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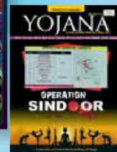
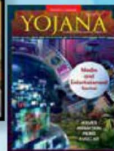
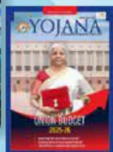
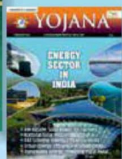
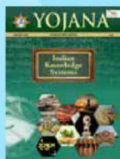
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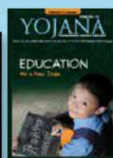
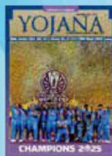
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Let noble thoughts come to us from all sides.
Rig Veda

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Human Capital

The Architect of *Viksit Bharat*

India's story of growth is undergoing a profound metamorphosis. It is no longer just a narrative of rising GDP figures or industrial output. It is a story of its people; their aspirations, their resilience, and most importantly, their skills. This transformation shifts the focus from mere statistical milestones to the qualitative empowerment of the individual. As we march toward the milestone of *Viksit Bharat* @2047, the pivotal question is not just how much we grow, but how prepared our human capital is to sustain and drive that growth. Human capital, in this context, emerges as the ultimate architect of our national destiny.

This May issue of *Yojana* delves into the ongoing transformation of the Indian workforce—a transition from being a passive reservoir of labour to becoming a dynamic powerhouse of innovation. It curates perspectives that highlight how the “Human Capital Engine” is being primed to lead in a competitive global landscape.

The cornerstone of this evolution is the reimagining of our educational and skilling ecosystems. We are moving past the era where learning was a terminal phase of life. Today, the new literacy is the ability to ‘learn, unlearn, and relearn.’ India is ensuring that the next generation is not only degree-holding but also ‘job-ready’ and ‘future-ready’ by integrating vocational training into secondary education. By closing the gap between academic theory and industry requirements, we are fostering a culture of agility and technical proficiency.

The landscape of work itself is being rewritten. Traditional trades are now converging with high-tech frontiers such as Artificial Intelligence, Semiconductors, and Green Energy. As the gig economy expands and digital platforms become the new marketplaces, our labor frameworks are also evolving to provide both flexibility and security. This digital revolution has democratised opportunity, allowing talent from the smallest towns to participate in global value chains.

But growth without equity is a journey half-completed. True empowerment is realised only when the margins become the mainstream. This issue underscores how the inclusion of women in the workforce, the essence of *Nari Shakti*, and the integration of tribal communities are not just social goals, but economic imperatives. Investing in the skill sets of those at the bottom of the pyramid is a strategic necessity for a balanced national fabric.

In the end, the vision of 2047 will not be realised by policies alone, but by the hands of a billion empowered individuals. It is about building a society where competence is valued over credentials, and where every citizen has the tools to adapt, the dignity to work, and the freedom to create. □





Looking Beyond High School: Today and Tomorrow

As a country, we must ensure that our young people reach adulthood with the knowledge, skills, and opportunities for going forward, not just in school or college, but also to be able to sustain a life-long learning path. Serious & immediate rethinking about this age group is urgently needed in terms of “learning for school”, “learning for work” and “learning for life”.

How ready are India's youth for life beyond high school? Are they ready for further education? Are they ready for life? Are they ready for work?

The new National Education Policy 2020 (NEP 2020) views the school career of children in stages. The foundational stage covers ages 3 to 8 (Anganwadi/pre-primary to Class 2). The preparatory stage focuses on ages 8 to 11 (Class 3 to 5). The middle stage is for ages 11 to 14 (Class 6 to 8), and the secondary stage includes those in the age group of 14 to 18 years (Class 9 to 12).

In recent years, there has been a great deal of attention paid to the foundational and primary stages in the school system. Research studies and data sets from government sources and others are available that track progress towards the learning goals outlined in NEP 2020. But to think about how India is getting ready for the future of work, we need to know much more about secondary age and about the pathways leading to high school and beyond.

Currently, the secondary stage of schooling is dominated by examinations. Life for high school students from Class 9 onwards is concentrated on exam preparation and exam taking - a time of high intensity, tension and competition. In addition to high school leaving examinations, there are high-stakes college entrance exams. Throughout the year,

newspapers carry full-page advertisements for exam preparation classes and materials. Online digital products and instructional packages are promoted, promising academic excellence. While students are at the centre of this high-octane environment, parents and schools also add to the heat. Doing well in exams is of critical importance for the reputation and standing of individuals, families, teachers and school systems.

In the last two decades, there has been a substantial change in the composition of the population heading into the secondary stage of schooling. Quick back-of-the-envelope calculations are useful in understanding this change. Based on projections from the last census in 2011, there are roughly 25 million children in each age group. In 2005-2006, all India Class 8 enrollment was close to 11 million. By 2020-21, this number had reached about 22 million. In short, today in India, more children have more years of schooling than ever before. At least part of the intense competition in high school is explained by the fact that a far higher percentage of students are now moving through the secondary stage compared to even ten years ago.



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What are young people in the age group 14 to 18 like in our country today? In India, compulsory education ends at age 14, but to work full-time in the organised sector, you must be at least 18 years old. A rural household survey conducted in 2023 reveals some interesting insights about this age group, especially about their activities, abilities (basic academic achievements), awareness and aspirations (Annual Status of Education Report - ASER 2023). The study sampled approximately 35,000 young people in the 14-18 age group in 28 districts (one rural district from each state, and two for Madhya Pradesh and Uttar Pradesh). It gives a glimpse into how prepared young people were for the path ahead, for further education, work, and life.

The findings from the study indicate that at age 14, more than 95% of the age group was enrolled in school or in an educational institution. By age 18, this figure drops to 67.4%. Among those enrolled in school, the percentage of youth working outside the home for at least 15 days or more in the previous month was 33.8% for males and 24.4 % for females studying in Class 10 or below. For those in Classes 11 and 12, the equivalent figures were 39.2% and 26.1%. Of those working, approximately 80% were engaged in agricultural work and usually on the family farm. Only about 5.6% of all youth in this age group were doing vocational courses. Most of those who do such courses are enrolled in short courses of six months or less.

For younger age groups, NEP 2020 has stressed the need for ensuring foundational learning. This applies to the secondary stage as well. The 2023 study also shows that having basic foundational skills like reading and arithmetic are very useful even for daily tasks and everyday calculations. Building basic math skills generates large dividends. Data from recent school-based national assessment initiatives like PARAKH 2024 (Performance Assessment, Review and Analysis of Knowledge for Holistic Development) and household sample-based surveys like ASER 2024 indicate the urgent need to strengthen learning in middle and secondary schools. Planning and implementing efforts to improve foundational learning for those who do not have it by the time they reach the secondary stage is of critical importance for future pathways.

Aspirations are hard to measure quantitatively. But to the extent that it is possible, the 2023 study (and an earlier version in 2017) suggests that youth aspirations and those of their families are strongly skewed towards



securing government jobs and in familiar professions like military, teaching, medicine and engineering. While some youths can find information online, many rural young people do not know exactly the route or the requirements to successfully navigate the road beyond high school.

The 2023 study is unique in how it provides data on digital devices and digital skills. As part of the household survey, young people were asked to do a set of actual digital tasks. These digital tasks were then repeated in a much larger national sample of more than 1 lac students (age 14-16) in the nationwide ASER 2024 survey. From ASER 2024 data, we can see that close to 90% of sampled students (ages 14-16) from rural districts across India had a smartphone at home. When asked to do simple digital tasks (like setting an alarm, browsing for basic information, finding a specific video and digitally sharing that with another person), well over three-quarters of all children could do them correctly.

Let us take a step back, take stock of both available data and accumulated experiences from the ground, and reflect on what is needed for the secondary school age group today and tomorrow. India is well on its way towards universalising secondary education. The majority of this age group is already enrolled in school. This number will grow. However, much of their high school life is currently dominated by examinations, and the focus is on developing exam-taking skills. Aspirations are directed at white-collar jobs and government employment. However, this is a critical stage in a young person's life; this is the time when an appropriate and relevant knowledge base, open, flexible mindsets and hands-on, applied skills need to be acquired before they leave school.

Looking ahead at the future of work or indeed even at future lives, many pathways will need to be

navigated, some of which may not be visible today. We can debate and discuss what is meant by “appropriate” or “relevant”, but we will all agree that it must be more than the current practice that concentrates narrowly on individual academic excellence. First, definitions are needed of what is meant by basic foundational learning in high school. Once defined, vigorous efforts must be made to ensure that all students acquire these skills. Second, given that a significant proportion of enrolled students also work (albeit on their own family farm), there must be a connection between what they are learning in school and what they are doing outside school, between school-based learning and learning by doing. Third, the practice of teaching-learning in high school today is individual oriented, but this is the age to learn how to work in teams and how to deal with different types of team members and how to deliver on projects by working together.

Digital technology can be a major support to students’ growth and development. Data from the 2023 and 2024 ASER surveys indicate that many students have learned basic digital skills even though they may

not have been taught how to deal with technology in school. Access to digital devices and diverse digital content is the starting point. At this age, youth explore, choose and learn on their own and from friends if they have the opportunity. They engage when they are interested. The use of digital technology must become integral to activities in the classroom and outside. How you learn is as important as what you learn. Learning with the help of digital resources must meaningfully connect young people to the evolving field of work but also strengthen capacities to navigate daily life.

As a country, we must ensure that our young people reach adulthood with the knowledge, skills, and opportunities for going forward, not just in school or college, but also to be able to sustain a life-long learning path. Serious & immediate rethinking about this age group is urgently needed in terms of “learning for school”, “learning for work” and “learning for life”. Answers to questions like what youth should learn, how and when they will learn, and why they will learn will evolve as opportunities increase for flexibly exploring and meaningfully connecting to real-life contexts. □

The advertisement features a yellow header with the Government of India emblem and the Ministry of Information and Broadcasting logo on the left, and the Publications Division logo on the right. Below the header, two smartphones are shown side-by-side. The left phone displays the 'Ebooks' section of the app, showing a grid of book covers including 'INDIA' and 'HINDUSTAN'. The right phone displays the 'Publications division magazines' section, showing a grid of magazine covers including 'YODHAN', 'SARVODAYA', and 'SARVODAYA'. To the right of the phones, the text 'Publications Division's Books & Magazines Now Available On' is displayed above a large blue app icon with a white 'W' logo. Below the app icon, a yellow banner reads 'Free of Cost*' with a crossed-out rupee symbol. At the bottom, there is a QR code with the text 'SCAN HERE' below it, and a small graphic showing the app available on Google Play and the App Store.

UPSKILLING

Amrita Pandey



From Scale to Skill: Powering *Viksit Bharat's* Workforce

India's path to becoming a developed economy will be shaped as much by its people as by its policies. The foundations of a skilling ecosystem are being laid. The next phase will determine how effectively these efforts translate into outcomes. The demographic dividend that India enjoys today is time-bound. Converting it into a sustained economic advantage will require coordinated action across government, industry, and academia.

Step out into any Indian city today and the signs are easy to spot. A delivery partner is navigating traffic with three apps open on his phone. A young graduate preparing for competitive exams while taking up freelance work on the side. A small business owner is putting in hard work to find workers who can operate new machines or manage digital systems.

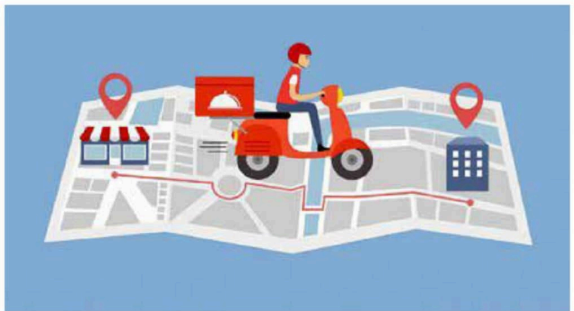
India is working. And now, it is sharpening its skills to match its ambition.

This is the reality beneath the headlines of growth. On one hand, millions are entering the workforce every year, willing to work, adapt, and move. On the other hand, employers across sectors continue to report a shortage of job-ready talent. The gap is no longer about opportunity alone. It is about preparedness.

What makes this moment more complex is the speed at which the nature of work itself is changing. Skills that were relevant a decade ago are already losing value, and new ones are emerging just as quickly.

As American futurist and author of *Future Shock*, Alvin Toffler, famously observed, "The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn." His warning was not about education in the traditional sense, but about adaptability. In a world defined by constant change, the ability to continuously acquire and update skills becomes the single most important form of literacy.

That insight is particularly relevant for India today, where the challenge is no longer access to work, but readiness for it.



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Entire categories of jobs that once absorbed large sections of the workforce have either disappeared or shrunk dramatically. The neighbourhood PCO (Public Call Office) booth operator, once a common sight across India, has been rendered obsolete by mobile connectivity. Typists in offices have been replaced by digital workflows. Travel agents have given way to online booking platforms. In banking, many clerical functions have been automated, shifting demand toward customer advisory and digital roles.

Even in manufacturing, repetitive assembly-line tasks are increasingly handled by machines, requiring workers to operate, manage, and maintain automated systems instead. What is disappearing is not work itself, but low-skill, repetitive work.

What is emerging in its place is more demanding. Jobs now require digital familiarity, problem-solving ability, and continuous learning. The shift is

structural, and it is accelerating.

India adds close to a crore people to its workforce every year. A strong skilling ecosystem is essential to ensure this scale translates into productivity and shared prosperity.

The Rise of the Gig and Platform Economy

One of the most visible responses to this changing landscape has been the rapid expansion of the gig and platform economy.

From ride-hailing and food delivery to logistics, home services, and digital freelancing, millions of Indians are now part of a workforce that operates outside traditional employment structures. For many, gig work offers flexibility and immediate income.

But the gig economy also highlights the evolving nature of skills. A delivery partner today is not just navigating roads but also digital platforms, customer interfaces, and performance metrics. A freelance professional competes not just locally, but globally.

This shift brings both opportunity and responsibility. While gig work expands access to livelihoods, it also makes skill progression critical. Workers must move from low-value tasks to higher-value roles over time. With the right skilling pathways,

As India moves toward its ambition of becoming a developed economy by 2047, this gap will define the pace and quality of that journey. A multi-trillion-economy cannot be built on scale alone. It will require a workforce that is skilled, adaptable, and aligned with the needs of a rapidly changing economy.

The Skill Gap Beneath the Employment Story

As India's formal education system has expanded significantly, the next frontier is strengthening the bridge between academic outcomes and industry readiness.

Only a small share of India's workforce has undergone formal skill training. Even with recent improvements, the proportion has room for significant growth. According to the Periodic Labour Force Survey, formally vocationally trained individuals accounted for 3.7 per cent of the workforce in 2022–23.

This statistical gap reflects a deeper structural issue. A large number of young Indians are entering the workforce without the specific skills that modern industries demand. The India Skills Report 2024 places youth employability at just over 51 per cent. This reflects the significant opportunity that remains as skilling efforts continue to scale.

the gig economy can become a powerful engine for upward mobility and long-term career growth.

For India, the challenge is not to resist this shift, but to strengthen it. Skilling systems must recognise gig workers as a core part of the workforce and design programmes that enable mobility, stability, and growth within this segment.

Building a Skilling Ecosystem at Scale

Over the past decade, India has taken significant steps to address the skilling challenge. The launch of the Skill India Mission in 2015 marked a clear shift in approach, placing skill development at the centre of economic planning.

Since then, millions of individuals have been trained, upskilled, or reskilled across sectors. Large-scale programmes have expanded access, while investments in infrastructure have strengthened delivery. Thousands of Industrial Training Institutes have been established or upgraded, creating a broader network of training centres across the country.

Flagship initiatives such as the *Pradhan Mantri Kaushal Vikas Yojana* have played an important role in scaling training efforts. More recent iterations have begun to focus on emerging sectors, including artificial intelligence, robotics, and advanced manufacturing. Apprenticeship programmes have also gained traction, offering practical exposure that bridges the gap between training and employment.

Budgetary support has increased in line with these ambitions, reflecting a recognition that skilling requires sustained investment. Equally important has been the effort to align training with industry needs through frameworks such as the National Skills Qualification Framework and digital platforms that enable monitoring and feedback.

India has also started to position its workforce globally, entering into agreements with multiple countries for the deployment of skilled workers. This reflects a broader shift in thinking, from viewing labour as a domestic resource to recognising it as a global asset. These efforts have laid a strong foundation for India's skilling ecosystem.

Preparing for a Changing Economy

The urgency of skilling is amplified by the pace at which industries are evolving.

Manufacturing sectors such as automotive are undergoing a fundamental transition, driven by

automation, electric mobility, and digital production systems. The skills required in these industries are changing accordingly, with greater emphasis on electronics, diagnostics, and systems integration.

In parallel, digital technologies are reshaping the services sector. Artificial intelligence, data analytics, and cloud computing are creating new roles while rendering others obsolete.

The transition to a green economy adds another layer of complexity. As India expands its renewable energy capacity and invests in emerging areas such as green hydrogen, new categories of jobs are being created.

What connects these shifts is the need for a workforce that can learn continuously. Skilling can no longer be treated as a one-time intervention. It must evolve into a lifelong process.

Inclusion as a Growth Imperative

The success of India's skilling efforts will depend not only on scale and quality, but also on inclusion.

Efforts to bring more women into the workforce are gaining momentum, though significant potential remains to be unlocked. Continued focus on accessible training, childcare support, and flexible work arrangements will be key to accelerating this progress.

Rural India presents a different set of challenges. Limited access to training centres, infrastructure gaps, and lower awareness of opportunities can restrict participation.

Inclusion is not just a social objective. It is an economic necessity.

The Road Ahead

India's path to becoming a developed economy will be shaped as much by its people as by its policies. The foundations of a skilling ecosystem are being laid. The next phase will determine how effectively these efforts translate into outcomes.

The demographic dividend that India enjoys today is time-bound. Converting it into a sustained economic advantage will require coordinated action across government, industry, and academia.

Above all, there must be a shift in mindset. Skills are no longer static assets. They are dynamic capabilities that must be continuously built and renewed.

India has the scale. It has the ambition. With the right focus on skills, India is well-positioned to translate its scale into sustained economic leadership. □


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Skilling India for an Innovation-Driven Future

The national skilling agenda is not merely a labour market intervention but the civilizational project of Atmanirbhar Bharat. As India accelerates toward the centenary milestone of Viksit Bharat 2047, its future of work will be determined by the cognitive resilience, adaptive intelligence, and productive dignity of its population.

The Fourth Industrial Revolution (Industry 4.0) is profoundly restructuring the global economy. Driven by the convergence of artificial intelligence, advanced semiconductor fabrication, biotechnology, and green energy systems, Industry 4.0 is dissolving the distinctions between physical, digital, and biological modes of production. For India, a nation simultaneously inhabiting multiple development temporalities, from agrarian to frontier technology services, this structural rupture represents both an unparalleled opportunity and a definitive test of institutional imagination. The national macroeconomic bedrock is firmly in place. India's GDP surpassed USD 4.13 trillion in 2025, establishing a credible trajectory toward the world's third-largest economy by 2028. India's demographic arithmetic constitutes its greatest strategic asset but also an urgent challenge. With over 65% of the population below the age of 35 and a median age of 28 years, India has the world's largest reservoir of youthful productive energy.

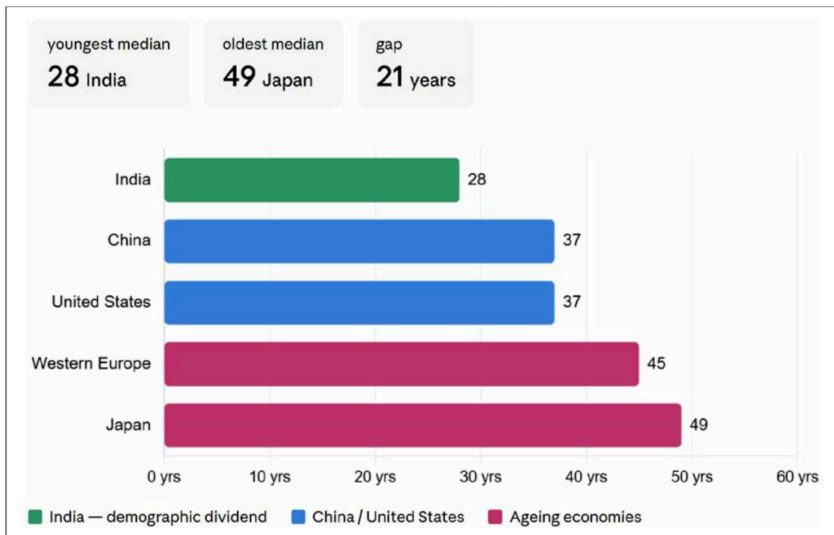
However, this advantage is available only temporally as India's working-age population share is projected to begin its decline after 2030. The window to convert this young cohort into high-productivity contributors is, therefore, time-limited, not a permanent condition. India must achieve this through an innovation-led ecosystem that rewards cognitive sophistication, adaptive learning, and technical mastery. Let us discuss the institutional and sectoral architecture India is building to meet this challenge.

Human Capital Development

The concept of Human Capital says that investments in education, training, and health generate returns at both individual and aggregate levels by augmenting productive capacity. In India, this framework has undergone a critical evolution: from its initial focus on primary enrollment rates and basic literacy toward advanced competency formation, digital fluency, and lifelong learning. However, there is a distinction between general human capital (transferable across employers) and firm-specific human capital (valuable within a single organisational context), which carries critical importance for India's vocational ecosystem. The hesitation of industry to invest meaningfully in apprenticeship training reflects that firms resist funding general capital formation whose returns competitors can freely appropriate.

The Economic Survey 2024-25 mentions a structural situation where a major segment of India's workforce is engaged in low-competency employment, and over 53% of graduates and 36% of postgraduates are underemployed in positions below their qualifications. This signals that the degree is structurally non-aligned to industry needs. Periodic Labour Force Survey (PLFS) 2025 confirms that while 67.8% of the population above 15 holds at least secondary education, formal vocational training coverage remains inadequate. The policy implications of this are directly reflected in recent reform architecture. The National Education Policy (NEP) 2020's emphasis on competency-based learning,

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Source: Institute for Health Metrics and Evaluation (IHME)

the National Credit Framework's (NCRF) portability mechanisms, and the *Pradhan Mantri* Skilling and Employability Transformation through Upgraded ITIs (PM-SETU) scheme's industry governance integration all represent deliberate institutional efforts to realign the production of human capital with robust competency formation.

Structural Integration

For a long time, India's skill development landscape operated in silos. IITs produced world-class engineering graduates whose primary destination was emigration or elite corporate employment, with insufficient feedback loops into domestic innovation ecosystems. The vast majority of vocational training institutions operated without industry guidance, producing graduates whose skills were systematically misaligned with evolving market demands. The consequence was the siloed landscape that the current reform wave is seeking to integrate. Lately, India has been advancing the integration of Institutions through programmes such as RDI, SPARC, NIDHI, IMPRINT, and the PLI (Production Linked Incentive) schemes. The Scheme for Promotion of Academic and Research Collaboration (SPARC) and Impacting Research

Innovation and Technology (IMPRINT) have pivoted the research mandate toward solving indigenous engineering and societal challenges, while the National Initiative for Developing and Harnessing Innovations (NIDHI) has established a robust pipeline for campus-based entrepreneurship. By aligning high-end research with large-scale industrial manufacturing, India is transitioning from a disconnected pedagogical system toward a unified model of innovation, where government policy, academic research, and industrial production are striving to function as a single, cohesive engine for national development.

Policy Metamorphosis

India's policy response in educational and vocational architecture represents one of the most ambitious reformulations among major emerging economies in the contemporary period. The distinction of the current reform wave lies in the government acting as the architect of a self-sustaining ecosystem of innovation in which industry, academia, and citizens are co-principals.

NEP 2020 represents the consequential restructuring of India's educational philosophy. It strives for the dismantlement of the rigid, colonial-era

bifurcation between academic education and vocational training. The NEP 2020 fixes this long-standing bias by treating vocational training as a prestigious career path rather than a fallback for struggling students. By creating a flexible system where practical skills and academic education are equally respected, it ensures that a carpenter's expertise is valued as much as a scientist's knowledge. The NCfR is enabling the creditisation of academic learning, vocational skills, and experiential learning within a single portable architecture.

The digital scaffolding of this institutional architecture is Skill India Digital Hub 2.0 (SIDH 2.0). SIDH centralises course discovery, enables portable digital credentialing, and integrates with *e-Shram* and the National Career Service to create a genuinely unified labour market information system. This could prove transformative in correcting the information asymmetries that systematically trap talented individuals in poorly matched educational and occupational pathways.

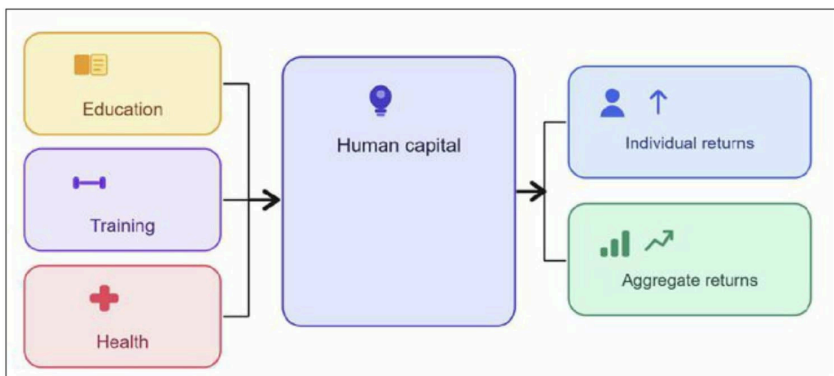
Sector-Specific Competencies for the Future Economy

India is strengthening the frontier technological domains in which sustained competitive advantage is strategically consequential. This reflects the acknowledgement that technological leadership increasingly determines geopolitical leverage and national economic resilience. The capacity to produce world-class talent in semiconductors, AI, and green energy is both a labour market concern as well as a dimension of strategic sovereignty. India is actively investing in these critical future domains.

Artificial Intelligence and Machine Learning

India's position in the global AI talent landscape accounts for approximately 16% of the worldwide AI talent pool. This reflects that the national investment in STEM (Science, Technology, Engineering, and Mathematics) education is now yielding strategic dividends at a moment when AI is emerging as the defining general-purpose technology of the 21st century. The Ministry of Skill Development and Entrepreneurship's tripartite framework of 'skilling in AI, skilling with AI, and skilling for AI' is conceptually sophisticated. It recognises that AI competency must simultaneously be a subject of specialised training, a tool that augments the learning process itself, and a generic capability embedded across all vocational and academic pathways. In order to realise this, the government aims to cultivate 1.25 million AI specialists by 2027.

The Rs 10,372 crore IndiaAI Mission's decision to strengthen GPU (Graphics Processing Unit) computing deserves particular attention. The computational infrastructure has historically concentrated AI research in the facilities of a small number of elite institutions and corporations. The AI Mission represents a genuine capability-expanding intervention. It enables researchers, startups, and academic institutions in Tier-2 and Tier-3 cities to participate in frontier AI development on commercially viable terms. The SOAR (Skiing for AI Readiness) programme, extending foundational AI literacy to school students and lifelong learners, ensures that this frontier-level investment has a broad human capital base.



A Generational Bet of Semiconductor Fabrication and Design

India is working to transform from a back-office design hub into a global manufacturing powerhouse. Currently, India is providing 20% of the world's chip design talent. This shift isn't just about economic growth but also a strategic move to secure supply chains. Following the disruptions of the pandemic and rising geopolitical tensions, India is racing to build its own semiconductor ecosystem to ensure it is less vulnerable to global shocks. The momentum of physical investment is now compelling. Micron Technology's USD 2.75 billion Assembly, Testing, Marking and Packaging (ATMP) facility in Sanand, Gujarat was inaugurated by The Prime Minister Narendra Modi in February 2026. Tata Electronics' Rs 91,000 crore fabrication plant in Dholera, developed in partnership with Taiwan's Powerchip Semiconductor Manufacturing Corporation and targeting 50,000 wafer starts per month, has completed land acquisition and begun site preparation for mid-2027 production. The HCL-Foxconn joint venture in Jewar, Uttar Pradesh, and the Tata Semiconductor Assembly and Test (TSAT) plant in Morigaon, Assam is projecting 48 million chips per day at full capacity, diffusing the geography of semiconductor manufacturing across the country's industrial landscape.

The human capital infrastructure supporting this industrial transformation is equally significant. The Chips to Startups (C2S) initiative has equipped 315 academic institutions with industry-grade Electronic Design Automation tools from Synopsys and Siemens, providing over 85,000 engineers with hands-on experience extending from device physics and circuit

design through physical fabrication and testing at the Semiconductor Laboratory (SCL) in Mohali. IIT Madras announced its SHAKTI processor project in October 2025 with a 2028 deployment target. These represent the qualitative transformation of India's semiconductor talent from a service-delivery workforce into a design-origination and manufacturing-leadership workforce. The result of this transition extends well beyond the labour market. It reduces vulnerability of supply chain disruptions, enhances leverage in technology diplomacy, and creates indigenous intellectual property.

Green Hydrogen and the 'Just Energy' Transition

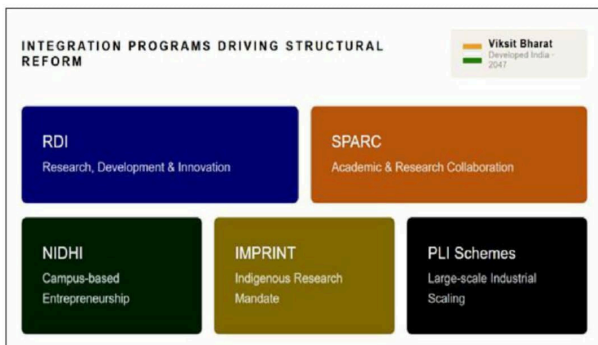
India's Net Zero 2070 commitment creates both an urgent demand for specialised green energy workforce capabilities and an opportunity to ensure that the decarbonization transition generates inclusive economic opportunity. The National Green Hydrogen Mission's dedicated skilling component, targeting 600,000 trained professionals by 2030, addresses the competencies of genuine complexity in electrolysis technology, speciality chemical handling, hydrogen storage systems, and fuel cell integration.

The concept of a 'just transition' necessitates that workers from carbon-intensive industries are equipped for and genuinely absorbed into green sector employment. It is an ethical as well as a political-economy necessity. NITI Aayog's recent publication '*Scenarios Towards Viksit Bharat and Net Zero*' highlights the structural challenge of spatial mismatch in green transition. The report highlights that large-scale renewable energy installations are located in remote geographies, while the skilled workforce remains concentrated in traditional urban industrial hubs. To bridge this gap, NITI Aayog advocates for a

dual-strategy approach that combines mobility-enabling infrastructure, allowing talent to move where it is needed, with community-level workforce development to build technical capacity within the local regions where these green energy projects are located.

The Orange Economy: AVGC and Creative Sovereignty

The global Animation, Visual Effects, Gaming, and Comics market (AVGC), valued



at approximately USD 800 billion, has historically captured Indian talent primarily as an outsourcing destination. Union Budget 2026-27 marks a strategic inflection: the government's decision to establish AVGC Content Creator Labs in 15,000 secondary schools and 500 colleges, and to target a USD 40 billion market share with 2 million jobs by 2030, represents the aspiration of India as a sovereign creator of cultural and creative capital, not merely a skilled subcontractor to global studios. The cultural and economic significance of this shift is worth emphasising. Indigenous IP creation in gaming, animation, and digital storytelling generates royalty streams, brand value, and cultural export revenue of a qualitatively different order from outsourced post-production. It also demands a technically proficient, entrepreneurially oriented, and culturally rooted human capital. India needs to build its AVGC sovereignty from the vast hinterland of cultural richness and creative intelligence that has always been India's most underutilised resource.

India as Global Skill Capital

Global labour shortages are projected to reach 85 million by 2030. India, by contrast, is positioned to generate a surplus of approximately 45 million skilled professionals over the same period. This is a massive labour market opportunity and a structural geopolitical leverage point. The academic debate over brain drain versus brain circulation is directly relevant here. The traditional brain drain framework, in which skilled emigration represents a net loss to the sending country, has been substantially revised by 'brain circulation', which represents the flow of capital, knowledge, networks, and technology that skilled diasporas generate back to their countries of origin, often creating innovation ecosystems of lasting consequence. The Indian diaspora has played a significant role in the growth of India's own technology sector through mentorship, venture investment, and knowledge transfer. The architectural transformation of India's approach to workforce mobility is being embedded in bilateral foreign policy frameworks. Bilateral agreements with the European Union, the United Kingdom, Australia, and the United Arab Emirates, the Migration and Mobility Partnership Agreements with Germany and Italy, and the India-Japan Specified Skilled Worker residency program, collectively constitute a new policy architecture in which human capital is explicitly recognised as a dimension of diplomatic leverage.

Grassroots Innovation and Uncodified Intellectual Wealth

The Indian Knowledge System represents one of the most extraordinary reservoirs of applied intelligence that any civilisation has accumulated. The national future skilling agenda must mainstream this civilisational inheritance. Thus, traditional knowledge and grassroots innovation must be recognised within the NCeR (National Credit Framework) with formal certification. Moreover, indigenous knowledge must be robustly documented, preserved and stored in a ready-to-be-retrieved format. This living, adaptive body of intelligence, when brought into productive dialogue with contemporary science and technology, can yield innovations of significant futuristic commercial and social value. Grassroots innovations with sound R&D can generate intellectual property of enormous worth.

India's frontier achievements in space technology, pharmaceutical manufacturing, and digital public infrastructure collectively demonstrate the robust national strength for world-class innovation. The scientists, engineers, and systems architects responsible for Chandrayaan-3, industrial-scale COVID-19 vaccine production, and the UPI platform each represent the measurable outcome of sustained, institutionally supported investment in technical and scientific capability. The structural limitation of India's innovation record, however, lies in the concentration of that investment. Excellence has, historically, been produced within a narrow band of institutions and geographic centres. The policy imperative of the current skilling agenda is the systematic extension of equivalent investment in infrastructure, pedagogy, and resourcing to the full institutional network, including Industrial Training Institutes, Skill Hubs, Jan Shikshan Sansthan, and PMKVY centres distributed across all districts.

The national skilling agenda is not merely a labour market intervention but the civilisational project of *Atmanirbhar Bharat*. As India accelerates toward the centenary milestone of *Viksit Bharat 2047*, its future of work will be determined by the cognitive resilience, adaptive intelligence, and productive dignity of its population. □

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Tahiruzzama



India's Labour Codes: Transforming Work, Empowering Workers, Building Viksit Bharat

For a country aspiring to become a developed economy by 2047, labour law reform cannot remain confined to statutory text. It must translate into living standards, safer work, social security coverage, and credible institutions of enforcement. The Codes provide the legal foundation. The next phase must focus on careful rulemaking, transparent implementation, capacity building, and continued dialogue among governments, employers, unions, and workers.

A Historic Restructuring of Labour Law

India's labour law reform through the four Labour Codes marks one of the most significant statutory reorganisations in the country's post-Independence legal history. By bringing into force the Code on Wages, 2019, the Industrial Relations Code, 2020, the Code on Social Security, 2020, and the Occupational Safety, Health and Working Conditions Code, 2020, with effect from 21 November 2025, the Government of India consolidated 29 central labour enactments into a more coherent legislative architecture. The reform is not just a codification. It reflects an attempt to reconcile three long-standing policy objectives that often appeared to be in tension: the protection of workers' rights, the simplification of compliance for employers, and the promotion of a formal, modern labour market suited to a fast-changing economy.

For decades, India's labour regulation was criticised for fragmentation, definitional inconsistency, overlapping compliance, and uneven enforcement. Different statutes contained different meanings of "wages," varied registration requirements, separate registers, multiple returns, and sector-specific thresholds that made legal compliance difficult, especially for enterprises operating across several states. The Second National Commission on Labour

(2002) had long recommended the consolidation of labour laws into a smaller number of thematic codes. The four Labour Codes are the legislative culmination of that recommendation.

Their significance lies not only in replacing older statutes but also in reframing the legal relationship between labour welfare and economic growth. In a country with a vast informal workforce, expanding platform work, interstate migration, and increasing demands for manufacturing competitiveness, the Codes seek to create a common legal foundation while retaining the welfare orientation central to Indian labour jurisprudence. The real test, however, lies in understanding both what the Codes provide and how far they can shape social and economic outcomes in practice.

From Fragmented Statutes to a Unified Framework

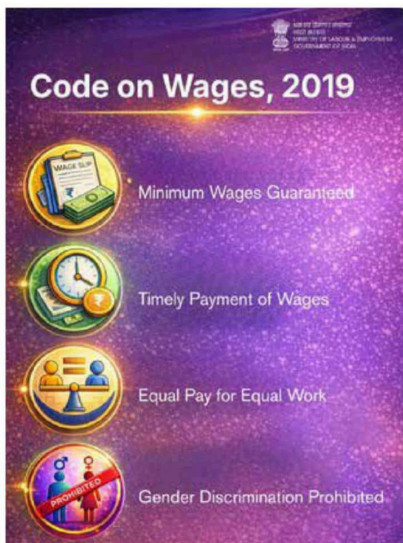
The architecture of the reform is straightforward. The Code on Wages, 2019, consolidates four laws relating to wages, bonuses, and equal remuneration. The Industrial Relations Code, 2020, consolidates three laws dealing with trade unions, standing orders, and industrial disputes. The Code on Social Security, 2020, consolidates nine laws concerning provident fund, insurance, maternity benefits, gratuity, and welfare schemes. The Occupational Safety, Health and Working

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Conditions Code, 2020 consolidates thirteen laws dealing with factories, mines, contract labour, migrant workers, dock work, plantations, and other workplace conditions.

This reorganisation is important because labour regulation in India has often developed in silos, disconnected from one another. The same employer could be subject to multiple definitions, separate inspectors, and repetitive filings under different statutes. By reducing this complexity, the Codes aim to improve legal certainty. This has relevance for enterprises seeking to expand employment, for MSMEs struggling with compliance burdens, and for workers who benefit when legal entitlements become easier to identify and enforce.

At the same time, consolidation should not be mistaken for mere simplification. The Codes also introduce substantive shifts. They widen the conceptual scope of labour law by recognising categories such as gig workers and platform workers, rationalise compliance architecture, and seek to standardise key concepts such as wages, registration, and dispute resolution. In policy terms, therefore, the Labour Codes represent both a legal clean-up and a structural attempt to adapt labour governance to new forms of work.



The Code on Wages: Towards Fairness, Uniformity and Transparency

Among the four Codes, the Code on Wages, 2019, has perhaps the widest conceptual reach because it applies to both organised and unorganised employment. One of its most important contributions is the introduction of a uniform definition of “wages.” Historically, different labour statutes used different definitions, enabling fragmented compliance and, in some cases, wage structuring designed to reduce the base for provident fund, gratuity, bonus, and other benefits. The new framework seeks to address that problem by harmonising the wage concept and limiting the extent to which allowances may be used to reduce the statutory wage base.

This definitional reform has major implications. By ensuring that excluded components of remuneration do not exceed the permissible threshold, the Code may increase the amount on which social security contributions and terminal benefits are calculated. From a worker welfare perspective, this enhances substantive protection. From an employer’s perspective, it creates greater predictability but may also increase compliance costs, especially for sectors where compensation structures were heavily allowance-driven. The importance of the wage definition had already been highlighted in judicial interpretation, especially in *Regional Provident Fund Commissioner (II), West Bengal v. Vivekananda Vidyamandir* (2019), where the Supreme Court emphasised that universally, ordinarily, and necessarily paid allowances cannot be artificially excluded for social security purposes. The Codes, in that sense, legislatively reinforce a principle that courts had already begun to protect.

The Code also empowers the Central Government to fix a floor wage based on minimum living standards, below which no state government may set its minimum wage. This is a significant policy innovation because it creates a national baseline while preserving space for state-level variation. It does not impose a single uniform wage across India; rather, it attempts to ensure that wage-setting reflects a minimum social standard without ignoring regional economic differences. This approach resonates with the constitutional vision reflected in Articles 38, 39, 41, 42, and 43, which place social and economic justice at the centre of governance.

The Code further strengthens wage governance by emphasising timely payment, bonus provisions, and non-discrimination in remuneration. Its absorption of



the principle of equal remuneration into a unified wage code is important not only from a compliance standpoint but also from a constitutional perspective, given India's commitment to equality and social justice. The Code thus links efficiency with dignity: it simplifies the law while reinforcing the principle that wages are not merely a market outcome but a matter of legal protection.

The Industrial Relations Code: Balancing Flexibility and Collective Rights

The Industrial Relations Code, 2020, addresses one of the most congested areas of labour policy: the balance between managerial flexibility and workers' collective protections. It brings together the law on trade unions, standing orders, and industrial disputes into a single statutory framework.

A central feature of the Code is the recognition of a negotiating union where a trade union has 51 per cent or more workers as members, and a negotiating council where no such majority exists. This seeks to reduce multiplicity in representation and facilitate structured collective bargaining. For industrial establishments, this can improve clarity in negotiations. For workers, it provides a more formal channel of representation,

though concerns remain regarding the practical inclusion of minority unions. The jurisprudential background to collective bargaining in India, including cases such as *Balmer Lawrie Workers' Union v. Balmer Lawrie & Co. Ltd.*, has long reflected the law's attempt to mediate industrial peace through representative mechanisms; the Code tries to carry that objective forward through statutory clarity.

The Code also formalises the concept of fixed-term employment, granting fixed-term employees parity in wages, benefits, and working conditions with permanent workers performing similar work. This is a notable reform because it attempts to reconcile labour market flexibility with fairness. Rather than relying excessively on informal or contract work, employers can use fixed-term arrangements within a regulated framework. The provision for gratuity after one year of service for fixed-term employees further strengthens this model.

At the same time, the Code raises the threshold for prior government permission for lay-off, retrenchment, and closure from 100 workers to 300 workers in certain establishments. It is argued that this encourages enterprise growth by reducing regulatory rigidities that previously discouraged employers from crossing workforce thresholds. The legal significance of this change lies in the fact that it rebalances the labour-capital relationship in favour of operational flexibility, though there is debate over whether adequate countervailing protections remain. That debate must be read against the broader constitutional position that while the right to carry on business under Article 19(1) (g) is protected, labour regulation has consistently been upheld as a permissible and necessary instrument of social control.

The requirement of prior notice for strikes and lockouts across establishments is another major shift. It aims to promote industrial peace and encourage conciliation before disruption. Yet its practical impact will depend on whether it is used to strengthen dispute resolution or to constrain collective action disproportionately. In that sense, the Industrial Relations Code reflects the broader philosophy of the labour reform project: formalisation, predictability, and negotiated order, but accompanied by continuing questions about the future of labour power.

The Social Security Code: Expanding the Idea of Labour Protection

The Code on Social Security, 2020, is perhaps the most ambitious of the four Codes in terms of welfare vision. By consolidating nine laws into a common framework, it seeks to rationalise the administration of social protection for provident funds, employee state insurance, gratuity, maternity benefits, and welfare measures.

Its most discussed innovation is the statutory recognition of gig workers and platform workers. This is a major conceptual development in Indian labour law. Traditional labour statutes were often built around conventional employer-employee relationships and therefore struggled to respond to app-based and digitally mediated work. By defining these categories and enabling scheme-based social security support, the Code acknowledges that the future of labour protection cannot be confined to standard employment alone.

However, this recognition must be understood carefully. The Code creates the legal framework for extending benefits to gig and platform workers; it does not mean that universal and fully operational

coverage already exists in practice. The effectiveness of this reform depends on the framing of schemes, contribution mechanisms, registration systems, and intergovernmental coordination. Therefore, while the Code is pathbreaking in legal design, implementation remains the key challenge. This distinction between statutory promise and enforceable benefit is essential for any serious legal assessment of the reform.

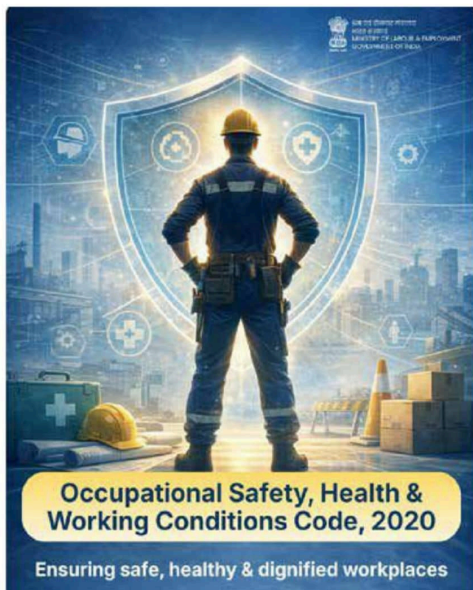
For workers in conventional sectors, the Code preserves and reorganises important protections relating to maternity benefits, gratuity, provident fund, and employee insurance. It also carries considerable significance for unorganised workers and inter-state migrant workers, especially when read alongside the digital registration ecosystem built around e-*Shram*. In policy terms, the Social Security Code reflects a movement from fragmented welfare statutes toward the idea of a more portable and integrated social protection system.

This shift is particularly important in the context of labour market mobility. Workers increasingly move across employers, sectors, and states. Social protection systems built around static or long-term industrial employment are therefore insufficient. By seeking greater portability and broader categories of inclusion, the Social Security Code responds to structural changes in the Indian economy, even though its promise will depend on the seriousness of execution. The Supreme Court's observations in *Bandhua Mukti Morcha v. Union of India* and related social justice jurisprudence remind us that labour welfare cannot be viewed narrowly; it is tied to dignity, health, and constitutional citizenship.

The OSHWC Code: Safety, Health and Dignity at Work

The Occupational Safety, Health and Working Conditions Code, 2020, (OSHC Code) consolidates thirteen laws dealing with workplace health, safety, welfare, and working conditions. Its importance lies in the fact that labour reform cannot be judged solely through the lenses of wage and flexibility; the quality and safety of work remain equally central.

The Code addresses several dimensions of workplace governance: appointment letters, working hours, leave, welfare facilities, contract labour regulation, and the rights of inter-state migrant workers. Its provisions



relating to safety committees, welfare officers, medical examinations, and regulated hours are designed to modernise workplace administration while promoting minimum standards of humane work. By unifying standards across multiple sectors, the Code attempts to reduce uncertainty without undermining the protective purpose of workplace regulation.

The inclusion of protections relating to women working at night, subject to conditions concerning safety, consent, and safeguards, reflects a more contemporary understanding of workforce participation. Equally important is the treatment of migrant labour. India's experience during the pandemic exposed the legal and administrative invisibility of many migrant workers. By bringing greater attention to registration, portability, and welfare, the Code attempts to respond to that structural weakness.

Another important reform under the OSH framework is the raising of the threshold for the applicability of certain provisions relating to contract labour. From the perspective of employers, this reduces compliance burdens for smaller establishments. From the perspective of workers, however, the issue remains whether threshold-based exemptions create gaps in protection. Thus, as with the other Codes, simplification and inclusion are accompanied by difficult policy trade-offs. The law of occupational safety has long rested on the principle that productivity cannot be divorced from human welfare; the Code retains that foundational insight while seeking to modernise regulatory design.

Policy Impact: Reform, Formalisation and the Limits of Transition

The policy rationale behind the Labour Codes is clear: simplification of labour regulation, reduction of compliance duplication, expansion of social protection, and support for formal employment growth. Official data indicates growing social security coverage, rising *e-Shram* registrations, and wider administrative reach of institutions such as ESIC (Employees' State Insurance Corporation). These trends suggest that the labour reform agenda is being situated within a larger project of formalisation and welfare delivery.

Yet policy impact must be measured carefully. It is analytically unsound to treat statutory enactment as equivalent to completed transformation. Labour is a subject on the Concurrent List, and therefore, state-level rulemaking remains critical. The pace and quality of implementation across states will determine whether

the Codes operate as a truly national framework or as an uneven reform patchwork.

Moreover, the shift from the older inspector-based model to an Inspector-cum-Facilitator approach is normatively significant. In theory, it encourages compliance assistance rather than adversarial enforcement. In practice, however, concerns remain that facilitation without sufficient inspection capacity may dilute deterrence, especially in sectors marked by informality and vulnerability. Similarly, digital platforms such as *e-Shram* can improve registration and portability, but digital exclusion, language barriers, and limited awareness can weaken their transformative potential.

The real policy impact of the Labour Codes, therefore, lies not only in what they simplify for employers but also in whether they deepen enforceable rights for workers. Their success should ultimately be measured by better wages, safer workplaces, wider coverage, lower precarity, and more reliable dispute resolution. From a legal policy perspective, the Codes should be viewed not as the end of labour reform, but as the beginning of a new regulatory phase in which implementation, institutional capacity, and social dialogue will determine outcomes.

The Road Ahead

India's Labour Codes represent an important attempt to build a modern labour law system compatible with both economic growth and social justice. Their strength lies in consolidation, conceptual expansion, and administrative rationalisation. Their promise lies in bringing clarity to employers, dignity to workers, and coherence to labour governance. Their challenge lies in implementation, particularly across states and in the vast informal economy.

For a country aspiring to become a developed economy by 2047, labour law reform cannot remain confined to statutory text. It must translate into living standards, safer work, social security coverage, and credible institutions of enforcement. The Codes provide the legal foundation. The next phase must focus on careful rulemaking, transparent implementation, capacity building, and continued dialogue among governments, employers, unions, and workers.

If implemented with fidelity to both efficiency and welfare, the Labour Codes can become more than a legal restructuring. They can become a framework for a more formal, fair, and future-ready world of work in India. □



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Bolstering Maritime Prowess: Union Minister for Defence Shri Rajnath Singh officially commissioned the advanced stealth frigate INS Taragiri into the Indian Navy in Visakhapatnam, Andhra Pradesh on 3 April 2026. Embodying the spirit of Aatmanirbhar Bharat, the vessel features over 75% indigenous content and exemplifies India's shipbuilding prowess.





Source : PIB

From Forest to Fashion

Tribal India Enters Global Value Chains

As India's tribal communities step into global value chains, one thing is clear- what tribal artisans create cannot be replicated by machines, and that very uniqueness has become their strongest advantage in an era of mass production. Initiatives like TRIFED and RISA are helping translate this strength into sustainable income and dignity.

The Quiet Revolution in India's Tribal Heartlands

India's tribal communities are redefining their place in the global economy, transforming forest-based livelihoods into sustainable, high-value products that resonate with modern consumers. This shift from subsistence to enterprise reflects a broader reimagining of tribal economies, where tradition is no longer isolated but integrated into national and global markets.

This transformation is vividly showcased at the Bharat Tribes Fest 2026, being held from 18–30 March 2026 at Sunder Nursery, New Delhi. Envisioned by the Tribal Cooperative Marketing Development Federation of India (TRIFED) in association with the Ministry of Tribal Affairs, the festival serves as a national platform where India's tribal heritage comes alive in its most dynamic form. Celebrating craft, culture, entrepreneurship, and livelihoods, it brings tribal traditions to the forefront of the country's cultural and economic landscape.

This transformation is driven by targeted policy interventions, including RISA: A Premium Tribal Brand, alongside programmes like the *Van Dhan Yojana* and the Tribes India network. Tribal artisans are transitioning from forest-based livelihood economies to active participation in global value chains. What emerges is a story that is equal parts heritage and ambition, where forests meet fashion, and ancient skills find their true market value.

The Tribes India Model: From Van Dhan to Value Chain

India's tribal economy is being systematically reshaped through institutional frameworks that combine livelihood security with market access. The Government has recognised that tribal communities, among the nation's most skilled artisans, require more than support; they need empowerment. This means enabling a structural transformation from mere suppliers of raw materials to creators and owners of brands that can command premium prices in global markets.

The TRIFED-led Tribes India network directly connects tribal producers to urban consumers, eliminating intermediary chains. *Van Dhan Vikas Kendras* (VDVKs) are community-owned centers launched by the Ministry of Tribal Affairs and TRIFED to promote sustainable livelihoods for tribal gatherers. They focus on value addition, processing, and branding of Minor Forest Produce (MFP) to enhance tribal incomes. Each VDVK cluster is structured as a federation of 15 tribal Self-Help Groups (SHGs), also known as *Van Dhan Kendras*. Each SHG comprises up to 20 tribal Non-Timber Forest Produce (NTFP) gatherers or artisans, bringing together nearly 300 beneficiaries within a single cluster and enabling collective enterprise development.

Key Festival Highlights

* 75 Van Dhan Vikas Kendras

* 400+ Tribal Artists

* 17 Live Demonstrations

* 310 Art & Craft Participants

* 120 Tribal Cuisine Participants



This model enables collective procurement, shared processing infrastructure, skill development, and stronger market linkages, thereby enhancing efficiency and bargaining power. Women in Bastar who process mahua or tamarind are no longer just cultivators; they are emerging as micro-entrepreneurs integrated into formal value chains. At the same time, RISA is elevating tribal craftsmanship, repositioning it as a premium offering in the global marketplace.

Tribal producers bring raw forest products, minor forest products and handicrafts to these *Van Dhan Vikas Kendra* centres where quality-grading, value addition, packaging and documentation is done. From there, the products move through Tribes India's retail network-stores in major airports and premium malls, as well as e-commerce platforms, before reaching international buyers and fair-trade markets.

TRIFED has also forged partnerships with design institutions, including the National Institute of Fashion Technology (NIFT), to ensure that traditional craft forms are adapted for contemporary consumer preferences without diluting their cultural authenticity. A Dokhra pendant from Chhattisgarh, once sold for a nominal sum to a local intermediary, now commands several times that value under its own certified identity.

Women Driving the Tribal Economy

The most transformative thread in this story is gender. Women are not passive beneficiaries- they are the producers, leaders, and quality guardians driving change. Women-led cooperatives have become hubs of economic empowerment, enabling collective savings, micro-lending, and shared investment in raw materials.

For many, TRIFED has provided their first formal economic identity, turning previously unrecognised subsistence work into documented labour.

At Bharat Tribes Fest 2026, these transformations are not only visible in measurable outcomes but also reflected in the lived realities and stories of the women

RISA: Timeless Tribal A Premium Tribal Brand

RISA, led by the Ministry of Tribal Affairs, is a flagship initiative to position tribal crafts in premium domestic and global markets. Inspired by the traditional Risa fabric of Tripura, it blends heritage with contemporary design and branding.

Key Features

- Designer-artisan collaborations for modern, market-ready collections
- Strong focus on innovation, quality, and global positioning
- Development and strengthening of tribal craft clusters

Featured Crafts

- Eri & Muga Silk – Assam
- Kotpad Cotton – Odisha
- Changpa Pashmina – Ladakh
- Toda Embroidery – Tamil Nadu
- Longpi Pottery – Manipur
- Turtuk Brass Cutlery- Ladakh
- Dokhra Art- Chhattisgarh.

themselves, offering a compelling window into their voices and experiences.

Changemakers Weaving Tradition into Tomorrow

24-year-old, Debongshi Chakma, a young entrepreneur from the Chakma tribe, hailing from Kamalanagar in Mizoram's Lawngtlai district, is quietly scripting a powerful story of change, where tradition is not left behind, but carried forward into the global marketplace. Rooted deeply in Chakma cultural heritage, she is reimagining indigenous knowledge systems as pathways to dignity, identity, and economic empowerment.

As the founder of the Bodhibloom Society, Debongshi leads a vibrant collective of over 500 members, with a strong and conscious emphasis on empowering women, particularly those facing social and economic vulnerabilities, including divorced women. Her initiative goes beyond a single craft; embracing a diversified, community-driven model of livelihood creation. From handwoven textiles and traditional food practices to jhum (shifting) cultivation and bamboo-based products, her work seamlessly integrates ecology, culture, and enterprise.

Operating in a region where mechanised infrastructure, Debongshi's journey highlights the resilience and ingenuity of tribal communities. Through collaboration with TRIFED, her products now reach audiences far beyond local markets, turning traditional practices into sustainable income while preserving cultural authenticity. With global consumers drawn to handcrafted, eco-friendly goods, her work sits at the intersection of sustainability and heritage.

Translating Heritage into Handloom

At 23, Urmila Sonwar, a Santhal artisan from Kajri village in Jharkhand, is emerging as a young designer inspired by her cultural and ecological surroundings. Her work draws on "Barah Khand," a sacred local



ritual, and the mountainous landscape of her village, translating these elements into handwoven sarees that are both visually striking and deeply rooted in identity.

Having completed her schooling up to Class 12, Urmila dedicated herself to weaving, turning heritage into livelihood while preserving indigenous traditions. Her designs not only sustain her economically but also bring wider recognition to Santhal culture, positioning local crafts in broader national and global markets. Through her work, she embodies a new generation of artisans who are cultural ambassadors, carrying forward their community's legacy with creativity and purpose.

The Elders Who Hold the Thread

For 42-year-old Sangeetha, a Toda artisan from the Nilgiri Hills of Tamil Nadu, embroidery is not a learned skill but a lifelong inheritance. Working with red and black thread on coarse white cotton, she creates intricate geometric patterns passed down through generations of women.

With the Toda community numbering barely a thousand, this tradition remains deeply fragile. Most pieces seen beyond the Nilgiris are the result of decades of practice, begun as early as adolescence. Sangeetha

serves as both practitioner and bridge, carrying this craft to wider platforms while ensuring recognition and returns reach the women who sustain it.

From Waste to Worth: A Sustainable Craft Journey

At 45, Anita Rana, of the Tharu tribe in Udham Singh Nagar, Uttarakhand, demonstrates how traditional ecological knowledge can power sustainable livelihoods. As part of a women's collective now spanning over 300 members, she has gained better market access, fair pricing, and opportunities to showcase her work at platforms like the SARAS Fair and tribal festivals.

Her craft centres on Munja grass weaving- a seasonal, biodegradable resource transformed into functional items such as roti hot cases, offering an eco-friendly alternative to plastic. By training younger women, Anita is preserving this indigenous practice while enabling dignified livelihoods within her community. Her journey reflects how sustainability, tradition, and enterprise can come together to create a lasting impact.

Growth Rooted in Identity

As India's tribal communities step into global value chains, one thing is clear- what tribal artisans create cannot be replicated by machines, and that very uniqueness has become their strongest advantage in an era of mass production. Initiatives like TRIFED and RISA are helping translate this strength into sustainable income and dignity.

With the expansion of *Van Dhan Vikas Kendras*, the growth of Tribes India's e-commerce presence, and rising visibility at platforms such as Bharat Tribes Fest 2026, artisans across regions can engage with the market on their own terms, as creators rather than beneficiaries.

From forest produce to global design spaces, tribal India is not just producing goods- it is shaping a model of development that is sustainable, inclusive, and deeply rooted. □

Source : PIB



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Smart and Sustainable Agriculture: A Synergy of Tradition and Technology

Tribal botanical knowledge teaches us that we are not masters of nature, but rather a part of it. Nanotechnology shows us the power of precision. When these two are combined with the speed of the digital age, a “smart livelihood” will emerge that is sustainable, dignified, and profitable. This approach teaches us to use science not to conquer nature, but to connect more deeply with it.

In a rapidly changing global landscape, as humanity grapples with the complex challenges of climate change, resource depletion, and food security, agriculture has transformed from a mere means of production to the foundation of sustainable development and economic self-reliance. This transformation holds particular significance for an agricultural nation like India. Here, centuries of accumulated traditional botanical knowledge and a nature-friendly philosophy are paving the way for a new agricultural revolution, combined with modern science and technology. The integration of nano-fertilisers, artificial intelligence, digital platforms, and precision agriculture technologies is propelling Indian agriculture from “subsistence” to “smart and sustainable livelihoods.” This innovative integration of tradition and technology not only ensures increased productivity and income but also has the potential to achieve environmental balance, social inclusion, and the dream of a self-reliant India. This integrated approach will pioneer the agriculture of the future, laying the foundation for a prosperous, green, and sustainable India.

The changing nature of work in agriculture is moving beyond the traditional realm of manual labour to “intellectual innovation” and “digital management.” Future agriculture is no longer merely a means of

subsistence, but is emerging as a high-tech, skill-based “smart livelihood.” In this paradigm shift, farms will now play the role of “data centres,” where a young farmer will not only plough the fields but will also make a name for himself as a drone pilot, data analyst, and agri-technology expert. This “future of work” integrates modern tools like artificial intelligence and nanotechnology with the age-old “ecological wisdom” of tribal communities. As we move from subsistence farming to smart entrepreneurship, it not only increases rural incomes but also revitalises agriculture as a prestigious and economically sovereign career option.

Traditionally, agriculture was considered merely a means of subsistence, where the farmer's primary goal was to meet the minimum needs of his family. Today, agriculture is no longer limited to the primary function of food production; it has become a global pillar of direct employment, technological innovation, nutritional security, supply of industrial raw materials, and, most importantly, environmental protection. This paradigm shift has established agriculture as a powerful “agri-business”, where value addition, processing, cold-chain storage and digital marketing have become as important and essential as production, right from sowing seeds in the field to reaching the end consumer's plate.

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In an agriculture-based economy like India, the sector's central role has always been undeniable. Approximately 54.6 per cent of the country's workforce still directly or indirectly depends on agriculture and allied sectors for their livelihoods, while its contribution to national gross value added remains between 18 and 19 per cent. India's production volume and diversity have established it as a global powerhouse. India's leading position in the field of staple crops like rice, wheat, sugarcane and cotton, as well as fruits, vegetables, dairy production and spices, not only ensures our internal food self-sufficiency but also makes India a reliable link in the chain of global food security.

In this modern and transformative era of agriculture, the importance of tribal botanical knowledge is being reestablished in a new and scientific perspective. Traditional botany is not merely a collection of old tales, but an authentic scientific study of the subtle knowledge traditions through which local and tribal communities have lived in harmony with plants for thousands of years. This knowledge offers a comprehensive and reliable analysis of plant classification, their medicinal properties, their role in ecosystems, cultural value, and hidden economic potential. It is essential to understand that this knowledge is not a lifeless relic of tradition, but rather the most solid and practical foundation for sustainable development in modern times. India is considered one of the world's richest countries in this respect, home to over 700 tribal communities with

their own distinct cultures, who are the true custodians of this invaluable traditional knowledge. From the rugged peaks of the Himalayas to the biodiverse hills of the Western Ghats, and from the scorching Thar Desert to the dense rainforests of Northeast India, each geographical region has developed its own distinct and rich plant science tradition.

The respect, compassion, and scientific approach to plants in the Indian tradition are abundantly mentioned in our oldest texts. The Rigveda and Atharvaveda hymns elaborately describe the glory of medicinal plants and their healing properties. Similarly, the *Charaka Samhita* and *Sushruta Samhita*, the cornerstones of Ayurveda, contain meticulous and scientific descriptions of hundreds of medicinal plants, which astonish even modern researchers. This knowledge not only guides the treatment of diseases but also establishes a balanced relationship between nature and humans. Currently, more than 7,000 plant species are actively used in various medical systems in India – Ayurveda, Siddha, Unani and folk medicine – which is a testimony to the country's rich biodiversity and ancient scientific knowledge.

Medicinal plants found in diverse geographical regions such as the Himalayas, the Western Ghats, Northeast, and Central India not only aid in the prevention and treatment of diseases, but also promote holistic health and a balanced lifestyle. Plants such as Ashwagandha, Giloy, Tulsi, Turmeric, and Neem are



renowned worldwide for their immune-boosting, antimicrobial, and healing properties. Their importance has also been recognised by modern medical science, leading to a steadily expanding global market for herbal medicines, nutraceuticals, and natural products. Thus, the unique gifts that traditional and tribal botanical knowledge have provided to modern medicine are truly incomparable. For example, reserpine, derived from the roots of *sarpagandha*, revolutionised the treatment of hypertension, while quinine, derived from cinchona bark, proved to be humanity's most effective weapon against malaria. Similarly, drugs like vincristine and vinblastine, derived from evergreens, have raised new hopes for the treatment of deadly diseases like cancer. All these examples attest to the fact that the botanical wealth inherent in Indian tradition and tribal knowledge has been a strong foundation for the development of modern medical science. Even the antiseptic and antimicrobial properties of turmeric and neem, readily available in our kitchens, have been recognised worldwide. They are being widely used not only in medicine, but also in cosmetics, agriculture, and biotechnology. All these examples bear witness to the irrefutable truth that traditional knowledge often forms the foundation of modern scientific inventions.

Thus, this integration of ancient tradition and modern science paves a strong path towards sustainable development and human well-being. This knowledge of local and tribal communities is not limited to medicine but also provides effective solutions to complex crop management problems. For example, many traditional societies use neem leaves or special clay coatings to preserve grain, which prove to be safer and more environmentally friendly than modern chemicals. Their seed selection process plays a vital role in preserving genetic diversity. They know exactly which seeds are suitable for which type of soil and which season. This nuanced empirical understanding appears to be a natural and practical form of the concept of modern genome mapping.

When modern agricultural scientists interact with these communities, they find solutions that are sometimes elusive even in sophisticated laboratories. Sophisticated forms of penda agriculture and shifting cultivation, prevalent in forest-dependent areas, teach how to develop a balanced and prosperous ecosystem by blurring the line between forest and farmland. These traditional methods have also become increasingly important for agricultural sustainability and environmental protection. Mixed farming, scientific

crop rotation, organic fertilisers made from locally available resources, natural pesticides, and rainwater harvesting techniques, once considered outdated, have now become the global gold standard for sustainable agriculture. These practices not only maintain soil biological fertility but also help improve groundwater levels and minimise chemical pollution. The Food and Agriculture Organization of the United Nations has also repeatedly underlined the fact that combining the empirical knowledge of local communities with mainstream science is essential to achieving the goals of climate-resilient agriculture. Their lifestyles provide excellent examples of low carbon emissions, conservation of biodiversity, and balanced use of natural resources. Their traditional rules for protecting forests and water sources prove to be more effective and community-based than modern environmental laws. Indeed, the philosophy that "the Earth is our mother and we are her protectors" should be the keystone of future agriculture.

While tradition connects us to our roots, modern science and technology are empowering agriculture to meet the challenges of the future. In this context, nanotechnology has emerged as a landmark achievement. Nano-fertilisers, which operate at the microscopic level, are transforming the entire agricultural landscape. Compared to conventional fertilisers, they deliver targeted nutrition directly to plant tissues, minimising nutrient wastage and significantly increasing their utilisation. The diverse applications of nanotechnology make this transformation even more impressive.

For example, nano zinc and nano iron improve crop quality and yield by addressing micronutrient deficiencies; nano copper and nano pesticides protect plants from diseases and pests; nano silica strengthens plant cells, making them more tolerant to drought and adverse conditions; while nano sensors enable precision farming by assessing soil moisture, pH, and nutrient availability in real time. This precision management is proving to be the cornerstone of the agriculture of the future. The benefits of nano-fertilisers are not limited to production, but extend to environmental protection and economic viability. According to soil science, only 30-40 per cent of conventional urea is absorbed by plants, while the remainder pollutes soil and groundwater. In contrast, nano urea has been shown to have a utilisation rate of over 80 per cent, reducing nutrient losses and decreasing fertiliser dependence. Consequently, the burden of fertiliser subsidies is

reduced, and the country's fiscal health is improved. Thus, the nano-revolution is a significant step towards green and sustainable agriculture.

Technological interventions don't stop there; the digital revolution in agriculture has connected the farm's boundaries to the global market. With the integration of artificial intelligence, the Internet of Things (IoT), big data analytics, and drone technology, the dream of precision agriculture is becoming a reality. Today, a farmer can access accurate weather forecasts, a soil health card, early warnings about potential pest attacks, and price comparisons across different markets, all through their smartphone. Drones not only enable the spraying of pesticides and nano-fertilisers with extreme efficiency, but also enable the monitoring of large farms in a jiffy. Digital platforms like e-NAM have eliminated the role of middlemen and provided direct access to national markets for farmers, increasing both transparency and profitability in agricultural operations. Sensor-based irrigation systems now determine the amount of water required by each plant, preventing the wastage of water resources.

The use of blockchain technology in future agriculture will ensure food safety and farm-to-fork traceability. Consumers will now know which seeds were used in their food, which nano-fertilisers were added, and which farmer's field it came from. This transparency will multiply the value of organic products and traditional grains like millets or Shree Anna in global markets. Technologies like Digital Twins are now creating digital models of farms, allowing accurate production forecasts even before sowing. This combination of technology and data is the true hallmark of "smart agriculture," transforming farming from speculation into a systematic science.

This shift is opening doors to self-reliance, especially for youth and educated women, and stemming migration to cities. Small processing centres and agri-startups springing up in rural areas have transformed farmers from raw material producers to entrepreneurs. Farmers are no longer simply selling grain, but are increasingly able to secure fair prices for their produce through branding and packaging.

Various schemes of the Government of India are the result of this modern thinking. While the *Pradhan Mantri Kisan Samman Nidhi* provides financial security to farmers, the Soil Health Card encourages them to practice scientific farming. The AgriStack being built under the Digital Agriculture Mission will be a vast

repository of data that will provide personalised advice to every farmer based on their land. Additionally, initiatives like the Traditional Knowledge Digital Library (TKDL) for the preservation of traditional knowledge have proven to be a milestone in preventing biodegradation. The Biodiversity Act has ensured local communities have rights over their traditional knowledge and a share in the benefits arising from it.

Carbon credit farming is a new emerging area to mitigate the effects of climate change. Farmers will be able to sell carbon credits on the international market by planting trees on their farms and absorbing carbon through traditional methods. This 'eco-service' will be a major part of future livelihoods. Tribal communities, who have been protecting forests for centuries, could be the biggest beneficiaries of this new economy. The future of agriculture lies not just in "higher production," but in "responsible production." We must understand that in future farming, "soil health" will be considered "bank balance."

The most crucial aspect of this transformation is climate resilience, which will become the true guarantor of future global food security. As global temperatures rise and monsoon cycles become more erratic, this combination of traditional crops and modern technology will emerge as a shield. Tribal communities possess a treasure trove of little-known and endangered seeds that have the natural ability to withstand extreme droughts or excessive rainfall.

For future agricultural success, educational and research institutions must also transform their role. Now is the time not just for bookish knowledge, but for field research and experimentation. Students must understand the interconnections between agricultural science, tribal culture, and nanoscience. Systems for providing local communities with appropriate recognition and royalties for their knowledge must be strengthened. It is essential to spread digital literacy in rural areas so that the benefits of technology reach the last-mile farmer. Cooperatives and farmer-producer organisations must be further strengthened so that even small and marginal farmers can take advantage of large machinery and global markets. This combination of social innovation and technological progress will bring about the real revolution.

The goal of inclusive development remains unfulfilled unless the benefits of these changes in agriculture reach tribal and backward areas equally. The livelihoods of the future are not just about income, but also about quality of life and protecting

the environment. We must champion this “Indian model” globally. Missions like “LiFE” (Lifestyle for Environment), which India has proposed on the global stage, reflect these traditional and modern methods of agriculture. When the world talks about “zero hunger,” India offers the solution of “nutrient-rich food,” a product of nano-fertilisers and tribal wisdom. India will serve as a hub for future agriculture, where the world will learn the tricks of sustainable farming.

The above discussion makes it clear that the future of work in agriculture will emerge as a coordinated, innovative, and visionary system, where the love for nature and centuries of experience of traditional communities, the precision efficiency of nanofertilisers, and the rapid pace of digital technology will complement each other. This transformation will not be limited to the struggle for subsistence, but will move towards ‘smart and sustainable livelihoods’ that ensure economic prosperity, environmental balance, and social inclusion.

To achieve this goal, it is very important to establish Smart Agriculture Service Centres in every village, subsidy for nanofertilisers, development of training and demo farms, documentation of traditional agricultural knowledge and its coordination with scientific research, expansion of rainwater harvesting and micro irrigation systems for water conservation, empowering farmer producer organisations and connecting them to digital markets like e-NAM, strengthen the digital literacy of farmers through local languages and to establish strong partnerships between research institutes, agricultural universities, private sector and the government.

Thus, the agriculture of the future will be intelligent, sensitive, and sustainable, where tradition and technology complement each other, ushering in a new golden era and a milestone towards a ‘Viksit Bharat 2047.’ This synergy will make Indian agriculture self-reliant, prosperous, and environmentally friendly, leading it towards a strong, inclusive, and sustainable future. □

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Mother Nargis

In 1972, when there was scant knowledge of cerebral palsy, Mother Nargis became the first patron of the Spastics Society of India. Her extensive work focused attention on the impairments suffered by the affected children. This role won her the nomination to the Rajya Sabha in 1980.

May 6, 1981. Sunil Dutt's *Rocky* was released nationwide. But Nargis Dutt was not there to see the debut of Sanju. Just three days prior to it, on May 3, she had lost the epic battle she was fighting with cancer. Through it, her husband had taken time off to direct the son she doted upon – in an action drama where he himself had played the guest role of a socially committed worker. His darling wife's cancer needed him to be in New York for a long stretch of time. This had resulted in the Ajanta Arts production being directed partly by Rahul Rawail, partly by Raj Khosla. And still, even in the aftermath of his huge loss, Sunil Dutt had battled on to release his son's launch vehicle. Because? The mother believed this was the only way to bring their wayward son back to normalcy.

Nargis Dutt was born to Jaddan Bai, a renowned singer who had emerged from the Tawaif tradition that had earlier seen Gauhar Jaan become the first Asian voice to be recorded on a gramophone. Jaddan Bai too became a first in many fields, based on her vocal strength as much as her chutzpah. The first

Bai to shift to Bombay, the epicentre of Indian cinema, from Calcutta, then the capital of Hindustani music, she rose to be a singer, actor, music director who launched singing star Suraiya, and a producer who launched her daughter, Fatima Rashid with *Talash-e-Haq* (1935). As *Nargis*, the child artist acquired a new identity and, in time, she went on to be the first actress to win the National Film Award (*Raat Aur Din*, 1967), the first actress to be conferred a Padmashri (1958), and the first Indian to win an international award, at Karlovy

Vary (*Mother India*, 1957). She was also the first actor to have a National Film Award category, National Integration, named after her and the first actress to have a street named after her, in Bombay's Pali Hill.

Having grown up in the world of cinema and performing arts, Nargis Dutt believed in the power of moving images. Of succumbing to the personas. Of singing and dancing, of loving and losing. That is why, when she realised that her firstborn, whom she'd spoil with her pampering protection when his father tried to discipline him, needed help to fight the



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demon of drugs, she urged her husband to launch their son. Sanjay had suppressed his grief at the loss of his mother until he heard a recorded message while in rehab. And decades later, he sought the calm of solitude and sat all by himself in the room his mother was born in, in a house on Kolkata's Indian Mirror Street.

Sunil Dutt – Balraj in real life – was born to Kulwanti Devi in June 1929. She was the driving force in his life since his father died when he was seven. So, Partition spelt Trauma with a capital T when it separated him from his mother and sister as they travelled from Rawalpindi to Amritsar. He witnessed carnage unlimited as he searched in camp after camp, and he considered it a miracle that in one such camp he heard his sister call out his pet name. "Balla" revered his "Maatey" and he respected the mother of his children. And he respected her wish of being laid to her final rest next to her mother, Jaddan Bai, in Bada Qabrastan.

Sunil Dutt was strict, "There could be no argument once he said No to anything," Priya Dutt once recounted. Nargis, the "Cool mother," would indulge the kids. He laid the rule that if they were going out, they must be back by sunset. Sanju would take liberties, he'd come home late, and he'd even sneak out with the car.

Was Sanju intimidated by the larger-than-life presence of his father? The man who had risen from the railway platform to be the superman striding across *Sujata* and *Mujhe Jeene Do*, *Yaadein* and *Padosan*? Did Sanju take to additions – and womanising – to muster courage? Whatever the cause, his mother's death led to his spiralling down. Rehabs, relapse, repeats. Despite the emotional loss of his anchor in life, he did succeed in Hindi films. Once firmly ensconced, he even built himself – his physique – and emerged stronger. And then came the nightmares of Bombay riots, TADA, Yervada and Arthur Road jails. Of career loss. Image loss. Flops. Until, again, Sunil Dutt wore the mantle of his screen father, in *Munnabhai MBBS*... Viewers have been floored by Sanjay Dutt's resilience. It saw him fight cancer too, and surge again. "He's not bitter despite all that he has gone through!" Admirable.

Nargis, charming, sophisticated, and poised, was at the peak of her career when she married Balraj Dutt. But this Mother India had stepped back from the limelight to give birth to Sanjay in 1959, Namrata



From left to right: Namrata Dutt, Nargis Dutt, Sanjay Dutt, Sunil Dutt and Priya Dutt

in 1962, and Priya in 1966. To raise them, she devoted her time, her attention, her education, and her moral values. But even as they were coming, she partnered her darling husband to go to remote areas along India's high altitude borders, with singers and actors of the Ajanta Arts Cultural Troupe, to entertain the sons defying blizzards and hailstorms, snow and sleet, deluge and squall, to protect Mother India. This was long before television and internet, satellite phones, or even videos had arrived.

This isn't the only instance of Nargis Dutt's commitment to social service. In 1972, when there was scant knowledge of cerebral palsy, Mother Nargis became the first patron of the Spastics Society of India. Her extensive work focused attention on the impairments suffered by the affected children. This role won her the nomination to the Rajya Sabha in 1980. Today, the Society continues to give special education and vocational training to Spastics.

As Radha of *Mother India*, Nargis had single-handedly upheld the moral values of her two sons even as she overcame floods, domestic tragedies and evil money-lenders. Small wonder she remained the iconic Indian mother who thought nothing of sacrificing even her son for the sake of her village, read, nation. Her two sons grew up to be the compliant Ramu and the rebellious Birju. And, it is to prevent him from committing an immoral act that Radha takes Birju's life.

The irony of it! In real life, Sunil Dutt playing Birju saved the life of his 'mother' when a disastrous fire broke out on the sets. In gratitude, Nargis looked after him as he recuperated from the burns caused by the fire. In the process, they fell in love and, undeterred by her fabled love for Raj Kapoor that gave birth to the

archetypal RK Films logo, they became the exemplary Mr and Mrs Dutt. Putting to rest every fear they may've had: He, of her youthful love for her romantic co-actor; she of what people would say about a 'mother' who married her 'son'.

In life, their partnership was marked by mutual respect and shared commitment to social causes. Compassion for those less fortunate cemented their bonding. Eventually their marriage came to define more than the unity of two souls, a unity of two personal religions. Not surprising that, at the peak of Punjab militancy, Sunil Dutt undertook a padayatra from Mumbai to Amritsar. Neither jaundice nor heat waves nor blistered feet could deter him because he was on a mission to promote communal harmony.

The same fear of 'log kya kahenge!' had led Nargis to forego offers to pair in romantic roles with her 'elder son' Ramu in *Mother India*. After the Mehboob Khan classic Rajendra Kumar's career had peaked and earned the sobriquet of 'Jubilee Kumar'. And the Lady in White? She was the stuff legends are made of: graceful, dignified, composed. But romancing the man who's been your son? Not done. Not in India. Period.

However, like her 'Darlingji' Sunil Dutt, Life made Rajendra Kumar an equal as a parent when Namrata Dutt married Kumar Gaurav (1980). He was the toast of the town after *Love Story*. She was the cynosure of the Dutt household, where cinema paralleled social service. It was an alliance of two Bollywood royalties.

Industry biggies had lines up in kanjeevarams with whispered blessings. Cameras had flashed politely. The relationship has lasted, touch wood. Just as their parents' had.

Some unions in filmhood are hyped. For Priya Dutt, the union of Nargis and Sunil Dutt is a legacy. The youngest born not only directed the hour-long documentary, *Nargis* (1991) for Films Division of India. She curated *Yaadon Ki Geetmala*, a nostalgic musical tribute that interspersed ditties like *Eechak dana beechak dana* and *Awara hoon*, with songs from *Mera Saaya*, *Padosan*, *Reshma Aur Shera*, and anecdotes from the lives of her illustrious parents.

That's not all. Having walked alongside her father on his *Sadbhavana Padayatra* (1987), and having watched him win five elections (1984, 1989, 1991, 1999 and 2004), she had perhaps imbibed his invincible drive. She naturally stepped into his role as Parliamentarian, winning twice in a row (2005, 2009). She looked upon it as "an opportunity to serve the poorest of Indians." And when she lost? It was a cue to carry forward the activities of the Nargis Dutt Foundation. Sunil Dutt started it (1981) to create awareness on and the treatment or counselling of cancer patients. Priya carries on with Tata Memorial Centre, and in remote areas it offers scholarships for students aspiring to become doctors and lawyers. Life's never easy for star kids. For, parents can only launch them, the journey has to be theirs. But those born to Mother Nargis are torchbearers of a heritage. □

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Women's Empowerment and Workforce Participation: Challenges and Possibilities

Unleashing the full potential of women in the workforce will propel the entire nation forward through socio-economic development, poverty reduction, improved human capital and greater inclusiveness and equity. As India progresses towards a 'Viksit Bharat@2047', ensuring 50 per cent female workforce participation will be crucial. Empowered, educated, and engaged women will not only construct the foundation of inclusive growth in the future but will also shape a more equitable and globally competitive India.

Women's presence in Indian history has remained secondary. Despite constituting half of humanity, they could never truly become a full human race. In a patriarchal society, women were severely victimised by narrow-mindedness, conservatism, evil practices and pseudo

family honour. This situation persisted until the Renaissance. Women's lives had become miserable due to numerous malpractices. Sati, polygamy, dowry, child marriage, mismatched marriages, purdah, lack of education and a disdainful attitude toward widowhood were among the numerous problems



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strongly prevalent in the society. In this narrow-minded society, the mere birth of a girl child was considered inauspicious. The 19th and 20th centuries saw significant feminist movements for women's rights, and in the West, feminist thinkers like Simone de Beauvoir, Germaine Greer, Kate Millet and Virginia Woolf waged ideological struggles for women's liberation. Simone de Boulogne once said, "One is not born a woman, but one is made a woman." She elaborates it further saying, "Woman is not woman merely by birth, but she turns a woman. No biological, psychological or economical destiny happens to be the lone creator of the fate of a woman. An entire civilisation creates such a peculiar creature."

Women in Patriarchal Society

The relationship between men and women is one of the two cornerstones of society. Only in a balance and equality between these two foundations can a healthy, democratic, and exploitation-free society be envisioned. However, for centuries, the situation has been the opposite. There is neither a proper balance in society nor women's freedom. Women have been subjugated. Since men have always feared women's independent power, they have primarily targeted their freedom. In this context, Rajendra Yadav's following comment is crucial: "In fact, through all this literary and culturally dignified jargon, man has the one thing about woman that has been killed, crushed, or tamed is her freedom. Man has always feared woman's independent power and has deliberately made it the focus of his attacks. In her integrity and completeness, woman is formidable and invincible. There she is a power that is free and unrestrained, wild and capricious—that is why man has broken her. Only by breaking can one be weakened and tamed. Man has constantly and in every way tried to make her dependent and passive, which is why Beauvais says, "Woman is not born, she is made."

Indian Women's Liberation Movement

In India, the women's issue first began to be discussed in the early 19th century when Raja Ram Mohan Roy, in Bengal, spoke out against the practice of Sati and advocated for women's rights to education and property. He opposed the practice of purdah and child marriage and supported widow remarriage. This wave of new consciousness in India had a widespread impact on women's society. A revolutionary shift in the women's liberation movement in India occurred when many women, including Savitribai Phule, Ma Sarada Devi, Pandita Ramabai, Fatima Sheikh, Anandibai Joshi, Ramabai Ranade, Sister Nivedita, Francina Sorabji,

Tarabai Shinde, Annie Jagannathan, Rukhmabai, Begum Rukeya Sakhawat Hussain, Annie Besant, Sarojini Naidu, Swarn Kumari Devi, Sarala Devi Chaudhurani, and Manorama Gupta, became part of it. These women creatively opposed social evils and irrelevant traditions and customs. This consciousness of women's liberation and resistance, which arose in the background of the Renaissance, has been flowing uninterruptedly in contemporary society today, passing through many powerful writers, politicians, social reformers, thinkers and intellectuals.

Legal and Social Changes after Independence

After independence, the social status of women in India underwent a healthier and more meaningful transformation. Along with significant constitutional protections, numerous progressive laws were enacted to protect women's interests, and numerous development policies and programmes were adopted to initiate and sustain efforts to uplift women in society and bring them to parity with men in all spheres of life. Since independence, the status of Indian women has seen significant improvements in education, employment, and legal rights, with them serving in roles ranging from the President to fighter pilots. However, they still face serious challenges, in some form or another, such as patriarchal mindsets, domestic violence, harassment, rape, gender discrimination, exploitation, torture, gender pay disparity, and the rural-urban divide.

To address this inequality, exploitation of women, and gender-based discrimination, and to promote women's safety, security, and empowerment, the Government of India and state governments are implementing a comprehensive Mission *Shakti* campaign. Under the *Sambal* and *Samarthya* sub-plans, it aims to empower women, provide legal assistance, and ensure access to benefits from various government schemes.

Government Schemes for Women's Empowerment

To empower women and ensure their equal participation in the workforce, the Government of India is implementing significant schemes and policies, including Mission *Shakti Yojana*, *Beti Bachao, Beti Padhao*, *Pradhan Mantri Ujjwala Yojana*, *Pradhan Mantri Matru Vandana Yojana*, *Sukanya Samriddhi Yojana*, *Pradhan Mantri Mudra Yojana*, *Lakshpati Didi Yojana*, *Namo Drone Didi Yojana*, *Mahila e-Haart*, *Swadhar Greh Yojana*, Mission *Indradhanush*, Trade Scheme, Women's Helpline, STEP initiative, *Mahila Samman* Savings Certificate, and *Mahila Shakti Kendra*. The Government of India is playing a significant



role in promoting women's participation in the workforce through the establishment of committees and commissions, such as NITI Aayog (Women's Action Framework 2047), Parliamentary Committee on Women's Empowerment (2024), Ministry of Skill Development and Entrepreneurship, Ministry of Labour and Employment (2025 Draft Policy), BRICS Forum on Women's Development (2025), Prime Minister's Economic Advisory Council, and the 16th Finance Commission.

Additionally, recent efforts to increase women's participation in the workforce have focused primarily on implementing incentives and employment programmes for women, such as the Mahatma Gandhi National Rural Employment Guarantee Act, the Prime Minister's Employment Generation Programme, and Mudra. The government has made efforts to provide safe workplaces and specialised skill training programmes for women. The Maternity Benefit Act of 2017 increased paid maternity leave from 12 weeks to 26 weeks and includes provisions that make it easier for women to work.

Female Workforce Participation: Trends and Statistics

As a result of these historic and innovative schemes, policies, committees, commissions, and campaigns initiated by the Government of India focused on

women's empowerment, India has achieved a major milestone in women's economic participation, with the female labour force participation rate increasing from 23.3 per cent in 2017-18 to approximately 41.7 per cent in 2023-24. This remarkable increase has also given India a distinct identity globally, as World Bank data confirms that India has recorded the highest increase in women's labour force participation among all BRICS countries over the past decade. According to the Ministry of Labour and Employment, India's female labour force participation rate (LFPR) is expected to nearly double from 23.3 per cent in 2017-18 to 41.7 per cent in 2023-24, reflecting the transformative inclusion of women in the workforce. According to the World Bank (2025), India has recorded the most significant growth among BRICS countries, with a 23 per cent increase over the last decade. According to the State of Working India Report 2023, the composition of the female workforce in India is changing; more young and highly educated women are now entering the labour market.

By 2030, India is projected to have the world's largest working-age population, reaching nearly 70 per cent. India is poised to become a major contributor to global economic growth and is targeting a GDP growth rate of 8 per cent over the next five years. Women are expected to account for more than half of new entrants

into the workforce by 2030, as highlighted in the report "India's Breakout Moment." According to the latest Periodic Labour Force Survey (PLFS) report 2023, the labour force participation rate for women aged 15 and above increased from 23.3 per cent in 2017-18 to 32.8 per cent in 2021-22, representing a growth of 9.5 per cent. This increase was more pronounced in rural areas, where it increased by 12 percentage points, while in urban areas it increased by 3.4 percentage points. Specifically, the LFPR (labour force participation rate) for women in rural areas increased from 24.6 per cent in 2017-18 to 36.6 per cent in 2021-22, representing a growth of 12.0 percentage points.

Challenges and Obstacles

Female labour force participation in India has seen significant growth in recent years, although it remains low compared to the global average. The female labour force participation rate declined from 31.2 per cent in 2011-12 to 23.3 per cent in 2017-18, reflecting women's exclusion from the labour market. However, this figure has also seen rapid change, with the female labour force participation rate expected to increase to 41.7 per cent in 2023-24. Despite numerous initiatives, awareness programmes, and reforms, challenges remain. According to a report by the Azad Foundation, the female workforce in India fell to 18 per cent in 2019 from 37 per cent in 2006. India ranks 135th out of 146 countries in the World Economic Forum's Global Gender Gap Index 2022. According to market researchers, only 6 per cent of India's largest 160 companies have women in board positions.

Currently, many traditional values, inhumane constraints, and familial, social, political, economic, and religious norms prevent women from working outside. The various obstacles that still stand in the way of increasing women's participation in the workforce in India are patriarchal social system, discrimination against women in government and non-government offices, physical and mental harassment of women, lack of self-reliance and independence, undervaluation of women's labour, gender pay gap and prevalence of gender stereotypes, socio-cultural biases, irregularities in maternity leave regulations, rural-urban divide, occupational segregation, lack of infrastructure for child care leave regulations, societal indifference towards women, exclusion from technical and STEM education, lack of sense of identity, existence and rights, lack of freedom to make decisions, dual mentality in families towards women, domestic violence/domestic

abuse, lack of awareness of schemes, rules and laws related to women's empowerment, lack of family encouragement for women to enter the workforce, increasing impact of mechanisation, shrinking agriculture and underdeveloped manufacturing sector, limited safe transportation facilities and unfriendly work environment.

POSH Act 2013 and She-Box Portal

Sexual harassment of women at the workplace not only violates their fundamental rights but also poses a serious challenge to their participation in India's labour force. It not only hinders economic progress but also creates an environment of fear and insecurity in the workplace. In this context, a safe and dignified work environment for women is crucial.

To ensure this, the Government of India enacted the POSH Act 2013 (POSH Act - Sexual Harassment of Women at Workplace Act). Its objective is to prevent, prohibit, and provide justice to women against sexual harassment. The Ministry of Women and Child Development has launched an online portal called the Sexual Harassment Electronic Box (She-Box) for women employees working in public and private enterprises. This portal is for filing complaints related to sexual harassment and violence against women.

Role of Women in Developed India

However, in the future, women's participation in the workforce can only be ensured by removing these barriers from Indian society. The division between women's domestic work and their work life must be stopped, and all women's work, both formal and informal, must be valued. Focusing on women's work options, while taking into account cultural context and autonomy, is essential. Promoting and supporting higher women's labour force participation is not only a matter of gender equality but also a key driver of social progress and development. Utilising women's full potential in the workforce will propel the entire country forward through socio-economic growth, poverty reduction, improved human capital, and greater inclusiveness and equity. As India progresses towards a *Viksit Bharat@2047*, ensuring 50 per cent female workforce participation will be crucial. In the future, empowered, educated, and employed women will not only form the foundation of inclusive growth but also shape a more equitable and globally competitive India. □

From Queues to QR Codes India's Payment Revolution



UPI is not just a payment system; it is a people's platform. It has made financial transactions faster, simpler, transparent, and truly inclusive. In doing so, it has not only transformed how India pays, but how India progresses.

Not long ago, a simple financial transaction demanded time, effort, and patience. Paying bills meant standing in long queues. Sending money required a visit to the bank, filling out forms, and waiting days for confirmation. For millions in India without access to banking, it meant exclusion from the financial system itself. That India, however, is now the past.

India's financial journey has evolved over centuries from barter systems and cowrie shells to coins, paper currency, and cheques. For much of its modern history, cash remained the dominant mode of transaction. While cheques and demand drafts formalised payments, they were slow and accessible only to a limited segment. Banking infrastructure was largely urban-centric, leaving rural and remote populations underserved.

The early 2000s marked the beginning of digital transformation in payments. The Reserve Bank of India introduced systems like Real-Time Gross Settlement (RTGS) in 2004 and Immediate Payment Service (IMPS) in 2010, enabling faster and round-the-clock transfers. These were significant milestones, but their reach remained limited to those already within the banking ecosystem, and access to formal financial services remained limited for many.

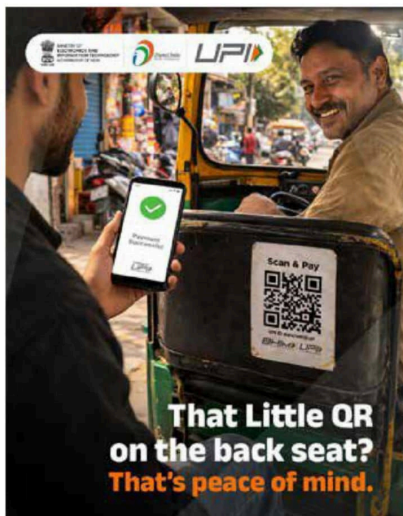
A large segment of India's population remained outside formal finance, without access to credit, insurance, or secure savings. The absence of a scalable, inclusive, and real-time digital infrastructure meant that the benefits of economic growth could not fully reach everyone. The need for a transformational shift was clear, and it was this need that set the stage for India's digital payments revolution.

JAM Trinity: A Structural Breakthrough for Digital Banking

India's digital payments transformation is built on a foundational architecture comprising three key

pillars: *Pradhan Mantri Jan-Dhan Yojana (Jan Dhan)*, Aadhaar, and mobile connectivity, collectively known as the JAM Trinity. Each pillar serves a distinct purpose, but together they have strengthened the financial ecosystem by reducing leakages, enhancing trust in formal banking, and preparing citizens to engage with digital services.

The *Pradhan Mantri Jan-Dhan Yojana* has brought millions into the formal banking system by enabling the large-scale opening of zero-balance accounts, ensuring that even the most underserved populations are financially connected. Aadhaar has strengthened this foundation by providing a reliable digital identity, enabling precise targeting and seamless delivery of services. The rapid expansion of mobile connectivity



 21.70 Billion Transactions in January 2026 alone	 ₹28.33 Lakh Crore Value processed in January 2026	 81% Share of all retail digital transactions in India
 49% India's share of global real-time payment transactions	 UPI: World's largest real-time payment system by volume (IMF)	 Under 10 Years Time taken to build a world-leading payments ecosystem

UPI in Numbers: Scale, Speed & Global Leadership

and internet access has empowered citizens with a convenient, real-time interface for communication, authentication, and transactions.

This integrated framework found its full expression through the Direct Benefit Transfer (DBT) system, which has streamlined the delivery of government benefits directly into bank accounts. By reducing intermediaries and enhancing transparency, DBT has improved efficiency while building confidence in digital systems.

Importantly, this transformation has gone beyond access; it has enabled participation. As citizens engaged with DBT, they became increasingly familiar with digital financial transactions, paving the way for the widespread adoption of platforms such as the Unified Payments Interface (UPI).

UPI: A Radical Innovation

In 2016, the National Payments Corporation of India launched the Unified Payments Interface (UPI), a system that fundamentally simplified how money moves in India. At its core, UPI enables any bank account to connect with another through a Virtual Payment Address, removing the need to share detailed banking information.

The idea of UPI was radical in its simplicity. No account numbers to memorise. It replaces complex inputs like account numbers and IFSC codes with a simple interface. Users only need a mobile number, a UPI ID, and secure authentication to initiate instant transfers. Transactions are processed in real time, available round the clock, and seamlessly interoperable across banks and applications.

This interoperability has been central to UPI's rapid expansion. From 216 banks in 2021 to 691

by January 2026, the network has grown into a unified payments infrastructure that enables users to transact effortlessly regardless of their bank or platform. In parallel, its low-cost architecture has reduced barriers for individuals and merchants alike, while encouraging innovation among banks and fintech players.

As UPI scaled, its impact extended beyond ease of payments. It began to reshape how individuals, small businesses, and informal workers participate in the financial system. Digital transactions became more accessible, reliable, and widely adopted across regions and income groups.



Beyond Convenience: Expanding Financial Access

UPI has moved beyond simplifying payments to reshaping participation in the financial system. By enabling instant, low-cost transactions, it has reduced dependence on cash, improved efficiency, and opened access to formal finance for millions. For small merchants and informal workers, this shift is especially significant, creating new pathways to credit, insurance, and savings.

The real story lies not in the volume of transactions, but in who is transacting. Autorickshaw drivers accept payments through QR codes. Village mandis settle transactions instantly. Street vendors no longer struggle with change. A domestic worker can send money across states in seconds using a basic smartphone. In this system, the divide between urban and rural, formal and informal, steadily disappears—marking a decisive shift towards financial inclusion.

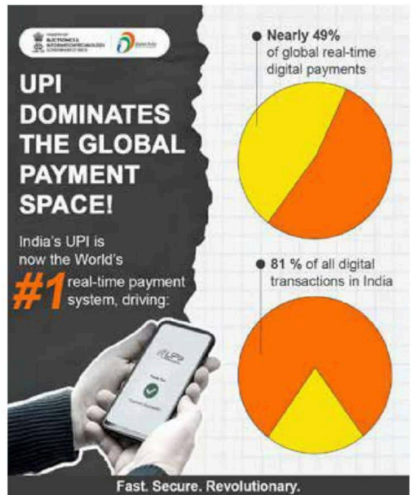
At the same time, UPI is evolving into a broader financial platform. UPI Lite supports quick, small-value payments, while UPI AutoPay streamlines recurring expenses such as utility bills and subscriptions. Credit on UPI extends its reach further by enabling access to pre-approved credit lines. Building on this infrastructure, NBFCs and fintech firms are delivering loans, enabling repayments, and offering tailored financial products—expanding the reach of formal finance across the country.

Digital Payments: Enhancing Access, Efficiency, Security and Trust

Building on this expanding ecosystem, UPI is now embedded in the everyday economic fabric of the country. What began as a tool for convenience has evolved into a dependable system that supports individuals, businesses, and financial institutions alike.

For users, the experience is defined by ease and trust. Transactions can be completed anytime, from anywhere, through a single application connected to multiple bank accounts. There is no need to share sensitive banking details, and built-in safeguards ensure that payments remain secure. Support features within apps further simplify grievance redressal, making the system accessible even for first-time users.

Further strengthening this trust, the Reserve Bank of India (RBI) has introduced enhanced authentication mechanisms for digital payment transactions, effective from 1 April 2026. The mandate of two-factor authentication ensures that every transaction



is verified through multiple layers, such as PINs, biometrics, or secure tokens alongside OTPs. This significantly reduces fraud risks while reinforcing confidence in digital platforms.

For merchants, it offers a fast and efficient way to receive funds without handling cash. They enable businesses to serve a wider customer base, including those who prefer mobile-based payments over cards or cash. Whether in small shops, street markets, or online platforms, transactions are completed instantly, reducing delays and operational challenges such as cash management or returns.

For banks and financial institutions, it enhances service delivery by leveraging existing systems to enable secure, real-time transactions. They support large-scale person-to-person and merchant payments while maintaining strong safeguards, improving efficiency and expanding access to formal financial services.

India's Innovation: Creating a Global Impact

India's digital payments ecosystem has not only addressed domestic needs but has also emerged as a reference model globally. Institutions such as the International Monetary Fund (IMF) and the World Bank have acknowledged its scale, efficiency, and inclusiveness.

Global leaders, including Emmanuel Macron, President of France, have noted India's achievement of processing over 20 billion transactions monthly through UPI, an operational scale unmatched by any other real-time payments system.

UPI has also expanded beyond national borders and is now operational or linked with payment systems in multiple countries, including the United Arab Emirates, Singapore, Bhutan, Nepal, Sri Lanka, France, Mauritius, and Qatar. This growing international footprint is facilitating cross-border transactions, supporting remittance flows, and contributing to financial inclusion, while strengthening India's role in the global fintech landscape.

UPI: A Boon for Financial Transactions in India

UPI has dissolved the divide between the financially served and the financially invisible. Rural and semi-urban India now transacts with the same speed and ease as metropolitan centres.

A homegrown system, built in under a decade, now leads the world. What began as an effort to include the unbanked has become the global gold standard for real-time payments. From queues to QR codes, India's journey reflects the power of inclusive innovation.

UPI is not just a payment system; it is a people's platform. It has made financial transactions faster, simpler, transparent, and truly inclusive. In doing so, it has not only transformed how India pays, but how India progresses. □

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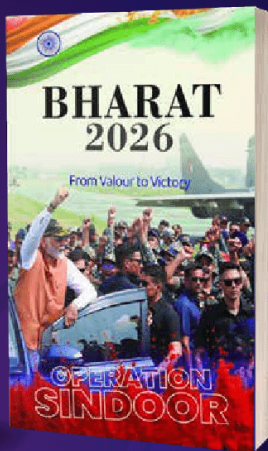
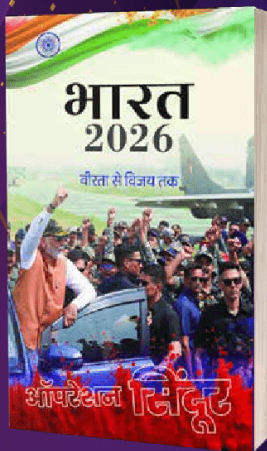
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