

# Information Technology and Society (Employment)

Muhammad Arif Saleem

Faculty Member, Faculty of Management Sciences, International Islamic University  
Islamabad, Pakistan.

**Abstract:** *Out of many business aspects influenced by information technology, employment in banking is one of such aspects. Based on literature review and supported by a case study of 14 different banks, it has been observed that technology eliminated, clustered many jobs into one and/or resulted into generation of some new type of jobs. For the performance of either clustered and replaced jobs or new jobs; skills nature and level required to perform these jobs either decreased or increased. These changes influenced the organization's structure and the investment on education and training as well. The extent of these changes needs to be measured in a quantitative study while taking care that this extent strongly influenced by other factors as well.*

**Key Words:** *Employment/job, Job Clustering, replacement, de-skilling, up-skilling, training, structure*

## INTRODUCTION

In earlier decades, profound changes had occurred in our society as a result of the innovations such as electricity, automobiles, the radio, jet engines, plastics, and even corrugated cardboard. However, during the last two decades these changes have been occurring in our society as a result of the introduction of new technologies based on the microprocessor. The Science Council of Canada (1980) [1] has noted that this remarkable innovation has extended the range of electronic processing to numerous economic applications in industry, office equipment, recreation, medicine, consumer goods and services. It was also discovered that this technology can be used to increase the productivity of the humans and processes as well.

Advancement in the size and function of this microprocessor brought in the technologies what we called information technology which consists of or define in terms of computers (hardware and software) and high tech communication. This technology has changed how we start our day, do our jobs, how we entertain ourselves and even our social values also changed due to this bundle of micro-processor based technologies.

The extraordinary diffusion of computers and information technology during the past 20 years has prompted question about IT's effects on a variety of aspects of this technology and human interaction. Technology's influence on employment is one of such dimensions which invite our attention to study its impacts and forecast about its future implications.

Different researches study the different dimensions of this influence of technology on employment in different

industries. Such as Buchanan, D and Boddy, D (1983) [2] who contend that with computer, Scientific Management is being applied to offices and to intellectual labor, as Cooley (1981) [3] quoted from General Motors that computer may be to middle managers what the assembly line was to hourly paid workers. This study extended by the work of Pinsonneault & Kraemer (1993) [4] The author found contradictory evidence of both increase and decrease in no. of middle managers due to information technology. Based upon the in-depth literature review favoring both the outcomes individually, the author looked at the role of information technology influence in perspective of organizational set up. And concluded that in the organizations where decision making is highly centralized and top management use middle management for collection and dissemination of information, in such organizations, no. of people employed in middle management decreased due to information technology. Whereas in organizations structure where decision making is more de-centralized, middle managers adopt technology to increase their number. This conclusion further reviewed in a more quantitative study by the same authors (1997) [5] and concluded that centralization and de-centralization of decision making influenced over the nature of impact of technology on number of middle management in a particular organization.

From more specific studies i.e., only middle management and information technology; other researchers studied its impact on a variety of job categories, and arrived at different conclusions. These research studies also look at the different dimensions of job/employment itself, like its nature, structure, and resulted set of skills required to perform today's and tomorrow's jobs.

Like Carnoy, Martin (1997) [6] in their comprehensive literature survey disclosed that information technology resulted into considerable up-grading of some jobs, elimination of others, and creation of new jobs. These authors also concluded that many of the lowest-skilled jobs were eliminated (clerks), but higher-level jobs (accountants) and middle-management jobs also disappeared.

In service sector this phenomenon studied further by Hunter, Larry W., Bernhardt, Annette, Hughes, Katherine L., Skuratowicz, Eva. (2001) [7]. The authors conducted case study of two banks to look at the impact of technology on employment nature and earnings of the jobs available in the banks, and concluded that technology has clustered different tasks or jobs into one. It also resulted into generation of new types of jobs as well like analysts required for data mining and customer service employees. Both these new jobs and clustered jobs are relatively

higher paid jobs. Within services, financial sector studied further by the McQuillan Kevin, Hoffman Jennifer, (2000) [8] about Ontario and London CMA also concluded that over the years jobs like auditors and accountants, books keepers, loan officers, supervisors, finance and insurance clerks, tellers have been reduced.

Rationale behind using information technology vary from enhancement of human or process efficiency to simplification and improvement of products and services offered by respective organizations. But along with these main products of information technology its impact on employment is one of its by-products.

In Pakistan many industries can be studied from this perspective but this paper focused on our banking industry. One reason for this is that banking industry is one of those industries which adopted and is adopting technology at the highest speed. And within banking industry it's the formerly nationalized banks which experienced these waves of change at higher speed than the other two groups of banks which are discussed in sampling design, and served them as good population to conclude this impact study.

### OBJECTIVE OF RESEARCH

The objective is to advance our understanding how technology has shaped up / shaping our today and tomorrow's jobs in banking industry, what sort of skills needs to be acquired to perform these jobs and how jobs/employment have been restructured for effective management. And what sorts of training issues are emerging in this new scenario.

### IMPORTANCE OF RESEARCH

We need to identify skills combination the today's or tomorrow's employees need to survive – to address our educational system, to redefine the recruitment policies of the banks, and to re-model our training programs directed towards this industry. This study will also help us to identify what sort of new skills are required to manage this changed employment structure. This paper provides a deeper and more nuanced understanding of some of the impacts technology have on banking sector's employment.

### RESEARCH DESIGN

To study precisely how technology has changed employment level, I use case study method in which qualitative interviews are conducted. An unstructured questionnaire consisting of questions like how technology has influenced the level of employment? Whether it leads to increase/decrease/no change in employment level? How nature of jobs have changed? What sort of skills and educational requirement are in this new employment scenario? What's its implication for training and recruitment policies of the banks? These and other

relevant questions are asked from a carefully selected sample.

With respect to this study banks can be categorized into 3 segments; 1) formerly nationalized banks which are laggards with respect to technology adoption, 2) private commercial banks emerged after de-regulation which opened their eyes in this technology era and they set their base with a reasonable technological level, and 3) multinational banks which remained the pioneer in technology adoption due to their strong parents organization's technological background.

Keeping in view these differences I focused on formerly nationalized banks to study the impact of technology but this focused is backed/supported by few interviews from new commercial banks and multinational banks as well. In this case study total 28 in-depth interviews were conducted from 14 different banks in the vicinity of Islamabad and Rawalpindi, which include; 3 interviews from multinational banks, 7 from new commercial banks and 18 from 5 formerly nationalized banks.

To get a more vigorous perspective, sample although non-probability but the people selected in this sample are experienced and who observed and observing the changes fueled by technology. Snowballing sampling technique is used to select the people who have been serving in banking industry from the last 10-15 years and now at the managerial seats of different banks. This sample also includes people from the training institutes of the banks which are intending to develop the respective bank's work force to match the today's banking requirements.

### FINDINGS

**Nature of jobs:** Technology has dramatically changed the nature of jobs in banking industry. This change in nature of jobs has created chain of effects which altogether changed the level of employment i.e., no. of jobs available in banks, how banks are now managing these new jobs or what sort of organization structure has emerged, and it also has implications for the nature of skills and level of education required to perform these jobs which ultimately affected the recruitment and training policies of the banks.

Technology has clustered the jobs which primarily considered as independent jobs, result of this clustering is that no. of people required to perform the same no. of tasks have decreased. In certain cases this clustering **replaced** the routine and repetitive jobs with **more challenging jobs** as people involved in check cash process replaced with personal banking consultants and in other situations it **get the challenge out of the jobs**, as now loan officer is not suppose to make a loan approval decision, it's the software, you need a data entry operator to enter the required information into the computer. But another aspect of this is that it **reduced the risk level**, as now the employees will not be responsible for a bad loan. Availability of electronic surveillance and other devices **eliminated** the supervisory level jobs as now computer is

recording, how many entries entered into computer, no. of calls handled, no. of customers served within the bank premises. Along with clustering jobs, elimination and replacement, information technology also resulted into development of **new jobs** like data mining analysts, system administrator, etc., which are more challenging jobs.

**Nature and level of skills and education:** On one hand this clustering **increased the skill and education** level required to perform these jobs as according to interviewees now it's the 16 years of education is required instead of 10 – 14 years of education to get a job in banks. Along with this increased in no. of years in education, today's employees need a **different basket of skills** as well which include analytical, interpersonal, communicational, and computer related skills. Thus it added different skills such as computer skills, a more specialized skill, as well along with addition of skills and education level. Knowledge about computer has become indispensable for every one working in a bank. Incorporation of computer in every function also replaced basic skills like mathematical and statistical to interpretation of these operations outcome, again emphasis is on analytical skills.

Although information technology enhanced the analytical power of the individual employees as the employees never have such luxury to put a variety of information on one computer screen, as they are enjoying today, in this way it **facilitated the job** as well but on the other hand jobs have become **more information loaded**. As job clustering changed the no. of task/no. of individual ratio in favor of no. of tasks, employees have to have added informed about a variety of their job's dimensions. Another argument about this added information is that **no. of tools required to perform these jobs** have also increased which also resulted into additional and diversified information loading on the employee. This is backed by **diversification in bank's offerings**, which increased the operational diversity, and this diversity needs more and more and changing information. Its not the only up-skilling; in certain cases information technology also resulted into de-skilling as well i.e., some replaced or new jobs required low level skill and education. Like analytical job of loan officer a high skilled replaced with a data entry operator relatively a low skilled job.

**Employment composition and structure:** The job elimination, clustering, replacement, and emergence of new jobs **changed the organization's employment structure** as well, as certain designations have been removed, clustered and other have been added, making a vertical and horizontal changes. Like cashiers, stenographers, have been replaced or clustered into other heads, such as telemarketers, customer service personnel, similarly supervisory jobs removed/reduced, and new titles such as system administrator/manager, data entry operators etc. have emerged.

As more administrative and process or operations oriented jobs are disappearing due to automation, clustering or replacement, and new jobs are emerging, these new jobs are either computer related or sales; which are more part time and contract oriented jobs. Thus **stable and full-time jobs in operations are disappearing** in favor of part-time and contract jobs which provide little to no security. This tendency has increased the per week no. of hours worked by the employees working in banks, as their compensation composition has also changed which is biased towards performance, which demands increase in no. of hours worked per week.

In our social settings the idea of job away from one's home town is not very much common. So although technology in certain cases do not resulted into elimination of jobs rather banks trained their trainable employees and employed them into branches somewhere else. So these displacements along with additional skills demand to perform those new jobs put a pressure on these displaced employees and its intensity becomes sever when the banks also expect to do it in a short-adjustment time.

It has also been observed from these interviews that technology not only increased the cost of initial **pre-employment investment on education and skills** by the individual but also by the bank as well. And this cost is increasing with the passage of time, as the technology is changing and so the skills that you need to perform those technologies influenced jobs which demand more investment on education and training leaving the past investment on education and training obsolete or less relevant.

## CONCLUDING DISCUSSION

In Pakistan technology becomes under focus in banking industry in 90's. In this decade, Pakistan was experiencing 3 different changes in its banking structure. This restructuring was in fact backed by structural adjustment program signed with IMF in which Pakistan agreed to de-regulate its banking industry in order to provide a good support for country's financial structure. It was the strategy of the economic managers of that time to save nationalized banks of that time from the intense competition which will emerge after this de-regulation. And this change in strategy demands change in structure of these banks as well. At that time Pakistan's banking industry was at its primitive stage with respect to its technology adoption. Multinational banks although working in Pakistan but were keeping their pace with technology based upon their strong financial, technological and more competitive parent banks background, but their share in Pakistan's total banking industry was minor.

So over the last decade of 20<sup>th</sup> century Pakistan's banking industry experienced changes like, de-regulation, (due to which new banks both national and multinational arrived into the market) expanded scope of banking products (i.e.,

instead of only receiving and giving money to auto & home appliances leasing, and home financing etc.) and the restructuring of formerly nationalized banks, which changed their philosophy of making profit by increasing the efficiency instead of increasing the no. of branches which may not be profitable. In fact it was the changed philosophy which brought in the technology element into focus.

As this technology changed the ratio of no. of tasks to no. of individual required to perform those jobs in favor of no. of tasks, it altogether changed the nature of jobs available in the banking industry. In the performance of these tasks, technology came forward as helping hand which facilitated and or replaced the human hands. Obviously, it increased the information requirement for the performance of those tasks by an individual employee, the employee needs a broader basket of skills, means more investment on education to get entry into a bank's door. But its not always the case, as reflected by literature review as well as my study, that technology does not always result into enhancement of skills, it also resulted into decreasing skill level to perform certain other jobs, a phenomena called as de-killing. As we observe that software is replacing like loan officers jobs, now it's the computer which will decide. From this perspective it can also be concluded that on one hand as the technology reduced the level of risk involved in jobs on the other hand it get the decision making authority away from the individuals. Now even branches don't have to look at regional or corporate offices for the sanctioning of a loan.

The jobs eliminated by the technology are more routine and repetitive for which banks considered it would be appropriate to deliver non-personal services to the general customers in the form of ATM's, telephone and internet banking, and reserve the personal services for the big clients. In this way they were able to reduce cost. But it also resulted into creation of certain other types of repetitive jobs like data entry operators instead of loan officers. Now the extent of this job creation and elimination is not clear. It is because of no. of forces operating in banking industry at that time and even now, like de-regulation, re-structuring, industry growth due to de-regulation, natural growth of the banking industry itself and the technology factor. Therefore, the conclusion based upon on any quantitative research needs to be accepted carefully and this factor also motivated me to go for case study instead of any quantitative study. But we need a quantitative research to enhance our understanding on this dimension.

Technology also resulted into increase in employment as well in the form of automation related and sales oriented jobs. As these jobs replaced the administrative and process oriented jobs, it also changed the nature of employment available now in the bank's which is more temporary instead of permanent. It has drastic impact over the no. of working hours of the individuals working in

banks as their compensation becomes more performance oriented forcing them to work for longer hours.

Technology has also increased the investment of the banks on training as the speed of technological advancement is higher so their payback on every previous investment kept on decreasing. It also reflects the increased importance of humans in this industry which become more valuable due to pre and post job education and skill related investment. But it created many management issues as well which needs to be studied in future research, issues like; as due to increased technology role personal interaction between and among customers and employees and within employees has decreased, what's its impact over psychological health of employees who are working in a more in-human environment? We also need to explore whether technology in working environment has increased tension/stress (due to increased no. of tasks need to be performed by an individual) or it has facilitated the employees in the performance of their jobs? As disclosed by Sherry Turkle (2003) [8]. It will also be interesting to look at whether increased monitoring due to technology in the form of electronic surveillance and other devices have increased or decreased the emotional productivity of the worker?

Case study research design restrict the capacity of this study with respect to generalization, more over another limitation can be as banks consists of most of repetitive and routine jobs therefore, the extent of technology's influence on employment may be higher as such jobs are more vulnerable to technology. So studies in other industries needs to be accompanied with this to see a broader picture of technological influences.

Technology has varying impacts over employment as in certain cases leads to growth and in other circumstances leads to contraction in employment in the banking industry. Therefore we need to identify the other factors as well which make it different. As one of such factors is the development of organizational culture in which middle and top management relying more on their skills for their personal office management such as the written and oral communication, although it's also backed by technology but it do not directly influenced employment. However it eliminated the jobs like clerks, stenographers, and dispatchers etc.

But one thing is evident by the study of McQuillan, Hoffman (2000) [9] that repetitive jobs lost their survival in this technology syndrome in Canada and London's financial markets, and more are losing. It's the case of a mature financial market, which reflects that my conclusion of considering other factors as well along with technology to study its impact on employment requires a fatuous thought.

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