National Skill Gap Study for High Growth

Questionnaire 10: Questionnaire for Computer Programming Activities (Information Technology Sector)

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The Ministry of Skill Development and Entrepreneurship (MSDE) is undertaking the 'National Skill Gap Study for High Growth Sectors' and NCAER is the implementing agency for the said study. The overall objective of in this work is develop a Labour Market Information System. The specific objective of this questionnaire is to understand the present and future demand for jobs roles/occupations and associated skills. This study is sponsored by the Ministry of Skill Development and Entrepreneurship.

Your identity would be held confidential while discussing your suggestions and views on the subject.

Respondent's Name: ....

Respondent's Company Name: ....

Respondent's Designation: ....

Respondent's Phone: ....

Respondent's Email: ....

FIRM PROFILE

1. *What is the firm's ownership type? (Please select one)*
   - ☐ Public Sector
   - ☐ Public Limited
   - ☐ Private Limited
   - ☐ Partnership/Individual Ownership
   - ☐ Multinational Company
   - ☐ Limited Liability Partnership
   - ☐ Cooperative
   - ☐ Others, please specify: _____

2. *What was the annual turnover range in FY 2023-24? (Please select one)*
   - ☐ ≤ Rs 5 crore (Micro)
   - ☐ > Rs 5 crore & ≤ Rs 50 crore (Small)
   - ☐ > Rs 50 crore & ≤ Rs 250 crore (Medium)
   - ☐ > Rs 250 crore (Large)

3. What is the key production/service activity of your firm? Tick one or multiple options
   - Industry 4.0
   - Cloud Infrastructure
   - Software Product
   - IT Integration / System Integration
   - End User Computing

EMPLOYMENT BACKGROUND

4. How many people are employed at the firm?

S.No.	Particulars	Number of people employed	
		Managerial Staff (No.)	*Workers (No.)*
	Total Employees (in numbers)		

5. With reference to the total employees identified in Q.4, what is the educational background of the employees (as percentage (%) of total employees)?

Below Class X (%)	Above Class X and Below Class XII (%)	Class XII pass (%)	Vocationally Educated (ITI, PMKVY, RPL etc.) (%)	Bachelor's degree and above (%)

II. <u>UNDERSTANDING HIRING, SKILLING, GENDER-BASED ROLES, AND SKILL SHORTAGES</u>

6. What is your experience of the IT/ITeS sector from the point of skilling? Is it mostly fresh skilling of workers or reskilling or upskilling or recognition of prior skills?

7. What is your outlook on skills availability?

8. Which domain do you hire?
    a. Agri tech
    b. Fintech
    c. Edu technology
    d. Health tech
    e. Others

9. What are the mediums used for hiring employees? *(multiple selections possible)*
    ☐ Employment agency
    ☐ Own website advertisements
    ☐ Vocational training institutes
    ☐ Newspaper advertisements
    ☐ Networks and referrals
    ☐ Online job sites/advertisements; Please specify: _____
    ☐ Campus recruitment; Please mention institutions: _____
    ☐ Sector Skill Council / Sector Skill Council affiliated institutes
    ☐ Internships/apprenticeships
    ☐ Others, specify: _____

10. What percentage do you hire from Universities?

11. Do you provide on-the-job training within the firm, either before or after deployment?
    Yes / No: _____
    If 'Yes', what is your policy? _____

12. How many people have you skilled or hired to be skilled in the last one year?
    a. For Lateral entrant – 2- 5 yrs / 5-10 Yrs / 5-15 Yrs / 15 yrs +
    b. For fresh hire

13. Were they reskilled or fresh skilled or upskilled?

14. Do you have the capacity to train aspirants in those job roles?

15. How do you structure capacity training?

16. Does the firm run its own skilling institution, or have any tie-up / partnership with another institution / NASSCOM for skilling purposes?
    Yes / No: _____
    If 'Yes', please mention which institutions: _____

17. What kind of association(s) does the firm have with the skilling institution(s) identified in Q.16, if any? *(multiple selections possible)*
    ☐ We offer apprenticeships/internships for trainee students
    ☐ We offer inputs to the course curriculum
    ☐ We sponsor fresh skilling programmes to absorb the students later
    ☐ No associations
    ☐ We send our staff to take visiting classes or other classes
    ☐ We sponsor lab facilities in TVET or other institutions
    ☐ We sponsor re-skilling/upskilling programs for our employees
    ☐ Other; please specify: _____

18. Do you offer career path to employees?

19. Do people prefer geographies? Are there particular geographies where jobs are more available?

20. What was the gender ratio on average?   Was it skewed towards one particular sector?

21. In the next three years, do you perceive a demand for women in particular job roles, either among the existing job-roles or those which will be in-demand in future?
Yes / No: _____
If 'Yes', please specify which ones: _____

22. Does the firm have hiring policies to encourage female employment, especially in non-traditional job roles?
Yes / No: _____
If 'Yes', please explain the policy in detail: _____

23. Has the firm defined sexual harassment policies, prevention systems, procedures and service rules for its employees (Prevention of Sexual Harassment at Workplace Act 2013)?
Yes / No: _____

Skill Gap

24. How easy or difficult was it to fill the job roles (including the number of positions) advertised by the firm in the last three years (FY 2021-22 onwards)? (Add rows if necessary. If the firm advertised many job roles, you can specify job roles at two extremes: those which were easiest to fill, and those very difficult / un-filled)

S.No.	Value Chain	Job Roles advertised (Annexure 10.1)	Geographic Availability/needs	Please Specify the Level: Entry level/ intermediate or mid-level/senior level / managerial level/ director level/ executive level	Difficulty of filling jobs (rank) 1. Very easy; 2. Easy; 3. Average; 4. Difficult; 5. Very difficult; 6. Not filled at all
1					
2					
3					
4					
5					

25. Please fill out table for job roles which were difficult or very difficult to fill or not filled at all due to skills shortage.

S.No.	Job Role	Skills Required / Important (Look at Table Q10.1 and Q10.2)			
		Cognitive Skills	Knowledge	Education	Socio–Emotional Skills
1.	Developer				
2.	Architect				
3.	Security Analyst				
4.	Program Manager				
5.	Domain Consultant				

Anticipating Skills

26. How is Gen 3 technologies changing the skills landscape in India? Are the jobs getting redundant or do they need upskill and reskill? Are the skills rare?

27. Do you anticipate any new job roles that will come up in the next three years due to the technological changes or old existing job roles that will require updated skill sets?

S. No.	Job Role	Geography where they will be required	Skills Required / Important (Look at Table Q10.1 and Q10.2)			
			Cognitive Skills (Table Q10.2)	Knowledge (Technical)	Education	Socio-Emotional Skills (Table Q10.2)
1.	Developer					
2.	Architect					
3.	Security Analyst					
4.	Program Manager					
5.	Domain Consultant					
6.	Others					

Table Q10.1
Table Q10.1: Details of Identified Job Roles
in Q.25 and Q.27 of the Questionnaire
(Request you to provide the details, for each of the relevant job roles, in the format as given below)

S. No.: _____
Job Role: _____

Job Descriptors

Descriptors		Firm's Answer
Alternative job titles in the industry		
Stage of IT value chain: 1. Industry 4.0 2. Cloud Infrastructure 3. Software Product 4. IT Integration / System Integration 5. End User Computing		
Is this job role: 1. 'Difficult to fill' at present, or 2. Will be in-demand in next 3 years by the firm (Q.27)		
How many do you need to hire at the 'present moment'/now, or you will need to hire 3 years from now?		
Tasks to be performed in the job role (please include specific systems / components / technologies / personnel required to be dealt or interacted with, if any)		
Education: School (up to what level?) / ITI/ Short-term vocational training programme/ Bachelors/ Masters)		
Knowledge	General? What knowledge?	
	Specialised (Sector, Occupational, and Trade)	
Technical Skills: Software languages required, or maybe required in the near future		
Years of Experience, if any		
Skills required and level of competence (refer to framework of skills in Table Q10.2 below)		
Difficulty of finding workers in the job role, with the above requirements and the skills as detailed below: 1. Not at all difficult 2. Somewhat difficult 3. Difficult 4. Very Difficult 5. Extremely difficult		
Geographical areas/spatial clusters (existing or emerging) where it is most difficult to fill the role**(mention States and Districts)		

** Please explain the reasons behind skill shortage in the specified states and districts: Are there *demand side factors* (such as low salary, demanding work conditions, absence of platforms to advertise jobs, non-acceptability of workers from conventional labour markets, competition from other sectors to hire the same candidate, etc) and/or *supply side factors* (such as course not offered by Indian institutions, specialised skilled people not available, absence of and/or proximity to training centres, poor quality of skilling and training programs, lack of programs for re-skilling/upskilling workers from traditional sectors, high salary expectations, non-aspirational job role, availability of other work avenues, etc)?

Table Q10.2: List of Skills

Skills Required	If required, what is the degree of competence needed in the employee? 1.Beginner 2. Intermediate 3. Competent 4. Advanced 5. Very Advanced	Comments
Please think whether the person in the above job profile would need the following skills to do their job. *(Please choose the relevant skills and indicate the level of competence required for those skills)*		
Reading Literacy: Would they need to read and		

Please think whether the person in the above job profile would need the following skills to do their job. *(Please choose the relevant skills and indicate the level of competence required for those skills)*		
Skills Required	If required, what is the degree of competence needed in the employee? 1.Beginner 2. Intermediate 3. Competent 4. Advanced 5. Very Advanced	Comments
understanding written sentences and paragraphs in work related documents?		
Writing: Would they need to communicate effectively in writing as per their audience for their job?		
Speaking: Do they need to talk to others to convey information effectively?		
Communication: Would they need to provide information to supervisors, co-workers, and subordinates by telephone, in written form, e-mail, or in person?		
Language Skills 1: Is knowledge of the structure and content of the language including the meaning and spelling of words, rules of composition, and grammar required for the job?		
Language Skills 2: Any specific language requirement for the job? If Yes, which one?		
Numeracy/Mathematics: Would they need to work with numbers for their job?		
ICT Literacy to Skills: Would they need to use mobile phones/tabs/computers etc. to do their job? For example, Arts & Graphics, Desktop Publishing, Presentation, Spreadsheet, Word Processing, Programming, Client Server/Networking/Hardware, Operating Systems, Database/Statistics, Engineering Software and Web Page Design etc.		
Self-learning to Active (Independent) Learning: Would they need to understand new information for both current and future problem-solving and decision-making at their job? Are they expected to do on their own for the job or self-learn, if the material is provided to them?		
Active Listening- Do they need to listen for their job, like taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times?		
Science- Do they need to use scientific rules and methods to solve problems at work?		
Problem Solving- Do they need to identify problems and review related information to develop and evaluate options and implement solutions?		
Learning Strategies-Do they need to select and use training/instructional methods and procedures appropriate for the situation when learning or teaching new things?		
Critical Thinking-Would the worker need to use logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to		

Skills Required	If required, what is the degree of competence needed in the employee? 1.Beginner 2. Intermediate 3. Competent 4. Advanced 5. Very Advanced	Comments
Please think whether the person in the above job profile would need the following skills to do their job. (Please choose the relevant skills and indicate the level of competence required for those skills)		
problems?		
Creativity-Do the workers need to develop, design, or create new applications, ideas, relationships, systems, or products, including artistic contributions?		
Independent research-Would the worker need to conduct literature review, undertake data collection, cleaning etc., develop research plan?		
Judgement and Decision-making- Would the worker need to consider the relative costs and benefits of potential actions to choose the most appropriate one?		
Systems Analysis- Would the worker need to determining how a system should work and how changes in conditions, operations, and the environment will affect outcomes?		
Systems Evaluation- Would workers need to identify measures or indicators of system performance and the actions needed to improve or correct performance, relative to the goals of the system?		
Financial Resources- Would the worker need to determine how money will be spent to get the work done, and accounting for these expenditures?		
Material Resources-Would the worker need to obtain and see to the appropriate use of equipment, facilities, and materials needed to do certain work?		
Personnel Resources- Would the worker need to motivate, develop, and direct people as they work, identifying the best people for the job?		
Time Management- Managing one's own time and the time of others		
Seek and Value Diversity-Do workers need to work with people (as colleagues/clients etc.) from other cultures/States/socio-economic backgrounds etc? Is it important for their job performance? Is it likely to be important for their job performance?		
Gender Diversity-Do workers need to work with female colleagues/clients etc.? Is it important for their job performance? Is it likely to important for their job performance?		
Conscientiousness (including attitude towards work)- Will the worker need to be organised, responsible, and hardworking or have any one of the following traits- Competence (efficient), organised, dutiful (not careless), ambitious, self-discipline (not lazy), and not impulsive?		
Openness to Experiences- Will the worker need to be open to new aesthetic, cultural, or intellectual experiences or have any one of the following traits- Imaginative,		

Skills Required	If required, what is the degree of competence needed in the employee? 1.Beginner 2. Intermediate 3. Competent 4. Advanced 5. Very Advanced	Comments
Please think whether the person in the above job profile would need the following skills to do their job. (Please choose the relevant skills and indicate the level of competence required for those skills)		
artistic, excitable, wide interests, curious and unconventional?		
Extraversion- Will the worker need to show the following traits- warmth (friendly), sociable, self-confident, energetic, excitement seeking (adventurous), and enthusiastic?		
Agreeableness- Will the worker need to work in a team in a cooperative, unselfish manner?		
Neuroticism/Emotional stability – Will the worker need to show emotional stability i.e. predictability and consistency in emotional reactions, with absence of rapid mood changes?		
Does the worker need social skills at work?		
Instructing- Does the worker need to teach others how to do something?		
Negotiation- Does the worker need to bring others together and try to reconcile differences?		
Persuasion- Do workers need to persuade others to change their minds or behaviour?		
Occupation-specific skills		
Physical skills, including job-specific complex psychomotor skills		
Global Competence – Globally competent workers		
Any other? Please specify:		

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