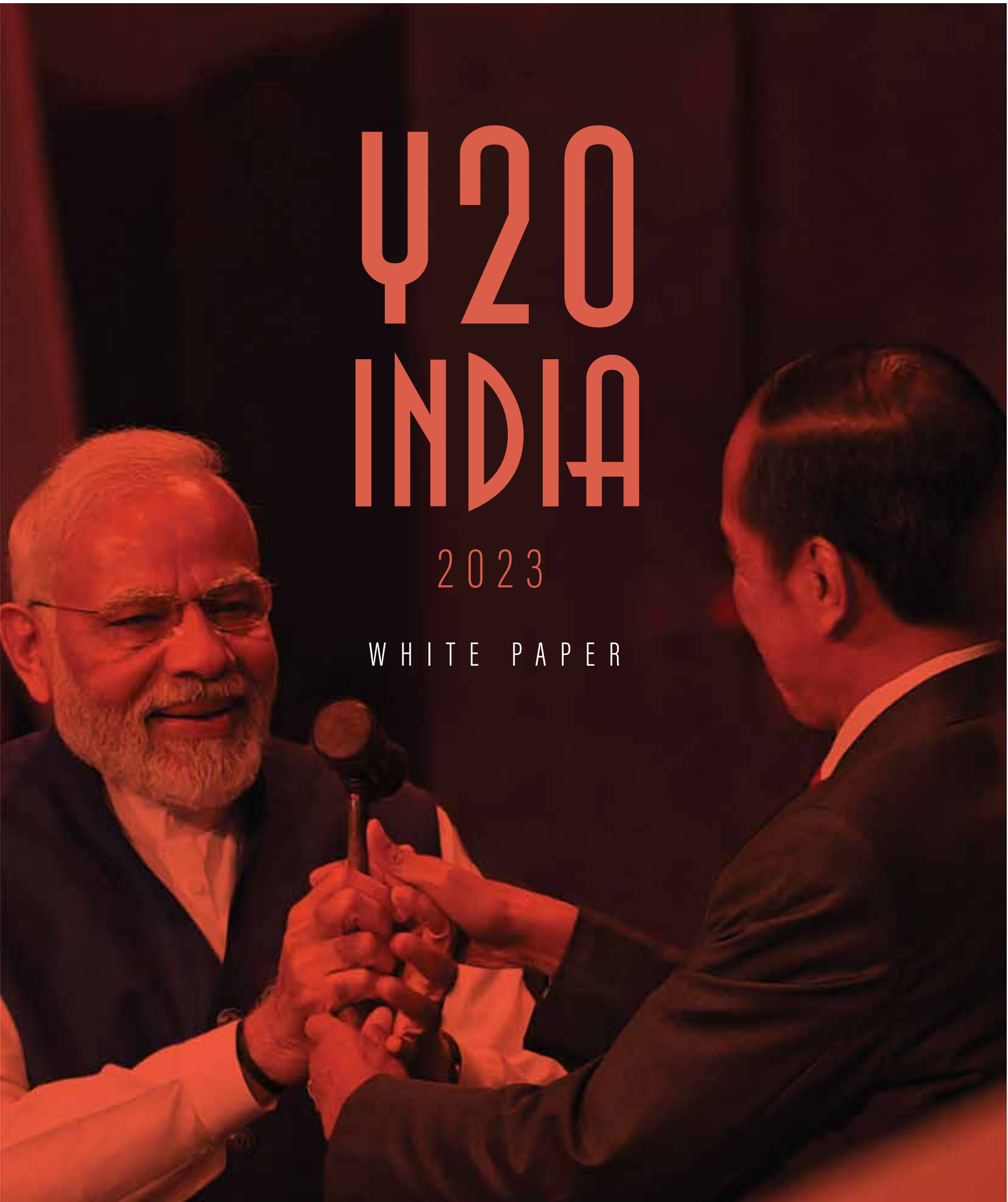


# Y20 INDIA

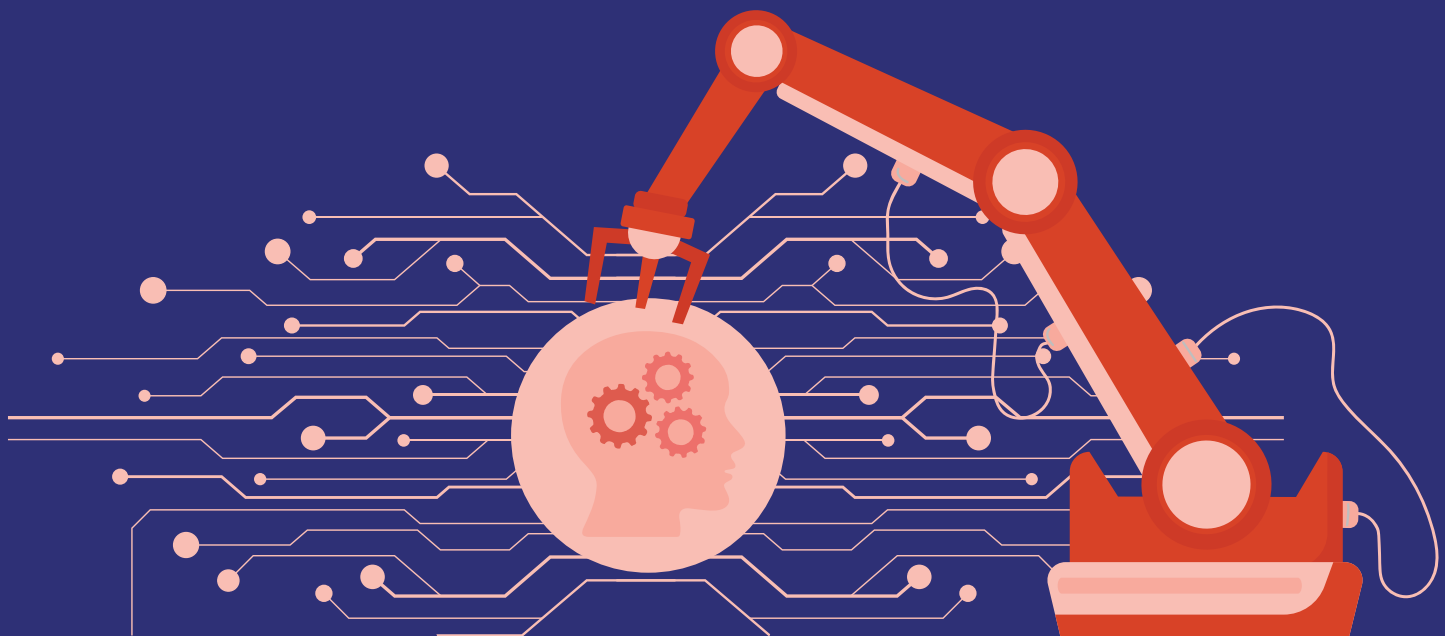
2023

WHITE PAPER

Y20 INDIA 2023

# FUTURE OF WORK

## INDUSTRY 4.0, INNOVATION & 21ST CENTURY SKILLS



## CONTENTS


| | |
|---|---|
| Acknowledgement | 01 |
| Contributors | 02 |
| Executive Summary | 03 |
| Glossary | 04 |
| The Global Landscape | 06 |
| Introduction | |
| I. Preparing the Workforce through the Principle of Unlearn, Relearn & Reskill | 07 |
| A. Efforts made Globally for Imparting 21st Century Skills | |
| B. Tools for Reducing the Inequality Between and Within the Countries in an Industry 4.0 World | |
| II. Cross-Border Innovation and Growth through Collaboration | 09 |
| A. Encouraging the MSME Sector | |
| B. Benefits of Cross-Border Innovation for the Youth | |
| C. Ways of Creating Awareness and Educating Youth about AI | |
| III. Gig Economy: The New Age Industry | 11 |
| A. Drawbacks of the Gig Economy and the Ways to Tackle them | |
| B. Changing Education Systems with Changing Industry Needs | |
| IV. Catalysing the Startup Ecosystem | 12 |
| A. Ways of Collaboration to Encourage Global Start-Up Ecosystem | |
| B. New Age Technologies Resonating with the Youth | |
| C. Encouraging Entrepreneurship amongst Youth | |
| V. Traditional Economy as a Part of Industry 4.0. | 14 |
| A. Improving Products through Technology-Driven Processes and Systems | |
| B. Ways of Easy Access towards Strategic Resources | |
| C. Providing Means of Engagement through Technology | |
| D. Right Business Environment for the Transformation of Traditional Economies | |
| The India Way | 16 |
| Case Study 1: Skill India Initiative | |
| Case Study 2: Digital India Initiative | |
| Case Study 3: Pradhan Mantri Mudra Yojana (PMMY) | |
| Case Study 4: National Curriculum Framework for School Education (NCFSE) 2005 | |
| Way Forward | 18 |
| Building 21st Century Skills | |
| Encouraging Entrepreneurship | |
| Access to Digital Infrastructure | |

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The views contained in this paper are the sole responsibility of the authors. Any omissions, inaccuracies, or errors are our own. No endorsement is implied for any commercial entity or product mentioned in this publication.

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## Executive Summary

Young people across the globe are regarded as having a more innovative mindset in addition to their desire to adopt advanced technologies to make work more convenient and efficient. According to the 2020 Global Youth Development Index which looks at developments in youth education, employment, health, equality and inclusion, peace and security, and political and civic participation, the conditions of young people have improved around the world by 3.1 per cent between 2010 and 2018, but the progress remains slow. Measuring youth development in 181 countries, 156 of them recorded at least slight improvements in their scores. The global education score increased by 3 per cent, with the Indian subcontinent making the largest improvement of 16 per cent. Levels of underemployed youth and those not in school, training or work however remained constant. In order to increase the rate of overall development of the youth, a significant financial investment, along with a suitable platform for exhibiting their ideas is a requisite. Taking these aspects into consideration, Y20 India has included the theme "Future of Work: Industry 4.0, Innovation and 21st Century Skills" along with relevant sub-themes with an aim to increase the scope of discussion on important aspects.

There is an array of sub-themes that fall under the broader theme, in order to encapsulate all aspects of technology considerations as well as the traditional industrial strategy. Additionally, concepts like the gig economy and growth through collaboration are also included. The Paper also endeavours to address the ambit of necessary technology like social media sites, the ways in which the internet can be used for better development and honing the skills of the youth to bring out the best in them. Furthermore, this Paper seeks to change the traditional approach to the workforce by introducing the concept of " unlearn, relearn and reskill." The idea is to bring more clarity on what ideas are working, what needs improvement, and what should be continued in the future. This document provides a comprehensive and meaningful discussion of various ideas as a means for overall growth. Great care has been taken to ensure that all information is supported by statistical data, giving readers a clear and convincing picture of the potential for growth through technology and collaboration. The Y20 engagement provides a space for young people to express their opinions on global challenges through informed discussion and collaboration. This will drive the incorporation of youthful perspectives into the global agenda, with the aim of being promoted and acted upon by the G20 members.

# Glossary

1. **AR:** Augmented Reality is an interactive experience that mixes the actual world with computer-generated material. Visual, auditory, haptic, tactile, and olfactory modalities are all possible for the material. It is described as a system that combines real and virtual worlds, allows for real-time interaction, and accurately registers virtual and real things in 3D.[1]
2. **VR:** Virtual Reality is a simulated experience wherein multi-projected environments and virtual reality[2] headsets are used along with using pose tracking and 3D eye displays in order to give a better real-life experience. Specific applications of VR are in education, entertainment, and virtual business meetings.
3. **Industry 4.0:** is a big change in how businesses make products. Manufacturers are using new technologies like the Internet of Things (IoT), cloud computing, and deep learning to improve their products and to distribute them more easily.[3]
4. **AI:** Artificial Intelligence is a technology which works on computer-based technology and on robotics because some operations require that amount of accuracy that humans cannot provide. This technology is used in reactive machines, limited memory, theory of mind concepts, etc. so as to get more precision.
5. **DI:** Data Intelligence encompasses AI, ML, and DL. These domains assist industries in understanding trends, developing new business insights, and automating procedures. Predictions such as what time of day, in which city, people order which items and food, have which type of medications, and maintaining relevant inventories are all part of the data intelligence necessary for the implementation of Industry 4.0.
6. **DL:** A deep learning network is a type of machine learning that uses complex patterns to learn from data. This can be done by building computational models made up of several processing layers.
7. **ML:** Machine learning algorithms construct a model using sample data, known as training data, to make predictions or judgements without being specifically programmed to do so. These predictions are used during the production aspects of the industry.
8. **RPA:** RPA is a technology that helps to automate processes in digital systems. It can be used to improve the efficiency of work in industries such as Manufacturing and the Service Industry.
9. **COVID 19:** COVID stands for coronavirus disease. This disease is a virus-borne infection caused by SARS-CoV-2, which was a pandemic. The economic and social impacts were devastating: tens of millions of people were exposed to health risks, at the junctures of severe poverty, a lot of people lost their jobs, and the economic conditions of every country came to a standstill.
10. **Data analysis:** Technology can be used to collect and analyse data on product performance and customer feedback, which can help identify opportunities for improvement. For example, using data analytics tools can help companies identify patterns and trends in customer behaviour, which can inform product development and marketing efforts.
11. **GDP:** GDP is an abbreviation for gross domestic product. GDP estimates the monetary worth of final products and services produced in a nation over a specific time period that are purchased by the ultimate user. GDP is made up of commodities and services generated for market sale as well as certain non-market output, such as government-provided defence or education services.[4]

[1]Adam Hayes, *Augmented Reality (AR) Defined, with Examples and Uses,* INVESTOPEDIA, (Oct. 29, 2022, 11:10 AM), https://www.investopedia.com/terms/a/augmented-reality.asp.

[2]T. Jung ET AL, *Effects of Virtual Reality and Augmented Reality on Visitor Experiences in Museum,* SEMANTIC SCHOLAR, (2016), https://api.semanticscholar.org/CorpusID:59618068.

[3]Nasser Alshammari ET AL., *Technology-driven 5G enabled e-healthcare system during COVID-19 pandemic,* IET, (Jun. 5, 2021, 11:12 AM) https://doi.org/10.1049/cmu2.12240.

[4]Tim Callen, *Gross Domestic Product: An Economy's All*, IMF (Jan. 25, 2023, 1:29 PM), https://www.imf.org/en/Publications/fandd/issues/Series/Back-to-Basics/gross-domestic-product-GDP.

12. **Blockchain technology:** Blockchain[1] is a distributed, unchangeable ledger that makes it easier to record transactions and track assets in a corporate network. Blockchain is great for delivering such information because it delivers instantaneous, shareable, and entirely transparent data recorded on an immutable ledger that can only be viewed by network users with permission. A blockchain network can monitor orders, payments, accounts, and production, among other things.[5]
13. **Digital Twin:** A digital twin is a virtual version of an object or system that spans its lifespan, is updated from real-time data, and aids decision-making through simulation, machine learning, and reasoning. These virtual models have become a mainstay in modern engineering to drive innovation and enhance performance as machine learning and other elements such as big data have advanced.
14. **SPRINT Challenges:** SPRINT stands for Supporting Pole-Vaulting in R&D through Innovations for Defence Excellence (iDEX), Naval Innovation and Indigenisation Organisation (NIIO) and Technology Development Acceleration Cell (TDAC). During the NIIO lecture 'Swavlamban' in New Delhi on July 18, 2022, Prime Minister revealed this scheme which seeks to increase the use of indigenous technology in the Indian Navy.
15. **Machine Condition Monitoring:** Machine condition monitoring is the process of examining the state of machinery while it is in use. It comprises data collection, processing, and comparison with trends, baseline, and representative data from other devices. Machine condition monitoring is conducted in the industry by machine physicians known as predictive maintenance engineers (PdMs). Their job is to employ diagnostic technologies to minimise unexpected production downtime and catastrophic breakdowns while keeping production halt and maintenance expenditures to a minimum.[6]
16. **Chatbots:** Chatbots can help users get the information they need by responding to their ubiquitous queries, from smart speakers at home to the need for business chat apps. The most recent artificial queries and requests via text, speech, or both, without human participation are known as chatbots.[7]
17. **Digital India:** Digital India is a broad initiative aimed at preparing India for a knowledge-based change. It binds a great number of ideas and concepts into a single complete vision, allowing each of them to be seen as part of a bigger purpose.[8]
18. **CAGR:** The compound annual growth rate (CAGR) is the rate of return necessary for an investment to increase from its starting balance to its ending balance, providing profits are reinvested at the conclusion of each period of the investment's life span.[9] It is one of the most reliable methods for calculating and determining returns for anything that might grow or decline in value over time.
19. **PLI Schemes:** Production Link Incentive schemes have been incorporated in various sectors in order to increase domestic production. The various ways in which it can be used are in ACC batteries, white goods, pharmaceuticals, large-scale electronic manufacturing, textiles and apparel, etc. They also aim to create jobs and improve the trade balance by reducing imports, attracting foreign investments and making India a global manufacturing hub.
20. **UX Designing:** UX stands for User experience for which the area of use is wide, diverse, and exciting. It shapes the goods and services we use on a daily basis and it may make or break a company's or brand's success. Its goal is to provide the user with simple, efficient, relevant, and all-around enjoyable experiences. They employ market research, product development, strategy, and design to accomplish this.[10]

[5]*What is Blockchain,* IBM (Jan. 25, 2023, 1:29 PM), https://www.ibm.com/in-en/topics/what-is-blockchain/.

[6]G. M. Smith, *What is condition monitoring and why is it preventing machinery failures important,* DEWESOFT (Jan. 21, 2023, 1 :29 PM), https://dewesoft.com/daq/what-is-condition-monitoring#what-is-condition-monitoring.

[7]*What is a chatbot?, IBM,* (Jan. 25, 2023, 10:45 AM), https://www.ibm.com/topics/chatbots.

[8]T. Basuroy, *India: DIGITAL Population by Type 2022,* STATISTA (Jan. 23, 2023, 2:09 PM), https://www.statista.com/statistics/309866/india-digital-population-by-type/.

[9]A. Saxena, *Teach 'em young: Fintech Startup Fyp wants to make kids in India financially literate,* YOURSTORY (Jan. 23, 2023, 2:05 PM), https://yourstory.com/2022/03/neobanking-startup-fyp-for-teenagers-children.

[10]Emily Stevens, *What Is User Experience(UX) Design? Everything You Need To Know,* CAREERFOUNDRY (Jan. 23, 2023, 12:38 PM), https://careerfoundry.com/en/blog/ux-design/what-is-user-experience-ux-design-everything-you-need-to-know-to-get-started/.

# THE GLOBAL LANDSCAPE

## Introduction

In today's world, development is of paramount importance, and this is reflected in the focus on accuracy, smart technology use, and youth involvement in driving growth through creative ideas and startups. Industry 4.0 approach differs from previous ones as the rate of change is exponential rather than linear. It is the latest phase which, according to the World Economic Forum, has no historical precedent, is evolving exponentially and has the propensity to disrupt every industry in every country leading to the transformation of entire systems of production, management, and governance. Exponential technologies enable rapid, nonlinear change, facilitated by significant progress (and reduced costs) in areas such as computing power, bandwidth, and data storage. The explosive increase in computing performance and the significant decrease in computing costs are allowing for the creation of new technologies such as artificial intelligence, additive manufacturing, and bioengineering. While the young population is known to be able to adapt to new technological changes, it is important to note that young people don't form a monolith. The success of the adoption of these new technologies is dependent on the opportunity of access, information, motivation etc. The share of youth not in employment, education or training (NEET) has increased from 13.1 per cent in 2019 to 15.3 per cent in 2020 for men, and from 30.3 per cent in 2019 to 31.1 per cent in 2020 for women.

The theme "Future of Work: Industry 4.0, Innovation & 21st Century Skills" aims to inform new priorities that address emerging technology and innovative thinking, particularly from the young generation who will play a significant role in shaping the future. Y20 India has taken the lead in introducing this theme to young people from all over the world together to ensure that the policy agendas on these issues also address youth-centric concerns. This theme is not just limited to technology, but also addresses the need for upskilling and reskilling the workforce to meet the demands of the changing job market. The theme focuses on the development of 21st century skills, such as critical thinking, collaboration, and problem-solving, which are essential for success in a rapidly evolving and increasingly interconnected world. The sub-themes within the "Future of Work" theme are designed to gather perspectives from the youth on the changes needed in learning, reskilling, and unlearning. It also includes discussions on industrial growth through collaboration, the gig economy, and the development of the startup ecosystem. The theme also aims to address the traditional economy as a part of Industry 4.0, ensuring that new technology is integrated into traditional working methods. These sub-themes are intended to provide a comprehensive understanding of the future of work, with input from experts and the latest research on these topics.

## I. Preparing the Workforce through the Principle of Unlearn, Relearn & Reskill

The COVID-19 pandemic has brought about unprecedented changes to the world of work, including widespread lockdowns and economic disruption. However, it has also opened up new opportunities for employment and growth, particularly in industries that have embraced the digital transformation and investment in skill development.[11] The rise of Industry 4.0, with its focus on technology, data analysis, and automation, has created new possibilities for workers to learn new skills, re-invent their careers and stay ahead of the curve. The principle of Unlearn, Relearn, and Reskill is essential for success in this new environment. To fully realise the benefits of this principle, companies must create a supportive culture that values continuous learning and development. This can be achieved through initiatives such as on-the-job training programs, online courses, mentorship, and knowledge-sharing sessions. It's also important to recognize that the process of Unlearn, Relearn, and Reskill is not just limited to workers, but applies to all stakeholders, including managers and executives.

Moreover, companies should take a proactive approach to help employees identify their career goals and assist them in acquiring new skills that align with their goals. With the fast pace of technological change and the increasing demand for new skills, the future of work will be shaped by those who are willing to continuously learn and adapt. The future of work is likely to be volatile, uncertain, and complex, with workplaces facing challenges in harnessing the growth potential of new technologies due to skill shortages. Companies must be proactive in fostering a culture of continuous learning, and employees must be willing to invest in their own development and embrace new skills and technologies.

[11] *Best practices in investment for development,* UNCTAD, (Jan. 21, 2023, 7:36 PM), https://unctad.org/system/files/official-document/diaepcb2010d5_en.pdf.

## A. Efforts made Globally for Imparting 21st Century Skills

Globally, there are various efforts being made to impart 21st century skills as part of the theme 'Preparing the Workforce through the Principle of Unlearn, Relearn & Reskill'. The aim of these efforts is to equip the workforce with the necessary skills to succeed in the digital age and navigate the changing job market. Online learning platforms such as Coursera, Udemy, and EdX provide various courses to help individuals reskill and upgrade their technical and soft skills. Corporate training programs offered by companies help employees upgrade their skills and remain relevant in their current roles or prepare for future ones. Governments are also investing in reskilling programs to support citizens in acquiring new skills and to address the skills gap in their workforce. Non-profit organisations like Code.org work to provide access to computer science education to all students and promote digital literacy and computational thinking. Universities and colleges are partnering with companies to offer short-term courses that focus on specific 21st-century skills such as data analytics, coding, and digital marketing. These efforts are aimed at preparing the workforce for the demands of the future.

## B. Tools for Reducing the Inequality Between and Within the Countries in an Industry 4.0 World

Reducing inequality in Industry 4.0 requires a comprehensive approach to address the challenges posed by technological change. One key tool for reducing inequality is skills development programs. These programs provide individuals with access to education and training that focus on the skills needed for the digital age. This investment in human capital helps to equip individuals with the tools they need to succeed in the job market, and it also contributes to the overall competitiveness and productivity of the economy.

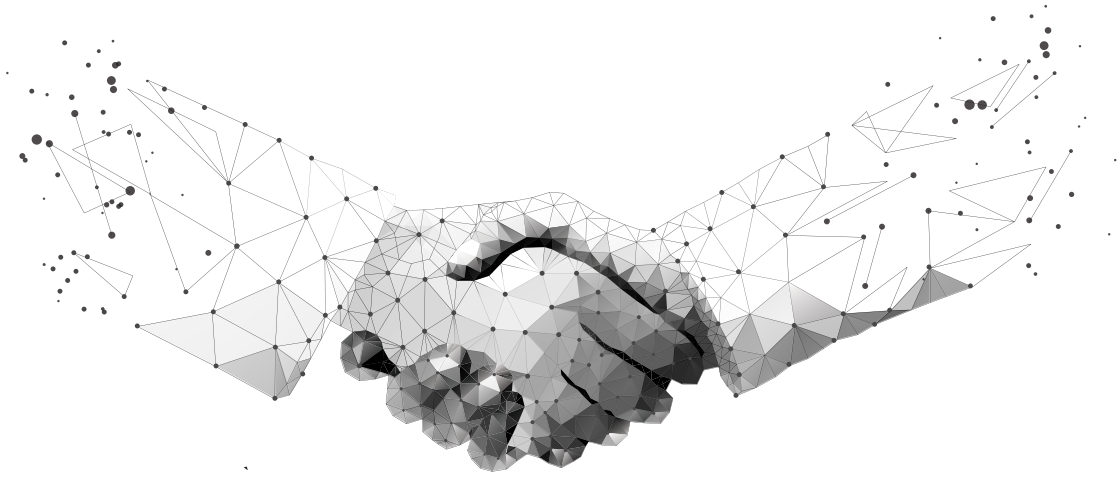
Another tool for reducing inequality is digital inclusion initiatives. Promoting digital literacy and ensuring that all individuals have access to technology and the internet is critical in an Industry 4.0 world where the digital economy is becoming increasingly dominant. Digital inclusion initiatives help to reduce inequality by providing individuals with the means to participate in the digital economy and succeed in the job market. This not only benefits individuals, but it also contributes to the overall health and stability of the economy.

In addition to these two tools, labour market interventions such as job placement programs and wage subsidies can provide individuals with access to job opportunities and fair wages. Social safety net programs like unemployment benefits and retirement savings plans can provide individuals with financial security and a safety net. To effectively reduce inequality, a collaboration between governments, the private sector, and other stakeholders is essential. By working together, countries can ensure that the benefits of the digital economy are shared by all and that inequality is reduced in the world.

## II. Cross-Border Innovation and Growth through Collaboration

When we refer to cross-border innovation, we mean exchanging innovative ideas, technologies, and business models across international borders through collaboration. This approach is more effective than competition as it allows companies and individuals to utilise their strengths and expertise. The G20, as an intergovernmental forum, can facilitate access to new international markets and provide opportunities to learn about the needs and interests of different countries. This can drive the development of new innovations that meet the demands of new markets, with the necessary funding and connections provided. As the world becomes increasingly interconnected, cross-border innovation and collaboration offer a powerful means of creating impact and driving sustainable growth on a global scale. This provides hope for the world's youth in realising a developed future with advanced infrastructure, cutting-edge technology, and a broad-minded approach.

Growth through collaboration can lead to increased efficiency, the sharing of best practices, and the development of new technologies. Collaboration between businesses, government, and research institutions opens up new avenues for growth and provides opportunities for companies to expand into new markets. Additionally, cross-border collaboration can result in the creation of new business models and the development of innovative solutions to complex problems. As the world becomes increasingly interconnected, growth through collaboration will play a critical role in driving sustainable economic development.



## A. Encouraging the MSME Sector

The MSME (Micro, Small, and Medium Enterprises) sector plays a crucial role in promoting cooperation between enterprises, the private sector, and research institutions for the benefit of youth today. They are typically more flexible and responsive to local market conditions and can quickly adopt new technologies and business models. The MSME sector also provides a platform for opportunities for youth to start and grow their own businesses and promotes startups among the youth. They generally operate in an environment that is driven either by a large manufacturer that sources supplies from MSMEs or a combination of both. Collaborating with people from diverse backgrounds can broaden the perspectives of young entrepreneurs and help them learn and adapt to new processes efficiently.

## B. Benefits of Cross-Border Innovation for the Youth

Cross-border collaboration can benefit young people by exposing them to new ideas, perspectives, and ways of doing business. This can help them develop a global mindset and gain a better understanding of the international market. Additionally, cross-border collaboration can provide opportunities for young people to network with peers and mentors from different countries, which can help them develop valuable connections and gain access to new resources. Also, governments and organisations can provide young entrepreneurs with access to resources such as funding, mentorship, and training to help them start and grow their businesses, thereby working together to create a supportive ecosystem for young entrepreneurs by fostering collaboration and innovation between different stakeholders such as universities, research institutions, and business organisations.

## C. Ways of Creating Awareness and Educating Youth about AI

The growth potential of AI is being realised through collaborations taking place on a global scale, making it essential to educate young people about its impact on the employment landscape. It is important to raise awareness about AI, including its legal and policy implications, by making careers in the field accessible and aspirational. To prepare students for the future, they must be exposed to the latest developments in AI and receive foundational coding and technical skills. Workshops, conferences, and hackathons focused on AI can provide opportunities for learning and collaboration with experts and others interested in the field. Encouraging young women in STEM, including AI, through gender mainstreaming and creating positive opportunities is crucial to ensure equal representation in the field. Improving skill sets in AI will lead to growth for individuals and the industry as a whole, making it a top priority for education and training.

## III. Gig Economy: The New Age Industry

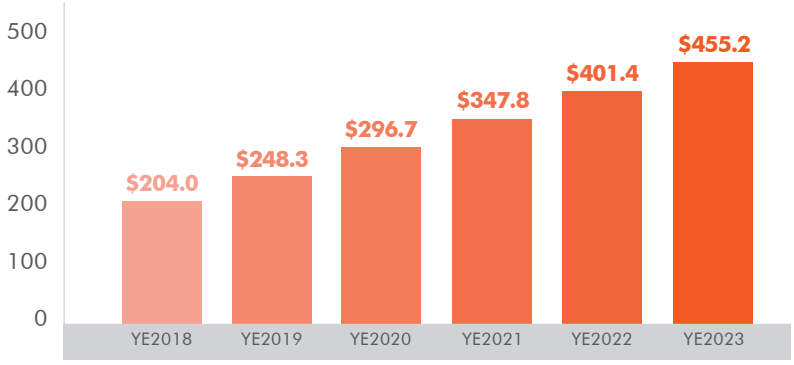
The gig economy is a labour market characterised by the use of independent contractors for short-term, project-based work. The term "gig" refers to a job that is done for a specific period of time. It is gaining popularity globally due to its appeal to a flexible workforce and the need for businesses to adapt to changing market demands. This trend is particularly attractive to young people who seek greater control over their work schedules and the ability to develop a diverse range of skills. Additionally, the gig economy offers young people the opportunity to work for a variety of companies, giving them exposure to a wide range of industries and perspectives. Furthermore, the gig economy allows young people to be their own bosses, giving them the freedom to set their own goals and determine their own success. With its many advantages, it is no wonder why the gig economy is becoming increasingly popular among young people.

### A. Drawbacks of the Gig Economy and the Ways to Tackle them

The gig economy has created new challenges for workers, particularly in the areas of job security and access to benefits. Due to the temporary and project-based nature of gig work, workers may not have the same stability as traditional employees and may not have access to benefits such as health insurance, retirement savings, and paid time off. To address these issues and support workers in the gig economy, it is important to establish new guidelines and protections. Despite these challenges, the gig economy offers significant advantages, including the ease of finding work through online platforms and access to a global network of clients.

### B. Changing Education Systems with Changing Industry Needs

Incorporation of the Gig economy into the work paradigm will likely change the education system leading to a greater focus on practical, job-specific skills training and offering flexible and self-paced learning options. Emphasis will be placed on technology and digital skills as well as collaboration and project-based learning. Personalised and continuous learning opportunities will also be emphasised, as well as the development of entrepreneurial skills. The education system will also incorporate gig work experiences into the curriculum. This shift in focus will better prepare individuals for the demands of the gig economy and equip them with the skills necessary to succeed in it.




Projected Growth of the Gig Economy to a gross volume of $455 billion by 2023[12]

[12] Ningning Fidel, *Kleros & Hyve - Arbitrated (truly) Freelance Marketplaces,* KLEROS (Jan. 23, 2023, 2:45 PM), https://blog.kleros.io/kleros-hyve-decentralized-disputes-for-the-gig-economy/.

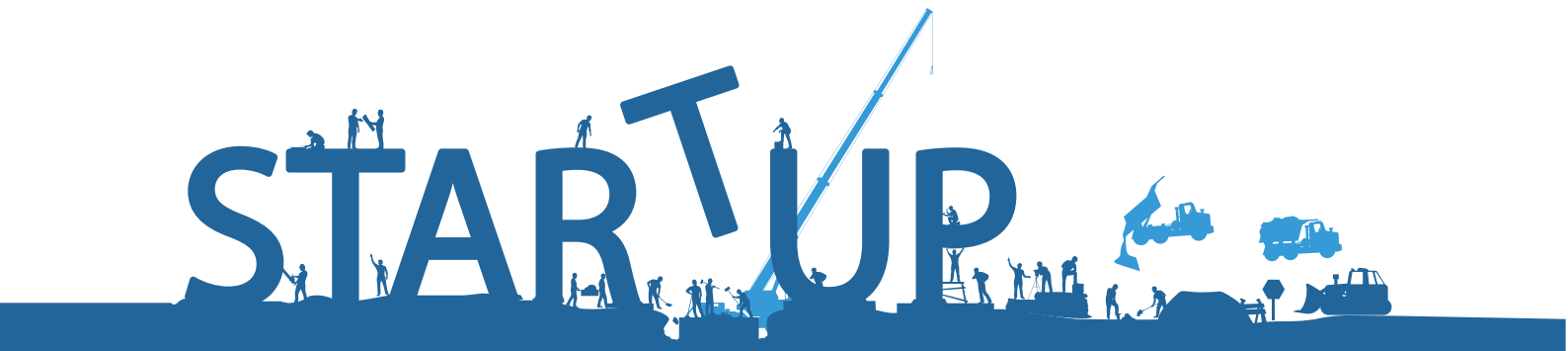
## IV. Catalysing the Startup Ecosystem

The startup ecosystem is a network of individuals, startups at various stages, and organisations that interact and collaborate to foster the creation of new startups. These organisations include universities, financial institutions, support organisations (such as incubators, accelerators, co-working spaces, etc.), research organisations, and big businesses. Each plays a unique role in supporting the growth and development of startups. However, external factors such as economic conditions and market changes can greatly impact the stability and functioning of the startup ecosystem. Despite its inherently dynamic nature, the ecosystem can recover and adapt to these challenges through its phases of development.

Industry 4.0 is shaping the future of work in the startup ecosystem. It seeks to design machinery that is automated, self-optimised, responsive to consumer needs, and highly accurate. This is crucial in the fast-paced and demanding environment of the startup ecosystem. Industry 4.0 has paved the way for improved connectivity and digital convergence across industries and operations, further supporting the growth and success of startups. The advancement of Industry 4.0 and the growth of startups are interdependent and will continue to shape the way work is performed in the future. The startup ecosystem's ability to adapt to challenges and embrace technological advancements will be critical in determining its continued success and impact on the future of work.

### A. Ways of Collaboration to Encourage Global Start-Up Ecosystem

A thriving global start-up ecosystem is essential for innovation and economic growth. Collaboration between various stakeholders such as governments, universities, and corporations can play a key role in fostering the growth of start-ups. One approach is to leverage international organisations such as the G20 and its engagement group, Startup 20, to bring together governments and stakeholders to share best practices and collaborate on initiatives to support start-ups. This can include providing access to funding, resources, and networks, as well as creating a favourable regulatory environment.



Another way of collaboration is through public-private partnerships. Governments can work with corporations and universities to provide support and resources to start-ups, such as incubators, accelerators, and co-working spaces. Additionally, corporations can mentor and invest in start-ups, providing them with the resources and networks necessary for growth. Another important aspect of collaboration is the sharing of knowledge and expertise. Universities can collaborate with start-ups and corporations to research and develop new technologies and products. This can also involve sharing information on market trends and customer needs, as well as exchanging ideas and strategies for growth.

## B. New Age Technologies Resonating with the Youth

The youth of today are embracing new-age technologies with a level of excitement and curiosity that is driving innovation in the modern world. The younger generation is not content to simply work with pre-existing concepts and technologies, but instead is looking to create new business opportunities through the use of cutting-edge technologies. One of the key drivers of this trend is Industry 4.0, which emphasises the use of advanced technologies like Artificial Intelligence (AI), Virtual Reality (VR), Augmented Reality (AR), Chatbots, Machine Vision, Machine Condition Monitoring, Digital Twin, Blockchain, and drones, to drive innovation and progress[13]. These technologies are attracting the interest of the youth due to their potential for creating new experiences and opportunities, both for businesses and consumers alike.

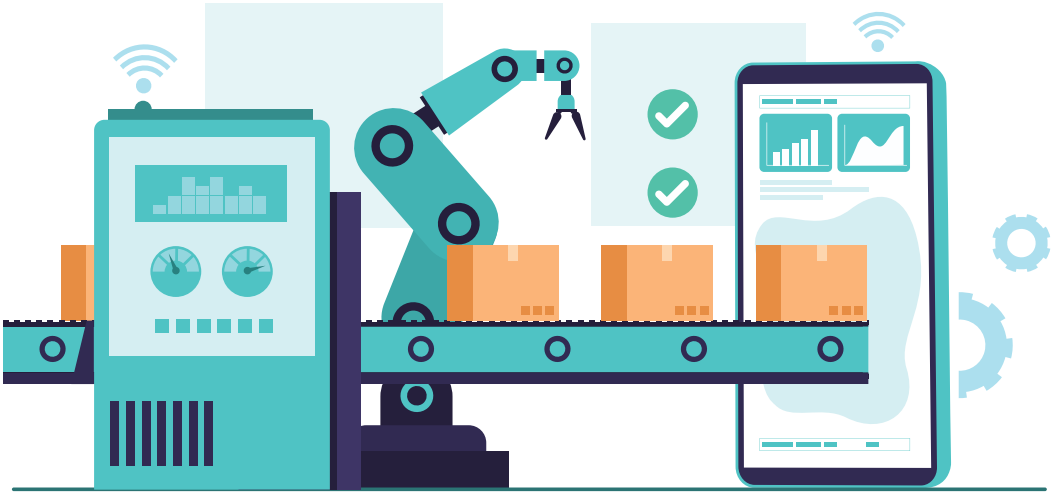
The startup industry has seen a surge in growth in recent years, with many young entrepreneurs seeking to establish new ventures and create innovative products and services. Despite the challenges posed by events such as the Russia-Ukraine war, the growth rate in the startup industry has remained strong, fueled in part by the adoption of new-age technologies by the youth.

## C. Encouraging Entrepreneurship amongst Youth

The current global recession, caused by the war, has led to widespread job losses across various industries, even impacting tech giants such as Google and Amazon. During tough economic times, companies often resort to layoffs to cut costs and maintain profitability. To combat the devastating effects of unemployment, it is crucial to foster a culture of entrepreneurship amongst the youth.

To encourage entrepreneurship amongst the youth, educational institutions must play a key role. They should provide students with the basics of starting a business, the various components required for establishing a startup, and insights from industry experts. By promoting open-ended discussions and offering opportunities for students to present and test their ideas, schools can help foster a more comprehensive understanding of entrepreneurship. By investing in the entrepreneurial education of the youth, we can create a bright future for the next generation.

[13] *What Are The Types of Technology,* SIMPLILERAN (Jan. 23, 11:03 AM), https://www.simplilearn.com/types-of-technology-article.



## V. Traditional Economy as a Part of Industry 4.0.

In a traditional economy, economic activity is organised around the production of goods and services for use within the community, rather than for exchange or sale on the market. These economies are typically found in rural and less developed areas and are characterised by low levels of productivity, and a lack of diversification. Integration of Industry 4.0 technologies into traditional economies can bring several benefits, such as increased productivity, improved quality, and reduced environmental impacts. Traditional economies can become more competitive on the global market, by increasing their efficiency and productivity. Technology provides a robust connection between traditional markets and the global market while improving the availability of tools, the traceability of goods and products, and advanced methods of production, causing a substantial decrease in production costs as well. The future of work in traditional economies will likely involve a mix of old and new ways of doing things, as traditional methods are adapted to incorporate new technologies. This could include using drones to monitor crops, blockchain to track transactions, and robotics to automate manual labour. The key is to find the right balance between tradition and innovation to ensure that the benefits of Industry 4.0 are leveraged while preserving the unique cultural and economic characteristics of the traditional economy.

### A. Improving Products through Technology-Driven Processes & Systems

Investment needs to be made in research and development to identify and develop new technologies and ways to integrate AI in small and medium-scale industries. New pedagogical approaches will have to be considered to support the training and upskilling of workers. To achieve this, governments should invest more in technical education and vocational training to create a skilled workforce that is equipped to work with Industry 4.0 technologies. Also, digital infrastructure, such as high-speed internet and data centres, should be established to ensure workers have access to the tools and resources they need to learn and work with these technologies.

Additionally, businesses in the traditional economy should actively seek out and adopt Industry 4.0 technologies to remain competitive and improve efficiency. They should also invest in the development of new business models that take advantage of these technologies. This will require a mindset shift, as well as a willingness to embrace change and innovation.

### B. Ways of Easy Access towards Strategic Resources

There are SMEs which have been developed to bring together the various types of businesses depending on their type of expanse. Many such companies follow the traditional economy processes which require the help of other businesses for their distribution, manufacturing, or for basic raw materials. Such SMEs can use fintech platforms and alternative sources of finance, such as crowdfunding and peer-to-peer lending, to access capital and finance their operations. These platforms often have lower barriers to entry and may offer more flexible terms than traditional sources of finance.

### C. Providing Means of Engagement through Technology

The COVID-19 pandemic has had a significant impact on technology, supply chains, and the semiconductor industry. The shift to remote work and online education has driven up demand for devices such as laptops, cameras, and reliable internet connectivity. As a result, physical stores have been forced to close or reduce capacity, leading to a surge in e-commerce and online marketplaces. To thrive in this new reality, countries must embrace technology-driven processes and systems. At the same time, it's critical for individuals to have a basic understanding of these technologies. By combining traditional lean methods with Industry 4.0 technologies, producers can capitalise on the momentum and increase the efficiency of their processes. Industry 4.0 technologies go beyond simply providing data, they also offer ways to analyse and gain insights from that data.

### D.Right Business Environment for the Transformation of Traditional Economies

To successfully transform traditional economies into Industry 4.0, it is essential to create the right business environment. This requires considering a range of factors including the mindset of the population, support from industry and enterprise, and access to capital. The adoption of Industry 4.0 technologies requires a shift in mindset, with individuals and businesses embracing innovation and change. This can be achieved through education and awareness programs that highlight the benefits and potential of these technologies.

Support from industry and enterprise is also crucial for the successful implementation of Industry 4.0. This may involve partnering with technology providers, investing in research and development, and adopting new business models that take advantage of these technologies. Access to capital is also an essential factor in the transformation of traditional economies. Governments can play a role in providing support, such as tax incentives and grants, to help businesses invest in Industry 4.0 technologies. Private sector investment is also necessary, as businesses must have the resources to implement and integrate these technologies into their operations. By creating the right business environment, countries can successfully transform into high-tech, efficient, and accurate economies. This will lead to improved product yield and better infrastructure, ultimately driving economic growth and competitiveness.

## Case Study 1: **Skill India Initiative**

The Skill India Initiative was launched in 2015, with the primary objective of providing curriculum-based skill training courses and certifications, in order to bridge the gap between industry demands and skill requirements in the country. The idea of the initiative was to generate both short and long-term skill training and employment. Pradhan Mantri Kaushal Vikas Yojana (PMKVY) is the flagship scheme of the Ministry of Skill Development & Entrepreneurship (MSDE) implemented with the objective of promoting industry-relevant skill training among the youth, encouraging employable skills leading to working efficiency and better job opportunities for the young population[14]. Further, the Ministry also initiated a curriculum on employability skills within the MSDE ecosystem to orient and prepare young students to adapt to the job market post-COVID.

India has had an outlook of investing in skill development to meet the ever-changing needs of the job market and ensuring that the youth workforce is not left behind with their traditional and obsolete approach and limited skillset. This initiative is an instance of India's efforts towards reskilling and upskilling its youth population to meet the needs of the changing global circumstances and ensure better job opportunities for the youth.

## Case Study 2: **Digital India Initiative**

This programme has the vision to transform India into a knowledge-based economy and a digitally empowered society by ensuring digital services, digital access and digital inclusion. There is an attempt to make the Indian digital space transparent and corruption-free. The overall goal of the initiative is to ensure that digital empowerment and technologies improve the life of every citizen, augment India's digital economy, and create investment and employment opportunities, thereby creating digital technological capabilities in India. The nine pillars of the Digital India Initiative converge into the primary vision of making transformational changes in the major growth areas in India by providing digital infrastructure to all parts of the country.

In the current global scenario, access to technology and digital empowerment is the future of industries and employment. Appropriate digital infrastructure, high-speed internet and data centres have to be developed to ensure that workers have access to the tools and resources they need to learn and work with Industry 4.0 technologies. This initiative is a step forward towards digitising the Indian population and governance services, making technology easily accessible to all sections of society, and meeting its vision of 'Power to Empower'.

[14]*Pradhan Mantri Kaushal Vikas Yojana*, PMKVY (Jan. 23, 2023, 1:12 PM), http://www.pmkvyofficial.org/.

## Case Study 3:
## Pradhan Mantri Mudra Yojana (PMMY)

Pradhan Mantri Mudra Yojana focuses on providing integrated financial support services for the bottom of the pyramid universe for their comprehensive economic and social development. It gives monetary as well as non-monetary benefits to the youth, encourages support for micro-enterprises, provides a simplified loan process, gives rise to an increase in GDP, and encourages small businesses to grow and involve the Industry 4.0 approach. It is a plan introduced to provide non-corporate, non-farm small/micro-entrepreneurs with loans of up to ₹10 lakh.

In order to combat the devastating effects of unemployment, and create a sustainable and value-based entrepreneurial culture, it is crucial to foster the promotion of startups amongst the youth. This initiative is an example of India's attempt to boost the entrepreneurial spirit of its youth by encouraging startups and achieving economic success and financial security through ease of the process and financial support, thereby creating an ecosystem of growth for the micro enterprises' sector.

## Case Study 4:
## National Curriculum Framework for School Education (NCFSE) 2005

National Curriculum Framework 2005 was published to guide institutions and schools to encourage the overall development of children and to move away from textbook-centric learning. It aims to define clear outcomes and introduce new educational approaches such as outcome-based education or standards-based education, which promotes a wholesome development of the child, encompassing the academic, emotional, physical, and emotional aspects. The Indian government has recognized the importance of promoting entrepreneurship among youth and has taken several steps to incorporate entrepreneurship education into the school curriculum. The National Curriculum Framework for School Education (NCFSE) 2005 has included entrepreneurship education as a cross-curricular theme at the secondary and senior secondary levels. The curriculum is designed to instil in pupils a sense of oneness, democracy, and togetherness, as well as to enhance our national identity and empower the next generation to reassess.

The guiding principles of this framework highlight India's focus on shifting the teaching practices and curriculum at the primary and secondary education levels. In order to make the environment conducive to learning, emphasis is laid on creative thinking skills, and different learning approaches, by integrating examination into classroom learning. India believes in educating its youth holistically, preparing them for future challenges and changing needs and opportunities.

# WAY FORWARD

### Building 21st Century Skills

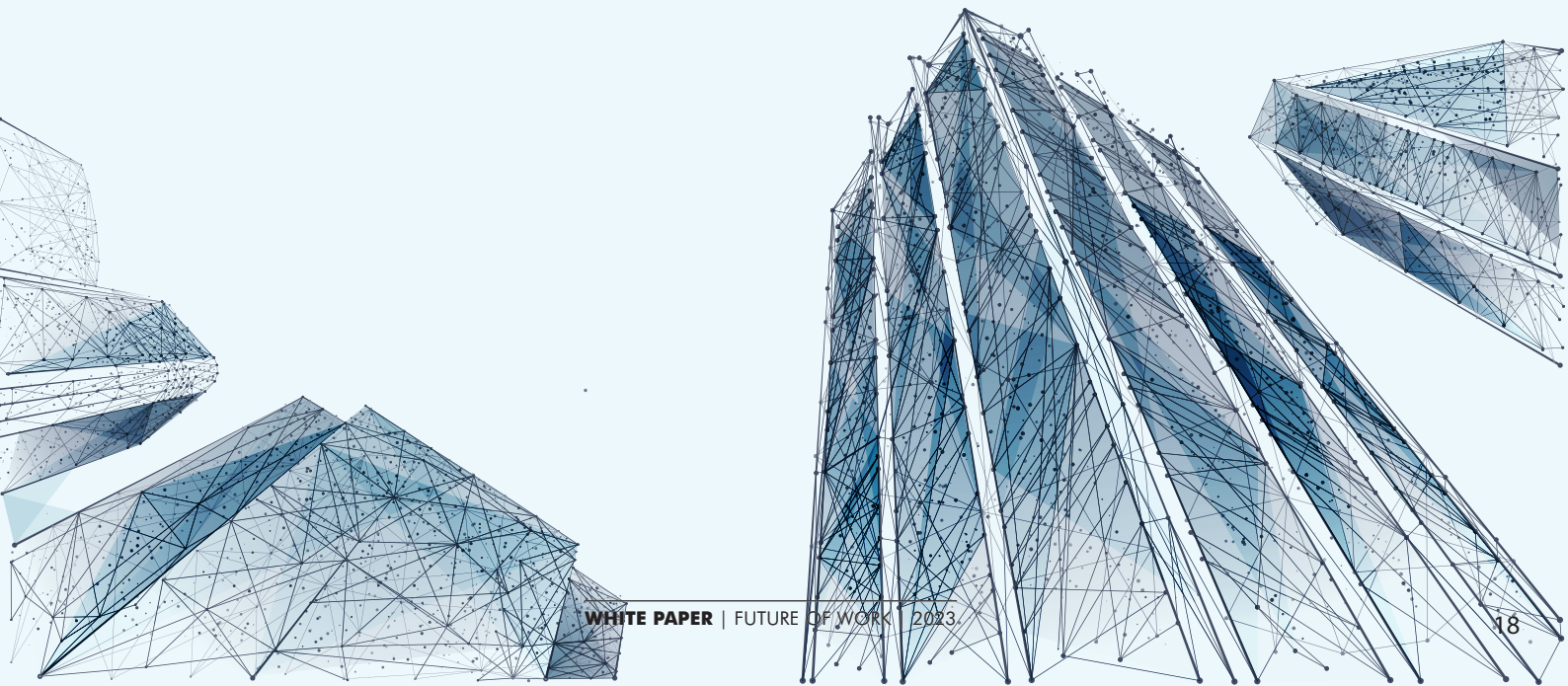
Young people are the future of the workforce, and it is crucial for them to develop the skills necessary to succeed in an Industry 4.0 world. Skills such as critical thinking, problem-solving, digital literacy, and communication are essential for success in this rapidly changing world. By providing young people with the opportunity to develop these skills, they will be better equipped to tackle the challenges of the future of work and to seize new opportunities. Governments, businesses, and other organisations can play a critical role in supporting the development of these skills through education and skills development programs.

### Encouraging Entrepreneurship

Entrepreneurship and innovation are key drivers of economic growth and development. Young people have the potential to bring fresh perspectives, innovative ideas, and a drive to make a difference to the table. It is important to provide them with the support they need to succeed, including access to finance, mentorship, and networks, as well as a supportive regulatory environment. Promoting innovation and entrepreneurship for youth is a key way forward for ensuring their success in the future of work, and it is also a way to create new job opportunities and drive economic growth and development.

### Access to Digital Infrastructure

The digital economy is a key driver of economic growth and development, and it is essential for young people to have access to digital technologies and the internet in order to participate. Providing young people with access to digital technologies and promoting digital literacy among them is critical for their success in the future of work and for driving economic growth and development. Governments, businesses, and other organisations can play a critical role in ensuring that young people have the digital infrastructure and capabilities they need to participate in the digital economy.



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