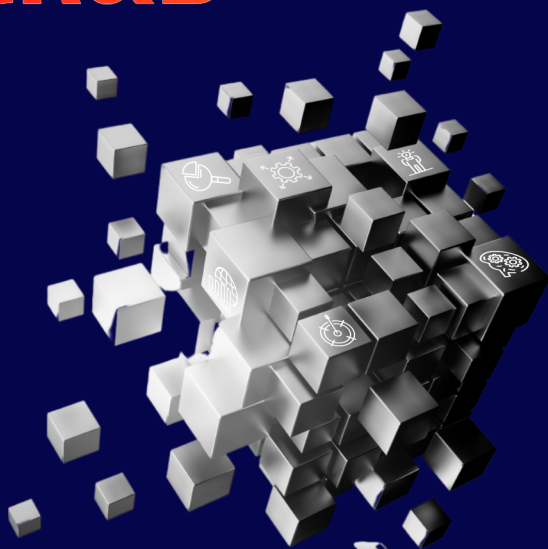


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# THE SKILLING IMPERATIVE FOR ER&D



ER&D  
PLAYBOOK  
2022



2022



# Acknowledgements

This Playbook is an upshot of the panel discussion conducted by NASSCOM on The Skilling Imperative for ER&D. NASSCOM ER&D council is grateful to our esteemed panellists Dr Acharya KNS, Director, Global Engineering Academy at L&T Technology Services, Krishna Bandaru, Executive Leadership Team at Skill-Lync, Dr. G.V.V. Ravi Kumar, Associate VP and Head Advanced Engineering Group at Infosys, who actively participated and shared their insights with us. Their disruptive thought process and deep expertise provided in-depth insights on best practices related to Skilling Talent at scale.

We would also like to thank Mr Karan Kamal, FutureFactor360, for moderating the discussion.

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# Executive Summary

## Imperatives of Engineering R&D Organizations:

The plethora of technological advancements coupled with changing customer expectations and the onset of the pandemic has led to the emergence of a few key imperatives for Engineering R&D organizations. Some of the key imperatives include:



## Widening Talent Gap

A large proportion of today's workforce lacks fundamental digital skills. More than half of companies acknowledge that the digital talent gap is widening and has hampered their ability to drive competitive advantage. The emergence of new job roles coupled with the division of work between humans and machines has led to the requirement of different sets of skills.

## India's Digital Talent Landscape

As of 2021, India's digital talent stood at 3.8 million. India's tech talent demand- supply gap is at 21.1 percent, the lowest among top tech locations such as the US, China, and the UK. However, this demand-supply gap is expected to rise more than 3 times by 2026.

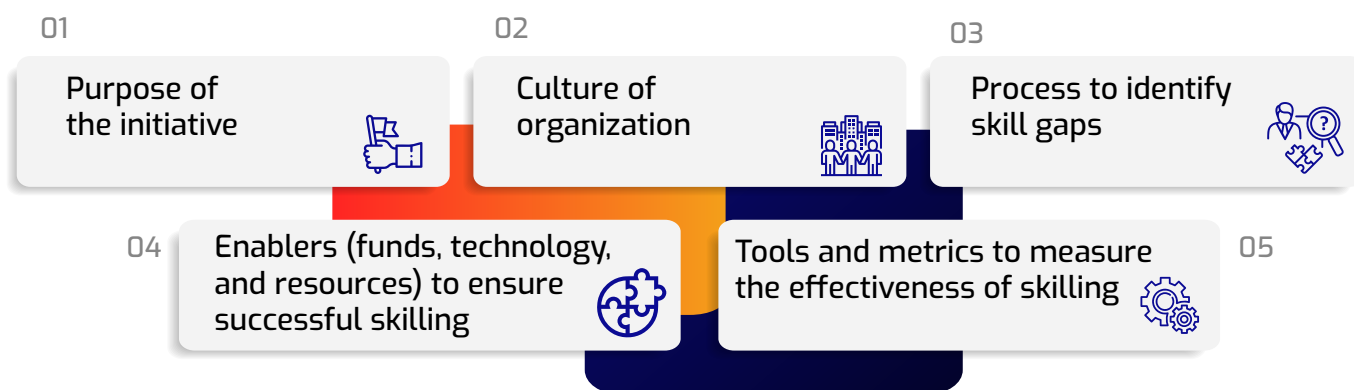
## Evolving Skills Profile

To address the increasing talent demand and supply mismatch, organizations are investing in skilling initiatives to upskill and reskill their employees. As per World Economic Forum (WEF), the world upskilling initiatives have the potential to unlock \$6.5 trillion in global GDP by 2030<sup>1</sup>. The requirement of skill profile has evolved from I-shaped and (dash)-shaped skill profile to T-shaped, (pie)-shaped and ultimately to E-shaped skills profile.

## Building Organizations' Skilling Strategy

Skilling has emerged as one of the most effective means to address the rising talent gap. However, very few organizations are well prepared to address the challenge of reskilling. Before embarking on a skilling journey, organizations need to define the following:

<sup>1</sup><https://www.weforum.org/press/2021/01/investment-in-upskilling-could-boost-global-gdp-by-6-5-trillion-by-2030/>



### • Approaches to Drive Skilling

Organizations have adopted several approaches such as collaboration with the external ecosystem, incentivized skilling, launching training programmes, and so on to motivate employees to reskill and upskill.

### • Key Metrics to Measure Success of Skilling Initiatives

Organizations need to establish effective KPIs/metrics to measure the effectiveness, success and ROI of various skilling initiatives undertaken. Metrics that can be used are the cost of the skilling programme, employee productivity and satisfaction, customer satisfaction, and increase in sales/revenue.

### • Different Modes of Learning

Over the years, the skill delivery and learning methods have evolved from *teacher-specific* to *learner-specific*. To make the learning experience more effective, special attention must be given to the content design and training duration. New learning methods adopted today use the principle of **Spaced learning** (an approach in which the course content is separated into small modules and spread over a longer duration with breaks in between) and **Adaptive learning** (optimization of learning path based on learners' skills, progress, and understanding ability).

### • Managing Employee Attrition Post Skilling

Often, after skilling, employees tend to switch jobs compelling organizations to look for ways to avoid attrition. Some of the ways to manage attrition are job rotation, use of internal talent marketplaces so that employees can find roles or projects to match their interest areas.

## • Skilling @Scale

For India to benefit from its huge demographic dividend, multiple interventions by ecosystem stakeholders (government, academia, organizations, industry bodies, and EdTech companies) are needed to enable Skilling@Scale. Some of the interventions include:

- Tapping into the untapped talent pool in Tier-2 and 3 cities, underrepresented groups, and minority groups.
- Democratizing learning to ensure learning is available to all regardless of previous certifications, training, employment status, degrees, and so on.

- Reforming school education to ensure that the younger generation develops the necessary skills needed for the future.
- Shifting to competency-based skilling that gives importance to learning new skills and developing capabilities instead of the traditional method of memorization and scoring high marks.

Government of India has launched a slew of initiatives, schemes, and policies to address the huge skill gap and to utilize the dividend of India's large workforce. However, a few challenges such as lack of quality trainers, inadequate educational infrastructure, and standardisation in assessment and curriculum (at the high school level), hampers the progress of skilling initiatives. To ensure that all reforms and schemes are implemented as quickly as possible, the government should "*break down the silos*" by bringing together different ministries responsible for various skilling initiatives, as well as other stakeholders.

### Indian ER&D Players can refer this playbook to:

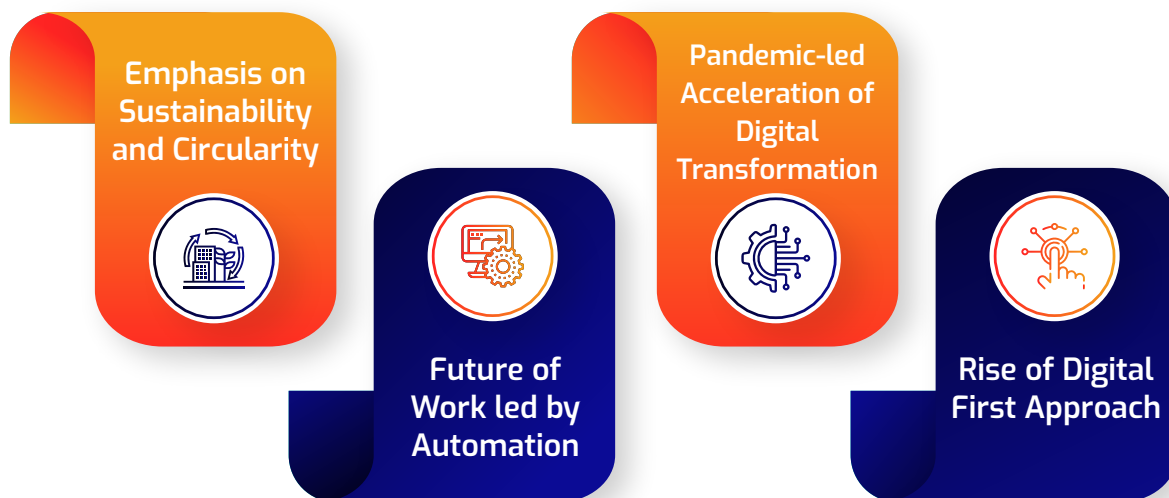
- Understand the various nuances of skilling talent.
- Explore the best practices related to skilling talent and avoid pitfalls such as talent attrition.
- Define KPIs to measure the effectiveness of skilling initiatives.
- Discover how various stakeholders can collaborate to ensure Skilling @Scale in India.



# 1 Imperatives for Engineering R&D Organization

The plethora of technological advancements coupled with changing customer expectations and the onset of the pandemic has led to the emergence of a few key imperatives for Engineering R&D organizations.

## Imperatives for ER&D Organization



### Rise of Digital First Approach

The rapid proliferation of new-age technologies - such as AI/ML, IoT, blockchain, Cloud and so on, is a key enabler of the transformation and evolution seen in the Engineering R&D sector. In the coming 2-3 years, there will be a stronger focus on quantum computing, metaverse, and 5G. Organizations are creating fast, frictionless digital-first experiences across all aspects of the value chain - products, plants, processes, people practise, or customer experiences to keep up with changing customer demands and technological advancements.

- **Products**

Products have witnessed a rapid shift from *physical to digital-first* products with *intelligence* and *connectivity* as key design elements. Also, these products can monitor, control, and provide needed alerts.

- **Plants & Processes**

Technologies such as AI, ML, big-data, robotics, blockchain, AR/VR, cybersecurity and so on are leveraged to optimize and automate (wherever possible) manufacturing, operations and supply chain activities.

- **People**

Technology adoption, further accelerated by the pandemic, has given employees the freedom to work from anywhere and at any time. The use of automation, AI bots, and

robots have liberated employees from repetitive tasks, giving them more time to focus on critical and cognitive tasks.

## • Customer

One of the top priorities of organisations is to improve the customer experience. Digital technologies have enabled a plethora of use cases, allowing organisations to create multiple customer touchpoints and design service offerings to provide a seamless customer experience.

## • Emphasis on Sustainability and Circularity

The increased emphasis on sustainability and circularity is resulting in the adoption of technologies to design products for circularity, optimise operations, ensure efficient energy management, optimise the supply chain, and enable efficient waste management. This, in turn, has led to a rise in demand for green jobs in near future.

## • Pandemic-led Acceleration of Digital Transformation

The onset of the Covid-19 pandemic accelerated an already increasing rate of digital transformation, compelling organizations to rethink their strategy. While this trend is evident for decades across all industries, the current acceleration is unprecedented. A report by McKinsey states that the pandemic has accelerated the pace of digital transformation by seven years<sup>2</sup>.

## • Future of Work led by Automation

The nature of work will change in the future as automation technologies such as RPA become more prevalent in routine tasks. As machines become smarter and more intelligent, labour will be divided between humans and machines. According to the WEF's Future of Jobs Report 2020, by 2025, 85 million jobs will be lost due to a shift in the distribution of work between humans and machines. This shift will also result in the creation of 97 million new roles/jobs<sup>3</sup>. The machines will take over the mundane and repetitive tasks, freeing people to do the tasks that require high cognitive skills and critical thinking.

<sup>2</sup><https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/the-new-digital-edge-rethinking-strategy-for-the-postpandemic-era>

<sup>3</sup>[https://www3.weforum.org/docs/WEF\\_Future\\_of\\_Jobs\\_2020.pdf](https://www3.weforum.org/docs/WEF_Future_of_Jobs_2020.pdf)



# 2 Widening Talent Gap

The last 18 months have seen a surge in digital investments across industries, all of which require digital skills. This exponential demand has widened the supply gap as well. A large proportion of today's workforce lacks fundamental digital skills. More than half of companies acknowledge that the digital talent gap is widening and has hampered their ability to drive competitive advantage. The growing skill gap can be seen in both soft skillsets – customer-centricity, design thinking and advanced technologies such as cybersecurity, data analytics, embedded engineering and so on. According to a study commissioned by Salesforce, 14 G-20 countries could lose \$11.5 trillion in cumulative GDP growth if the digital skill gap is not addressed<sup>4</sup>.

As per WEF's Future of Jobs report, the job roles that will witness highest growth rate include AI Specialists, Data Scientist, Full Stack Engineers, Customer Success Specialists amongst others.

The emergence of new job roles coupled with the division of work between humans and machines has led to the requirement of a different set of skills. The skills in high demand can be categorized into four different categories - **Business Skills, Industry-Specific Skills, Soft and Cognitive Skills, and Technology Skills**. However, the ratio of skills needed varies for different job roles and industry verticals.

## Categories of Skill Sets



Digital is becoming sort of a given norm of skills that are needed for every engineer. We are not calling engineers as a digital engineer and non-digital engineer. Those days are going away because everyone needs to have fundamental knowledge of digital skills across all the industry verticals be it telecom, medical etc.

**-Dr Acharya K.N.S,**  
 Director - Global Engineering Academy at L&T Technology Services Limited

### Business Skills

- Sales and Marketing
- Project Management
- Budgeting
- Business Development

### Industry Specific Skills

- Skills specific to a particular vertical. For example, Statistics understanding for a Data Scientist.

### Soft and Cognitive Skills

- Leadership
- Communication
- Negotiation
- Problem-Solving
- Critical Thinking
- Logical Reasoning

### Technology Skills

#### Basic/General

- Ability to use technology tools such as
- Collaboration tools (Share-Point, Google Sheets etc.)
- Communication tools (Microsoft Teams, Zoom and so on)
- Specific job-related tools (for example, CRM tools such as Salesforce, HubSpot for a person in Sales/Marketing)

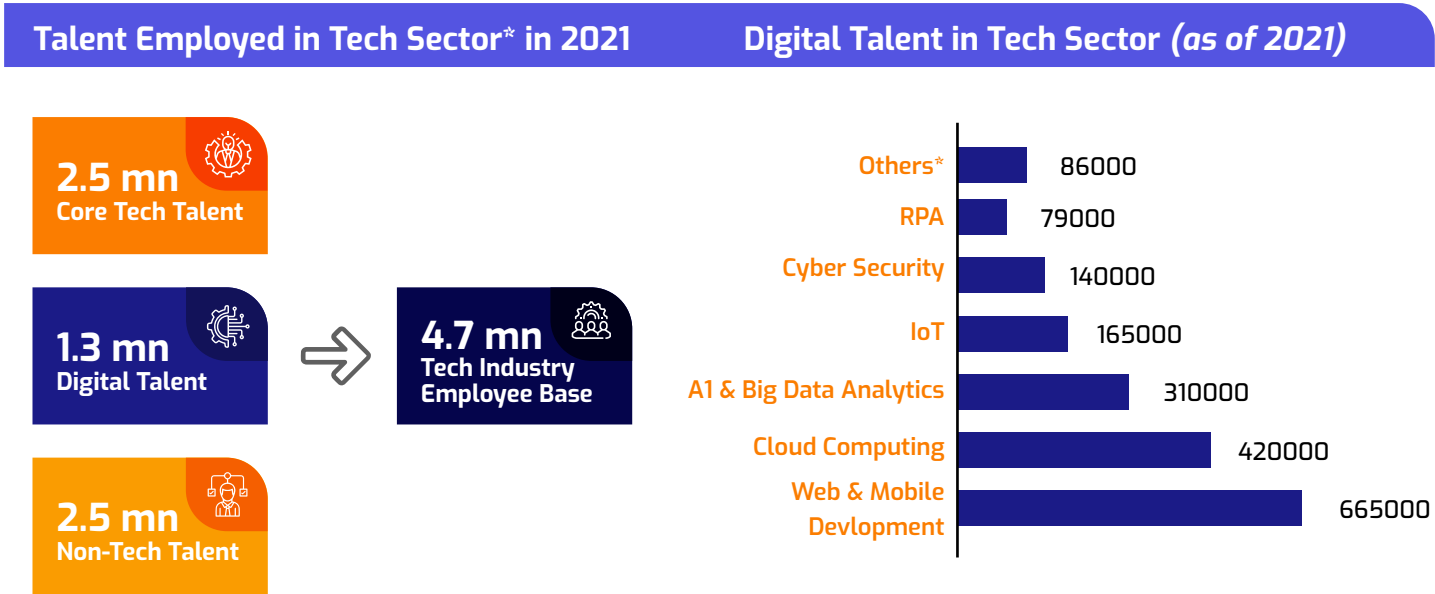
#### Specialized

- Data Science
- Natural Language Processing
- Automation
- Blockchain
- Robotics
- Cloud Computing
- Cybersecurity
- Robotics
- Embedded (VLSI)

<sup>4</sup><https://www.salesforce.com/news/stories/digital-skills-gap/>

# 3 India's Digital Talent Landscape

India is a powerhouse of talent and is leading the world in terms of digital talent. As of 2021, India's digital talent stood at 3.8 million. Eighty-seven percent of India's digital talent is concentrated in Tier-1 cities such as Bengaluru, Mumbai, Delhi, Hyderabad, Pune, and Chennai. In India, the digital tech talent is growing five times faster when compared to core tech talent.







- Tech Sector\* Companies in the IT Services, BPM, Engineering R&D, GCCs and Software Products sectors
- Core Tech Talent: tech talent employed in traditional/core tech (outside the Digital Talent Pool) which includes Network & Systems, IT Infrastructure, IT Support, Database, Test/OA, Legacy Software Development
- Digital Talent consists of the AI & Big Data Analytics, IoT, Cloud Computing, Cyber Security, RPA, Blockchain AR/VR, 3D Printing) as well as professionals employed in Web and Mobile Development technologies
- Non-Tech Talent: Tech Talent employed in functions such as Sales, Admin, HR etc.
- Others\* includes 3D Printing, Block Chain, AR/VR, Quantum Computing, SG, Robotics

Source: India's Tech Industry Talent-Demand Supply Analysis, NASSCOM-Draup, Feb 2022;

India's tech talent demand supply gap is at 21.1 percent, lowest among top tech locations such as the US, China, and the UK<sup>5</sup>. This demand supply gap is expected to rise more than 3x times by 2026.

<sup>5</sup>India's Tech Industry Talent: Demand Supply Analysis, NASSCOM draup, Feb 2022

<b>Digital Talent Gap 2021</b>			
 <b>Digital Skills</b>	 <b>Supply</b>	 <b>Demand</b>	 <b>Talent Gap</b> <i>(as percent of Supply)</i>
<b>Web and Mobile Development</b>	650-680K	875-895K	31 percent
<b>Cloud Computing</b>	410-430K	580-600K	40 percent
<b>AI and Big Data Analytics</b>	300-320K	430-450K	50 percent
<b>IoT</b>	155-175K	220-235K	52 percent
<b>Cyber security</b>	130-150K	170-180K	29 percent
<b>RPA</b>	23K	102K	29 percent
<b>Others*</b>	86K	120K	40 percent

*Other\* includes 3D Printing, Block Chain, AR/VR, Quantum Computing, 5G, Robotics*

*Source: India's Tech Industry Talent: Demand Supply Analysis, NASSCOM draup, Feb 2022*

Furthermore, as per the NASSCOM Global Engineering R&D Pulse Survey 2022, AI/ML/DL, automation, big data/engineering analytics, IoT, and 5G have emerged as the most sought-after digital skills by the Indian ER&D companies<sup>6</sup>.

<sup>6</sup><https://community.nasscom.in/communities/engineering-research-design/nasscom-deloitte-global-engineering-rd-pulse-survey-2022>

# 4 Skilling: Deep Dive

Skill gap is a major issue faced by most organizations. According to NASSCOM's Global Engineering R&D Pulse Survey 2022, 36 percent of the 99 companies surveyed stated that *availability of key skills* is one of the top challenges faced by organisations<sup>7</sup>. To address the increasing talent demand and supply mismatch, organizations are investing in skilling initiatives to upskill and reskill their employees. As per WEF, the world upskilling initiatives have the potential to unlock \$6.5 trillion in global GDP by 2030<sup>8</sup>. To deal with ever-changing work dynamics and the industry landscape, employees today need to have a perfect blend of both soft and technical skills.

## Evolving Skills Profile

There has been a shift in skill profile from I-shaped to T-shaped which has gradually evolved into (pie)-shaped skill profile. Having expertise only in one field that is, having I-shaped skill profile or having some knowledge across several areas - having (dash)-shaped skill profile will not suffice. In addition to having domain and technology expertise, employees also need to have critical thinking, logical reasoning, and problem-solving skills.

### • T-shaped Skill Profile

Employees with a T-Shaped skill profile have expertise in one area and are skilled in many other areas. The vertical bar of T represents the depth of skills whereas the horizontal bar represents the breadth of skills across various disciplines. An individual with T-shaped skill profile will have a blend of technical skills and soft skills.

### • π -shaped Skill Profile

Employees with π-shaped skill profile have evolved from T-shaped skill profile by having general knowledge of other skills across various areas but have deep domain/technological expertise in two areas. Such employees can provide greater flexibility to the organization as they have knowledge in multiple areas.

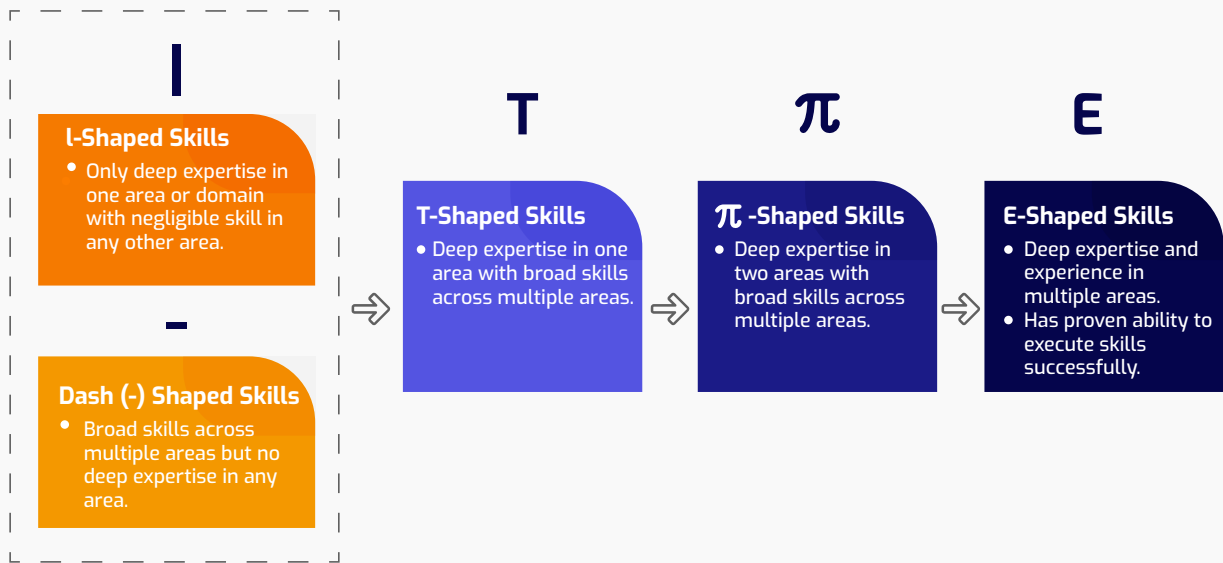
### • E-shaped Skill Profile

Further evolution of T-shaped and π -shaped skill profile has led to a paradigm shift in skill profile that is, E-shaped skill profile. Employees with E-shaped skill profile have developed expertise in multiple areas demonstrating traits of experience, expertise, execution, and exploration. Such employees can become valuable asset for an organization with their ability to improve continuously and deliver results.

Employees who have both deep expertise in several areas demonstrate strong leadership skills and have the ability to motivate others under the **X-Shaped** category. For a team to function efficiently, it should have a combination of employees of both T- and X-shaped profiles .

<sup>7</sup><https://community.nasscom.in/communities/engineering-research-design/nasscom-deloitte-global-engineering-rd-pulse-survey-2022>

<sup>8</sup><https://www.weforum.org/press/2021/01/investment-in-upskilling-could-boost-global-gdp-by-6-5-trillion-by-2030/>



# 5 Building Organizations' Skilling Strategy

Skilling has emerged as one of the most effective means to address the rising talent gap. According to a recent McKinsey survey, 53 percent of leaders believe that developing skills is the best way to close their company's capability gaps in the coming years<sup>9</sup>. In fact, reskilling was mentioned more than twice as frequently as hiring as the preferred strategy. As per Deloitte's Global Human Capital Trends Survey 2020, 53 percent of survey respondents agreed that in the next three years, nearly half to all of their workforce will need to change their skills and capabilities. Organizations recognize and agree that reskilling is the need of the hour. However, very few organizations are well prepared to address the challenge of reskilling. Only ten percent of the organizations surveyed by Deloitte agreed that they are well-prepared to reskill their workforce<sup>10</sup>.

Organizations need to understand that skilling is the most crucial factor for its long-term growth and success. Before embarking on a skilling journey, organizations need to focus on a few key considerations:

## Purpose

- What is the purpose of the Skilling Initiative?
- Does the core purpose of the initiative align with the organization's overall vision and strategy?

## Culture

- Does the organization have a continuous learning culture?
- Do the leadership encourage and support employees to continuously reskill and upskill for career growth?

## Process

- How does the organization identify current and future skill gap?
- How does the organization identify the learning needs of individual employees and entire company?
- How does it design customized career and learning paths?
- How does it plan and design skilling initiatives and programmes? *(For example, conducting a psychographic analysis on an organization's workforce segments/teams and using the resulting data to design upskilling programmes can result in increased innovation output and ROI on skilling initiatives.)*

## Enablers

- Does the organization have the required technology, funds, and resources to support reskilling and upskilling of employees?
- Does the organization leverage and take advantage of the external ecosystem for reskilling and upskilling?

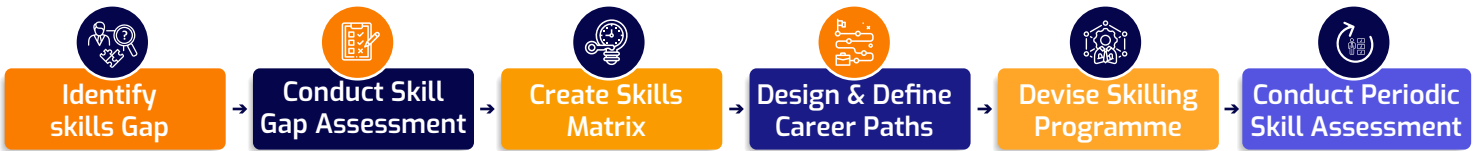
<sup>9</sup><https://www.mckinsey.com/business-functions/people-and-organizational-performance/our-insights/beyond-hiring-how-companies-are-reskilling-to-address-talent-gaps>

<sup>10</sup><https://www2.deloitte.com/content/dam/Deloitte/cn/Documents/human-capital/deloitte-cn-hc-trend-2020-en-200519.pdf>

## Tools & Metrics

- Does the organization have proper measures and KPIs in place to measure the effectiveness of the entire skilling initiative?

### Skilling Roadmap



Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
<b>Identify skills Gap</b>	<b>Conduct Skill Gap Assessment</b>	<b>Create Skills Matrix</b>	<b>Design &amp; Define Career Paths</b>	<b>Devise Skilling Programme</b>	<b>Conduct Periodic Skill Assessment</b>
<ul style="list-style-type: none"> <li>◦ Identify skills needed by the organization - both current and future</li> </ul>	<ul style="list-style-type: none"> <li>◦ Conduct a Skill Gap Assessment to find existing skills gap in the organization</li> </ul>	<ul style="list-style-type: none"> <li>◦ Create a Skill Matrix for each employee and frequently update it. The Skill Matrix will include primary, secondary, and tertiary skills of an employee.</li> <li>◦ Skill Matrix of an employee must be updated regularly based on projects done, trainings completed, certifications received and so on</li> </ul>	<ul style="list-style-type: none"> <li>◦ Design well-defined career paths for management and technical roles. Both management and technical career paths must present opportunities for growth</li> </ul>	<ul style="list-style-type: none"> <li>◦ To devise an effective Skilling Programme, along with an analysis of skills gap, employees' career goals, areas of interest, and so on must also be taken into account</li> </ul>	<ul style="list-style-type: none"> <li>◦ A periodic skill assessment is required to keep track of the organization's skill gaps and determine whether new skilling initiatives are required</li> </ul>

## Creation of “Technical Career Path”

Previously, organisations followed only one career path - Management Track, in which employees were placed in-line for management/leadership roles regardless of their interest or work experience (technical or non-technical). This model worked well for employees interested in leadership/management roles, but it required others to look for work outside of the organization. In a bid to attract and retain talent, organizations are creating a well-defined technical career path to provide a holistic visibility of career progression. Employees who want to stay in technical roles now have a well-defined path for advancement. Employees can advance their careers in technology without having to switch to pure-play management roles.

### Intel's Technical Career Path

Intel offers different technical career path comprising different roles across different technology areas.



Employees get opportunity to specialize in any domain such as software, firmware, hardware, and design, architecture as per their interest area. Additionally, employees are assisted to identify their goals and actions needed to meet that target.

### L&T Technology Services' Skill Matrix

Currently, every engineer must have at least the basic level knowledge of digital skills. As a first step, LTTS has identified and well documented the nomenclature of digital skills needed for each industry vertical and horizontal. LTTS has created a Skill Matrix where the primary, secondary, and tertiary skills of almost 20K employees are mapped along with the industry vertical and technology horizontal. This provides visibility of each employee in terms of current project and future project where the skills of a particular employee can be leveraged. The effectiveness of the Skill Matrix is a crucial aspect and it needs to be updated frequently. For example, if an employee has completed a training module, he/she needs to update the skill matrix.



## 5.1. Approaches to Drive Skilling



Organizations have adopted multiple approaches to skill their employees to make them future-ready. In context to the Indian Engineering R&D, both the GCCs and ESPs are investing significantly in skilling initiatives for their employees to tackle rising concerns of high attrition and widening talent gap. Also, organizations can benchmark its industry peers and adopt some of the best practises to design impactful skilling programmes.

Some of the approaches considered are:



Ways	Brief Description
<p><b>Tools/Platforms to Guide Employees</b></p>	<p>Having smart digital tools in place to assist employees in the actions/steps required to acquire new skills or change job roles based on their current skills.</p>
<p><b>Collaborations with the External Ecosystem</b></p>	<p><b>Collaborations with:</b></p> <ul style="list-style-type: none"> <li>• Academia/Universities</li> <li>• EdTech Companies/MOOC Platforms</li> </ul>
<p><b>Training Programs &amp; Platforms</b></p>	<p><b>Launching of:</b></p> <ul style="list-style-type: none"> <li>• Digital Learning Academy</li> <li>• Customer Specific Academy</li> <li>• Training Centres</li> <li>• Digital Training Platforms</li> </ul>
<p><b>Incentivise Skilling</b></p>	<p><b>Incentivise Upskilling and Reskilling for employees through:</b></p> <ul style="list-style-type: none"> <li>• Providing better job roles post reskilling/upskilling</li> <li>• Salary Raise</li> <li>• Opportunity to earn course credits for on-the -job training</li> <li>• Opportunity to earn professional certificate (industry-wide accepted)</li> <li>• Digital Badges</li> </ul>
<p><b>Proactive Building of Talent Pipeline</b></p>	<p>In addition to undertaking various skilling initiatives for employees, some companies are also focussing on building an industry-ready talent pipeline by proactively undertaking initiatives to skill the students. Most of these initiatives are taken in collaboration with external stakeholders such as government, industry body, NGO, and other organizations.</p>

Examples for each of the approaches mentioned earlier:

## Tools/Platforms to Guide Employees

Company	Brief Description
	<p><b>PwC</b> Designed a <i>Digital App</i> that enables users to check their current digital fitness score, identify knowledge gaps, and choose a suitable learning path. The app is free for everyone<sup>11</sup>.</p>
	<p><b>Infosys</b> Introduced a personalized app Learning and Career that allows employees to explore opportunities and upskill anytime, anywhere<sup>12</sup>.</p>

## Collaboration with the External Ecosystem

Company	Brief Description
	<p><b>Samsung R&amp;D Institute India-Bangalore (SRI-B)</b></p> <p><b>For Higher Education</b></p> <ul style="list-style-type: none"> <li>• Collaborated with International Institute of Information Technology Bangalore (IIIT, Bangalore) to sponsor the Masters degree for 180 graduates.</li> <li>• Collaborated with IISc, Bangalore and IIT, Madras to sponsor part-time PhD</li> <li>• Sponsored full-time M.Tech at IITs based on Graduate Aptitude Test in Engineering (GATE) score and selection of employees.</li> <li>• Collaborated with IISc for their upcoming part-time M-Tech program.</li> </ul> <p><b>For building domain expertise</b></p> <ul style="list-style-type: none"> <li>• Collaborated with Texas University, Austin and Great Learning program (Post Graduate diploma in AI/ML – eleven months program) to build AI/ML Centre of Excellence.</li> <li>• Working closely with IISc, Bangalore to develop short courses (duration of two-three months).</li> <li>• Coursera and Udemy: All employees have free access to courses available in Coursera and Udemy.</li> </ul>
	<p><b>University Research Alliance<sup>13</sup></b></p> <p>The objective of the University Research Alliance is to build stronger partnerships with Indian universities, focusing on fostering research, innovation and collaboration. The alliance gives partner universities an opportunity to design courses around advanced memory design and technology and data sciences. Students can access Micron's labs, avail international internships and fellowships, and choose from a wide range of learning resources while faculty and their research groups can use Micron's expertise and infrastructure to collaborate on open problems in memory design, storage technologies, and systems.</p>

<sup>11</sup><https://www.pwc.com/my/en/issues/upskilling/digital-fitness.html>

<sup>12</sup><https://www.infosys.com/about/corporate-responsibility/social/employee-development/entry-level-employees-ranking.html>

<sup>13</sup><https://in.micron.com/careers/uram>

ESPs



**Infosys**

**Manager and Leadership Enablement Programs**

- Partnered with leading universities such as Harvard, Stanford, IIM, Cornell, and Purdue to provide leadership, strategy, and program management training. Leaders and managers are continuously led through Master classes, technology manager training programs and certifications, and Manager Quotient (MaQ) programs on digital skills.





**Cyient**

**To increase the number of Embedded Professionals**

- Partnered with Skill Lync to add 500 Embedded professionals in its workforce and achieve its long-term goal of adding 4,000 embedded professionals. As a part of this partnership, Skill-Lync has invested in and launched a new curriculum on Embedded Systems Development and Validation to bridge the skill gap and reduce the training costs for the new workforce.

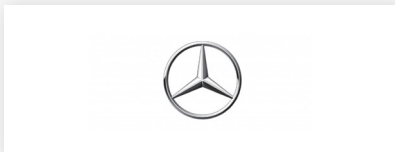
**Curate Specific Training Program, Platforms and establish Learning Academies**

Company	Brief Description
	<p><b>ABB India</b>  <b>ABB University India</b></p> <ul style="list-style-type: none"> <li>• Includes training programs for engineers, programmers, and maintenance and operations personnel. Provides up-to-date technical expertise for existing and new products, processes, and technology advances. Some of the courses offered are Industrial Automation, Robotics and Motion, and Electrification Product<sup>14</sup>.</li> </ul>
<p><b>SAMSUNG Research</b></p>	<p><b>Samsung R&amp;D Institute India-Bangalore (SRI-B)</b>  <b>Software Competency Program</b></p> <p>A global program for all the software category engineers with three certification levels - Advanced, Professional and Expert. The program's objective is to build algorithms, efficiently write codes, and leave no <i>technical debt</i>. In any given time, an engineer spends 4-6 hours per month practising for the test to move to the next level and another 4-8 hours per month for taking the test in person at Samsung premises. It's one of the most rigorous and respected certifications in the industry, which does not have an equivalent amongst Samsung competitors.</p>
	<p><b>Cisco</b>  <b>Cisco Networking Academy</b></p> <ul style="list-style-type: none"> <li>• Provides in-demand digital skills such as Networking, OS &amp; IT, Programming, IoT, Infrastructure Automation, and Cybersecurity and till date has trained over one million learners<sup>15</sup>.</li> </ul>

<sup>14</sup><https://new.abb.com/service/abb-university/india>

<sup>15</sup><https://www.dqindia.com/skilled-employees-will-become-the-torchbearers-of-organizational-success-harish-krishnan-cisco/>

Company	Brief Description
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**Mercedes-Benz Research and Development India (MBRDI)**

**Online Learning Platforms**

- To enable and facilitate anytime/anywhere learnings for employees (tailor-made courses specific to functional requirements).
- **One for IT** meets the needs of all learners with interactive learning, live online training courses, books, videos, and more.
- **One for Engineering Org** provides the best-in-class content in the automotive space for the employees.



**Philips Innovation Campus, Bengaluru**

**Boot Camp for Campus Hires**

- Opportunity for software engineers, fresh graduates from college, and interns (less than three months in the system) to understand the real-world live scenarios through gamified and simulated case studies and agile workflows.
- Understand the importance of clean coding practices and distinguish between clean and faulty code.
- Understand how faulty code can generate more technical debt.
- Appreciate the adoption of Test-Driven Development, Continuous Integration, and other software best practices to improve code quality.
- Realize the cost savings for organizations through clean coding practices.
- Internalize the passion required to practice clean code.

**Internal Programs for Employees**

- **Philips Architecture Programs:** To develop and instil architectural style thinking in junior and senior architects and become effective technology leaders.
- **Leadership xPO for leaders:** A customized program to build well-rounded leaders with latest skills.
- **Leading Edge for Managers:** Immersive learning sessions for managers to connect, share and learn from peers and subject matter experts.
- Technical leadership development programs for technical talent.
- **Technical Modules for Data-centric skills:** AI, security, cloud computing for all employees, and customized technical modules for domain experts.

**ESPs**



**L&T Technology Services (LTTS)**

**Customer Specific Academies**

- Set up Customer Specific Academies focussed on customer's future plans and based on which employee are trained.

**Skilling Program for Young Graduates**

- LTTS has identified that undergraduate and post-graduate students require different skills and curated different skilling programs. Currently, LTTS is running at least 22 different skilling programs for those graduating from different universities.



## Infosys

### Account-specific Academies

- To facilitate faster onboarding and to meet continuous talent needs and skill improvement of focus/key accounts, delivery leadership and academy SPOCs established **account-specific academies**. These academies train talent on required technologies, domains, processes, and behavioural skills. Also provided are client-specific training sessions on techniques and tools.

### Onboarding Program

- Provides a structured onboarding program for new hires to bridge the gap between industry and academia and transform freshers into professionals. The program imparts domain, technical, professional, and organizational skills. Fast track onboarding programs are specially designed to reward fast learners.

### Lex-Infosys Digital Learning Platform

- The platform enables learning anytime, anywhere, and through any device by providing personalized learning content, sandbox environments for practice, and secure certification assessments. Employees can receive on-demand education based on their performance reviews and feedback from the managers and clients on the platform. Over 100 new courses and certifications relevant to engineering skills are developed and launched on the platform every year.



## Wipro

### Talent Transformation group

- Over 100 strong faculty team supports upskilling and cross-skilling employees in various emerging technologies and management studies. In FY 2021, thousands of Engineering R&D employees attended 8,000 sessions of proactive training.

### Immersive programs

- These programs help employees get excellent skills. Employees can develop end-to-end solutions using polyglot technologies and understand the emerging technologies for making faster contributions. Hundreds of employees completed immersive upskilling programs in FY 2021 that included deep-dive learning of cutting-edge digital skills like micro services, DevOps, ML, front end development, IoT engineering, 5G and wireless, data science, and cloud-native.

### TrendNxt

- A skill-based learning framework that aims at enhancing employees' technical knowledge year on year. It follows a credit point approach wherein credits are earned by undertaking technical certifications and attending technical training.

Other Global Companies



Deloitte

Deloitte Cloud Institute

- In 2019, Deloitte launched its formal training program, Cloud Institute, to allow employees to complete courses and earn certification for career paths such as Developers, Software Engineers, AI Engineers, and so on. This training programme is a part of Deloitte's \$2 billion investment in employee upskilling<sup>16</sup>.



Manpower

Digital Learning Platform



- Launched a digital learning platform **powerYOU** which offers more than 7,500 courses with bite-sized content customized as per employee's career stage and region.

Incentivized Skilling (Enablers of Skilling)


Company	Brief Description
	<p><b>Samsung R&amp;D Institute India-Bangalore (SRI-B)</b></p> <p><b>Sponsorship for Professional/Domain Expertise Certification</b></p> <ul style="list-style-type: none"> <li>• Sponsorship for Amazon Web Services certification for select employees</li> </ul>
	<p><b>Mercedes-Benz Research and Development India (MBRDI)</b></p> <p><b>Sponsorship for Higher Education</b></p> <ul style="list-style-type: none"> <li>• Provides M.Tech and PhD program support to enable employees to pursue academics in fields of mutual interest for company and individual by fully funded and customized courses</li> </ul>
	<p><b>Micron India</b></p> <p><b>Education Assistance Program</b></p> <ul style="list-style-type: none"> <li>• Tuition assistance is provided for industry-related or degree-level courses (associate, bachelor, and master degrees) from various institutions. In some cases, targeted programs and courses are made available on-site for employees.</li> </ul>
	<p><b>IBM</b></p> <p><b>Digital Badge</b></p> <ul style="list-style-type: none"> <li>• Awards <b>Digital Badges</b> to employees to highlight their unique skills and achievements after completing a training and activity/project. The badges are machine readable and provide a deep insight into the employees' skill profile<sup>17</sup>.</li> </ul>

<sup>16</sup><https://www.businessinsider.in/strategy/news/how-deloitte-is-spending-2-billion-to-train-4000-workers-on-the-hottest-tech-jobs-of-2020/articleshow/73192452.cms>

<sup>17</sup><https://www.ibm.com/blogs/ibm-training/reskilling-for-robots-ai-and-the-future-of-jobs/>

Company	Brief Description
	<p><b>Salesforce</b></p> <p><b>Badges of Achievement</b></p> <ul style="list-style-type: none"> <li>Launched Trailhead, an innovative learning platform that helps employees acquire the skills they need as their roles change over time. <b>Badges of Achievement</b> enables employees to showcase new skills learnt. This initiative has enabled employees to transition from jobs in recruiting or sales to engineering positions<sup>18</sup>.</li> </ul>
	<p><b>Infosys</b></p> <p><b>Incentivized Skilling and Digital Skill Tags</b></p> <ul style="list-style-type: none"> <li>Implemented <b>Digital Skill tags</b> for new-age roles and skills. Employees who get Digital Skill tags are eligible for incentives and advancement in their careers. Also, Infosys has established Digital Specialist career streams to nurture and expand digital talent and provide distinct opportunities for employees with digital skills.</li> <li>Opportunities to transition across career streams and enhance domain and technical expertise through <b>Defined Bridge Programmes</b><sup>19</sup>.</li> </ul>

### Proactive Building of Talent Pipeline

Company	Brief Description
	<p><b>Cyient</b></p> <p><b>Skilling Program for Engineering Students of Telangana</b></p> <ul style="list-style-type: none"> <li>Collaboration with <b>Telangana Academy of Skill and Knowledge (TASK)</b> on skill-building and improving employability for engineering students through technical and soft skills training. The primary goal of this collaboration is to use Cyient's engineering expertise to create a pool of skilled workers in Telangana who are ready to meet industry demands.</li> </ul>

In addition to the above-mentioned approaches to drive skilling, organizations are also changing their hiring strategy to attract talent with the right skill set and motivate potential employees to acquire skills through vocational training and e-learning.

### Changes in Hiring Approach

While hiring, companies looked for and placed importance to grades, degrees earned, and the institution. It was assumed that students graduating from a premium university will by default have all the skills and qualities meeting industry requirements. However, of late, due to high demand of skilled talent in new-age technologies and ensuing talent gap, companies are compelled to rethink on hiring approach. Instead of prioritising degrees earned, companies need to focus more on skills and capabilities developed while hiring a candidate. Bootcamp education, industry-standard certifications, and self-taught abilities have all emerged as viable alternatives to a degree. Companies such as Google,

<sup>18</sup><https://www.forbes.com/sites/davidmichels/2019/09/27/going-pi-shaped-how-to-prepare-for-the-work-of-the-future/?sh=769377c647d6>

<sup>19</sup>NASSCOM ER&D Digest, Vol 3.0

IBM, Dell Technologies, Tesla, and E&Y are hiring candidates without degrees but with skills needed for the role<sup>20</sup>. A study by Harvard Business Review and The Burning Glass Institute found that only 26 percent of Accenture's job posting for position of software-quality assurance engineer had a degree requirement<sup>21</sup>.



Companies should start recruiting based on skills and ask candidates to demonstrate skills gained via their project portfolio.

**-Krishna Bandaru**  
Executive Leadership Team,  
Skill-Lync

## 5.2 Different Modes of Learning

Over the years, the mode of skill delivery and learning has evolved with learning becoming more *learner specific* rather than *teacher-specific*. The previous approach of *one-size-fits-all* is no longer valid and does not meet current skill requirements. The learning approach differs depending on the learner and the skill/course offered. For example, to learn a coding language (Java, C++), an individual can learn nearly 80 percent by self-learning and remaining 20 percent can be learnt with help of an instructor. However, for courses related to embedded and mechanical, the approach used to learn a coding will not suffice. In this instance, close to 80 percent of learning must be instructor-led classroom-based learning while remaining can be self-learning.

The pandemic-led accelerated wave of digitalization has enabled learning with courses available at our fingertips on click of a button. Learn from home has become a norm and learning is no more constrained by place, time, mode, instructor availability, content, and language. The shift to learner-specific learning has paved way for new and innovative methods of skill delivery, which combines different aspects of traditional learning methods to curate customized learning path for individuals.

Last few years has seen the rise of many EdTech Platforms for Skilling

- Udemy
- Coursera
- PluralSight
- LinkedIn Learning
- NASSCOM FutureSkills

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To make the learning more effective, special attention must be on content design and training duration. As per The Forgetting Curve, an individual will forget 75 percent of information learnt within few days if no attempt is made to retain and reinforce it. **Spaced learning** is an approach in which the course divided into small modules and spread over longer duration with breaks in between. Different methods such as story-telling, case-study analysis, videos, and so on are used to repeat the same context. Additionally, **adaptive learning** is used in which the learning path is optimized based on a learners' skills, progress, and understanding abilities. Some of the new ways of learning include:

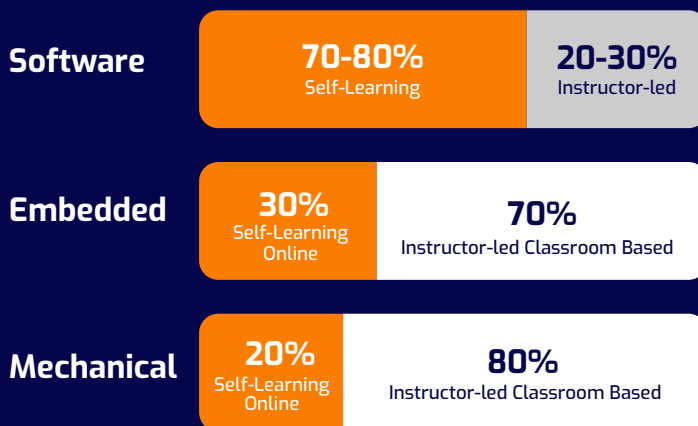
<sup>20</sup><https://www.computerscience.org/resources/companies-that-dont-require-a-college-degree/>

<sup>21</sup>[https://www.hbs.edu/managing-the-future-of-work/Documents/research/emerging\\_degree\\_reset\\_020922.pdf](https://www.hbs.edu/managing-the-future-of-work/Documents/research/emerging_degree_reset_020922.pdf)



## Experiential Learning

Experiential learning is an immersive learning process, which emphasizes on learning by doing. This is based on the principle that 70 percent of knowledge is gained from experience by doing difficult tasks/assignments. Some examples of experiential learning include on the job training, case study analysis, roleplay sessions, lunch and learn, and so on.



## Blended Learning

Blended learning is a learning methodology that combines face-to-face traditional classroom instruction with online learning tools to make learning more enjoyable, contextual, and engaging. Learners are provided with a variety of learning resources such as video lectures, podcasts, articles, and so on allowing teachers/instructors to support and lead discussions while also facilitating engagement. This aids in the transition of learning from passive to active.

## Microlearning or “just-in-time” Learning

The attention span of people has reduced considerably which inhibits trainees' capability to completely grasp and process large chunks of contents. Moreover, longer duration of trainings or courses can be a deterrent for individuals to participate in a particular training/skilling program. Also, sometimes individuals are not able to utilize the knowledge gained immediately in their job. This has given rise to the concept of *micro learning* in which bite-sized or small learning contents are designed to help individuals quickly grasp and comprehend necessary concepts. Employees are sometimes required to attend trainings, but they are unable to apply what they have learned in their jobs, rendering the training ineffective. As a result, companies are shifting their approach to training from *just-in-case* to *just-in-time* for some skills. The *just-in-time* approach provides individuals with needed content/information as and when required. For example, while learning to use a particular CRM tool, an immediate prompt is provided in case of an error. This method makes learning more effective and useful.

### LTTS' Micro-Learning Modules

There has been a shift from *project-based hiring* to *skill-based hiring*. Requirements or job descriptions in projects are such that it is difficult or near impossible to find a candidate with all the skills as per project's requirements. Therefore, any candidate who meets 50 to 60 percent of project's skill requirement is selected. As per skill assessment, the candidate is trained via micro-learning modules one or two weeks before working on the project.

### g2g (Googler-to-Googler) Peer Learning Program by Google

Google has implemented a peer-to-peer learning concept called g2g that is, Googler-to-Googler. It is a volunteer teaching network where more than 7,000 Google employees dedicate a portion of their time to help their peers learn and grow. Volunteers can contribute in various ways such as teaching specific courses, provide 1:1 mentorship, designing learning materials and many more. An interview is conducted to select the employees who want to volunteer for the program.

**Course Type:** Leveraging micro-learning strategy, bite sized course content called *Whisper Courses* are designed.

**Incentives:** Employees who volunteer to teach or contribute in the program are awarded and recognized.

## 5.3 Key Metrics to measure Success of Skilling

Organizations worldwide are investing huge amount in skilling initiatives. However, only investing huge amount in skilling programs will not benefit an organization. Organizations need to establish effective KPIs/metrics to measure the effectiveness, success, and Rol from various skilling initiatives. Gathering data and keeping track of these metrics can help organizations to design and develop high-impact tailored skilling program meeting the needs of employees and make winning business case for further investments in skilling.

Organizations can leverage and take inspiration from evaluation models such as *Kirkpatrick model*, *CIRO (Context, Input, Reaction, Output) model*, *Philips Rol model* to strategize and design KPIs for measuring the effectiveness of Skilling Initiatives.

**Only investing huge amount in skilling programs will not benefit an organization. Organizations need to establish effective KPIs/metrics to measure the effectiveness, success, and Rol from various skilling initiatives.**

Before starting any skilling program, some of the points mentioned below must be outlined clearly.



#### Objective:

What is the intent of the programme? For example, to fill open job positions by reskilling internal candidates, to increase employee productivity.



#### Target audience:

Who are the target audience for the programme?

Below are some of the KPIs

Stage	Metrics Category	Brief Description	Ways to gather data
Pre-Training	Design & Delivery	<p>Prior to designing a training module/program, and finalizing on mode of delivery, some parameters should be measured and analysed to ensure the program meets its desired outcome.</p> <ul style="list-style-type: none"> <li>Utilization rate of learning platform (if any)</li> <li>Number of participants enrolled for a specific training</li> <li>Completion rate of specific training/course</li> <li>Mode of delivery with high participants turn out</li> </ul>	<p>Data - both qualitative and quantitative can be gathered by several ways such as:</p> <ul style="list-style-type: none"> <li>Survey</li> <li>Assessment</li> <li>Quiz score</li> <li>One-on-one interview</li> <li>Feedback</li> <li>Observation</li> <li>Employee Story Boards: Employees can talk about and share their experience post skilling and how skilling helped them/their team.</li> </ul>
	Cost	<p>Measures and compares the cost of skilling against not skilling (hiring new employees)</p> <ul style="list-style-type: none"> <li>Cost of skilling program (trainer fee, paid time spent on training, and so on)</li> <li>Cost of Hiring (CTC of new employees and onboarding costs.</li> <li>Period for which an open job position lies vacant</li> </ul>	
Post Training	Productivity	<p>Measures employee productivity that is, increase in efficiency level of employees</p> <ul style="list-style-type: none"> <li>Time taken to complete a task</li> <li>On-time completion and delivery of projects</li> <li>Quality of work (number of errors)</li> </ul>	
	People	<p>Measures employee related parameters such as:</p> <ul style="list-style-type: none"> <li>Employee Satisfaction Rate</li> <li>Employee Retention Rate</li> <li>Employee Engagement/Morale</li> <li>Employee Value Proposition (increase in talent attraction)</li> </ul>	
	Business	<p>Measures the parameters related to business outcome such as:</p> <ul style="list-style-type: none"> <li>Customer Satisfaction</li> <li>Successful Project Delivery</li> <li>Sales/Revenues</li> </ul>	

However, care must be taken while using some of the KPIs as it can paint a false picture of successful outcome from skilling while there is none. For example, using KPIs, an employee's training hours or the number of courses/trainings completed may indicate that the higher the number, the more successful the skilling programme. However, training is only successful if an employee can apply the skills he has learnt in his daily tasks or demonstrates the desired behaviour change while carrying out various tasks.

## 5.4 Managing Employee Attrition Post-Skilling

Employee attrition has emerged as one of major roadblock post-skilling. Often it is seen that after skilling, employees tend to switch job which has compelled organizations to look for ways to avoid employee attrition. Employees switch job because they may not find projects where they can apply their newly acquired skills and learnings.

Some of the approaches that organizations can adopt are:

### Job Rotation

Job rotation is a method in which employees can work in different projects as per their interest for a fixed period of time. It also helps employees to get a holistic view of functioning of an entire department/team.

### Internal Talent Marketplaces

Having an Internal Talent Marketplace within an organization enables employees to find open internal positions, projects and associated skills needed. It is a win-win situation for both employees and employers because employers can quickly redeploy talent to meet business needs, reduce time to hire, and lower costs associated with external hiring while employees can advance their careers in areas of their choice<sup>24</sup>.

## HERE Technologies

### Internal Talent Marketplace

HERE Technologies - a provider of mapping and location-data services, uses an internal marketplace tool to track talent. Employees fill out a profile that details their current skill set as well as the skills they want to learn, and the tool lists out the next-steps of actions.

### LTTS' Forum

LTTS has created a forum where employees can interact directly with the CEO and sign up for open projects as per their interest areas. LTTS has also set up a Practise Organization where employees can work on futuristic technologies as part of internal project rather than working on external projects with day-to-day deliverables.

### Intel

#### Start-up Job Rotation Program

Intel has a Start-up Job Rotation Program in Poland, where employees can apply for job rotation in a start-up in which Intel has invested<sup>22</sup>.

#### Engineering Rotation Program

Programmable Solutions Group (PSG) is a 12-18 months program in which employees get an opportunity to work with four different groups in PSG for a duration of four to six months each and explore career opportunities and different roles in various areas such as application engineering and technical marketing<sup>23</sup>.

<sup>22</sup><https://community.intel.com/t5/Blogs/Intel/We-Are-Intel/INSIDE-A-TECHNICAL-CAREER/post/1334545#:~:text=A percent20technical percent20career percent20at percent20Intel,Engineer percent20and percent20Senior percent20 Principal percent20Engineer.>

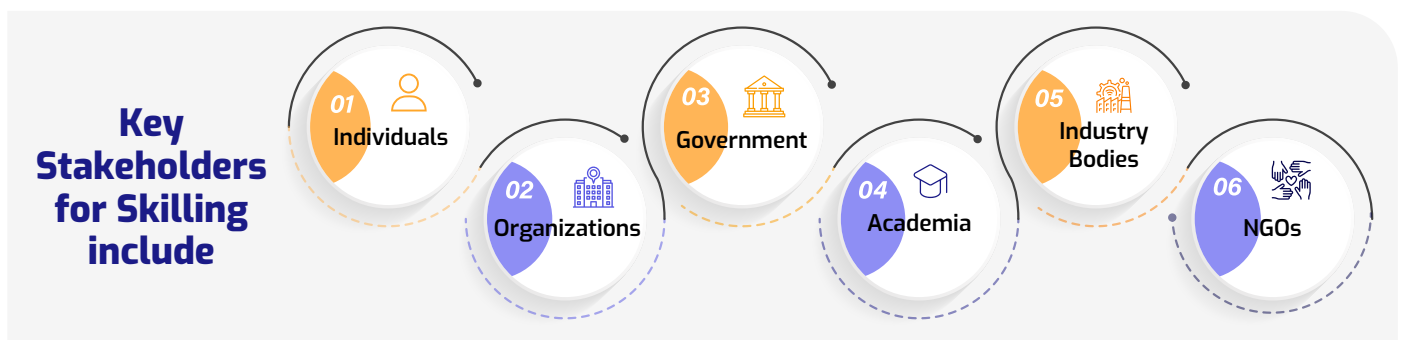
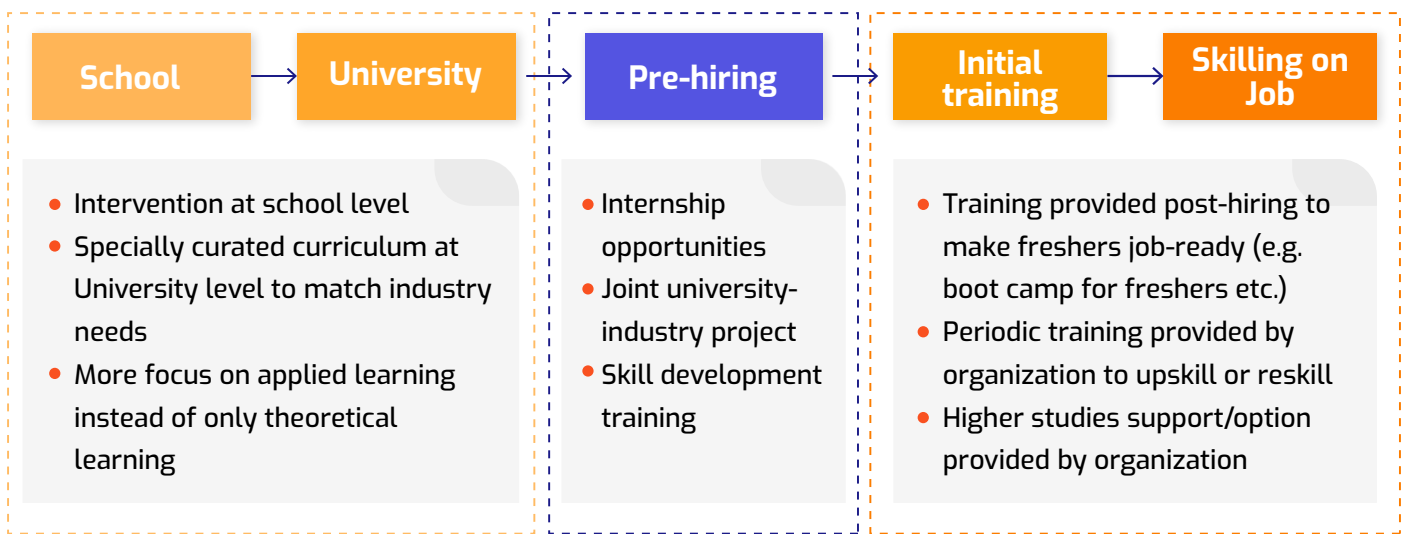
<sup>23</sup><https://jobs.intel.com/ShowJob/Id/3207124/PSG-Engineering-Rotation-Program/>

<sup>24</sup><https://www.shrm.org/resourcesandtools/hr-topics/talent-acquisition/pages/internal-marketplaces-future-of-talent-management.aspx>

# 6 Skilling @ Scale

To ensure skilling@scale, the entire ER&D ecosystem comprising government, organizations, universities, edtech companies (MOOC Platforms), and industry bodies need to initiate measures across the entire learning lifecycle of an employee/person. Focussed interventions can help develop industry-ready talent and address the rising demand supply gap.

## Stages of Learning Lifecycle



### Major interventions are needed for Skilling@Scale:

To enable skilling @scale and to utilize the great talent dividend, the education system of India needs to undergo a paradigm shift. Rather than prioritising grades and degrees, more emphasis should be on skill mastery. To meet future skill demands, several reforms in education policy, curriculum design, mode of learning delivery, and a shift in the mindset that learning can only take place in classrooms are required.

	Tapping into the untapped talent pool (Tier-2 and 3 cities, underrepresented group, women, and so on)
	Democratize Skilling/Learning
	Skilling Intervention at School Level
	A Universal Digital Certification
	Shift to Competency Based Skilling/Education
	Courses in New Technology Areas
	Structured Industry-University Collaboration

## Tapping into the untapped talent pool (Tier-2 and 3 cities, underrepresented group, women, and so on)

To enable Skilling@Scale, government along with industry and other stakeholders must devise ways to effectively tap into the huge talent pool available in Tier-2 and Tier 3 cities. Some of the organizations in collaboration with NGOs, Government, and Industry bodies have launched large-scale skilling initiatives. Many skilling initiatives are already in progress in India.


**By Companies** (in collaboration with MOOC platforms, government, NGOs, Industry Body etc.) - India

Company	Brief Description
	<p><b>PwC India</b></p> <p><b>Digital Upskilling Program</b></p> <ul style="list-style-type: none"> <li>In 2020, announced the launch of a strategic collaboration with <b>UNICEF</b> and <b>YuWaah (Generation Unlimited in India)</b> to help bridge the digital gap and help upskill 300 million young people in India over the next 10 years and enable them to emerge as changemakers in society<sup>25</sup></li> </ul>
	<p><b>Cisco</b><sup>26</sup></p> <p><b>Internship Program</b></p> <p>Collaborated with <b>AICTE and NASSCOM</b> to roll out a Virtual Cybersecurity Internship Program and has shortlisted 20K people for phase-1 of the program.</p> <hr/> <p><b>Women Entrepreneurship Program (WEP)</b></p> <p>Collaborated with <b>NITI Aayog</b> to launch WEP with the intend of empowering Women Entrepreneurs in India.</p> <hr/> <p><b>Part of The Future Right Skills Network</b></p> <p>The Network works with the DGT under <b>Ministry of Skill Development and Entrepreneurship</b> to upgrade technical and vocational training ecosystems through research and technology-led learning and training models.</p>
	<p><b>Google</b></p> <p><b>Part of The Future Right Skills Network</b></p> <p>The Network works with the DGT under <b>Ministry of Skill Development and Entrepreneurship</b> to upgrade technical and vocational training ecosystems through research and technology-led learning and training models.</p>
	<p><b>Microsoft</b></p> <p><b>Joint Skilling Program</b></p> <p>Collaborated with <b>SAP India</b> to launch a joint skilling program, TechSaksham, to skill over 62K women in areas of AI, Cloud computing, Web designing and many more. Also, nearly 1,000 women will be provided with opportunities for job, internship, and entrepreneurship<sup>27</sup>.</p>

<sup>25</sup><https://www.generationunlimited.org/stories/pwc-unicef-yuwaah-upskill-300-million-youth-india>



<sup>26</sup><https://www.dqindia.com/skilled-employees-will-become-the-torchbearers-of-organizational-success-harish-krishnan-cisco/>

<sup>27</sup><https://analyticsindiamag.com/top-5-upskilling-programmes-initiated-by-leading-tech-giants/>

Company	Brief Description
	<p><b>Women Workforce Skilling</b></p> <p>Collaborated with the <b>National Skill Development Corporation (NSDC)</b> to skill more than 100,000 under-served women in India. The main intent of the collaboration is to enhance women's workforce participation by equipping them with skills required to thrive in a digital economy.</p>
 <p><b>WhatsApp</b></p>	<p><b>WhatsApp</b></p> <p><b>Digital Skill Champions Programme:</b></p> <p>Collaborated with NSDC to launch Digital Skill Champions Programme with an intent to provide training on digital skills to Indian youth and make them ready for industry. The initiative will train high school and university students in digital and online skills, culminating in the awarding of Digital Skill Champions certification by WhatsApp and the NSDC. Also, as part of the initiative youth from Tier-3 and 4 cities will be trained on critical aspects of digital safety and online privacy<sup>28</sup>.</p>

India can benchmark some of the large-scale skilling initiatives at global level taken by below mentioned organizations

**Companies** (in collaboration with MOOC platforms, government, NGOs, and Industry Body)

Company	Brief Description
	<p><b>IBM</b></p> <p><b>Skill 30 million people globally by 2030</b></p> <p>In 2021, IBM announced its commitment to skill 30 million people globally by 2030. As part of the commitment, IBM entered into 170 new partnerships with government, universities, NGOs, industry bodies in countries across Asia, America, Europe, Africa amongst others. With an aim to democratise learning, the program ranges from technical education for teens to paid, on-site IBM internships and apprenticeships. The program also aims to reskill or upskill groups such as underserved youth, women, and military veterans<sup>29</sup>.</p>
	<p><b>Google</b></p> <p><b>Google Career Certificate</b></p> <ul style="list-style-type: none"> <li>In 2021, announced a certification program, Google Career Certificates, in collaboration with <b>Coursera</b>, to skill fresh graduates in areas of project management, automation, UX design, and data analytics. Google aims to skill one million fresh graduates in the next two years, provide scholarships to one lakh fresh graduates, and connect them with job opportunities<sup>30</sup>.</li> </ul>

<sup>29</sup><https://newsroom.ibm.com/2021-10-13-IBM-Commits-to-Skill-30-Million-People-Globally-by-2030>

<sup>30</sup><https://www.businesstoday.in/latest/corporate/story/google-announces-career-certificates-in-partnership-with-coursera-to-boost-digital-skills-312605-2021-11-18>

Company	Brief Description
	<p><b>Tech Skills Program (Israel)</b></p> <ul style="list-style-type: none"> <li>In 2022, launched a Tech Skills Program in Israel to train the underrepresented groups in digital skills. Google will invest \$25 million for over next five years to increase the number of employees in Israel's tech sector from current 10 percent to 15 percent<sup>31</sup>.</li> </ul>
	<p><b>Microsoft</b></p> <p><b>Global Skills Initiative</b></p> <p>Launched Global Skills Initiative in collaboration with <b>LinkedIn</b> and <b>GitHub</b> with the intent to skill 25 million people on digital technologies. Also, the initiative will provide affordable certification with job searching tools to look for jobs based on digital skills acquired<sup>32</sup>.</p>

## NGO

### Reskilling Revolution by WEF

In 2020, the WEF launched Reskilling Revolution, an initiative aimed to provide better education, skills, and work to billion people across the world by 2030. The initiative will act as a platform for connecting and coordinating individual initiatives within specific countries, industries, organizations, and schools<sup>33</sup>.

## Industry Body & Government

### NASSCOM FutureSkills

NASSCOM's FutureSkills is a joint initiative by NASSCOM, MeITY, and the IT industry, aimed to reskill professionals, potential employees, and students in the industry. The initiative focuses on providing trainings of over 155 skills for >7+ job roles in 10 emerging tech and 10 non-tech domain areas (including AI, Big Data, Cloud, Cyber Security, Blockchain, and so on), through its online learning B2B/B2C platform FutureSkills Prime. The program aims to reskill 4 million professionals by 2023. Various SMEs from industry and academia are collaborating with FutureSkills to provide curated learning content on the platform. The platform also enables individuals to get certified on the skills of their choice and be future-ready<sup>34</sup>.

#### Key features of the programme are:

- Provides end-to-end skilling from assessment to certification
- Affordable and credible content curated by industry leaders
- Industry recognized certifications
- Bite-sized learning modules

<sup>31</sup><https://en.globes.co.il/en/article-google-cfo-unveils-25m-israeli-inclusivity-tech-skills-program-1001402918>

<sup>32</sup><https://blogs.microsoft.com/blog/2020/06/30/microsoft-launches-initiative-to-help-25-million-people-worldwide-acquire-the-digital-skills-needed-in-a-covid-19-economy/>

<sup>33</sup><https://www.weforum.org/press/2020/01/the-reskilling-revolution-better-skills-better-jobs-better-education-for-a-billion-people-by-2030/>

<sup>34</sup><https://futureskillsprime.in/>



## Democratize Skilling/Learning

Learning content must be available to all, regardless of previous certifications, trainings, employment status, degrees, and so on. In order to remove language barriers from learning, the content must be available in regional languages and be device agnostic. To democratize skilling/learning, India can benchmark and take inspiration from Singapore's SkillsFuture movement.

## Singapore's SkillsFuture

SkillsFuture is a national movement by Singapore with the intent to help each individual gain mastery of skills relevant to the future irrespective of their age, academic qualification, and job. Emphasis is on acquiring relevant skills rather than just having degrees<sup>35</sup>. The key objectives of the movement are:

- Assist individuals make well-informed choices related to education and career
- Design a high-quality education ecosystem that meets the constantly evolving needs
- Foster a culture of life-long and continuous learning
- Promote career development based on skills mastery

Targeted to all Singaporeans, SkillsFuture encourages life-long learning and skills development.

## Skilling Intervention at School Level

To ensure that the younger generation develops the necessary skills needed for future, interventions must be made right from school. This will improve the talent readiness of the country. Additionally, schools should also impart essential life and social skills. Some interventions are also taken in India to develop essential skills in school students.

### AI for Youth Program by Intel

Through its *AI for Youth Program*, Intel has collaborated with Central Board of Secondary Education (CBSE). The programme has aided in the development of an AI curriculum for students, the creation of AI skill labs for students, and the training of AI facilitators for CBSE schools.

Examples of skilling intervention at school level at global level include

### Barefoot Computing by British Telecom

Through its Barefoot Computing programme, British Telecom aims to develop curiosity about technology among children aged five to eleven and ensure sustained learning. The programme was launched in 2014 in the UK and has benefited two million children.

### Ignite My Future in School by TCS and Discovery Education

A joint initiative by TCS and Discovery Education, Ignite My Future in School intends to transform the way students learn through computational skills. Students are taught to solve problems using the same components as a computer, enabling them to combine creativity with computational thinking. The initiative is rolled out in the US<sup>36</sup>.

<sup>35</sup><https://www.skillsfuture.gov.sg/AboutSkillsFuture>

<sup>36</sup><https://www.ignitemyfutureinschool.org/>

## A Universal Digital Certification

Today, we as a nation lack a single certification for a particular course/skill which is unanimously accepted across the industry. A single skill level certification must be accepted across the industry irrespective of entity which provided the training. A standard body is needed which can create and own up industry-level certifications for different skills. Additionally, a single universal digital record must be created which will contain details of all the certifications, degrees, and so on, and should automatically update any further certification gained by an individual. India can take inspiration from credentialing system introduced in Singapore and Europe.

### Digital Credentials Consortium

The Digital Credentials Consortium has been founded by leading universities of the US, Canada, Mexico, Germany, and Italy with the intent to create a trusted, distributed, and shared infrastructure that becomes the standard for issuing, storing, displaying, and verifying digital academic credentials<sup>37</sup>. It also provides learners more control over their credentials, allowing for a verifiable record of lifelong learning.

### Singapore Workforce Skills Qualification (WSQ)

WSQ is a national credentialing system that trains, develops, assesses, and certifies the workforce skills and competencies. The bite-sized training modules are intended to develop job-specific and generic skills required to enter a new industry, job, or advance in one's career. WSQ does not require any academic pre-requisites and it recognizes an individual's prior work experience and credentials earned<sup>38</sup>.

## Shift to Competency Based Skilling/Education

The current skilling/education system is heavily skewed toward old traditional syllabuses and is incapable of meeting current industry demands. The *one-size-fits-all* approach in education system is not keeping pace with the industry's technological advancements. More weightage is given on content transmission and memorization instead of learning skills and developing capabilities. A competency-based skilling/education approach must be adopted where learning is measured by a candidate's demonstration or mastery of skills rather than time spent in the classroom. Also, candidates can customize and choose their own learning path based on their interest, learning speed, and previously acquired skills.

Traditional Education	Competency Based Skilling/Education
More focus on time spent in classroom	More focus on learning
One-size-fits-all approach	Self-paced, Personalized Learning
Fixed time period to complete a course and earn certification. For example, four years to graduate	Flexible time period based on one's learning speed. For example, one candidate can graduate in two-and-a-half years while another candidate might take three years to graduate

<sup>37</sup><https://digitalcredentials.mit.edu/wp-content/uploads/2020/02/white-paper-building-digital-credential-infrastructure-future.pdf>

<sup>38</sup><https://www.ssg.gov.sg/wsqa.html>

To design a competency-based education system, Indian universities can benchmark and take inspiration from Western Governors University (WGU).

### Competency Based Education at Western Governors University (WGU)

Western Governors University is a shining example of how the education system and learning methods must evolve with the rapidly changing industry dynamics.

WGU is an online university with the intent to make education accessible to all. It offers competency-based education where students can customize their learning journey based on their previously acquired skills and competency level. Upon demonstrating their mastery on a specific material, students can advance swiftly through their courses rather than waiting for semester to end. This in turn leads to students completing their graduation program in two-and-a-half years instead of standard four years<sup>39</sup>.

#### Key Salient Features:

- 24/7 availability and access to online learning resources
- Freedom to customize learning schedule
- Ability to fast-track course
- Personalized one-one mentor support
- Focus on concept understanding through coursework and assessments rather than time spent in class
- Flat rate tuition pricing structure to make education affordable

In addition to adopting Competency Based Skilling/Education, a system or mechanism must be in place at national level to identify current and forecast skills most in demand. It should also be able to keep track of the supply demand gap of each skill. The data gathered can be used to implement necessary policy changes and reform the entire skilling ecosystem of the country.

### Germany's Skill Anticipation Process<sup>40</sup>

The Skill Anticipation Process of Germany consists of a range of activities including sectoral studies, employer skills survey, econometric prognoses of employment by vertical, qualification, analysing skill gaps, and so on. The activities are further complemented by data collected from National Monitoring Schemes which tracks the number of graduates from educational institutions. Key members of the group include research institutions, educational institutions, the German Trade Union Confederation, the German Employers' Organization for Vocational Training, and the Federal Institute for Vocational Education and Training (BIBB). The data collected from the process is used by different stakeholders for various purposes such as:

<sup>39</sup><https://www.wgu.edu/>

<sup>40</sup>[https://www.cedefop.europa.eu/en/data-insights/skills-anticipation-germany#\\_aims](https://www.cedefop.europa.eu/en/data-insights/skills-anticipation-germany#_aims)

- Assist employers and jobseekers to tackle recruitment problems
- Provide educational and career guidance services
- Frame Educational Policies
- Providing training and retraining for certain focussed skills

## Courses in New Technology Areas

With the rapid evolution of technology, courses in AI, Data Science, Quantum computing, and cyber security must be offered to skill the youth. Most of the premium institutes in India have started offering courses on new-age technologies. Some of the examples include<sup>41</sup>:

IIT Hyderabad	Offers B. Tech course in Artificial Intelligence IIT Jodhpur
IIT Jodhpur	Started a new undergraduate program in AI and Data Science
IIT Ropar	Offers B. Tech programme on computational data sciences with emphasis on AI
IIT Guwahati	Offers an online course on <i>Fundamentals of Artificial Intelligence</i> .
IIT Delhi	Set up <i>School of Artificial Intelligence</i> and offers PhD degree

## Structured Industry-University Collaboration

Both the university and industry must take a structured approach towards collaboration which will be beneficial to all the stakeholders that is, universities, organizations, and students.

### Curriculum and Content Design:

Universities and organizations need to join together and co-develop curriculum that is abreast with the changing times while preparing students for the unprecedented future. To make industry-ready talent, curriculum should be designed in consultation with industry experts. Special attention must to be given to the content used for learning. Content should be designed in such a way that it can be consumed but in online and offline format. The content must be a unique blend of basic engineering knowledge with large application-oriented learning, assignments, and projects.

#### Most important components of learning:

- **Curriculum** designed by Industry Experts
- **Content**- mix of basic engineering knowledge and lots of projects and assignments
- **Learning Mode** - Blend of self and instructor-based learning





It is very important to take the curriculum roadmap from industry professionals who have 15+ years of industry experience and who know what an entry level professional should be equipped with before joining the industry.

**-Krishna Bandaru**  
Executive Leadership Team, Skill-Lync



<sup>41</sup>Advantage India: Gateway to Global Engineering R&D and Innovation, NASSCOM -FutureFactor360, Oct 2021

Many organizations have collaborated with universities in India to design specially curated curriculum that meets the talent requirements of industry. Some of the examples include:

	<p>Manipal Academy of Higher Education (MAHE)</p>	<p>Developed curriculum for <b>Design and Definition of AI and Data Science</b> course and conducts joint mentoring programmes for PhD candidates.</p>
	<p>IIT Guwahati</p>	<p>Set up a <b>Digital Academy</b> at IIT, Guwahati to train more engineers on cutting-edge technologies like AI, ML, and IoT.</p>
	<p>IIT Kharagpur</p>	<p>Signed a MoU with IIT, Kharagpur to set up a digital academy on the institute's campus to train students for job readiness.</p>
	<p>IIT Roorkee</p>	<p>Developed high-performance computing programming and deep learning skills to bridge the gap between academia and industry.</p>

● **Joint Research Activities:**

One of the ways in which both university and industry can benefit is by embarking on joint research initiatives. Joint research initiatives can mutually benefit from expertise both industry experts, university faculties, and scholars. Students working on such projects get an opportunity to work on live industry projects and be industry ready.

# 7 Conclusion

The government of India has launched a slew of initiatives, schemes, and policies to address the huge skill gap and to utilize the dividend of India's large workforce. Taking into account the urgent need to prepare industry ready talent, Government of India has launched National Education Policy (NEP) 2020 to introduce key reforms in elementary and higher education. The policy puts emphasis on digital literacy, logical reasoning, vocational training amongst others to equip the next-generation of talent to thrive in digital era. To do away with segregation of streams into pure-play science and arts, the policy recommends the adoption of a multidisciplinary approach to ensure overall skilling. Skill India Mission was launched to provide industry-related skilling to youth of India to make them job ready. Similarly, NASSCOM in collaboration with Ministry of Electronics & Information Technology (MeitY) and the IT Industry has launched FutureSkills, an online skilling platform. The intent of the platform is to enable youth and professionals to acquire digital skills to increase their employability and stay relevant. Recently, the Union Budget 2022-23 announced the establishment of a **Digital University** with the intent to provide better access to high-quality higher education in multiple languages through digital channel/medium at door-step.

Despite multiple initiatives and schemes, India needs interventions at various levels to take advantage of its large available working age population. Some of the challenges that India faces in ensuring Skilling at Scale include a lack of quality trainers, inadequate educational infrastructure, and a lack of standardisation in assessment and curriculum (at the high school level), among others. To fast track the skilling process, the Government of India needs to break down silos and bring together different ministries responsible for various skilling initiatives, and also the other stakeholders (academia, organizations, EdTech companies, NGOs, and Industry Bodies).

To conclude, India needs to act fast as it has only twenty years window to take advantage of its huge workforce dividend and prevent it from turning into a liability. Interventions at the grassroot level are needed with joint ownership and equal participation from all the stakeholders.



## About NASSCOM

NASSCOM is the industry association for the IT-BPM sector in India. A not-for-profit organization funded by the industry, its objective is to build a growth led and sustainable technology and business services sector in the country with over 2,800 members. NASSCOM Research is the in-house research and analytics arm of NASSCOM generating insights and driving thought leadership for today's business leaders and entrepreneurs to strengthen India's position as a hub for digital technologies and innovation.

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