4 Leaders & One Goal
An IIoT Enabled India

What happens when 4 leaders of the industry get together and talk about the most happening innovations in the field of IIoT and discuss its future, benefits, and its impact in the manufacturing world? There is a lot of knowledge sharing that happens, and the vision becomes clearer.

This is exactly what happened when Mr. Vinod Vaswani (of A.T.E. ENTERPRISES PRIVATE LIMITED), Mr. Vishwanathan, (of Team AVS), Mr. Anil Mehta, (CEO, Sarla Technologies), and Mr. Akshay Goliya (BU CEO of Energy Solution Labs Pvt Ltd) got together.

What are the technologies available in the Indian market that promote IIoT? How will it be more beneficial than automation for machine tool builders and users?

Mr Vinod Vaswani: Industrial internet of things (IIoT) is a technology which ranges from connected sensors to electronic control systems, internet network, cloud technology, and advanced analytics. India's matured telecom industry manages the data connectivity while connected sensors, electronics, and IoT gateways are supplied by a range of small and large technology companies.

Global technology companies such as Amazon, Google, IBM, and Microsoft provide reliable and secure cloud infrastructure to companies like us who have their own framework and platform, and also provide their own platform to system integrators. The right mix of ability to provide domain specific solution, IoT sensors / gateways, cloud technology, and actionable analytics is starting to be the real game changer for users.

Automation systems usually manage devices and systems within a physical location in real time, while IoT components of a system can be

practically located in any part of the world. A device connected to the internet can be a part of multiple systems, while a device in the automation world is usually a part of a single system. The impeccable combination of automation, IoT, cloud technology, and big-data analytics allows diversified systems from shop floor to top floor in global enterprises to give practical, actionable insights which an automation system is not designed to deliver. Furthermore, automation systems typically manage the process within defined set points, whereas IIoT analytics can help optimise set points based on other business system triggers.

Mr. Viswanathan: The technologies driving this vision across the industrial world mainly include - IoT (Internet of Things), Robotics, Big Data Analytics, Artificial Intelligence, 3D printing and Cloud computing.

IoT, Big Data Analytics and Cloud computing are the main drivers in India. Robotics, Virtual Reality and 3D Printing are still nascent areas.

The best part of the scenario in India is that the IIoT is fueled by vibrant start-ups or smaller players. This is mainly driven by the available of cheap sensors and devices, which are not only "open" easy to install and integrate.

Machine tool builders and their users are important stakeholders in the IIoT initiatives. IIoT connects the physical world of sensors, devices and machines with the internet and by leveraging insights gained from the data gathered through the connection.

Most of the machine builders designed machines with a stand-alone assumption and with no linkage to other networks. One of the key challenges for the machine builders will be to make their products Internet ready. And also make them as "open" as possible for system

Vinod Vaswani (A.T.E. ENTERPRISES PRIVATE LIMITED)

integrators and users to connect them to other devices and machines using the power of IIoT.

> # The technologies driving this vision across the industrial world mainly include - IoT (Internet of Things), Robotics, Big Data Analytics, Artificial Intelligence, 3D printing and Cloud computing.

Mr. Anil Mehta, A lot of technological options are available in Indian market for IIoT. The mix contains both Indigenous solution providers and global players. Frankly, IIoT is that rare technology that is least impacted by the domestic-international divide. The start-up revolution has fuelled the IIoT engine. Innovative companies are changing the rules of the game by pumping specialized solutions that are industry

focused and are targeting specific pain points.

The technologies/devices used at each layer of IIoT differ both in application and form. Some of these are:

Technologies: WiFi, Bluetooth Low Energy, Thread, ZigBee etc.
Edge Devices: Rasberry Pi, Arduino, Intel, AMD, ARM etc.|
Standards: OPC UA, JSON, OIF, OCF, AllJoyn, HomeKit etc.
IIoT Platforms: Thingworx, Predix, Datonis, Watson, Splunk etc.
Applications: Smart City, Smart Manufacturing, Remote & Condition Monitoring, Overall Equipment Effectiveness (OEE), etc.

Mr. Goliya: IOT is a network of computers, devices, sensors, and machines that collect big data. The collected data then sent to the cloud-based services which aggregate with another algorithm and passed to the end user in an easily understandable structure. The IIOT now deeply penetrated to homes, schools, organizations, commercial complexes, and in many industries which does many of the manual works in a fraction of seconds.

Mr. Anil Mehta, (CEO, Sarla Technologies)

Industrial Internet of Things primarily known as IIOT is the piece of overall IOT. The use of IOT in the manufacturing industry is known as "IIOT or Industrial IOT." The IOT in industrial production is revolutionizing the industry by enabling the accessibility of big data with a speed we can not imagine and by far more efficiently than the conventional practices. Many companies have already started implementing the IIOT by leveraging on connected sensors to build products which will fast-track the manufacturing.

Some applications of IIOT currently used by industries today:

Shell, an oil & gas company, uses IOT to find the oil and gas resources. Using visualization technology and a vast quantity of seismic data to outline the fields by using giant MRI-like technology to find oil and gas.

The connected sensors to the pipeline are used for monitoring of long oil pipelines to check the potential bottleneck using sensors connected inside and outside the pipelines.

IIOT can also perform basic application such as

Motion Control - To control the torque, speed, and position of the motor or motor-driven equipment.

Machine-to-Machine - To communicate between two machine e.g. energy meters acquires the energy-related data from the meter and sends to cloud for processing then a user can access the data on their devices through the internet.

Predictive Maintenance - It notifies when the asset has issues. Such as induction motor assessment, when the bearing is not functioning well, it will give a warning alarm through email.

Smart Grid - Monitoring of energy at both the ends, power distributor and the user through the use of energy metering.

Do you believe India will be Industry 4.0 ready when incorporating industry 3.0 in the Indian manufacturing sector has proven to be a task?

Mr Vinod Vaswani: Indian manufacturers are now willing to invest a substantial amount of time and resources to boost productivity and efficiency. Employing Industry 4.0 can enable Indian manufacturers to remain efficient and become globally competitive. It has become imperative for manufacturers to rediscover their processes with analyzed data from their shop floors to improve their processes, systems, and machines, and re-augment their workforce.

We at EcoAxis are very confident that the Indian manufacturers will adapt quickly as soon as cost effective Industry 4.0 solutions are available in the market. Some of our customers are actively investing to develop some components of IoT technology with us to gain first mover advantage in the industry.

Mr Vishwanathan: I strongly believe so. The very fact that we have not made much progress on the shop-floor is a great opportunity.

India has a unique opportunity to innovatively pave its own road to Smart Manufacturing. It can skip several steps that other countries adopted in their evolution from an agrarian society to their current stage of development.

India can leapfrog from a predominantly Industry 2.0+ environment to become a manufacturing powerhouse.

By the way, India has successfully leap frogged in two key sectors like Telecom and Financial sectors.

Mr Anil Mehta, Indian manufacturing has a very dynamic and complex ecosystem. Latest technologies and traditional practices complement each other and coexist under the same roof. Industry 4.0's ability to integrate all the loosely coupled pieces of supply chain separates it from its predecessor. This is one plank where Industry 3.0 disappointed a lot of Indian manufacturers.

Progressive Indian companies are leapfrogging to digital factories. The best part about Industry 4.0 is that it can be implemented in discrete packets. So, while one part of the plant is on a 4.0 pilot phase, the other can be enabled to walk

the journey. As we speak, one of our global customers is leveraging our services to enable a small part of their plant in France for a pilot implementation of Industry 4.0.

Mr. Goliya: The industry has already started embracing the change in the technology. Bosch, a German auto component manufacturer, will begin implementation of smart manufacturing at its 15 centres in India by 2018. General Electric has invested USD 200 million in the facility in its only multi-modal factory in India where digitally interlinked supply chains, distribution networks, and servicing units form part of this intelligent ecosystem

Rising need for mass production and competition at the same time demanding the effective practices in the industry. The way for fulfilling these need is innovation achieved from the industry 4.0. If we take a closer look at industry 4.0, it is nothing but the automation with machine-to-machine communication. The previous records of automation have proven the help to the manufacturing sector to scale up the business without investing much on the asset side.

The future of manufacturing is the smart factory; reports are claiming that the smart factory business to touch $215 billion by 2025 and in the world, there has been no major economy which has not embraced this change.

In the coming years, many of the manufacturing companies will be equipped with the Industry 4.0 technological products, not being the fancy but be as a need of an hour.

Going forth, how will IIoT change the way the manufacturing sector functions?

Mr. Vinod Vaswani: Similar to how the internet has impacted the way people

> In the coming years, many of the manufacturing companies will be equipped with the Industry 4.0 technological products, not being the fancy but be as a need of an hour.

socialize, connecting machines to the internet can bring a whole new dimension to the way manufacturing functions.

Decision makers in organizations ranging from the senior management to shop floor supervisors are expected to make decisions driven by data from IIoT. The influence will not only be limited to manufacturing decisions, but also business decisions which include machine and material purchase, resource training, and entering new markets including business models.

Mr Vishwanath: By using highly connected, embedded intelligent systems, products and machines will be able to exchange information autonomously, with processes, transportation and usage monitored and autonomously controlled online. The predicted result, apparently, will be hitherto unachievable operational efficiencies and production line and supply chain agility, and the creation of potentially valuable new service opportunities. This will create new business models by connecting individual consumer demand with a highly distributed network of supply.

The heart of the IIoT is intelligent and smart manufacturing, i.e., applying the tools of information technology to production.

The real breakthrough in this field will happen when the over 1million SMEs in India begin to implement IIoT.The good news is that the SME sector, contributing to 45% of industrial output, are generating use cases that will herald an adoption across the industry.

Mr. Anil Mehta, Basically, all manufacturing matrices are a function of Quality, Cost and Delivery (QCD) parameters with the relative scale of time.

Mr. Vishwanathan, (Team AVS)

discrete layers of factory from field sensors to shop floor equipment to plant boards to enterprise application to board room MIS determines the ultimate QCD success of the manufacturing.

IIoT is that bridge that we all have been looking for. It is the string that ties all these discrete layers at the rate of knots. With IIoT, gone are the days, when a bearing failure in engine oil compartment of a compressor used to stall the production lines of dairy plant. The bearing operational in Chennai now proverbially 'talks' directly with the maintenance head sitting probably miles away in Chicago.

Manufacturers have a lot of technologies, equipment and systems around them. IIoT will help them 'make sense' out of these multiple touch points. IIoT will reduce the noise associated with systems and make the manufacturers 'Smarter'. Smarter, not only in terms of educated decision making, but also from the view

their way. I believe, ultimate benefit of IIoT will be that it will enable the operators to 'talk' with their machines and vice versa.

Mr. Goliya: The world is becoming more connected every day, internet penetration in India became very high, there is an increase of 34.8% in internet users compare to last year. India is ranked at 2nd for growth in internet users. The day is not too far that people will talk with the machine through a smartphone.

"Connected factories will sync global production and supply chains. It works on real-time information flow and throws in opportunities from creating analytics frameworks to software platforms that drive efficiency," says Vijay Ratnaparkhe, MD of Robert Bosch Engineering India Ltd. He says that software is the core of every solution today starting from factories to cars to health care to home.

John Deere, the $37 billion heavy equipment company, has fitted its tractors with sensors the world over. This helps

the manufacturer update the farmer if a moving part of the tractor or the harvester is going to fail, one month before the event.

Plants operated by Godrej and Welspun use the Intelligent Plant Framework provided by Covacis Technologies to run their factory floors. The IPF connects every machine node in a factory and understands the rate of work and efficiency.

The examples plainly explain the trend of IIOT in the manufacturing industry.

IIoT is expected to create a seamless supply chain. How will it help upgrade suppliers who may not have access to basic automation?

Mr Vinod Waswani: Timely arrival of raw materials, tracking the quality and volume of production and dispatching of finished goods at the right time to the right location has always been critical for success of organizations at each step of the supply chain. Until the 1980's, the management of these critical success factors in organizations depended on the ability of the people managing them. In the last two decades the advent of supply chain management softwares have streamlined planning of business processes such as purchase, production, and transportation.

As a natural progression, early adopters are now not only using IIoT to plan and visualize supply chains on their laptops, tablets, and phones, but also to replan operations to reduce the impact of unforeseen disruptions.

IIoT technology has now become very cost effective and scalable for small and large organizations. Suppliers without access to basic automation can today incorporate the right sensor and IoT technology to quickly solve their immediate pain areas.

Mr. Vishwanath: IIoT will create new business models by connecting individual consumer demand with a highly distributed network of supply.

Connected factories will sync global production and supply chains. IIoT works on real-time information flow and throws in opportunities from creating analytics frameworks to software platforms that drive efficiency.

The components of IIoT are fairly simple to adopt and its easily possible for the suppliers or any other player in the network to upgrade and leapfrog.

Mr. Anil Mehta, One of the greatest advantages for IIoTin India has been that its arrival has coincided with the mobile revolution. We have grown from a negligible number to over 350 million mobile users in less than 2 decades. By 2021, about 45% of our population is estimated to have LTE 4G Network. The government's flagship project of National Optical Fibre Network will be a great boost when implemented in full swing. Edge devices working with 2G speeds using Bluetooth® Low Energy and 6LoWPAN technologies are already finding its place on our technological maps. All these factors will take IIoT to the remotest corners of India.

The next wave of IIoT will be lighter and agile. Therein lies your answers to the supply chain challenges. OEMs and Tier 1, 2, 3 and 4 suppliers will be seamlessly integrated with their end-users. The feedback mechanisms will be smarter and swifter thanks to mobile telephony. Automation was unidirectional, needed costly equipment and did not have the hardware to communicate with end users. IIoT's ability to connect sensors, mobiles, PLCs, DCSs and all elements of information supply chain will be the real game changer.

> **"Connected factories will sync global production and supply chains. It works on real-time information flow and throws in opportunities from creating analytics frameworks to software platforms that drive efficiency,"**

Mr. Goliya: Energy Solution Labs was formed with a core aim to help industries digest data that they generate with the growing number of sensors, meters, and measuring devices deployed in their units and plants. All meters and sensors now days are communication ready, but making meaningful and actionable use of the data generated by them was a fascinating area we thought we could contribute immensely.

Our product, marc.energy follows the trend of industry 4.0. It is equipped to communicate with the connected sensor through the internet. It is cloud based next generation energy data analytics platform for demand side management of energy loads and process parameter monitoring. It is designed to handle quantitative and qualitative data to provide users with an in-depth analysis and insight into their load systems enabling them with possibilities for optimization, energy OPEX savings, and building efficiency in their load networks.

Through the use of data analytics, marc.energy helps facility managers to save on energy. The analytics are shared and displayed in the form of comparison, benchmarking, graphs, data tables, etc. The information is very easy to enable facility managers to take the decision. Monitoring of energy is the first step towards saving and if you do not measure

Mr. Akshay Goliya (BU CEO of Energy Solution Labs Pvt Ltd)

Moreover, we empower OEMs to make their products smarter, besides enhancing their customer service experience and generate new revenue streams by enabling remote equipment health monitoring, maintenance, and value added services for installed base of their equipment.

Last month, we were awarded the "2017 Big Data Industry Growth Excellence Award" by Frost & Sullivan. One of the key aspects of their evaluation was "impact caused to industry". The award is a clear validation of the value we have created for our customers. We are very proud of this recognition.

Mr Vishwanath: Our mission is to help our clients to scale greater heights and succeed in the Industry 4.0 age. We are committed to helping Indian Manufacturing Industry to leapfrog into Industry 4.0.

We bring our rich domain expertise in the manufacturing and process arena and create value through IIoT by designing shop-floor systems to improve operational efficiencies and decision making at various levels.

We bring value by connecting heterogenous machines and devices through our Universal Data Bridge and create an Intelligent and Connected Digital Value Chain.

By designing and implementing the Production Automation system architecture (comprising of

you cannot save it. Following this important thought, marc.energy provides data in real-time, it helps to monitor the ongoing activity from the premise.

How does your company help create value additions for the customer/end-user through IIOT?

Mr. Vinod Vaswani: We at EcoAxis offer end-to-end IIoT services from consulting to deployment, training, and support for our customers. We bring together extensive experience and expertise of industrial processes and systems with outstanding competence in data acquisition, algorithms, and big data analytics, delivering transformational value for our customers.

For manufacturing customers, our smart manufacturing suite helps digitalize manufacturing shop floors, and use big-data analytics to provide actionable insights, helping such customers to achieve their vision of operational excellence.

programmable controllers, sensors, SCADA, PCs, network etc.) for SMEs, we empower these organisations to combat the size and automation equation which was hitherto stacked against them. Of course, we also help larger organisations to improve their competitive edge through use of IIoT.

We have some very good use cases in the pharma, auto component and machine building industry, and we are well on way to scale up our operations.

Mr Anil Mehta, Sarla Technologies is uniquely positioned to leverage our 17 years of experience in Industrial Automation and club it with our knowledge of latest IIoT technological platforms like Amazon Web services (AWS), GE Predix, Microsoft Azure, Thingworx and Datonis enterprise.

Over the years, we have been instrumental in bringing leading edge technologies and products from Kepware, GE Digital, SAP, Werum MES and ATS-Global to Indian market. We have catalysed the offerings of these global giants and Indigenised them for local manufacturers. This transition of serving global products with local touch is the most critical aspect of technological evolution.

We help customers walk the journey of transition from a traditional to digital factory. Our solutions encapsulate offerings right from selecting the best suited technology for IIoTto installing the sensors, from pushing data at cloud to developing business rules, from identifying patterns to creating real-time alters, triggers and dashboards in a language best known to end user. Our Plant IT expertise help us to enable Business Intelligence and Operational Excellence across the enterprise. Plus, we do all of this with a smile 🟧🟦