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# Enhancing Industrial Growth through Excellence of Skilled Workforce

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**ABSTRACT**

*Make in India"has been announced by the Indian Prime Minister.Canit emulate"economic miracle" Japaneseachieved post-cold war years and make an attempt toreach the export shelves,aligning Enhancing Industrial Growth.*

*In the granularity of Enhancing the Industrial Growth, through excellence in Plant Management requires,drawing a road map onvarious frontsthat include improving manpower skills against updated standards,with global importance.*

*Aholistic approach for achieved through Men with high Skill competencies with updated Skill Standards to as per international standards, using quality 5M's (Men, Materials Money, Machinery and Methods).The Manpower Skill Standards gained importance due to Competencies or talent shortages experiencedworld overrequiring mapping and appropriately marketed showcasing Indian Skills.To stay afloat in competitive world, every activity needs analysis, corrected and benchmarked for achieving industrial growthenhancement. Benchmarking the Skill Standards is as important as other aspects for achieving plant management excellence. This paper analyses the Skilling from national perspective, as well as industry or enterprise, its impact on Technical Vocation, Education & Training (TVET) Institutions, Trainers, Education system and etc. how it affects the human asset supply chain infrastructure and role of talent refineries.*

*USA, Canada, UKand other countries are working hard to sustain Industrial growth and are incompetition to attract Global TVET talent . India can bea source for meeting the talent demand and skilled youth.*

*Indian Skilled manpower for offshored manufacturing to India by other countries or as expatriatesoverseas becomes anasset.*

*India's economy has to grow fast enough to absorb the skilled manpower or alternatively Indian skilled manpower to be readied to get expatriated to greying mighty developed nations for their sustenance. All these parameters will give fillip to"excellence in plant management" to global standards throughimproved Skill Standards of Indian youth have to help India attainEnhanced Industrial Growth.*

*Skilling is the prescription for Growth and employment to avoid the repeat of Arab Spring and assessment of Skill gaps is important in this automated industrial world. The Paper examines the Skill Gaps of what Industry requires and what the individuals come ready with.*

**KEYWORDS : Make in India,Enhanced Industrial Growth, excellence in plant management,Automation, Internet of Technologies, Disruptive technologies, Skills supply chain, Global Economy and Skills, Skilling technologies, TVET Skill providers, Robotics, Manpower as own asset, Human Capital for foreign remittances.**

**Introduction:**

In Japan, it was with the cooperation from all-the manufacturers, suppliers, distributors, and banks in closely knit groups called keiretsu; the powerful workers' unions, government bureaucrats, polity for lifting the economy and the improvement in employment, all the stake holders seriously rallied behind Japan Inc. Japan had a period of rapid economic growth between 1955 and 1961 which paved the way for the "Golden Sixties," the second decade that is generally associated with the Japanese economic miracle.


**Figure 1 Skilling Target Vs. Achieved**

The TVET / Skills landscape is bound by demand supply matrix. The impacts of investments facilitated by the government's policies in Enhancing the Industrial Growth shape the economy, accordingly requirements of TVET, its landscape and thus are our compulsions of mainstreaming the TVET in general Education stream. World, now a global village with internet, social media, web connected witheasier & faster travel, various countries are facilitating the occupational mobility of skilled manpower (even facilitating skill development) with international certification on relevant standards.

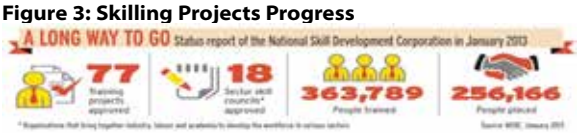
India has a demographic advantage-a much debated subject, but Indian NoS for various Industrial sectors are yet to be developed, which is a must for Enhancing the Industrial Growth for achieving plant management excellence and realize "Make in India" dream. These programs are being undertaken in countries like India to help their respective country to source the skilled manpower as per their National Occupancy Standards (NoS or Skill standards) to meet deficit of younger skilled workforce in their countries.


**Figure 2 Giant Elephant replaced by Agile Lion**

By Enhancing Industrial Growth with "Make in India initiative" India is reshaping its economy by re-emphasizing on achieving manufacturing prowess and export led growth improving India's competitiveness. The new manufacturing technologies need a lot of automationand Human Machine Interface (HMI) to be cost effective. The youth have to take on TVET. To instill pride and confidence in TVET through Industrial Training Institutes (ITIs), two dozen brand ambassadors for ITIs have been appointed by the authorities. This paper emphasizes on closing the skill gaps; and for deliberations analyses the Skill gaps in industrial automation (just as one case on Skill Standards for the purpose of discussions) in one of the core sectors through its survey results. Similarly high pressure welding that goes into many sectors like Power, Refinery, ship building, space crafts and many others as well as Industrial Electrician, Plant Operators, Offloaded work to sub-contractors; Critical work functions etc. in Indian Industry have also been analyzed separately out of this paper. The other area of importance is hard to find jobs, which will decide the TVET landscape in India has also been studied separately out of this paper.

**Excellence in Skilled Manpower -Issues:**
With "Make in India" dream (Fig.1),Enhancing Industrial Growth, the manpower Skill Standards & the TVET in India, achieving excellence in plant management, need deliberations in regard to:

**Figure 3: Skilling Projects Progress**




What is the target (Fig.1), a relook at the initial targets of Skilling numbers & Skill Standard numbers?

Is TVET Skilling TVET projects (Fig.2) are for India's captive needs, if so, is Indian Industry getting expanded to absorb all?

Is TVET Skilling to strengthen the skilled workforce supply chain to meet the Global shortages outside India, if so, and thenare the Global skill standards to be met?


**Figure 4Long Term Targets for Skilling. (Core Sector requirements are clubbed under infrastructure)**

Is TVET Skilling based on Global Salary range (for high value Skills)-

Fig 5&6in respect of the hard to find skilled workforce?

Is TVET Skilling for future Technologies knocking to enter the world for outsourcing andare we getting ready to grab the opportunity as an outsource destination?

Status of Skilling / TVET Infrastructure and Trainers'readiness?

Status of India's needs the workforce for low skills range?

Which are India's competitor countries for global skilled workforce supply chain getting ready for what skill profiles?

What is the impact of Skill Standards in enhancing industrial growth and achieving excellence in plant management?

**With above analysis in mind India has to have a look into:**
Processes to be relooked for a holistic approach of Skilling / TVET. Higher number of TVET trainees or higher quality of TVET trained(Quantity Vs Quality).

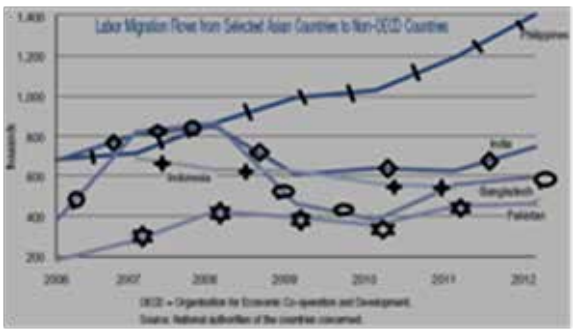



**Figure 5 NRI Skilled Workforce to Non- OECD**

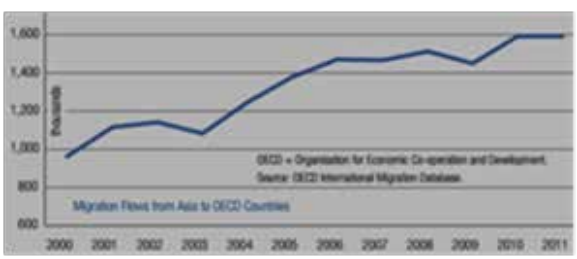



**Figure 6 Migration of Skilled Workforce to OECD**

The Budget proposals for FY 2014-15 and further years are to be focused on supporting labour intensive sectors to get aligned with pro-job-policy of the new government. The job creation may be by re-activating apprenticeship or developing entrepreneurs forMedium , Small & Micro Enterprises (MSMEs).

Skill Standards / TVET Status in India- For Excellence in Plant Management

Plant excellence needs workforce to meet bench mark excellence in Skill standards, there is a need for aligning general education with TVET and providing a career growth with"Retooling of vocational education"as per the article of The Economist of 23rd August 2014 which has highlighted that the Technical Vocational Education and Training (TVET) has suffered from two curses: lower status than conventional education and no innovation in the delivery of TVET.India has a poor skilled manpower base of India having around 11% who received vocational training with only 1.3% having received formal vocational training and balance 89% of the 15-59 year olds having no vocational training. The current training capacity is a fraction of the 12.8 million new entrants into the workforce every year Therefore access to skills programs becomes a major challenge. After "Education for All" UN is getting ready for positioning TVET post 2015 UN's development agenda onFig.7reflects the India's unemployment at various education levels.Skills sometimes may be hard to measure and manage, because new technologies frequently requiringnewerspecific skills that TVET Institutions don't teach and that labor markets don't supply. Since information technologies have radically changed much work over the last couple of decades, employers have persistent difficulty in finding workforce forworking on the most of the new technologies.

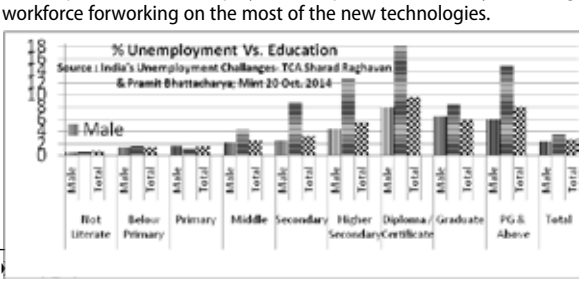


**Figure 7**
Employability, Global Demographic imbalance has brought sudden focus on TVET and requires alignment to educational qualifications to avoid unemployed youth specifically those who are educated.

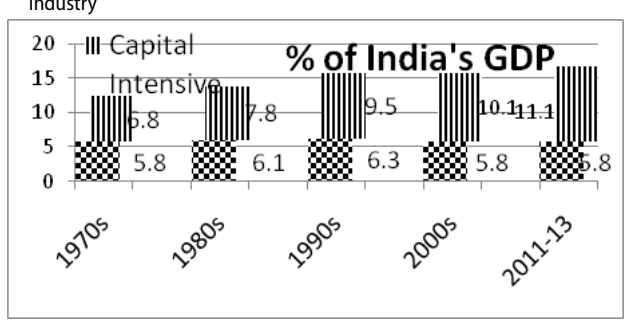
**Changing landscape of Skill Standards /TVET**: New compulsions of Environmental concerns, 'Green'ing TVET , Energy efficiency-( importance emphasized by 'Blue'ing Light as in LEDs' noble prize award 2014), for higher lumens / watt (reducing environmental degradation), growing pressure on resources leading to zero wastage, zero defect, higher productivity or zero breakdown, Cross discipline skills, sustainable development (environment, economics and social) coupled with wired world having increased internet penetration, widespread use of smart phones / machines, personal digital assistants,RFID technologies, laptops / tablets etc. remote controls of machines and Skill requirement in Capital Intensive Industry is increasing. The depicts are changing Skill Scapes

Enhancing Industrial Growth aligned to "Make in India"-and to National manufacturing Policy (NMP)

Skilling is the biggest differentiator for Industry to be competitive. Skilling youth who are replacing the aging workforce to ensure enhanced plantperformance to updated skill standards,needed to support uplifting the sagged GDP looking for growth includes core sector major industrial plants as well as the MSMEs which are supporting these core sector industry, bearing the fact that a 45% of manufacturing output and 40% of the country's exports originate in more than 26 million MSME units across the country. These MSMEs employ 65 % of the manufacturing workforce in India as per OECD's study. These MSME units are engaged in the production of more than 6000 products, 22% of which are food products, 12% are chemicals and chemical products, 10% basic industry metals, 8% metal products, 6% each of electrical and machinery parts and rubber and plastic products (36% of miscellaneous products). The Core sector Industry while working on vendor development have to ensure that the MSMEs workforce also meets the Skill Standards, including for products that are manufactured under labour intensive processes keeping in view their contribution. Table 1 indicates how many more numbers are required for employment and their contribution to GDP so far.

| Skilled hands needed for additional Employment with Pro-job-Policy ( 2012-2020 @avg. 7% GDP growth[1] | Nos. in Mn. |
|---|---|
| Labour Intensive Manufacturing | 14.5 |
| Capital Intensive Manufacturing | -3.2 |
| Labour Intensive Services | 36.1 |
| Capital Intensive Services | 7.6 |
| Construction | 13.3 |
| Total Non- Agriculture | 69.3 |
| Labour Intensive Manufacturing & Services | 50.6 |
| Agriculture | -10.2 |

Table 1 Contribution to GDP by Capital Intensive &Labour Intensive Industry




Skilled manpower will be an icing on the cake of Indian growth story and TVET development in the next decade.

Challenges of Skilling India

India's Growth Story is linked to Enhanced Industrial Growth through Enhanced Plant Management need enhancing Industrial Automation-the Skills which also spread to other low GDP growth contributing sectors as well as new /evolving technologies. The developed countries are bringing in technological advances enhancing their industrial growththrough highly efficient processes that are more productive, requires lesser manpower interventions, remote controlled, energy efficient, environment friendly and so on which is a part of plant management excellence on their part. Thus, we are heading towards altogether different Skill regime and we have to gear up for the same, keeping in mind scale, speed and skills involved. The industrial growth can focus on import substitution or it can be export led growth, keeping in mind the Europe is reducing its consumption.

India's "demographic bulge" (millions of youth) will be entering in for job markets in the next decade-is in danger of sliding into a lopsided paunch with a dangerto weigh the nation downwards and crimp India's GDP. Indian education system so far has made the youth obsessed with textbook education and white-collar dreams in air-conditioned space need career growth opportunities and alignment to expanding Industry sector jobs.

Replicating Japanese experience of last 50 years or Chinese last 2 decades is difficult and India has to find its own path, picking up the best features of the two experiences. India needs Skilling for investment of physical infrastructure like roads, ports, power, water, minerals, water etc. India has been making the agriculture work force move to manufacturing all these years.


**Figure 8 UNESCO's Global skill Validation**

**Global Skill Deficit**
The Industrial world is now competing for sourcing talent of which United States, United Kingdom and Canada dominate the Competition for Global Talent (demographic compulsions) among various countries.

Taking an in-depth look at the BRIC countries, research[1] finds that people are leaving India for work in US/UK / Australia/ Canada. However, as India's economy is showing fringe improvement, job seekers are considering India for migration in the opposite direction. TVET trained people's presence in areas where new TVET trained competitors from other countries are also popping up after developing Skill Standards (Fig 8). The key for TVET trained for these destinations is not just to employ people from India in but also to effectively inte grate these local employees and local business processes into the infrastructure of global organizations in order to remain competitive.

**Readiness on International Skill Standards (NoS):**
UNESCO has already initiated work on the next global skills challenge tackling the massive imbalances and skills gaps that exist between developed and emerging economies, skills mismatches which hold back productivity, competitiveness and development. Skills mismatches obstruct mobility essential to quality and productivity improvement in business and inward investments. The Internationally recognized Skill standards are critical to improving vocational and technical education mobility. About 60 Countries (shown in green-Fig 8) have got the Skilling program validated and 48 Countries that include India, USA and UK are under validation (yellow colour). Countries in grey colour are yet to start working on these standards. After the submittal of this paper Benin, Cambodia,Iraq, Latvia, Lithonia, Myanmar, Nepal, Philippines, Qatar, South Africa, Uganda and USA

were also have joined the list of countries that UNESCO has validated recently.

India has thus to upgrade Skills to International Standards tackling skills mismatches, including the recognition and industry validation of skills and with local and transnational perspective.

**India a new high quality Talent destination**

With India's rich experience in handling offshore servicesBusiness Process Outsourcing (BPOs) and an enviable talent pool to boot, India is one of the most sought-after offshoring destinations. As international firms are focusing on improving value for money, there has been a flow of offshoring manufacturing, especially of non-critical roles to low-cost nations. The drivers of today's TVET landscape change are workplace automation, computational world, new literacy methods (beyond text) and offshoring of value addition processes to economical destinations in this highly competitive world. Longer lifespans (with continuous learning / multiskilling) is another driver that is shaping TVET's land scape.

Thus, creating an agile workforce through talent management transformation of human capital is a compulsion of today for any nation, industry & enterprise for achieving excellence in plant management. In today's continually evolving global business environment, opportunities for growth are juxtaposed against a shrinking pool of high-performing talent that can quickly seize these opportunities, leaving many organizations with a shortage of quality resources. The ability to anticipate talent needs, optimize a talented workforce, and keep manpower attrition lower despite constant technological change ,is the key to a company's sustainable competitive advantage. The alignment of the workforce with business objectives , by using measurement to drive decisions, monitor performance and improve results has become important for HR management.

India has already made the platform ready for Foreign Direct Investment (FDI) by moving its status from initial Primary Industry to Manufacturing and now on to tertiary phasewhere Skill requirements vary as per table 2.

Today, the competency model of human resource management is applied to all components of human resource management - learning and development, performance management; succession planning, job design, as well as staffing and recruitment. These add to the challenges of HR management today.

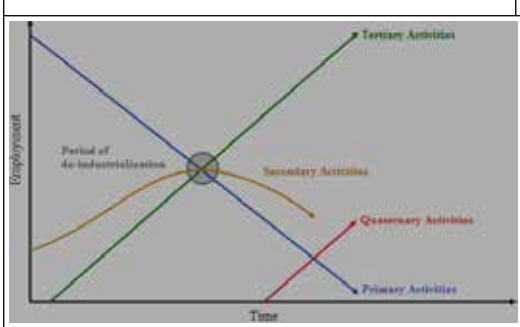
In expanded definition of management with 9 M's covering"Measurement" skills measured objectively in terms of unit of Skill Competency[2] having variety of components, to be able to use the units of competency to plan, deliver, assess, verify, certify and accredit Skilling / training, starting with understanding the individual components of Skill Competencies. 5 M's expanded to 7M's with the inclusion of Measurement and Marketing and then 9M's covering measurement, market information etc.

The Occupational gap Analysis is carried out to identify and establishthe Skill competenciesthat go into a manufacturing cycle, satisfactorily, economically, safely, caring for environment.

Analyzing the role of various occupations / jobs / trades / professions within an enterprise, is an initial step in a Skilling/ training matrix process (training life cycle) requiring to identify a Skilling Package known as Competency Development Framework (CDF) used for development of the Curriculum (Off-the-Job Training), Practical Training Programmes (On-the-Job Training- OJT) including apprentice programs (where skills are acquired according to the needs of the organization), Assessment and Verification requirement for each occupation / job / trade / profession. To optimize the cost of OJT, if "Off the job" training curriculum at TVET is aligned to Industry requirements.

The Internal Assessor within an Enterprise or Skilling / TVET Institution is generally assessing the different competencies acquired by the worker / trainee against the established standards and evidences provided. This assessment is either verified by the Enterprise or TVET Institution via appointment of an External Verifier from a recognized international body or Internal Verifier from the Enterprise or TVET Institution.

**Table 2**

| Employment Scale for various phases of development | | | | |
|---|---|---|---|---|
| Sl. | Phase[2] | Primary Sector | Secondary Sector | Tertiary Sector |
| | Initial Phase of Economy/ development | 70 % | 20% | 10% |
| | Transitional Phase of Economy/ Development | 40% | 40% | 20% |
| | Investment Phase | 10% | 20% | 70% |
| | Remarks | This phase is for early part of the industrialization. | Mechanization / Automation increase from Phase to Phase. Now Machines (Robots) are manufacturing Machines | Mech./ Automation further increases due to growing demands of the tertiary sector.<br>Financial Sectors start developing and investments are made.<br>Today the tertiary sector has grown to such an enormous size that it is sometimes further divided into an information-based quaternary sector, and even a quinary sector |
| |  | | | |

**Skill/ Competencies Standards/ NoS- the concept**

Skill Competencies are the personal attributes (including soft skills), skills and knowledge that are critical to be an effective and successful performer in a given job. These identify requirements essential to perform a specific work. The competency development process recognizes the acquired competencies in different ways i.e. formal learning in a school or online; or through informal learning. That is how a concept of recognition of prior learning has come in. The Skills are mapped, measured and gaps are filled to meet the Skill Standards

The quality assurance process (assessment & verification) demonstrates performance for all acquired competencies including Health Safety and Environmental Protection (HSE)-critical tasks (or Occupational Health and Safety Act-OHSA tasks) which are known as Critical Tasks against specified competency standards and performance assessment criteria. However, the success criteria for the Basic Training (Off-the-Job Training) are different from On-the-Job Training (OJT).

2 Dr. MoustafaWahba, Competency Assurance & TVET Consultant , Scottish Qualification Authority SQA Qualified Internal Verifier IV , in an interaction on a forum on Skills

In the Basic Training, the worker / trainee is competent when he/she achieves a certain percentage while in OJT, he/she is competent when he/ shequalifies all the tasks (or the critical tasks) included in the Competency Development Framework.

Industrial Automation Survey on Skill Standards-a research study for deliberations

To make an understanding of the competency units , a survey was conducted making the supervisors as respondents to various questions in respect of Skill Competencies of Entrant Engineering Diploma Holders to Industry (in this case was for Power Sector, though it may apply to other Industry also). The Industry Skills requirements with the units of competencies and the Skills of entrants have been described in Fig 9. The responses were checkedstaticallyfor its relevance. It was noticed that in theseskills being in high technology area, the bell curve of the Skills of the work force is a matter of straight fact and the Trainers have to align the team's Skill sets near to group's median, dispersion as close as possible, making the Skill bell curve to lepto (skiny) or Leptokurtic, bringing the workforce Skills by matching median & mode of the Skills aligning the workforce skill with business objectives.

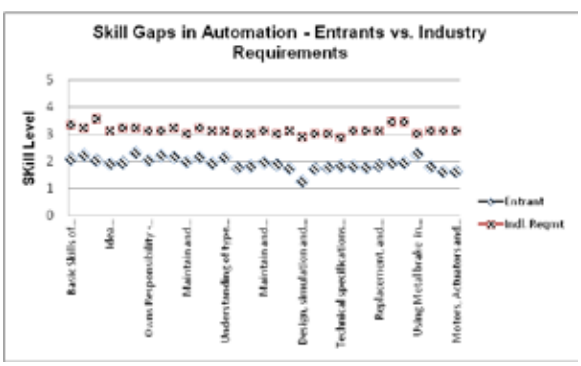



Figure 9: Skill Gaps for Industrial Automation for Entrants & the Industry requirements

In today's Industry everything depreciates except the skilled workforce which appreciates[3].The apprenticeship scheme will help develop the workforce meeting the needs of an enterprise with the requisite Skills rather than producing in large workforce which may get redundant due to changing technologies in this dynamic world where Machines (Robots) are producing machines. But the networked work is now allowing disbanding monolith organizations getting replaced with aggression of value added activities dispersed widely.

**Limitation of the Study:** The results of this study are applied universally, whereas the study was conducted in India on a small sample pertaining to one Industry. Results may not change on global level and for various industry sectors requiring similar skill sets.

**Summary**

The demographic dividend will accrue to India only if enough jobs are created in India, general education also gets job opportunities and career growth, as well as the alignment of general education and TVET or Skilled / TVET trained people are tailored suitably for the foreign assignments also; else the dividend cheque is likely to bounce.

The drivers with big disruptive shifts that are likely to reshape the future landscape of the Skill Sets and to be a confluence of several drivers working together that produce true disruptions about future technologies and thus future work skills. The rise of smart machines and systems, Workplace automation nudging the human workers out of rote, repetitive tasks, computational world will bring in massive increases in sensors and processing power make the world a programmable system, complementing the smart machines. These technologies require new media ecology with new communication tools that will require new media literacies beyond text. These technologies will lead to super-structured organizations with social technologies to drive new forms of production and value creation. New technologies and social media platforms will be driving an unprecedented reorganization of how we will producecreate value and enhance industrial growth; in globally connected world with Increased global interconnectivity puts diversity and adaptability at the center of organizational operations.

Although it is difficult for workers and employers to develop some of the new skills on their own, this difficulty creates opportunity for the TVET Institutions. Those workers who acquire the latest skills earn good pay; those employers who hire the right workers and train them well can realize the competitive advantages that come with new technologies.

**Conclusions**

An overarching Indian Goal is to empower the people is merely not by GDP growth or making it a 3 USD trillion economy. Consonant with this, to take "Make in India" further not by Govt.'s pull but by Industry's push, enhancing Industrial Growth and empowering people through employment, developing the human asset supply chain for entrepreneurship byskilled manpower contributing enhancing the industrial growth.All the stakeholders have to get involved for this push and developing skilled workforce for achieving excellence in Plant Management.

**Recommendations:**

India needsVishwamitras (Trainers) for Transforming our Work force through Transition like Rama & Lakshman were trained.These Vishwamitras can being in excellence in plant management needed for enhancing our industrial growth. Action: Industry & Skilling Institutions.

Scale and Speed (with in a time frame are a must for Skilling India- a must for excelling in the plant management; otherwise we will miss the bus to reach the growth levels we are aspiring for.Action: Industry & Skilling Institutions.

Skill Standards are to be developed faster, made known to the stakeholders and everyone to work for meeting the requirements. Till Sector Skill Councils finalize Skill Standards, Industry can come up these standards of their own and can make a contribution in developing these voluntarily Action: Industry & Skilling Institutions.

Enhancing Industrial growth base based on zero defect and zero effect (environment) is behind the philosophy of "Make in India", enhancing industrial growth and achieving excellence in plant management. Action:Industry.

Our Skilled / TVET work force is to be highly efficientfor excellence in plantoperations to meet global standards aligned to Post 2015 requirements set by UN and today skilled workforce acts as a currency for the country. Action: Industry & Skilling Institutions.

Continuing to achieve excellence in plant management, Multiskilling is answer to dynamic change in Technologies.Action: Industry and Skilling Institutions

Indian Population has made Indian Political empowerment achieve a rank of 15 / 142 at World's Economic forum 2014 but ranks poorly in Education attainment 126/142, Economic Participation & Opportunity Index 134/142. The Govt. has now in turn is required to empower its people with Skills and Employment, Employment opportunities by facilitating FDI by investor friendly policies, rules, laws, procedures in terms of Labour laws, Land acquisition and approvalsto help uplift India's global rank of "ease of doing business" to help India get technologies, Finances for people's empowerment. Action: Govt. of India.

Talent development to support achieving the excellence in plant management , the Skilling Institutions have not to work for plucking the low hanging fruits but what the Industry needs.Action: Skilling Institution

India to quickly bring in Vocational training programs matching the aspirations of youth, to adaptive of the economy, collaborative and be credible (and portable) certifications. Portability to be between certificates, diplomas, degrees and also geographical across Globe. Action: Government

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