalization has also presented some challenges to the real estate industry. One of the most significant challenges is adapting to new technology continually. Real estate firms must invest in the latest software and tools to remain competitive, which can be costly and time-consuming. Another challenge is the need to understand and manage data effectively. With the rise of big data and artificial intelligence (AI), real estate firms must be able to analyze vast amounts of information to make informed decisions. This requires skilled professionals who understand and interpret data, which can be a significant challenge for some firms.

To overcome these challenges, real estate firms need to embrace digitalization fully. This means investing in technology and developing new business models that take advantage of the latest digital trends. For example, many firms are

moving towards a hybrid model that combines traditional in-person services with digital tools and platforms. In addition, real estate firms must focus on increasing operational efficiency to maximize return on investment. This includes streamlining processes and reducing costs through automation and outsourcing. By doing so, firms can free up resources to invest in new digital initiatives and stay ahead of the competition.

Finally, real estate firms must understand digital disturbance and learn about consumers' preferences to stay relevant. They must keep abreast of the latest trends and technologies to provide the best possible service to their clients. This requires a commitment to ongoing education and training, as well as a willingness to experiment and adapt to change.

Overall, it is clear that digitalization has had a significant impact on the real estate industry in India, and it will continue to shape the way this industry operates in the future.





# How India is Leveraging Technology to Empower its Citizens

*With the rapid proliferation of smartphones and internet connectivity, India is poised to take advantage of technology to create a more inclusive and empowered society.*



## B. K. Goenka

Past President, ASSOCHAM and  
Chairperson, Welspun Group

India is a country that has been harnessing technology to empower its citizens, especially those who are underserved and marginalized. With a population of 1.4 billion people, India has taken significant steps to empower its citizens by leveraging technology. From providing digital access to underserved communities to promoting digital literacy and facilitating e-governance, technology has played a pivotal role in empowering citizens.

One of the major initiatives that India has taken to provide digital access to its citizens is the Digital India program. Launched in 2015, this program aims to transform India into a digitally empowered society and a knowledge-based economy. The program has a vision of providing broadband connectivity to all citizens, providing digital infrastructure, and delivering services digitally. The Digital India program has successfully provided digital access to underserved communities in India, with over 300,000 Common Service Centers (CSCs) established nationwide. These CSCs provide services such as e-governance, education, healthcare, and banking to people in rural areas.

**The Digital India program has successfully provided digital access to underserved communities in India, with over 300,000 Common Service Centers (CSCs) established nationwide.**

The government of India has also launched several other initiatives to promote digital access and empower citizens. One of these initiatives is the Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA) program. Launched in 2017, this program aims to make one person in every rural household digitally literate. The program has successfully provided digital literacy to millions of people in rural areas. As of 2021, over 67 million people have been trained under the PMGDISHA program.

Another initiative that has successfully provided citizens with digital access is the Jan

Dhan Yojana program. Launched in 2014, this program aims to provide banking services to all citizens of India. The program has been successful in providing bank accounts to over 400 million people, most of whom were previously unbanked. This has enabled people to access various financial services such as loans, insurance, and pensions, increasing financial inclusion and empowerment.

The private sector in India has also played a significant role in providing digital access to citizens. Private companies have made significant investments in digital infrastructure, providing high-speed internet connectivity to people across the country. The widespread availability of affordable smartphones has also enabled people to access digital services and information.

The impact of these initiatives on citizen empowerment has been significant. Citizens are now able to access information and services digitally, which has increased their knowledge and awareness. They can also participate in decision-making processes, with various government initiatives such as MyGov and e-Samiksha enabling citizens to provide feedback and suggestions to the government. The availability of digital services has also increased entrepreneurship and job creation, with many people starting their own businesses and earning a livelihood.

One example of the impact of technology on citizen empowerment is the success of the e-NAM (National Agriculture Market) platform. Launched in 2016, this platform enables farmers to sell their produce online, eliminating intermediaries and enabling them to get better prices for their produce. The e-NAM platform has been successful in

**India's journey towards digital empowerment has been impressive, with the government and private sector playing a vital role in promoting technology and digital infrastructure.**

empowering farmers, with over 1.7 million farmers registered on the platform and over 150 agricultural commodities being traded.

However, there are also challenges that need to be addressed to ensure that the benefits of technology are accessible to all citizens. One of the major challenges is the digital divide, with many people still lacking access to digital infrastructure and services. This is particularly true in rural areas, where the digital divide is more pronounced. There is also a need to address issues related to digital literacy and cybersecurity to ensure that citizens are able to use digital services safely and securely.

India's journey towards digital empowerment has been impressive, with the government and private sector playing a vital role in promoting technology and digital infrastructure. The initiatives taken by the government have enabled citizens, especially those from underserved communities, to access basic facilities such as healthcare, education, and financial services. The impact of technology on citizen empowerment has been significant, and India's continued investment in technology is expected to bring even more important benefits to its citizens in the future.

# Digitization holds the key to democratizing healthcare



## Cmdr. Navneet Bali

Co- Chairperson, ASSOCHAM Healthcare Council and Regional Director – North, Narayana Health

COVID, while being devastating, has brought a radical change in the way people experience healthcare.

While in the past, hospitals and clinics would usually see a high number of patients waiting their turn for consultation, with changing customer expectations, the current trends seem to be constantly evolving around creating a superior experience unlike witnessed by the industry before – a Digital Revolution as some may call it.

This revolution of digitization in healthcare is speeding up and reshaping the way healthcare organizations, delivery providers and consumers interact, share medical data or make decisions related to treatment or outcomes. While there are notable examples of healthcare digitization, including AI Powered medical devices, telemedicine, blockchain, remote patient monitoring and electronic medical records, there are also immense efforts in integrating these to create smarter healthcare systems enabling better care, clinical outcomes, lower costs and significantly improved experiences. While the revolution continues, it is important that we take a closer look at key trends that are reshaping the new normal:

**The focus on standardizing Electronic Medical Records (EMR) has also been seen as an opportunity to eliminate the usage of paper and create paperless hospitals in the future.**

On-demand healthcare is growing as individuals seek guidance at their convenience (gifted by several other sectors), which majorly comprises actions involving booking medical appointments and researching information about doctors, healthcare professionals, treatment options and hospital and medical facilities. With the rise in education levels and smartphone usage, the trends also seem to be rising in tier 2 and tier 3 cities and not just the metros. This has also helped make market access easier for quaternary care consultations, reducing the need for people to travel to metros where high-end specialists were available.

The focus on standardizing Electronic Medical Records (EMR) has also been seen as an opportunity to eliminate the usage of paper and create paperless hospitals in the future. Another trend is seen in increasing efforts to develop significantly superior healthcare systems which enable seamless conversations across multiple structures to create a consumer experience like never before while maintaining transparency and trust. Narayana Health is one of the organizations to have successfully taken the first step in that direction. With the vision to democratize healthcare - with a focus on optimizing the cost of running the hospitals while creating systems that enable patients to spend less time inside the hospitals and consume services easier and are still user-friendly - has started the journey towards the concept of queue less and paperless hospital where consumers don't end up spending most of their time waiting for either consultation or tests etc.

Health Awareness has also greatly benefitted the wearable industry. While earlier, people would consult a doctor when their health was affected, today the focus has shifted to preventive health and knowing their health status frequently, which has changed because of evolving technology. This trend has encouraged healthcare providers to invest in wearable technologies which could not just help patients or families track vitals but also enable

**The increasing role of connected devices, extreme demand for quality services with the need to reduce cost have not just created the demand for Virtual Reality (VR) in healthcare.**

monitoring of patients with severe health risks. The benefits of wearables extend beyond these with personalized healthcare experiences and gamification opportunities.

The increasing role of connected devices, extreme demand for quality services with the need to reduce cost have not just created the demand for Virtual Reality (VR) in healthcare, but it is also anticipated that healthcare could be among the leading industries to adopt VR for medical education, training, surgery and rehabilitation among others. 5G network bandwidth, low latency and large connection technology open possibilities for remote robotic surgeries enabling life-saving surgeries at remote locations. Another changing experience that has been garnering interest is virtual reality healthcare services as an alternative to traditional healthcare.





# Driving the AI-enabled digital transformation

**Preeti Malhotra**

Chairperson ASSOCHAM National Council for Corporate Affairs, Company Law and Corporate Governance and Chairman, Smart Bharat Group



**D**igital technologies have been evolving and disrupting the way we live, work, and organize. Their potential is, at once, astoundingly unrealized and quietly realized as companies and countries engage in the never-ending race to adopt the latest in tech to report better growth, higher efficiency, and sustainable progress.

With regard to the effect of digitalization on globalization, cross-border data flows have grown nearly 50 times since just 2005. Virtually every type of cross-border transaction now has a digital component. Currently, about 15 per cent of the global goods trade is conducted via international e-commerce. Additionally, digital platforms for traditional and freelance employment are beginning to create a more global labor market. In India, the rise of digitalization and digital transformation has also exponentially increased post-pandemic and is likely to remain on an upward trend. This is most evident in how it has upended the payment ecosystem. The India stack for payments, led by UPI, now processes 40% of all real-time digital payments in the world.

Critically, India has taken to digital transformation, especially AI-enabled digital transformation, like a fish to water. The added layer of Artificial Intelligence opens up new growth possibilities than ever before. Globally,

**AI-led innovations supported by robustly growing data sets are inundating the consumer markets, bolstered by an enabling government that has taken steps to solidify India's position as a future AI global leader.**

the AI market will be worth \$42 billion by 2023. AI is also expected to add US\$ 967 billion to the Indian economy by 2035 and USD 450–500 bn to India's GDP by 2025, accounting for 10% of the country's \$5 trillion GDP target.

India's SaaS markets are booming. AI-led innovations supported by robustly growing data sets are inundating the consumer markets, bolstered by an enabling government that has taken steps to solidify India's position as a future AI global leader. According to a report by the Brookings Institution, India is among the top 10 countries in terms of technological advancements and funding in AI. It is also believed that India is a more mature market for leveraging AI than the US or the UK.

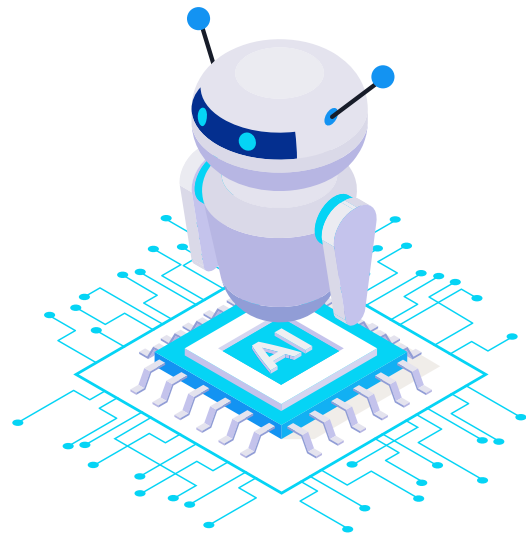


Of course, the Government of India is a founding member and the current Chair of the Global Partnership on Artificial Intelligence (GPAI). The intent to adopt AI in every aspect of the economy is supported by the availability of talent in AI. According to a Nasscom report, India ranks first in AI skill penetration and talent concentration and 5th in AI scientific publications. Encouragingly, India's AI Skills Penetration Factor has been reported to be 3.09, the highest among all G20 and OECD countries, indicating that India was 3X more likely to have or report AI skills than other countries.

While the opportunity is immense, the proliferation of digital transformation has galvanized several industries, from cyber security to data science and presented a new challenge for policy developers. Across the globe, governments and businesses are scurrying to develop policies that cover everything from AI development to deployment. Moreover, new government policies on AI run the risk of being subservient to pioneers of the AI industry who have more insights on the subject.

Contrary to other industries, policymakers now have to make an AI system or its designers accountable for its decision-making. The lack of transparency and the technical nature of coding makes it hard to decipher why an algorithm made a particular choice. AI is game-changing, but the businesses that pioneered AI control the game – they are the ones with full access to key algorithms protected by patents and trademarks. As a result, as AI gains control of decision-making, accountability becomes harder.

The rise of digitalization also drives the rise of crimes associated with the virtual world. The creation of the virtual world has expanded the threat landscape, necessitating the need for cyber security. This has far-ranging implications for business. AI algorithms rely on large datasets and are devised in a manner that it eliminates the tendency towards bias.



Cyberattacks can be used to manipulate these data, and introduce bias, causing unknown security risks that businesses are not equipped to deal with.

To **'Make AI in India'** and **'Make AI work for India'**, the government has recently pushed new regulations for data usage. Organizations such as the **National Data Analytics Platform** and the **Data Governance Quality Index** will gain prominence. The **National Data Governance Framework Policy** is a work in progress, and it will be required to develop policies on "AI ethics" - guidelines on issues of value systems and goals encoded into machines with a vision of the potential systemic impacts of AI on social, political and economic structures. The intent here is to mitigate the impact of a potentially rogue AI. Some people have also called to more explicitly include justice as a goal of Fair, Accountable, and Transparent "FAT" AI development. India's AI must focus on inclusion and avoid the perennial risk of perpetuating inequity.

AI has finally come of age, and businesses and governments need to follow suit. For C-suite executives, this is an opportunity to build more lean, efficient businesses with thoroughly defined processes. For employees, it is both a threat and an opportunity. The proliferation of AI is your chance to upskill. The rise of open systems such as ChatGPT helps optimize performance, and it is up to us to own this new technology to improve our field.

# Building trust in tech is key to India's techade

**Ashutosh Chadha**

Director & Country Head, Public Policy and Government Affairs, Microsoft India



India's tech sector has grown significantly in recent years, emerging as a hub for innovation and entrepreneurship. The government's Digital India program has played a key role in driving this growth, with initiatives such as the Aadhaar biometric identification system and the Unified Payments Interface (UPI) transforming the way Indians interact with technology. India's tech stack has truly matured, and the country is leading the world in building digital public goods infrastructure with global applicability. India's tech sector has also been boosted by the rise of mobile internet and the increasing adoption of smartphones, which has led to the growth of e-commerce, digital payments, and other online services. The age of celebrating technology for technology's sake is over, and it is now about enabling everyone to use the best tech tools and making societies and economies more inclusive.

India is increasingly being recognized as a global powerhouse of innovation thanks to its thriving startup ecosystem. While India continues to lead the world with its innovation, entrepreneurship and digital public goods, it is also uniquely positioned to seize the moment and take the lead in building trusted tech. As organizations adapt to new challenges, they are turning to technology to help them succeed in doing more with less. At Microsoft, we're

**While India continues to lead the world with its innovation, entrepreneurship and digital public goods, it is also uniquely positioned to seize the moment and take the lead in building trusted tech.**

optimistic about the benefits of technology yet clear about the challenges. To drive positive impact with technology, people need to be able to trust the technologies they use and the companies behind them. We are committed to earning trust—both trust in business model alignment with our customers and partners and trust in technology, spanning privacy, security, digital safety, the responsible use of AI, and transparency. As we drive global economic growth, we are also committed to creating a more inclusive, equitable, sustainable, and trusted future.

With 2023 being a critical inflection point for artificial intelligence, the opportunities for

people are enormous. And the responsibilities of those of us who develop this technology are even bigger. We need to use this time not just for new AI advances but to responsibly and effectively address both the promises and perils that lie ahead. As the technology landscape rapidly evolves, it is critical that we adopt a collaborative approach with deeper and broad-based collaboration between governments, the tech sector and civil society. By working together, we can create mechanisms to manage the rapidly changing present and prepare for a future of completely new paradigms. The government has a critical role to play in setting the regulatory framework for data privacy and cybersecurity, while the industry aids in developing more secure and privacy-respecting products and services. Civil society also has an important part to play in raising awareness and advocating for greater accountability and transparency from companies.

Data today is among the most valuable currencies. Organizations are using data to optimize, transform, innovate, and gain a competitive edge. With the increasing adoption

of AI and cloud, technology is projected to have a significant impact on economies, industry verticals, market segments, and consumers. We all share the responsibility of ensuring that these advancements are used for the greater good. It is, therefore, essential for technology makers to design responsible technology. A non-negotiable first step is to ground this creation in a core set of principles that include fairness, reliability and safety, privacy and security, inclusiveness, transparency, and accountability.

To guarantee that technology is developed and used in a responsible manner, it is crucial to implement these principles into laws that foster trust. We need to seize this momentum and institutionalize a foundation of trust for our own future and for the generations that come after us. As India continues to evolve as a tech hub, it is important that all stakeholders work together to address the challenges and seize the opportunities. By building trust in technology, India can unleash its innovation and ensure long-term success for the sector.



# Digital Transformation: Accelerating the Future of India's Financial Service Industry



**P A Sudhir**

Co-Chairman, ASSOCHAM National Council on Business Facilitation and Global Competitiveness and Group CEO, Aeries Technologies

**W**ith the integration of next-generation technologies, digital transformation is changing the way businesses operate and deliver value to their customers. The financial industry has seen a significant technological transformation in India over the last few years. Traditionally, banks and non-banking financial companies (NBFCs) dominated the financial service industry in our country. However, driven by the need to adopt digital transformation technologies and the urgency to deliver better customer experiences, increase efficiency, and reduce cost, the industry has seen an influx of new-age fintech companies.

India alone has over 7500+ Fintech Startups leveraging digital technologies to offer innovative financial products and services. These fintech companies are disrupting the traditional financial service industry, offering products and services that are more customer-centric and convenient.

In this article, we will explore the role of digital transformation and how these fintech startups are leveraging these digital technologies to accelerate the future of India's financial service

**Digital Payments Driven by the government's push for a cashless economy and the widespread adoption of smartphones, digital payments have gained significant traction in India.**

industry, and how digitalization has increased financial inclusion and lowered costs.

## **Impact of Digital Transformation on the Financial Service Industry**

**Digital Payments** Driven by the government's push for a cashless economy and the widespread adoption of smartphones, digital payments have gained significant traction in India. Further, leading digital payment platforms have also made it easy for people to pay for goods and services using smartphones, transforming the way people transact.



### 1. New Products & Services

Digital transformation has also led to the development of new financial products and services catering to the needs of different populations. For instance, microfinance institutions are using digital technologies to reach out to unbanked and underserved populations in India. Fintech companies are offering digital loans and digital insurance products, making it easier for people to access financial services. Some finance products also involve solutions for income tax and property tax filing.

### 2. Data Analytics

Another significant impact of digital transformation in the financial service industry is the increased use of data analytics. Banks and financial institutions leverage data analytics to gain insights into customer behaviour, identify trends, and develop targeted marketing campaigns. Data analytics can mitigate risks and identify fraudulent activities by handling massive amounts of data at once and help track trends and possible problems substantially faster.

### 3. Cloud Computing

The adoption of cloud computing is changing the financial service industry operates. Cloud computing allows financial institutions to store and access data and applications from anywhere, making it easier for employees to collaborate and work remotely. Cloud computing also reduces infrastructure costs and increases scalability, allowing financial institutions to respond to changing business needs.

### 4. Artificial Intelligence (AI) and Machine Learning (ML)

AI and ML automate manual processes, reduce errors, and improve customer experiences.

For instance, chatbots provide customer support services, and robo-advisors provide financial planning services through automated algorithms.

### 5. Blockchain

Blockchain technology is another aspect of digital transformation that is transforming the financial service industry in India. It provides a secure and transparent way of recording transactions, making it ideal for financial transactions. Banks and financial institutions are exploring blockchain technology for various applications, including international payments, trade finance, and fraud prevention.

### Impact of Digitisation on Financial Inclusion and Lowering Costs

1. **Increased access to financial services:** Digitization has enabled people to access financial services, such as bank accounts, loans, and insurance, through digital channels. This has greatly increased financial inclusion, especially in remote or underserved areas where traditional financial services are not readily available.
2. **Lower transaction costs:** Traditional financial transactions and money lending practices involved paper-based documentation, manual processing, physical transportation of documents, and inaccurate interests, unnecessarily raising the cost of transactions and hampering the banking experience of customers. With the intervention of online banking, there has been a significant cost reduction and increased accuracy for financial institutions and customers.
3. **Efficient processing:** Digitization has automated many of the processes involved in financial transactions, making them faster and more efficient. Automating the banking process has resulted in quicker transaction turnaround time and improved customer satisfaction.



4. **Financial literacy:** Digitization has also provided a platform for financial education and literacy, which has enabled people to make informed decisions about their finances. It has empowered individuals to take control of their financial lives and make better financial decisions.

### Role of Digitization in Formalizing the Economy

Digital technologies such as mobile banking, electronic payment systems, and online platforms enable the government to monitor and regulate economic activity. For example, digital payment systems can track transactions and identify economic activity patterns, providing policymakers with valuable insights into the size and nature of transactions and helps them to design policies that are more effective in formalizing the economy.

Digitalization helps access financial services, particularly for individuals and businesses from the informal financial sector, such as small businesses and entrepreneurs, low-income households, women, etc. Digital financial services enable them to save and invest while promoting economic growth and reducing poverty.

### Parting Thoughts

The adoption of digital technologies is driving the evolution & transformation of the financial service industry. Financial companies that embrace digital transformation are in a better position to meet the needs of their customers and stay competitive. As India continues to grow technologically, financial institutions must embrace digital transformation to remain relevant and succeed in this dynamic industry.



# Future of Digitization in India



**Rakesh Nangia**

Co-Chairman, National Council on International Taxation  
ASSOCHAM and Chairman, Nangia Andersen India Pvt. Ltd.

India is one of the largest and fastest-growing markets for digital consumers, but adoption is uneven among businesses. It is among the top two countries globally on many key dimensions on digital adoption. As digital capabilities improve and connectivity becomes widespread, technology is unshaken to change nearly quickly and completely every sector of Indian economy. This is likely to create significant change in the nature of work for millions of Indians.

Digitization is uplifting our country towards advancement and filling gaps owing to physical infrastructure. With this, government services are reaching citizens in the remotest of locations to fulfil their needs.

Along with Aatma Nirbhar Bharat and Aadhaar, the Government of India has also been working on its Digital India initiative over the last few years. Digital India was a massive campaign launched by the Government of India to increase the use of technology and make India Digitized. In here creation of digital infrastructure, digital service, digital literacy was a part and we are nurturing well towards achieving the same. The adoption of digital transformation is one of the important trends at present. It will gain further traction in the future

**With improving digital infrastructure and the rising number of internet users in India, there is every prospect of the digital transformation of the country touching a new high in the future.**

with its widening acceptance by businesses. With improving digital infrastructure and the rising number of internet users in India, there is every prospect of the digital transformation of the country touching a new high in the future. The initiative's primary objective is to promote digital transformation in India and pick its benefits.

For maximum growth in the digital space, India is focusing on technologies such as artificial intelligence (AI) and data analytics. These technologies are significant because they will shape and drive the growth of fintech and other tech companies. Acknowledging the significance of AI and digital technology, many technology and business leaders have

embraced them. This trend is likely to gain traction in the coming years. Whether one thinks of the Internet or digital technology, both have improved speed and connectivity due to innovation. At present, they are indispensable for business organizations as well as consumers. They are likely to remain valuable assets to business organizations in the future. The effect of innovation is currently at an all-time high in the private sector. As a result, more consumers can access internet-enabled services in the future. Enhanced speed and deeper penetration of the internet will pave the way for digital technology inclusion across different sectors. These will include governance, energy, healthcare, education, and more.

Artificial Intelligence is the main force of the fourth scientific and technological revolution, which is dedicated to embodying human intelligence through computational methods. It is widely used in various fields and currently

mainly possesses functions such as voice and image recognition, logical reasoning ability, and emotion recognition. AI tools help us by providing predictive maintenance – letting us know ahead of time when machines will need servicing or repairing. In knowledge industries, such as law, we will increasingly use tools that help us sort through the ever-growing amount of data that's available to find the nuggets of information that we need for a particular task.

On the other hand, data analytics is a systematic computational analysis of data or statistics. It is used for the discovery, interpretation, and communication of meaningful patterns in data. It also entails applying data patterns toward effective decision-making. It can be valuable in areas rich with recorded information, computer programming, and operations research to quantify performance.

As things stand, India has a bright future for digital transformation.



# Inter-woven Digital and Sustainability Agenda



**Dr Lovneesh Chanana**

Member, ASSOCHAM National Council on IT & ITES and Vice President & Head of Government Affairs (Asia Pacific and Japan), SAP Asia Pte Ltd.

**S**ustainability is the business challenge of our generation. And India's role in our global climate is one of responsibility, impact, and opportunity.

- **Responsibility:** Asia and India are responsible for a high proportion of emissions. India alone is aiming to reduce its contribution of 7% of annual global greenhouse gas emissions. Our wider region of Asia is responsible for more than half (51%). Asia's decarbonization rate remains significantly below the world's average and isn't expected to improve until after 2030.
- **Impact:** The impact of climate change will disproportionately affect India. Based on a severe temperature increase, India is projected to see a reduction in GDP, well above the global average of 18%. Due to frequent droughts and floods, agriculture yield in India – and therefore food stocks – could fall by ~25% by 2050.
- **Opportunity:** What this means is that India and Asia represent the world's biggest opportunity for change. More than half (53%) of the new revenue opportunity for sustainability business models comes from Asia, and more than half (57%) of the 133 million jobs predicted to be required

**Sustainability is the business challenge of our generation. And India's role in our global climate is one of responsibility, impact, and opportunity.**

to service new revenue opportunities will be situated in Asia. India is among the top 15 countries (11th), with the most companies and investors participating in climate adaptation initiatives. India is on a remarkable development path. On one side, the commitment to net zero has been led from the top with a vision and a plan around the Panchamrit or five nectar strategy. And on the other side, digital initiatives like the Aadhaar, financial inclusion, Unified Payment Interface, Digilocker, Open Network Digital Commerce (ONDC), Digital India, and tech-entrepreneurship are indeed pathbreaking. And that's where the inter-woven digital and sustainability strategy comes in.



The key will be to create climate action business cases that fundamentally integrate sustainable processes. Many digital transformations don't currently include climate-related solutions – but they should. This means building climate action into business cases from their inception, and climate action cannot be an adjacency to other business processes. In today's world, digital tools are critical to identifying, collecting, analyzing, and using data.

Companies tend to move through three stages as they undertake their digital climate journey:

- from the early stages of driving data transparency;
- then optimizing and using data to make more sustainable business decisions;
- and to then scale climate best practices across industry business networks and value chains.

But we are still in the early stages of this transformation. Our own research found that 54 per cent of Indian businesses are not completely satisfied with their ability to measure their impact on the environment accurately. Three in ten (31%) Indian businesses rely solely upon assumptions and estimates to screen the environmental impact of their supply chain. And 46% of Asian businesses say they don't have complete visibility over the climate metrics of their external supply chain.

The first step for every business is to start capturing emissions data reliably at the source. In the same way, we measure the financial impact of every activity in our organizations; we must integrate non-financial, environmental, and social data into our core business processes as well. Only then can we operationalize climate action in our decision-making. That's when we will be able to traverse the path of zero emissions, zero waste and zero inequality.

And sustainability is not only about minimizing risk. It is an opportunity too. IDC predicts that by 2024, 30% of organizations will use ESG Data Management Platforms. The other interesting development is that of connected data to use scope 3 for organizational accountability. Gartner found that two-thirds of organizations intend to hold supply chain leaders accountable for defined environmental and social sustainability KPIs. That's where the need to realize the value of connected data to track, report and reduce impact across the entire product life cycle. Similarly, IDC predicted that by next year, 80% of Forbes Global 2000 companies would capture their carbon data to report their enterprise-wide carbon footprint. IDC also predicts an increase in sustainability-related digital technology spending next year by 25% as compared to 2022.

Therefore, sustainability offers the potential for cost savings and performance improvement.

A great example of this is WayCool, a food and agritech company in India. They created an environmental dashboard to pull data from IoT devices and financial and operational data from its ERP and provide insights on clean energy, energy and water efficiency, and waste management. WayCool has mitigated over 83 tons of carbon emissions and saved tens of thousands of dollars at the same time. Similarly, GreenToken by SAP uses blockchain technology to boost sustainable outcomes and increase circularity by better recovering waste plastics. The process aims to visualize the manufacturing process, the inspection process, physical properties, and quality information to understand how much-recycled material is contained in the products.

The opportunity exists for all to integrate Digital technologies into a vision of moving from profitably sustainable to sustainably profitable.

# Digitalization: Towards inclusive growth



## Rishi Gupta

MD & CEO, Fino Payments Bank and  
Co-Chair, National Council for Banking, ASSOCHAM

The last decade and a half witnessed innovations in financial technology that forever changed the banking and payments landscape.

Not long ago, this was unthinkable as millions of Indians, especially from rural areas, were deprived of access to formal financial services owing to poor or lack of banking infrastructure. Today, we are in a different space with digital encompassing every aspect of life, more so in banking.

### Game changer

Aadhaar has single-handedly transformed banking and emerged as the game changer of all innovations. The digital infrastructure created on the Aadhaar platform, India Stack, is helping firms scale up and create sustainable business models. For the BFSI sector, the ease of Aadhaar-based eKYC for onboarding customers and authenticating transactions resulted in increased customer engagement and value creation for all stakeholders.

As of February 2023, over 136 crores (1.36 billion) Indians have Aadhaar numbers, with more than 55% (75.4 cr) of them linking their bank accounts with Aadhaar. Such a huge database of digital identity-linked bank accounts helped widen access to financial services at a low cost.

**Aadhaar has single-handedly transformed banking and emerged as the game changer of all innovations. The digital infrastructure created on the Aadhaar platform, India Stack, is helping firms scale up and create sustainable business models.**

The JAM (Jan-Dhan, Aadhaar, Mobile) trinity opened more than 48 crore accounts, with 67% from rural areas. Interestingly more than 55% of the total accounts are of women, indicating their key role in managing household finances.

### Digital payments

Unified Payments Interface (UPI) has become the new normal for making small-value grocery and food payments. With the amount directly credited into the bank accounts instantly, entrepreneurs can focus more on improving

their business. The seamless integration of payments and banking is leading to higher deposit accumulation and savings.

To put in perspective the impact of UPI, the network processed ₹ 7,404 crore transactions worth ₹ 126 lakh crore in FY22. In FY23, till the end of February, around ₹ 7,374 crore transactions worth ₹ 123 lakh crore have been processed.

The success of UPI is an excellent example of technology enabling inclusion. From the top corporate executives to students, to women, to vegetable vendors, to people in the hinterlands, all get to feel the same seamless digital experience without any differentiation.

## Goods and Service Tax

Another digital intervention that has been formalizing transactions is the Goods and Service Tax (GST). Easier tax filings through online portals resulted in many manufacturers and small business owners joining the formal system. It is now possible to collect, store and analyze information on the informal sector. Since its launch in 2017, the registered GST taxpayer base doubled from over 6 million to 13.6 million by the end of FY22.

## Digital financial inclusion

An estimated 600 million people need access to quality banking services. Financial inclusion, therefore, is a major step toward achieving inclusive growth. To take banking to the last mile, the digital-led branchless model proved an efficient option against the expensive branch approach. Micro ATM and AePS-enabled neighbourhood shops are the new local banking points that are helping Bharat customers adopt digital banking, though largely in the assisted mode. The impact of branchless banking on inclusive growth has been:

- **Cost-effective banking access:** At a fraction of a cost, the neighbourhood stores become banking outlets, i.e.

**human ATMs.** It is scalable, sustainable and profitable.

- **Employment:** More than 22 lakh business correspondents (BC) or merchant outlets provide banking services in villages. An alternate employment opportunity is created for local youth.
- **Interoperable and paperless platform:** Any bank's customer can bank at the BC outlet. Being paperless is customer as well as eco-friendly.
- **Remittances** are a key source of family income in rural areas critical for economic and social growth. Branchless points make it easier for the sender and the receiver.
- **Local economy:** Enables cash digitization for businesses operating in cash-dominated rural markets. Local cash in the local economy improves cash availability.
- **Democratize banking:** Anytime availability, access to a range of products - savings, health, life, motor insurance, credit, mutual funds, gold loan etc. to ensure financial security.
- **Direct benefit transfer (DBT):** The expanding Aadhar-linked banking reach is critical in ensuring last-mile delivery of welfare payments. The effectiveness of the digital-based channel was felt during COVID.

## Conclusion:

Aadhaar is undoubtedly the key to digital integration in India. With customers across age groups, profiles, and demographics on digital platforms, analyzing their transaction data would open new avenues for engagement, product innovation, and service enhancement.

As a banker, I personally get excited at the pace of digital transformation that has the potential to realize the fortune at the bottom of the pyramid through inclusive growth.

# Digitalization: The Future of Sustainability in India



**Umesh Kamble**

Co-Chairman, ASSOCHAM MSDC and  
| Founder & Director, Farm to Fork Solutions

India is a developing country with more than 1.3 billion people. With the increasing population, the demand for resources is increasing, and the need for sustainability has become more critical than ever. One of the most significant developments in recent years is the rise of digitalization.

Digitalization has become an essential component of modern life, with the rise of technology and data-driven processes that have transformed the way we live, work, and communicate. In recent years, India has made significant strides in embracing digitalization, with the government's Digital India initiative and the technology sector's rapid growth. This trend is set to continue in 2023, with digitalization playing a crucial role in ensuring the sustainability of India's economic, social, and environmental systems.

The government's Digital India initiative aims to bridge the digital divide and promote digital literacy and connectivity across the country. The initiative is expected to create a digital infrastructure that will enable the country to embrace new technologies and innovations, leading to improved economic growth and social welfare.

Digitalization has become an essential component of modern life, with the rise of technology and data-driven processes that have transformed the way we live, work, and communicate.

The implementation of digitalization in various sectors of the economy is expected to play a significant role in promoting sustainability in the country. The following are some of the ways that digitalization is expected to contribute to sustainability in India:

- **Energy Efficiency:** Digitalization can help improve energy efficiency in industries and buildings by leveraging IoT (Internet of Things) technology to monitor and control energy consumption. With the help of smart sensors and automation systems, industries can optimize their energy usage, reduce wastage, and minimize their carbon footprint.



- **Renewable Energy:** The energy sector is a significant contributor to greenhouse gas emissions in India. The government's push for renewable energy through initiatives such as the National Solar Mission and the Green Energy Corridor project has been significant. Digitalization can help optimize the utilization of renewable energy resources, improving energy efficiency and reducing carbon emissions.
- **Smart Agriculture:** Agriculture is a significant sector in India, employing over 50% of the population. Digitalization can improve the efficiency of agriculture practices through the use of precision farming techniques. This can help reduce water consumption, improve crop yields, and reduce the use of harmful pesticides and fertilizers.
- **Smart Cities:** India is one of the most urbanized countries in the world, with over 30% of the population living in cities. The government's Smart Cities Mission aims to promote sustainable urban development through digital technologies. Digitalization can help improve the efficiency of public transport, reduce energy consumption, and promote sustainable waste management practices.
- **E-Waste Management:** The rapid adoption of digital technologies has led to a significant increase in electronic waste in the country. Digitalization can help improve e-waste management practices through blockchain technology, which can ensure the traceability and accountability of e-waste throughout the recycling process.

## The Future of Sustainability in India

The combination of digitalization and sustainability is expected to pave the way for a brighter future in India. The government's push for digitalization and sustainability is expected to create new opportunities for businesses and

entrepreneurs, leading to improved economic growth and social welfare.

The adoption of digital technologies in various sectors of the economy is expected to create a more connected and sustainable future. The increased use of renewable energy, smart agriculture practices, smart cities, and improved e-waste management practices are expected to significantly reduce the country's carbon footprint, leading to a more sustainable future.

However, digitalization also brings challenges that must be addressed to ensure that it contributes to sustainability in India. One of the key challenges is the potential for increased energy consumption and carbon emissions associated with the use of digital technologies. As more devices and infrastructure are connected to the internet and data usage continues to rise, the energy consumption of the technology sector is expected to increase. To mitigate this impact, it is essential that the sector focuses on energy-efficient solutions, renewable energy sources, and the use of green data centres.

Another challenge is the potential for digitalization to exacerbate inequality and social exclusion. While digital technologies have the potential to provide access to essential services and resources, they can also create new forms of exclusion, particularly for those who do not have access to the internet or the necessary skills and knowledge to use digital technologies effectively. To address this challenge, it is essential that efforts are made to bridge the digital divide and ensure that digitalization benefits all members of society.

In conclusion, digitalization is set to play a crucial role in ensuring the sustainability of India's economic, social, and environmental systems in 2023 and beyond. With the right policies, investments, and collaborations, India can harness the power of digitalization to create a more sustainable and equitable society.

# Realizing the benefits of intellectual property in a digital environment



**K Subodh Kumar**

Co-Chairman, ASSOCHAM National Council on IPR and  
Head IP Services, TATA Consultancy Services Ltd.

Intellectual Property creation in the world of digitalization is location agnostic, and it is highly collaborative, involving multiple partners and co-creators. The co-creation environments necessitate interoperability and the application of high-security standards in data transfer and information processing. The ecosystem for inventors has to be agile, intuitive, location-agnostic, collaborative, secure, interoperable, reliable, and sustainable. In the assessment phase of novelty, utility and inventive steps of an idea, the inventors are challenged to reimagine the boundaries of inventions:

- Is it anticipative of shrinking the interdisciplinary boundaries of technologies?
- Is it adaptable to the ever-growing demands and needs of the market?
- Is it agile and brings in the key elements of cutting-edge differentiation that sustain the innovation for a longer duration and wider markets and customer base?

The landscape of intellectual property in a digital environment is redefining traditional boundaries. The white spaces of IP creation are an interplay of intellectual property,

**Investments in emerging areas like artificial intelligence, blockchain or 5G have ushered in a variety of products and knowledge-intensive solutions that are collaborative, intuitive and interoperable and set new standards of technologies and systems.**

competition, technology advancements, and investment priorities, which identify niche areas for businesses to create intellectual property and sustain in the fast-paced technological environment.

Investments in emerging areas like artificial intelligence, blockchain or 5G have ushered in a variety of products and knowledge-intensive solutions that are collaborative, intuitive and interoperable and set new standards of technologies and systems. So therefore,

building technologies which are resilient, futuristic, sustainable and capable of meeting the dynamic expectations of the customers is the order of the day. How do we secure IP Rights in a fast-paced technological environment?

## Ascertaining IP Ownership

As we increasingly discuss the changing environments related to co-creation and collaboration in the fast-paced technological environment. The complexities of ascertaining IP ownership must be sorted out and understood in various kinds of commercial engagements. The Question of IP Ownership in inventions related to AI is an interesting point for discussion-

These inventions require the involvement of various training data sets and exposure to various experiences. This is creating an immense opportunity to develop a wide array of AI-powered intelligent and intuitive modules which learn, deep learn and as a by-product, create and spawn new Intellectual property. Here the question of ownership of IP is a matter of important discussion that we are witnessing today, and the entire IP world is looking for answers to this important question.

## Realizing the benefits of Intellectual Property

The most important facet of this integration will be the realization of the benefits of Intellectual property.

The return on investment will be one of the standard expectations from an IP Owners perspective. The various dimensions of how the IP has been translated into an IP asset and how this has been leveraged in the market and the estimation of the business realization of the IP creation and protection. The realization of value from IP has to be established in an environment where co-creation and collaboration happen with multiple partners, e.g., Inventors, Startups, Academic institutions, third-party technology providers etc.

In a scenario where the IP asset is backed by Patents, the products or solutions are directly licensed and not the patents, the models of estimation of the business value of patents may see a paradigm shift from the conventional models. IP Owner to establish the return on investment on inventions in a variety of inter-related dimensions could leverage some of the approaches such as:

- The ability of inventions and intellectual property to enhance the product's or solution's intrinsic value and functionality. (Technical dimension)
- The intrinsic character of IP to benefit the intangible value creation from a customer point of view, i.e. customer perceptions of the innovative potential of the product/solution, the confidence in the process(es) of IP creation, Legal safeguards, risk-free potential. The customer expects to provide an intellectual property asset with minimum legal risk and maximum realizable value. This is certainly an engineering challenge too!

The above aspects can directly/ indirectly enhance the brand image of the corporate entity and thereby has immense potential to translate into a price premium and create an opportunity to generate profitability and revenue generation.

It is important for business decision-makers to realize that the adoption of these approaches in their internal assessments will facilitate the realization of the benefits of Intellectual property. It will also justify the rationale for investing in technologies, processes, products and platforms which facilitate the ease of operation, support the agile delivery mechanism, and enable faster and quicker realization of the benefits of Intellectual property.

# The future of Digitalisation in Indian healthcare



**Dr. Sujit Chatterjee**

Co- Chair ASSOCHAM Healthcare Council and  
CEO Dr. L. H. Hiranandani Hospital

India has been globally recognised for its capacity to innovate in the digital space. The country is also leading the campaign to support various countries around the world, especially the Global South, to learn from each other in tackling the digital and connectivity challenges.

Over the last few years, digital transformation has become a critical strategic priority, with the country leading the way in leveraging technology to empower its citizens and strengthen governance. With more than 500 million internet users, the country is among the leading and fastest-growing digital consumer markets. Additionally, being a vibrant start-up market allows India to foster innovation further and standardise new technologies. As India focuses on enhancing its manufacturing prowess and embedding itself as a preferred hub across global value chains, digital transformation on the back of emerging technologies, such as AI, ML, IoT, robotics, blockchain, and cloud computing, will drive economic growth.

The healthcare ecosystem comprises providers (doctors, physicians, specialists, etc.), payers (health insurance companies), pharmaceutical

**In the modern healthcare domain, electronic health records (EHRs) have been widely adopted to enable healthcare providers, insurance companies, and patients to create, manage and access patients' healthcare information from anywhere and at any time.**

companies, IT solutions and services firms, and patients. Provisioning healthcare involves massive healthcare data in different forms (structured or unstructured) on disparate data sources (such as relational databases, file servers, etc.) and in different formats. When a patient is admitted to a hospital, his/her information is entered into electronic health record (EHR) systems. Physicians diagnose the patient, and the diagnostic information (from medical devices such as CT scanners, MRI



scanners, etc.) is stored in EHR systems. In the diagnosis process, the doctors retrieve patients' health information and analyse it to diagnose the illness. Doctors can take expert advice by sharing the information with consulting specialists. The cloud can provide several benefits to all the stakeholders in the healthcare ecosystem through systems such as health information management systems, laboratory information systems, radiology information systems, pharmacy information systems, etc. With public cloud-based EHR systems, hospitals do not need to spend a significant portion of their budgets on IT infrastructure. Public cloud service providers provide on-demand provisioning of hardware resources with pay-per-use pricing models. Thus, hospitals using public cloud-based EHR systems can save on upfront capital investments in hardware and data centre infrastructure and pay only for the operational expenses of the cloud resources used. Hospitals can access patient data stored in the cloud and share the data with other hospitals. Patients can provide access to their health history and information stored in the cloud (using SaaS applications) to hospitals to streamline the admissions, care, and discharge processes. Physicians can upload diagnosis reports (such as pathology reports) to the cloud so that doctors can access them remotely to diagnose the illness. Patients can manage their prescriptions and associated information, such as dosage, amount, and frequency, and provide this information to their healthcare provider. Health payers can increase the effectiveness of their care management programs by providing value-added services and giving access to health information to members.

In the modern healthcare domain, electronic health records (EHRs) have been widely adopted to enable healthcare providers, insurance companies, and patients to create, manage and access patients' healthcare information from anywhere and at any time. Typically, a patient may have many different healthcare providers, including primary

care physicians, specialists, therapists, and miscellaneous medical practitioners. Besides, a patient may have different types of insurance, such as medical, dental, and vision insurance, from different healthcare insurance companies. As a result, a patient's EHR can be found scattered throughout the entire healthcare sector. From the clinical perspective, in order to deliver quality patient care, it is critical to access the integrated patient care information that is often collected at the point of care to ensure the freshness of time-sensitive data. This further requires an efficient, secure and low-cost mechanism for sharing EHRs among multiple healthcare providers. Particularly in some emergency healthcare situations, the immediate exchange of patients' EHRs is crucial to saving lives. However, in current healthcare settings, healthcare providers mostly establish and maintain their own electronic medical record (EMR) systems for storing and managing EHRs. This kind of self-managed data centres are very expensive for healthcare providers. Besides, the sharing and integration of EHRs among EMR systems managed by different healthcare providers are extremely slow and costly. Such inefficient usability and low cost-effective fashion become the biggest obstacles to moving the healthcare IT industry forward. A common and open infrastructure platform can play a vital role in addressing and changing such a situation.



# Role of digitization in sustainability



**Avinash Gupta**

Co-Chair, ASSOCHAM MSME Development Council and  
Managing Director & CEO – India, Dun & Bradstreet

**S**ustainability has become a mainstream business concept and not just an ethical consideration. In fact, sustainability is high on the global corporate and government agenda. At the start of 2023, 140 countries had announced targets towards net zero, accounting for 90% of global carbon emissions. To achieve India's target of cutting its carbon emission by one billion tons by 2030 and reaching net-zero carbon emissions by 2070, the Indian government and businesses have a larger role to play as they are the key economic agents driving the change.

Indian companies are taking steps to reduce their environmental impact as they recognize the importance of sustainability. In this regard, digitization has an important role in promoting sustainability by ensuring transparency and accountability. The use of digital technology in sustainability reporting helps improve transparency and accountability, making it easier for stakeholders to hold businesses accountable for their environmental impact.

Besides, the use of digital technology in areas such as natural resource and waste management, sustainable urban development, and planning and monitoring would improve

**The use of digital technology in areas such as natural resource and waste management, sustainable urban development, and planning and monitoring would improve sustainability outcomes.**

sustainability outcomes. However, it is important to recognize that digitization is not a silver bullet and must be combined with other sustainability initiatives to achieve meaningful results.

To achieve the potential benefits of digitization for sustainability, it is important for businesses to adopt sustainable processes, even more so for MSMEs. Since MSMEs account for 99 per cent of all businesses in India and are important agents for regional development, their adoption of sustainable processes will be critical for India to achieve its goals around carbon neutrality. Yet only a small percentage

of MSMEs are implementing sustainability initiatives. In a survey conducted in early 2023, Dun & Bradstreet found that awareness of sustainability measures amongst MSMEs is low, and 69% are only partially aware of the opportunities from implementing sustainability measures and relevant sustainability factors for their business, sector, and geography. Survey findings indicate a significant disparity between 'speak' and 'walk'.

Large enterprises view sustainability as a strategic issue and are prioritizing their efforts. Conversely, MSMEs face more fundamental barriers due to a lack of financial resources and knowledge. Compared to large entities, MSMEs find it more challenging to commit to sustainability because they don't have the basic building blocks to create a sustainable foundation for their business.

A Dun & Bradstreet (D&B) survey found that technical know-how and established operating procedures are the biggest challenges for 45% of MSMEs. Hence, despite the thrust towards sustainability, there is no clear strategy that small businesses have for determining why, when, and to what extent they should adopt sustainable practices as part of their overall business strategy. This is where digitization and technological adoption can make a significant difference. Digitization allows for near-real-time knowledge transfer and an instant feedback loop (through measurements and monitoring at the source). Recent technological advances provide low-cost, efficient, and effective tools to monitor and control emissions, waste, and resource utilization.

D&B plays a crucial role in enabling Indian companies in their sustainability efforts. By leveraging data and analytics on a range of sustainability indicators, such as environmental impact, social responsibility, and governance practices, D&B helps businesses identify areas where sustainability improvements can be made. We make this information available to businesses, investors, and other stakeholders.

D&B plays a critical role in promoting sustainability in India by providing reliable and comprehensive information on corporate sustainability practices.

D&B also provides ESG reports and risk assessments, which help companies identify and mitigate ESG risks in their operations and supply chains, thus helping them avoid reputational damage, regulatory sanctions, and financial losses associated with ESG risks. D&B also helps companies build sustainable supply chains by providing data on the sustainability practices of their suppliers. This enables companies to identify suppliers who share their sustainability values and work with them to improve their sustainability performance.

In conclusion, corporate data providers play a critical role in promoting sustainability in India. By providing reliable and comprehensive information on corporate sustainability practices, they encourage transparency and accountability, promote sustainable investing, help identify sustainability challenges and opportunities, drive innovation, and promote sustainability reporting. It is hard to think of achieving sustainability in a vast and diverse country like India without the adoption of technology and digital transformation.



# Mapping Cyber-Security

**Jyoti Prakash Gadia**

Co - Chair, Haryana State Development Council and  
Managing Director, Resurgent India Ltd.



In the event of a data breach, scrambling to address the crisis as it unfolds can be an unnerving task. A recent study revealed that data breaches are among the top three sorts of incidents that can harm a brand's reputation. Consumers typically anticipate some form of compensation following a security breach. To prepare for a data breach and streamline the response process, it's essential to establish a crisis communication team within your breach response team. Also, it is imperative to establish clear roles and responsibilities in advance, to ensure everyone knows their part in safeguarding data. This means taking a comprehensive inventory of your data assets and potential risks and conducting simulations to anticipate the goals and manoeuvres of potential attackers.

Determining where to begin and what factors to consider can be daunting as a company seeking to safeguard your data. An employee misplacing a laptop does not have the same ramifications as a data breach caused by criminal activity. Criminals breaking in is the reason for 45% of cyber security breaches, and this is causing the cost of breaches to hit the roof. Organizations need to recognize the distinctive impact of malicious attacks versus internal errors.

**The vast majority of successful attacks can be traced back to mistakes made by network administrators and users, such as failing to patch vulnerabilities in legacy systems, misconfiguring settings, and violating standard procedures.**

To effectively manage risk, it's not enough to simply implement security procedures. It is important to understand which types of attacks leave you most vulnerable. Although technical upgrades are essential, minimizing human error can be even more vital. The vast majority of successful attacks can be traced back to mistakes made by network administrators and users, such as failing to patch vulnerabilities in legacy systems, misconfiguring settings, and violating standard procedures. These errors create vulnerabilities that malicious actors can exploit, accentuating the need for



a human-driven approach to cyber security that emphasizes vigilance and adherence to established protocols.

Managers, however, frequently rely on vague qualitative guidance to assess their vulnerability, which groups routine minor and exceptionally big losses together. This approach falls short in providing managers with a clear understanding of the scale of their problems, leaving them unsure if they're dealing with a Rs. 1 crore or a Rs. 100 crore issue. In order to prioritize their cyber-security capabilities accurately, companies must move beyond vague categorizations and adopt a more data-driven approach to risk assessment.

By analyzing their risks through the lens of foregone revenue, possible legal claims, and reputational damage, companies can more realistically determine how much they should invest in mitigating their cyber threats. This multifaceted approach does also enable businesses to allocate their resources more efficiently.

Companies that fall victim to a cyber-security breach are confronted with numerous risks, including the possibility of significant liability losses. The potential financial impact of legal claims or litigation resulting from the breach can be devastating for a business. In many cases, companies may be held responsible for damages resulting from the breach, including loss of personal data, theft of intellectual property, or if sensitive information is compromised.

To address this risk, companies must take proactive measures to reduce their liability exposure. This may include implementing robust cyber security protocols and ensuring compliance with germane regulations and standards. Businesses also need to develop a response plan in the event of a breach, including procedures for notifying affected parties and mitigating the impact of the breach. Companies



that fail to take adequate steps to address their liability risk often find it hard to recover from the reputational damage caused by a breach.

In order to gauge their risk exposure accurately, organizations must acquire and analyze comprehensive business, operational, and technical data that can be simulated against both base-case and worst-case scenarios. Additionally, companies must also consider the potential impact of cyber breaches on their customer base and financial performance in case of a cyber-attack-caused outage and assess the damage that a reputational hit from a cyber-attack could inflict on their margins.

Gathering and analyzing this information allows managers to assess the effectiveness of their existing cyber-security protocols and proactively budget for potential cyber-security risks. While quantifying cyber threats can be complicated, businesses must prioritize this effort. Fortunately, many companies possess the necessary technical expertise and understanding of cyber threats to assist managers in evaluating the costs and benefits of addressing these risks. Compared to the past, there is now a smaller margin for error in assessing cyber risks.

# Challenges of Digital Transformation in SMEs



**Arunabha Ghosh**

Founder & CEO, Blue Copper Technologies Pvt. Ltd.

I would like to share some of my Digital Transformation and Solution Implementation experience in the MSME segment. Claimed as one of the huge untapped markets in India and abroad, it allows an organization the opportunity to reimagine the way a business can make use of the new digital processes and tools.

As a business leader, I have taken every step to understand the various digital transformation challenges which are or are not directly related to technological concerns or technical barriers. It is imperative that we identify and assess which specific problems affect a business to create a plan to overcome them.

Over the years, I have realized that courage and the will to adopt change are the first steps toward owning a digitized company. Digital transformation is not a short sprint but rather a marathon. Most companies are still warming up and have not really started running. Just like a marathon, digitization cannot be covered in the shortest possible time, as the path holds a number of challenges and hurdles that need to be overcome.

Just taking part in the race is also easier said than done - as per the statistics, 70 per cent of

**Digital transformation is not a short sprint but rather a marathon. Digitization cannot be covered in the shortest possible time, as the path holds a number of challenges and hurdles that need to be overcome.**

digital transformation fails due to resistance from employees and lack of support from the management (McKinsey). Furthermore, only 16 per cent of employees stated that their company's digital transformation efforts enhance their performance.

For this reason, a business owner, in most instances, is looking for solutions and not technology. To have the solution, they either ask to build it or buy a product. And they consider this engagement successful when it meets their business needs within time & budget.

Let's discuss the factors a business needs to consider to plan a successful implementation of digital transformation.

### **What is the actual & precise business problem to solve?**

Various digitization projects are still running in patches. Often the overarching strategy in a company makes it difficult to maintain an overview of the ongoing project status. To guarantee competitive security in the long term, it is important to take a holistic view of the business. The identification of actual & precise business problems is the most important point in the course of strategy development.

At this point, every SME must ask themselves whether their entire business model will change due to the digital transformation or whether the first step for them is merely to digitize supporting processes.

To successfully master digital transformation, it is crucial to understand how the business can evolve through an overarching strategy in which the actual transformation takes place.

What kind of data is needed for this implementation; how do you ensure this timely, clean data?

The importance of clean data cannot be overstated - as most of the future-looking solution is data-driven, It's like creating a foundation for a building: do it right, and you can build something strong and long-lasting.

### **How does this solution impact existing workflow & processes?**

With the introduction of new processes and technologies, the existing workflow often faces resistance to change. For a new software implementation, companies should look to provide comprehensive onboarding training. We need to create product and process champions within the team to carry out a smooth transition.

### **How does your customer react to this new solution?**

In this transformation world, with constant evolution - digital transformation is not an easy project to adopt. It is an intensive transformation that takes years to accomplish. But during this process, our end client should be least impacted, and we should plan accordingly.

### **What kind of challenges do we usually face within an organization?**

It is witnessed that there is a certain risk-averse culture that lingers within many enterprises when it comes to digital transformation. Some business leaders see no benefit in changing their tried-and-true practices, especially if they are achieving positive results. Employees may feel uncertain about the new roles and responsibilities that come with digital transformation. By not addressing these issues, businesses risk losing crucial growth opportunities.

### **What organizational changes do you need?**

Organizations that are still working with legacy systems and manual processes are often stuck with their old-school nature. Things get nurtured slowly, automation is often looked down upon, and new technologies become difficult to adopt.

A significant cultural challenge that digital transformation faces is that everyone – from top management to new employees – must be aligned to the digital strategy. Everyone should be ready to adapt to changes and not be afraid of learning new things.

### How much money do you need to invest?

We know that digital transformation is not a cheap investment - those organizations who have less-than-stellar transformation strategies, their scope creep can slowly start to push back deadlines and add in new work – all adding to the cost of a project.

So the business should target phased & result-oriented

implementation that will help them to utilize their budget more efficiently & optimally.

### What will be the ROI of this investment?

Every SME needs to understand what their long-term goals are, and what ROI they plan to achieve from their transformation process. This will help to clearly understand what spending is too much and what room they have to increase in their budget.

### In which timeframe do we want to get your investment back?

Implementation of the digital transformation is not always very costly for the SME - a smart & comprehensive strategy should be in the first place by the experts and the business should

set the time frame to get their investment back on that time period.

To start with one should calculate the expected costs, potential long-term benefits, and investment returns before implementing the transformation. Consider also additional costs your digital shift will entail as your business grows.

## Wrapping Up

After completion of the successful study, people have to identify the right solutions & the partner who can implement this because the best solution in the market may not be the RIGHT solution for you.

Solution Partner will play a very important role not only in Solution Development & Implementation but also in the adoption process through the right training and handholding.

So it is not the GOAL to build & implement new technologies; the real achievement will be how we can help our clients to ADOPT the right solutions to solve their true operational & business problems and contribute to their business growth.

And that will be a real success!





# Unlocking India's Digital Future

*How Digitization is revolutionizing the Way We Live, Work, and Connect!*



## Simarpreet Singh

Co-Chairman, ASSOCHAM Higher Education Council East and Director, JIS Group Educational Initiative

The world nowadays has shrunk to minuscule. Earlier, life was very different, where people primarily relied on physical interactions and transactions, which were time-consuming and often inconvenient, but technology has changed everything. With the advent and advancement of technology, digitalisation has transformed businesses, society and the world. To say the least, it became an integral part of India's economic and social fabric.

The adoption of digitalisation has brought about significant changes in the way businesses used to operate. There is a flood of E-commerce companies like Flipkart, Myntra, Amazon, etc., that are among the largest retailers in India, with millions of transactions taking place online every minute. Similarly, online food delivery platforms like Swiggy and Zomato have revolutionised the food industry, making it easier for people to order food from their favourite restaurants without even having to step out of their homes.

Apart from transforming the way businesses today operate, digitalisation has also had a profound impact on India's socio-economic

**Digital Payments Driven by the government's push for a cashless economy and the widespread adoption of smartphones, digital payments have gained significant traction in India.**

landscape and pace of growth. With the rise of social media platforms like Facebook, Twitter, and Instagram, people now have powerful tools at their disposal to connect and communicate with each other. Today, it is easier than ever before to stay connected with friends and family members who live far away in a remote part of the world.

However, the benefits of digitalisation span beyond just convenience and connectivity, and it has also played a crucial role in transforming the lives of millions of people in India. For instance, the government's Digital



India initiative, launched in 2015, aims to provide all citizens with universal digital literacy and access to digital infrastructure and digital services. Through this initiative, the government has bridged the digital divide and empowered millions of people with access to education, healthcare, and financial services.

Moreover, digitalisation has also played a critical role in driving financial inclusion in India. With the launch of the Unified Payments Interface (UPI), people can now transfer money instantly and securely from their mobile phones without the need for physical cash. This has not only made transactions more convenient but has also helped bring millions of people into the formal financial system.

Among several areas where digitalisation has made the most significant impact in India is education. With the rise of e-learning platforms like Byju's, Unacademy, and Toppr, students have a choice of institutes and can choose the best among the lot and now access high-quality education from the comfort of their homes. Moreover, with the proliferation of affordable smartphones and internet connectivity, students from even the remotest corners of the country can now access digital education.

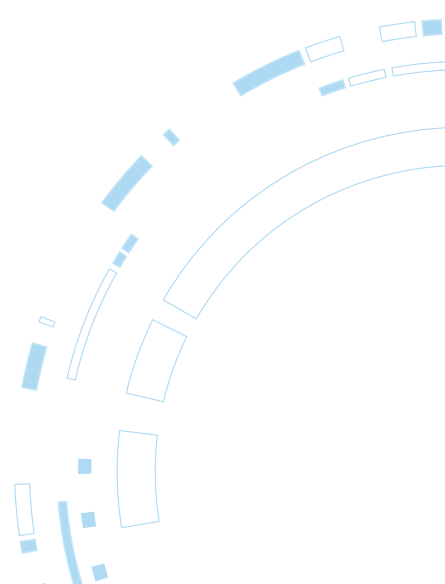
Not only in the education sector, but digitalisation has also played a critical role in driving entrepreneurship in India. With the rise of digital platforms, it is now easier than ever before to kick-start and run a business in India.

Platforms like Amazon and Flipkart have made it possible for small businesses to sell their products to customers all over the country, while platforms like Ola and Uber have created new horizons and innumerable opportunities for people to earn a livelihood.

However, there is a flip side to digitalisation too. While it has brought a whole lot of significant benefits, it has entailed new challenges. Among many challenges, data privacy and security are the top most threatened. People are sharing more and more of their personal information online, thus becoming vulnerable to cyber-attacks and data breaches.

The second most important issue with digitalisation is that it has brought with it the issue of job displacement. Increasing automation and artificial intelligence have made it possible for machines to perform many jobs which were previously performed by humans. While this has led to increased speed, efficiency and productivity, it has also led to job losses in a few sectors.

There is no denying the fact that digitalisation has transformed India in more ways than one. It has brought about convenience, connectivity, and empowerment and has played a crucial role in driving economic and social progress in the country. As India continues to embrace technology, it is bound to become an even more digitally-enabled society, paving the way for a brighter tomorrow.



# Future of Construction and Real estate (CRE): Metaverse



**Ar. Jyothi Gupta**

Associate Professor, School of Architecture, Christ Bangalore

Industries are looking for strategies to transform disruption into an opportunity as the Metaverse takes shape and starts to reflect and improve all elements of real life. The Metaverse is not only having an influence on consumer goods, entertainment, and other industries, but it is also altering the way we think about co-development and co-design, places, enterprises, and societies. By 2024 alone, the worldwide income opportunity in the Metaverse is expected to total \$800 billion, according to Bloomberg. The Metaverse is blooming with innovative projects, many of which involve CRE value chain participants. Examples include enhanced city development, such as that promoted by the University of Pretoria, or city co-development and co-design, as we have seen in Singapore. Also, we see a trend towards co-design and co-development based on building information modelling (BIM) and digital twin in a more immersive fashion, as well as through the exchange of virtual land and CRE assets like architectural designs and actual homes using non-fungible tokens (NFTs).

With stakeholders from across the world, go through the development of a new building,

**The design industry will need to stay one step ahead as Moore's Law kicks in and technology accelerates this convergence of physical and digital environments.**

**The 3D, Metaverse will make it easier to make changes in the products, services, and work processes of design firms.**

discuss any issues, and plan the following phases. The meeting can start with everyone using a virtual reality headset. They are then brought to the virtual conference table, where they may view digital copies of themselves to represent the finished product.

Using 360-degree cameras, virtual guests may have a virtual tour of the project's actual

site location. Let's examine how the building industry will change because of the Metaverse.

Construction has a smaller profit margin than most other global economy businesses. So, it must benefit from any technological developments that increase production. One may increase production rates by implementing robots, intelligent automation, and artificial intelligence in several sectors. In the Metaverse, project cooperation will be more effective.

Throughout the first two years of the epidemic, we have seen how useful augmented, and virtual reality can be when working outside of the usual office setting. Engineers may interact with clients more efficiently, present models remotely, and save time travelling if they use virtual and augmented reality (VR and AR). The advantages of collaborating virtually outweigh those of the zoom call.

The most recent technology and an update of traditional CAD methods are called building information modelling (BIM). Virtual reality (VR) expands on this by displaying a virtual image of a physical object.

In this area of the Virtual world, engineering and construction companies are more likely to be engaged. The next logical stage in the CAD/plan evolution is digital twins. It enables a thorough representation of existing structures like bridges, and one may produce whole cityscapes. Some of the most well-known creators of digital twin software are Cupix, Bentley Systems, and Unity Software. Along with Hyundai, Unity created a digital duplicate of a key South Korean car plant.

The term was coined by American author Neal Stephenson in his science fiction novel *Snow Crash*, which came out in 1992. In the novel, humans interact with avatars in a three-

dimensional virtual environment, which is essentially what we anticipate from the Metaverse. In addition to its name, numerous businesses are currently working on the next section of the internet.

The conversation regarding the role that architects and designers play in establishing connections between the real and virtual worlds has only just begun, and it will continue to develop as new layers emerge. Authors and researchers think that designers must take advantage of this opportunity, even though they acknowledge that it may be frightening to some due to its novelty. The authors assert, "It will be better for us to assist in defining this new digital world than to ignore it." It is occurring. And how designers and architects participate is entirely up to us."

The Metaverse is coming, regardless of its definition. Look at the ubiquity of smartphones and watches, augmented and virtual reality (AR/VR) headsets, immersive video games, Peloton screens, and futuristic Tesla dashboards. It is already here in many ways. The design industry will need to stay one step ahead as Moore's Law kicks in and technology accelerates this convergence of physical and digital environments.

The 3D, Metaverse will make it easier to make changes in the products, services, and work processes of design firms. The opportunities range from developing entirely new universes and revenue streams to creating a parallel digital universe that imitates the real world.

By the end of 2026, the metaverse industry in India is anticipated to reach a staggering \$758 billion, according to market estimates. Not only that, but India is currently ranked fifth among the nations that are driving the metaverse market.



# Digitalization and Automation to tackle Productivity challenge in Construction Industry



**Sudip Mazumder**

Head Digital, Larsen & Toubro Ltd

## Construction Industry: The Good, Bad and Ugly faces

The global construction market was valued at approximately 12.9 trillion U.S. dollars in 2020. The construction industry in India was valued at approximately 3.05 trillion Indian rupees (approx. 41 billion U.S. dollars) in 2020 by Statista Research

The turnover of the construction industry varies depending on various factors such as economic environment, infrastructure emphasis, and government policies. The figure may not include other aspects such as construction-related services or the manufacturing and supply of construction materials. If put together, the gross size could be double the size estimated.

In India, the construction industry the construction industry employed over 51 million workers in 2019-20 which includes both formal and informal workers, according to a report by the National Skill Development Corporation (NSDC),

Globally, the construction industry is one of the largest employers, with estimates ranging from around 100 million to 180 million

**Globally, the construction industry is one of the largest employers, with estimates ranging from around 100 million to 180 million workers worldwide.**

workers worldwide. The International Labor Organization (ILO) estimates that around 7% of the global workforce is employed in the construction industry.

The construction industry is comparatively hazardous, and unfortunately, India has observed incidents and fatalities in the sector. According to the Ministry of Labor and Employment, 5,638 accidents and 1,061 deaths took place in India in 2019. The frequent causes of accidents include falls from heights, being struck by falling objects, electrocution, and hit by machinery.

The construction industry is estimated to be responsible for around 23% of global carbon



emissions, according to a report by the Global Alliance for Buildings and Construction. This includes both operational emissions from buildings and emissions from construction activities. Additionally, the construction industry is also responsible for the emissions associated with the production and transport of building materials.

### The Productivity Challenge: Labor and Machine

The Construction Industry has significant Productivity issues, globally when compared with other core industries such as Manufacturing or Oil & Gas. Productivity is one of the critical reasons of project estimation and delays.

Productivity data for the construction industry can vary depending on the country, region, and construction sector. However, here are some global and India-specific statistics on construction industry productivity:

- The construction industry has seen an average productivity growth of only 1% per year over the past two decades, compared to an average growth of 2.8%

for the total world economy. (Source McKinsey Global Institute)

- In India, the construction industry's productivity has been growing at an average rate of 1.7% per year over the past decade. (Source National Skill Development Corporation)
- A study by the Boston Consulting Group found the construction industry estimated to be less than 10% of productivity in the manufacturing sector.

The Construction Industry has been seeing both Labor Productivity and Machine Productivity challenges.

The sector has been increasingly facing lack of workers in general with the growing trends in urbanization, lack of skilled workers relevant for Construction sector, inadequate technology adoption, and not-so-good project management practices as some of the factors contributing to low productivity in the sector.

Plant and machinery are critical components of the construction industry, as they are used to carry out a wide range of construction activities efficiently and safely. The use of

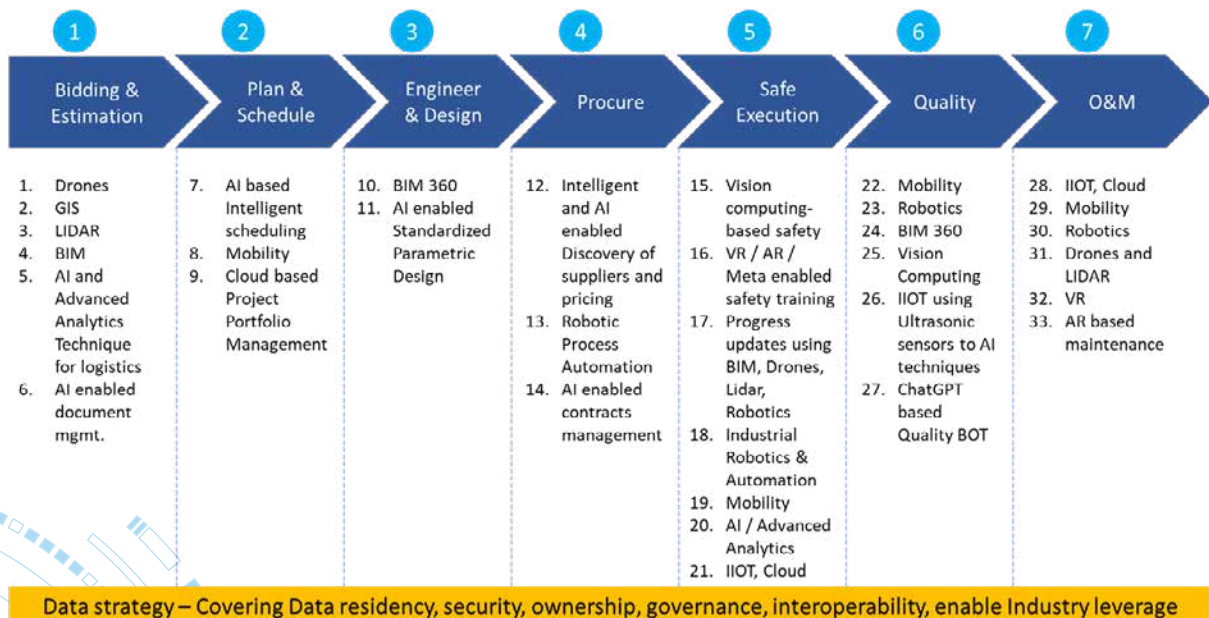


## Improvement of Productivity: Digitalization, Automation and Mechanization

Improving productivity in the construction industry is critical for delivering projects on time and on budget with desired Quality. The value chain of Construction industry has immense potential to boost efficiency and productivity using various tools, technologies, software, hardware of modern era. Industry 4.0 has opened a new horizon to connect the Construction Industry operations and capturing last mile information. Last mile information is helping reducing gaps through delayed reporting to timely interventions, increased transparency, thereby, higher productivity.

advanced plant and machinery has become increasingly important in the construction industry. However, plant and machinery in the construction industry also poses some challenges, such as the high cost of acquiring and maintaining the equipment and the need for skilled operators to operate the machines safely and efficiently. Additionally, the use of heavy machinery can have an impact on the environment and can contribute to noise and air pollution.

Some of the Digital and Automation tools and solutions have been listed in the diagram below and it goes without saying that the companies have started deploying many of them in their work sites innovatively.





## **Conclusion: Use judgement, raise skills, collaborate to raise Industry adoption**

Adopting advanced technologies is must for the Construction Industry. Technology does not mean only Digital alone as the Construction sites are rugged, often devoid of any civilization. The latter condition necessitates to look all options such as mechanical, Electrical, Electro-mechanical automations as well.

Tasks are often repetitive and high volume, machine intensive, labor intensive or both. Therefore, usage of Automation, Mechanization and Digitalization must be weighed

appropriately along with the flow of Labor force, skills levels, type of work that are being carried out, complexity of machines and spare parts, logistical challenges and so on.

Industry needs to work collaboratively to raise the general adoption of technology to create better quality, labor movement, fungibility of machines to a good extent. Such environment will unlock the company, industry, and national potential by reducing the inefficiency and unproductive resources. This will, instead of price war based unhealthy competition to an era of competing through value addition and innovation.





# Harnessing the power of digital transformation to transform the education sector



**Prof (Dr.) Manpreet Singh Manna**

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Over the past few years, the world has witnessed a massive transformation in how education is imparted and accepted. The concept of learning and teaching has changed drastically with the advent of digital inclusion in the education sector. Digital transformation has paved the way for a new era of learning and education.

Technological advances have made education more accessible, interactive, and engaging than ever before. The wealth of online educational resources has allowed students a more comprehensive understanding of their field of study and access to a much more extensive range of educational materials.

Digital tools have enabled students to collaborate and interact with each other and their teachers and mentors, thus creating an active learning environment. Digital transformation of the education sector has also made it easier for teachers to collaborate and share resources. Teachers can now effortlessly share course materials, lectures, and assignments with their colleagues, making the teaching process more streamlined.

**The acceptance of digitalization by educational institutions is helping to create a more equitable and accessible education system.**

In recent years, most countries have started making a commendable effort to accelerate the innovation and application of digital technologies in education. For instance, the Honourable President of India, Shri Pranab Mukherjee, launched SWAYAM, the world's most extensive Massive Open Online Course (MOOC) platform, on 9th July 2017.

The SWAYAM platform has been jointly developed by the Ministry of Education (MoE) and AICTE with the assistance of Microsoft, offering free access to over 2,000 interactive online courses from class 9 to the post-graduate level. The primary objective of the SWAYAM

initiative is to achieve the three cardinal principles of education, viz., access, equity, and quality.

Another notable achievement of the Ministry of Education (MoE), Government of India, is the National Digital Library of India. NDLI is a globally renowned national mission project on education to develop a single-window platform to access learning and educational resources in English and ten of the most used Indian languages.

NDLI results from the remarkable capability of technological advancement, designed to make digital educational resources accessible to society which will further inspire, empower, and encourage learning. It provides free access to over 45 million digital resources to realize the vision of creating an inclusive, equitable, and accessible learning environment.

Furthermore, the development of the Vedic Heritage Portal at IGNCA, under the guidance of the Ministry of Culture, Government of India, is paramount in further uplifting the education sector globally. The digitalization of the ancient texts of India allows for easier access to a wealth of knowledge vital to understanding India's cultural and spiritual heritage.

By making ancient texts accessible, scholars and students can better understand India's spiritual and cultural heritage. In addition, the digitalization of Vedas, Brahmanas, Aranyakas, Upanishads, and Vedangas will help to preserve India's cultural legacy by making it easier for people to access and study these ancient texts.

The emergence and rapid adoption of ChatGPT in recent months have had a massive impact on education. Many teachers have started using it for routine tasks like grading and assessment and creating personalized content. As a result, students can engage more deeply with the material and get more out of their learning experiences.



ChatGPT is also used for creating virtual tutors and classrooms, enabling students to get personalized feedback and assistance on their assignments and lessons. It has the potential to positively impact education on a global scale by providing students and teachers with more efficient and engaging learning experiences.

Software applications such as Learning Management Systems (LMS) and Enterprise Resource Planning (ERP) have become indispensable to educational institutions due to their remarkable capability to improve the educational experience. Educational institutions use LMS to efficiently deliver course materials, content, and assessments, enabling seamless interaction between teachers and students.

On the other hand, ERP systems provide real-time data that allows schools, universities, and other educational organizations to gain insights into their students and faculty and adjust their teaching and learning methods to suit the needs of their students. LMS and ERP systems provide educators with more effective tools for teaching and helping students and providing them with a superior quality of education.

Digital transformation has revolutionized the education sector by improving accessibility, teaching strategies, and enhancing the global education system. The acceptance of digitalization by educational institutions is helping to create a more equitable and accessible education system.

# Digital transformation is driving agility



**Dr. Inderpreet Kaur (IEEE Impact Creator)**

Member, ASSOCHAM Chandigarh UT Development Council and Director, GREAT Alliance Foundation, India

**D**igital transformation (DT) is now an important fact in the world. Digital transformation, perceived only as a technical subject, first transformed into a philosophical approach and then became a vital practice at the level of tangible and visible. Today, there is almost no platform where technology is not used, tracked and developed. Technology and its innovations in every field or sector that can come to mind, from education to health, transportation to industrialization, agriculture to mining, are blaring. As the pace of development of technology continues, some concepts come to light, or many new concepts enter the literature.

With the advent of the Internet and connected technology, as the 21st century progresses, the world is becoming inherently digital. The traumatic COVID-19 pandemic, which limited physical and social contact, has further accelerated the ongoing trends and transition towards DT and integration in a wide variety of industries. It is difficult to find sectors of the economy or businesses where digital technology is not somehow integrated. Digitalization is considered the third industrial revolution or the digital revolution, which began in the 20th century. Now we are shifting towards the digital era where everything is

**DT makes it possible for businesses to use collected data to mine insights that are relevant to their business. DT helps organizations to have a single view of its customer by understanding the customer journey, finance, production, operations, and business opportunities.**

turned digitalized. The applications of digital technology are spread everywhere, in every aspect of human life. Moreover, today it is very rare to point out any sector which is out of reach of any kind of digital technology. DT impacts the way a company operates. A company's systems, culture, processes, and workflow form the critical elements that determine its success or failure. Embracing DT is accepting to use technology in a synchronized way to bring together data from several elements to enhance efficiency.

DT makes it possible for businesses to use collected data to mine insights that are relevant to their business. DT makes it possible for the various departments in a company to turn raw data into informed business decisions through data analysis. By enhancing insights generation across different functional units, DT helps organizations to have a single view of its customer by understanding the customer journey, finance, production, operations, and business opportunities.

DT enables companies to integrate applications, software, and databases into a central repository that makes it easy for business intelligence. Successful DT demands the buy-in from top leadership and full collaboration of mid-level managers to ensure that everything is done with a single focus, and to use resources and information in a way that improves an organization. It is critical to ensure that data is optimized and secured all the time, regardless of where it is used. Teams should also be provided with the right tools to accomplish their tasks effectively.

In this digital age, data is the single most important resource to have. Companies that have the right data can unlock customer insights, and data is enough to provide a competitive edge in the market. Companies that have invested in understanding their customers continue to outperform those that have not. Thus, organizations need to become data-driven. DT is not only focused

on unlocking efficiencies but also helps deliver better seamless experiences to customers. Organizations that have embraced DT have better email communications, easy-to-use user portals, and innovative digital products, and this has greatly made them attract new customers.

DT promotes a digital culture. Organizations must ensure that their employees have the right tools to get the job done. As much as digital tools are focused on encouraging better ways for teams to collaborate, they provide the right support needed to advance an organization digitally.

Organizations that have enfolded digital transformation are more agile. Digital transformation has provided businesses with the confidence to learn from the world of software about the importance of agility and its importance in cost reduction and profitability. Agile businesses can innovate faster and adopt clear processes to improve their processes, systems, and culture.

Organizations that have to unwind digital transformation have created a better environment for improved productivity. With the right tech tools, the team can collaborate easily and help each other to complete projects on time, hence improving productivity. Integrating data from all functional units in an organization helps to empower team members to work more effectively and efficiently.





# Transforming Tax Litigation: The Promising Role of Artificial Intelligence

Amit Rana

Chartered accountant



The world of taxation is changing rapidly, and technology is playing a vital role in that transformation. The digitization of taxation is not a new concept, but it has gained momentum in recent years due to the increasing use of advanced technology.

## What are technologies that show most potential in the domain of tax litigation?

Artificial Intelligence (AI) is one technology that has the potential to revolutionize the way we approach tax litigation. Generative AI is a type of AI that can generate novel content, rather than simply analyzing or acting on existing data. Also, because machine learning and deep learning are inherently focused on generative processes, they can be considered types of generative AI, too.

Natural Language Processing (NLP) deals with how computers understand and translate human language. With NLP, machines can make sense of written or spoken text and perform tasks like translation, keyword extraction, topic classification, and more.

AI-powered chatbots, for example, use NLP to interpret what users say and what they intend to do, and machine learning to automatically deliver more accurate responses by learning from past interactions.

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## Tax litigation and AI

Tax disputes are often complex and time-consuming, with vast amounts of data and legal precedents to consider. Tax litigation is expensive and creates unwanted uncertainty for businesses and Government for years. In India, extensive litigation is one of the big factors that impact the ease of doing business. The use of AI in tax litigation has the potential to accomplish results that can be truly astonishing. In this article, we will explore how AI is changing tax litigation and its impact on the future of tax law.

## Legal Research

AI can be used in tax litigation in legal research. Tax law is complex, with numerous statutes, regulations, and legal precedents to consider. Legal research is a critical part of any tax dispute, and it can be time-consuming and challenging to keep up with all the latest developments.

AI-powered legal research tools can simplify the process, providing lawyers/ professionals with instant access to vast databases of legal information. Machine learning algorithms can analyze legal precedents and case law, identifying patterns and trends that human lawyers might miss. This can help lawyers build stronger cases, find more relevant precedents, and reduce the time and effort involved.

### Predictive Analytics – on outcome guess based on provision

AI can also be used in tax litigation for predictive analytics. Predictive analytics involves using data analysis, machine learning, and other techniques to identify patterns and trends in data. This can be used to identify potential risks and opportunities, providing lawyers and tax authorities with the information they need to make informed decisions which could include the decision to litigate an issue or not.

With such insights gained from AI based research and predictive analysis, matters that may be taken into dispute may significantly reduce and even if matters are taken up in dispute, the cost of the litigation can significantly reduce.

### Importance of training an AI model with quality data

Training data is perhaps one of the most integral pieces of machine learning and artificial intelligence. AI Models would not be able to learn, make predictions, or extract useful information without learning from quality

training data. Similar to how humans learn from past experiences, artificial intelligence uses training data to learn and develop intelligence to make decisions. Because of that, a model is only as good as the quality of the training data. This means that training data of higher quality will yield a better-trained model and more accurate results, reducing the chances of a model with a high bias or high variance. Hence, organisations with quality proprietary data and resources available to train the models will have an edge on this front. This includes the tax authorities and Governments. The proprietary data alongwith the extensive data in the public domain can be used to build a robust AI model that provides a superior output.

### Challenges of using AI in tax litigation

Despite the many benefits of AI in tax litigation, there are also some challenges to consider. One of the primary challenges is ensuring the accuracy of AI algorithms. AI algorithms are only as good as the data they are trained on. If the data is biased or incomplete, the AI algorithm may produce inaccurate results. This can be especially problematic in tax litigation, where accuracy is critical.

### Conclusion

Artificial intelligence has the potential to revolutionize tax litigation, making it faster, more accurate, and less costly. While there are still some challenges to overcome, such as the need for transparent and unbiased algorithms, the potential benefits of AI in tax litigation are significant. As AI technology continues to improve, we can expect to see more widespread adoption of AI-powered tools in tax disputes. It will be interesting to see how it impacts the future of tax law and the practice of tax litigation.

# Digital Transformation in the Hospitality Industry



**Dr Suborno Bose**

Founder & Chief Mentor, International Institute of Hotel Management

Most hotel employees will naturally perceive digital transformation as a change to the status quo, which triggers anxiety, uncertainty, confusion, and doubt. As a result, the team experiences a lot of resistance or sabotage in the worst case. And if a hotel experiences resistance or sabotage, then no technology will come and save the day. Thus, it is necessary to transform the mindset. With the change, people's mindset is naturally designed to default to fear. And fewer people that are actively involved in the change more likely it is that it will spiral down the path towards resistance.

## Digital Transformation Matrix for Hotels

- Digital Transformation Framework
- Digital Transformation System
- Discover what you have and be thankful
- Build relationships and make friends first
- Unlock new possibilities - embedded hospitality
- Collaborate with the community
- Optimize, be thankful, and celebrate

## What is Digital Transformation?

Digital transformation, at its core, refers to the ability of an organization to change its

**Digital transformations involve some digitization of assets and/or increased use of technology, but for a transformation to succeed, it must involve cultural and operational changes as well.**

approach to technology, people, and processes to impact business performance and deliver value to consumers. As one expert describes, "Digital transformation closes the gap between what digital customers already expect and what analogue businesses actually deliver."

Digital transformations involve some digitization of assets and/or increased use of technology, but for a transformation to succeed, it must involve cultural and operational changes as well. This might mean changing leadership, adopting a new business model, evolving the company culture, or reassessing how the company delivers value to its customers.

Companies are often motivated to attempt a digital transformation when new competitors

enter the market. A perfect example is Uber's rapid success – and subsequent disruption – in the transformation market. Their model forced had a widespread impact on taxis, car rental agencies, car manufacturers, and even bike companies like Citibike, forcing these companies to learn how to incorporate similar technology into their business model. Digital transformations are rarely self-motivated, and often, these transformations fail due to a lack of preparation.

### Digital Transformation Examples: Learning from Failure

Unfortunately, less than 30% of digital transformations succeed. There are a few reasons why digital transformations aren't successful, but a common thread among failed transformations is lack of focus. Consumer goods leader Proctor & Gamble's unsuccessful digital transformation perfectly epitomizes why focus is imperative for hoteliers seeking to undergo their transformation process.

In 2012, P&G attempted to become "the most digital company on the planet." If this sounds like a far-reaching goal, it was – and too broad a goal to be achievable. This unspecific goal led to broad initiatives that lacked purpose. In practice, P&G's initial approach was "anywhere, anytime shopping" to abandon marketing in favour of "personal conversations" with consumers. It was an ambitious (and ambiguous) goal with unsurprisingly subpar results. When the economy slumped, P&G's digital transformation imploded; the CEO was asked to resign, and the company had to reassess their approach.

As Harvard Business Review describes, "P&G could have lost little ground to competitors had it invested in digital in a more targeted fashion. Today it does so; no digital initiative is undertaken at P&G if it doesn't fit the strategy closely and if it's not hardwired to value."

The lesson here? Hotels should break out their digital transformation into small, achievable efforts directly connected to a business outcome. At the brand level, hotel chains should not build tech in-house and should partner with best-in-class tech vendors. By definition, successful digital transformation takes integrating new technology with your processes and people. Hotels must focus on one area of improvement at a time rather than trying everything at once.

### Digital Transformation Strategy For Hotels

Hotel owners know there are many goals a digital transformation can help achieve. The mission in approaching digital transformation is to pick the goal with the highest impact. Digital transformation can help to:

- Increase digital revenue and website traffic
- Reduce operational costs
- Improve product and service quality
- Improve customer outcomes

Pick one of these goals, or something similar, to begin your digital transformation. Pegging your technology acquisition to a specific outcome will drive the operational and personnel changes necessary to be successful.

If anything, the P&G experience proves that your goal should drive the adoption of new technology; and your goal must be specific and focused. Imagine a scenario in which your hotel decides to increase digital revenues across your properties. One obstacle to gaining digital revenue is a high volume of overbookings. Overbookings occur when the total number of rooms reserved by guests during a certain period exceeds the number of available rooms. Hotels often overbook to mitigate losses from no-shows, cancellations, or early check-outs; however, overbookings also indicate poorly run operations.



In this scenario, one potential digital transformation initiative could include adopting a new property management system – like Oracle OPERA – that includes an intelligent accommodation management tool. This tool avoids overbookings of specific room types and ensures that rooms are cleaned and maintained in a timely manner. The platform automatically enforces booking rules, schedules, and availability of item inventory to deliver a great guest experience and ensure there are no added costs from bringing guests to a second location.

A PMS can also play a significant role in a second example of digital transformation: improving customer outcomes. In this scenario, a hotel is trying to solve long wait times at check-in. Oracle OPERA is equipped with a mobile version to allow staff to check-in guests via any smartphone or tablet. The mobile platform

also allows for reservation management, room status, task sheet management, room maintenance, and real-time updates on rooms and maintenance requests. Your team can go mobile to improve efficiencies around the property and meet guests' needs quickly – leading to an overall better guest experience and shorter wait times.

## Bringing Digital Transformation to Your Hotel

A digital transformation is as much about the operational and cultural changes you make as it is about the technology. A PMS can provide many solutions for reaching your business goals: but having the right leaders is also critical. Oracle's many digital upgrades work only as far as your training program, lines of communication, and other staff support tools do.









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