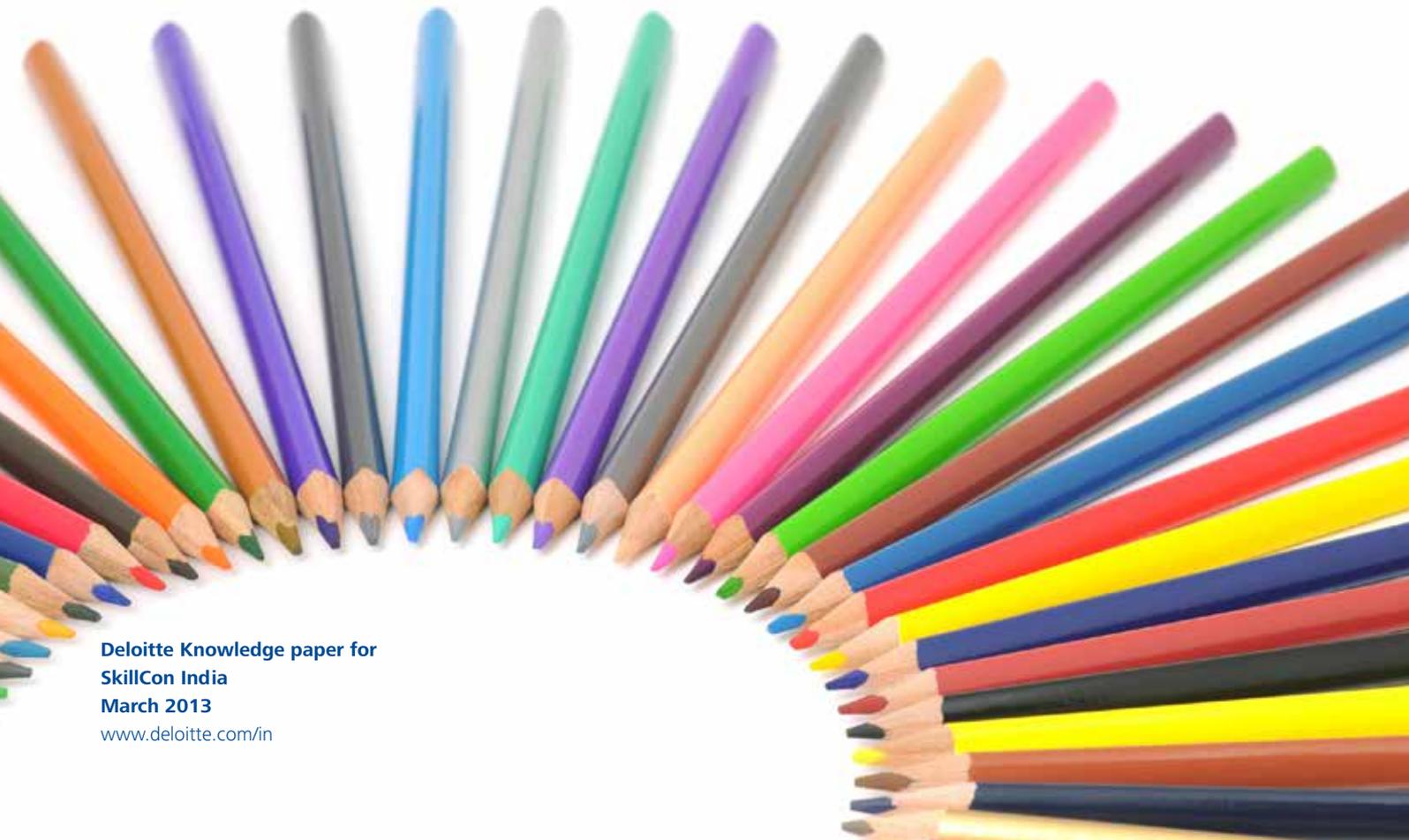


Perspectives on Skill Development in Maharashtra

Matching aspirations to opportunities



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Foreword

During the last few years Technical and Vocational Sectors have witnessed a rapid advancement throughout India. Availability of quality employment oriented education ensures an increase in the working capability, productivity and employability of the people of the country. Education and Training are both strategic necessities that deliver employment enhancing skills, in turn increasing productivity and accelerating the future of economic growth of India.

The Planning Commission of India has estimated that around 500 million skilled persons are required by 2022 while the current capacity of the skill development program is 3.1 million. Considering issues like population growth, unplanned rural-urban migration causing urban poverty, high school dropout rates, India is likely to witness a deficit of 5.25 million employable graduates and vocationally trained workforce in next few years. In a few states, it has been observed that the economic progress of the state is directly related to the development of Technical and Vocational Education System. Those states, where good progress has been made in the field of skill development, have attracted higher Private Investments as well.

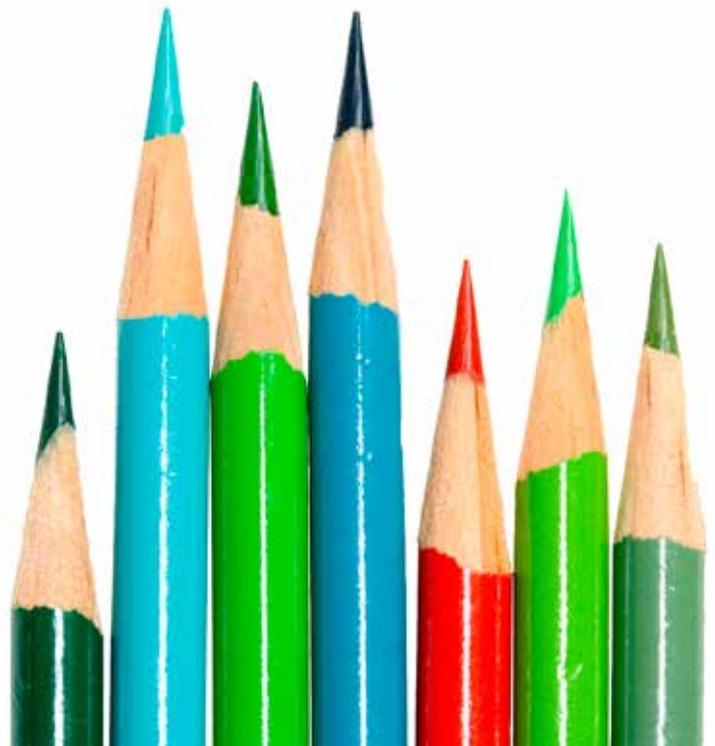
In the opinion of the several national level industrial organisations, the man-power currently being trained by the Technical Educational Institutions is not as per the demand of the market and industry. Although there has been a sharp increase in the technical educational institutions offering graduate and post-graduate level courses in various states, the number of institutions, the number of courses, availability of seats and intake capacity has not increased in the same proportion.

In an attempt to address these issues, this report prepared by Deloitte provides a comprehensive profile of all involved in the field of skill development including, education providers, service sector, government sector, semi government sector, public-private partnerships, investors and so on. Learning from the case studies of state governments and other countries, addressing the issues of imparting skill education the report voices the opinion of all.

We are very happy and thankful to Deloitte for handing us over such a wonderful analysis, practically incising each and every section. We are sure that the information provided in the report will certainly prove relevant to the Industry, state government as well as the Educational Institutions that have come forward to initiate the process of addressing this critical issue of demand of quality employment and that of supply of skilled quality manpower.

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Message from the Education Sector Team

Skills and knowledge are the driving forces of economic growth and social development for a nation. Countries with higher and better levels of education and skills are more likely to adjust effectively to the challenges and opportunities of the world.

The need to equip the workforce with technical capabilities and varied skills, consistent with the demands of the industry has been recognised by the Planning Commission also. The Eleventh Five Year Plan laid out the framework to move towards a sustainable long-term skills development initiative. The National Skill Development Policy (NSDP) announced in 2009 attempts to address the skills mismatch in the economy from the larger perspective of the vision of 'inclusive growth'. Under this policy, the government having recognised that skill development will play a vital role in transforming India into an economic superpower in the future has set a target of skilling 500 million people by 2022. To complement the achievement of this ambitious target, it has to be ensured that there is corresponding creation of employment opportunities for the youth, to enable them to participate and contribute to the growth. While the economy may be on a steady track of growth, data on social indicators indicate wide disparities and inequalities across the country. Further, the Twelfth Five Year Plan goals of "faster, more inclusive and environmentally sustainable growth", also indicates that skill development in India is critical for both the growth, on the one hand and for providing decent employment opportunities to the growing young population, on the other hand.

As per census projections, India's total population is expected to increase by 371 million between 2001 and 2026, of which the share of the working age population (15-59 years) in the total increase is likely to be 83%. While there may be emerging employment opportunities in the Indian economy in the future, those seeking work, need to be sufficiently educated and qualified to be able to attain these jobs and work productively. Enhancing the employment capabilities through skill development is essential to meet Maharashtra's aspirations of becoming a major competitive player in the global knowledge economy, as well as to improve the livelihood of its people. Failure to productively employ the increasingly young population can have damaging economic and social implications for the state.

In this background, this report aims to place the current skill development system in Maharashtra in the overall development and economic context of the state. The report outlines the key strategic options that can be considered to bolster the state's response towards creating a skill development system that is responsive both to the aspirations of the youth and needs of industry.

Happy Reading!
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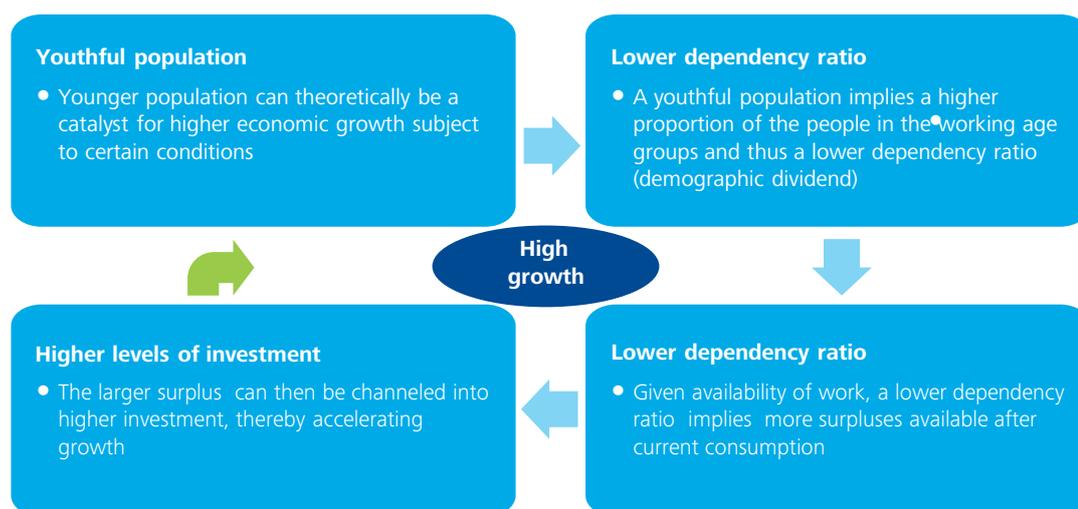
Demography and Education Context

Different sources¹ offer broadly consistent pictures of India's population profile for the year 2030 with roughly 1.5 billion people, implying an average rate of growth of 1.1% per year. Of which 68% of the population will comprise men and women of working age (15–64 group), compared with 65% today. India could benefit economically from this 'demographic dividend', if it is able to productively employ its people. As per Associated Chambers of Commerce and Industry of India (Assocham) report "nearly 300 million people of the 18-50 age groups are unemployed because they do not have any marketable skills. Huge numbers of Indian youth are not only unemployed but unemployable". The principal reason to India's growth could be its youth force, therefore, it is imperative to educate and skillfully equip them to help gain employment.

In 2020, the average Indian will be only 29 years old, compared to 37 in China and the US, 45 in West Europe and 48 in Japan². The advantage India has over China is that while China's share of the working age population in relation to its total population is on the decline, in India, it will continue to rise until 2035.

While the demographic advantage in itself is not significant from an economic perspective, it has growth implications which could shape India's future. There are studies, which suggest that having a demographic advantage in terms of a youthful population can translate into growth implications for a country's economy. Most of the implications are pertinent in the case of Maharashtra as well. These are illustrated in the diagram below.

An international comparison of some key education and training indicators illustrates the significantly poor qualifications of India's working age population. According to the 2011 census, the total literacy rate in India is 74.04% compared to the world average of 83.4% (2008). India's Gross Enrolment Ratio (GER) in higher education is only 15% and lags behind much of the developed world as well as other developing countries³ (see graph)

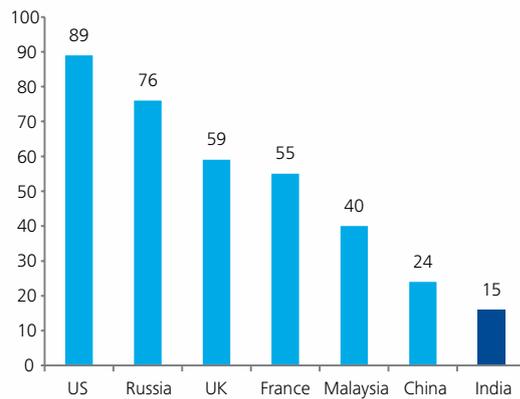


1 The U.S. Census Bureau and the UN Population Division (UNPD)

2 Annual Report to the People on Employment, Ministry of Labour and Employment, Government of India, 2010

3 UNESCO Institute for Statistics Database

GER in Higher Education (2009) - International Comparison



Source: UNESCO Institute for Statistics Database

In terms of vocational training⁴, India again lags well behind the developed world with only around 5% of the labour force in the 20-24 year old age group estimated to have received formal training in 1994 while the figure was 28% in Mexico (1998) and 96% in South Korea (1998).

In addition to the problem of a poorly skilled workforce, India also faces a challenge arising from misalignments between demand and supply in the labour market.

• Occupation – skill mismatch

While 88% of the population (15-29 age groups) receives no vocational training, 91% are employed in 'Skill-based' jobs⁵. This indicates a mismatch in the context of India between skill levels and occupation structure.

• Graduate unemployment

Over 82% of total enrolment in higher education in 2005 was in arts, science and commerce programs with little occupational focus⁶. There are far more graduates in general streams than those with professional qualifications, which may lead to mismatches between their skills and labour market demands, resulting in unemployment.

• Sectoral mismatch

Much of the growth in labour force is in the unorganised sector, which is primarily in rural areas, which have low levels of education and skills.



4 UNESCO GED 2010
5 India Labour Report 2007, TeamLease Services
6 Higher Education and the Labor Market in India, Pawan Agarwal

Maharashtra

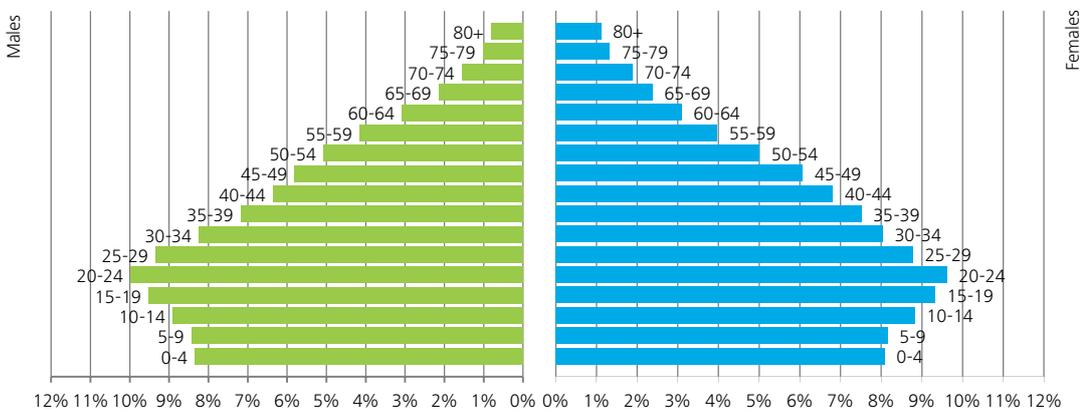
The following section looks more closely at the various dimensions of the development context of Maharashtra by analysing the demographic context, the sex ratio, migration rate, the poverty situation, and trends in education. This chapter will provide a useful overview of the overall development context in Maharashtra and will extend a better understanding of the need for skill development opportunities in the state.

Demographic Profile

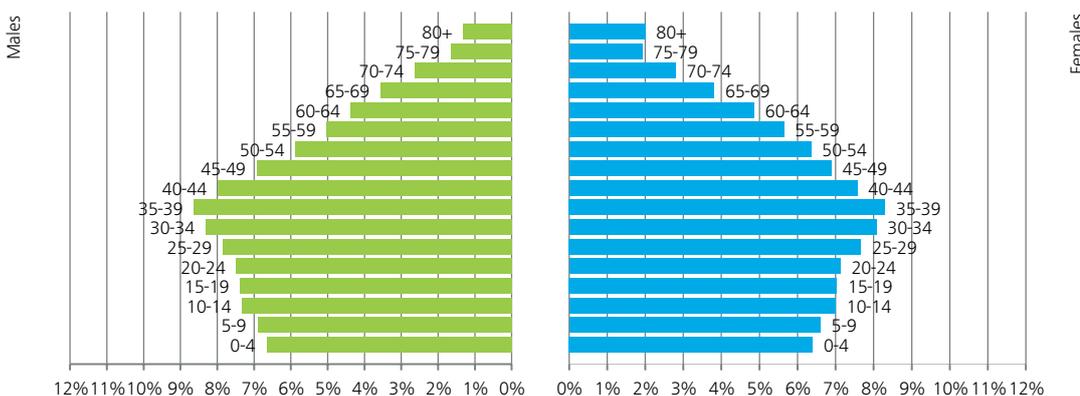
Maharashtra is the second largest state in India both in terms of population and geographical area (3.08 lakh sq. km.). The State has a population of around 11 crore (Census 2011) which is 9.3% of the total population of India. The state is highly urbanised with 45% people residing in urban areas.

As indicated in the graph below, the proportion of population in the 0-14 year age group is projected to drop from 27% to 21% between 2011 and 2026. The proportion of population in the 15-59 year age group, i.e. the working age group, is projected to rise marginally from 64.5% to 65.6%. The proportion of population in the 60+ year age group, i.e. the elderly age group, is projected to rise substantially from 9% to 13% during the same time period. The 2026 projections for India in the 0-14 year age group, 15-59 year age group and 60+ year age group are 23.4%, 64.3% and 12.4%, respectively. Thus, in comparison, Maharashtra's projected proportion of population in the working age group and elderly age group is higher than the projections at the all-India level, and it is predicted that population in the 0-14 year age group would be lower than the National projection for 2026.

Population Pyramid 2011 Maharashtra



Population Pyramid 2026 Maharashtra



Source: Census 2001 - Population Projections for India and States 2001-2026

Sex ratio

Census 2011 revealed that sex ratio of the State has slightly increased from 922 in 2001 to 925 females per thousand males in 2011, whereas, at the National level, the same was 933 in 2001, which increased to 940 in 2011 and the State stands at 22nd position in India. The sex ratio is on lower side in Mumbai City (838), Mumbai Suburban (857) and Thane (880) districts. Ratnagiri district has the highest sex ratio (1,123) followed by Sindhudurg district (1,037).

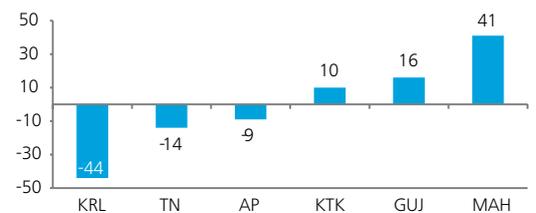
Migration

As per NSSO⁷ Report of 2007-08, Maharashtra has a net migration rate of 41, implying that 41 persons per 1000 population are in-migrants to the state. (Net migration for any region, may be defined as the difference between in-migration and out-migration. Maharashtra has registered the highest net migration rate of 41 persons per 1000 population followed by Gujarat with 16.

Human development

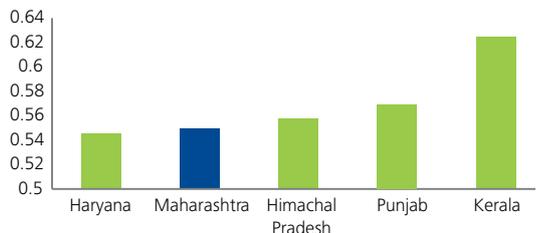
The Human Development Index (HDI) is a composite parameter based on education, health and income; used to benchmark the performance of various states/countries. The HDI ranks of few of the Indian states as on 2010 is shown in the graph.

Net migration rate (per thousand)



Source: NSS Report No. 533: Migration in India: 2007-08

Human Development Index of select Indian states



Source: Inequality adjusted Human Development Index for India's states, UNDP, 2011



While Kerala has the highest HDI (0.625) followed by the state of Punjab, Maharashtra figures at 0.549. An analysis of the individual scores of Maharashtra on the sub-components of the HDI shows the following: Maharashtra with an Education index score of 0.489 ranks fifth among 20 states; it ranks fifth on the income parameter as well; and ranks third on the health parameter (refer table below).

Sub-components of HDI

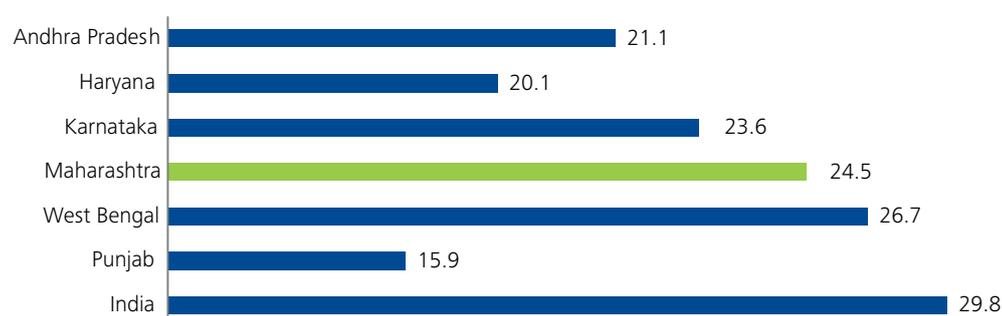
State	Education	Rank	State	Income	Rank	State	Health	Rank
Kerala	0.535	1	Kerala	0.534	1	Kerala	0.854	1
Punjab	0.523	2	Himachal Pradesh	0.468	2	Punjab	0.782	2
Haryana	0.513	3	Uttarakhand	0.454	3	Maharashtra	0.747	3
Himachal Pradesh	0.499	4	Tamil Nadu	0.454	4	Himachal Pradesh	0.744	4
Maharashtra	0.489	5	Maharashtra	0.453	5	Tamil Nadu	0.731	5
India	0.465		India	0.4		India	0.688	

Source: Inequality adjusted Human Development Index for India's states, UNDP, 2011

Poverty

Among the states compared below, Maharashtra has one of the the highest percentage of people below the poverty line (24.5), which is however lower than the national average of 29.8%.

% of population below poverty line



Source: Press Note on Poverty Estimates, 2009-10 Government of India

Trends in Literacy rate

The state has registered impressive growth in literacy among major states in India. Despite this, the state stands at 12th position, according to Census 2011, as against 10th position in 2001 in India.

The literacy rates for males and females are 89.8% and 75.5%, respectively. The gap in literacy rates of males and females show a decreasing trend. Though the state has registered impressive growth in literacy during the decade 2001-2011, about 1.70 crore persons are still illiterate of which 69.2% are females. Literacy rate is highest in Mumbai Suburban (90.9 %) and lowest in Nandurbar (63.0 %).

Status of Primary/Upper primary Schooling

Enrolment

At the primary level, comparison of the Gross Enrolment Rates (GER) reflects that West Bengal (136.86) has the highest GER followed by Punjab (112.22) and Karnataka (108.64).

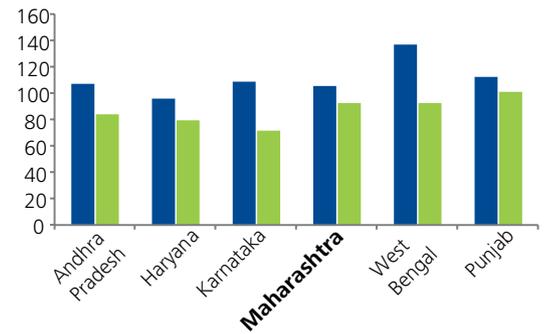
At the upper primary level, Punjab (100.88) has the highest GER followed by West Bengal (92.43) and Maharashtra (92.43).

Comparison of Literacy Rates among Select States

State	Literacy rate (2001)	Literacy rate (2011)
Andhra Pradesh	60.47	67.66
Haryana	67.91	76.64
Karnataka	66.64	75.6
Maharashtra	76.88	82.9
West Bengal	68.64	77.08

Source: Census 2001 and 2011

GER at primary and upper primary level



■ Primary ■ Upper primary

Source: DISE report, 2009-10



Infrastructure

Analysis of support infrastructure in schools include various factors such as classrooms, toilets and drinking water facility, in both primary and upper primary schools.

Maharashtra has a relatively low number of single teacher schools of 4.5 in comparison with the other states. Andhra Pradesh (13.7) has the highest number of single teacher schools. A review of the Pupil Teacher Ratio (PTR) across states indicates that Maharashtra has a PTR of 27, which is less than the national average of 33. Andhra Pradesh has a PTR of 22, while West Bengal has the highest PTR of 48.

Percentage of single teacher school, 2009 and Pupil Teacher Ratio (PTR)

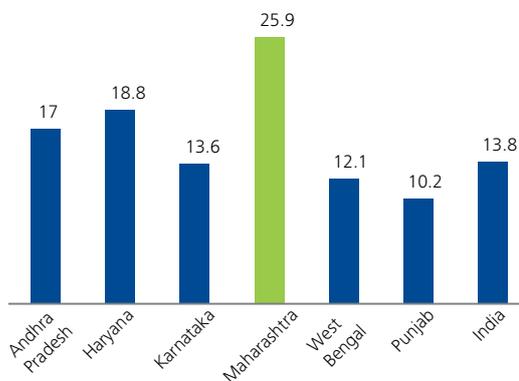


Source: DISE Report 2009-10

Enrolment in Higher Education

Statistics for the Enrolment rates at the Higher Education level in 2011 indicate that Maharashtra has the highest enrolment rate of 25.9 among all the comparable states followed by Haryana at 18.8. Other states like Andhra Pradesh, Karnataka and West Bengal have GER comparable to the national average of 13.8.

GER in Higher Education



Source Statistics of School Education, 2007-08

Key takeaways:

- Maharashtra's projected proportion of population in the working age group and elderly age group is higher than the projections at the all-India level.
- While the sex ratio has slightly increased from 922 in 2001 to 925 females per thousand males in 2011, it stands at 22nd position in India.
- Maharashtra has registered the highest net migration rate of 41 followed by Gujarat with 16 per 1000 population.
- In terms of HDI while Kerala figures among the top performing states, it ranks fifth among states in education and income parameters and third on the health parameter.
- Maharashtra has a higher percentage of people below the poverty line (24.7%) which is however lower than the national average of 29.8%
- Though the state has registered impressive growth in literacy during the decade 2001-2011, about 1.70 crore persons are still illiterate of which 69.2% are females.
- At the upper primary level, Maharashtra (92.35) has an average GER while at the primary level, the GER stands at 105.34.
- While Maharashtra has relatively low number of single teacher schools of 4.5% in comparison with the other states and a Pupil Teacher Ratio (PTR) of 27, which is lower than the national average of 33. It ranks lower in infrastructure parameters like toilets and drinking water facility.
- Statistics for the enrolment rates at the Higher Education level in 2011 indicate that Maharashtra has the highest enrolment rate of 25.9 among all the comparable states and significantly higher than the national average.

The changing demographics reflect that the proportion of Maharashtra's working age population is expected to rise higher than the projections at the all-India level. While the state performs reasonably well compared to the national averages in many human development indicators, it may not be fully equipped to cater to the increasing demands by the increasingly educated population to provide basic amenities and equip the students for the labour market. Therefore, special attention needs to be provided to cover these gaps.



Economy and Employment Context

Despite two decades of exceptionally rapid economic growth, material poverty is still widespread in India—the World Bank estimates that well over 50% of the country still lives on less than \$2 a day⁸.

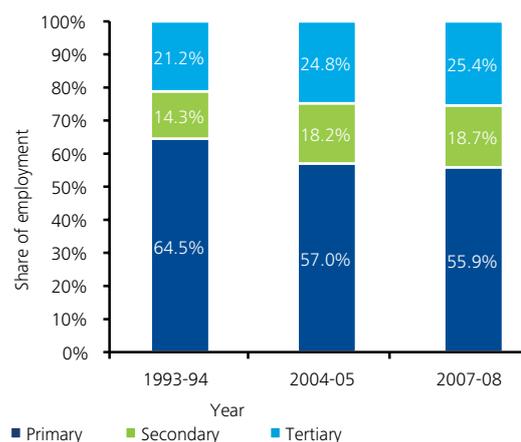
Agriculture, as a sector of economy, has witnessed a decline in its share of the national GDP, from 20% to 14% between 2004-05 and 2010-11. During this period, the Service sector has seen an increase from 53% to 58%, while Industry sector has increased marginally from 26% to 28%. The aggregate GDP growth in the range of 7-9% over the past decade has largely been brought about by a growth in the Service sector output at the average rate of 9.3 % and Industry sector output at 7.3%.

In 2010, India's labour force was estimated to be 478 million, 52% of the labour force in India is employed in the agriculture sector, with 34% employed in the service sector and 14% in industry. The comparative figures for employment in agricultural sector in China, Russia and Brazil are about 42%, 28% and 22%⁹, respectively. The unemployment rate in India is 11%, ranking at 118th¹⁰ in the world. However, of India's current workforce of 478 million, only about 14% are involved in the formal economy; 86% are therefore in the 'unorganised sector'¹¹.

- Between 1993-94 and 2007-08, the share of primary sector in employment has reduced by 8.6% while those of secondary and tertiary sector grew by 4.4% and 4.2%, respectively
- In 2004-05, the unorganised sector accounted for 86% of total workers. Between 1999-2000 and 2004-05, of the total incremental employment generated, 86% was in the unorganised sector
- Employment projections forecast a gradual shift in employment from agriculture towards industry by 2016-17. However, a majority of these jobs will continue to be in the unorganised sector.

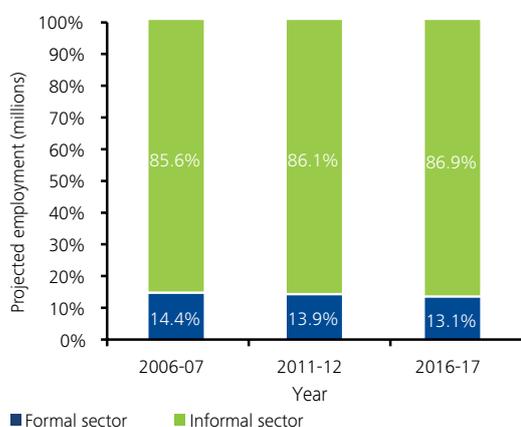
Training the unorganised sector constitutes the most important and complex aspect of India's skill development challenge since it constitutes 86% of employment in India. However, the sector is characterized by low educational qualifications of workers. Many workers in the unorganized sector have never been to educational or training institutes.

Share of Broad Sectors in Employment (UPSS)



Source: Economic Survey of India 2011

Break-up of employment projections(millions) for 9% GDP growth



Break-up of employment in India (2004-05)

Total Employment (million)	Informal Worker	Formal Worker	Total
Unorganized Sector	391.8	1.4	393.2
Organized Sector	28.9	3.7	62.6
Total	420.7	35.0	455.7

Source: The Challenge of Employment in India An Informal Economy Perspective; Vol I; NCEUS 2009; Computed from unit level data of NSS 61st Round 2004 - 2005, Employment-Unemployment Survey

8 National Bureau of Asian Research, India's Demographic outlook: Implications and trends Dec 2011

9 Edu Sector Access- Deloitte's Quarterly Newsletter

10 CIA Publications <https://www.cia.gov/library/publications/the-world-factbook/geos/in.html>

11 The informal, or unorganised, sector is defined as consisting of the production of products and services designed to generate income for the producer. Employment is often casual and/or based on personal relations and there is little organisation involved.

This implies, that firstly, our economy and employment structures are not properly aligned, secondly that a majority of our workforce is in the unorganised sector, which is characterised by lower wages, largely because of low formal skill training (but also due to lesser regulation etc.).

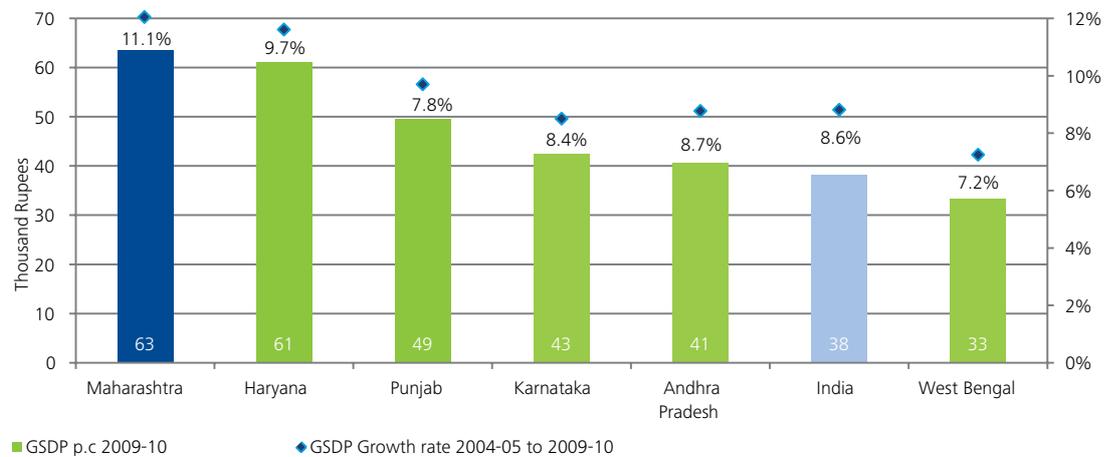
Maharashtra

The following section looks more closely at the structure and performance of economy in Maharashtra.

The gross state domestic product (GSDP) of Maharashtra at current prices for 2010-11 is estimated at 1,029,621 crores¹³ and contributes about 14.9¹⁴ per cent of the GDP. The GSDP has been growing at a rapid pace over the last few years. Presently, industrial and services sector both together contribute about 87% of the state's domestic product and agriculture and allied activities sector contributes 13% to the state's income.

The calculations for growth rate of GSDP between 2004-05 and 2009-10 indicate high economic growth for Maharashtra in the last decade. While the average growth rate for India was 9.0% during this period, Maharashtra grew at 11.1%, above all the comparative states and the all India average.

GSDP per capita (2009 - 10); GSDP growth (2004 - 05 to 2009 - 10)



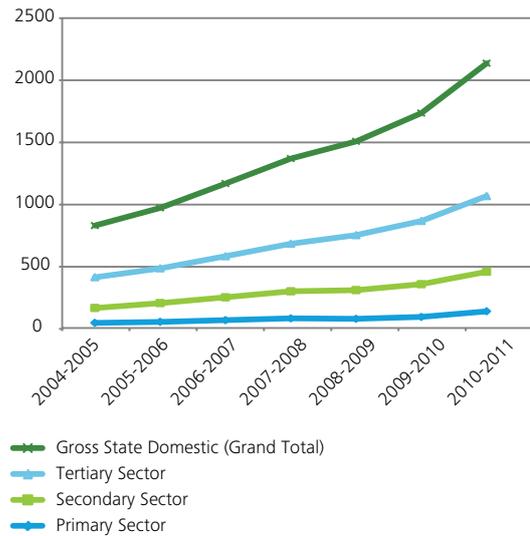
13 Source- Planning Commission, GoI
 14 Source- Maharashtra Budget 2012 - 2013

Sectoral Analysis

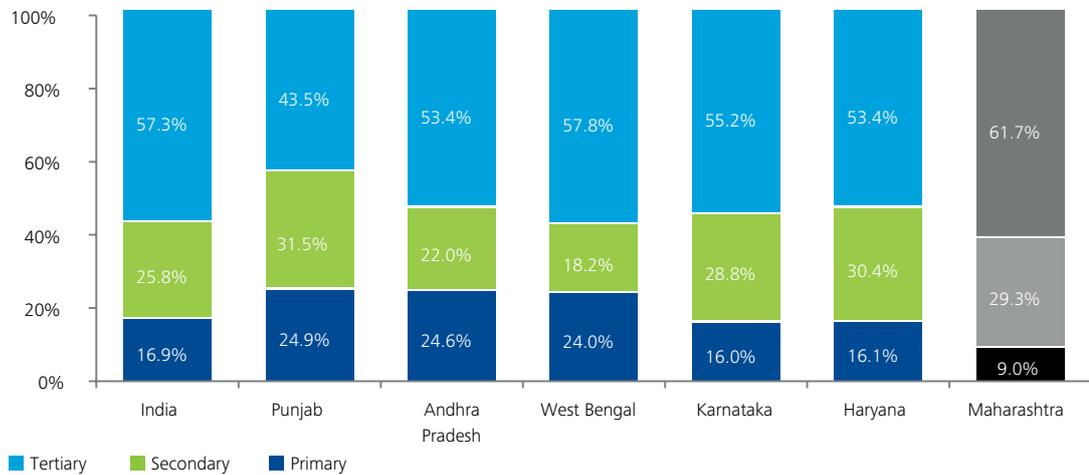
As per latest data (2010-2011), Maharashtra's primary sector contributed 13.2%, secondary sector contributed 29.8% and tertiary sector contributed 57.0% to GSDP¹⁵. The graph on the right represents gross state domestic product by industry of origin at current prices for primary secondary and tertiary sector.

The graph below indicates the share of GDP across India, Maharashtra and the comparative states for 2009-10 and suggests that the services sector plays a greater role in the state as compared to the national average.

Sectorial GSDP for Maharashtra

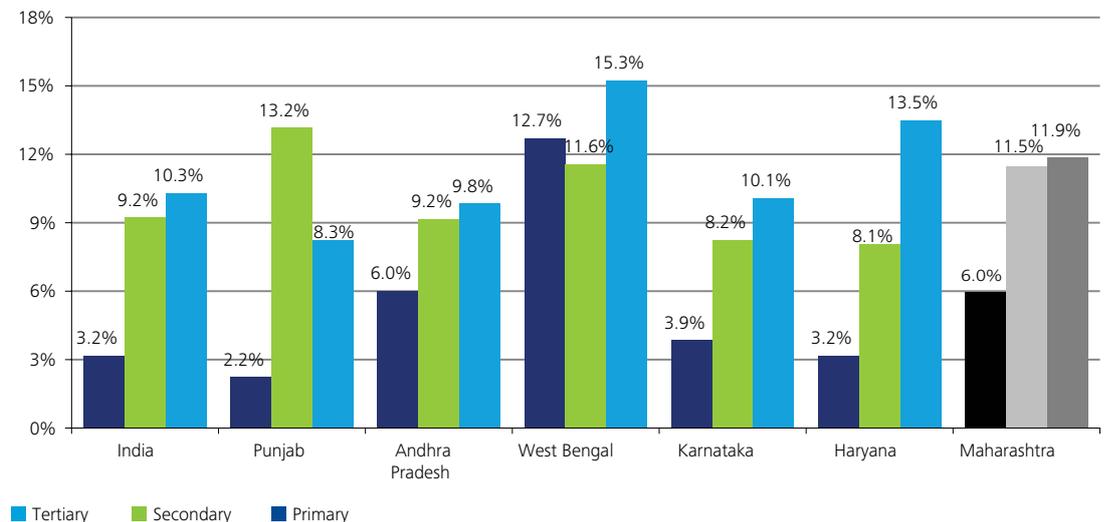


Sectoral GSDP Share (2009-10)



The figure below indicates the growth rates of the primary, secondary and tertiary sectors across Maharashtra, India and the comparison states between 2004-05 and 2009-10. While Maharashtra's primary sector grew at 6.0%, secondary sector grew at 11.5% and tertiary sector grew at 11.9%, the primary sector at the all-India level grew at 3.2%, the secondary sector at 9.2% while the tertiary sector grew at 10.3%.

Sectoral Growth Rates (2004/05-2009/10)



In the Maharashtra economy, primary sector saw a decline in the contribution to GSDP over the last few decades. However, following sectors may have had implications in the growth of other sectors of Maharashtra:

- Policy incentives from the government, like, Maharashtra IT / ITES Policy 2009; Industrial Investment and Infrastructure Policy, 2006; Tourism Policy, 2006; Maharashtra Biotechnology Policy, 2001; Grapes Processing Industry Policy 2001 etc.
- Social, physical and information technology infrastructure including road network, rail network, airways, ports, power, telecom, education institutions etc.
- Climatic conditions supporting food processing, agro processing due to availability of raw material
- IT & ITes: More than 30% of the country's software exports, along with over 1,200 software units are in the state. State has set up 36 IT parks; additionally there are 426 private IT parks out of which 88 are functional.
- Pharmaceutical & Biotechnology: The state accounts for around 40% of the country's pharmaceuticals and around 33% of the biotechnology output and its relative research capabilities is indicated by the state accounting for over 30% of the country's patents.
- Auto & Auto Components: The state also accounts for 38% of the country's automobile manufacturing. The major automobile centres in the state include Pune, Nasik, Aurangabad and Nagpur. 40% of the workforce engaged in the country's automobile industry is employed in the state.
- Engineering: Strong presence in engineering goods; the engineering industry in the state is highly diversified and produces a large range of machine-parts, from industrial machinery to industrial castings and forgings.
- Petrochemical, Oil & Gas: The state contributes 27.4% to the country's chemicals, petrochemicals, oil and gas output and 18.2% of the country's employment in the sector.

Employment

As seen in the graph below, Maharashtra employs 64% of its labour force in agriculture, without commensurate contribution to GSDP from the agriculture sector. Maharashtra has the largest disparity as the share of labour force engaged in agriculture is 64% though the sector's contribution to GSDP amounts to only 9%. With respect to the industrial sector, there appears to be a better alignment between the share of employment and contribution of GSDP across the states. However, Maharashtra employs the smallest share among comparable states in the industrial sector amounting to 14%, while the sector contributes 28% of state income.

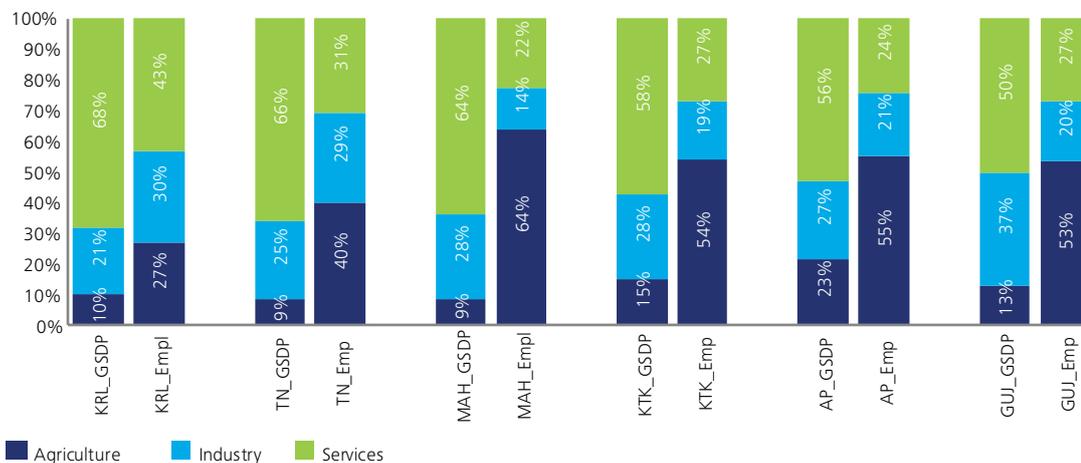
In the service sector, we find a relatively smaller labour force contributing a large share of GSDP, thus implying high labour productivities in the sector. In Maharashtra,

22% of labour force engaged in service sector is contributing to 64% of GSDP.

According to the revised draft labour policy 2011, Government of Maharashtra, Maharashtra has a large number of work forces in the unorganised sector. This includes

- Shops and establishments sector with a registered work force of nearly 28.75 lakhs and 15 lakh workers.
- Agricultural workers accounting for approximately 2.42 crore
- Nearly 20 lakh domestic workers
- Construction sites engaging more than 30 lakh building and construction workers
- Loading and unloading workers registered with 34 Mathadi Boards at nearly 2 lakhs
- Almost 32,000 security guards registered with 6 Security Guard Boards

Sector-wise composition of GSDP & Employment across states



Source: NSS Report No. 537: Employment and Unemployment Situation in India, 2009-10; Census 2001 Projections; RBI Handbook on Indian Economy; and Team Research

Key takeaways:

- The gross state domestic product (GSDP) of Maharashtra at current prices for 2010-11 is estimated at 1,029,621 crores and contributes about 14.92 per cent of the GDP and has been growing over the last few years. While the average growth rate for India was 9.0% during this period, Maharashtra grew at 11.1%.
- Maharashtra's primary sector contributed 13.2%, secondary sector contributed 29.8% and tertiary sector contributed 57.0% to GSDP. Between 2004-05 and 2009-10, while the primary sector grew at 6.0%, secondary sector grew at 11.5% and tertiary sector grew at 11.9%.
- Maharashtra employs 64% of its labour force in agriculture, without commensurate contribution to GSDP from the agriculture sector.

The above indicates that the rate of transformation of the employment structure has lagged behind the transformation of the economy structures, resulting in a disproportionately high dependence on agriculture where growth has been sluggish and incomes are low. Its implication on the skill development system includes specific programmes to enable the movement of the employable workforce to more productive sectors within the economy.

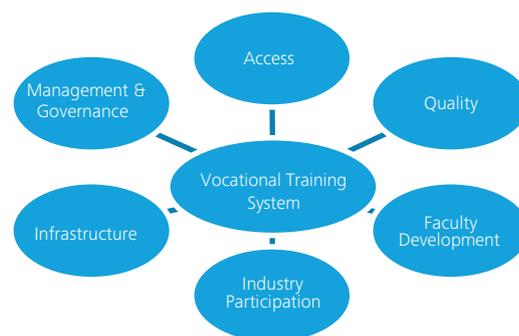
Skill Development Ecosystem

As highlighted in the foregoing chapters, India is currently on an upward trend in terms of its working age population (defined as the 15-59 years age group). Based on projections, India will have the largest population in this age group in the world by 2025¹⁶, comprising approximately 918 million people of a global aggregate of 4.9 billion working age people (~19%). Between 2025 and 2040¹⁷, the working age population will comprise 64-65% of the total population in India. However, large sections of the working age population lack the education and skills to be gainfully employed. Ensuring that a significant majority of its population is educated and employable will be a major challenge for the country. Having recognised this, the 11th Five Year Plan has laid the strong foundation for the skill development initiative, while the 12th Five Year Plan takes the same forward, which aims for faster, more inclusive and environmentally sustainable growth.

The understanding of the skill development system requires a multi-dimensional approach to appreciate the various interlinked factors affecting the performance of the entire ecosystem. The key dimensions involved in the skill development system are:-

- **Access:** Skill development systems must be open and inclusive to give even the most underprivileged access to learning and training, including women and people in rural areas. The opportunity for people from all communities / areas to train themselves to lead productive lives is essential for reducing poverty and enhancing the prosperity of the people in the state. Access needs to be considered along the aspects of financial access, physical access, information access and access to disadvantaged groups.
- **Quality:** Quality in technical education is a key factor that needs to be addressed through a continuous research into the factors that impact quality in education such as curriculum design, teaching methods and assessment methodologies. Quality is an all pervasive dimension; so performance of the system across various dimensions like faculty, infrastructure, industry orientation, etc. determines the overall quality.
- **Infrastructure:** Expansion of the education infrastructure should constitute a key component of the policy considering the expected increase in the student population emerging out of the school system in the coming years. This will include physical infrastructure such as buildings, etc., technical infrastructure such as Information Technology

Key Dimensions - Vocational Training system



requirements, laboratories, etc., as well as, the infrastructure needs for sports and recreational activities such as grounds, courts, etc.

- **Faculty Development:** The shortage of faculty and their inadequate qualifications constitute a major problem in educational institutes in India. The needs to facilitate capacity building through faculty development programs and faculty exchange programmes have to be addressed.
- **Industry Orientation:** Improving industry linkages is an important requirement of enhancing the skill development system in the context of high levels of unemployment/ unemployability. This include addressing aspects relating to curriculum revision to make it more industry relevant, as well as, industry-institute collaborations through avenues such as internships, faculty from industry, etc., and strategies to promote entrepreneurship. The other aspect of industry orientation is the creation of industry ready workforce. This can be assessed by the placement of candidates passing out of the system. The aim should be to provide the overall approach, which will provide a structured basis for conducting industry-institute interactions through the entire life cycle of the education.
- **Management and Governance:** The management of technical institutes has been a problematic area in the Indian education system. The overall approach for developing appropriate institutional linkages among institutes, guidelines for the admissions process, scholarships, student exchange programmes and tie-ups with national and international institutes. Regarding Governance, aspects like financial and administrative autonomy, private participation, accountability and strategies to ensure effective monitoring and evaluation also.

16 UN world Population Prospects:2008 The Revision – Population database
17 UN world Population Prospects:2008 The Revision – Population database

Institutional Framework of Skill Development Sector

The term “skill development sector” in India has been referred to mean informal education sector, the purpose of which is to equip a person with employable skills. Skill development and vocational training is a concurrent subject under the Indian Constitution and both the central and state governments share responsibility on various aspects of the same.

The traditional drivers for the skill development sector in India are the vocational training institutes viz. ITIs and ITCs. Conventionally, the Directorate General of Employment & Training (DGE&T) in the Ministry of Labour & Employment is the apex organisation for development and coordination at national level while the day-to-day administration of ITIs rests with state governments. The central government is advised by the National Council of Vocational Training (NCVT), a tripartite body having representatives from employers, workers and central/ state governments on aspects like prescribing training standards, evaluation, certification, and accreditation.

In order to achieve the target of skilling a huge workforce in the country, the Government has recently formulated the National Skill Development Policy. The policy aims to increase the productivity of India’s workforce and enhance India’s competitiveness in the global market by empowering people through improved skills, qualifications and access to employment and to attract investment in the skill development sector in India.

Further, the policy envisages creation of a separate regulatory authority under the chairmanship of the Prime Minister for policy formulation and strategic review of the skill development sector in India. This led to the creation of three tier structure consisting of:

- National Council on Skill Development (NCSD)
- National Skill Development Coordination Board (NSDCB)
- National Skill Development Corporation (NSDC)

National Council on Skill Development

NCSD is an apex institution for policy direction and review of the vocational education and skill development initiatives in India. The council is entrusted with the responsibility of developing the vision and laying down core strategies of this sector. The council is assisted by the National Skill Development Coordination

Board (NSDCB) and strives to consistently come up with measures and changes to facilitate the growth of skill development in India.

National Skill Development Coordination Board (NSDCB)

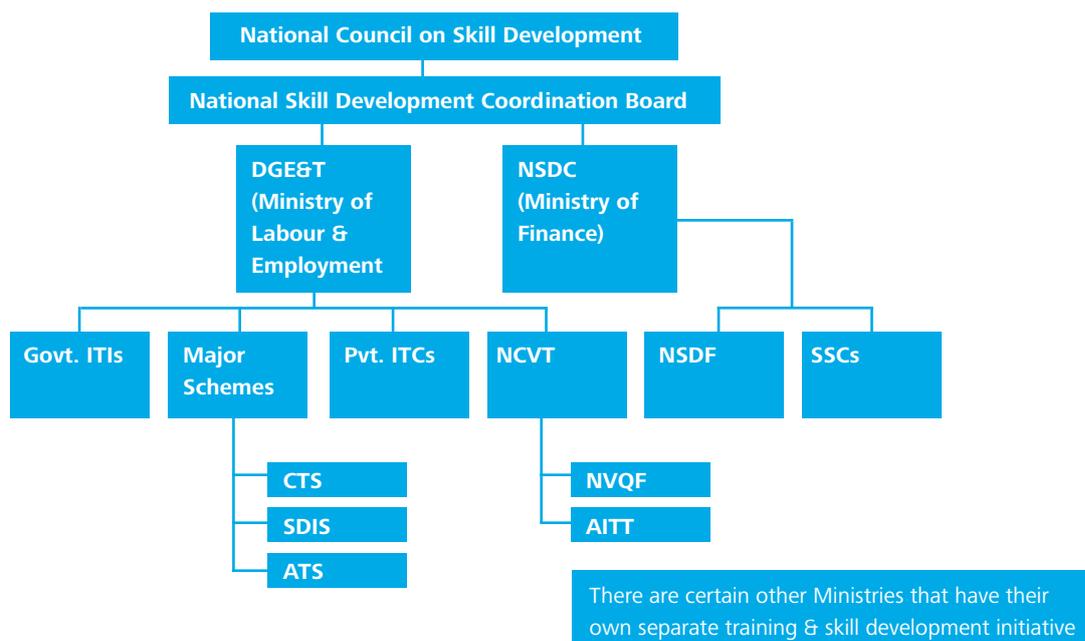
The NSDCB is chaired by the Deputy Chairman of the Planning Commission. It is responsible for coordinating skill development initiatives and actions both in the public and the private sector. The council strives to consistently come up with measures and changes to facilitate the growth of skill development in India. NSDCB is primarily responsible for ensuring smooth coordination between DGE&T, NSDC and other administrative ministries engaged in the skill development sector. At present, about 20 central government ministries playing a vital role in the skill development sector in their respective fields. Some of these ministries have independent training and skill development initiatives, while the others contribute through funding the skill development initiatives in their field.

National Skill Development Corporation (NSDC)

NSDC is a not-for-profit organisation set up by the Ministry of Finance, under Section 25 of the Indian Companies Act. It is a first of its kind Public Private Partnership (PPP) in India that aims to foster skill development by facilitating the setting up of high quality, for-profit vocational institutions with all the necessary facilities and equipment. The corporation provides funding support to approved training centers who meet specific pre-defined criteria for creation of necessary training infrastructure. Its mandate is also to enable support systems such as quality assurance, information systems and ‘train the trainer’ academies either directly or through partnerships. NSDC is also tasked with developing an enabling environment for skills development, including promotion of Sector Skills Councils (SSCs) for key sectors of the economy.

The mentioned figure depicts the institutional framework of skill development sector in India.

Institutional Framework of Skill Development Sector in India



Maharashtra

Under the aegis of National Skill Development Policy, the Government of Maharashtra seeks to skill 45¹⁸ million people over a period of next 10 years. Maharashtra has put in place a governance system for undertaking various skill development initiatives in the State.

State Apex Committee on Skill Development

At the top of the structure, a State Level Apex Committee on Skill Development under the chairmanship of chief minister has been formed which will formulate strategies for skill development strategies. The apex committee is also responsible for creating skill strategy development and drive state level skill development programme to fulfil the skill deficiencies.

State Executive Committee for Skill Development

A State Executive Committee for Skill Development under the chairmanship of chief secretary has also been set up for implementation of various skill development initiatives in Maharashtra.

Core Group for Skill Development

The core group has been mandated with the responsibility to establish contact with various agencies in the state to drive the skill development mission of

the state. It also has the responsibility of formulation of action plan for the next generation of skilled workforce in the state.

Regional Level Committees

The Regional Level Committees, which come under the core group for skill development, monitor the activities of the respective District Level Committees and also provide guidance to these committees for skilling and training of individuals to satisfy the demand of skilled manpower at regional level.

District Level Committees

The district level committees have been set up with the objective of inter alia implementing the 'State Skill Development Program' and employing 'Sector Skill Development Plan' to achieve the targets being set by the state at the district level. The committees also help in up-gradation and skilling of the teaching faculty within the district. Further, the committees provide support to fresh and self-employed skill manpower within the District to acquire respectable employment/entrepreneurial opportunities.

¹⁸ Skill Development Initiative Scheme, Maharashtra: http://sdimh.mkcl.biz/CMS/Content_Static.aspx?did=190

Programmes & Schemes

Vocational training has been traditionally delivered through ITIs that operationally report to and are funded by the state governments, as well as, ITCs that are either privately funded or are 'Government-aided institutions'. There has been a steady growth in the number and seating capacity of ITIs in the country. The number of ITIs has grown from 59 in 1959 to 8687 in 2011. The seating capacity has increased from 3.89 lakh in 1992 to 12.06 lakh in 2010. The following table reflects the regional wise number of ITI/ITCs and their seating capacity.

A comparison of the regional spread of vocational training infrastructure and proportion of working

age population shows that the southern states have performed better than other regions, both in term of number of institutes and seating capacity.

In order to augment its skill development initiative, the government of India has launched various schemes. The objective of these schemes is to provide training to India's increasing workforce through a network of vocational training institutions spread across the states. Most of these schemes provide short term flexible training to the work force to attain minimum skills so as to be gainfully employed. This is particularly important especially for the large section of people working in the unorganised sector who are generally engaged without having received any formal training.

Region-wise number of ITIS and seating capacity

Region	No. of Govt. ITI	Seating capacity (Govt.)	No. of Pvt. ITCs	Seating capacity (Pvt.)	Total ITI/ ITC	Total Seating Capacity	Approx. working age population
Northern	777	118,818	1,828	204,529	2,605 (30%)	323,347 (27%)	30%
Southern	394	90,460	2,802	306,070	3,196 (37%)	396,530 (33%)	22%
Eastern	200	49,242	1,046	173,645	1,246 (14%)	222,887 (18%)	26%
Western	818	194,826	822	76,458	1,640 (19%)	222,887 (18%)	23%
Total	2189	453,346	6,498	760,702	8,687	1214,048	

Source: Annual Report, 2011, Ministry of Labour and Employment

Skill Development Initiative (SDI) Scheme

SDI Scheme formulated by DGET aims at providing short term demand driven vocational training courses to school leavers, existing workers, ITI graduates to improve their employability. Currently, Modular Employable Skills (MES) is being offered under this Scheme. MES aims at imparting minimum skills set through its short terms and flexible course curriculum to prepare the trainees for gainful employment. There are about 6400 vocational training centers providing vocational training to around 1 million people annually in 1257 courses.

In Maharashtra, the MES is available in 340 courses covering about 31 sectors.

Craftsmen Training Scheme (CTS)

CTS has been framed with the key objective of ensuring the steady supply of skilled workers in different trades and to raise the quality and quantity of industrial production by systematic training of potential workers. There are over 8,000 ITIs provide vocational training to 1.22 million people annually in 116 trades.

The scheme is offered in 89 trades through government ITIs in Maharashtra, of these 89 trades, 81 trades come under NCVT, while 8 trades fall under SCVT.

Apprenticeship Training Scheme

The Apprenticeship Training Scheme is provided under 'The Apprenticeship Act 1961' which casts an obligation on the employers in specified industries to engage apprentices as per prescribed ratio.

In Maharashtra, there were about 5270 establishments providing apprenticeship training as on March 2011 with a total seating capacity of about 73,707, of which 45291 have been utilised.

Advanced Vocational Training Scheme (AVTS)

The Scheme has been framed with the key objective of providing opportunity of training to the industrial workers already employed & those deprived of pre-service training in the past, and to upgrade their skills to meet the present need of modern industry. The scheme also aims to provide intensive training to the instructional staff.

In Maharashtra, there are currently 8 institutes offering AVTS with the intake capacity of about 4885 persons.

Centre of Excellence (CoE) Scheme

(CoE) Scheme has been formulated with the objective of converting the existing ITIs into Centres of Excellence for producing multi-skilled workforce of world standard by providing appropriate infrastructure, updated syllabi with introduction of new trades which are relevant in modern economic scenario. These institutions are expected would cater to the skill requirement of the cluster of industries in the particular areas by organizing multi-skilling courses on modular pattern.

Key takeaways:

- Skill development and vocational training is a concurrent subject under the Indian Constitution and both the central and state governments share responsibility on various aspects of the same.
- The traditional drivers for the skill development sector in India are the vocational training institutes viz. ITIs and ITCs.
- In order to achieve the target of skilling the workforce in the country, the Government has recently formulated the National Skill Development Policy and has led to the creation of three tier structure consisting of- National Council on Skill Development (NCSD); National Skill Development Coordination Board (NSDCB) and National Skill Development Corporation (NSDC)
- Under the aegis of National Skill Development Policy, the Government of Maharashtra seeks to skill 45 million people over a period of next ten years. Maharashtra has put in place a governance system for undertaking various skill development initiatives in the State.



Maharashtra Scenario

In line with the above mentioned dimensions, the following section provides an overview of the Vocational Training System in Maharashtra and the key issues involved therein.

Seating capacity

There are about 833 ITIs/ITCs operating in Maharashtra with a total seating capacity of 154,702. During the year 2010-11, about 1,57,523 students were enrolled in ITIs/ITCs against the total capacity of 154,702.¹⁹

Further, the table below indicates the number and capacity of ITIs across the comparison states according to DGET. Maharashtra ranks after Punjab and Andhra Pradesh in terms of ratio of population per ITIs.

Table 3 Distribution of affiliated ITIs across states

Sl. No.	State	Total Number	Govt. it is	Private it is	Population	Population per ITI ('000)
1	Karnataka	1377	138	1239	1,210,193,422	879
2	Maharashtra	833	390	443	112,372,972	135
3	Andhra Pradesh	714	117	597	84,665,533	119
4	Punjab	321	113	208	27,704,236	86
5	Haryana	182	96	85	25,353,081	139
6	West Bengal	90	44	46	91,347,736	1015

Source: DGET website, <http://dget.nic.in/lisdapp/ITI/Reports/rpttclTIState.asp?ListType=101>, Census 2011 provisional figures

Vocational Education

There are about 1,444²⁰ senior schools in Maharashtra offering 150 courses in major vocational areas i.e. HSC (Vocational) with total intake capacity of over 88,000. During the year 2011, about 59,854 students appeared for HSC (Voc) examination out of total seating capacity of 88,000, which reflects the under-utilisation of the capacity to an extent of 32%. There are many reasons for the diminishing relevance of vocational courses amongst the students.

It has been observed that majority of vocational courses offered at school are terminal in nature, as there is no uniformity on entry requirements and progression routes for vertical mobility and therefore, skill gained through these courses are lost. For instance, in Maharashtra, only HSC (Vocational) students of technical stream get limited entry into second year of Polytechnic Diploma.

However, other stream students do not have this option²¹. Further, it has been seen that most of the vocational courses at school level are offered at 11th and 12th level, whereas students at this level aspire for higher education. This can be evidenced from that fact that only 2% of students at 12th level enrol for vocational education at the national level. The position is slightly better in Maharashtra with about 6.8% of the total student population at 12th level²² enrolling for vocational education.

Management and Governance

Effective management is crucial in ensuring a well-developed vocational training system. The involvement of a plethora of agencies, lack of coordination, and lack of autonomy are issues that impede effective management and governance of institutions. This section covers institutional structures and governance mechanisms.

Institutional Structures

The multiplicity of organisations involved in regulation and management result in lack of demarcation of duties and lack of coordination among various bodies. There are multiple authorities providing vocational education/training in Maharashtra at different level without any uniform policy governing such vocational education/training. There are reports, which have cited instances to that effect in case of National Council of Vocational Training (NCVT) and State Councils of Vocational Training (SCVTs), despite a clear demarcation of

responsibilities on paper.

Directorate of Vocational Education & Training, Mumbai (DVET)

Directorate of Vocational Education & Training, Mumbai (DVET) is the apex authority for vocational training an education in the State. This Directorate has been further divided into (a) Director, Training; and (b) Director, vocational Education²³

- Director, Training looks after the various schemes related with CTS (ITIs), ATS, MES & other important schemes,
- Director, Vocational Education looks after the schemes related to Pre S.S.C. Level Vocational Education, +2 Level Vocational Education, Certificate Courses of MSBVE & other important Schemes.

Further, all these schemes are monitored by Department of Higher & Technical Education at the state level, while at the central government level, these schemes under Director, Training are monitored by Ministry of Labour & Employment, DGET, New Delhi. Whereas Ministry of Human Resource Department, New Delhi monitors the schemes under Director, Vocational Education are monitored.

Institute Management Committees (IMC)

Institute Management Committees (IMC) has been set up for Government ITIs to involve the concerned Industry in the day-to-day management of the Institutions. Adequate powers have been delegated to these committees by the State Government. The ITIs are governed by the Institute Management Committee (IMC) consisting of members from the Industry (as Chairman), Employment Officer, District industries centre and the principal of the institute (as Member Secretary). In case of ITIs under the PPP mode, the chairman of the IMC is the industry partner who invests time and effort from the private sector, whereas, the Government invests capital. The IMC has more financial autonomy under this scheme for e.g. Principal has higher sanctioning powers. In private ITIs, an educational society manages the institute.

State Council for Vocational Training (SCVT)

The SCVT, which is affiliated to the NCVT functions as a state agency to advise the State Government in carrying out the training policy as laid down by the National Council and to co-ordinate the Vocational Training Programme throughout the State. The SCVT is chaired by the Secretary for Higher and Technical Education.

20 Vocational Education Committee Report, 2011 by Maharashtra Government

21 Vocational Education Committee Report, 2011 by Maharashtra Government

22 Report on National Workshop on Equivalence, Vertical Mobility of vocational courses at 10+2 level & Placement prospects of vocational pass-outs, 13th May 2010.

23 DVET website <http://www.dvet.gov.in/AboutUs.aspx>

Governance Mechanism

Although Institutional Management Committees (IMCs) were established to enhance the role played by industry in the management of ITIs in India, the 2007 World Bank report²⁴ cites the issue of limited decision making powers which are restricted to a select few training programs. The management of many technical and vocational training institutes does not have the incentive to improve performance given that they do not have complete autonomy with respect to staffing, course development, administrative or financial matters.

Excessive reliance on Government financing, very low fee structures and lack of cost-sharing agreements with the private sector have resulted in shortage of financial resources for improvements in quality in nations such as Bhutan and Nepal.

A 2006 FICCI Report also highlighted inefficiencies in the use of funding by ITIs in India where 50% of the participating institutes spent 90% of their funds on teacher salaries, leaving very little for infrastructure development, teacher training, purchase of raw materials etc.

Encouraging the private sector to be more involved in management could go hand-in-hand with sharing of costs of training students. The aforesaid World Bank

report notes that the fee structures in vocational training institutes in India are not viable to ensure profitability of some institutes and developing a more realistic fee structure and targeted scholarships for needy students may be more effective in the long run. In India, the World Bank report also notes that training providers do not have the incentive to improve performance given that student fees are retained by state governments with respect to ITIs. Another problem arises due to lack of performance-based funding to institutes, which in turn adds to inertia amongst the institution management and staff to better the quality of institutions.

The table below indicates the number and capacity of ITIs across the comparison states according to DGET. While the percentage of private ITIs in Maharashtra is the second highest after Karnataka, the private ITIs tend to have a smaller capacity and offer a smaller number of trades. Nevertheless, it is worthwhile to consider higher private sector participation to increase capacity in the future.

Further, there is lack of academic and financial autonomy at government ITIs as it is felt that the governance and management need to be centralised since field level staff may not have the capabilities unlike the staff at polytechnics and colleges.

Table 4 Distribution of affiliated ITIs across states

Sl. No.	State	Total Number	Govt ITIs	Private ITIs	% of private ITIs to Total ITIs
1	Karnataka	1377	138	1239	90
2	Maharashtra	833	390	443	53
3	Andhra Pradesh	714	117	597	84
4	Punjab	321	113	208	65
5	Haryana	182	96	85	47
6	West Bengal	90	44	46	51

Source: DGET website. <http://dget.nic.in/lisdapp/ITI/Reports/rpttclITISate.asp?ListType=101>

Faculty Development

It is important to have faculty with industrial experience to ensure more practical and relevant training. Various studies have brought this out as an important determinant of quality of faculty in vocational training systems. According to OECD findings²⁵, even in countries like Korea teachers in the vocational education/training system are highly-qualified in terms of academic/pedagogical background but lack sufficient industry experience. Currently, there are insufficient systematic faculty development programmes to address the training needs of all teachers, principals, head of institutes, etc.

Lack of in-service training results in a skills mismatch between what the trainer has learnt as opposed to the nature of curriculum set for ITIs (trades).

There is no clear academic calendar for teachers which will allow for their growth and development. While there are provisions to send faculty for training to Advanced Training Institutes (ATI under DGET, GoI), which are present across the country in places like Mumbai, Ludhiana, Hyderabad, etc. there is no mandatory training or even a periodic training schedule for teachers.

In other countries Bachelors of Vocational Education (BVE) is often a mandatory qualification for teachers. However, in India no specific qualifications are being imparted for Vocational Education teachers.

Industry Participation

Industry participation plays an important role in the growth of vocational training system as no government can achieve desired results without the active participation of industry. However, such participation has only begun to gain momentum in India. Improving industry linkages will be an important requirement for enhancing the vocational education system in Maharashtra.

The table below indicates the number of Industry Partnerships across states over the last 4 years. Maharashtra seems to be the leader in attracting industry players to participate in the Vocational Training system.

Further, in 2008, Mahindra group signed a MoU with Maharashtra Government under the Upgradation of 1396 Government ITIs through PPP scheme to upgrade two ITIs at Ghodegaon and Manikdoh. The MoU included the development of an Institute Development Plan (IDP) by the Institute Management Committee (IMC) and Mahindra to ensure scaling up trades, increased intake of students and faculty. This MoU was meant to provide relevant training to both students and faculty and encourage students to work with Mahindra's new plant in Chakan. Similarly, as of 2009, Bharat Forge Limited signed a MoU with ITI Khed to impart vocational training under CTS in 6 trades to project affected people candidates under proposed SEZ to be set up in 15 villages.

Number of Industry Partnerships under 'Upgradation of 1396 Government ITIs through PPP'

Sl. No.	State	2008-09	2009-10	2010-11	2011-12
1.	Karnataka	26	23	1	0
2.	Maharashtra	55	60	29	8
3.	Andhra Pradesh	36	3	2	0
4.	Punjab	19	22	7	1
5.	Haryana	13	10	12	0
6.	West Bengal	12	5	4	0
7.	India	306	301	121	40

Source: DGET website, <http://dget.nic.in/ItiUpgradePPP/welcome.html>

25 Vocational Education and Training in Korea Strengths, Challenges and Recommendations, OECD 2009

Gaps in the existing Vocational Training System

Based on the above discussion, following table provides an overview of the key issues in the vocational training system in Maharashtra. Some of the issues brought out herein have also been discussed in other reports and studies .²⁶

Dimensions	Key issues and challenges
Seating capacity	<ul style="list-style-type: none"> The available data on seating capacity clearly underscores the requirement to scale up the capacity of ITIs/ITCs in the state.
Vocational Education	<ul style="list-style-type: none"> The under-utilisation of the capacity for HSC (Voc) examination indicates a need to reform the stream to make it more relevant to the needs of the students like option for vertical mobility, etc.
Management and Governance	<ul style="list-style-type: none"> Presence of multiple authorities in vocational training system leading to overlapping of authority and duplication in efforts. It has been expressed that the NCVT affiliation process is slow and hence the responsiveness of the trade offered to the demands of the industry is low. Moreover, the role of the SCVT is very limited in the current system. The financial and academic autonomy at the institute level is low which needs to be relooked, especially for larger ITI's, which are being positioned as Centres of Excellence. The private ITIs are not engaged in effectively in administrative decision making and enjoy much less autonomy in aspects like admissions, examinations, etc. The quality of delivery of training in private ITCs may be compromised due to low fee structure
Faculty Development	<ul style="list-style-type: none"> The current system of Faculty development requires a systemic intervention as no mandatory training and development programs or Industrial orientation is being offered to the trainers. The private ITIs receive no support from the Government on this front. No minimum qualification prescribed for the faculty/trainers
Industry participation	<ul style="list-style-type: none"> No adequate Industry participation in the field of curricula development, training of instructors and other aspects of vocational training

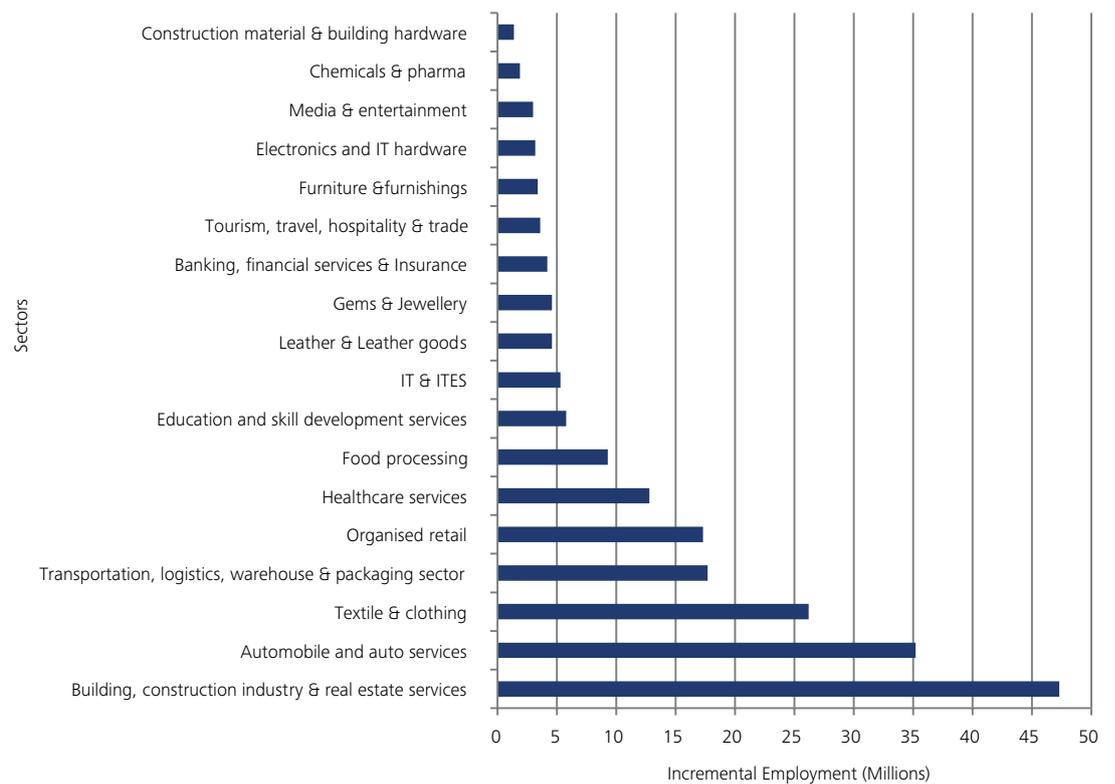


26 A Global study to get India World-Ready, Building Sector Skills Body for India by Manipl City and Guilds; and Vocational Education Committee Report, 2011 by Maharashtra Government.

Skill Workforce Requirement

Since one of the main objectives of skill development is to prepare students for employment, it is important to appreciate the larger labour market context in India as it reflects the demand-side requirements of the technical education system. In terms of estimates of skill requirements, the Planning Commission has identified 20 sectors (10 each in secondary and tertiary sectors) which it believes will be areas of high growth.

Human Resource Forecast in High Growth Sectors



Under the aegis of skill development mission of the Government of Maharashtra, the State has identified 11 top priority industries for which sector specific committees have been set up.

These sector-specific committees have been mandated with the task of inter alia analysing the skill gap of the available workforce in these industries and to suggest the skill development action plan.

The below mentioned section provides an overview of the projected demand of the skilled manpower in Maharashtra in 2022 and qualitative deficiencies thereof in some of the key sectors.

11 priority sector identified by Maharashtra	
Sectors with high demand of skilled manpower <ul style="list-style-type: none"> • Agro-Processing; • Automobile; • Construction; • IT & ITES; • Textile • Production & Manufacturing; 	Other sectors <ul style="list-style-type: none"> • Pharmaceutical, Chemical & Petro-Chemicals • Retail • Hospitality • Healthcare • Banking, Finance & Insurance

Table: Projected demand of manpower in Maharashtra in certain high growth areas in 2022

Sector	Projected demand in 2022 (figures in '000)
Construction	14,155.9
Automobile	5,500
IT&ITES	2,238
Textile	3,639
Agro Processing	1,389
Manufacturing	387.56



Projected demand of workforce in certain high growth sectors in Maharashtra

Construction Sector

Brief overview of the sector

The construction sector is one of the largest employers in India and currently employs approximately 32 million workers directly or indirectly. The contribution of the sector in the country's GDP stands at about 5%. It is estimated that in the coming years an additional 4 million people per annum is to be added to the existing workforce to maintain growth levels in the construction sector.

Projected skill requirement

In Maharashtra, there are currently about 400 projects worth US\$.5 trillion going on, majority of which are into sectors like civil engineering, housing and healthcare. As per an estimate, there will be an incremental demand of 8,041,510 people in construction sector till 2022 in Maharashtra, of which 56,29,040 people would be required in infrastructure sector, while there will be a requirement of 24,12,470 workforce in the real estate sector. The below mentioned figure indicates the manpower requirement in construction sector till 2022 in Maharashtra.

Projected demand of manpower in construction sector in Maharashtra up to 2022 (Figures in 000's)

Projected demand of manpower in construction sector in Maharashtra up to 2022 (Figures in 000's)



Source: Maharashtra State Sector Skill Committee Report on Construction Sector, 2012

Qualitative Deficiencies²⁷

SI No.	Function	Skill gap
1	Land acquisition and land bank creation	<ul style="list-style-type: none"> Civil engineers hired for this role usually lack knowledge about relevant government procedures and clearances Lack of aptitude to write good basic investment proposals in English language Personnel are not very articulate while liaisoning
2	Project conceptualisation, design, planning and marketing	<ul style="list-style-type: none"> Inadequate ability to plan out large scale projects – including high rises, large housing complexes, infrastructure projects.
3	Facility	<ul style="list-style-type: none"> Incomplete understanding of maintenance services Inadequate customer orientation and interaction skill Inadequate understanding of AMC Inadequate documentation skills Insufficient ability of managing people involved in delivering services
4	Tendering	<ul style="list-style-type: none"> Inadequate techno-commercial orientation Insufficient knowledge of legal issues Not very articulate while presenting or liaisoning Poor communication skills, oral as well as written

27 Maharashtra State Sector Skill Committee Report on Construction Sector, 2012 & NSDC, Report on the Construction industry in India

Emerging trends in Industry which may have an effect on Skill needs ²⁸:

Some of the emerging trends in human resource and skill requirements in the Building, Construction and Real Estate Industry in India are as below:

- Technology and Mechanisation: Much advancement has been seen with respect to batching plants, plastering techniques, etc. in construction sector. It is also expected that the level of mechanization in the building, construction and real estate industry in India would further increase. The use of modular structures, pre-fabricated parts and pre-cast parts is helping reduce the slab-to-slab time.
- Reduction in proportion of unskilled workforce needed: With the increasing use of technology and with the level of mechanisation increasing, the proportion of unskilled workmen needed at a construction site is expected to reduce. With the changeover to steel girders, lesser number of personnel is required; and those required will be mainly for the assembly operation.
- Increasing trend of facility management: The trend towards facility management is comparatively new to India. This is expected to increase, and an increasing number of developers are expected to provide facility management services at an additional cost, including the entire gamut of activities – security services, plumbing services, gas pipe services, food stores within the residential complex, television cable services, electrical services), maintenance service, etc. This trend is expected to generate employment for such set of people.

Automotive Sector

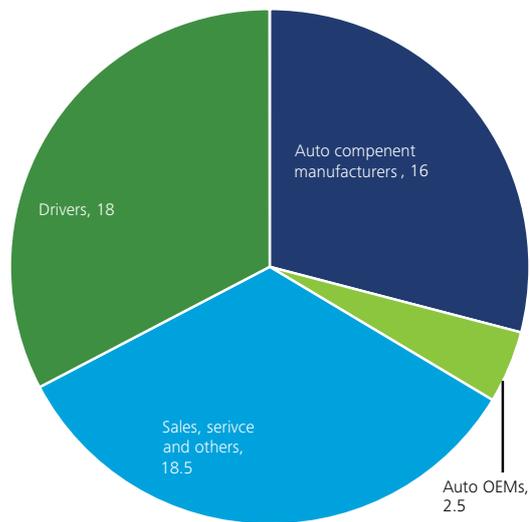
Brief overview of the sector

The automotive sector in India which, comprises of automobile and auto component sub sector has witnessed a consistent growth in the last decade and it is expected to grow about 11.5% over the next decade. The sector is also one a major contributor in generating employment and is projected to employ over 25 million by 2016-17. By the year 2022, the sector would employ about 35 million people on direct or indirect basis. Maharashtra has a share of over 25% in Indian automotive sector and as such, there would be a huge demand of skilled manpower in the state.

Projected skill requirement

As per an estimate, there would be a demand of 5.5 million people on incremental basis in the automotive sector in Maharashtra by the year 2022. The below mentioned figure reflects the demand of manpower in 2022 in different segments of the automotive sector in Maharashtra.

Projected demand of workforce in automobile sector in 2022



Source: Maharashtra State Sector Skill Committee Report on Automobile Sector, 2012

²⁸ Maharashtra State Sector Skill Committee Report on Construction Sector, 2012 & NSDC, Report on the Construction industry



Qualitative Deficiencies common to Auto OEMs and large Tier I suppliers²⁹

Sl No.	Function	Skill gap
1	Manufacturing/ Operations	<ul style="list-style-type: none"> • Tendency to be inflexible and do not accept that vehicle production defects may be due to errors committed in the particular shop that the shop head leads • Insufficient understanding of automobiles, their subsystems and functions of important parts such as suspension, exhaust, fuel system, coolant circuit, etc. • Tendency to be narrow minded and resist changes required in the particular shop, say, to accommodate a new vehicle version • Inadequate ability to liaison with various production lines and departments • Inadequate knowledge across all facets of the company's business – for example, the shop head of the transmission shop of Product A typically does not have knowledge of the engine manufacturing processes being used in Product B • Adequate understanding of financial/commercial impact of their decisions related with the particular shop
2	Design and Development	<ul style="list-style-type: none"> • Inadequate ability to multitask and coordinate with multiple agencies at once • Tendency to be 'protect' module heads / module designers working with him / her by not being very receptive to feedback received from other agencies on design changes required in systems / modules / components • Inadequate ability to understand technical details of 'black box' items and have meaningful discussions with suppliers of such items
3	Vendor Development / Materials / Purchase	<ul style="list-style-type: none"> • Inadequate commercial sense in terms of taxations, material prices, sourcing methods, etc. • Inadequate knowledge of optimum manufacturing processes for producing given components • Inadequate negotiation skills, thus leading to the suppliers dominating negotiation discussions at times • Inadequate technical knowledge of products being supplied by the suppliers
4	Projects	<ul style="list-style-type: none"> • Inadequate understanding of technical aspects of vehicle design and manufacturing • Lack of coordination between departments • Inability to liaison with senior projects personnel from other projects to emulate best practices across projects
5	Sales and Marketing	<ul style="list-style-type: none"> • Inadequate understanding of customer profiles while designing marketing strategies • Inadequate market intelligence • Ineffective utilization of advertising budgets • Ineffective forecasting of expected sales, leading to inventory built-up / stock- outs at the manufacturing units
6	Service / Spares	<ul style="list-style-type: none"> • Inadequate ability to handle and manage operations of service centres spread across multiple locations • Inadequate ability to maintain and ensure that standard operate in procedures are followed at the service centre level • Insufficient skills for maintaining the required service levels and customer satisfaction levels

²⁹ Maharashtra State Sector Skill Committee Report on Automobile Sector, 2012 & NSDC, Report on the Automobile industry in India

Emerging trends in Industry which may have an effect on Skill needs³⁰:

- Human resource and skill requirements related to the emerging trends in the industry: Several emerging trends are seen in the Automotive Industry in India. These trends in turn give rise to the corresponding human resource and skill requirements. For example, more number of electronics engineers will be needed to work on the increasing electronic content of vehicles, design engineers will need to work on complicated engine designs, and design as well as manufacturing personnel will be needed for hybrid vehicles. Similarly, personnel to work on the emerging regulatory trends will be needed – for example, design engineers will need to have advanced knowledge of emission and safety regulations.
- Increasing recruitment of BSc graduates: A recent trend seen in the Automotive Industry in India is the recruitment of BSc graduates at the same level as ITIs or diploma engineers. It is observed that BSc graduates are able to adapt to the manufacturing environment and learn quickly – they need to be given the same amount of training (6 months to one year) that is generally provided to fresh ITI’s or diploma engineers.
- Shortfall of human resources in vehicle design and styling functions: Styling of vehicles is a key competitive advantage for OEM’s, but at the same time styling and design capabilities are significantly lacking in India – this is why most auto OEM’s in India depend upon design houses abroad for styling of the vehicles being developed by them.

IT & ITES Sector

Brief overview of the sector

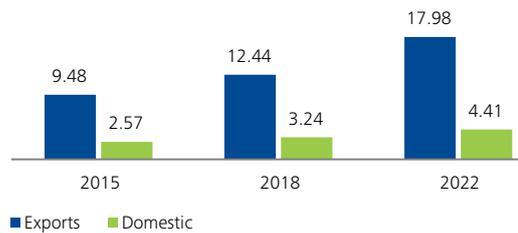
The India IT & ITES has grown at a CAGR of about 30% between 2004 and 2009. The sector is not only one the largest employer in India but also a significant contributor to foreign exchange with about 80% of the revenue coming from exports. As per a Nasscom report, the number of people employed in the IT/ and ITES sector has increased from 6,70,000 in 2003 to 2,572,000 in 2010.

Maharashtra ranks amongst the top state for IT /ITES related services, with Pune featuring as a leader in BPO services. The state also contributes about 30% of country’s total software exports.

Projected skill requirement

With the projected growth in the IT and ITES sector, it is expected that the sector would employ about 7.5 million persons directly by 2022. The demand of manpower in Maharashtra would increase from 0.852 million in 2011 to 1.568 million in 2018. The same is further expected to be increased to 2.238 million in the year 2022. The below mentioned figure indicates the requirements of human resource in the IT/ITES sectors in Maharashtra till 2022.

Projected demand of workforce in IT & ITES sector up to 2022 (Lakh Persons Employed)



Source: Maharashtra State Sector Skill Committee Report on IT & ITES Sector, 2011

30 Maharashtra State Sector Skill Committee Report on Automobile Sector, 2012 & NSDC, Report on the Automobile industry in India

Qualitative deficiencies in IT & ITeS³¹

Segment	Level	Skill gap
IT Industry – Delivery	Software Engineer	<ul style="list-style-type: none"> • Inability to ‘deep-dive’ into a particular language/technology platform as experience level increases • Inadequate soft skills, especially when it comes to interacting with the client • Inadequate knowledge of corporate culture – reporting, compliance, escalations, email etiquettes and protocols • Most persons are not able to view their role as a ‘software engineer’ – they see it more as a ‘programmer’ – this results in gaps in ‘systems approach/thinking’ • Lack of awareness concepts of software engineering
IT Industry – Delivery	Project Leads and Module Leads	<ul style="list-style-type: none"> • Inadequate specialisation • Poor domain exposure • Less than adequate ability to undertake project estimation • Ineffective communication skills and soft skills in many cases, • Specific experience is lacking which leads to gaps in abstraction of learning
IT Industry – Delivery	Project Managers	<ul style="list-style-type: none"> • Inadequate domain/business knowledge • Inadequate ‘solutions’ mind set when interacting with customer • Inadequate process knowledge • A large portion of these skills are learnt by experience, which is further compounded by the fact that there are no structured training programmes at this level
IT Industry – Delivery	Business/Group Heads	<ul style="list-style-type: none"> • Inability to manage large scale on transition from a Project Manager to a Business Head position • Less than required negotiation skills when interfacing with customers
Pre-Sales and business Analysis	Business Analysts	<ul style="list-style-type: none"> • Insufficient ability to understand customer requirements • Inadequate ability to understand specifics of other markets – regulations, compliance requirements • Poor communication skills – especially written/business communication skills • Inadequate proposal presentation skills
Pre-Sales and business Analysis	Product Developers and Analysts	<ul style="list-style-type: none"> • While most of the skills required here have enough room for improvement, the areas where gaps are acute: insufficient knowledge of market regulations and other areas specific to the product less than adequate- depth in domain knowledge and process flow

31 Maharashtra State Sector Skill Committee Report on IT & ITeS Sector, 2012 & NSDC, Report on the IT & ITeS industry in India

Emerging trends in Industry which may have an effect on Skill needs:³²

- Increasing play in Migration Projects: While a large proportion of projects would be in the maintenance space, the industry is likely to see an increasing share of projects which would involve migration across systems and platforms. This would be on account of consolidations and Mergers and Acquisitions occurring in several industry sectors globally.
- Green IT and Cloud Computing: This could be one more potential area for building scale and innovation going forward. This spans aspects both internal and external to the industry. Adoption by industry of Green technologies and practices including Green buildings, Green computing infrastructure e.g. energy efficient data centres, power efficient computers, sharing infrastructure e.g. shared data centres, addressing issues like ewaste management is a potential growth area. This has also a vast business opportunity in terms of consulting with clients on Green IT.
- Increasing share of other business verticals: While the IT industry has been dominated by the BFSI segment, the industry is likely to witness increased share from segments such as Retail, Telecom, Healthcare, Technology etc.
- Increasing play of Infrastructure Management Services: This is likely to be a major growth areas with companies increasingly outsource much of their infrastructure management to Indian IT vendors, including ITIL management, and IT Service Management.
- Larger share of newer markets: The industry is likely to see increasing share from continental Europe, Japan, and even continents such as Africa and Latin America.

Textile Sector

Brief overview of the sector

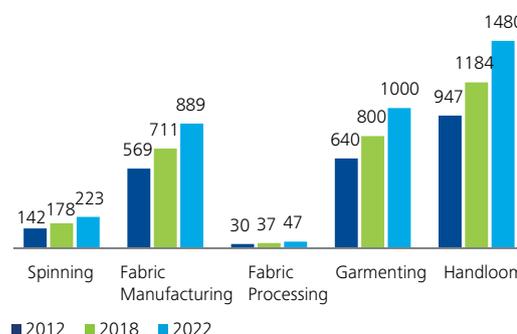
The textile sector currently accounts for about 14% of the country's total industrial production. The sector is also the second largest employer after agriculture providing direct employment to about 35 million people. It has a share of 4% to the country's GDP.

Maharashtra contributes about 10.4% of the textiles and apparels production of the country. The state enjoys abundant raw material availability, proximity to international market via excellent port connectivity and has among the best human resource polls because of traditional hubs in the state. It is also the second highest cotton producer in the country.

Projected skill requirement

The human resource requirement for the textile sector at the national level is expected to increase from about 35 million currently to about 60 million by 2022. This would translate to an incremental human resource requirement of about 25 million persons. In Maharashtra, the requirement of human resource in the textile sector would increase from 23,28,000 people in 2012 to 36,39,000 in 2022, thereby, creating an incremental demand of 13,11,000 workforce. The table mentioned below reflects the manpower requirement in Maharashtra across different segments in textile sector.

Projected manpower demand in Maharashtra in textile sector



Source: Maharashtra State Sector Skill Committee Report on Textile Sector, 2012

32 Maharashtra State Sector Skill Committee Report on IT & ITeS Sector, 2012 & NSDC, Report on the IT & ITeS industry in India

Emerging trends in Industry which may have an effect on Skill needs ³³

- Research & Development: The textile industry does not have R&D as a focus area. The industry would have to invest more in both process and product R&D to maintain product and cost competitiveness. This requires industry-academia collaborations as well as individual R&D efforts by the companies.
- Labour laws: More flexible labour regulations will positively affect the industry. Currently, T&C industry comes under the purview of Contract Labour Act, 1970 which prohibits contract labour for the work that is perennial in nature. The exporters find it difficult to manage the seasonal and order based volatility in demand on account of this. Also, the current regulations prohibit women from being employed in night shifts. Relaxation of the same with adequate safeguards can lead to more participation of women and also help in addressing the skill shortage in the industry.
- Modernisation of technology: It would necessitate more technical skills for operators in the production and maintenance functions across the value chain of the textile industry. The sector also needs multitasking/ multi skilling at the operator level.
- The garmenting sector: It would be the key driver of the employment in the textile sector. Majority large portion of the human resource requirement will be for operators who have the adequate knowledge of sewing machine operations and different types of seams and stitches. Although, the industry will continue to have predominantly line system of operations, designer and high end fashion exports would necessitate “make through” system of operations which would require the operators to have the ability to stitch the complete garment. The availability of merchandising and designing skills would be crucial for increasing share in export markets and tapping the potential in new markets.

Agro Processing Sector

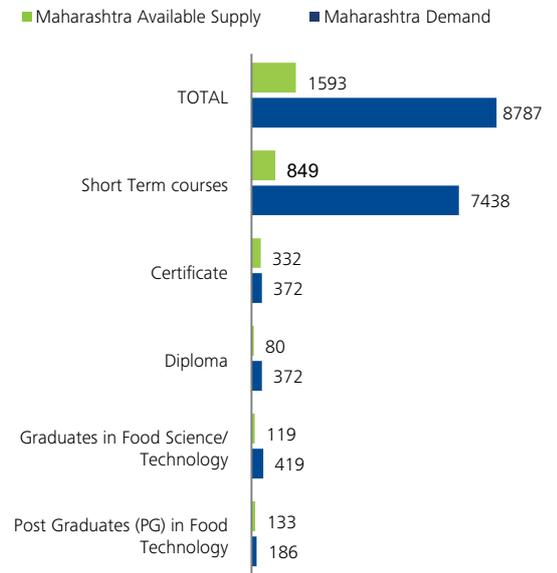
Brief overview of the sector

Maharashtra is one of the leading states in agriculture produce with a share of 10.7% in nation’s total output and therefore, has an important say in the food processing industry. The technological advancement in the sector has also increased the demand of skilled labour in the state.

Projected skill requirement

The projected demand of workforce in food processing sector in Maharashtra is expected to increase from 6,65,000 people in 2008 to 13,89,000 in 2022. The requirement for skilled personnel in the Food Processing Sector as a whole is much larger, however, in order to give illustration on the demand-supply gap that exist in the sector, the below mentioned figure considers only the organized sector.

Annual Skilled Human Resource Supply & Demand in Food processing



(Source: Maharashtra State Sector Skill Committee Report on Agro-processing Sector, 2012)

Qualitative Deficiencies³⁴

Segment	Function	Skill gap
Dairy Processing Segment	Production	<ul style="list-style-type: none"> Inadequate education of farmers about latest techniques for minimising wastage Inadequate knowledge of ways of maintaining quality of produce
Dairy Processing Segment	Procurement	<ul style="list-style-type: none"> Inadequate ability to forecast demand Inadequate communication skills, especially in local language because of diverse dialects
Dairy Processing Segment	Testing/ Quality Check	<ul style="list-style-type: none"> Inadequate ability to practically conduct tests and record results
Food Grain Milling Segment	Operations	<ul style="list-style-type: none"> Inadequate team handling and worker handling skills Inadequate planning of work schedules Inadequate understanding of machine controls Inadequate understanding of ways to minimise breakage Inadequate ability to stitch gunny bags well, leading to leakages from the bags Inadequate ability to follow rules of marking gunny bags
Food Grain Milling Segment	Procurement	<ul style="list-style-type: none"> Inadequate ability to forecast the demand accurately Inadequate training skills for encouraging the producers for better productivity and quality
Food Grain Milling Segment	Testing	<ul style="list-style-type: none"> Inadequate practical expertise in conducting tests

Emerging trends in Industry which may have an effect on Skill needs³⁵:

- Untapped consumer markets: Majority of the disposable income of a household is spent on food consumption. Increased economic growth, evolving food-consumption patterns, a higher standard of living due to rising disposable incomes and a trend towards nuclear dual-income families, all present considerable potential for growth in spending on food consumption. Changing lifestyles and increasing consumer awareness, due to increasing proportion of working women and the emergence of nuclear/ double income families, especially in urban areas is also changing food consumption patterns.
- Increasing foreign investments: There has been a significant inflow of Foreign Direct Investment (FDI) into the Food Processing Industry. The FDI in Food Processing Industry in June 2007 stood at \$1,282.06 million. Progressive Government policies/measures to encourage the FDI in India are expected to further improve this situation in future.
- Product innovation: The Indian market is witnessing a revolutionary change and multinational companies are introducing globally known products in the Indian markets. There has been a sudden increase in frozen foods segment, the number of players and the consumption of frozen products has changed due to changing lifestyles.
- Infrastructure: The government is working on agri-zones and the concept of mega food parks. About 30 such mega parks are coming up across the country in various cities to attract Foreign Direct Investment (FDI) in the Food Processing sector. The Government has also announced a 15-25% capital subsidy scheme for investment by private players to facilitate the construction of rural go-downs, thus increasing the role of PPP in the Food Processing sector.
- Equipment: New equipment has been introduced or are planned to be introduced in the Indian market by both the international and the national players. Siegling, a major player in industry has launched "Series 6", a new product in the modular belt range, specially designed for particularly hygiene-sensitive areas. Retail giants such as Reliance Retail, Aditya Birla Retail (ABR), Wal-Mart, Mahindra Retail and Big Bazaar are planning to source world class cold storage containers.

³⁴ Maharashtra State Sector Skill Committee Report on Agro-processing Sector

³⁵ Maharashtra State Sector Skill Committee Report on agro-processing Sector, 2012 & NSDC, Report on the agro-processing industry in India

- Technology: Large MNCs are tapping into the Organised Retail sector through the cash and carry route. The Indian market is witnessing innovative and technologically advanced products. There has been a growing demand for machines to pack pre-cooked food (Indian dishes) in restorable pouches.

Manufacturing Sector

Brief overview of the sector

Manufacturing sector is important for any nation due to its ability to generate huge employment opportunities. The sector has always been a significant contributor to country's GDP and currently it has a share of about 16%. With the advent of National Manufacturing Policy, 2011, the sector is expected to get a further fillip. The policy inter alia targets to create 100 million jobs in the manufacturing sector that will contribute to 25% of the GDP.

Home to about 16,376 industries, manufacturing sector plays a vital role in Maharashtra's economy. The state is emerging with industrial and service sector, and both these sectors contribute about 89 percent of state domestic product.

Projected skill requirement

As per estimates, the sector would generate arrogated employment of about 33,80,160 workforce upto 2022 from the present demand (2012) of 2,37,926 people.

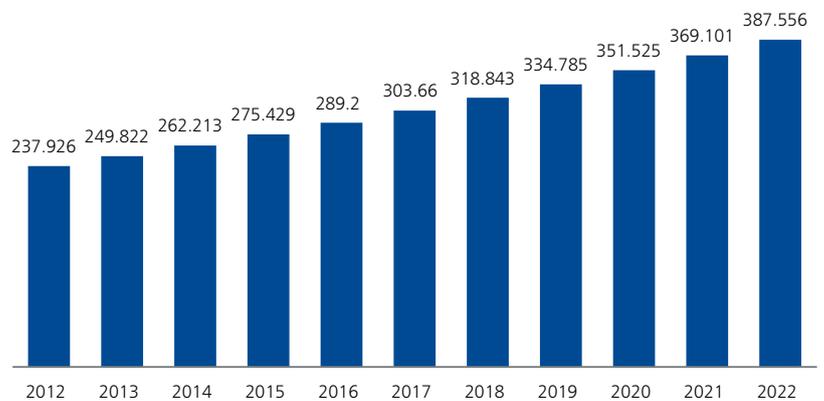
The figure below indicates the year on year requirement of the manpower in Maharashtra in manufacturing sector.

Manufacturing – Electronics

India is a recognized as a global player in software and software services. It although lags behind in electronics hardware manufacturing capabilities, though it is increasingly becoming a destination for chip design and embedded software. The National Policy on Electronics aims to address the issue with the explicit goal of transforming India into a premier global hub for electronics system design and manufacturing (ESDM) so as to meet the growing domestic and global demand.³⁶

Electronics and IT Hardware industry has the potential to grow at a Compounded Annual Growth Rate (CAGR) of about 17% till 2022 and even thereafter considering the fact that the GDP is expected to grow at a rate of 7.5% to 8% over this period³⁷. Therefore, we expect the production of Electronics and IT Hardware to increase from Rs. 844 billion in 2008 to Rs.7,520 billion by 2022. Consumer Electronics, Computers, Telecom Equipment, and Industrial Electronics would contribute to a large portion of the size of the industry.

Projected demand of workforce in manufacturing sector till 2022



Source: Maharashtra State Sector Skill Committee Report on Production and Manufacturing Sector, 2012 (Figures in 000's)

³⁶ National Policy on Electronics, DeitY, 2012

³⁷ NSDC, Report on the human resource and skill requirements in the Electronics and IT hardware industry in India

Skill Gaps in the Electronics and IT Hardware Industry

Level	Skill gaps
Helper level	<p>The helper level personnel generally lack the industrial culture to work on the shop floor. They are to be provided with short duration training on behavioral aspects as their job does not involve any technical skills, but still gaps remain. Key skill gaps are:</p> <ul style="list-style-type: none"> • High absenteeism, lack of punctuality • Lack of discipline at workplace for adhering to production norms • Inability to identify deviations in material and inform the operators/supervisors • Insufficient awareness of health and safety standards, despite being educated about the same • Inability to identify deviations in material and inform the operators/supervisors • Insufficient awareness of health and safety standards, despite being educated about the same
Operator/ Technician	<ul style="list-style-type: none"> • Inability to understand material variation and take corrective action or escalate the issue so that wastages can be minimised • Incapable of identifying defects at any particular point in the production line and rectifying the same on time • Lack of machine handling ability and knowledge of latest technologies • Insufficient orientation to learn - Operators do not make an attempt to understand new processes and need handholding for a much longer period than required • Inability to understand instructions and product designs completely • Quality technicians lack the computer proficiency and data management skills, the quality manual is not referred to diligently in few cases. Most of the people lack understanding of latest quality concepts and techniques
Supervisor	<ul style="list-style-type: none"> • Inability to keep the team motivated and manage their expectations • Inability to involve subordinates or take their feedback in decision making process • Poor capability to prepare inspection manuals and supervise the inspection process • Lack the enthusiasm to organise quality/system improvement training and inculcate a culture of quality consciousness among workers
Across the Production Function	<p>Across the Production function, there are skill gaps in the following areas:</p> <ul style="list-style-type: none"> • Soldering – manual and automatic • Shop floor concepts, clean room • Equipment identification and handling • Quality and safety issues.

Emerging Trends in Electronics and IT Hardware Industry and Implications on Human Resource and Skill Requirements

The following are some of the emerging trends in the Electronics and IT Hardware Industry:

- Increasing consumption and potential for production: The expected steady increase in the Private Final Consumption Expenditure (PFCE) on Home Appliances, Recreational and Education Services, both ranging between 13% and 15%, is expected to drive the consumption and production of Electronics and IT Hardware. This is expected to drive industry/production growth at about 17%, with major contributors being Computers, Consumer Electronics, and Telecom.
- Sales and Service Ecosystem as a driver of employment: The sales and service support functions are expected to generate an incremental employment of 1.2 million persons till 2022. This would be due to a large nation-wide footprint of tier-2 and tier-3 industry participants (dealers, franchisees, service agencies, etc.). This 'ecosystem' would contribute to a large portion of the human resource requirement.
- Manufacturing has potential for increasing localisation: While a large portion of manufacturing is actually currently a combination of sourcing and assembly, increasing content would be locally manufactured – for example, passive components, certain active components, more complex motherboards, increasing adoption of Surface

Mounted Technologies and other high-tech areas. Certain components such as CRT based picture tubes may eventually see a reduction in production given the increasing adoption of LCD/Plasma displays. Incremental employment in manufacturing is likely to be 1.5 million till 2022.

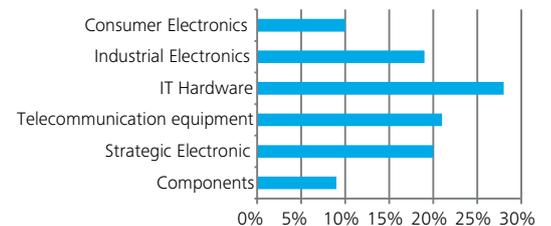
- Increasing adoption of E-Waste Management (electronic waste management) driven by regulation is likely to see more 'organisation' of the industry in that space.
- Global trends such as green and energy efficient technology is likely to have increasing adoption in India too.
- Increasing contract manufacturing and stronger OEM-supplier relationships would also be a key success factor towards developing a better ecosystem. There is a strong case for cluster development in this sector.
- Growing segments would be major contributors to employment: Segments such as Consumer Electronics, IT Hardware, Telecom Equipment would be major contributors for employment. Illustrative growth categories are:
 - Set Top Boxes
 - Mobile Handsets
 - Plasma/LCD TVs
 - PC assembly
 - End to End IT solutioning - assembling, installation, support at on-site and off-site, infrastructure management, emergence of newer technologies such as cloud computing.

Telecom & Telecommunication

The Telecom Service Sector 2011-12 indicating a growth of 13.82%. In 2011- 2012 the number of telephone subscriptions increased by 12.41 %. The wireless subscriber base increased by 107.58 million and the wireline subscriber base recorded a decline of 2.56 million. The wireless segment continued to dominate and the overall teledensity in the country increased to 78.66 from 70.89.

Several significant policy recommendations were made by TRAI during the year which include recommendations on spectrum management, licensing, Telecom Infrastructure, Green telecommunications and Telecom equipment manufacturing. TRAI also notified several regulations relating to consumer protection, complaint redressal and for controlling unsolicited commercial communications. The enormous growth of the Telecommunications in the country has unfortunately not been accompanied by a corresponding growth of the Telecom equipment manufacturing industry. Resultantly, while only about 12.5% of the demand for telecom equipment is being met by domestic production, the Indian products account for a mere 3% of the demand.³⁸

Growth rates of key segments CAGR (FY 2002 to FY 2008)



Source: IMAcS analysis

38 TRAI Annual report 2011-2012. <http://www.trai.gov.in/WriteReadData/Miscellaneous/Document/201301150318386780062Annual%20Report%20English%202012.pdf>

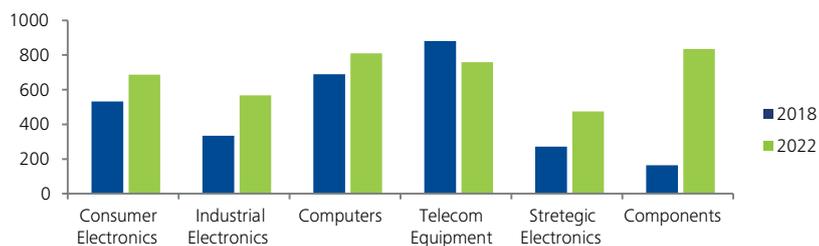
Telecommunication equipment is the second fastest growing segment after IT hardware. The estimated production of this segment in FY2009 was Rs. 260 billion.

The segment includes digital exchanges (EPABX, RAX, TAX and MAX), transmission equipment (HF/VHF/ Microwave trans-receivers), satellite communication terminals, optical fibre communication equipment, two-way radio communication equipment. Communication technology has taken a big leap forward and received national recognition as a key driver for development and growth. India has taken a leading position in the mobile handsets market. Some of the world renowned mobile set manufacturers, like Motorola, Samsung, Sony Ericsson and LG have set up production bases for mobile handsets in the country.

Telecom Equipment: The key skill gaps, especially in servicing mobile handsets are:

- Fault identification
- Customer interaction
- Board level repair
- Signal testing and signature reading
- L1 and L2 repairs.

Incremental human resource requirement in the Electronics and IT Hardware Industry (in '000s)



Source: IMaCS analysis

Strategic Directions

Select International Practice

The below mentioned section outlines an overview of some of the international practices in skill development sector, considering that the same may be relevant in the context of India and its states.

Germany³⁹

Vocational training in Germany is provided on the job and in vocational training schools. Based on what is referred to as the dual system, practical vocational training is given at work, backed-up by theoretical training and general education provided in vocational training schools which are generally attended on one or two days a week. Vocational Universities in Germany called as Universities of Applied Sciences offer Bachelor's and Master's Degree Programs in Vocational Streams. The Universities of Applied Sciences offer practical university-level education and training focus more heavily on teaching rather than research and by offering degrees tailored to specific jobs and industries. Courses at these universities are in great demand as they increase the status of vocational training by providing opportunity to vocational students to pursue University level courses. In fact, Universities of Applied Sciences in Germany currently train nearly all of Germany's social workers / social educators, two-thirds of all of its engineers and about half of its economists and computer scientists.

39 Vocational Education Committee Report, 2011 by Maharashtra Government; and Hamburg Chamber of Commerce (http://www.hk24.de/en/training/348086/duale_system.html;jsessionid=740E15987B0365DB475034B20DCB25B3.repl2)

40 Skill Development in India - The Vocational Education and Training System, The World Bank, 2007

41 UK Department of International Development (DFID) and the World Bank (WBG) Study; and Vocational Education Committee Report, 2011 by Maharashtra Government

42 Vocational Education and Training in Ireland Strengths, Challenges and Recommendations by OECD (<http://www.oecd.org/edu/ndadultlearning/45399591.pdf>); and Draft Report on Initial Vocational Education and Training in Ireland

South Korea⁴⁰

The vocational educational system in Korea has witnessed a transition from producing semi-skilled workers in early 1960 to its current emphasis on equipping students with basic knowledge and skills and providing them with a foundation which will enable them to learn further. Some key features of the system include:

- Delaying streaming into vocational education till high school (for three years after grade 11). All students undertake a common national curriculum in the first year of high school, following which they choose to enter the general or vocational stream for the remaining two years – however, the vocational stream includes extensive elements of general education;
- Ensuring the vocational stream is not dead-end – by allowing vocational students to proceed to higher education;
- Financing vocational education through government and private resources – about 40% of financing for vocational education comes through entrance and tuition fees;
- Linking up vocational schools with specific industries to ensure that curriculum and outputs match industry needs.

China⁴¹

The system of vocational education in china consists of education in vocational schools and vocational training. After opening up of its economy, much attention has been paid to the quality and level of vocation education as well as the schooling efficiency. Vocational education in China is primarily associated with two or three-year institutions, and specialised training institutions closely linked to local industry and business needs. Post-secondary education in China is divided into four categories: formal four-year higher education institutions, three-year or two-year vocational education institutions/ universities, private institutions and adult universities. China's Vocational Qualifications and Certification System is an essential part of Chinese labor employment system and also a special form of national examination system.

Ireland⁴²

In Ireland, vocational education and training primarily focus on the education and training of young persons, aged 15 – 20, who have generally completed compulsory second level education and who have not yet significantly engaged with the labour market.

The vocational education is delivered at a number of different levels; in second-level education; in vocational training including apprenticeship; in further education and in higher education. The VET in Ireland may be characterized with the following features:

- Wide range of provision of different types of VET at post-secondary level, targeted at a wide range of different client groups, including those in and out of work and with second chance opportunities.
- The national qualifications framework is comprehensive, integrating both vocational and general qualifications and includes a strong commitment to the avoidance of dead-ends and pathways of progression.
- Collaboration with social partners is well-established and takes place at most relevant levels.
- The apprenticeship system is well-structured with a systematic blend of on and off-the-job elements.
- At high level there is good co-operation between the two lead departments, with little sense of rivalry. The National Skills Strategy provides for common objectives.

Key take-away:

Learning the foreign modern vocational education thought and teaching patterns to improve the level of teaching is an important component of the reform of vocational education.

For example, the "dual-track system" of Germany, the educational and training pattern based on the ability in Australia and Canada, the Employment Education Structure (MES) advocated by the World Labor Organization, the "Skill Courses for Starting Small Enterprises" initiated by the UNECO and the "Business and Trade Simulated Company" springing up widely all over the world, all became the models for the reform of Chinese vocational education in China.

Source: <http://www.china.org.cn/english/LivinginChina/185280.htm>

Listed below are some key initiatives taken by the Victorian state government and the Australian government which have helped restructure and scale up the capabilities and capacities in the skill space.

In Victoria, tertiary education sector accounts for over 5% of GDP and educational services are Victoria's strongest export, worth more than AUD 5.4 billion (Australian dollar), surpassing tourism and automotive sectors. The state is a magnet for immigration, attracting 178 638 international student enrolments in 2009 which represents 31% of the total for Australia.

Victoria is one of the prime locations for science and research in Australia. The Victorian Government's science-led strategy seeks to build Victoria's innovation capabilities while focusing them on key drivers of ageing, climate change and international competitiveness. There has also been a recent shift towards more user-driven strategy with collaborative projects to deliver public benefits in health, sustainability and productivity.

The universities in Victoria have launched initiatives, projects and programmes to restructure or reformulate their approach to teaching and learning. For example,

- Victoria University has committed to integrating work and community-based learning into all its courses with at least 25% of assessment based on such learning. The University of Melbourne has restructured its curriculum, introducing six three-year broad-based undergraduate degrees leading to three possible pathways:

Innovative initiatives have been launched to enrich learning experience and improve the employability of university graduates, such as global citizen initiatives, student leadership programmes and volunteerism.

- The Victorian Science Technology and Innovation (STI) Initiative: The Victorian Government has made considerable investment in boosting research and innovation. The centrepiece of the Victorian research

investment has been the Science Technology and Innovation, an initiative co-ordinated by the Office of Science and Technology. The Initiative supported collaborative, leading-edge biomedical, environmental, agricultural, manufacturing, design, and information and communication technology (ICT) projects across metropolitan and provincial Victoria. The capabilities built up over the period of the STI programmes deliver user-driven innovation to Victorians under the key themes of health, sustainability and productivity.

- Collaborative efforts supported by the Victorian Government: VPAC, an independent eResearch and Advanced Computing R&D service provider, is a not-for-profit registered research agency established in 2000 by a consortium of Victorian Universities: Deakin University, La Trobe University, Monash University, RMIT University, Swinburne University of Technology, the University of Melbourne, the University of Ballarat and Victoria University. VPAC provides expertise, training and support in eResearch, advanced computing, and professional R&D including the application of advanced computing for academia, industry, and government.
- The National Centre for Dairy Education: In 2005, The Australian Senate Inquiry into rural Skills Training and Research found that it was increasingly difficult to attract and retain young people in agriculture. There was a need for agricultural industries to get involved with vocational training to ensure it is relevant, timely and aligned with the needs of the industry. In response to the inquiry, national dairy industry representatives and key industry bodies identified future education and training directions and Dairy Australia formed a partnership with Goulburn Ovens Institute of TAFE (GOTAFE) to address the dairy industry's education and training needs.

The National Centre for Dairy Education is an initiative of Dairy Australia and GOTAFE at Shepperton. It delivers nationally accredited short courses and customised programmes for dairy and processing organisation, individual farmers and people in the dairy service industry. Courses are offered in agriculture, food technology and food processing as part of a framework of re-skilling and up-skilling. An Industry Education Steering Committee (IESC) guides the direction of education and training, and ensures that the programmes remain relevant to the sector. A national network of nine industry advisory committees provides

industry guidance on course content, priorities and outcomes. School-based apprenticeships or traineeships enabling secondary school student the opportunity to work with an employer and complete a nationally recognised qualification are also available. GOTAFE has responsibility for delivering the programme across Victoria.⁴³

- The Enterprise Connect initiative: A new opportunity for Australian universities to engage with small and medium-sized enterprises (SMEs) is provided through the Enterprise Connect initiative, an Australian Government programme that provides comprehensive support to eligible SMEs. It aims to help Australian firms develop the skills, tools and knowledge needed to improve their competitiveness and productivity and to maximise their growth potential.

Core services include

- Business reviews at no cost to eligible firms
- Grant assistance to implement recommendations flowing from the business reviews.

"The Researchers in Business" element offers the placement of researchers from universities or public research agencies into businesses to help develop and implement new commercial ideas. Enterprise Connect's Innovative Regions Centre is based at Deakin University in Victoria.

- The Cooperative Research Centres (CRC) Programme: The Australian Government funded Cooperative Research Centres (CRC) Programme began in 1991. The objective of the programme is to deliver significant economic, environmental and social benefits to Australia by supporting end-user driven research partnerships between publicly funded researchers and end-users to address clearly articulated, major challenges that require medium to long term collaborative efforts (Commonwealth of Australia, 2008). The Cooperative Research Centres (CRC) Programme links researchers with industry to focus R&D efforts on progress towards utilisation and commercialisation. The close interaction between Australian and international researchers and the users of research is a key feature. Another feature is industry contribution to CRC education programmes to produce graduates who are ready to enter the labour market Since the inception of the CRC Programme in 1990, 186 CRCs have been funded, with 42 active in 2010-11

⁴³ Source: NCDEA (2010), National Centre for Dairy Education - Australia website, www.ncdea.edu.au, accessed 16 April 2010.

- Collaborative Research Networks Since the OECD review visit in December 2009 the Australian Government has released a discussion paper on Collaborative Research Networks (DIISR, 2010), in which the recommendation is to provide some modest research funding to those less-research intensive universities in suburban and non-metropolitan areas if they partner with other research intensive universities. One rationale for this funding is to support structural adjustment in institutions which are more strongly connected to local needs and priorities. The objectives are to focus such universities' activities on areas of excellence and to strengthen their links to other universities as well as addressing wider national research and innovation goals. It is, however, difficult to see how this initiative would better assist these universities to connect with local needs and areas of specialization apart from one comment on larger "lighthouse" projects maintaining research capability in areas relevant to regional and outer-suburban areas.
- Schools Network Access Programme (SNAP) The Schools Network Access Programme (SNAP) is a partnership between selected disadvantaged Government schools and RMIT to increase access to tertiary education for students from low socio-economic backgrounds. It is a non- ENTER based early admission access scheme that uses recommendations from teachers and a student statement as the basis for selection. The programme has expanded to 75 schools with a geographic focus on the northern suburbs of Melbourne and Gippsland. Over 44% of SNAP students are identified as low SES, compared to 14.5% of the total domestic student population. Given the range of ENTER that SNAP students bring to their selection, and the highly selective nature of many RMIT programs, this is testament to benefits of an alternative entry scheme that recognises the academic potential of disadvantaged students. Future plans include the building and expanding relationships with SNAP schools through academic engagement activities (e.g. science in schools programmes), partnerships to recruit more Indigenous students and the delivery of university preparation programmes.⁴⁴

Key Strategic Option for improving the skill development system in Maharashtra

While the state can adapt from success stories of other states in India and abroad, the approach should necessarily be also formed through a consultative process involving expert inputs as well as with the considerations of all other key stakeholders (demand and supply-side), combined with learning from the best practices in policy formulation and an appreciation of the contemporary industrial culture and economic environments of the state so as to ensure it is comprehensive and contextual.

Addressing these various challenges of scaling-up the capacity and capabilities of technical education in the state, while ensuring quality and access to all sections of society, necessitates the formulation of a planned and coherent approach.

The below section lists the key strategic options, along the dimensions identified earlier, that the state has to address the issues faced by the vocational training/skill development system in Maharashtra and to achieve its objective of emerging as a source of competitive industry ready manpower for the development of the state and its people.

44 Source: Royal Melbourne Institute of Technology - RMIT (2010) Schools Network Access Programme, <http://rmit.com/browse/About%20MIT%2FHelp%2FMedia%20Assets%2FImage%2F;ID=7unf1vuw6dob1.jpg;STATUS=A#content>, accessed 21 August 2010.



Dimension Access	
Objective:	<ul style="list-style-type: none"> • Strengthen the vocational education structure. • Create and promote a culture of life-long learning. • Offer support to improve informed career decisions to students. • Improve financial access to disadvantaged socio-economic groups.
Strategic options	<ul style="list-style-type: none"> • Certain aspects of general education need to be retained in vocational education which may give the option to students to go back to mainstream education subsequently. • A clear framework for horizontal and vertical mobility for students opting for vocational education needs to be put in place. • Improve access to information by offering mentoring services, career counseling, career guidance seminars, etc. • Develop framework and guidelines for introduction of ICT-enabled vocational training and promote creation of digital content to address requirement of learning resources. • Create talent management system for disbursement of scholarships and low-interest loans to learners.
Dimension Quality	
Objective:	<ul style="list-style-type: none"> • Improve quality of delivery through a Quality Assurance framework and monitoring system. • Improve quality of training in terms of industry relevant curriculum and practical oriented training, as well as, assessment.
Strategic options	<ul style="list-style-type: none"> • Formulate a Quality Assessment system to focus on various aspects of quality of training. • Conduct periodic 'Student/Trainee Engagement Surveys', 'Student/Trainee Destination Surveys' and 'Employer Satisfaction Surveys' • Promote the national competency framework for state-wide consistent recognition of training/skill outcomes. • Enable up-skilling and improving employability of trainees and students by promoting the SDI scheme. • Support to current ITIs covered under the CoE scheme to become actual 'Centers of Excellence'.
Dimension Infrastructure	
Objective:	<ul style="list-style-type: none"> • Address the gaps between demand and supply in training across various sectors and across regions. • Ensure creation, revamping and maintenance of appropriate physical and teaching infrastructure (equipment, laboratories and teaching aids). • Facilitate adequate private and Government funding support for training infrastructure.
Strategic options	<ul style="list-style-type: none"> • Conduct/ support periodic skilled manpower demand forecast / capacity assessment studies. • Assess the current and short-term physical infrastructure needs of institutes and publish a composite 'Infrastructure Index' for each institute. Thereafter, prepare plans to strengthen existing infrastructure. • Define and implement a norm for physical access to institutes. • Constitute suitable institutions to carry out extensive studies relating to demand assessment and for analysing and publishing data on manpower needs and occupational forecasts.

Dimension Faculty Development

Objective:	<ul style="list-style-type: none">• Improve the quality of instructor development training to encourage and reward faculty/instructors.• Set aside adequate funding for instructor development activities.
Strategic options	<ul style="list-style-type: none">• Conduct an assessment of the region-wise and trade-wise vacancy among faculty or field staff• Initiate the concept of a state-wide 'faculty bank'.• Introduce mandatory trainings such as two-week Induction Training Programme (ITP) or Pre-Service Training for faculty to enable the young trainers to better orient and equip themselves for the teaching profession.• Launch a six-month certificate course on technical teacher training for diploma students during the final year to take up teaching career.• Conduct upgradation of qualification through technology-enabled distance learning and identify mentor institutions.• Design an extensive Faculty/Instructor development programme (FDP/IDP) in collaboration with the respective industry players.• Explore partnerships with employers (public sector and private enterprises) for providing industry representatives to train the faculty.• Introduce a comprehensive performance appraisal system for instructors, faculty and administrators.

Dimension Industry Participation

Objective:	<ul style="list-style-type: none">• Improve linkage with industry through meaningful engagement with industry at all stages of industrial training.• Expand the self-employment opportunities for graduates passing out of the training system through promoting the culture of entrepreneurship
Strategic options	<ul style="list-style-type: none">• Enable industry to provide cluster-based mentoring of ITIs where special modules can be designed and delivered.• Set up events such as 'Skill Olympiads' to enhance the number of industry- institute interactions.• Design and Implement Entrepreneurship Awareness and Development Programs.

Dimension Management and Governance

Objective:	<ul style="list-style-type: none">• Institute a strong monitoring and evaluation system to enhance the effectiveness of programme delivery and impact evaluation of initiatives and schemes.• Create a comprehensive management information system to support better decision making.• Provide the institutes with greater financial and administrative autonomy accompanied by strong governance and accountability mechanisms to improve their responsiveness to the needs of the learners and industry.
Strategic options	<ul style="list-style-type: none">• Create a comprehensive monitoring and evaluation framework for skill development in Maharashtra.• Implement reforms in institute funding, based on the performance of the institute.• Design and develop a Skill Development Management Information System for effective and informed decision making.• Carry out impact evaluation studies and publish the findings.• Devise strategy for innovative financing mechanisms including a PPP blueprint for training and create a PPP cell as a single window agency in the state.• Introduce private management of institutions in a phased manner.• Enable internal revenue generation at institutes.

While the above mentioned strategic options will help solve some of the expansion, equity and excellence challenges related to skill development in the state, there are still other aspects that need to be further explored through research-

- Modular skills and specialization may result in the loss of craftsmanship/ artistry which may adversely affect the earning capability (in the long run) and job satisfaction of the skilled workforce. While this may lead to specialization among labour, the approach will also require a high degree of standardization. There is a concern that this may lead to the loss of traditional craftsmanship in this process. How can this issue be addressed?
- While a majority of the working age population may reside in few states, their share in the GDP and subsequently jobs in the industrial sector may be lower. This results in migration especially for contractual labour (in industries like construction, etc.) with implications on the society as a whole for e.g. children of these workers grow up without their father in the vicinity, these workers may not be able to participate in the democracy, etc. How are we geared up to handle these unforeseen consequences?
- The increasing casualization of labour and its implication on the skill development system needs to be understood better. For instance in such a context, how can we incentivize employers to invest in skill development?
- In many countries, there has been a regional evolution of sectoral guilds or councils that have become the modern skill councils, etc. Moreover the standards for competencies and qualifications have matured over a long period. In India, we are planning a centralized approach and in a much shorter timeframe. We need to evolve a more effective approach so that we do not lose the regional expertise within India. Are there any lessons from other countries like Australia in this context that can be incorporated in our approach?
- Also, internationally, there are several countries with successful skill development models, like Germany, Australia, South Korea etc. Which aspects of each of these countries' Skill development model would be appropriate to implement in the skill development structure in India?

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