fab eX 19
Towards Exponential Growth
EVENT REPORT
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Benjamin Franklin once said, “When you're finished changing, you're finished.” And Faber Infinite, our continuous effort is towards continuous evolution!

We are pleased to present to you this exclusive proceeding report of successful symposium on Man-Machine Partnership - FabEx2019. The objective behind conducting FabEx2019 was to foresee smart manufacturing as an essential to survive in today's global competitive market. Becoming a better business leader has always been "a work in progress" goal that requires tenacity, and the willingness to embrace new ideas.

The rise of industrial IoT will soon bring the factory of the future to reality. Material handling, manufacturing, product distribution and supply chain management will all be automated to a degree in the years to come. The industrial internet of things, also known as industry 4.0, has already started the fourth industrial revolution - era of man-machine partnership. The adoption of Industry 4.0 is empowering the industrial users to securely leverage the data, AI and analytics for predictive analysis, reduced machine downtime, centralized storage and remote asset monitoring, more automation has already led boost in productivity, reduced breakdowns, adoption of flexible production techniques & predictive maintenance.
Industrial Internet of Things (IIoT) brings with it tremendous amounts of complexity. To tackle that complexity, organizations must overcome the challenges which are the main obstacles on the path of IIoT. But is it enough to plunge into the ocean of digital transformation without a single lifeboat?

FabEx2019 attempted to take these questions and also pointed towards THAT lifeboat to speed-up the man-machine partnership in India. In this post event report, we have tried to encapsulate the power packed event for everybody's benefit. We shall be glad to take this endeavour further with your continued patronage.

Looking forward with high optimism,

Aakash Borse
There are many who fear that as machines get smarter, humans will become obsolete. There is no doubt that machine learning capabilities will continue to advance. However, in the world of science, experts truly believe that man and machine relationship will remain symbiotic, and in fact, become even more crucial. Effective and smart manufacturing solutions, the Internet of Things, smart analytics, AI, automation and hyper-connectivity is shifting that depiction into a representation of the digital transformation potential. Illuminated, smart factories are rapidly replacing dark dungeons and gloomy manufacturing alleys.

Man-Machine collaboration is a model in which men co-work with artificial intelligence (AI) systems and other machines rather than using them as tools. As in greatest successful collaborations, each brings to the table abilities that the other lacks. The purpose of man-machine partnerships is to custom the strengths of both types of intelligence, and even physical capabilities, to fill in the other’s weaknesses. Man proposes, but Machine disposes. Society has rules, regulations, and transparency built into its fabric. AI does not. We, our societies, our cultures, need to reinvent the rules of engagement and governance, privacy and human rights, and apply them to our machines.

“Not only in blue collars but automation is also entering white collars space fast.”

In the future, world will confront problems that don’t even exist today. Our quest for new discoveries and innovation will become increasingly complex and the amount of data accessible will be unimaginable. Without a doubt, we will require machines more than ever to help us navigate and make sense of it. But ultimately, humans will continue to be essential to the process as well, setting innovative constructs that enable greater machine learning and applying machine-gleaned insights to drive new discoveries. Autonomous systems are the result of long-term learning and evolution. There will never be a moment when we suddenly say, “It works! We’re done!” We are still in the very beginning of the first inning of this game. People working on autonomous navigation realize this.

Try to remember all the things you have learned in your life. Can you do it? For most people, the answer is unanimously no. And that is where machines play a leading role. Unlike humans, machines never forget. They can remember every data input and every pattern established. They also have the ability to process massive amount of information at a rapid speed. It is this eternal memory of massive volumes of data that allow machines
to identify patterns and make inferences most humans simply could never discover on their own. However, machines’ exceptional capabilities have a limit - and, human expertise and context are needed to achieve big data’s full potential.

This collaborative “give-and-take” is the keystone of the man and machine relationship today. Machines enable humans to process large volumes of information faster and resolve more challenging problems by finding patterns in that data. Likewise, humans enable technology to evolve and deliver the best possible results. But, will this relationship continue to be one of collaboration in the future?
ABOUT FABEX 2019

“Transformation is inevitable. Transformation is the key. Are you ready?”

FabEx - 2019 was a flagship event by Faber Infinite Consulting – to prepare industry leaders for the next leap in the domain of Manufacturing. It was a symposium of industry stalwarts to build and share best practices on the future of man and machine partnership. The event was one of its kind. If we were to envision the world in 2030, the partnership between man and machine will be reshaping lives. It had engaged approximately 100+ top profile delegates with the objective to discuss the endless possibilities, which the future holds and was a perfect setting to share and evolve together towards exponential growth! The theme of FabEx 2019 – ‘Man and Machine Partnership’ explored how the progressive organizations were working on winning the partnership between man and machine and how the future would be. The key challenges for next industrial revolution addressed and growth opportunities were identified with the base of a collective pool of thoughts with the best in manufacturing sector as well as the linkages among operational excellence, man & machine partnership and smart manufacturing were deciphered. FabEx 2019 would help the business community to accelerate on the fast lane of the industrial revolution.
Value of information should be the first priority in this industrial revolution as we are working in this information-based economy. Value of Information is a forcing function behind every industry in today’s world. Value of information doesn’t survive the moment in which it was new. It lives only at the moment it has to surrender to it (moment) completely and explain itself to it without losing time. Value of Information doesn’t explain itself. It preserves itself and concentrates its strength and is capable of releasing it even after a long time. 4th Industrial revolution has helped us to find new and better ways to change the economic activities in our country by:

1. Empowering our Economies (energy)
2. Moving our economies (logistics)
3. Managing our economies (communications)

But the global economy still is in crisis again as economists warn that we face another 20 years of declining productivity, slow growth, steep unemployment and increasing inequality. The economic downturn in fuelling growing discontent towards governing institutions and spawning extreme political movements around the world. And now 200 years of industrial activity, scientists report that climate change is ravaging the planet, taking us into 6th mass extinction of life on earth “WHICH NO ONE IS SPEAKING ABOUT”

Every time we are trying to create value, we

Mr. Jagmohan Singh Sekhon
Executive Advisor
Reliance Industries Limited

Operational Excellence is the best fit to help organisations to drive the future of manufacturing. Industry 4.0 is a natural progression of Lean Six Sigma and next wave of Operational Excellence. It allows you to accelerate, how you create even more gains in terms of your productivity, your quality, flexibility.

Operational Excellence is the backbone for the new infrastructure that we want to create.
are increasing the efficiency of production system and thus increasing the Aggregate Efficiency. It is the ratio of potential work to the actual useful work that gets embedded into product or service. The higher the Aggregate Efficiency, the less waste is produced in every single conversation in its journey across the value chain.

Since last 30 years, India has stalled at 22% aggregate efficiency, as efficiency at every step of value creation process, averages around 10-20%. While US has this same average of 13%, CHINA has 18% and Germany has the maximum average, that’s 22%.

Now within the modular structured smart factories of industry 4.0 or Industry Revolution No 4, cyber-physical systems monitor physical processes, create a virtual copy of physical world and make decentralized decisions. Cyber-physical system is the system collaborating computational elements with controlling physical entities. It is the physical and engineered system whose operations are monitored, coordinated, controlled and integrated by a computing and communication core.

Six design principles of Industry 4.0 are Interoperability, Virtualization, Decentralization, Real Time Capability, Service Orientation and Modularity. Above that Operational Excellence is the backbone for the new infrastructure that we want to create. New technologies have much to do, but for that, any business or organization needs to understand which technology can be applicable and appropriate, based on the understanding of its practices.

Key issues of Industry 4.0 are:

- Co-creation
- New ways of consuming, using, accessing or free-riding
- Downscaling
- Rethink products and processes from an ecological perspective

To cope up with these, Operational Excellence is the best fit to help organisations to drive the future of manufacturing. Industry 4.0 is a natural progression of Lean Six Sigma and next wave of Operational Excellence. It allows you to accelerate, how you create even more gains in terms of your productivity, your quality, flexibility.
Industry 4.0 is the effective way of implementation. It is about how quickly an organization adopts to the situation, so that they can reap benefits. For Industry 4.0, an organization needs to understand what is available, how strategically they can utilise those resources for their competitive advantage and finally end up into a customer centric organisation.

Comparing India with developed countries, there is a lot of difference between the working methodology of Indian organisations and organisations in developed economies. Their production procedure is quite different than that of India and hence there is a huge difference in the percentage of productivity that they achieve and what organizations in India achieve. Reason being, in developed countries, the manufacturing organisations are well equipped, they have different tools and methods, where as we are still struggling with the mundane methods of manufacturing.

One of the best advantages of Industry 4.0 is the technology innovation, which is going to happen in near future and going to give us the speed and flexibility. Gone are the days when serial and mass production concepts were there, and people were thinking of low cost products and fast deliveries. Now everyone is looking for ‘unique’ and ‘customized' products.

One of the challenges of Industry 4.0 is the mindset of the people. Until and unless
the mindsets are prepared to accept and implement the change, nothing can happen. As we are talking about Industry 4.0, “Smart Manufacturing” is the necessity and Operational Excellence is the foundation of smart manufacturing. If we want to have strong foundation for building Industry 4.0, then we need to first focus on operational excellence, and only then we can think and discuss beyond excellence.
It is important to know the difference between “Efficient” and “Smart” manufacturing. Efficient manufacturing is such that organization runs without any inputs of decision makers, so that they can invest their time in strategic thinking. While smart manufacturing is about anticipation and about predicting the future scenarios, for example, what orders are coming in next quarter? Can the inbuilt algorithm give an insight into the future with all the predictive analytics?

The challenge for Industry 4.0 in India is the geopolitical and socio-political system. The infrastructure that Indian manufacturers put on is quite high. Today, the ease of doing business in India is lesser than in US. Renewable energy is also a challenge in India and hence it impacts the Return on Investment (ROI) directly or indirectly. If we solve these infrastructure level challenges, it will help all the industries in India to remove those barriers and will propel the country as a whole.

Now, Operational Excellence is a vast terminology and can be applied to various industries. Talking about manufacturing industry, key parameter to measure Operational Excellence is the yield. For example, if an average industry is making 23%, can an organization make 25%? It is essentially important to reduce the input compared to the output. Operational Excellence is different from Organizational Excellence in terms of soft skills – ‘Can the
employees adapt to a new issue that comes up? Organizational excellence is achieved when the employees are trained or capable enough to take decisions independent of the management. To improve the efficiency, technology will aid humans to get right information at the right time.
Coming from the MSME sector, there is some resistance to accept the changes. Breaking mindsets and creating ownership is biggest challenge and employee engagement is a solution. Industry right now is not capable to put down the real problem and what are its actual needs. Challenge of Man machine partnership is smart manufacturing and ERP system. Data should be scattered at only one point. In today’s scenario, data is analysed, digitized (through Internet of Things (IOT) and other technologies) after the manufacturing, but it should be processed before that. Transferring information should be digitized and technologies should be implemented without having blocks in the entire chain. Individual value chains of respective sources in entire supply chain should be interlinked and transformation should occur without having any bottleneck.

Elaborating the term ‘Beyond Excellence’, job descriptions of employees bound their excellence, while giving them the ownerships, defines the term “beyond excellence”. India is ready for next industry revolution, it just needs collaboration between two generations and utilization of the power of young generation.
Relationship between Man and Machine is imperative for Pharmaceutical industry. Almost all top pharmaceutical players are in the hands of regulators and hence, one has to invest in CAPEX. Also one should know how to handle the machines and data that particular machine churns out. It is necessary to have knowledge to manage data and errors.

Though pharmaceutical industry has the best of the machines and bots to help but it also requires the right skilled resource to manage the machines and every industry right now is facing same challenges. Beyond robots, there are certain sensors - alarms that a machine generates and churns out the entire data. While the regulators come once in a year and then they expect that the particular organization has taken corrective measures. Challenge in pharma is the regulations and audit. About skill set when we compare India with the developed countries, it is lagging in terms of education and hence education system needs to be strong.

Regarding smart manufacturing, machines in pharma sector should be able to give all the information in real time like the real time efficiency of the shift, rejection rate and all the analytics. Last but not the least, the current challenge of industry 4.0 is the rigid mindset and resistance for any kind of change. To tackle this, employee engagement and motivation is the only solution.
Man is the master of machine. Man cannot completely shut down machines as they are helping them. About intelligence, initially machines were doing fixed set of functions, but over a period of time, machines are doing the functions which were not possible previously. Over a period of time, man is putting intelligence into machines and so more and more intelligent work could be possible through machines and by intelligence of humans.

Talking about the challenges of Industry 4.0 is again mindset. One should think what excellence is and put it into efforts. We should use and invest in technologies. It is not a threat to anybody's job. As, only a part of any job is automated, but not the entire job.
The man and machine partnership decides the existence of an industry. The machine alone won’t be able to do things, and same is the case vice-a-versa. When both are put together, they will bring the synergy and the business in economic scenario. It is imperative to know the Man-Machine partnership, Machine-Human skills, in minute details and equally important to enhance the Operational Excellence so that one can convert everything into Profit after Tax (PAT). Simultaneously, before operational excellence, an industrialist should know the difference between Operational Excellence and Organisational Excellence as well as smart manufacturing and efficient manufacturing. India should not only be ready, but also be prepared to reach beyond excellence. Excellence is a journey, it is a never-ending process. With all given situation, all the constraints, all the limitations, one must know the industry and basics of that industry specifically. To be in competition with developed countries, we need to be competitive, irrespective of whatever is the situation.

Mr. Sanjay Suthar
Vice President - Human Resource and Industrial Relations
CERA Sanitaryware Limited

The man and machine partnership decides the existence of an industry.

Excellence is a journey, it is a never-ending process.
For many manufacturers, the route to building a Smart Factory is still perplexing because of information excess. In order to overcome this, manufacturers should view transformation as a journey with four stages that reap ongoing benefits to their operations. As with any extensive company-wide transformations, trying to achieve the end goal too speedily can leave you back where you started, having wasted time and money. It is critical that manufacturers understand that the Smart Factory is primarily about basic infrastructure which includes data. Prior to the fourth Industrial Revolution, commonly known as Industry 4.0, manufacturers trusted on clipboards and manual methods to collect machine data, perform root-cause analysis, or gain insight into their operations.

But as the modest landscape of manufacturing changed, and consumer demand increased, the industry reached a point where these manual processes were no longer effective. In fact, they cost manufacturers time and money in the form of lost productivity, suboptimal machine output and product quality. The Smart Factory evolution is about to structure upon the advancements of the Third Industrial Revolution by automating the collection of data from machines and applications and transforming that data into instant insights. This new technology turns the tedious, but critical, process of extracting insights from data into one that is prompt, streamlined, and achievable for every manufacturer. The journey can be categorized in following four phases:

Phase One: Data Availability

Phase One system is pretty much in status quo. Phase One is more about the data availability and its proper use for the best. At this phase, availability of data is pretty good, but it is difficult to use data to make decisions or implement enhancements. The data is in siloed systems, necessitating manual work to integrate and interpret into fruitful information. Problem solving at this phase is enormously time-consuming. When a product quality or machinery issue arises, operators and engineers must scramble to manually gather data from various systems before they can ascertain what happened and how to fix it. This manual tactic is not only frustrating, but costly; it drains time, resources, and money from the factory. Manufacturers at level one should move to level two as quickly as possible or risk wasting resources in lost production output from unplanned interruption each day.

Phase Two: Data Accessibility & Basic Stability

Phase Two eases the access to the data
as well as provides the basic stability to the organization. Phase Two system integrates all the dissimilar data sources into solitary single source of truth and continuously gathers and tracks production data. With the data in one location and always accessible, problem solving becomes almost frictionless and leads to basic stability of 4Ms – man, machine, method and material. When an issue occurs, operators and engineers can access the data in the system using data visualizations and dashboards—essentially leveraging the system as a query engine. With easy access to all the data, they can answer questions quickly, enhancing plant productivity.

In accumulation, a phase two system permits engineers to concentrate on addressing high-value issues such as improving the product itself, changing materials, or adopting a mass customization strategy. However, at phase two, proactive analysis, which enables factories to make improvements before issues occur, still needs time, effort and engagement from engineers.

To move from phase one to phase two, manufacturers must device a new data architecture and process framework, which takes only a matter of months. Also, when selecting a new architecture and adopting process framework, make sure it permits you to scale the amount of data you can gather without sacrificing performance.

**Phase Three: Data Activeness & Proactive Improvement**

Phase Three deals with the data activeness and readiness of the organization for the proactive improvements. A Phase Three system moves manufacturing operations from reactive problem solving to proactive analysis and improvements. The system empowers operators and engineers to be truly preventative and proactive in cracking problems, which would not be possible in a phase two system.

To change from phase two to phase three, you must figure on the previous phase’s data architecture and framework by adding new system proficiencies such as predictability and intelligence. These new tools permit you to start generating insights in as little as two or three months, depending on your product mix. These new features, collective with the phase two system that aggregates all your production data, create an intelligent system that on its own will discover valuable insights and forecast let-downs more precisely, while delivering information to the appropriate person at the right time. Users do not have to query the system or perform manual process analysis in order to find the answers to cracking production issues.

An instance of phase three system embraces learning models that predict product flaws or machine failures and identify ways to produce products more efficiently. In a phase three system, a person is still required to make
the variations that the intelligent system recommends.

**Phase Four: Action - oriented Data**

Phase four is the action phase. At phase four, the data system deploys the recommendations that it finds from analysing manufacturing data. For instance, a machine learning model will identify an optimization, then generate and send the recommended new settings to the machine, where it is automatically implemented. In such a closed-loop artificial-intelligence-controlled production line, the time it takes to implement on an intuition discovered by the system becomes negligible. Accomplishing phase four needs datasets that are large enough and have enough authenticated cases to provide the information required for the system to “know” the effects of a production change. The time required to move from phase three to phase four differs based on the amount of time it takes to gather the essential datasets.
To conclude, technology has already reshaped working habits and people's life. But we have just scratched the surface of what can be achieved, as new innovations become ingrained into everything that we do. To make this dream a reality, organizations need to prepare now, or be prepared to beat the competition. By 2030, every organization will have to be a digital organization, powered by software and analytics, enabling and powering man-machine partnerships. If organizations do not prepare themselves today—by readying their infrastructure, practices, workforce, technology, security—they will be left far behind. As discussed, and concluded by the eminent panel, Operational Excellence is the foundation for effective and smart manufacturing, its philosophy is the guiding principle for Man and Machine partnership.
Faber Infinite Consulting (part of Faber Infinite Creative Solutions Pvt Ltd) is one of the finest management consulting and training organization aimed to support transformation journeys for clients and deliver extraordinary results. Over the last few years, the team has been assisting organizations in implementation and training of Organizational Transformation practices. Team Faber Infinite strongly believes that People Alignment coupled with elements of focus on aspects of Strategy, Operations and Design drives organizational success. Hence our novel methodology of building alignment and tailor-made implementation approach for each organization helps clients to achieve sustained benefits and customer delight through continual improvement. Faber Infinite’s plush portfolio encompasses a wide range of innovative and futuristic services that are dispensed through four platforms namely Consulting, Technology, Training & Development and Benchmarking. Our delivery is focused on the real place of action approach with real people and real problems in real time. The focus is always on ACTION. We take pride in calling ourselves as “Implementers” with hands on experience. The key differentiator of Faber Infinite is not only to equip our clientele with state-of-the-art management practices on Strategic & Operational level, but also support them to sustainably implement these practices for long term gains.

In addition, the insights and quality services we deliver help transform organizations in economies across the world. We develop outstanding client teams to become experts in transformation practices. In doing so, we play a critical role in crafting a better world for our people, for our clients, and for our communities.

Faber Infinite Consulting has spread its footprints across 8 countries in Asia Pacific, Africa & Middle East across key industry verticals including Automotive, Construction, FMCG, Engineering, Chemical, Food and Beverages, Plastics, Textile, Industrial Manufacturing, Pharmaceuticals, Transportation & Logistics, Commercial Farms, Retail, Health Care and more. Faber Infinite strives to support the organizations’ quest for transformation and culture building initiative by providing rapid, performance-based, implementation focused solutions.
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