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ICT UNBOUND

VOLUME 16 ISSUE 1 FEBRUARY 2022

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Gurmeet Singh
Editor

EDITORIAL

> "El- Softech's stress is mostly on policy tailwinds and to gauge their impact on the different layers of industry startups, micro, small, medium and large."

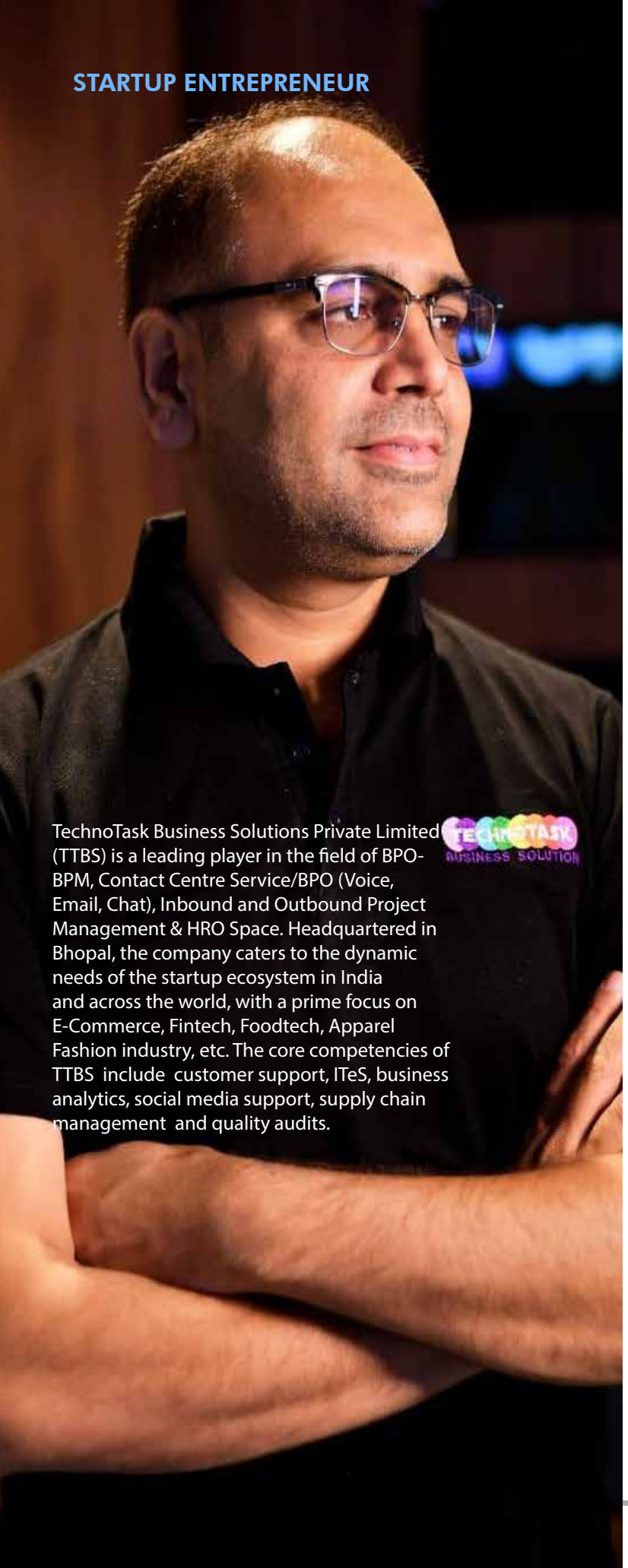
We are delighted to present to you the El-Softech in the new format. By changing the name, our objective is to give more focus to technology, the key driver of the ICT sector. Yet, the transformation from El-Softex to El-Softech signifies the contemporaneous importance of the sector as an economic driver. The monthly magazine will continue to focus on the ICT sector in its entirety - electronics hardware, software, telecom, technology and exports, segments which can catalyze India's development process. The other change we have made is giving a tagline 'ICT Unbound' to the magazine to sharpen the focus on the segment.

ICT sector (icluding electronics) contributes close to 14 per cent of India's GDP. India's digital economy generates approximately $200 billion annually from information technology (IT) and business process management (IT-BPM), IT-enabled Services (ITeS), E-Commerce, electronics manufacturing, digital payments, and digital communication services.

It is far below the potential. Estimates indicate that India can reach a $1-trillion digital economy by 2025, contributing one-fourth of the GDP, which is set to peak to US$5 trillion by that time. ICT worldwide as also in India has not been negatively impacted by the pandemic, thanks to quick and timely efforts of the players to re-tool their operations deploying mainly automation processes. These efforts are being realized with the help of emerging technologies, such as robotic process automation, big data, artificial intelligence, machine learning, blockchain, cloud computing, the internet of things, cybersecurity, augmented/virtual reality and a host of other state-of-the-art technologies.

The supportive role being played by the government is commendable in the case of electronics hardware and telecom amplified by a slew of measures such as introduction of Production-Linked Incentives (PLI) Schemes, including the recent one for semiconductors, which are aimed to create global players in the segment and to align the Indian ICT sector with global supply chains. Importantly, the Budget 2022-23 has laid unprecedented focus on the ICT sector as a change agent, unveiling multiple programmes that can transform the ICT sector.

Admittedly, a lot of literature, periodicals and publications are emerging nationally and internationally in the ICT segment. Each has its own niche and focus. El-Softech's stress is mostly on policy tailwinds and to gauge their impact on the different layers of industry startups - micro, small, medium and large. In a macro sense, they are all active players of the industry chain and are mostly interdependent and their growth matrices are, by and large, synchronized. In a growing segment aiming at fast-tracking the growth stimulus, there should be an effective platform for communication amongst the players, including the government ■



TechnoTask Business Solutions Private Limited (TTBS) is a leading player in the field of BPO-BPM, Contact Centre Service/BPO (Voice, Email, Chat), Inbound and Outbound Project Management & HRO Space. Headquartered in Bhopal, the company caters to the dynamic needs of the startup ecosystem in India and across the world, with a prime focus on E-Commerce, Fintech, Foodtech, Apparel Fashion industry, etc. The core competencies of TTBS include customer support, ITeS, business analytics, social media support, supply chain management and quality audits.

Offshore to Nearshore- A Tryst with Destiny...

Business Process Outsourcing (BPO) is an integral part of India's ICT segment accounting for a major share of foreign exchange revenues. Undoubtedly, it will continue to be the dominant source of revenue. Yet, there will be a transformation in the overall structure of the industry.

El-Softech's editorial team caught up with one of the promising players in the Customer Relations Management (CRM) domain Syed Adil, CEO, TechnoTask Business Solutions, to know more about the recent changes in the BPO and CRM domains. Excerpts of the interview are given below:

El-Softech: You are headquartered in Bhopal, a tier-2 city and you have chosen only tier 2 and 3 cities for your operations. What was the rationale behind such a decision?

Syed: We have units in three locations in India, viz, Bhopal in Madhya Pradesh, Rajnandgaon in Chhattisgarh, Mysuru in Karnataka and two locations overseas - Texas in the US and Alexandria in Egypt. The locations in India are in tier 2 and 3 cities.

These cities offer some unique advantages such as low attrition level, cost advantages in terms of manpower and rentals, and flexibility of operations. The lower costs of operations enable us to deliver our services with great cost advantages to our clients in India and abroad. With excellent air connectivity, even to the tier 3 and 4 cities, clients can visit our delivery centres at ease. The visiting clients also enjoy the cost advantage in terms of air fare and hotel expenses that are considerably lower in these cities compared to metros.

It also has significant social implications. Look at the people we are employing in different stations. In Chhattisgarh, over 8% of our employees are from tribal communities, 43% are women and a good number of them are from economically weaker segments, who might have migrated to their home towns during the pandemic. That way, we contribute to inclusive growth. With fibre optics and digital backbone getting strengthened in the semi-urban and rural areas also with more than one service providers to choose from, more and more companies are encouraged to set up their bases in tier 2 and 3 cities, including the Naxal-infested areas in Chhattisgarh, which can help resolve employment challenges in these regions.

El-Softech: Has BPO business been impacted by the pandemic?

Syed: Interestingly, BPO businesses in general have considerably benefited from the pandemic with its increased focus on digital transactions to avoid physical contacts. Our company, in the last one year, has considerably upped our presence during the pandemic time. There are some pandemic-born companies which have come into being taking advantage of the focus laid on contactless business. Some of them are doing exceedingly well.

El-Softech: What are the new concepts emerging in the BPO segment?

Syed: Dynamics in the BPO sector is ever-changing. Earlier, there were only two predominant concepts and approaches - offshore and onshore. Most of the employees will be offshore and a few may be working onshore or on-site, who are critically important for the day-to-day work.

But the latest trend is the concept of nearshore. For instance, Indian IT behemoths like Infosys, TCS, WIPRO, etc are setting up their bases in Latin America and East Europe to service their clients in the US, Europe and Britain. Some of the North African countries like Egypt are fast emerging as nearshore locations for IT companies, particularly for BPOs. Latin America, East Europe and Africa have the time zone advantage unlike countries like India. Employees based in these countries need not work at odd hours to service their clients who are in the same or closer-time zones. For instance, Egypt is fast moving up in the value chain by providing nearshore facilities to service clients in the Middle East, Europe and the US. BPOs and CRMs in Egypt also can leverage the availability of smart English and Arabic speaking youngsters. These regions are emerging as strong competitors to Indian BPO companies. For instance, in a place like Alexandria in Egypt, there are more than 10,000 employees in the BPO segment. A number of firms including world-renowned ones are seeking to relocate to these regions.

43% of employees of various delivery centres are women, substantially contributing to their empowerment

El-Softech: You have offices in Alexandria and the US. How do you find operations of these units?

Syed: Our Alexandria operations can be categorized as nearshore facility to serve our clients in the US, the UK, Europe and Middle East. Our Middle East clients prefer to connect to Arabic speaking. This is an advantage of Egypt, which has the skillset to cater to people in multiple locations. Our offices in Latin America function as development centres for the US and other nearby markets.

El-Softech: What about CRM services you render in India?

Syed: Our delivery centres in India have people with different local skills. We are also trying to expand our footprint to other tier-2 cities like Mohali in Punjab ande a tier-2 city in Maharashtra, to emerge as a true pan-India entity.

El-Softech: You serve clients in a number of verticals such as agribusiness, consumer electronics, retail and e-commerce, healthcare, micro mobility, fintech, e-governance and public sector and a lot more. Which is the most promising sector in the days to come?

Syed: BPM industry undergoes transformation every now and then and is closely linked to the level of technology. When BPM started, the demand was for call centres and similar works. With the advent of new technologies, most of the manual work is replaced with technologies based on Artificial Intelligence, machine language, cloud computing, etc. Later, we had, and still have, demand for outsourcing in travel and tourism, connecting with consumers and clients, etc. With startup culture across the world, outsourcing work has become the buzzword to emerge as lean and mean enterprises. Well, regarding the segment that has the greatest potential for the future, my take is fintech. That service can manifest in various forms and hues. For example, banks and financial institutions can outsource a number of jobs which they are doing in-house, like regular communications to the customers, vetting loan applications, finding credibility benchmarks of loan applicants and so on. Similarly, e-governance has huge scope.

El-Softech: Do you think technology, at some point of time, can replace the concept of outsourcing?

Syed: I do not think so. With advancement of technologies, more services can be framed out rather than doing them in-house. With the proliferation of mobile telephones, the trend will be to use web-based technologies and voice and replace non-voice or physical services. What can happen is change in priorities in outsourcing. It could be fintech tomorrow and later the focus can be on e-governance with the type of thrust given for inclusive growth, digitization and building huge databases about citizens. What I am driving home is that the process of outsourcing will be in continuum ■

FACE TO FACE

My First Love is Electronics...

Uma Reddy, MD, Hitech Magnetics & Electronics Pvt. Ltd., is a first-generation entrepreneur manufacturing custom built transformers, coils and electronic sub-assemblies for the past 3 decades. An executive committee member of FICCI, FKCCI, Consortium of Electronics Industries of Karnataka (CLIK), she has been taking active interest in promoting ICT sector in India. She has been advocating active involvement of women in technology-related spheres, including electronics hardware and software. An avid spokesperson of electronics industry in India, she has been closely connected with several ICT sectoral organizations.

Uma Reddy
Managing Director
Hightech Magnetics & Electronic Pvt. Ltd., Bengaluru

Today, electronics touch every aspect of modern life. As years roll by, use of electronics is expected to become all-pervading and experts predict that sooner than later, trade in electronics would outpace that of oil.

In the late 1980's or early 90's when electronics goods were mostly known to the general public as TV sets or tape recorders, Uma Reddy ventured into the magic world of electronics after graduating in engineering from a college in Bengaluru (then Bangalore). Instead of trying her luck in the software domain, which the city was famous for, she plunged into the brick and mortar electronics. Perhaps, the only motivation could be the presence of Bharat Electronics Limited (BEL), which had a string of vendors at that time. BEL sourced many components from the vendors including printed circuit boards that go into the original equipment it manufactured. That time, the process of sourcing went with the generic name "ancillarisation", the modern-day equivalent of outsourcing.

Uma vividly remembers how she got into the vendor list of BEL. After her

In the late 1980's or early 90's when electronics goods were mostly known to the general public as TV sets or tape recorders, Uma Reddy ventured into the magic world of electronics after graduating in engineering from a college in Bengaluru (then Bangalore).

engineering, her passion to become an entrepreneur (she admits she could not spell that word correctly that time) forced her to do an apprentice with her uncle, who was a vendor to BEL. That helped her to know the officials in BEL. Later, she wanted to start her own business of supplying PCBs to BEL. "Most of the works that time were done manually and since I cannot afford a unit of my own because of difficulties in getting finance, most of the works were done from a makeshift place at home and that too manually," she reminisces, adding that a lot of running around was to be done, which at that time ladies usually shy away from.

In the last three decades, electronics industry has grown by leaps and bounds globally. Production surged, so also the number of global players. India is gradually witnessing the dynamics of that transformation. "It may take time for India to witness that pace of change, but it will certainly happen, given the massive demand for electronics goods globally and locally," she adds.

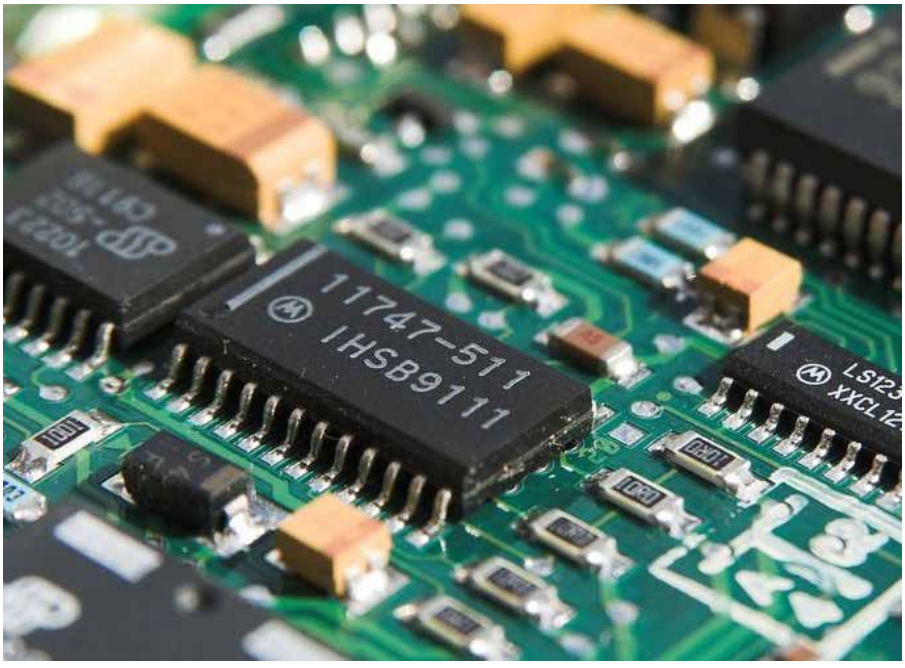
What about the recent policy initiatives taken by the government to promote electronics production in the country such as production-linked incentives (PLI)? She welcomes the policy tailwinds, but feels that it has to be further finetuned to help

the MSMEs. "Should government come out with a PLI for MSMEs, that would augur well since the benchmarks set for production and exports are very stiff in the present dispensation and are largely suited for multinational and large Indian corporations, making it near impossible for the MSMEs to compete to get benefits under the scheme," she laments.

Does the electronics ecosystem favour MSMEs? She is circumspect. A lot more has to be done, for India to reach the benchmarks of Japan, South Korea and China, where promotion of ecosystem conducive to the growth of the MSMEs has been something ingrained in the policy architecture. Look at the electronics and hardware clusters present, R&D outfits, incubators etc, in China and South Korea. That helps even the micro units to get into innovation, product improvisation, e-waste management and customer relationship and a whole lot of other activities in a cost-efficient manner. "Yes, in India, we have to go a long way and we need to be proactive and focus more on implementation and that too in the right time because for electronics, there is no tomorrow and if we leave things for tomorrow, products would become obsolete," she cautions.

What should be the role of associations of ICT manufacturers like CLIK, MAIT, NASSCOM in the gameplan to help the electronics sector? "We have a number of business associations that are working in the space; individually, they may be doing a good work; it is time for all of them to come together, work in tandem for taking the electronics industry to the higher orbit of growth and to assign the MSMEs a prime role in the overall architecture," she points out.

MSMEs in the electronics hardware face a number of imponderables. Foremost is the infrastructure. Unlike the software, electronics hardware, which is a part of the brick and mortar sector, needs a sound physical infrastructure. The basic reason why China, Japan, South Korea and even Vietnam have made mark in electronics is their excellent physical infrastructure. Next in importance is the infusion of capital, where the MSMEs have a huge handicap. There should be focused attention from the



government to dissect the real problems of the MSMEs and find solutions through a consultative process.

Uma recalls the problems that she faced in 1990's while setting up her own unit Hitech Magnetics & Electronics Pvt. Ltd. That time while granting loans, banks insisted on collaterals. "I did not have any collateral to pledge and that forced me to start the operations from the place I was living," she avers, adding that could be the case with many of my counterparts.

It augurs well that the state governments are really going hammer and tongs for attracting investments in the electronics sector. They are offering additional incentives for attracting investments and even motivating large global players to relocate to India, given the present geopolitical developments, when everyone has started thinking about a China plus policy to find alternative centres for sourcing their electronics requirements. "I only hope that such promises should not remain on paper or couched up in rhetoric; there should be credible follow-up actions to walk the talk to translate dreams into reality in the foreseeable future," she stresses.

What do you expect from the State of Karnataka? Foremost thing is the need for focussing on ease of doing business. There are positive developments for filing tax returns, GST, complying with requirements under ESIC etc. These compliances now can be filed through the internet and one need not have to visit the respective government offices. But one thing that refuses to go is the inspector raj. "I find inspectors of various departments keep vising the office premises, which is a distraction; why not they follow the virtual medium to seek information from the companies, that will work out well for both parties for saving time and for the units, which are working with skeletal staff, especially during the pandemic, to focus on their work," Uma laments.

The other important thing the state can provide is the amenities for "plug and play". Such facilities will greatly help the micro units and startups to set up their units with least infusion of capital. "Across the world, there are such facilities extended at the most vantage places where the units need not have to worry about electricity, water, handling e-waste challenges and such centres are ideally situated for marketing of manufactured goods," she says.

Uma hopes that more and more women entrepreneurs should come up in the electronics sector, not alone for themselves; they can provide a large number of employments to other women since some of the accuracy and precision needed for the electronics sector can be better handled by women. And that will give better momentum to women empowerment ■

Outsourcing Trends for 2022 and Beyond

Assuming that pandemic impact will get over or at least the intensity gets reduced, they have come out with a set of criteria that the companies may be deploying while deciding on outsourcing works. The foremost reason for outsourcing that will be the decisive factor, they feel, could be quality and not the price, while maintaining that the tempo of outsourcing will get more traction during 2022 and beyond.

Technology enables outsourcing. Notwithstanding the fact that it has come to stay in the IT domain and will likely continue in one format or the other as the technology leaps, experts are in the game of predicting how it will unfold in the coming years and decades. Indeed, pandemic has impacted the process of outsourcing in a curious way. Before pandemic, the experts were of the view that least-cost arbitrage was no longer the prime reason for outsourcing. They tend to believe that quality instead of pricing drives outsourcing. But a study undertaken by Deloitte found that the financial strains experienced by the firms during the Covid-19 pandemic forced them to put cost consideration as the major drive of outsourcing. That could be a temporary phenomenon. Once the pandemic gets bottomed out, the priorities may change. Gartner has come out with the trends of outsourcing in 2022. According to its estimates, global IT spendings will be increased to $3.8 trillion in 2022, 3% more as compared to the previous year.

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Worldwide IT Spending Forecast (Millions of U.S. Dollars)

Source: Gartner (July 2021)

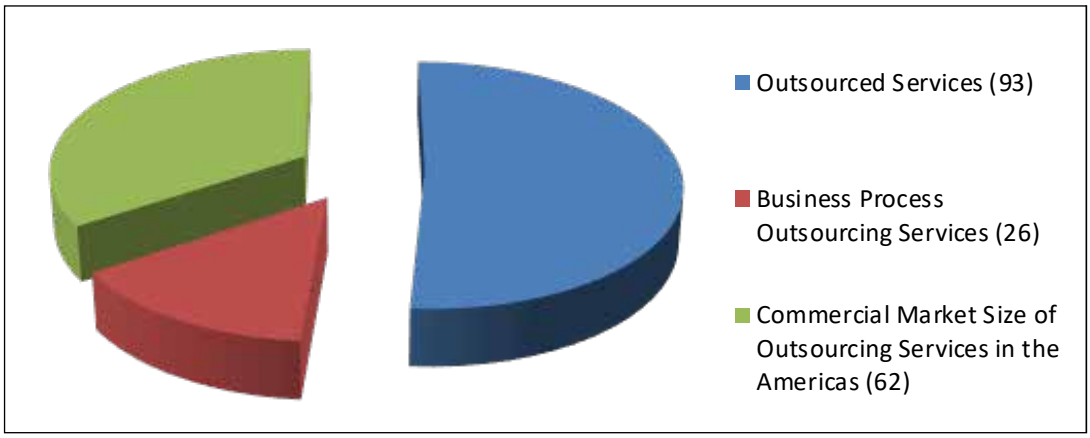
High quality service at competitive prices will be the deciding factor and not cost alone. Empirical evidences indicate that many companies which are outsourcing have been moving towards that paradigm, at least before the outbreak of the pandemic.

Non-availability of skillsets could be another reason. Newer technologies like blockchain, cybersecurity, or cryptocurrency are constantly evolving. For operating in these verticals, firms need highly qualified specialists, who can handle advanced tasks. Most often, in-house talents will be lacking in these domains or hiring them will phenomenally be a costly affair.

New Contract Models

New contracting changes also won't be long in coming. This trend will help IT outsourcing become more impersonal. There's a suggestion that the new contracts will be focussed on outcomes more rather than on outputs. Software development companies will also be sharing risk and responsibility for this or that task. Notice periods will also be shorter. As a result, the competition between different outsourcing companies will be higher. All this will help IT vendors choose the best company which guarantees good quality.

Global Market Size (Billion US$) - 2019



Global Outsourcing Industry Revenue from 2010 to 2019, by Region (In Billion US$)

Region	Year									
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
EMEA*	42.2	55.3	48.6	47.8	54	48.3	38.3	55.6	44.7	56
Americas	40.4	30.9	37.5	26.3	37.2	32	30.4	47.8	61.3	62
Asia Pacific	10.5	8.9	13	8.8	13.4	8.6	8.2	13.4	13.3	17.5

*(Source: Statista * Europe, the Middle East and Africa)*

More IT Outsourcing Options

A few years ago, India and China were the main countries providing outsourcing services. These countries now experience fierce competition with Eastern and Central European regions. Such locations as Ukraine, Romania, Poland or Belarus became new top-notch places for offshore software development. Software developers from these countries show themselves to good advantage. Now, they face the market with some of the best IT offerings.

Automation of Manual Processes

Today, there's a tendency to use Artificial Intelligence solutions, such as bots or virtual agents. These tools can streamline a variety of routine tasks. According to a GSA survey report, 83% of respondents consider that Robotic Process Automation will be the leading technology of the upcoming decade. Therefore, the demand for specialists in the niche of AI will also be increased. If a company wants to stay on the top, it should update the service offerings.

Cloud Sourcing

Cloud computing is not a new trend; it is a necessity in the 21st century. In the coming years, the demand for cloud services will also be increased. Because of the increasing popularity of cloud computing, IT outsourcing companies need cloud platforms for their data storages, though outsourcing with cloud computing has become easier. That also forces outsourcing companies to enlist the support of reliable and credible companies which have strong firewalls against hacking.

Smart Software

The rapid development of technologies is what caused the birth of the Internet of Things, which is widely known as a network of objects that can collect and exchange data in real time. Smart software helps link a variety of data processes. IoT is widely used in the IT industry. It is expected that many companies will start investing in innovative systems in order to provide much better services and serve their clients better. That said, there are very limited experts in the domain. That forces companies to outsource the work.

	2020 Spending	2020 Growth (%)	2021 Spending	2021 Growth (%)	2022 Spending	2022 Growth (%)
Data Center Systems	178,466	2.5	191,648	7.4	201,659	5.2
Enterprise Software	529,028	9.1	598,957	13.2	669,114	11.7
Devices	696,990	-1.5	793,973	13.9	800,172	0.8
IT Services	1,071,281	1.7	1,176,676	9.8	1,277,228	8.5
Communica-tions Services	1,396,287	-1.4	1,444,980	3.5	1,481,878	2.6
Overall IT	**3,872,052**	**0.9**	**4,206,234**	**8.6**	**4,430,051**	**5.3**

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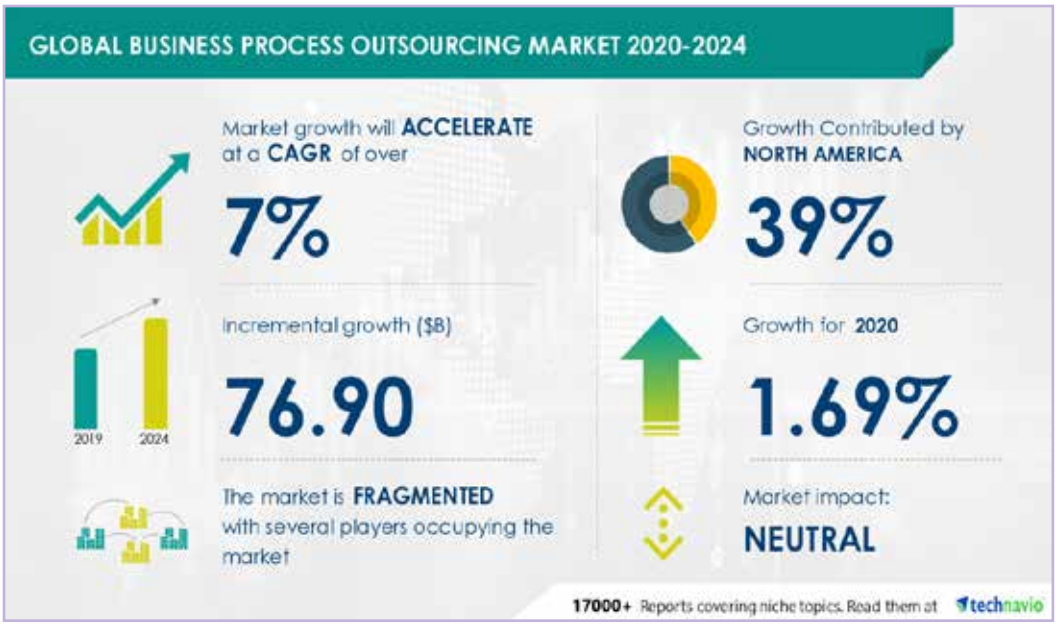


What is the future of outsourcing?

According to the GSA report, 70% of companies plan to increase the use of IT offshoring in the nearest future. Moreover, 83% of service providers explain that with the expectation of the IT outsourcing industry to grow significantly, we can already see that the future of IT outsourcing is pretty promising.

The business world is continually growing, competition is thriving, and it takes hard work and strategy to come out on top. If you're looking into outsourcing, you'll want to take the time to do your research. The following outsourcing statistics shared by our friends over at Timedoctor will help you understand how big the outsourcing industry is, whether or not it's truly worth your time, and how much you can potentially save your organization.

Why Companies hire Third Parties
More efficient use of internal resources
Cost reduction
More effective business processes
More time to focus on customer experience
Access to specialists and skills not available locally

Global markets and improvements in technology have changed the way businesses work. For many, staying competitive means capitalizing on the world being a smaller, more tech-savvy place, and enjoying the benefits of outsourcing.

Hiring an overseas workforce to outsource certain business functions can lead to:
Lower overheads
Increased growth
Greater focus and service quality

According to another survey conducted in 2019, Clutch's 2019 Small Business BPO Survey, the main reason small businesses choose to outsource was to increase efficiency. 24% of businesses surveyed by Clutch said that through outsourcing, they could manage more projects yet still maintain clarity, quality and a fresh state of mind. Cost reduction actually was only a priority for 12% of small businesses at the time. Going back to Deloitte's 2020 study, it is evident that the pandemic has forced businesses to do a full-360 and focus on costs once again.

Sectors and functions are outsourced the most

Some business functions and industry sectors lend themselves better to outsourcing than others. This boils down to practical issues around setup and management. According to Clutch's 2019 Small Business BPO Survey, the most commonly outsourced services are accounting (37%), IT services (37%) and digital marketing (34%).

As it stands, American businesses most commonly outsource IT functions. But they outsource a lot of other functions too. When asked about current and future outsourcing levels, respondents revealed that they planned to increase the amount of tax, HR and procurement tasks handed to offshore. Finance shows the biggest difference. Currently, US businesses outsource around 39% of finance functions, but wish to push this up to 89%. Clearly, these statistics prove how successful outsourcing continues to be for modern American businesses. And the rest of the world seems keen to capitalize on the benefits of outsourcing, too.

Adoption and Revenue beyond the Americas

Based on an assessment of 38 metrics, A.T. Kearney compiled a report and identified the countries with the strongest underlying fundamentals to potentially deliver IT, BPO, and voice services. The top 10 countries were India, China, Malaysia, Indonesia, Vietnam, the United States, Thailand, the United Kingdom, Brazil and the Philippines.

America is a major outsourcing region. When professional services company KPMG analyzed outsourcing deals closed in Q1 2017, the US contributed 41.5% of the total deal value. But Asia-Pacific regions and Europe, the Middle East and Africa (EMA) aren't far behind. Fill the expertise gap in your software development and get full control over the process ■

Budgetally... Digitally yours...

Every new measure spelt out in the Budget, there is an interface with technology and digital platforms, be they connected with introduction of the new digital currency to be operated through blockchains, or welfare measures like education and healthcare, e-passports, banking, land reforms or programmes for ensuring better governance.

What is unique about this year's Budget. There are, many old-timers say. Before the finance minister started reading out the Budget and cheering and heckling started, there was an announcement from Speaker of the House Om Birla that it would be a 'digital budget', in the sense that it would be read out from a tablet; something that no finance minister had ever done including the present one Nirmala Sitharaman, when she presented her earlier Budgets. Emphasis on digital technologies, startups cutting across sectors - from agriculture and education to post offices, banking and more, came later. As one wag put it succinctly, the Budget was transformative in the sense that finance ministers from now onwards will tread a new path of presenting the Budget electronically.

What are the most important takeaways for the digital economy from the Budget?

Data Centers

Creation of an application programming interface-based platform for the transportation sector that will integrate data from road operators to cut logistics costs and time was cheered up not alone by the industry but also by other stakeholders. In the same breadth, the finance minister announced that data centers will be given the status of infrastructure. That, experts believe, would ease financing of the sector. Infrastructure status given to data centers will provide a huge boost to the fast-evolving digital environment of the country. Close to 2,500 MW new data center capacity will be needed by 2026 in India, and this announcement will greatly help in achieving this capacity and support India's ambition of being a strong data center player in the region.

Agri Modernization through Technology

'Kisan Drones' will be promoted for crop assessment, digitization of land records, spraying of insecticides, and nutrients. For the delivery of digital and hi-tech services to farmers, a scheme in PPP mode will be launched. A fund with blended capital, raised under the co-investment model, will be facilitated through Nabard to finance startups for agriculture & rural enterprise, relevant for farm produce value chain. The government intends to include the agro tech industry in PPP which is a big welcoming step and would set the tone for further much-needed initiatives for the farming community.

Welcoming the Union General Budget 2022-23, Sandeep Narula, Chairman, Electronics and Computer Software Export Promotion Council (ESC), said that one aspect that stood out in the Budget was its heavy and unprecedented focus on technology, digital tools and platforms.

"Every new measure spelt out in the Budget, there is an interface with technology and digital platforms, be they are connected with introduction of the new digital currency to be operated through blockchains, or welfare measures like education and healthcare, e-passports, banking, land reforms or programmes for ensuring better governance," ESC Chairman said, adding that as an organization, which is closely connected with digital India". We feel enthused and elated by this great transformation of leveraging technology for common good."

Narula feels that the announcement by the Finance Minister to re-calibrate customs duties to provide a graded rate structure and duty concessions to help boost electronic products, is an encouraging one and hoped that such changes would be to further address the inverted duty structure on the ICT components to ensure a degree of protection to the struggling domestic component manufacturers.

Importantly, Narula said, the government would be replacing the existing legislation on Special Economic Zones (SEZs) to make it more relevant to the needs of the industry and exporting community. It is important to take the business community, particularly the exporters into confidence while formulating the new policy to make the scheme industry friendly and to yield better results.

The Finance Minister has spelt out some of the expected benefits of the Production-Linked Incentives, which the government has been coming out from time to time. The PLI scheme has, among other things, also extended to the ICT sector intended to create more production, exports and employment. While some of the large Indian and multinational companies have been beneficiaries of these schemes, MSMEs are largely kept out of it due to the entry-level barriers. "We are hopeful the government will come out with a new scheme exclusively for the MSMEs to align them with global supply chains. Sooner that scheme for MSMEs is unveiled, the better since in countries where the ICT sector has been performing exceedingly well, MSMEs are the pillars," ESC Chairman added.

Animation

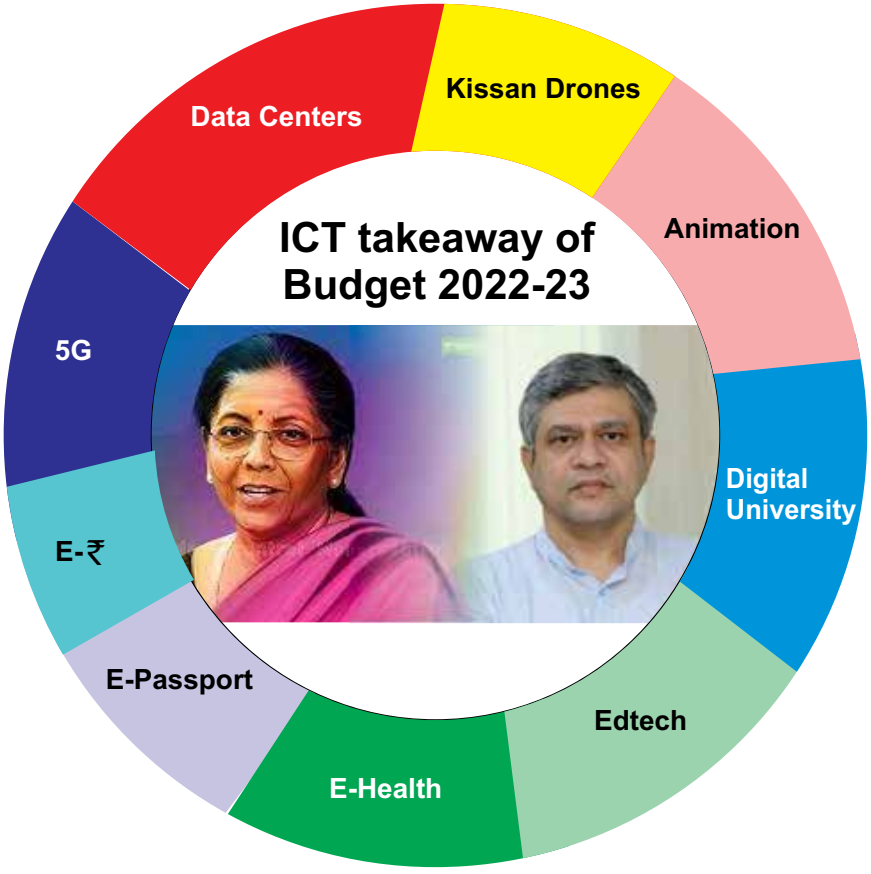
For the first time ever, the animation, visual effects, gaming and comic (AVCG) segment found mention in a Union Budget. A task force will be set up for the animation, visual effects, gaming and comics as the sector offers immense potential for employment. Indeed. Startups got cheered by this announcement especially in the gaming sector, which have been battling with several state governments on their status as industry.

Gaming

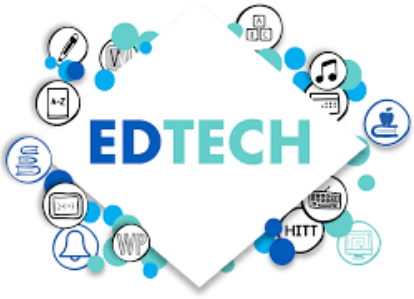
The Budget's move to tax gains made on crypto transactions by investors at 30 per cent has come as a respite for the country's crypto startups. There had been a fear that the government could place a ban on virtual assets which is now out of the question, said founders of startups dealing in virtual assets. Also, the announcement by Sitharaman that the Reserve Bank of India is going to come out with a digital rupee later this year is an encouraging signal as it will lead to a wider understanding and adoption of virtual assets in the country, according to industry experts.

Crypto and Digital Rupee

Digital banking, digital payments and fintech innovations have grown at a rapid pace in the country. The government has proposed to set up 75 Digital Banking Units (DBUs) in 75 districts of the country by Scheduled Commercial Banks. Also, the financial support for the digital payment ecosystem (which was Rs.1,500 last year) announced in the previous Budget will continue in 2022-23. The idea of setting up Digital Banking Units in multiple districts will help in the homogenisation of the financial services in the rural and semi-urban geographies.



Edtech



The proposal to set up a digital university to provide education that will be built on a hub and spoke model was a welcome feature of the Budget to create talented manpower across the board. The plan to connect all villages and their residents with optical fibre by 2025 is a welcome step in this regard. The proposed digital university with a personalised learning experience will make higher education more accessible and equitable.

Digital Health

An open platform for the National Digital Health Ecosystem to be rolled out. 'National Tele Mental Health Programme' for quality mental health counselling and care services to be launched. A network of 23 tele-mental health centres of excellence will be set up, with NIMHANS being the nodal centre and International Institute of Information Technology, Bengaluru (IIT-B) for providing technology support.

5G auctions to happen this year

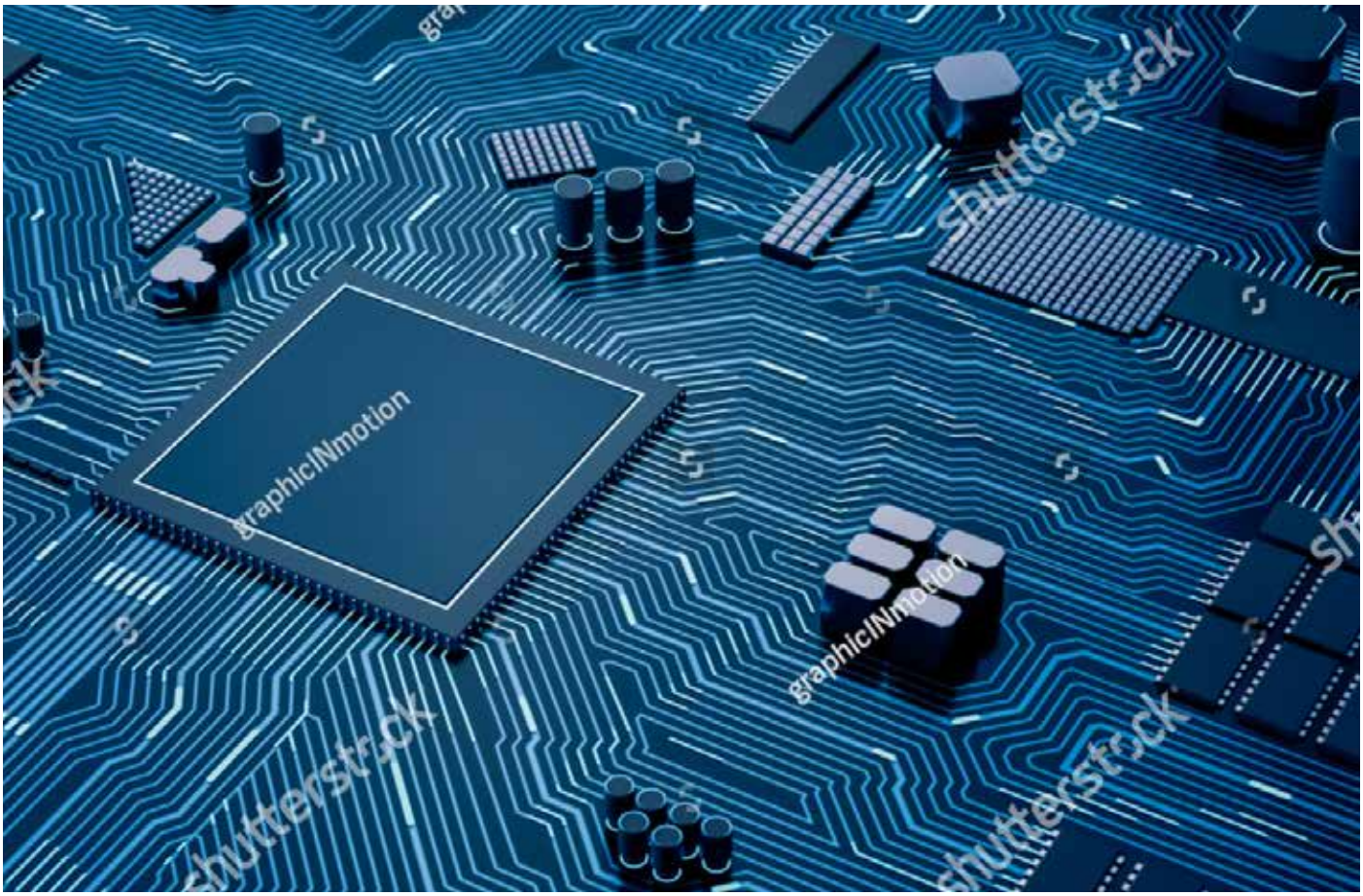
The government promised the rollout of 5G services, proliferation of broadband services in rural areas and boost to local manufacturing under the Productivity-Linked Incentive scheme in the Union Budget. The 5G spectrum auctions will be conducted in 2022 to facilitate commercial service rollout by private companies in the fiscal 2023.

"The impetus towards the rollout of 5G and broadband services in 2022 will catalyze an entrepreneurial culture and expand India's presence on the global map of technology innovation."

E-Passport

Introduction of E-Passport will considerably reduce the time for issuance of passports to the citizens. Presently, the passport issuance involves delays, and considerable paper work causing inconvenience to the people. E-Passports will enable India to be one among a very few countries issuing passports in this format

Can India join the Semiconductor Bandwagon?



Semiconductors, often referred to as chips, these days are grabbing headlines, perhaps for the wrong reasons. Prices of these tiny particles, that make electronic industry tick, are going north. Severe shortages because of a variety of reasons opened up a can of worms and even geopolitical hostilities. ICT pundits are divided on the reason for the shortages and solutions thereto. Should that lead to a tug of war between countries that produce these modern-day icons of economic supremacy and those who need them? With blues of trade war still looming large, controversies surrounding chips are going to stay alive at least for some time.

El-Softech tries to fathom the current imbroglio and attempts to discern the nuts and bolts of the situation, that can go murkier, if not resolved at the earliest.

What is the problem?

An understanding of the present state of chips is important to know the gravity of the problem. To say that the world is getting interconnected is an understatement. Even in the remotest villages of Africa and Asia, mobile phones, electronic goods and devices are inundating at an accelerated speed and pace, be it for socialization, entertainment, education, healthcare, and gathering information for all hues and situations, including governance. Could we think of a situation without modern technologies? It is practically unimaginable, whether we like it or not. In most of the cases, these devices are powered by semiconductors - small chips that conduct electricity. Over the years, the chips are becoming smaller and cheaper because of two main reasons. One could be the incremental research and innovation that is going into chip manufacturing. Billions of dollars are invested in that by chip manufacturers to move in value chain to make the chips smaller

and more potent. For instance, the complicated algorithms that go into Artificial Intelligence, machine language, robotics, driverless cars, etc are being made possible through chips. Second reason could be the economies of scale that can be derived through mass manufacturing, which can bring down the unit cost of production. Even while the Covid-19 is staring at the world, refusing to go, semiconductor companies are expected to have a compound annual growth rate of at least 4-5% per year by 2027.

The production landscape of chips is complicated, to say the least. No country can claim that the entire process of production takes place in one place. For instance, chip design takes place in one country, rare earth which goes into the chip manufacturing is sourced from another country, production can be in a third country. That geographical specialization worked well for the booming industry for some time. But pandemic has upset the balance in many ways. It was largely due to skyrocketing demand for chips created by the pandemic with the proliferation of production of electronic devices and applications. There was a huge shortage of chips, which is still continuing unabated. That led to many undesirable consequences. Chip prices pushed up electronic device and component prices in some countries like India by 30%. Countries that believed in geographical specialization and reaped rich dividends all of a sudden grooved into a different strategy.

The production landscape of chips is complicated, to say the least. No country can claim that the entire process of production takes place in one place.

The United State's passing the bill on Innovation and Competition Act in June 2021 was a major turning point. The world's ICT leader realized that geographical specialization no longer holds good if one has to go hammer and tongs for commanding top slot in the foundational and indispensable part of electronics - that is chip making, for which the demand is ever growing, particularly for the memory chips that are below 10mm, which are produced mostly overseas. The Act has set apart US$52 billion for chip manufacturing, research and design.

It is relevant to have a look at the Chinese chip manufacturing strength. Though it boasts of the most powerful supply chain in electronics, indigenous Chinese chip industry is relatively small. It accounts for slightly over 7% of the total global semiconductor sales. Let alone that, the quality of Chinese chips is not reckoned very high in the international market. Chip firms there mostly sell discrete semiconductors, lower-end logic chips, and analog chips to consumers, communications, and industrial end markets. Conspicuously, Chinese chip firms are laggards in the market for high-end logic, advanced analog, and leading-edge memory products. That is true of China's indigenous semiconductor supply chain. It lags significantly in advanced logic foundry production, EDA tools, chip design IP, semiconductor manufacturing equipment, and semiconductor materials.

2014 was a watershed year for China's chip industry when it released the National IC Promotion Guidelines which laid out ambitious targets for industry revenue, production capacity, and technological advances. Later, China published the Made in China 2025 Plan, which aimed at achieving 70% self-sufficiency in semiconductors by 2025. Since then, China has set apart huge funds for semiconductor research, starting with the National Integrated Circuits Industry Development Investment Fund, known as the Big Fund. In later years, this fund was increased along with various other schemes, including China's National IC Fund with a corpus of $39 billion, of which 69.7% has been for front-end manufacturing with the goal to increase China's share of global semiconductor production. An important aspect of China's drive towards semiconductor self-sufficiency is that it is government driven.

Worldwide Semiconductor Market Growth - Regionwise

Region	Amount in US$ Million			% Growth from Previous Year	
	2020	2021	2022	2021	2022
Americas	95,366	118,835	131,084	24.6	10.3
Europe	37,520	47,126	50,467	25.6	7.1
Japan	36,471	43,581	47,621	19.5	9.3
Asia Pacific	271,032	343,419	372,318	26.7	8.4
World Total	**440,389**	**552,961**	**601,490**	**25.6**	**8.8**
All regions are projected to grow in 2022					

(Source: World Semiconductor Trade Statistics (WSTS))

Then who drives the semiconductor industry? The industry is dominated by companies from the United States, Taiwan, South Korea, Japan and the Netherlands in that order. The foundries in these countries, undoubtedly, have registered sustained growth. But their growth traction is marked by volatility. Now, chip firms are researching on developing strategies to adjust to the rapid pace of change in the market. Many products embedded in semiconductor devices often have a very short life cycle. Now research is on to rectify that defect and develop components that will have long durability.

Chip industry is characterized by interconnected foundry model, and no country can boast of a self-sufficient supply chain for chips. To put it simply, the operations for the manufacture of chips are integrated, characterized by the presence of semiconductor fabrication plants (foundries) and integrated circuit design operations, each belonging to separate companies or subsidiaries. Only three firms are able to manufacture the most advanced semiconductors as of now: TSMC of Taiwan, Samsung of South Korea, and Intel of the United States. That is because of the high capital cost involved in the setting up of foundries. For instance, TSMC's latest factory, capable of fabricating 3 nm process semiconductors, had entailed a cost of $19.5 billion. Intel is considering outsourcing some production to TSMC since it can only produce 10 nm semiconductors, while TSMC and Samsung can both produce 5 nm.

In the meantime, the chip crisis has become intense for those countries which do not have the wherewithal for chip production and are depending on imports, including countries like India. They are undergoing a double whammy. Foremost is the shortage, accompanied by higher prices to the tune of 30% for chips of certain specifications. Now, more countries are looking at achieving self-sufficiency in chips, however difficult it could be.

Interestingly, the present trajectory that the chip industry is passing through has been described by analysts in many ways. Some say, it is the golden time for chip manufacturers; others, particularly those who have to depend on imports, rue it as a weaponization of the supply chain, and a third set of people say that the matrix of the game is such that winner takes all. Significantly, this phenomenon is apparent along the entire value chain - from equipment production to chip manufacture. Alas, those who want to give chip manufacturers a run for its money may find it difficult to catch up, since the leading players are often several years ahead in technology development.

The proverb 'God helps those who help themselves', is seemingly relevant here. Even fortune, luck, or the divine intervention will appear only for those who are constantly assertive themselves. For those who don't make an effort but rather sit idly waiting for God to intervene and resolve their difficulties, will wait forever, so goes the sage's erudition.

That dictum is forcing many countries to join the bandwagon of chip manufacturing, no matter how result-oriented it may be in the short or medium term. India is trying its luck, or maybe India is one among them. Industry insiders have their reasons to adduce. The way in which electronics are entering into the ordinary life of a citizen is amazing. India will become one among the electronic goods guzzlers in the time to come if this consumption pattern continues. Without creating domestic capacities to produce, the country will have to depend on excessive imports that can drain the foreign exchange, which otherwise can be put to use for other productive purposes. Even if production capacities are created for the production of various electronic goods, without the main component - chips - available domestically, foreign exchange outgo cannot be stemmed.

Worldwide Semiconductor Market Growth - Productwise

Product Categories	Amount in US$ Million			% Growth from Previous Year	
	2020	2021	2022	2021	2022
Discrete Semiconductors	23,804	30,100	32,280	26.4	7.2
Optoelectronics	40,397	43,229	45,990	7.0	6.4
Sensors	14,962	18,791	20,913	25.6	11.3
Integrated Circuits	361,226	460,841	502,307	27.6	9.0
Total	**440,389**	**552,961**	**601,490**	**25.6**	**8.8**

For 2022, the global semiconductor market is projected to grow by 8.8 percent, mainly driven by the sensors category.

(Source: World Semiconductor Trade Statistics (WSTS))

A number of industry insiders whom El-Softech talked to, concurs with the rationale of India's tryst with chips. "Sooner or later, India has to develop capacities for components including chips for moving in electronics value chain, since chips are foundational and indispensable in the electronics ecosystem," says Vinod Sharma, Managing Director, Deki Electronics, a prominent name in India's growing component manufacturing segment, adding, "bereft of that, we will be subjected to producers tyranny as evidenced now with prices of components including those of chips soaring some 30 percent or so in recent months, making us believe that there is something called weaponization of supply chain."

TSMC, Taiwan is the largest semiconductor company in the world

Empirical evidences are there to prove the hypothesis. While the supply of chips and other components was

Top 10 Semiconductor Manufacturers

The companies producing semiconductors continue to grow at a steady rate. Even with the many issues caused by Covid-19, semiconductor companies are expected to have a compound annual growth rate of at least 4-5% per year by 2027. That's a predicted increase of almost 315 billion dollars compared to the total 2019 sales of these companies.

Intel (INTC)
2020 Revenue: $77.87 billion
Total Assets: $153.09 billion
Founded and headquartered in Californias in 1968.

Samsung Electronics
2020 Revenue: $52.2 billion
Total Assets: $304 billion
Founded in 1969 in South Korea; branches in 74 countries.

Taiwan Semiconductor Manufacturing Co. (TSMC)
2020 Revenue: $45.5 billion
Total Assets: $89.87 billion
Founded in Taiwan in 1994 and produces over 10 million semiconductor wafers per year.

SK Hynix Inc.
2020 Revenue: $25.27 billion
Total Assets: $56.08 billion
SK Hynix Inc., formally known as Hyundai Electronics, is a South Korean company.

Broadcom Corporation
2020 Revenue: $23.89 billion
Total Assets: $75.93 billion
Established in 1991, Broadcom is a public American company headquartered in Irvine, California.

Qualcomm
2020 Revenue: $23.53 billion
Total Assets: $35.59 billion
Founded and headquartered in Southern California, Qualcomm is a semiconductor company that also specializes in software and other wireless technologies.

Micron Technology
2020 Revenue: $21.43 billion
Total Assets: $53.68 billion
Micron Technology is an Idaho-based semiconductor company that specializes in manufacturing memory and data storage for computers.

Applied Materials
2020 Revenue: $17.2 billion
Total Assets: $22.35 billion
Applied Materials is a Silicon Valley giant that was founded in 1967.

Nvidia Corporation
2020 Revenue: $14.78 billion
Total Assets: $26.88 billion
Headquartered in California's Silicon Valley, Nvidia is a unique semiconductor company specializing in graphics processing units (GPUs).

Texas Instruments Inc.
2020 Revenue: $14.46 billion
Total Assets: $19.35 billion
Texas Instruments (TI) is one of the oldest semiconductor companies founded in 1930.

mostly disrupted, thanks to demand peaking during the pandemic, chips-producing countries have resorted to rationing of exports. They have reported to have grossly reduced the exports mainly because of two reasons: to reap the benefits on account of the demand peaking, and the other, for spiking the countries that are dependent on imports for chips. One need not have to dwell further on this issue, except looking at the circumstances in which US Senate had enacted Innovation and Competition Act, 2021 as latest as June 2021. It has its roots in the famous trade war between the US and China.

Today, India's semiconductor demand stands at around $24 billion and is expected to reach $100 billion by 2025. Presently, the country's semiconductor demand is entirely met through imports. With the growing technology and the advent of IoT and 5G technology in India, the demand for semiconductor chips is increasing. India is set to witness a significant demand spike by 2025 driven by electronic manufacturing, electric vehicles, IoT products and data center facilities. Semiconductor

INDIAN GOVERNMENT INITIATIVES

In the Union Budget 2017-18, the Government of India increased the allocation for incentive schemes such as the Modified Special Incentive Package Scheme (M-SIPS) and the Electronic Development Fund (EDF) to Rs.745 crore (US$111 million) for providing a boost to the semiconductor as well as electronics manufacturing industry.

The Union Cabinet approved an incentive of up to Rs.10,000 crore for investors by amending the Modified Special Incentive Package Scheme (M-SIPS), to further encourage investment in the electronics sector, generate employment and reduce dependence on imports.

The government is committed to play a more active role in developing the sector by attracting more private players and providing initial capital to make India a global semiconductor hub.

The government has set up the Electropreneur Park at the South Campus of Delhi University, which would incubate 50 early-stage startups and create at least five global companies in five years.

The Centre last week sanctioned Rs.76,000 crore under the Production-Linked Incentive (PLI) scheme to encourage the manufacturing of various semiconductor goods within India. The scheme comes amid an inadequate supply of semiconductor chips in the global market, which has severely affected the supply of a number of goods such as cars, laptops and phones. Under the scheme, the Centre will offer financial support to companies that want to manufacture a range of semiconductor goods in India. The subsidy will bring down the production costs of companies manufacturing such goods, and thus encourage them to set up new factories and other facilities. It is seen as an attempt to build a strong semiconductor industry that would put an end to the country's reliance on imports to meet its semiconductor needs and is also expected to help in the creation of jobs.

Worldwide Growth in Integrated Circuits - Categorywise					
Integrated Circuits	**Amount in US$ Million**			**% Growth from Previous Year**	
	2020	**2021**	**2022**	**2021**	**2022**
Analog	55,658	72,842	79,249	30.9	8.8
Micro	69,678	79,102	83,980	13.5	6.2
Logic	118,408	150,736	167,396	27.3	11.1
Memory	117,482	158,161	171,682	34.6	8.5
Total	**361,226**	**460,841**	**502,307**	**27.6**	**9.0**

In 2021, overall the semiconductor market was not negatively impacted in spite of Covid. Robust consumer demand pushed all major product categories to double-digit growth rates, except optoelectronics. The largest growth contributor was Memory with 34.6 percent.

Source: World Semiconductor Trade Statistics (WSTS)

shortages in the pandemic and the new geopolitical realities of semiconductor supply chains further exacerbate the need to develop reliable and trusted sources for semiconductors.

India's tryst with chips should be seen from this context. The government has announced grand plans for semi-conductor production and recently unveiled a Production-Linked Incentives (PLI) Schemes in line with the incentives rolled out for other electronic goods like mobile phones, OEMs, components, etc.

India imports 100 per cent of its semiconductors. Indian companies such as Tata and others have recently announced their aspirations to increase their lead in the design and ramp up manufacturing. It is also looking to enter semiconductor manufacturing. The reason is not far to seek. The given geopolitical standoff may affect the dependence on China for components. Also, India is learning more from the international experiences. How long India can depend on other countries for its requirement of electronics, while the ongoing trend is that countries are developing strong supply chains for their requirements. Look at the Chinese, Japanese and Germans who are producing OEMs; they are sourcing their requirements including printed circuit boards, components, semiconductors and peripherals domestically to ensure inventories are kept very low and to insulate them from other uncertainties, including diplomatic skirmishes between countries and the regions, cost advantages apart.

It is not the large companies alone which are trying to answer the clarion call of the government to enter the industry. There are a number of SMEs wanting to enter the bandwagon, mainly driven by their expertise in chip designing, knowing fully well that setting up a foundry is not a plug-and-play affair. It will entail huge cost. The investment required to set up an FAB can range from $3 billion to $6 billion, depending on the technology node and wafer capacity of the FAB. If one has to go for manufacturing chips of sizes lower than 10mm, the cost will be prohibitive. Though some of the firms El-Softech spoke to are keeping their plans close to their chest, they are counting on their overseas partners for investment support and a regime government support. A person who refuses to divulge his name said, "China's grand plans to establish its strength in chip making is solidly backed by the government support and if India can extend such game plans with a liberal approach, in two or three years, the semiconductor dream can take a concrete shape; otherwise, it may remain a pipedream" ■

Market Capitalization for 20 Top Semicondutor Companies in the World for 2020-21

Rank	Name	Market Cap	Price	Country
1	TSMC	$627.60 B	$121.02	Taiwan
2	NVIDIA	$606.02 B	$243.19	USA
3	Samsung	$419.71 B	$61.79	S. Korea
4	ASML	$266.35 B	$652.81	Netherlands
5	Broadcom	$253.13 B	$590.16	USA
6	QUALCOMM	$201.91 B	$179.47	USA
7	Intel	$200.47 B	$48.01	USA
8	Texas Instruments	$158.39 B	$171.42	USA
9	AMD	$152.59 B	$123.60	USA
10	Applied Materials	$124.13 B	$135.57	USA

Rank	Name	Market Cap	Price	Country
11	Micron Technology	$90.89 B	$81.17	USA
12	Analog Devices	$84.59 B	$161.03	USA
13	Lam Research	$80.78 B	$579.07	USA
14	Tokyo Electron	$73.96 B	$475.50	Japan
15	SK Hynix	$71.47 B	$103.95	S. Korea
16	MediaTek	$61.50 B	$38.66	Taiwan
17	Marvell	$59.99 B	$71.10	USA
18	KLA	$56.87 B	$377.38	USA
19	NXP Semiconductors	$52.68 B	$198.12	Netherlands
20	Infineon	$52.48 B	$38.35	Germany

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India is on the cusp of an Electronics Revolution

Vinod Sharma

Through his managerial excellence and creativity, Vinod Sharma has steered Deki Electronics into a world-class manufacturer of "Film Capacitor". Under his stewardship, Deki registered an average growth of 30% over the last seventeen years.

Vinod Sharma is an active proponent of the role of electronic sector in India's economic strategy and is often consulted by the government on matters governing electronics policy. He is presently the Chairman of the CII's National Electronics Committee. Other important positions held by Vinod Sharma include Chairman, ELCINA; Chairman, Electronics and Computer Software Export Promotion Council (ESC), etc. He is often invited by think tanks and other organizations to know his insights on the future of the ICT sector.

Vinod Sharma is a keen trainer and consultant and devotes his time towards enhancing competitive management skills in managers and entrepreneurs around the world. He is a retained expert at CBI, Centre for developing imports from developing countries – Ministry of Foreign Affairs, the Netherlands. As a CBI expert, he has undertaken several training, audit and consultancy projects – in India, South Africa, Vietnam, Rwanda, Mozambique, Egypt, Kenya, Tanzania and Uganda.

El-Softech caught up with Vinod Sharma to discuss a number of issues concerning the ICT sector, his personal views on a number of policies that were unveiled and what more industry and government should do to build a vibrant electronics ecosystem in the country. Excerpts of the interview are given overleaf.

On Macroeconomics Dynamics

India has one-fifth of the world's population and ideally it should have the same share of Gross Domestic Product. What holds us back, among other things, is lackadaisical manufacturing competitiveness. We have legacy problems and happily, such imponderables are being addressed in recent years. Yet, we have to go a long way.

The three main challenges that cripple our manufacturing activity and impair our competitiveness are the dearth of sufficient electricity, logistics and finance. To accelerate economic growth, India needs a technology-driven growth paradigm, where the ICT industry has a prominent role.

On Weaponization of Supply Chain

Global electronic ecosystem is heavily polarized. Countries with manufacturing strengths in the electronics sector, can arm twist the rest. That is what is happening. Look at the prices of electronic goods, components, particularly semiconductors etc. In the recent months, they have shot up by 30%. What does it mean? Importing countries have to part with higher resources.

Electronics are omnipresent in every sector, be it healthcare, manufacturing, governance, education, communication, power generation, entertainment, smart cities, cybersecurity and so on. That is going to be the trend for some more time. In short, a country which does not build production capacities in electronics will perpetually be at the mercy of the countries with the capacity to produce and market. Let me take an example. The US focussed on chip designing, and processing of rare earth, chemicals, etc for chips, while the real manufacturing was shifted to countries such as Taiwan, South Korea, China, etc. Now it is reevaluating that strategy by setting up foundries to manufacture chips. Yes, we have to review the old theories in the light of recent geopolitical polemics triggered by the trade war.

Ideal Supply Chain for Electronics

Supply chains are all globally interconnected whether they are for manufacturing original equipment, printed circuit boards, chip designing and importantly component manufacturing facilities to align with global chains. Along with that, there should be efforts to create strong domestic supply chains to align with global

chains like what Japan, Germany, China, etc. have done. India also should follow such approach. There should be a phased approach in building capacities. In India's case, we have a tremendous scope for building capacities in components. For instance, my company supplies capacitors to some of the foremost global brands. There are other local companies in that league.

Does it mean the industry needs support?

Is there any industry in the world which has grown without government support? Such a support mechanism can manifest in different forms. There can be higher customs duty to protect the domestic industry. It can be in the form of additional incentives. Yet another could be tax incentives. I am happy that the Government of India finally recognized the latent potential of India emerging as an ICT production hub.

Is there any industry in the world which has grown without government support?

A slew of schemes have come up in recent times. Production-Linked Incentives (PLI) Scheme is one among them. First, such an incentive was extended to mobile phones and components. Later, the number of ICT products under PLI has been expanded. Of late, incentives and capital subsidies were granted to semiconductor production. That is at a good pace. The scheme has already attracted several multinational corporations and large Indian companies. There will be a spate of investments in various segments of the ICT sector. I have a feeling that PLI for components should have contained the same proportion of benefits as was the case with mobile handsets to help smart phone manufacturers to source their components locally, and achieve price competitiveness.

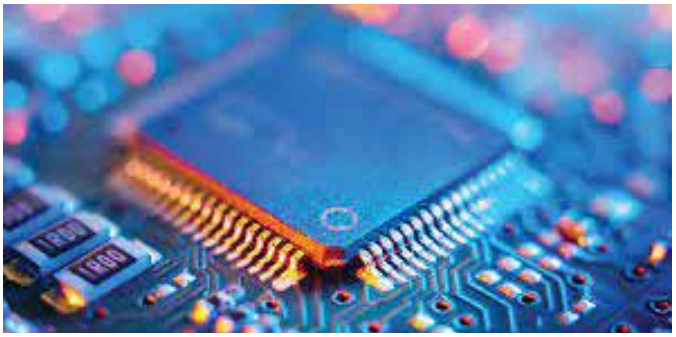
What about a PLI exclusively for the small sector?

Yes, there is a demand from the small sector to come out with a PLI exclusively for them since the benchmarks set and investments that are needed are ideally suited for multinational corporations and large Indian companies. "I believe that their demand is genuine and should be closely looked into by the government, without much lapse of time. That will undoubtedly be a motivation for them to achieve economies of scale and to go for state-of-the-art technologies. Undoubtedly, MSMEs are facing a number of handicaps", he pointed out.

Does PLI for semiconductors have any relevance now since huge cost is involved in setting up FABs, amounting to several billion dollars?

I often hear the argument that first we should go for low hanging

fruits like components, design, PCBs, OEMs and then chips. That can be an argument before the onset of the concept like weaponization of supply chains and disruptions it can create to the production processes. Also, it should be understood that by granting incentives



for such projects, things would be made available soon. There can be a gestation period between investment and real production of chips. If chips can be produced a few years from now, it can be an ideal situation which we should aspire for. I feel it is a well thought-out decision. All those incentives that the government is extending by way of PLIs and capital subsidies can be realized by creating higher employment, income, exports and revenue to the government through taxes.

What is the role of R&D?

I am tempted to say that electronics is nothing but R&D, innovation and incubation. Electronics is heavily dependent on technology. Shelf life of products is ephemeral. The percentage investment of global ICT leaders in R&D, on an average, is in double digit of their turnover. That helps them to stay as the leaders in the market.

What about India?

We have to evolve a careful policy for R&D and innovation in India. First, as far as the R&D expense in terms of GDP is concerned, we fare very poor. In the ICT sector, where R&D is a decisive factor, our records are abysmally poor. In India, most of the R&D expenditure is done by the government - the labs under the government control. There also, I must say, R&D is done in silos. Most of the research remains as scholarly studies without any commercial applications. Why should not the government fund only such projects in the ICT sector, which can have commercial application? I feel the industry should be consulted before the government sanctioning such projects in the ICT sector so that the output of research should have a commercial application. That can also strengthen the academia and industry partnership with the government acting as an arbiter.

What are the joint ventures that you operate and are in the pipeline?

For a long time, Deki has been synonymous with film capacitors. To cater to new demands in the sector, we are venturing into other emerging areas by establishing joint ventures and partnerships. These collaborations are helping us to establish a global presence.

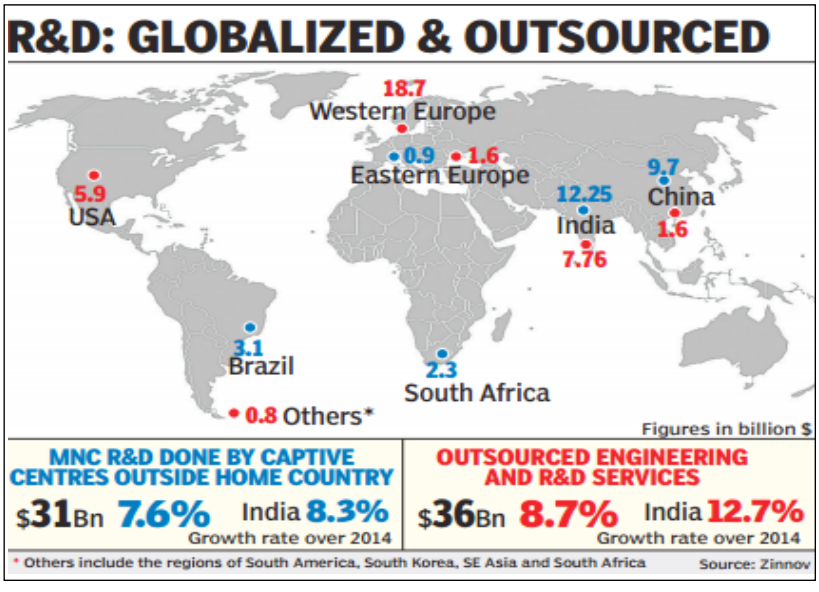
We have established a joint venture with NeoLync, an Israeli electronics company. The idea was to marry NeoLync's technological knowledge and Deki's proven track record in capacitor manufacturing, and set up a large manufacturing facility

in passive electronic components. Last year, NeoLync India was awarded approval under the Production-Linked Incentive (PLI) Scheme for Large-Scale Electronics Manufacturing.

IPEC India Private Limited was formed in 2017 as a joint venture between DEKI Electronics, MEHER Group and Sung Ho Electronics. With its deep domain knowledge, manufacturing and business experience in the power, electrical and electronics sectors, its vision is to be a leading provider of power electronics products and solutions in the areas of E-mobility and Energy Storage.

IPEC Drive Systems Pvt. Ltd is a joint venture between IPEC India Pvt. Ltd and L7 Drive Ltd of Finland in the sector of electric mobility.

Deki Power Roll Pvt. Ltd, a collaboration with Power Roll Limited, UK, offers an innovative range of energy storage devices ■



Technology Extravaganza

Apple's Next Version of Airpods

Apple is likely to launch the next version of its AirPods Pro in the second half of this year. Apple's suppliers are getting ready for shipments of the new high-end product, according to Digi Times. The second-generation AirPods Pro may support lossless audio support and a charging case that makes a sound to help you find it. The upcoming wearable may support Apple Lossless Audio Codec (ALAC) and can also have integrated AirTag features in the charging case and support for Apple Lossless.

Google's creative tribute to Stephen Hawking

To celebrate the 80th birth anniversary of Stephen Hawking and

to pay tribute to the most respected physicist of the modern world, Google found a creative way - physicist with a Doodle. The animated video, which runs for two-and-a-half minutes includes narration in the physicist's own computer-generated voice outlining his work and painting a message of hope for the future. The tech giant worked with his family to create a video Doodle that gives us a condensed version of his life. Google used Hawking's famous computer-generated voice to narrate his work and experiences from the time he graduated.

Meta to have Privacy Centre

Meta has introduced a Privacy Centre across its family of apps to educate billions of users. It will be available only to a limited number of people using Facebook on desktop in the US at the moment. The Privacy Centre is expected to educate people on their privacy options and make it easier to understand how Meta (formerly Facebook) collects and uses information. It will roll this out to more people and apps in the coming months. Meta said that the Privacy Centre would serve as a hub for those controls and privacy education.

Samsung-Eco-Remote 2022

Samsung debuted its newest energy innovation at this year's Consumer Electronics Show (CES)—capturing the energy in radio frequency signals emitted by home Wi-Fi routers to power a TV remote control.

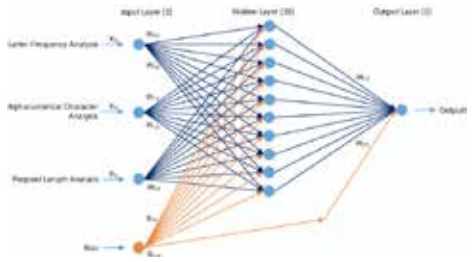
The technology is part of Samsung's stated mission to make consumer products more environmentally friendly. Last year, Samsung debuted a TV remote at CES (the Eco Remote) that could be charged using either room light or sunlight, or using a USB cable. Samsung's new remote can be recharged in multiple ways. It can harvest energy from artificial room light, from sunlight, from a USB cable, and now also by capturing the energy in radio frequency signals generated by Wi-Fi routers.

CES 2022 showcases Top-line Gadgets

A foldable smartphone, a tablet with light-powered wireless technology, a foot-controlled electric carrier and multiple empty booths are some of the items unveiled at CES 2022. Products from Samsung, Oledcomm and Pickwheel, among other companies, were displayed at the show. Covid-19 had its toll on the much-celebrated show. Several major companies also dropped out of physically attending CES 2022 in Las Vegas, including Amazon, T-Mobile and Microsoft.

New Neural Network to address Fibre Nonlinearities

Researchers at Princeton Lightwave Lab and NEC Laboratory America have recently created a new neural network hardware that could help to overcome limitations caused by fibre nonlinearities that affect long-distance transmission systems. The neural network, presented in a paper published in *Nature Electronics*, is run on a silicon-based photonic-electronic system composing of a few neurons, which can, in principle, outperform commercial DSP chips in throughput, latency and energy use.



Body Tracking Wearable Circular Ring

Startups at the annual gadget extravaganza in Las Vegas touted technology-enhanced accessories designed to look fetching on the outside while scrutinizing what is happening on the inside of wearers. The wearable Circular Ring provides a wearer with a daily "energy score" based on the intensity of their activity, factoring in heart rate, body temperature, blood oxygen levels and other data. The good thing is that at night it continues to track the phases of sleep, how long it takes one to fall asleep, if you are aligned with your circadian rhythm. It also vibrates in the morning to wake you up. The ring will cost less than 300 euros ($340) when it hits the market later this year.

Health freaks watch out

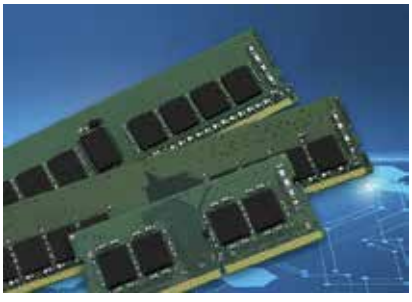
Growth has been driven by smart watches such as those made by powerhouses Apple and Samsung, as well as internet-linked sports gear—which boomed during the pandemic—and personal tracking devices. Companies are also moving to fill a need for instruments that provide data that can be relied on as part of a pandemic-driven trend of remote health care. Swiss Biospectal taps into smartphone cameras to measure blood pressure when a finger is placed over a lens. French Quantiq is developing algorithms that calculate heart rate, respiratory rate and blood pressure from "selfies".

Next-Generation Batteries

All-solid-state batteries are now one step closer to becoming the powerhouse of next-generation electronics, as researchers from Tokyo Tech, National Institute of Advanced Industrial Science and Technology (AIST), and Yamagata University introduce a strategy to restore their low electrical resistance. They also explore the underlying reduction mechanism, paving the way for a more fundamental understanding of the workings of all-solid-state lithium batteries. All-solid-state lithium batteries have become the new craze in materials science and engineering as conventional lithium-ion batteries can no longer meet the standards for advanced technologies, such as electric vehicles, which demand high energy densities, fast charging, and long cycle lives. All-solid-state batteries, which use a solid electrolyte instead of a liquid electrolyte found in traditional batteries, not only meet these standards but are comparatively safer and more convenient as they have the possibility to charge in a short time.

Memory Revolution

A pioneering type of patented computer memory known as ULTRARAM has been demonstrated on silicon wafers in what is a major step towards its large-scale manufacture. ULTRARAM is a novel type of memory with extraordinary properties. It combines the non-volatility of a data storage memory, like flash, with the speed, energy-efficiency and endurance of a working memory, like DRAM. To do this, it utilizes the unique properties of compound semiconductors, commonly used in photonic devices such as LEDs, laser diodes and infrared detectors, but not in digital electronics, which is the preserve of silicon. Initially patented in the US, further patents on the technology are currently being progressed in key technology markets around the world. Digital electronics, which is the core of all gadgetry from smart watches and smart phones through to personal computers and data centers, uses processor and memory chips made from the semiconductor element silicon. Due to the maturity of the silicon chip-making industry and the multi-billion dollar cost of building chip factories, implementation of any digital electronic technology on silicon wafers is essential for its commercialization.



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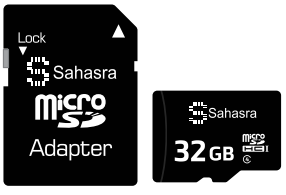

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Balkan to Serbia - Booming ICT Sector

With their strategic location in Southeast Europe (SEE), flourishing economies and growing tech talent, the Balkan countries are emerging as strategic business destinations for ICT. In this digital interview, with BOJAN DIZDAREVIC, Head, Balkans Direct Investment LLP, El-Softech Arya Nambhoothiripad takes a look at the growing trends in the Balkan ICT sector with special focus on Serbia

Arya : How has the ICT sector emerged as one of the most promising sectors of the Balkan region?

Bojan: The Balkans generally comprise of Albania, Bosnia and Herzegovina, Bulgaria, Croatia, mainland Greece, Macedonia, Serbia, Kosovo, Montenegro, part of Turkey and Slovenia. Generally speaking, all these countries, of late, are developing ICT sector. The computer literacy and internet penetration is very high, particularly in countries like Serbia and Croatia. More than that, most of these countries are looking ahead in developing ICT. These countries have preferential access to the European Union. Also, they have equal access to countries like Russia and some CIS countries.

A: What are the advantages of the Balkans in general as an investment destination?

B: Most of the countries in Balkan are either a member or a potential member of the European Union and enjoy free trade with the EU. Additionally, as part of the Open Balkans Initiative, Serbia, North Macedonia and Albania have signed agreements which aim to replicate the Schengen Zone's free flow of people, capital and goods, initially between the three countries but potentially across the entire region. In the next few years, the Open Balkan Initiative is expected to have a market of 20 million people making the region attractive for nearshoring opportunities.

A: How strong is the English language proficiency of the Balkans, a key skill to attract Business Process Outsourcing (BPO) business?

B: Most of the countries in the region, of late, have become proficient in multiple languages, including English. Let me speak about my country. Globally, Serbia is ranked anywhere between

Country	Number of ICT Students per 100,000 of Population
Estonia	333
Serbia	325
Albania	312
North Macedonia	306
Latvia	297
Kosovo	254
Ukraine	251
Hungary	229
Belarus	226
Georgia	213
Montenegro	207
Slovenia	203
Romania	203
Czechia	187
Bulgaria	178
Bosnia and Herzegovina	173
Armenia	162
Croatia	157
Moldova	138
Lithuania	131
Poland	131
Slovakia	126
Azerbaijan	99

5th and 15th position in English proficiency. Serbians are also well versed in German, French and Russian. Thus, Serbia offers an attractive location for the BPO industry and currently has a wide global client base. That is true for some of the other countries as well.

A: What is the extent of internet penetration and broadband infrastructure in the region?

B: Most of the countries have good digital infrastructure, such as mobile, internet and broadband penetrations at varying degrees. Serbia has a robust and well-built internet infrastructure and is ranked at the top in broadband speed, use of computers & mobile phones and internet penetration.

A: You are from Serbia and you have been promoting the ICT sector in your country. What is your take on the advantages of Serbia?

B: With strong government backing, the Serbian ICT sector has grown rapidly over the past 10 years. The last 5 years witnessed exceptionally high growth rate. In the upcoming years, the Serbian ICT industry is expected to hit 20-30 percent annual growth, mainly driven by outsourcing. In 2017, Serbia has achieved an IT export turnover of of 1.5 billion euros by 2020-21. Now, it has set an ambitious target of 4 billion euros to be achieved in the next 3-4 years.

A: What are the major incentives and policies of the government to attract investment in the region?

B: The Balkan region keenly welcomes foreign investments. The government of Serbia in particular, has undertaken numerous measures to promote business in the country. The Serbian President Aleksandar Vučić recently announced that the country would provide one of the highest rates of subsidies in the Balkan region – i.e., around 5 to 10 percent more than what is offered by other Balkan countries. Also, it is interesting to note that Serbia has different schemes for different parts of the country based on unemployment rates, average salary of employees and other indicators. The hardware and software sector has numerous incentive schemes which are given only after meeting certain conditions (similar to the PLI scheme in India). Overall, the total incentives range between 5,000 and 30,000 euros, depending on the industry, location and other factors, besides, tax breaks, concessional land and other facilities being extended.

I might add that Serbia has been consistently ranked first in the Financial Times Greenfield FDI Performance Index for the last few years. The country is also ranked among the top with respect to job creation as a result of FDI as indicated in the 'Global Location Trends' published by IBM.

A: Which are the hardware and software companies that have relocated to the Balkan region?

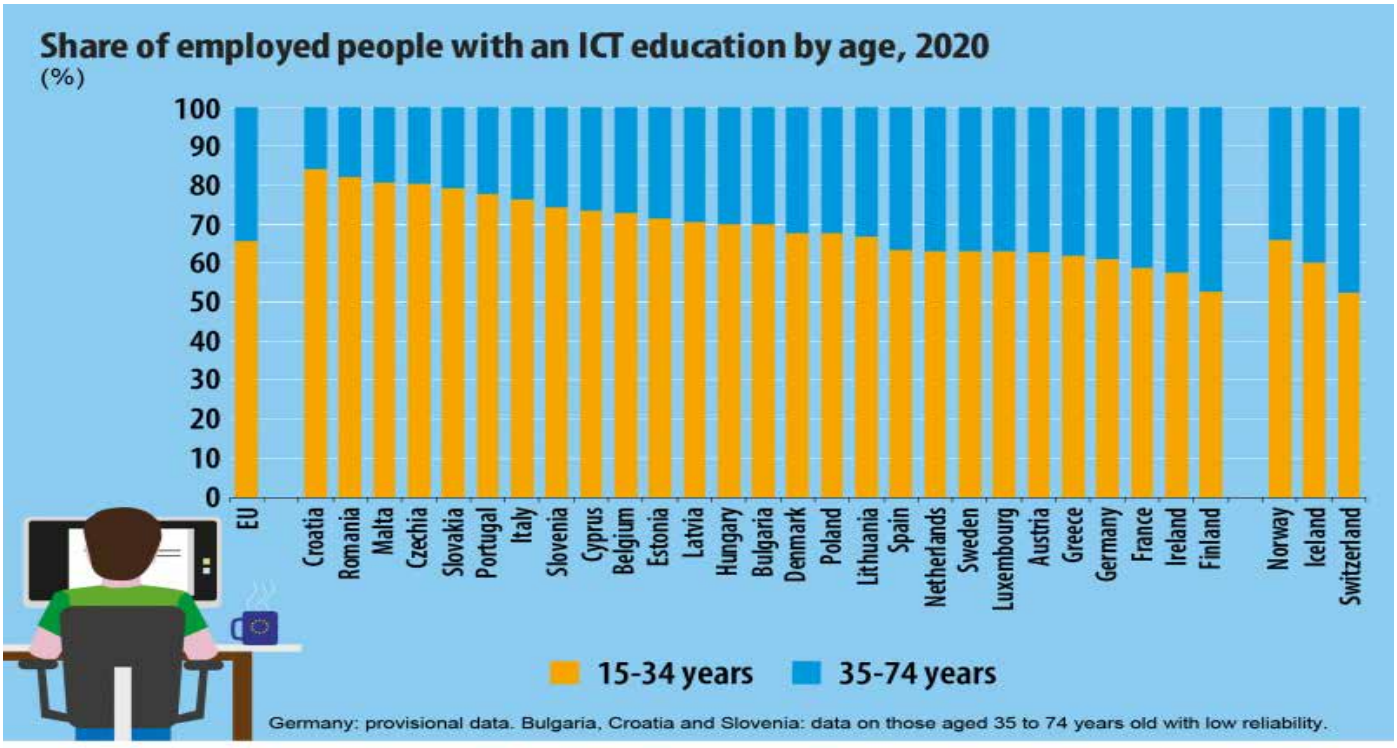
B: Balkan countries such as Bulgaria, Romania and Serbia have several huge IT companies such as VMware, Oracle, Nutanix, etc. it is expected more companies would set up their bases in Balkans because of the geographical advantages.

A: Can you give some examples?

B: Around 15 years ago, Microsoft chose Serbia as its location to establish its 5th Development Centre. Also, NCR, one of the largest US companies, invested 90 million dollars to set up its second-largest establishment in the world in Serbia. From 200 employees in 2012, NCR has grown to over 5,000 employees performing customer support to high-level programming in just 10 years.

A: Could you shed some light on the electronics industry in Serbia?

B: Thanks to the government initiatives, electronics sector has also started catching up. The country has started attracting



Source: ec.europa.eu/eurostat

capital-intensive high-tech investments that rely on research and development. In the last four to five years, Serbia has seen opening up science parks in four of the major cities, with plans for setting up more. Also, several companies in electronics and automotive industry have started opening R&D centres. NIDEC, the Japanese electro motor company, is opening up its largest R&D facility and largest electric motor factory in Serbia. German Continental Automotive Company is also setting up units in the country. With such substantial inflow of foreign investments along with the presence of large lithium mines in Serbia, the country's electronics and automotive industry looks very promising.

A: The prices of chips have gone up tremendously and currently there is a shortage of supply. In the context of weaponization of supply chains and trade wars across the globe, what is the region's dependency on China for chips?

B: The domestic demand of chips in the Balkans has recently shot up dramatically. A large part of the demand was met through imports from China and a few other Eastern and Southeastern Asian countries. However, post the pandemic, the European Union has been devising plans to invest in local FABs to source it domestically or at least nearshore. Countries like Germany, France and UK are now aiming for shorter supply chains and are looking for nearby countries that also offer educated workforce, cost-effective labour and so on. This comes as a huge advantage to the Balkan region, given its location.

A: Is the ICT sector in Serbia attracting young talent? How would you assess the startup culture in the country?

B: Recent Emerging Europe report has ranked Serbia as second with respect to the number of IT students per 100,000 people among 23 countries. Thus, the IT industry is expected to witness an influx of new talent in the coming years. Startup Genome, a website that tracks startup ecosystems across the globe, has ranked two of Serbia's largest cities as great startup locations - the City of Belgrade and Novi Sad. Serbia is also ranked among the top 5 with respect to the number of blockchain developers. It is also highly ranked globally in gaming. Recently, Serbia saw the launch of a large domestic telecom operator. Furthermore, crowdfunding and micro funding are gaining popularity in the country, making startups less dependent on commercial bank loans.

A: What are some of the promising sectors of Serbia that India could prospectively invest in? And what sectors in India would the Balkan region, particularly Serbia, consider investing in?

B: The key sectors with lucrative investment opportunities in Serbia are BPO, electronics, automotive industry and agribusiness. There already exists good bilateral relations between India and Serbia in the agriculture and allied sectors, and Indian investors have long recognized key opportunities for investments in the Serbian agricultural industry. For instance, an Indian tractor manufacturer recently acquired one of the prominent local tractor companies.

As for Serbian investments into India, potential sectors would be in tech, agriculture and energy. India currently has around 15 to 20 million new electricity users every day, thus making it a hotspot for investments in coal, power plants, hydro plants and so on. Serbia has been traditionally strong in the power sector, even before Serbia's separation from Yugoslavia ■

Ecowas - The Booming ICT Market

Dr. Enobong UMOESSIEN is the Acting Director of Private Sector Promotion for the ECOWAS Commission. He is also the focal point for the implementation of EU/ACP Private Sector Strategy in West Africa as well as the ECOWAS Cooperation Programme with emerging markets, including India.

Dr. Umoessien has over 30 years' professional experience spanning work in the private and public sectors of Nigeria, including national planning, international trade and cooperation, insurance, exports development and marketing, development banking and SMEs/entrepreneurship development. He has been involved in different levels of work with UNCTAD, the International Trade Center (ITC), African Union and the World Bank.

El-Softech editorial team interacted with Dr. Enobong UMOESSIEN and excerpts are given below:

Communication is the live wire of development. The ECOWAS is mindful of the role of adequate communication in the realisation of the integration programmes. The ICT policy is geared towards promotion of the digital infrastructure.

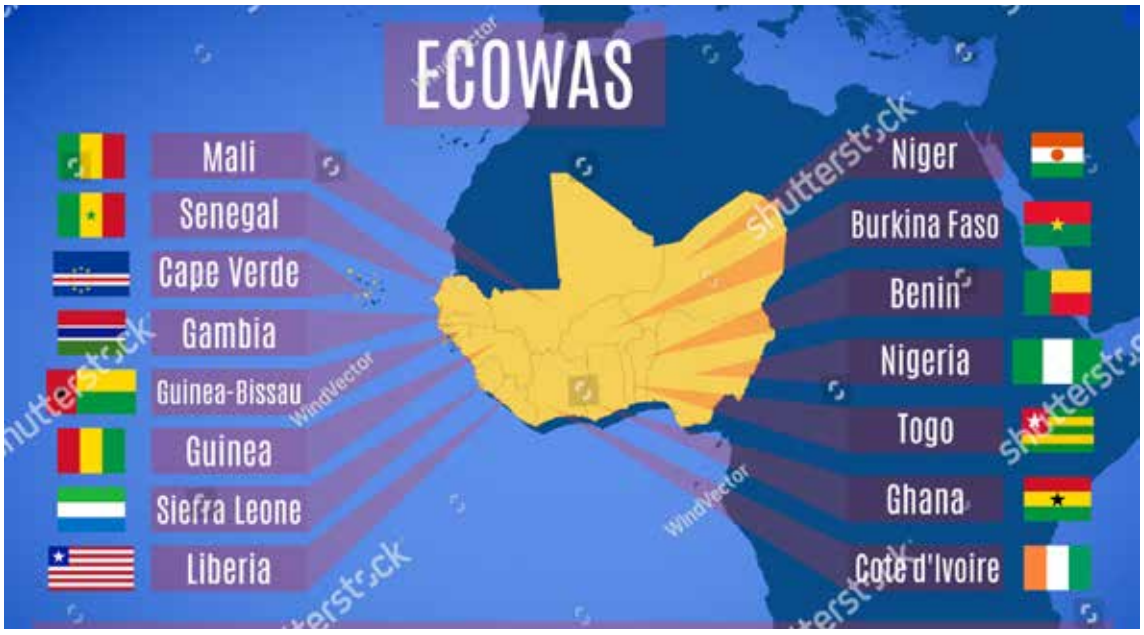
El-Softech: Last month "ECOWAS Vision 2050" was announced in Abuja. Can you give us some details of this vision?

Eno: The Economic Community of West African States (ECOWAS) was established on May 28, 1975, by the Treaty of Lagos, with a mandate to promote cooperation and integration among Member States, economic and political stability, to increase economic opportunities for its peoples and improve their level of well-being. Within the framework of this mandate, the Conference of Heads of State adopted, in June 2007, the ECOWAS 2020 Vision with the ambition of moving ECOWAS "from an ECOWAS of States to an ECOWAS of peoples". This vision had the merit of taking into account the popular dimension (civil society, private sector), and used an inclusive approach in its implementation. It has encouraged a strengthening of the integration process on sectoral issues. Notable achievements have been observed, but persistent challenges remained. Thus, ECOWAS decided to produce the 2050 Vision document, based on an in-depth review of the results of the 2020 Vision assessment, the diagnostic study of the region as well as the aspirations of the populations and key stakeholders.

The ECOWAS Vision 2050 is fully aligned with the United Nations 2030 Agenda for Sustainable Development and the African Union's 2063 Agenda. The Vision notes that the current dynamics of ECOWAS are underpinned to a large extent by endogenous variables related to human capital and social welfare, governance and strong institutions, peace and security which interact in an environment strongly conditioned by international geopolitics and globalization. And these variables defined the scenarios, pillars and the formulation of the 2050 Vision document. The Vision will be supported by the Community Strategic (Implementation) Framework as well as a Communications and Resources Mobilization Strategies. Ultimately, the Vision seeks to sustain the emergence of an integrated, peaceful and prosperous West Africa.

El-Softech: Can you give us the highlights of the ECOWAS ICT policy with a special focus on Nigeria?

Eno: On the status of the policy and legal framework of the



ECOWAS moves to improve Digital Accessibility

telecommunications / ICT sector, the ECOWAS Commission is currently revising the existing community acts adopted several years ago to take into account the rapid technical evolution of the sector and support the development of the digital economy so as to maximize the opportunities for users and investors. In this regard, a draft policy and legal framework was prepared in 2020 and a wider national consultations process is ongoing with relevant operational, policy and regulatory stakeholders of the digital economy in Member-States, to ensure inclusion and full acceptance of the envisaged new policy. Specifically, the ECOWAS Commission is also collaborating with the National Regulatory Authorities (NRA) of Member-States to fast track the development and implementation of various sub-policies in this sector. Some of these include policies on Roaming on Public Mobile Communications Networks in the ECOWAS space, facilitation of a more secure ECOWAS cyberspace, development of broadband infrastructure and the promotion of digital skills and digital entrepreneurship for youth as well as establishment of ECOWAS regional radio. These are complemented by policies and initiatives to create awareness and build relevant capacity in the citizenry.

El-Softech: As a leading member of ECOWAS, Nigeria is fully involved in the conceptualization and implementation of these policies. How far have you moved in achieving a harmonized and standardized ICT infrastructure across the region?

Eno: On the development of broadband infrastructure, the Commission, in collaboration with the ECOWAS Project Preparation and Development Unit (PPDU) and member-states, has prepared a roadmap for the development of a Submarine Cable project (Amilcar Cabral) to connect Cabo Verde to its closest neighbours in mainland West Africa, namely, The Gambia, Guinea Bissau, Guinea, Sierra Leone and Liberia. The cable will also provides additional international capacity to the concerned countries. The roadmap details the institutional/governance framework and the scope of the preparation, promotion, marketing and structuring services required for the advancement of the project. Our objective in the ICT value chain is to create a single digital market with access to all ICT goods and services for all citizens and also to facilitate the use of ICT as an enabler for competitiveness in other sectors. In this regard, we are implementing programmes for roaming, cyber-security, fiber optics development, regulatory reforms, policy harmonization and business competitiveness. As at June 2019, the ICT sector in ECOWAS featured six submarine cable systems with 25 landing points that connect ECOWAS to the rest of the world. Internet penetration was 36.4% (expected to have doubled under the pandemic), 61 mobile operators on ground and about 90% mobile telephone ownership. The EU is also supporting the development of ICT and its leverage to enable transformation in three other value chains, including cassava, mangoes and cotton textiles in its West African Competitiveness Programme.

El-Softech: What are the steps being undertaken by the ECOWAS for promoting digital economy and computer literacy among the members? What is the progress and future plans?

Eno: The ECOWAS Programme on the promotion of digital skills and digital entrepreneurship, especially for youths, is a flagship programme with the overall objective of promoting digital entrepreneurship, creating jobs, reducing poverty, promoting employment, enhancing digital skills and business environment support. Specific projects include the development and establishment of frameworks and an enabling policy environment to create and sustain startups. The Commission is also implementing projects for training youths in digital technology (DT), ICT and ICT entrepreneurship while working to establish the ECOWAS Regional Radio.

El-Softech: Could India with a large pool of computer talents be of any relevance in that drive?

Eno: Absolutely! India can come in as investors, donors,

entrepreneurs, consultants, etc. The ECOWAS Common Investment Market Policy, SME Charter, common industrial policy, etc all support the ECOWAS ICT and Telecommunications development programmes, giving room for international participation. Besides, ECOWAS has as a region, along with its member-states, has strong historical and economic ties with India, and these can provide leverage for India in the ECOWAS region.

El-Softech: Some of the Indian companies have investments in Africa, particularly Infosys, TCS, Wipro, etc. There are also some Indian SMEs, which have invested in Nigeria. What are your suggestions to up the Indian investments for mutual advantage?

Eno: India has considerable expertise in two areas: fintech and e-governance. How do you foresee the potential of collaborations with African companies in this regard?

In the past, several partnership events were organized between India and the ECOWAS region – by FICCI, ASSOCHAM, ESC, etc. These need to be revived and stepped up to provide platforms for awareness creation and interaction of Indian and ECOWAS businesses. Again, almost all ECOWAS countries also have diplomatic relations with India. We also need to step up binational economic diplomacy, establishment of business councils, etc. Indian businesses and investors should simply invest in ECOWAS, especially in infrastructure and PPPs. And for SMEs, most importantly, India should provide cheap funds to them to partner with Indian businesses to do business and invest in the region or India, and back this up with zero import tariff regime and establishment of Technology Towns in ECOWAS, to showcase Indian technology and promote trade and capacity building.

El-Softech: As the nodal point for promoting private-public partnership in ECOWAS, what are your priorities?

Eno: Within the context of providing a high standard of living for the ECOWAS population, private resources are being sought to blend and support public capacities to deliver on this. All ECOWAS member-states are implementing PPP projects, but the regional PPP policy and framework seeks to harmonize the various policies and introduce important regional commonalities and predictability so as to encourage and enable private participation in long-term big-ticket projects, especially cross-border regional projects. In this regard, the priority scale is led by infrastructural projects like telecoms, roads, railways, energy, special economic zones, automobile plants, etc. The specific details of priority projects including their cost structure are available and can be provided to investors on demand.

El-Softech: A country like Nigeria has the highest number of billionaires in Africa. For instance, the most decorated industrialist Aliko Dangote, who has extensive interests in petrochemicals and cement, has some investments in India. Do you think any of such industrialists will be interested in India's growing ICT sector?

Eno: Africa is emerging to become an international economic hub. And with the advent of the AFCTA, we are likely to see intra-Africa trade boom, along with a new crop of billionaires. I am very sure that many will be interested in the Indian market ■

Countries	Annual GDP	Debt ($M)	Percentage change in internet usage between 2000 -2021
Benin	$15,652M	5,934	25.25%
Burkina Faso	$17,378M	8,106	45.84%
Cape Verde	$1,704M	2,705	4.3%
Ghana	$68,532M	41,720	49.13%
Guinea	$15,681M	5,186	31.8%
Guinea-Bissau	$1,432M	949	16.57%
Ivory Coast	$61,349M	29,300	30.53%
Liberia	$3,201M	1,689	152%
Mali	$17,465M	7,008	66.3%
Niger	$13,761M	6,202	67.18%
Nigeria	$429,423M	150,635	101.48%
Senegal	$24,644M	16,989	24.27%
Sierra Leone	$4,063M	2,952	20.77%
The Gambia	$1,862M	1,498	11.71%
Togo	$7,575M	4,583	912%
~TOTAL: ECOWAS	**$683,722M**	**285,457**	

Source: https://countryeconomy.com/& Statista

An American Dream blends with Indian Ingenuity

Mukesh Vasani

Mukesh Vasani has a lot of faith in the Indian growth story. India is slowly emerging from the clouded shadows of the past in recent years. There is greater value for entrepreneurship as evidenced by more people from the universities and technical institutes are chasing that dream. "The forces that held us back are slowly losing grip in recent years; so also corruption and mismanagement slowly thinning, giving way to efficiency and transparency," he avers.

There is an old saying that only dreamers can achieve and what fuels them to dream is their ambition and commitment. It is also true that dreamers and achievers continue the pursuit forever because it is there in the DNA. Mukesh Vasani (58) continues to dream with the same intensity and vigour as he had done in his teens. Born in a nondescript village in Gujarat, where primary schooling was a luxury in the 1960's, Mukesh took the pains to travel on foot to get educated and be on his own. Traversing from one village to the other to complete his schooling, Mukesh finally set his eyes on Civil Engineering. After completing his education in India, there were not many options before him but to chase his Great American dream. There unfolds the story of hard work, perseverance and above all rock-hard determination of an achiever.

Mukesh Vasani began his career in the US in the construction industry and realized quickly that was not his cup of tea. He was always intrigued by the magic world of electronics, though he admits that in his schooling time, he did not even know how to spell electronics nor did know what it was about. Mukesh went

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back to school to receive his electronics degree from DeVry Technical Institute, Illinois, US. To realize his entrepreneurial dreams, in 1998, Mukesh became a minority owner at an electronics manufacturing company in the suburbs of Chicago that quickly grew to more than US$27 million in revenue annually in seven years.

The year he had chosen to quit the partnership and to set out on his own was in 2009, a year which went into the annals of history as the beginning of financial meltdown, that shook the financial world and mighty companies that had proven track record had bitten the dust and fell along like a house of cards.

Scouting talents and to provide them a tech-savvy ambience at workplaces was his long-cherished goal. That only can fire imaginations and ferret out products and solutions that have a global appeal. "I always wanted to create top talents and expose them to the state-of-the-art technologies in a family-friendly atmosphere so that the employees can have a good work-life balance," said Mukesh to the editorial team of El-Softech, in his digital conversation with the team.

With several employees in the US and double that number worldwide and state-of-the-art manufacturing units in multiple locations in the USA and India, Aimtron, the company he founded and is presently the CEO, is raring to become a world-renowned brand in electronics. It is not alone business that he set his eyes, he wants to go beyond the realms of profit making and visualizes his Aimtron Foundation, which carries out a number of useful works for the community both in the US and India, to train people in technology so that they can take the roles of future technology leaders.

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Ten years down the line, Mukesh visualizes a groundswell of opportunities staring at Indians. That was not the case a few years ago. "I have personally experienced such foundational and impeccable transformation," he said, while recounting how he cleared the import of machinery from the US in recent times in Gujarat, in record time, without any interlocutors and rent seekers. "We want this type of system to be replicated everywhere so that businesses operate with full freedom and transparency," he laments.

What is his take on keeping two dreams parallelly - the American and Indian one. His reaction was quick and apt: "You can take the boy out of the country, but you can't take the country out of the boy; the boy remains a bucolic rube even though he moved from his origins". That explains the quintessence of Mukesh. He left the country when he realized his ingenuity to blossom required a different landscape. Now he is jetsetting between the country he adopted and the country he was born and spent his early part of life in. "I can creatively contribute to both countries and can work towards fostering friendship and cordiality between the two countries, though separated by thousands of miles", Mukesh says, adding that there are many commonalities between the two countries, such as English language, which most of the Indians speak, democracy - we are the largest and oldest democracies, stress on corporate structure and importantly, the trailblazing intellectual capital," he opines.

Mukesh's enterprises have operations in three places in India - Vadodara, Ahmedabad and Bengaluru, apart from multi-city operations in the US. The latest two offices - Ahmedabad and Bengaluru - are now focussing mostly on R&D. What are the product lines of his manufacturing units? A bouquet of products in electronics, such as product design, chip design, circuit card assembly, high-value assembly, integration and tests, layout and routing, etc are there in the product profiles. "It is expanding and we are ever interested in trying newer products and applications," he says, adding that the Bengaluru facility is currently doing R&D on recharge of electric vehicles. When asked about the recent announcement of the Government of India, a slew of packages for promoting electronic production in the country, including mobile phones and semiconductors, Mukesh said they were in good pace. That shows the commitment of the government to revamp electronic production in the country and to emerge as an important production and export hub. "This is a vision that we

should chase leveraging the strength of our large pool of technical people and high caliber intellectual capital; given a conducive ecosystem, we can move in value chain and can give China a chase for its money," he says, while adding that a good percentage of experts working in the global US technology firms are Indians. He also shared his commitment to replace the Chinese digital platforms operating in India with that of more secured and efficient ones to bring a paradigm shift in India's digital ecosystem.

Why India is lacking big names in the electronics sector, while we have names to reckon with are there in other domains like automobiles, pharmaceuticals, other segments of manufacturing and even in the case of software? "It is only a matter of time we catch up in this domain also sooner or later, given the creative and proactive schemes that are unveiled; maybe the big name in electronics can be that of Aimtron and Vasani," he shares, though jokingly but with a spark in his eyes, which can be noticed even in the digital screen.

Mukesh is sure that India has begun its journey in electronics and that it should continue to get government support. For instance, a segment like chip production needs a lot of investment; setting up an FAB needs multi-billion dollars, which can come only with heavy government support. When asked what type of support the US government and states extend for manufacturing units, he said that the government support mainly goes for creating the right infrastructure and the rest is left to the enterprises to compete, innovate, reform, survive and create jobs. That is the dictum in a liberalized economy, where industry is mostly independent of the government, except for policy tooling.

What about the future plans of Aimtron Foundation in India? "Education and providing exposure to young people in technical domains will continue to be our focus," he indicates, adding that under the purview of the Foundation, over 7,200 youngsters in both countries - India and the US - were given orientations in various avenues of technical education and entrepreneurship. The overall philosophy of the organization is to empower people to help themselves and not to extend charity to get the best results for the money spent.

Yes, Mukesh has a long gameplan for India, while keeping his operations in two continents. That is at a good pace ■

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