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Editorial

Transforming Governance for Empowered Citizenry

or most of the government and public sector organizations, conventional operational procedures have been like an albatross impeding their positive transformation for better and effective delivery of services to citizenry. Hence, the government organizations must examine the possibilities of combining new technologies in creative ways. Some agencies are combining cloud, cognitive technology, and digital reality to simulate work environments to attract and retain top talent in very competitive markets. Organizations are finding that increasingly sophisticated simulation and modeling capabilities, power visualization, better interoperability and IoT sensors, and more widely available platforms and tools are making it possible to create simulations more detailed and dynamic than ever. As capabilities grow, the sector can expect to see more organizations using digital twins to optimize processes, make datadriven decisions in real time, and design new products, services, and business models.

In this day and age, it is imperative for governments to meet citizens on their own terms and via their preferred channels, such as in person, by phone, via mobile device through smart speakers, chatbots or via augmented reality, in order to fulfill their expectations and achieve program outcomes. One of first things to be done is to have a digitally enabled work environment that is aimed at achieving employee satisfaction, retention and engagement. However, the sector has a long way to go to accomplish that. A workforce of selfmanaging teams needs the training, technology and autonomy to work on digital transformation initiatives. Helping them out are technology solution and service providers that are enabling them to take their operations to the next level and improve their service delivery.

In this issue, we bring to you the lists of 10 Most Promising Government and Public Sector Service Providers who have made their mark in this domain with their technology acumen and industry expertise. These companies have kept abreast of the new technological advancements in this segment and have leveraged them to their full potential.

We hope this issue gives you helpful insights into this market landscape.

Sudhatar Singh

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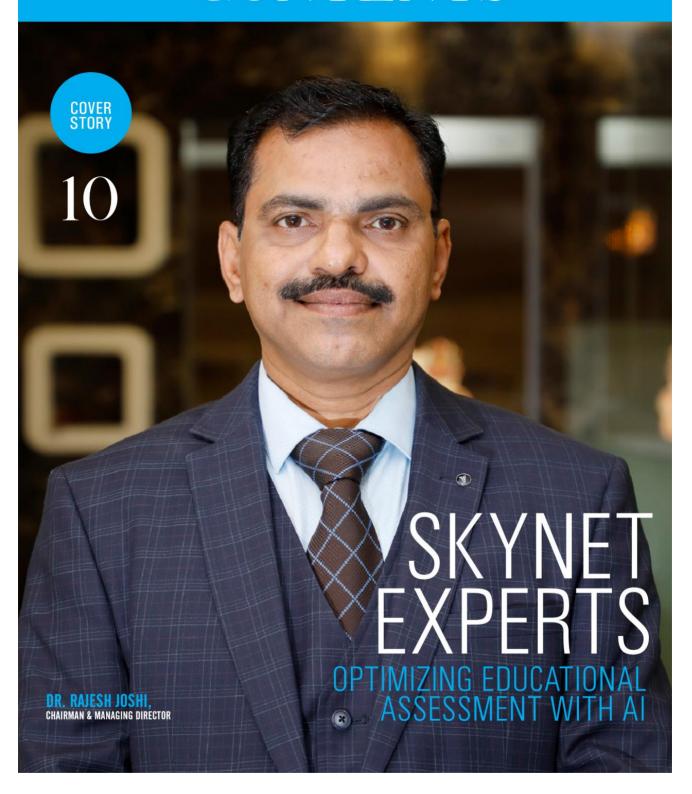
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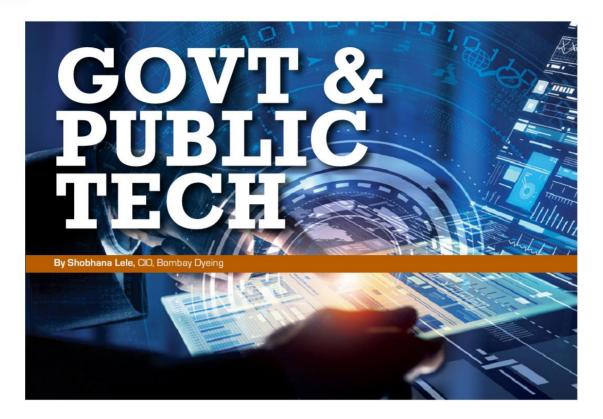
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LAST WORD

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Ocean Conservancy

IN MY OPINION



n India, technology is progressive and steadily moving to an advanced stage in the Government and public sector. In the past few years, these sectors have opened to technology and are warming-up to Digital Transformation initiatives. This is heartening to see not just because it gives businesses and citizens of the country easy, efficient and fast processes, but also because it has forced a number of technology-averse organizations to sit-up and invest in technology.

Additionally, it has resulted in (call it as a 'Corollary to the Theore') –

 Modernization of government offices which are required to maintain an IT Setup Upgrade of its staff, as otherwise, they would be in danger of becoming defunct

Initiatives viz NetBanking, UPI, BHIM, GST Returns, IT Returns, EPFO, Aadhaar, Electoral Forms, MCA & SEBI Forms & Repository, Online Tickets, Admissions – the list can go on and on. Looking at the technology roadmap for the country, these are some of the technologies that Government and Public sectors must invest in. While we are aware that some of these initiatives are already in progress, below are some highlights on the areas in which these technologies have maximum impact.

Language Inclusion: If technology has to reach the length and breadth of India, it cannot be done in

one language. A comprehensive plan of unicode and uniform keyboard layouts specifically developed for Indian languages will go a long way in technology outreach. Translation and online availability of our historical assets are required to preserve our scriptures and manuscripts. This will also increase the ability to do more research and outcome-based approaches by taking advantage of this powerhouse of knowledge.

Digitization: While this is a very misinterpreted term, by this, not only must governments digitize their existing records, but they should look at doing away with paper based forms altogether and move to an era of online forms and processing. A strong point in case is the e-voting. This will be a boon to voters who

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would be able to exercise their right from anywhere in the world and participate in the most important democratic process.

RPA & BPM: RPA can drive huge efficiencies and cost savings. Logistic and distribution operations consisting processing of bills, invoices and automated Business Process Management will bring a faster and process-oriented approach.

BI & Analytics: The sheer volume of India as a country cannot go without the inclusion of Big Data initiatives which will drive faster decision making. While it is easy to get lost in this space, a phase by phase approach will drive big benefits. Start with basics like essential commodities, medical outcomes, geographical data consolidation, and others.

simulations, will also drive participation from younger technologists.

Blockchain: Whether it is KYC Forms, secure transfer of medical records or patient history, space programs, the opportunity is huge.

Artificial Intelligence: Innumerable use cases for AI in bettering supply chain, researches in farming, agriculture, medical field, education, fraud investigation – the list is endless, and this is by far one of the most important technologies to implement

Manufacturing, Services & IoT: Traditional manufacturing of goods and consumption of services cannot survive without IT innovations. Information Technology along with few other portfolios. With growing relevance of technology, a dedicated 'CIO' for the country is required to drive policy decisions, budgets and roadmaps. This includes strategic

planning for short and long term.

Reduce Technology
Dependence on Other
Countries: It is quite
paradoxical that although
most major technological
giants are led by Indians,
India has not led manufacturing and innovations
in technology. There is

no dearth of talent and resources; but more policies and subsidies are required for India to reach this stage. One cannot forget 'Data is the new Oil'.

Dedicate a Separate Slot in the Union & State Budget for IT: Just like Railways is tabled as a separate budget, it is imperative to table a separate budget for Information Technology. This will bring-in more focus.

Address Environment & Health Impact: Finally, one cannot ignore the fact that every piece of technology is adding-up to the clutter of ewaste, and continuous exposure to digital devices leads to health issues, mental or physical. There has to be focused government and publicprivate partnerships to bring about a sustainable approach to disposal, reuse and recycling of waste. Further, technological innovations need to be approved only after definition of its waste disposal and power utilization/renewal energy capabilities. Similarly, a mandatory 'Digital Detox' may be needed to be made imperative in the long run as a policy enforcement to assure overall health and well-being. CR



A comprehensive plan of unicode and uniform keyboard layouts specifically developed for Indian languages will go a long way in technology outreach

Education & Learning: Availability of online and interactive e-learning can greatly help in increasing literacy levels across the length and breadth of India. Mobile enabled learning modules will drive faster and eager adoption. Use technology to make the dream of 100 percent literacy closer to reality.

Mobility, Smart Devices & Interactive Media: Technology will drive great benefits for the Media, Infrastructure, Services, Travel and Tourism industry. Bringing information at fingertips including kiosks with AR/VR enabled commentaries and

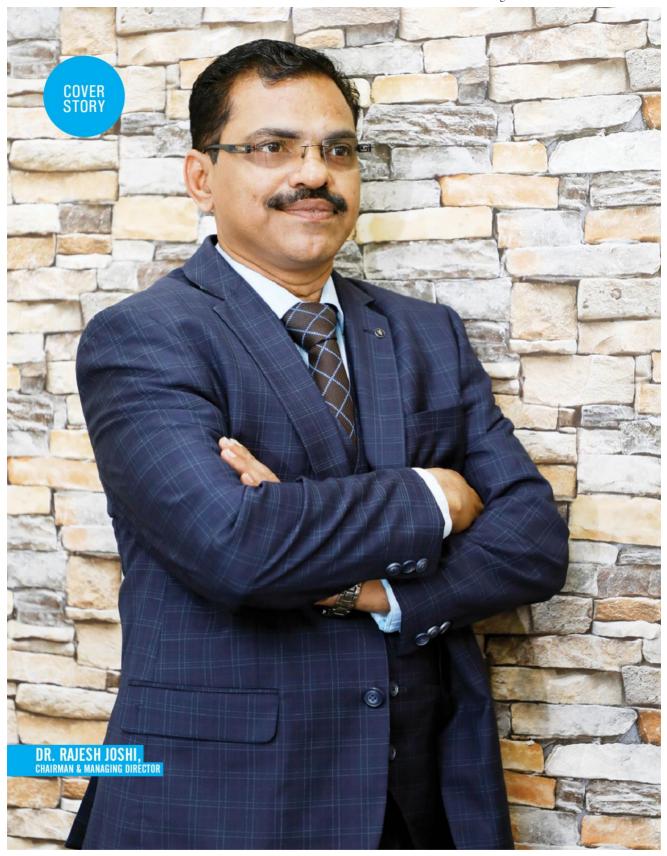
Technology will bring-in completely new dimensions in delivery of goods and services, particularly essentials.

Security: No technology can survive without an able security and governance framework, and principles including and not limited to cyber security, counter intelligence, breaches of data, confidentiality of information, and others.

Suggestions/Recommendations

Appoint a Dedicated Ministry for Information Technology: Today, the Information and Broadcasting Minister assumes the responsibility of

CIOReviewIndia



SKYNET FXPFRTS



OPTIMIZING EDUCATIONAL ASSESSMENT WITH ALL

BY JANIFHA EVANGELINE

he smart learning market size is anticipated to reach \$56.5 billion by 2024. Factors driving the growth of this market include the proliferation of connected devices in the education sector, adoption of e-Learning solutions, and growing use of Artificial Intelligence and Machine Learning techniques in smart learning.

Educational Assessment is the need of the era, and it is the critical piece of the learning process, as it determines whether or not the course's learning objectives have been met. Moreover, educational assessments help in having a successful career. According to Technavio's latest report on education testing and assessment market analysis, the market to register a CAGR of five percent by 2022.

A good career assessment helps candidates increase their self-awareness and understanding of the job market. Most career assessments follow the methodology that a student/candidate needs to understand their interests, aptitudes, values and skills to determine what their real interests are and where exactly they fit in the job market. While recruiting an employee, organizations look for certain skillsets, and the education system helps students develop a certain set of skills. However, identifying the right candidate with the required skillset is a huge challenge today.



This is where Pune based Skynet Experts comes into the picture. As a leading educational assessment company, Skynet Experts provides the most innovative and hi-tech solution to assess today's graduates for their jobs. Skynet's AI based online assessment platform helps the company to assess the candidate's career interest and helps them find the perfect job.

"What makes our platform different from the other assessment platform is the platform is AI, ML, CMM Level-5 with the Six Sigma Black Belt Standards of Quality, and the capability of our online assessment platform to assess more than one million applicants, making our platform robust and scalable," says Dr. Rajesh Joshi, Chairman & Managing Director of Skynet Experts.

UNIQUE CAREER ASSESSMENT PROCESS

Assessment are an essential part of the recruiting process. The right assessments can lead to higher productivity and results, a more efficient hiring process, reduction in costs associated with turnover, and increased defensibility of the hiring process through the use of an online platform. Skynet Expert's online assessment platform helps in assessment process right from the selection phase of the candidate till the skilled based recruitment phase. With the help of the career mapping software, the Skynet team analyses the career interest of the candidate and with the help of its training partners, the candidates are trained in their particular area of career interest. Upon the training completion, Skynet team assesses the candidates' performance on the platform by conducting certain tests. The platform has a huge question bank with random selections of the questions as per the language



requested by the candidate, which is a unique feature that none of the other assessment platform possess.

After the completion of this particular assessment, Skynet has corporates lined-up for the interview sessions, wherein the eligible candidates are provided with a corporate test prepared by the organizations. This system helps corporates to recruit their employees in a faster manner and with nominal cost. The main idea behind this assessment process is to retain the candidate in the organizations for a longer period of time, as the candidates are analysed, selected and trained as per their career interest.

QUALITY ASSESSMENT SYSTEM

The company provides assessment solutions for Boards, universities and skill vocational & regular training, career guidance and certifications as well. Skynet Experts also provides reliable, customised and significantly reduced human effort tech platform-based assessments. It also consists of video queries, images, graph analysis, software tools, precision & speed typing, and speech synthesis. This platform is compatible with specific incorporation of regional languages. Moreover, quality audits are a key part of educational capital

markets, and Skynet has set the best quality assessment system in the country.

"We work with leading skill universities, states and competency councils in the sector. Skynet Expert uses latest technological tools and AI based assessment tools to assess the young talents of the country, which will help our clients in selecting the perfect workforce that will act as a business growth catalyst for them," affirms Rajesh. "Our vision is to build a global platform and a connected community to guide the students on their journey to achieve their aspirations. We aspire to be a global leader in the field of educational assessment and help today's generation in shaping their career," he adds.

REMOTE PROCTORING SOLUTIONS

Skynet offers a leading remote proctoring solution. The company partners with educational institutions, colleges, universities, organizations and certification providers to carry-out safe test experiences with high quality. The company also ensures that the test operators comply with all established test integrity and use the best-in-class approach to support test participants throughout the process.

CIOReviewIndia 12 June 2020

Potential infringements are detected using Machine Learning algorithms, implemented by the company in its solution. The Remote Proctoring solution records the behavior of the test participants through screenshots, audio or video files. This solution also manages remote candidate disclosure using intelligent photo capture and video sharing, which helps in detecting cheating during online exams. The other products offered by Skynet Experts include Smart Exam Management app, Smart Admission Management app, Smart Aadhar app, Smart Employee and Smart Attendance app.

IIT, IIM & IIT ALUMNI, WITH DECADES OF EXPERIENCE IN TECHNOLOGY & EDUCATION

Skynet Experts is an ISO 9001:2015 company that was established by a

on development of native tools and designed & deployed lots of large scale projects. And for the last ten years, he is into policy designing for the central and state of India, Nepal, Thailand, Malaysia, UAE and Saudi Arabia.

The technology team is headed by Devdatta Sathe, who has 25 years of experience in the Technology field and has worked with top corporates like IBM. The operations are headed by Dr. Rupali Joshi, a Six Sigma black Belt certified with 20 years of operational experience in fortune 100 companies of the world. The international business is handled by Dr. Firoz Syed, highly experienced in the UAE, Gulf and African continent. Skynet is fortunate to have highly qualified and dedicated team of colleagues in the Software development, project management, human resources, finance, Quality,

WHAT MAKES OUR PLATFORM DIFFERENT FROM THE OTHER ASSESSMENT PLATFORM IS THE PLATFORM IS AI, ML, CMM LEVEL-5 WITH THE SIX SIGMA **BLACK BELT STANDARDS** OF QUALITY, AND THE CAPABILITY OF OUR ONLINE ASSESSMENT PLATFORM TO ASSESS MORE THAN ONE MILLION APPLICANTS, MAKING OUR PLATFORM ROBUST AND SCALABLE

company has delivered assessments in automobile, beauty & wellness, construction, retail, hospitality, IT, mining and sales sectors. Skynet Experts has conducted assessments in more than 21 states and has certified 3.5 million candidates across 20 sectors with Sector Skill Councils that comprise Telecom, Sports, Rubber and Domestic Sector Skill Council. On 15 July 2019 (World Youth Skills day), the company set a record in Asia book of records and Indian book of records by evaluating 3000 candidates in a single day.

THE JOURNEY AHEAD

Currently, Skynet Experts is working closely and rendering services to the state governments of India such as Maharashtra, Jharkhand, Haryana, Uttarakhand, Uttar Pradesh, Madhya Pradesh and Goa. The company is also working closely with the CTEVT and educational ministry of Nepal, TVET of Thailand and its education ministry, TVET of Malaysia and its education ministry, educational ministry of UAE, and educational ministry of Saudi Ariabia. Moving ahead, the company is in plans of expanding its services to several other countries in the African continent. CR



team of IIT, IIM and IIT alumni, who have decades of experience in the field of technology, education and training. This team is headed by Dr. Rajesh Joshi, who has 25 years of experience in the IT sector. Rajesh is a PHD holder in IT and operations, Princes 2 Certified, PMP Certified, and has worked for HCL, Microsoft

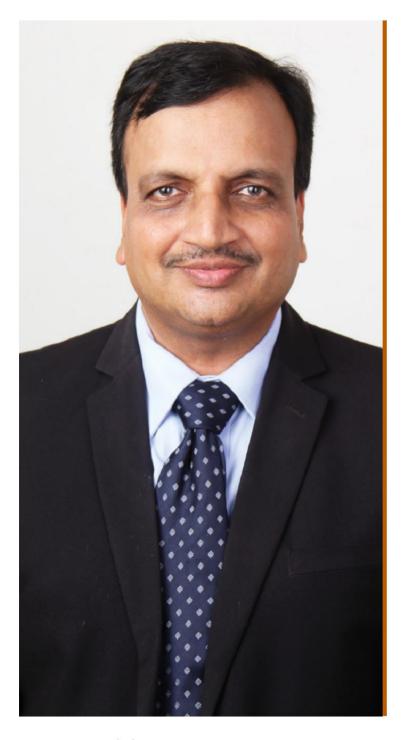
back office and field executives (Assessors and Tech Support for the field assessments).

RECORDS & ACHIEVEMENTS

Skynet Experts works with leading MNCs under RPL (Recognition of Prior Learning) project and its recruitment partners as well. The



CXO INSIGHTS



ENSURE MASS
PUBLIC HEALTH
SURVEILLANCE
DURING PANDEMICS
SUCH AS COVID-19
THROUGH
RPA
SOLUTIONS
ON THE

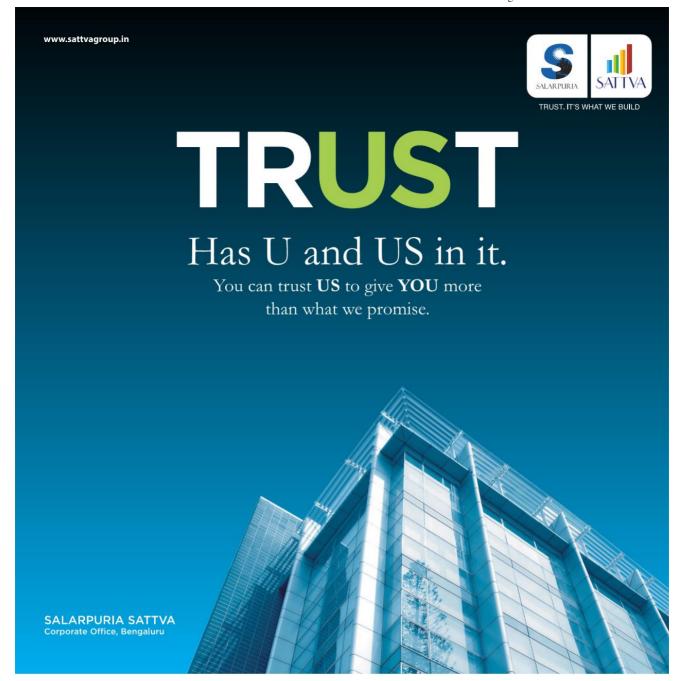
By Rajesh Agarwal, SVP & Head - RPA, Datamatics Global Services

OVID-19 may or may not have been the fall-out of mass commercialization that resulted in creating a turf for antigens to transcend the natural barriers and create drug resist-

ant strains. But when the resultant virulence results in a mass scale global pandemic, the state authorities have to quickly take stringent measures. One of them is rapid public health surveillance, and what a great idea it is to assist it with the latest of the information technologies such as Robotic Process Automation (RPA). Earlier, state infrastructures had the option to adopt automation solutions at their discretion. But as pandemics surge, putting a high pressure on the state health machinery, the only option is automation in order to share as well as source information across a distributed network of health providers across the nation.

How can RPA Assist in Public Surveillance during COVID-19 like Pandemics?

It is popularly known that local doctors, diagnostics, and hospitals are the first point of



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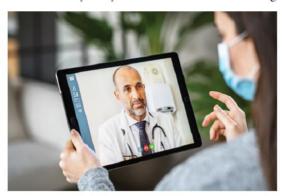
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SALARPURIA SATTVA

contact as well as succor for patients. A patient may not know that he has been afflicted by a particular antigen, but the treating doctors and the local clinics can diagnose it faster than any rapid action team, which usually focuses on only a sample target population. The health infrastructure points inevitably have Electronic Medical Record (EMR) and Electronic Health Record (EHR) systems, which are interconnected in small networks at a local level. They are synchronized across the connecting



points, but depending on the availability of staff and at pre-defined intervals only.

RPA solutions help here. These solutions can interconnect the siloed systems not only across a city or state, but at a national level with a governing body at the centre. Not only that. These systems can be connected across the globe for rapid information sharing in real-time with a central global authority using RPA solutions hosted on cloud. With this solution in place, you can distribute the pressure experienced by the health infrastructure by sourcing as well as sharing the information collected across wider geographies. No more just sample testing, but real-time testing and real-time information sharing, especially so when the patients in the infected state may or may not show symptoms, as well as the patients who have already recovered are still in the stage of virus shedding.

At a national level, these RPA solutions have to be deployed in a top-down approach with a central, national level authority in the driver's seat. RPA solutions are unique and allow a two-way information sharing across the pre-defined pathways. Cloud hosting gives tremendous compute power. This crowd sourced big data can be further tested in the ambits of Artificial Intelligence to come-up with intelligent patterns which are not easily visible to a mind accustomed only to linear thinking.

This pattern generation is immensely useful to curb the droplet borne transition from spreading any further or thwarting the suspicions of the pandemic becoming air borne right in the bud to avoid community spread.

Is an RPA Solution More of Crowd Sourcing?

RPA is not crowd sourcing. It makes the use of real data collected from EMRs and EHRs in a timely manner to deal with emergency and war-like situations. The key during pandemics is the availability of the right information at the right time without putting pressure on the healthcare authorities, who may have reached the point of exhaustion. This timely information is also crucial when treating patients with comorbidities, lung diseases, and asthama, who use topical air pump medicines instead of the contemporary medicines, as their bodily systems are already distressed.

The key during pandemics is the availability of the right information at the right time without putting pressure on the healthcare authorities, who may have reached the point of exhaustion

The information is also important during surveillance and checking cases that may be living in crowded areas, but still having a low rate of disease progression or transmission due to the use of air-borne disinfectants instead of water-based ones curbing the disease spread in the vicinity of their residence.

In Summary

The key in dealing with pandemics is the fast sourcing of authentic data in real-time at one place at a central authority level such that it can be quickly analyzed to make a focused use of limited resources. Pandemics can disappear as fast as they surface due to the right decision making at the right time. In order to be successful, you need to source real data from ground zero at a central place. RPA solutions on cloud offer that robust infrastructure to deal with emergencies in a fast and secure manner by integrating the local EMR and EHR systems at a national level and enable to be prepared to deal with any emergency or war-like situations in the future. CR





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- → Perform together
- → Empower and inspire

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ASUJA eSERV

ENABLING GOOD GOVERNANCE USING TECHNOLOGY



SMITA MAMMEN, FOUNDER & DIRECTOR

BY MARY JANIFHA EVANGELINE X

he proliferation of smart phones and better internet services are transforming the way common people access public services, bypassing the traditional physical means with e-governance. However, though there exists a great growth potential, the e-governance market in India is still in nascent stage in comparison with the global scenario for a variety of reasons. Technically, unskilled manpower is certainly the biggest problem in realizing the digital dreams in governance through technology implementation. In addition to the unskilled manpower, lack of robust IT infrastructure to ensure seamless availability of citizen services poses another challenge. Moreover, implementation of the software that is at the heart of e-governance is becoming increasingly complex unlike the hardware implementation, signifying the importance of a technology partner in the e-governance projects implementation.

FACILITATING DELIVERY OF PUBLIC SERVICES

Addressing all the e-governance challenges, Asuja eServ, a company headquartered in New Delhi, comes-forth with a vision to help people harness the power of digital technologies while availing public services. Incepted in 2013 as a Proprietorship Company in the name of Suja eServ Enterprise, it evolved in 2015 into Asuja

eServ Private Limited as a Technology and Services provider that facilitates the delivery of public platform services and schemes focused on the betterment of common people. The company provides a wide range of e-Governance services such as Aadhaar Seva Kendra, Banking Correspondance, PAN Facilitation, GST Suvidha Centres, and Bankig Correspondence Services such as Account Opening, RD Account, Term Deposit and many others.

"The widespread usage of smart phones is changing the way governments deliver citizen services across India. We aim to enable good governance through technology powered e-governance by bridging the gap between the citizens and government," says Nicholas John, CEO & Managing Director, Asuja eServ, who comes with rich experience of over 19 years spanning across various industries including e-Governance & BFSI. The company is running more than 2000 Aadhaar Seva Kendra in the centres spread across the country from J&K to Kanyakumari with Punjab National Bank, United Bank, OBC Bank and other PSU banks. The company, in collaboration with UTISL, is runing Pan Facilitation Center Pan India & with NSDL, is running GST Suvidha centres at the district level, Bankig correspondence service with Bank of India and helping rural India better access the Government services.



UPSKILLING THE INDIAN YOUTH

Asuja eServ provides Skill Development Programs in collaboration with the Government of India under the DDU-GKY, which is a part of the National Rural Livelihood Mission (NRLM), tasked with the dual objectives of adding diversity to the incomes of rural poor families and cater to the career aspirations of rural youth. DDU-GKY is uniquely focused on rural youth between the ages of 15 and 35 years from poor families. As a part of the Skill India campaign, it plays an instrumental role in supporting the social and economic programs of the government like the Make In India, Digital India, Smart Cities and Start-Up India, Stand-Up India campaigns.

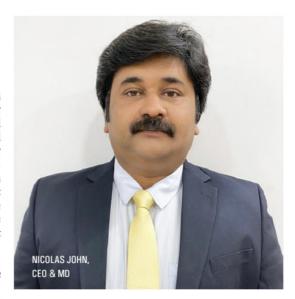
GENERATING/CREATING **ENTERPRENURSHIP EMPLOYMENT THROUGH B2B PORTAL EPORTAL**

In addition to the Aadhaar Seva kendra, Banking Correspondance, PAN Facilitation and GST Suvidha Centers services, the company offers Aadhaar Enabled Payment System (AEPS), Domestic Money Remittance (DMT), Nepal Money Remittance (NMT), Baharat Bill Payments (BBPS), Recharges, Insurance Services through their own developed B2B Portal in the name www. eportal.net.in, and through this, Asuja is generating/ Creating Enterprenurship & Employment both in Rural, Semi Rural, Semi Urban, Urban area and targets to open 3 Lakh Kisok by creating Enterprenurship till 2025.

HEALTHCARE SECTOR

"We are working on Mobile Mini Hospital, where patients can access medical services from remote locations minimizing the need to visit hospitals, and thorugh our telemedicine services, we have established a system wherein patients can book appointment with the doctor and discuss their problems. They can also upload





documents & photos and receive proper medication form the experts. We provide every OPD facility available in the hospitals except the physical presence of the doctor with minimum cost".

Taking us through the success journey of Asuja eServ, he says, "We Smita Mammen, N. Nicolas John and Chandan Kumar Singh have started our propreitorship company almost seven years back (2013) when the digitization was at its budding stage in India, without any external funding and without any business experience with a capital of Rs.10,000, and with hard work and targeted aim, we evolved this propreitorship company into a Private Limited company in 2015. And though these years time was bed of roses with lots of ups and downs, we never gave-up in worst situations. Today, we can proudly say that we are competing with large firms with revenue of Rs.100-1000 crore in the domain of e-Governance, BFSI, Skill & Training Development, Healthcare and B2B Serices. It is possible only because of our clear vision and unwavering commitment towards betterment of the country and society through technology".

The company envisions creating young and dynamic entrepreneurs in rural India and envisages association with social organizations and self-help group (SHG) for rural employment, including woman entrepreneurs. "In the coming five years, we would like to see Asuja eServ as a nation-wide leader in the segment e-Governance, BFSI, Skill & Training Development, Healthcare and B2B Serices. Therefore, we are planning to enhance our manpower by recruiting some of the best talent in the market," concludes N. Nicholas John, CEO, Asuja eServ. CR

CIOReviewIndia 19 June 2028



CXO INSIGHTS





n May 22, 2010, a computer programmer ordered two large Papa John's pizzas. But what's so special about an order that took place around a decade ago? Well, he paid 10,000 mined Bitcoin for those two pizzas. The deal valued

about \$30 back then. Today, had he saved those mined Bitcoin, he would've been richer by more than \$103 million, or by about \$200 million if he would've sold them when Bitcoin peaked in 2017. However, the rather luckless event is now celebrated as the 'Bitcoin Pizza Day' amongst Bitcoin enthusiasts globally. The programmer, Laszlo Hanyecz, has become an internet celebrity himself having his own Wikipedia page and extensive media coverage. But how exactly did he mine Bitcoin? Aren't they supposed to be purchased in the first place? To answer that, we will have to dive into some specifics.



How is Bitcoin mined?

The reason why Bitcoin became popular and continues to be so is that it is highly secure. Its intense security comes from the technology behind it, i.e. blockchain. Every transaction that takes place on the blockchain network is verified by its stakeholders through hash codes (one-way encryption) and proper timestamps. You also cannot alter any previous block. Any new transaction only gets added as a new block, forming a long chain of blocks; hence the name 'blockchain'.

But doing this requires computational power to verify transactions. It prevents double-spending, since any digital information can be reproduced. The verification is done by solving complex math problems (returning a 64-digit hexadecimal number) through computers. We can skip how it is done, since it is irrelevant in our context. What's relevant is that miners receive a 'block re-

ward' whenever they verify a transaction, i.e., add a new block of transaction to the existing blockchain.

Now, back in the day, all that the people mining Bitcoin, like Laszlo Hanyecz, needed was a computer running an application. They would typically receive 50 Bitcoin as a block reward. This reward is halved every 210,000 blocks added to the overall Bitcoin network. The halving process has since brought it down to 12 Bitcoin and might further bring it to 6.25 Bitcoin this year. Earlier, since the competition was less and rewards were



higher, the difficulty level to mine a block was also less. It was 1 in 2009, which literally means that there was a 100 percent chance of returning the correct value. The difficulty level has now gone beyond 15.466 trillion. In other words, there is a chance of 1 in 15 trillion for a computer to give the desired value. So, it is no longer feasible to solve these complex math problems via traditional computers. That's why supercomputers are today put to the task.

Can't such supercomputers be installed in India?

Obviously, they can be. As a matter of fact, there are a number of mining programs that are currently live in our country. You can even purchase a mining plan that has a speed of about 15 tera-hashes per second for less than Rs. I lakh. However, the scenario can dramatically change if the regulatory creates a conducive environment around the same. It is a good idea to regularize crypto currencies.

What's the Regulatory View on Crypto Currencies?

Unlike the widely-held belief, crypto currencies aren't illegal in India. They only have been 'ring-fenced', thereby preventing banks from conducting business with crypto exchanges. So, all crypto currency transactions are currently processed in the P2P format within our country at present. This means that two crypto traders exchange money via their respective bank accounts directly, while the exchanges keep the crypto currencies with them in an escrow account till the transaction gets fulfilled. Currently, the matter is sub judice in the Supreme Court and the verdict will be announced soon. The bench of judges has questioned the RBI on the burden-shifting ploy in terms of regulation. A positive judgment is expected, as it will promote innovation in India.

The reason why Bitcoin became popular and continues to be so is that it is highly secure

So, what about the Indian crypto mining landscape?

Now, any innovation-driven investor willing to invest a sizable sum on infrastructure for mining Bitcoin - or any other crypto currency for that matter - would ideally not want the investment to be in the direct threat, especially the one coming from the regulatory. The Reserve Bank of India must change its policy stance and eliminate apprehension around the crypto. It will create a room for blockchain-based innovation in India. Doing so will also help the Indian players to tap a lion's share in the global market.

The regulatory's positive stance will further drive a large chunk of global innovations towards India. Similarly, it will prevent the brain drain of relevant skills and rather reverse the trend with a brain gain landscape. Ultimately, it will prevent India from walking in the shoes of Laszlo Hanyecz and giving-up on something whose future value is only going to increase - thereby avoiding a Pizza Day of its own! CR

CIOReviewIndia 2 June 2020





Ithough government organizations have started coming to terms with the importance of new technologies, implementation and maintenance remains a major concern as more often than not they lack resources. Hence, they are willing to partner with service providers who can bring them at par in terms of technology maturity while allowing them to focus on their core function. Governments around the world face many complex issues and are constantly challenged to deliver public services in the most efficient way. Therefore, these sectors should be enabled with efficient governance practices infused with ingenuity and aided by technology. In a world where technology disruption reigns supreme, one of the toughest challenges the government and public sector organizations face is to strike a balance between regulation and innovation. This is where AI comes into the picture and has become one of the main driving forces of technology-driven disruption today, enabling public sector organizations to innovate in new areas that would have been unimaginable in the past. Service providers are coming up with integrated services to take care of the varying needs of government and public sector firms.

For the Government and Public Sector organizations that are looking for service providers who can keep them in pace with the changing norms. CIOReviewIndia presents a list of "10 Most Promising Government & Public Sector Service Providers". These companies have been closely scrutinized by a distinct panel of judges including CEOs, CIOs, CXO, analysts and CIOReviewIndia editorial board.



10 Most Promising Government & Public Sector Service Providers - 2020

Company	Management	Description
Asuja eServ New Delhi asuja.com	Smita Mammen, Founder & Director	Provides a wide range of e-Governance services such as Aadhaar Seva Kendra, Banking Correspondence, PAN Facilitation, GST Suvidha Centres, and more
Cyfuture Bangalore, Karnataka cyfuture.com	Anuj Bairathi, Founder	Offers e-governance models by simplifying the core infrastructure and application of digital technology to provide flexibility and affordability to the public sector firms
DuPont de Nemours Gurgaon, Haryana dupont.co.in	Pierre Samuel, Founder	Meets the requirement of government agencies through science driven innovation and collaboration
East Consultancy Services Mumbai, Maharashtra eastcs.com	Amit Joshi, CEO	Delivers digital identity management solutions that are designed around the Aadhaar eKYC and Aadhaar Offline KYC ecosystems
Futurism Technologies Pune, Maharashtra futurismtechnologies.com	Sheetal Pansare, CEO	IT services are provided to support local government organizations and online solutions are created and upgraded online to meet the needs of general public
Inspirisys Gurgaon, Haryana inspirisys.com	Malcolm F Mehta, CEO	Empowers digital environment across every segment of governance, and enables government organisations to better assist the citizens
IPS e Services Mumbai, Maharashtra ipsindia.co.in	Shan Azam, Founder & CEO	A registered Seeding Agency as well as Enrolment Agency empanelled by UIDAI, Government of India
Itzeazy New Delhi itzeazy.com	Himanshu KK, Founder & CEO	Offers services like passport consultancy, marriage registration services, obtaining birth certificates, VISA and immigration services, PAN card, ration card and Adhaar card application and income tax return filing
KRAN Consulting Thiruvananthapuram, Kerala kran.co.in	Ajith Kumar, CEO	Consulting, software development, maintenance and support, project/product implementation, hosted solutions and app development services are offered
Skynet Experts Pune, Maharashtra skynetexperts.com	Dr. Rajesh Joshi, Chairman & Managing Director	Offers Al based online assessment platform that helps assess a candidate's career interest and helps them find the perfect job

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echnology is getting smarter by the day, fast becoming an intrinsic part of our daily lives. From the moment we wake up, it is watching and analyzing us, thinking ahead of us, predicting behavior and patterns to make our lives easier, healthier

and better.

Cutting-edge technologies like IoT and AI are seeing widespread acceptance globally. According to IDC, India is only behind China and South Korea in terms of IoT spending in the region, with about USD 21 billion spent this year. According to industry estimates, the region is expected to become the global leader in IoT spending, accounting for about 36 percent of the worldwide total.

The massive potential of IoT to drive revolutionary modernization in industries across telecom, utilities, logistics, manufacturing, and transportation is the key reason for this wide-spread enthusiasm.

IoT is transforming operations and best practices, enabling companies to specifically target the desired outcomes of the end customer. Amongst the large number of connected devices that we use today, a majority of them are powered by IoT. Technology companies, including ours, are focused on creating new platforms and chipsets to power this next generation of devices in India. The convergence of these two technologies is making an increasing number of internet-connected devices, even more, cleverer and smarter. Assisted by large volumes of





IoT is transforming operations and best practices, enabling companies to specifically target the desired outcomes of the end customer

data that is collected, shared and analyzed these innovative technologies have the potential to change a lot of the way we do things.

This fusion of IoT and AI, powered by intelligent sensors provides real-time data and feedback that enables companies to determine when a piece of machinery or equipment will break down and proactively intervene to prevent failure. Sensors can also suggest immediate action to prevent power outages and, for instance, make India's vast rail network safer by warning the controls of impending track failures. The continuous data captured by adaptive sensors can enable systems to learn the right actions to be taken autonomously.

Another domain gaining ground in India is the advent of smart home products. In 2018, spending on home automation products was about 1 to 3 percent of the total cost of homes, with security and surveillance products identified as the most desired enhancements in India's home automation market. Over time, we can also expect smart devices such as advanced refrigerators and washing machines to make their way into the new-age home.

As the IoT industry evolves into AIoT, the potential for new applications, such as facial access control to secure entry points for employees in smart buildings or high-resolution cameras and an integrated depth engine in automated forklifts to enhance scenario awareness and obstacle detection, can be expanded to the data processing IoT devices. Such innovations are anticipated to revolutionize homes, buildings, cities, and the entire industry going ahead. As more consumers adopt IoT devices, these technologies will be able to learn and react intelligently to tailor and improve the user experience, especially because industry 5.0 is all about people using machine learning, IoT and AI to get rid of monotonous jobs.

While the automotive sector has climbed onto the smart tech bandwagon, the International Federation of Robotics (IFR) reported that India still lags behind Japan, the US, and Germany when it comes to robotics adoption, largely because of a lack of skilled workforce to work alongside emerging technologies.

As we stride ahead, companies will need to combine IoT with AI technologies to realize the full potential of IoT enablement while quickly identifying how they'll drive value because ready or not, IoT devices will soon be here to push the industry forward. CR

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CXO INSIGHTS



e're all familiar with the concept of the Industrial Revolution, but change has never stopped. We're now well into the Fourth Industrial Revolution and it's transforming the way busi-

nesses function and grow. Indeed, companies that fail to transform into data and model-driven organizations

are doomed to failure. This is especially true of incumbents that risk being left in the dust by disruptive upstarts, companies comfortable with a data and model-driven approach from their inception.

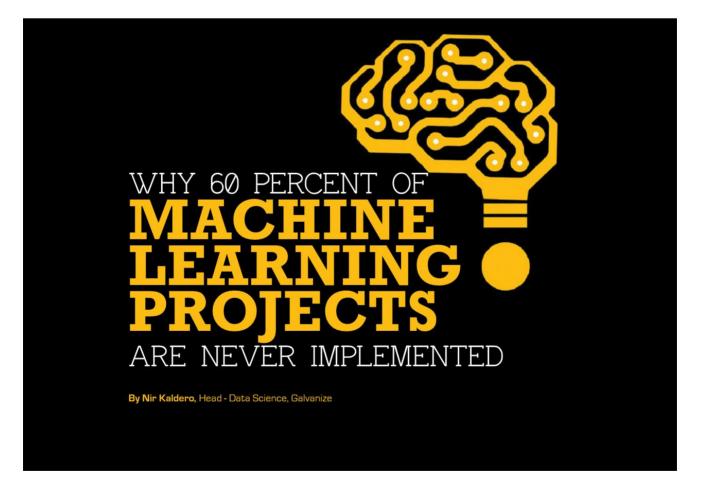
As a brief primer, the First Industrial Revolution was about steam and railroads, the Second about electricity, and the Third brought about by the Internet. The Fourth Industrial Revolution is based on artificial intelligence (AI). The transformation it brings will be bigger than that

any previous revolution has brought about. There are three fundamental pillars of AI adoption: data, technology, and people/culture/process. In my experience working with many of the largest organizations in the world, I see a consistent pattern: they are willing to invest in cutting-edge projects with the power to revolutionize their organization, but they struggle to operationalize these projects. Approximately 40 percent

reach implementation, while 60 percent stall or flame-out.

Why is this? It's because business leaders do not pay attention to crucial change-management processes that need to be considered from the very beginning. If you don't think about how to operationalize machine-intelligence at the start of a project, you won't be able to transform your business or realize ROI. As an executive and a leader, a big part of your role is managing the change that must, by necessity, take place if your organi-





zation is to embrace data science applications. Change management is the vital step in operationalizing datascience projects and transforming your organization into a data- and model-driven enterprise.

Four Ways to Solve Change Management Problems

Change management can be daunting. Fortunately, the issues I see are consistent, as are the solutions. In this section, I'll give you a brief summary of the most common steps organizations need to take to solve their change management problems:

1. Business & Technical Teams Must Work Together: These areas of a company are usually home to very different types of people, with different talents, priorities, and background. For successfully implementing and operationalizing data science, leaders need to build and nurture an environment where these two distinct types of people can work together seamlessly.

At this stage in the progression of the fourth Industrial Revolution, standing back and waiting is no longer a good option. It's important to start taking advantage of data science and become a data and a model-driven organization

- 2. Lead from the Top Down: As an executive, you must understand that change comes from the top. Without active leadership on your part, it's highly unlikely that projects will move in the most productive direction. You need to be responsible for aligning the entire organization with your vision and guiding projects toward operationalization and the realization of ROI. It's all about your people, the culture you cultivate, and the processes that will help your organization to best respond quickly to this game-changing technology.
- 3. Allow Enough Time to Adopt Changes: Adopting new initiatives takes time. Many organizations fail to allow enough time to undertake such major changes successfully. To implement a data science project effectively, the typical enterprise must start working with their IT team and software vendors eight months prior to implementation. This is why you should think about the change-management and processes required for implementation at the beginning of the project.

4. Get Strategic about Operationalization: To ensure that projects reach implementation, it is vital to stay nimble and create strategies that allow for unexpected scenarios. Too many organizations start-out unprepared for the system enhancements and other operational factors that can derail a project. When these obstacles occur, they are too willing to drop initiatives entirely, rather than adapting to the new circumstances. Always think about these anecdotes and create short term strategies for implementation.

Implementation Isn't a Data or Technology Problem, It is a People Problem

At this stage in the progression of the Fourth Industrial Revolution, standing back and waiting is no longer a good option. It's important to start taking advantage of data science and become a data and a model-driven organization. If you engage in a new data science initiative however you want to do so successfully. You don't want your project to be one of the 60 percent that never makes it to implementation.

You already have access to a tremendous amount of data. It may need to be cleaned and labeled, but it exists, ready to be put to use. Chances are that funding for large technology initiatives is readily available if ROI can be proven. Indeed, technology updates can be highly cost-effective because they move organizations from large expensive providers to open source providers.

The real issue preventing organizations from embracing the technology and becoming data and model-driven is management. In the 21st century, change management involves more than business leaders and executives. Technical people now have a prominent and integral role in the process. Fourth Industrial Revolution change-management processes involve both business and technical teams.

Most non-technical business leaders are not familiar with technical personas, their vocabulary, or their way of working. Realizing the ROI from implementation of machine-intelligence models requires a paradigm shift and an understanding that the work of the technical team is integral to the implementation of machine learning initiatives. When you as a leader understand this, you will be in a position to take the other steps described above. Instead of allowing projects to drift, you will lead. Instead of rushing adoption, you will allow enough time. Instead of allowing operationalization issues to catch you unawares, you will expect them. And you will put your organization in a position to thrive, not wilt, in the Fourth Industrial Revolution. CR

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LAST WORD

A DEEPER LOOK INTO THE OCEAN

By Andreas Merkl, President, Ocean Conservancy

Incorporation of Data Analytics to Overcome Challenges

ocean advocates, Ocean Conservancy is a classic environmental organization, working to treat oceans to preserve it in all its glory. The most significant ocean issue today is climate change. The ocean is a complex system, which is increasingly stressed by a warming climate. Climate change triggers a number of reactions in that complex ocean system, such as increased acidity, shifting currents, reduced levels of oxygen and more. Faced with this magnitude of stress, we must naturally ask ourselves: 'Could parts of the ocean system change catastrophically?' After all, in geologic history, the ocean has reacted to climate stress in drastic ways.

However, predicting what will happen to a system as complex as the ocean is out of reach we cannot build a process model capable of predicting precisely what will happen when and where. However, using tools from other fields, (like economics, epidemiology, and internet security), we can take advantage of the almost unlimited processing potential that Amazon has to offer and perform very sophisticated scenario-analysis on particular parts of the ocean. This in effect, helps with the prediction process in forecasting what is most likely going to go wrong, but more importantly, when. Our partnership with the Oxford, Stanford and George Mason Universities and Amazon has proven beneficial in collaboratively building a networkspaced model to monitor ocean stability under ocean stresses.

On a positive note, the ability to understand rather complex Earth systems—whether related to the atmosphere, the ocean or desert ecosystems—is exploding. If we understand the dynamics behind these systems faster than we are damaging them, we might be able to take corrective action in time. This is one reason—besides the obvious for-profit applications—why companies like Microsoft and IBM have started looking at Earth systems, be it observation, management or data, as an enormously important field.

General Challenges & How AWS Combats Them

Three pressing issues arise when working with complex systems. First in line is complete data abundance, which is essentially just a staggering amount of data. Satellites, buoys, etc, can create huge data sets - but data don't necessarily lead to insight. The second issue has to do with having lesser data, equating to a learning problem. This is known as data scarcity and requires proxies to extrapolate from the lesser amount of data to render increasingly better representations of what the main system would resemble. The last in line is known as data dispersion, which involves bringing vastly diverse data onto the same scale: both spatial and temporal. The collaboration of artificial intelligence, machine learning, and cloud technology offers the solution to these three pivotal issues in the industry today. The ocean stability model we have built is highly data intensive which requires the capacity that AWS has to offer. With the help



of their cloud resources, we are now able to perform massive simulations of the ocean system.

The sustainability of the ocean is a growing concern. Predicting its future is beyond the scope of traditional analytics, which is where the AWS services come into play. This collaboration is seen as an opportunity to save exhaustive natural resources by utilizing the processing capacity of the AWS.

Aligning with Future Trends

The ocean is a resilient medium - but not endlessly so. There are trouble spots where the system can respond to claim the stress in potentially catastrophic ways. This may manifest as huge dead zones in the ocean, extinction events, food chain crashes, current changes, etc. The alliance with partnership companies—that have both algorithmic knowledge as well as processing capacity-helps Ocean Conservancy look at these systems from a highly analytical perspective, enabling us to hone in on where the trouble starts from, and focus on making efforts to prevent it. Personally, I am optimistic about the process. In the end, building networks of friends and experts, and being open to feedback or constructive criticism is crucial.





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