

Labour Market Information System

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Abstract: *In India, organizations related to Information Technology have made its place and name in the global IT market based on large and cost-effective labour force. Over the years, organizations across the world have recognized the value of India's huge and readily available pool of IT professionals. In order to transfer this huge pool of skilled labour force into productive labour force, pre-requisite is to conceptualize a centralized framework that provides the information on labour market where people can find job and employer can find a candidate with required skills. Labour Market Information System, commonly known as LMIS, is a platform for manpower management that has the ability to integrate process, analyze and disseminate labour market information. LMIS acts as a single window for data and information source on the labour market. LMIS also bridges the difference between the required and available skill levels of the huge labour force in the country. It will facilitate students to take right decision about education, job process, required types of training program and identification of key skill requirements across different IT sectors, geographies. Objective of this paper is to conceptualize a well-structured LMIS to assist planning of information system for Indian geography. This paper provides the overview of labour market information system and framework of it in IT Sector.*

Keywords: *Labour Force, Labour, Labour Market Information System, Centralized Framework, Information Technology.*

I. Introduction

Indian economy is considered as the tenth largest and the fastest growing economy with estimated GDP growth of more than 7% for the upcoming years. Furthermore, India's population was 1 billion in 2001 and is estimated to reach 1.4 billion in 2021 of which 64% is estimated to be of age group 15-34 and labour force is also estimated to increase by 20% between 1990 to 2011 [6].

Labour force refers to number of employed and unemployed people available for work. Currently, India has the second highest labour force and is estimated to have 25% of the world's total labour force by 2021. According to National Sample Survey Office (NSSO), about 40% of the population belongs to the labour force [7]. Organizations across the world have recognized this vast pool of cost-effective and easily available labour force of India.

Skill anticipation plays very crucial role in introducing a virtuous cycle of high skills, high productivity, and high rates of wages. Proper anticipation of skills will help in reducing mismatch and would prepare people for newer technologies. Employment growth and development committee states that "A mismatch between demand and supply of skills has high economic and social cost which leads to structural unemployment. Advance identification of ongoing and future skill requirement is part of a forward-looking strategy that reduces the gap between required and available skill set". Over 67% companies in India have reported difficulty in filling jobs, which is second highest in the world after Japan.

In order to bridge the gap between required skills and available skills, one centralized framework solution can be developed that has potential to rectify key skill requirements and evaluate the existing skill level of vast labour pool. Labour market information system has the ability to collect, analyze and disseminate information of labour market. LMIS converts skilled people into productive people. It will support information based decision making by providing research authenticated market information regarding reliable workforce to the stakeholders.

Information technology encompasses all forms of technology for storing, transmitting and manipulating data for business. IT sector in India is known as knowledge economy. The sector has increased its contribution to India's GDP from 1.2% in FY1998 to 7.5% in FY2012 [8]. This sector has contributed in generation of large employment and has also served bright future in sub sectors like BPO, Software and ERD.

Purpose of this paper is to describe the overview of LMIS and framework structure which will bridge the required gap. The paper is organized into three parts. It starts with the overview of LMIS which portrays the definition, objective, needs and importance of LMIS. Second part describes the different stakeholders of LMIS and third it shows proposed framework with key features, user role and sources of data.

II. Overview Of LMIS

The labour market is the one in which job seeker can find work and employers can get required manpower. LMIS is defined as a single window that provides all information regarding labour market and which has capability to collect, evaluate and disseminate labour market information to all the stakeholders. Like other markets, LMIS can be defined as market of demand and supply components as shown in Figure 1. Jobs and skills forms a feedback loop in it. Disparity arises when one of them changes which leads to huge consequences for the other one. There is an interaction between demand and supply. Demand refers to the employment (outflow) and supply refers to the employer with their skill and characteristics (inflow). There is no single exact definition for LMIS. There are however, many different definitions from different authors providing different views and characteristics of LMIS.

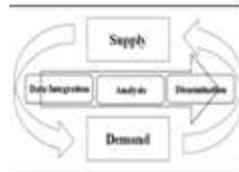


Figure 1 Information Flow of LMIS

The International Labour Organization defines LMIS as “Any information concerning the size and composition of the labour market or any part of the labour market, the way it or any part of it functions, its problems, the opportunities which may be available to it, and the employment-related intentions or aspirations of those who are part of it.” Sparreboom defines LMIS as “Statistical and non-statistical information concerning labour market actors and their environment, as well as information concerning labour market institutions, policies and regulations that serves the needs of users and has been collected through the application of accepted methodologies and practice to the largest possible extent” [2]. Woltermann defines LMIS as “Active labour market policy instrument that collects, evaluates and provides labour market information to both the labour supply side and the labour demand side”[3].

Using these various but related views of LMIS, We are using the following definition for this study “Labour market information system includes qualitative and quantitative information and it collects, analyzes and disseminates information that assists and empowers its stakeholder for correct planning, selection and decision making related to education, career, business requirements, training programs, job search, hiring, government policy and investment strategies.”

Stakeholders of LMIS

LMIS is ‘one single source’ of all information available on the labour force. It will be the single source of information available on the workforce. Information for industry, trade, geography and time-lines will be covered on necessary skills like education and occupation with respect to industry sector. It has the following objectives:

1. Be a portal for cutting-edge and timely market data
2. Provide job opportunity and its requirements
3. Predication of future demand-supply
4. Information on training service and resources for skill build up
5. Develop and distribute quality labour force and economic information to promote informed decision making
6. Serve business by recruiting and referring the best qualified applicants to jobs, and provide resources to diverse job seekers in support of their employment needs.
7. Career Planning and preparation for particular occupation

Need of LMIS

Countries like Japan and Germany where skill development has been imparted by the industry has less skill mismatch. There is a need to align national skills development system within industry and reduce irrelevance and mismatch. Growth rate of employment depends on the economy growth rate of country. Economy itself is affected by many factors. One of the factors is the ability of national market to attract investors and the amount of foreign direct investment. India is a pool of young people and a hub for IT industry. In order to attract foreign investors to large pool of dexterous people India requires one window framework that provides the information and intelligence on labour market.

LMIS has ability to collect, evaluate and process labor market so that individuals can provide information about their skills and employers can offer their vacancies and provide information about working conditions, hiring requirements and skill requirements. This central structure for collecting and dissemination of information will reduce the search costs and time for employers and job seeker equally.

Output of organization will decrease if skill set of worker does not have a suitable match to the assigned work or his education is too low. Better quality job searching with available skills do not only lead to higher productivity but also increase the workers and employers satisfaction and elevates profit of organization.

If new investor comes to market and establishes organization it would be requiring new skills, in such cases LMIS will inform students, job seekers and training providers about it, it will also provide information on possible training and qualification program related to new skill.

Selecting the right career according to skill and reference is essential for better future and quality life. One needs to identify their area of interest and determine future scope in it. For that, LMIS provides counsellors and career map to help people find their professional profile. Career map provides occupation wise qualification standards, training institute mobility map and job availability in order to help students and job seekers to take right and proper decision for education and skill build up.

Importance of LMIS

Based on the use-case, following is the importance of LMIS:

8. Government can make quick response and change the program design, funding decisions, policies and standards to reflect on changes in demand and supply in LMIS. They can change, update and re-evaluate the policy and standards of labour force. They can see the current wages rates, employment rate and unemployment rate.
9. Student and job seeker can identify what education or training is required for different occupations. They can also identify growing occupations and skill requirements for current and future job market. They have ability to search jobs location, technology and occupation wise. They can find information on training institute, qualification program and workshops for skill building.
10. Training and education provider will align their courses and programs for different location according to skill demand in those locations. They can upload materials, career posters and can also offer industry based training program.
11. Industry can upload the job for new recruitment based on staff change or for new business establishment. They can also access information on what types of skills are available in labour market and make decisions on advanced skill buildup of their staff according to future demand.

III. Stakeholders Of LMIS

LMIS will play a major role for providing market information available to different stakeholders. As stated earlier, LMIS is a single source of information that provides qualitative and quantitative information for man-power management. This information is generated by different labour market producers who plug-in into LMIS for proper dissemination. The information producers are the stakeholders that continuously or timely provide information to keep LMIS updated and consistent. The Stakeholders can either be the source of information or recipient of information of LMIS. For example, job seeker or student acts as a recipient of information while employers are the source and recipient of information. The Stakeholder plays a crucial role for existence of LMIS. There are multiple stakeholders involved in LMIS, among them the main stakeholders are:

1. Government: LMIS will help the government to take quick decisions based on change in labour market that has largely impacted the economy of the country. With newly updated data, government can utilize this data set for changing tax rates and structures, investment, funding and program decisions.
2. Policy Makers and Planners: Policy makers will bring a new policy for change in existing system in order to bridge the difference between the supply and the demand for labour workforce. LMIS will help planners to monitor progress towards the objective, and take the feedback on difficulties which are being experienced during implementation and then decide what actions need to be taken in order to resolve the situation.
3. Education and Training Provider: LMIS will help the education and training provider to understand the nature of labour market and demand for a particular skill. This will help them to align their courses by searching what kind of courses should be expanded in near future and which should be cut back. Training provider will work towards making new curriculums and courses with an aim of providing skill to large workforce. This will be completed by providing vocational training to programmers.
4. Unions: Unions will find LMIS information for bargaining purpose. They will get information about current average wage rates, productivity for particular occupations in different sectors and the number of work permits.
5. NGO's and Community Groups: LMIs will make NGO's and Community aware of the market conditions so that they can provide needful support to the remaining stakeholders.
6. Employers: LMIS will provide timely, updated and accurate information about the labour market to help them make new plans for ongoing operations like replacement of employees and new business investment. The employers will upgrade their skill in advance according to future skill demand and that can also help them for seeking employment in other field or firm.

7. Student and Job Seeker: LMIS will allow students to make correct decision for both long-term and short-term and will guide them towards education and training requirement for different occupation based on current demand. LMIS helps job seeker by providing information for job opportunities, skill level requirement and effective job search. It also provides information to student on what type of careers they would follow if they are enrolled for a particular program and which type of programs of study will lead to successful career.
8. Guidance and Career Counsellors: LMIS will create a link between the job seeker and the guidance and career counsellors which will help job seeker in locating an appropriate job. The guidance and career counsellors can also help the job seekers to understand specific job profiles and help them in defining a perfect career path.

IV. Proposed Framework

The LMIS is a portal that brings information together from diverse sources in a uniform way. There is an essential need for collecting, integrating, analyzing, disseminating and presenting labour market information in real-time. It should also be available electronically to stakeholders. There is no single set of characteristics or requirements that can define optimal framework for labour market information system. But based on study of different leading practices we are proposing design and framework for web portal with key features which are listed below. Currently we are going to implement framework for IT Sector but later it can be expanded for other sectors also. Figure 2 on next page shows the optimal framework of Labour Market Information System.

As per Figure 2, pillars of an LMIS are:

9. Labour related information includes the information about market of various sectors, occupation, ages, genders for labour employed, demanded, supplied and anticipated.
10. Market related information includes the information of current wages, current demanding occupation and information about training and education provider.
11. Information provided needs to be updated, accurate, secured and reliable.
12. System refers to the way of providing information in formal, secure and timely manner to all stakeholders

Input

1. Evaluated data for different sectors from different stakeholders.
2. Frequently updated data from key sources like surveys and reports

Output

1. System will process the request data through information system analytics to transform the data into useful information for different stakeholders
2. Sector skill will identify the different stakeholders for the information and will define the access rights for different stakeholders

Key Modules of Framework

Career Map

This feature provides the career map for particular track such as software development of particular sector such as IT. Further it can be specific to particular occupation such as application development. Career map shows the entry level, middle level and leadership level job roles for the track so user can decide what path they want to follow to reach particular position such as CEO or head of Team in organization. On clicking the listed job role on career map, system will provide the information about qualification standards, training provider, job availability, and mobility map for that job role.

Career Plan

This Feature provides the career planning information for job seekers and students based on the following statistics. Organization with highest wage rate will display the list of organization in ascending order by wages rate. Organization with highest decline employment displays the list of organization with number of decline employment in last five years. Total employment by Organization displays the list of



Figure 2 System to provide Information on labour market for informed decision making organization with total number of employment in last five years. Occupation wise Organization information displays the list of occupation with list of organization that provides that occupation.

What is hot in market?

These features provide the information on most demanding occupation and identify what types of jobs are in demand. It provides following information.

1. **Fastest Growing Occupation:** It finds the fastest growing occupation which includes the details about employment, salary and education.
2. **Occupation with Most Demand:** It displays the list of occupation which includes details about number of opening, average salary and education level for it.
3. **Occupation with Largest Employment:** It displays the occupations with the largest number of employment.
4. **Occupation with Largest Decline Employment:** It displays the occupation with largest rate of decline employment.

Market Indicators

This feature allows user to explore subsectors of the Indian IT Industry for occupational mapping, career information and job availability in graphical informatics.

Language and Font:

This feature provides the two language options in which one is national language Hindi and other is the International language English. It also provides the font size option from 12pt to 18pt for better viewing experience.

Success Tips

This feature includes tips for enhancing the resume making, interview facing and do and don't for sectors relevant procedures.

Listing and Analysis of Training Provider

This feature will provides the list for available training program by three types of search

1. **Basic Search** will find the training institute by stream and location.
2. **Map Search** will search the training institute in graphical way. Map of India will be displayed initially and on clicking on the particular state, map of that state will be displayed, further on clicking on particular city of state, training provider for that city will be displayed.
3. **Advance search** allows the user to search training institute by location, stream and cost.

Industry Speak

This feature allows the actor to view testimonial or messages quoted by prominent IT Organization personnel.

Social Connectivity

This feature allows the actor to view and make use of social networking contents of LMIS. Below are some of the social networking sites for LMIS:-

1. Facebook
2. Twitter
3. LinkedIn
4. Google plus

My Skill My Future

My Skill My Future will provide the information on new career, job matching, number of openings, average salary and skill requirement for that job when current job title or past job title is entered by user.

Technology of Lmis

Below Table 1 describes the technology used for building the proposed framework

Table 1: Technology stack of Lmis

Area	Technology	Use-Case
Drupal	CMS	for edit, modify, publish and maintains of data
Aqua Drupal	Open-source software	Used for developing Drupal site
Database	MySql	Used for insert, update, modify and retrieval of data
Application server	WAMP	Used to local host the application and get availability of the application
ESB	Mule	Used to connect applications together and enables them to exchange data
Dream weaver	Editor	Used for design, development of web page
Languages	HTML, CSS, Php, JavaScript, AJAX	Use to develop and implement a business logic

Risk Management

There are number of stakeholders and external factors that influence the LMIS, so there is a chance that the LMIS fails to meet all user requirements and objective of LMIS. Risk management includes the identification and mitigation of risks that are experienced during designing and implementing of LMIS. Some the major risks are below

1. An inaccurate and incorrect architecture of LMIS will lead to wrong functionality, wrong information dissemination to stakeholder.
2. Security risk may rise if LMIS does not have proper authentication method for user authentication, which increases the spam users and load the server's resources.
3. Improper design and navigation will became headache for user and user might avoid using it.
4. Due to many number of stakeholders it is possible that all of them may not agree to follow the LMIS initiative.
5. Inability to meet user requirement because of whimsical requirement from user to user.
6. Risk associated with financial support and manpower management for building up the LMIS.

V. Results

Various modules been implemented for providing desired functionalities in a user friendly manner. Below I have explained the flow of one of the modules named 'Market Indicators'.

In Market Indicator system displays the geography of India when user navigates through demand side analytics. The map displays the state with higher demand with higher intensity colour shades with respect to the state with lower demand. System prompts actor to select any state on the map as show in Figure 3 on next page. Currently actor has clicked on Maharashtra State.

If the actor selects any state on the India's geography for demand, then system navigates the user to the next page which displays four subsectors (IT Service, BPM, ERD and Software Products) wise demands for prominent cities of the selected state (Maharashtra) as shown in Figure 4 on next page.



Figure 3: Page Layout of LMIS when user clicks on “where is the demand coming from.”

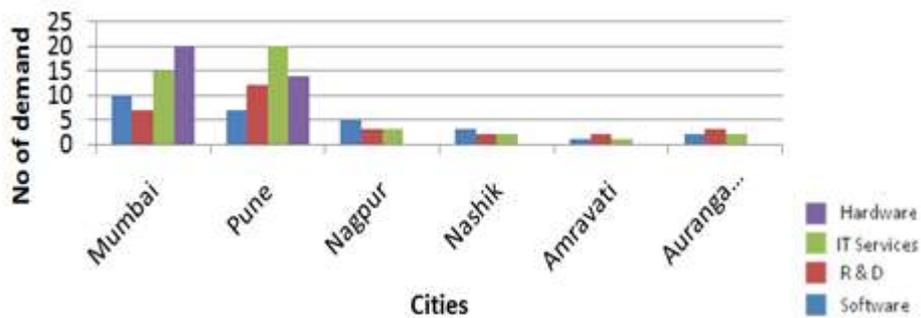


Figure 4 IT Demands Of Maharashtra

If actor clicks on any of the sub sector on the graph of demand from prominent cities then system displays occupation wise demand for the respective subsector of the selected city (Pune) as shown in below Figure 5.

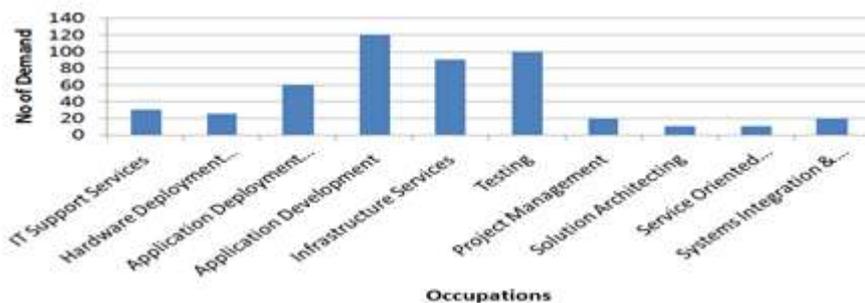


Figure 5 Occupation wise demand of IT in Pune

Actor can click on any of the occupation on the graph to view job role wise demand in the selected city (Pune) as shown in below Figure 6.

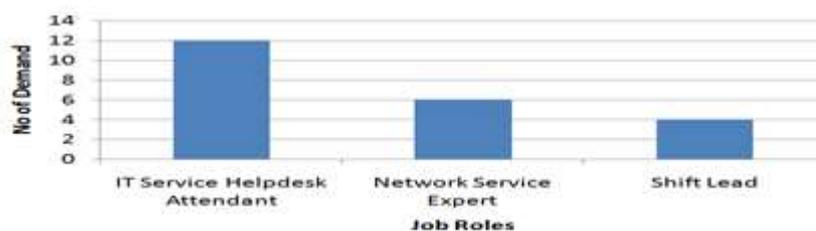


Figure 6 Job Role wise demand of IT in Pune.

If the actor clicks on any of the job role on the graph then system displays company wise job role demand in the selected city (Pune) which is shown in below Table 2. Below data is displayed for the selected job role:

Table 2: Company wise Opening of It Services Helpdesk Attendant in Pune

No	Company Name	Company website	No of Openings
1	IBM	www.ibm.in	5
2	Netdoers	www.netdoers.com	1
3	Accenture	www.accenture.com	6

VI. Conclusion

LMIS acts as Key labour market policy instrument and has structure that largely depends on country needs and labour market requirements. It bridges the gap between the labour force demand and supply and improves the information flow in the labour market. LMIS provides the information on jobs and wages, industries coming, going and changing, cities and communities, future trends and conditions of labour market. LMIS cannot be used to generate jobs, but will help in improvement of the adaptation of the labour force to the requirements of the labour demand by providing information on the needed skills. For consistency and efficiency, LMIS needs to be dynamically updated with new labour market information.

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