• Future Disruptions

• Workforce of the Future
  Transforming Skills & Education Impact - Technology in Education

• ‘Technology’ Transforming Higher Education & Skills Development
  Leading to an Improved Employability landscape

• Questionable Perceptions: United States Higher Education System
  and other Examples

• Shared Challenges

• Systemic Transformation: The Role of Technology in the Path to the Future

• Navigating Culture

• Scaling Best Practices

• Conclusion and Recommendations
Global Disruptions Impacting India

• During the next 20 years the labor force in the industrialized world is expected to decline by 4%, while in India it will increase by 32%.

• Estimated average age in India by 2020 will be 29 as against 46, 40 and 47 in Europe, USA and Japan.

• Massive multiple disruptions are predicted in the next 10 years driven by Connectivity, Technology, an Aging Global Population and Humungous Urbanization.

• There will be more than a trillion objects connected to the internet by 2025.

• The way we live, learn and work will redefine the new age entrepreneurs & jobs thereof

In view of this the Prime Minister of India desires of making India the “Global Human Resource Capital” – wherein the skilled Indian labor workforce could not only meet Indian needs but also fill-in the global shortfall.
Indian IT Industry – Trends and Future Outlook

Total Revenue Projection - 2020

• Industry to most likely grow at 13% CAGR to USD 230 Billion
• Domestic market will grow to USD 50 Billion

Total Revenue (2008-2020)

USD Million


63       69       74       88       88       108       300

300 Billion
CAGR – 16%

225 Billion
CAGR – 11.5 %

Source: Accenture Research; NASSCOM STR 2008-2013; NASSCOM Perspective 2020
Future Disruptions & the Relevance of Today’s IT Workforce

~30 per cent of workforce will not be relevant in 2020; 50 to 60 per cent of the remaining will need to be reskilled

**Type of reskilling needed**

- Traditional, transformative and Disruptive organization co-exists

**Per cent**

| Today’s workforce | 100 |
| Workforce not Relevant in 2020 | 30 |
| Relevant workforce in 2020 | 35 | 35 | 70 |

**Reskilling of talent**

- Less than 50 per cent of the talent would be relevant without reskilling
- 60 to 70 per cent talent would be relevant with reskilling

SOURCE: McKinsey Perspective 2025 CXO survey; McKinsey analysis
### Future Disruptions Changing Tech Priorities - Changes Talent-Needs

**Part-I**

- Higher requirement of process engineers, energy scientists.
- Shift towards electrical and electronics, embedded software engineer requirements and not just mechanical requirements.
- Skills in advanced and alternate materials like plastics, composites, carbon fiber.

### Re-skilling

<table>
<thead>
<tr>
<th>Field</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical engineering</td>
<td>+8</td>
</tr>
<tr>
<td>Thermo-dynamics</td>
<td>-2</td>
</tr>
<tr>
<td>Software/IT</td>
<td>-12</td>
</tr>
<tr>
<td>Chemistry/Material Science</td>
<td>-23</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>-32</td>
</tr>
</tbody>
</table>

**Automotive Example**

Shift in R&D employees 2010-30, Powertrain R&D example

FTE thousands

- Mechanical Engineering: +8
- Thermo-dynamics: -2
- Software/IT: -12
- Chemistry/Material Science: -23
- Electrical Engineering: -32

**Source:** Reuters; McKinsey analysis
<table>
<thead>
<tr>
<th>Role</th>
<th>Role as Described in Job Postings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online content strategist</td>
<td>“Combine data analysis, user research, benchmarking, and content audits to make content decisions and orchestrate content development”</td>
</tr>
<tr>
<td>Search engine optimization lead</td>
<td>“Understand customer search behaviour and be able to translate those findings into meaningful, actionable and measurable insight”</td>
</tr>
<tr>
<td>Community manager</td>
<td>“Grow the help community in Amazon.com, Facebook &amp; Twitter…identify and develop power users to promote crowdsourcing”</td>
</tr>
<tr>
<td>User experience architect</td>
<td>“Evangelize the customer point of view… for the development multichannel experiences… connecting site, mobile and store”</td>
</tr>
<tr>
<td>Mobile payments product</td>
<td>“Drive compelling mobile user experiences and be able to develop innovative mobile payments products”</td>
</tr>
<tr>
<td>Social media associate</td>
<td>“Will assist with all social media marketing/PR efforts, from strategy and planning, to implementation and analysis”</td>
</tr>
<tr>
<td>Machine learning scientist</td>
<td>“Millions of customers, billions of transactions, petabytes of information – use this data to optimize the experience of buyers online”</td>
</tr>
</tbody>
</table>
‘Technology’ Transforming Higher Education & Skills Development
Leading to an Improved Employability landscape’
Leveraging technology as a platform and an enabler for education:

- **Inclusiveness**
  - outreach via Webinar, Webex, Audio Video conferencing via a range of hardware, SMAC

- **Affordability**
  - Scale/Cheaper online learning; Analytics; Big Data; database BI; loans & learning

- **Efficiencies addressing**
  - standardization - quality benchmarks /outcomes (learning pedagogy+ animation & gamming)
  - academic & administrative governance impacting educational outcomes
  - scope/range of relevant knowledge available
  - latest hardware providing connectivity (mobile, wearable, embedded)
  - speed of accessibility
  - multiple learning styles, customized learning using blended methods - leaner and branched
  - self paced learning and assessment
  - flip class rooms & collaborative learning & research
  - assessments measuring competencies

**Case Study:**
Use of technology in institutions virtual/open; continuing education for real time updating of employment related competencies; MOOCS: IIT Madras; Andhra Pradesh; Telangana; Anna University FSIPD; Australia; UK; Canada;
‘Systemic Transformations’
‘Systemic Transformation’ should:

• Create a sustainable industry-ready talent pipeline by scaling quality capacity

• Enhance employability at all levels, leveraging technology and our experience in large-scale skill development, in a sustainable manner across skill sectors

• Nurture diversity and inclusive growth to stimulate economic activity relevant to the local ecosystem

• Make education inclusive, affordable & efficient
Systemic Transformation: Sector Skills Councils in India

National Skills Qualification Council (NSQC)

Ministry of Skills Development & Entrepreneurship (MOSDE)

National Skills Development Corporation (NSDC)

SSCs (Sector Skills Councils)
National level bodies feeding into development-based on employer needs & industry standards.

28
SSCs
Formalized

2
Approved
Under Formation

Security  Automotive  Organized Retail  IT-ITeS  Media & Entertainment  Gems & Jewelry  Leather  Telecom
Rubber  Plumbing  Agriculture  Capital Goods  Electronics  Construction  Healthcare  Apparel & Furnishing
Life Sciences  Power  Mining  Beauty & Wellness  Iron & Steel  Handicraft & Carpets  Logistics  BFSI
Tourism & Hospitality  Textiles & Handicrafts  Earth Moving & Infra.  Food Processing  Chemical  Paint & Coating

* Sector Skill Council Details Source – NSDC updated 27th April 2015 *
Impact of Technology in Education & Skill Development

Capacity building for Present & Emerging Occupations - Right Candidate for the Right Job
## Industry Structure & QPs

<table>
<thead>
<tr>
<th>Industry Sub-Sector</th>
<th>Domestic</th>
<th>Transnational</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Entry- Level</td>
<td>Entry- Level</td>
</tr>
<tr>
<td>ITS (IT Services)</td>
<td>1</td>
<td>19</td>
</tr>
<tr>
<td>BPM (Business Process Management)</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>ERD (Engineering and R &amp; D)</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>SPD (Software Products and Development)</td>
<td>0</td>
<td>18</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>6</td>
<td>68</td>
</tr>
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</table>
Infrastructure Management Services (IMS) and Information Security are seeing a lot of movement in terms of skill development as well as revenue potential.
Click on the Job Role/ QP to see the respective Career Track.
### Qualifications Pack - Security Analyst

**Job Details**

<table>
<thead>
<tr>
<th>Qualifications Pack Code</th>
<th>SSC/Q 0901</th>
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</thead>
<tbody>
<tr>
<td>Job Role</td>
<td>Security Analyst</td>
</tr>
<tr>
<td>Sector</td>
<td>IT-ITeS</td>
</tr>
<tr>
<td>Sub-sector</td>
<td>IT Services</td>
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<tr>
<td>Occupation</td>
<td>Information Security</td>
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<table>
<thead>
<tr>
<th>Version number</th>
<th>0.1</th>
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<tbody>
<tr>
<td>Drafted on</td>
<td>30/04/13</td>
</tr>
<tr>
<td>Last reviewed on</td>
<td>30/04/13</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Role Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ensure the confidentiality, integrity and availability of system and data to the ‘right’ users within/outside of the organisation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NQF/NVQ level Minimum Educational Qualifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optional to Engineering or any graduate course</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Maximum Educational Qualifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor’s Degree in Science/Technology/Computers</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Training (Suggested but not mandatory)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certification in Information systems or related fields, Basic soft skills training</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2 years of work experience/internship in security</td>
</tr>
</tbody>
</table>

**Applicable National Occupational Standards (NOS)**

1. SSC/N 0901 (Contribute to managing information security)
2. SSC/N 0902 (Co-ordinate responses to information security incidents)
3. SSC/N 0903 (Install and configure information security devices)
4. SSC/N 0904 (Contribute to information security audits)
5. SSC/N 0905 (Support teams to prepare for and undergo information security audits)
6. SSC/N 9001 (Manage your work to meet requirements)
7. SSC/N 9002 (Work effectively with colleagues)
8. SSC/N 9003 (Maintain a healthy, safe and secure working environment)
9. SSC/N 9004 (Provide data/information in standard formats)
10. SSC/N 9005 (Develop your knowledge, skills and competences)

**Performance Criteria**

As described in the relevant OS units
Analytics, Health, HRO and KPO are seeing a lot of movement in terms of skill development as well as revenue potential. Consequently, these require maximum skill development efforts.

Note: All the Horizontals - Occupations, Tracks and Job Roles cut across the Industry Verticals.
R&D and PLM are the emerging ‘occupations’ in the R&D space. Skills required for R&D are extremely high end, but in terms of revenue and employability R&D has a cascading effect on the downstream activities.

Note: All the Horizontals - Occupations, Tracks and Job Roles cut across the Industry Verticals.
SPD too has a similar trend in terms of Product R&D and PLM being the emerging occupations. Trend is towards managing an entire lifecycle of product as against one time product development.
Proposed BVOC Framework

For: IT-ITeS Industry – ITS, ERD, SPD

Year 1 & 2
- Students complete Foundation Skills Program along with current curriculum
- Current FSIT or FSIPD Program is proposed for integration as a Foundation Skill Program

Year 3 & 4
- Students select any of the 3 Specialization offerings + Internship Program with ITS, ERD or SPD industry

Certification
- Successful Completion of the Program awards a NOS Certificate for ERD or SPD Industry

Year 4 Specialization + Internship

Year 3 Specialization

Year 2 Foundation Skills

Year 1 Foundation Skills

Job Roles offered as Specialization in Year ‘3’ for ITS, ERD & SPD Industry:
(a) Testing
(b) Data Analytics
(c) SMA

Bachelors of Science / Bachelor of Science + F&A

Bachelors of Vocation / Bachelor of Vocation + F&A
Challenges & Perceptions
Challenges w.r.t. Technology in Education in India

- Questionable Perceptions
- Shared Challenges
- Conclusion and Recommendations
Thank You

- Inclusiveness
- National Growth
- Affordability /Economic Development
- Technology In Education