**Abstract:**

Since the beginning of the industrial revolution, mankind has always strived towards bringing efficiency and cost optimization to the production environment. Electricity, assembly lines and programmable logic controllers have been important steps in this direction. However, with a rising competition in the global market; a rush towards more efficient production, faster delivery and lesser downtime have outdated the technologies which served us reliably in the past. In this paper, we examine industry 4.0; the science and technology behind smart factories with artificial intelligence, cyber-physical systems, internet of things and cloud computing at its core. Also, a larger problem is in finding the right talent to provide, consult and set up industry 4.0 solutions for organizations to create value.

**Impact of each Revolution**

> Introduction of new products and means of producing existing ones.

> Disruption of competitive status quo (both within and between countries and enterprises)

> New requirements to workforce and infrastructure.

**Introduction:**

Fourth Industrial Revolution or Industry 4.0 encompasses a wide range of spectrum which includes cyber-physical systems, Internet of things, cloud computing and cognitive computing; that has in turn led to the creation of "smart factories". Industrial Analytics is at the convergence of IT & OT, which has significantly improved the business process and ROI.
We define Industry 4.0 as the next phase in the digitization of the industrial sector, driven by four disruptions: a) the astonishing rise in data volumes, computational power and connectivity; especially new low-power wide-area networks, b) the emergence of analytics and business-intelligence capabilities, c) new forms of human-machine interaction such as touch interfaces and augmented-reality systems and d) improvements in transferring digital instructions to the physical world, such as advanced robotics and 3-D printing.

In our experience, we are seeing an upsurge in the acceptance and incorporation of data analytics & data science by the industrial sectors such as EPC, Automotive, Aerospace, Oil & Gas, Energy and Indian business houses leading the chart.

| Cost Optimization | ✓ Reduce manpower cost  
|                  | ✓ Boost labor productivity  |
| New Opportunities | ✓ Adapt to changing demographics and customer demands  
|                  | ✓ Adopt mass customization  
|                  | ✓ Identify new value-generating services  |
| Greater Operational Efficiency | ✓ Improve process visibility and quality of products  
|                  | ✓ Reduce variability in operations  
|                  | ✓ Allow remote monitoring and maintenance through networked systems  |
| External Factors | ✓ Develop competitive pressure on other companies  
|                  | ✓ Derive benefits from government mandates and incentives  |
Adoption in India

Under initiatives such as "Make in India" and "Smart Cities Mission", the transformative journey of manufacturing through *Industry 4.0* has already begun in the country which is aiming to increase the share of manufacturing to 25% of the GDP from the present 17%, with a view to create millions of jobs and pushing the country’s economic growth.

Bosch will begin smart manufacturing in India by 2018 and General Electric (GE) has invested in smart manufacturing ecosystem in India as well. Additionally, the Indian Institute of Science along with Boeing is building India’s first smart factory in Bengaluru.
Case Studies:

Black and Decker

Power tool manufacturer Black & Decker turned to Cisco to provide Industry 4.0/smart factory solution that increases visibility and decreases complexity in its manufacturing plant in Reynosa, Mexico.

Black & Decker reached out to Cisco for wireless connectivity and to Aeroscout Industrial for its enterprise visibility solutions. Black & Decker deployed a real-time location system in the form of Wi-Fi radio-frequency identification tags that attach to nearly every material, so that tracking them becomes nearly effortless.

Aero scout’s Wi-Fi tags integrate with the company’s Programmable Logic Controller, which monitors quality control and delivers its results once the product reaches the end of the line. This allows floor managers visibility at every step of the production process, giving them the ability to slow down or speed up processes, and see how quickly employees are completing their respective tasks.

The plant achieved an estimated 10% greater labor efficiency and better use of labor critical resources, which improved utilization rates from 80% to 90%. It also resulted in quality improvements with first-time pass defects per million opportunities reduced by 16%.

The RFID tags and Cisco wireless network increased overall equipment effectiveness by 24%, and Black & Decker estimates a significant cost saving for each line in the plant.

Great Lakes Brewing Company

Great Lakes Brewing Company, an Ohio craft brewery, worked with Rockwell Automation to connect production machinery and provide workers with the data analysis needed to improve operational efficiencies as part of a digital transformation using industrial internet of things solutions to focus on smart manufacturing.

Brewery staff can access data insight by talking to Shelby, an app, built on the Microsoft Bot Framework that uses natural language processing to help quickly identify and solve equipment problems.

Great Lakes Brewing Company is using Rockwell Automation’s FactoryTalk Analytics for Devices. The appliance captures data from an industrial network then converts the Information into a “health and diagnostic dashboards,” according to the company. If there’s a problem, the system can send “action cards” to engineers’ smart phones or tablets.

In addition to supporting the Shelby app, FactoryTalk Analytics is designed with a focus on “device interactions,” which the company describes as enabling “these devices to start becoming system aware, gaining an understanding of device interactions. Understanding the devices allows a higher level of analysis to be performed. For example, the system feed can find and display issues that would normally be very hard to determine by checking each device, but since we know about each device, systemic issues can be identified and alerted on.”
Industry 4.0 Talent Scenario in India

Apart from technology, systems & processes; employees trained in the respective technologies help organizations realize their transformation towards industry 4.0. We at Rianalytics believe that the most critical component of the transformational journey towards the adoption of industry 4.0 and eventually to smart factories in India is going to be the talent pool.

As we have observed, there are a selected few individuals in India who are trained and experienced in technologies relevant to industry 4.0 and those who can actively provide consultation, adoption and transformation from legacy technologies to smart factories & smart manufacturing.

In India, leadership talent scenario in Industry 4.0 landscape is in a transitional phase. People with relevant domain skills are readily available in the market, but they do not bring relevant data science or digital experience to the table. One possible solution to this situation is to collaborate with domain leaders from relevant industries such as oil & gas, aerospace or automotive as subject matter experts and hire Digital/Data Science experts below them with a top down approach to build the team. It can be done with a bottom-up approach as well.

Large corporations have already up-skilled their workforce with the relevant skills. Specifically, for IOT and Digital technologies, they are open to hire leaders from other industries too. Another interesting phenomenon that we observed is that global corporations are gradually shifting their talent pool and CoEs from their home country to India as a response to the enormous potential it provides to solution providers and end customers, helping create a large talent pool.

Talent Landscape insights in India: Industry 4.0

1. Information technology services companies employs the highest portion of industry 4.0 professionals, followed by Mechanical & Industrial engineering companies, closely followed at ~30%
2. Least number of people are employed in the automotive and Electrical manufacturing industry.

Experience Spread

1. Most of the prospects fall under the experience range of 15-20 years, followed by 20+ years.
2. Least number of prospects fall under the experience bucket of 0-5 years.
3. Roughly the similar number of people are there in 6-10 and 10-15 years of experience bucket.
Geographical spread

1. Bengaluru has the highest number of Industry 4.0 professionals, followed by Mumbai and Pune respectively.

2. Least number of professionals reside in Chennai.

3. Pune and Gurgaon have 7.5% and 6.2% of all the professionals in the country.

Qualification Spread

1. 77% of all professionals have a bachelor’s degree and above.

2. 18% of all professionals have a Master’s degree and above.

3. 3.5% of the professionals have other degrees such as PhDs etc.

Data Science/AI Skill set in Industrial Sectors:

- Optimisation (Process, Supply Chain, Inventory), Predictive Maintenance, Time-series/sensor data analytics.

- Time-series/Sensor data analysis, Image processing, Deep Learning.

- Predictive Analytics, Time-series, Optimization, Computer Vision.

- Optimization Analytics, Predictive Analytics, Computer Vision.
**Recommendations for talent development in Industry 4.0**

“An army of sheep led by a lion can defeat an army of lions led by a sheep” – African Proverb.

The individual is at the centre of the change, be it in the industry or the academic world. Acting as a building block, we need future leaders who can rally the workforce to strive towards excellence, innovation and positive change. Some of our recommendations to create Industry 4.0 talent both from Industry, Academic front and industries with relevant skills are below:

**Industry Front:**
1. Re-skilling and up-skilling the existing workforce
2. Recognition of Innovation and excellence

**Academic Front:**
1. Shifting the pedagogy from theoretical exercises to practical, real world problem solving.
2. Creating dedicated programs within Institutes.

**Cross Technology / Functional Skills relevant for Industry 4.0:**

![Cross Technology / Functional Skills relevant for Industry 4.0 Diagram]
**Conclusion:**

Industrial Analytics revolution is in its nascent stage and Indian manufacturing industry is evolving at an exponential rate. There's ample scope for growth, as it opens out channels of revenue generation for all involved in the connectivity chain, extending out to include map providers, web application developers, enterprise application specialists and others who offer value-added services. To a large extent, mobile technology will fuel the growth of this sector. Manufacturing companies, telecom providers, healthcare sector and cloud service providers all have a significant role to play in the effectiveness of any given service. As talent partners, pioneering the strategic hiring for Data Science, Big Data, Analytics and IoT for over half a decade, we see a sharp contrast in the opportunity versus availability, capability infrastructure, up-scaling of skill sets and buy-in from the top management for the business model. We are instrumental in bringing about the next revolution in the industrial talent landscape, helping the companies to contribute in the up-shift of the ecosystem in the entire value chain.

**Credits/Sources:**

1. Roland Berger Website: Accessed October 2017
2. FICCI Website: Accessed October 2017
3. Schneider Electric Website: Accessed October 2017
4. BCG Analytics website: Accessed October 2017

**About Rinalytics Advisors:**

Rinalytics is a super specialized retained talent search and talent advisory firm focused exclusively in Analytics, Big Data, AI and Data Science talent hiring cutting across the industry sectors. Founded by veterans in the executive search business, with deep subject matter expertise and reach leveraged through industry leaders as its board members.

We serve ourselves as “Chief Analytics Talent Advisors”

**Offerings:**

- Board, CXO and Co-founder appointments
- Retained Talent Search
- Startup Advisory Services
- Research Services - Talent Mapping, Skill and Competitive Intelligence

Visit us at [www.rinalytics.com](http://www.rinalytics.com)

**The Author:**

John Irudayaraj is Managing Partner at Rinalytics Advisors. Besides doing all that it takes to build a successful business with utmost client satisfaction, he is also responsible for Industrial Analytics (IIoT) and Digital Transformation strategic talent search and advisory services globally in the Industrial sectors covering Automotive, Aerospace, Defense, Energy, Oil & Gas, Utilities, Manufacturing, Automation and related.

John is a trusted advisor in building C-level team composition with organizations across sectors, particularly Industrial Engineering, Automotive and Manufacturing, with nearly two decades of market experience serving clients in the talent management space.
Industrial Analytics Practice and Team

Our Industrial Analytics practice is a dedicated team of experienced Industrial Engineers, focused on strategic talent search and advisory services in the areas of Industrial Internet of Things (IIoT) and Industry 4.0 covering Automotive, Aerospace, Defense, Energy, Oil & Gas, Utilities, Manufacturing and related sectors.

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Finding the best talent search partner:

At Rinalytics Advisors, we fit the pieces of the puzzle together, thanks to our knowledge of analytics global market and talent ecosystem, experience in sourcing key talent and rigorous assessment process.

We look forward to partnering with you in your journey towards success in Industry 4.0.