Deloitte.

The Future of Manufacturing..

Implications for Public-Private Partnerships in Skilling for Jobs

A Point of View

Ajit Mathai

Deloitte Touche Tohmatsu India Private Limited

January 2015.

Contents

Introduction: The Paradox!

The Indian Paradox…

Demographic Dividend: Advantage India

- 605 M people < 25 years of age
- By 2020, 116 M workers in the age bracket of 20 to 24 years, as compared to China's 94 million
- By 2020, Average age will be 29 years in India; 40 in USA, 46 in Europe; 47 in Japan
- In 20 years, the labour in industrialised world will decline by 4%, in China by 5%, while in India it will increase by 32$

Global Context: World Development Report 2013 on Jobs, WB
The Perception: ILO

Indicates a surplus of labour

The Industry …

- Manpower is their biggest challenge (NREGA Scapegoat!)
- Willing to train – but labour is not available
- At Supervisory / Technician levels, skilled employees are not available

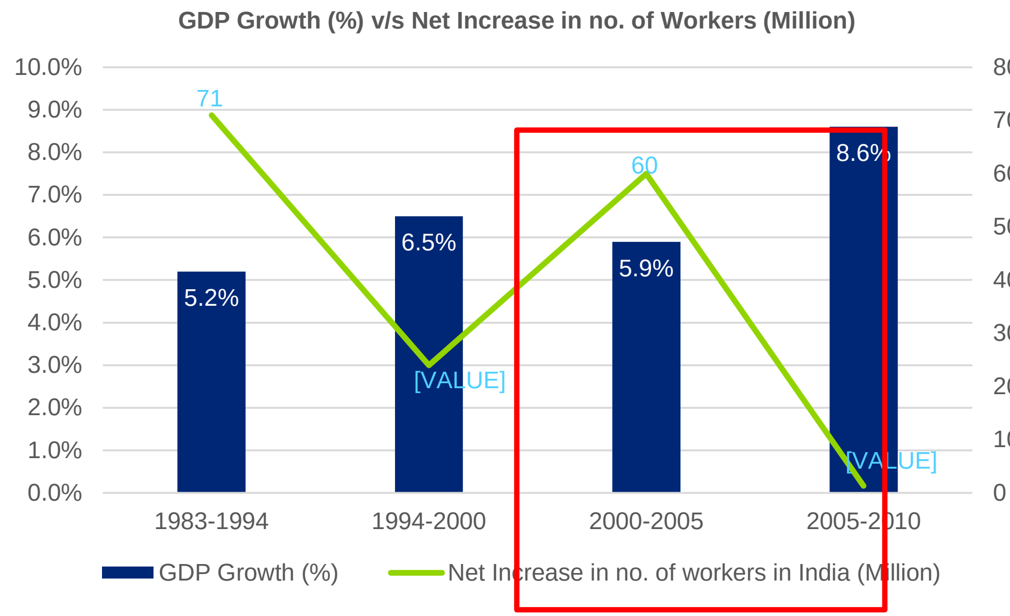
The Youth …

- Employment is hard to come by
- People who want jobs are not getting them
- Educated (by Degree) people seeking jobs in lower order skills

Industry is growing, but no manpower

Trying to Understand the Paradox…

- **1980s:** Fast growth of non-agricultural employment in Rural India
- **1990s:** Employment growth slowed down sharply in rural areas
- **2000-2005:** Employment growth revived impressively with a net increase of 59.5 million new jobs, and with a significant jump in the numbers of the "**self-employed**"
- **2005-10: Jobless Growth:** Employment generation declined sharply again, with only 1.25 million new jobs recorded in the country between 2004-05 and 2009-10
- **Slowdown in employment not in sync with growth in GDP**
- Employment growth missed by a huge distance the target of **50 million** new jobs set by the Eleventh Five-Year Plan



Only exception was in the increase in Casual employment in the Construction Sector, employment increased from 8.4 to 18.1 Million employees.

Casual Employment in Construction, Ship Breaking, Diamond sweat shops…Is This What India Wants?!

Thomas, EPW, 2012, vol XLVII No. 51

The Mega-Tends impacting manufacturing in new ways…

Mega-Trends

Demographic changes including, urbanization and mobility

Rapidly growing demand for energy

Megatrends

20th Century

- World War reconstruction
- Cold War and Space Race
- Rise of the middle class & Urbanisation
- Feeding growing population

Technology advances

Making new materials

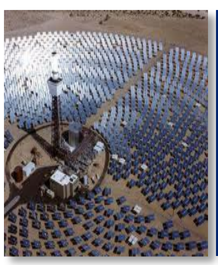
Semicon ductors

Plastics

Key themes

- **Performance**: faster, cheaper, lighter
- **Replacing natural materials with synthetics**
- **New functionality**
- **Consumerism**

Water scarcity



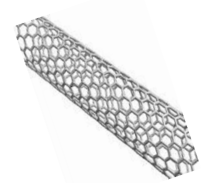
Climate change, environment and sustainability

Growing demand for food, nutrition and health

21st Century

- Sustainability
- Resource scarcity
- Escalating energy demand
- Disaggregation-Connected Communities
- Food, nutrition, and health

New ways of making & using existing materials



Biorefining

Nanotech

Collaborative Technologies Artificial Intelligence & Robotics

- **Flexibility:** Recycling and reuse, renewables, decentralized systems, Systems level innovation
- **Scarcity**
- **Speed (reduced cycle times)**
- **Collaboration vs Competition**
- **Personalization & Consumer Consciousness**

Countries successful in fostering innovation….GDP growth

At a country level, direct R&D investment contributes to, but does not drive, national innovation success

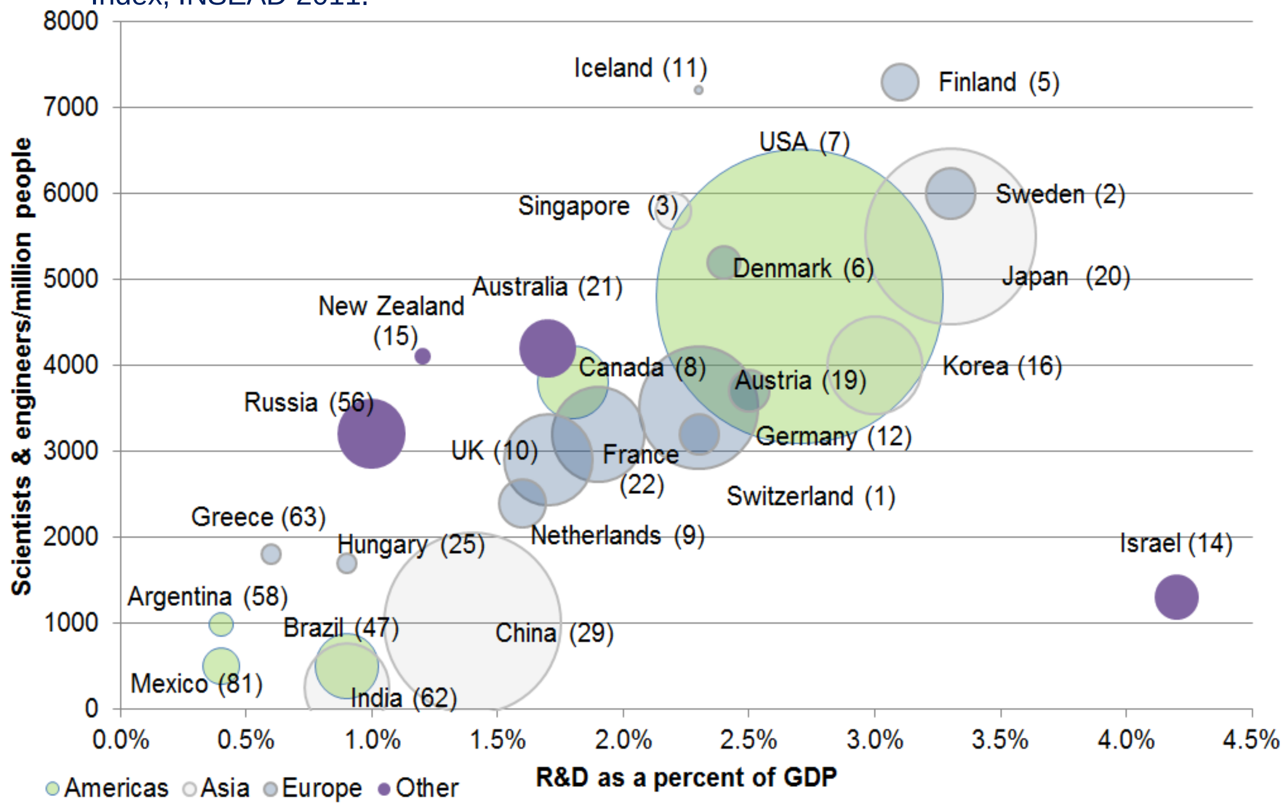
Global innovation rank

Rank	Country	R&D as % of GDP
1	Switzerland	2.3
2	Sweden	3.3
3	Singapore	2.2
4	Hong Kong	0.8
5	Finland	3.1
6	Denmark	1.6
7	US	2.7
8	Canada	1.8
9	Netherlands	1.7
10	UK	1.7
12	Germany	2.3
20	Japan	3.3
29	China	1.4
47	Brazil	0.9
62	India	0.9

= Innovation ranking

R&D spend by country 2010

The diameter of each circle represents the relative annual R&D spend by country. The number in the parentheses represents the innovation ranking on The Global Innovation Index, INSEAD 2011.



Despite relatively low absolute R&D spends, Switzerland and Sweden are the most innovative countries; the US fares reasonably well, and its ability to innovate may be something to build on and give them an edge in the global battle for investment

Source: INSEAD. 2011. The Global Innovation Index 2011:Accelerating Growth and Development. 18-19; R&D Magazine. December 2010. Global R&D Funding Forecast.

Companies that master collaborative innovation on a global scale stand to be more globally competitive

- To develop differentiated products and services at a faster pace and with limited R&D resources, companies need to fundamentally change their approach to innovation
- Collaborative innovation counters issues of traditional R&D models and give companies access to vital technologies and know-how without having to build them in-house
- Collaborators share development and marketing responsibilities, as well as benefits and risks
- Companies need to spend time analyzing the intent and scope of the collaboration in order to identify the most suitable collaborative innovation model

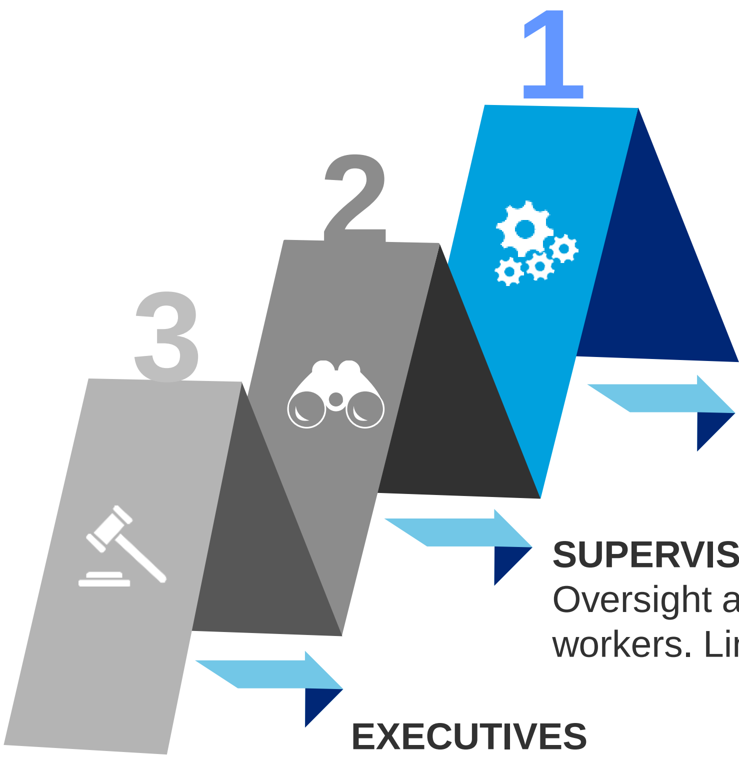
What will happen to manufacturing?

What will happen to manufacturing?	What will happen to manufacturing people?
• Will disintegrate. Big OEMs will turn inventors, assemblers and marketers. Manufacturing will not be a core competence • Products will compete on the basis of intelligence and not hardware • Industry boundaries will disappear • The life cycle of products will shrink rapidly • Batch runs will get shorter with high level of customization • National boundaries will disappear • Low cost will be redefined	• Just physical skills will disappear from shop floors • Manufacturing managers will deal less with 'workers' and more with software, partners in the supply chain • Product and process changes will be continuous • The 'worker' will be an empowered autonomous unit • The managers will have to carry out value-adding activities • The notion of factory will change – your home could be your factory • Therefore, the manufacturing manager will be a cross-functional entity • The focus would be on improving the present rather than maintaining the status quo

Skilling Models

Jobs and Job Families in Industry
Skilling – Different for each level

- Primarily, any industry requires employees at three distinct levels – Workers, Supervisors and Executives



WORKERS
Actual hands and legs on the factory floor. Highly physical and manual job

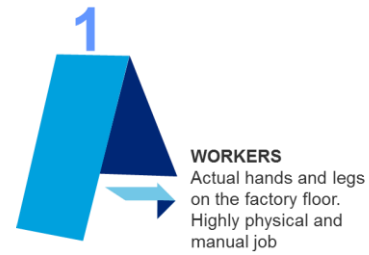
SUPERVISORS
Oversight and monitoring of workers. Line In-charges

EXECUTIVES
Oversight of overall production, design and foreign trade

- ***Nature of job at each level is different***
- ***Hence the training and skilling required at each level is also distinct***
- ***Approach to providing the skilling will also therefore vary across the three levels***

On the following slides, the skill requirements, the approach to skilling and the global models used for similar skilling have been examined

Some Models of Skilling



Classic UK Model

Classic Model.

- Publicly funded Apprenticeships. Considered as Gold standard for Work based training.
- Three levels of apprenticeship programs with defined competencies.
- City and Guilds of London Institute is an established vocational training organization providing 500 qualifications across industries.

Collaborative German Model

German Dual Education Model

- Industry/ School Collaboration: Combines apprenticeship in a company + vocational school Education. 3-4 years
- Controlled by Govt. with inputs from industry
- Collaboration between school and industry equips students with skills for all 3 levels of jobs

Operational Eastern Model

Singapore's VET (Eastern Model)

- Focus on training workforce at the primary and secondary levels for Manufacturing – worker and supervisor levels
- The institutes of technical education specialize in training skilled technicians and professionals.
- Polytechnics specialize in training technologists and middle-level professionals (Yan, 2010)

Innovative Scandinavian Model

Scandinavian model in line with the current trend of innovation in the Manufacturing Industry

Scandinavian Model

- Upper Secondary Education has 13 vocationally oriented programmes and 4 academic national programmes + 15 days of workspace training
- Councils of local employers and employees assist schools in identifying venues for vocational training
- Builds skills for all 3 levels of job families

Approach to Skilling – Case Studies
Skilling of Workers – Diverse PPP Models

Skilling of workers in the Automobile Sector

- Maruti Suzuki has adopted an ITI in Ambattur
- Equipment, spare parts etc. provided by Maruti
- Pedagogy, content etc. jointly developed

- Eastern Model of Skilling
- Focus on operational aspects of the skills and the industry – training on primary and secondary levels of manufacturing

Institutionalization of Skilling – Spinning Mill

- Key Challenge: Attraction of labour

Models in India & Srilanka:

- A PPP model driven by Ministry of Textiles
- The process starts from the very seed of building trust with the worker, visiting the villages; community mobilization; professional arrangements for logistics; skilling on the shop floor
  - Enhanced focus on girls / women
  - Come in as a Girl and leave a woman
  - Recruitment at 17 – 18 years; focus on building skills (a vocation such as tailoring, handicrafts, candle making etc.)

- Example of the Eastern Model of Skilling
- Focus on operational aspects of the skills and the industry – training on primary and secondary levels of manufacturing
- Builds the skills of workers and supevisors among the villagers

Approach to Skilling – Case Studies
Skilling of Workers – Diverse PPP Models

NPC Model- AMCHAM & Deloitte

Connected Thinking in Core Engineering
- NPC + Industry Body Partnership Program
- NPC provides the facility and training
- Industry provides internships / jobs – validates relevance of course content and curriculum
- Invests in the PPP through its CSR funds
- Focus on "Connected Thinking" and OLQs – requirements of Executives on jobs

- Fostering innovation through Connected Thinking – Example of the Scandinavian Model
- Builds skills for the role requirements of Executives

Glass Manufacturer in Chennai

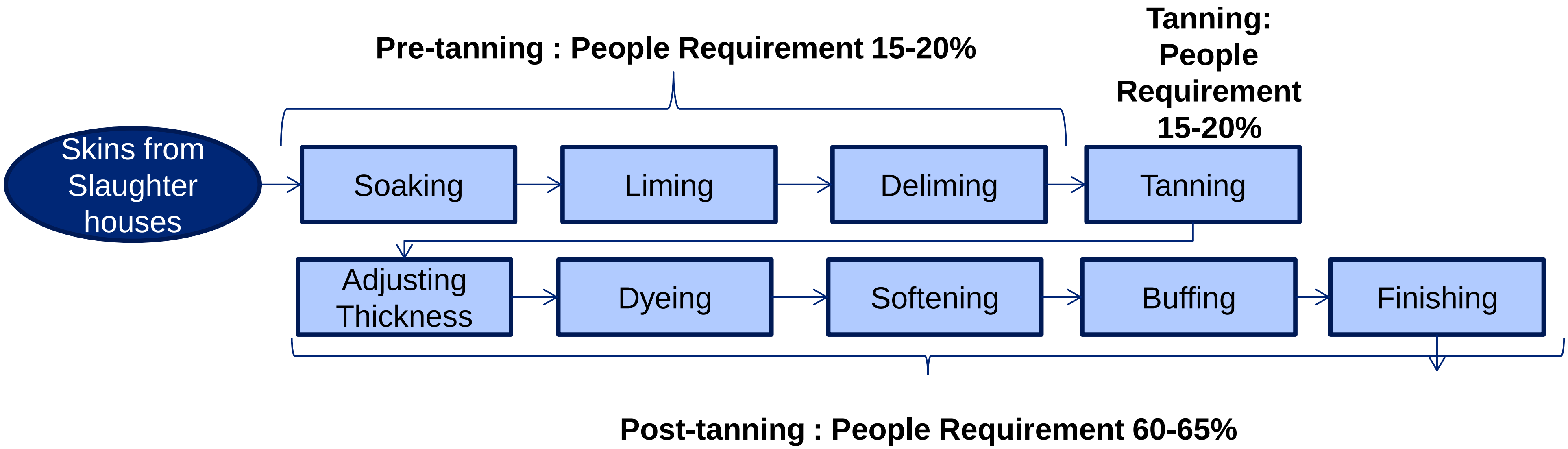
- Partnership with GoTN / ITIs to adopt and train school drop outs over a 3 – 4 year time frame on trades such as Fitters / Welders etc.
- Students are employed with Saint Gobain or with other industries in the area
- GoTN looking at replicating model across sectors

- **Collaborative German Model – Partnership between GoTN / ITIs and Industry players**

Learnings for the Leather Sector

About the Sector

The Indian Leather Industry – Key People - Process Aspects



Key Roles	Prodn Manager	Line Incharge	Operator	Helper	Unskilled Worker
	Responsible for quality, quantity, adherence to schedule, pricing and customer interface	Production line incharge. Responsible for prodn. target and quality.	Performing activity in prodn. line as per specification and daily target.	Understudy to operator	Packing and other unskilled manual labour.
	Dip. / Grad Engg. with PG in Footwear M/f	Dip. / Grad Engg. with PG in Footwear M/f	ITI with 3 to 5 years of exp.	10th / 12th	Minimally educated
	2-3%		1-2%	90-95%	

Key Takeaways

- Large skilled young working force will continue to be a distinct advantage for the Indian leather sector. However models of employment built solely on **Cost Arbitrage** will growingly be a challenge to sustain.
- Mass manufacturing will increasingly be automated and technology driven. Mass markets will see use of innovative material. **Labour as a factor of production will give way to technology and capital.**
- A globally environmentally conscious market, will require considerable investments into **safe and ethical manufacturing**.
- Personalised, niched quality products will continue to grow globally. This will require a **trained, self motivated and committed work force** which will have to be nurtured and cared for.
- Distributed manufacturing with strong traceability and aggregation systems will probably be the way forward
- Industry will have to move away from competitive, exploitative and opportunistic employee sourcing strategies to collaborative industry/ institute partnerships

Deloitte.