REVIEW ARTICLE

WOMEN IN INFORMATION COMMUNICATIONS TECHNOLOGY

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ABSTRACT

The emergence of the Information Technology sector in mid 1990s, facilitated by the availability of high-speed data communication links, has brought a substantial female work-force into the organized sector employment. This paper analyses the issues of empowerment of women through employment in IT / ITES sector. Such employment opportunities are providing indirect incentive to female students to take up technical and professional courses with a view to the job market. The paper critically examines empowerment issues concerning information technology sector for women by addressing concerns particularly of 'feminization' and 'glass ceiling' approaches for women in this sector. The results reveal that an optimal level of gender inclusivity is yet to be achieved especially at the senior level in the IT sector. The paper desires that the policy makers should focus more on gender planning and gender sensitive priorities towards gender inclusive information sector.

Key words: Women, Information Communications Technology, Empowerment, Feminization and Glass ceiling.

INTRODUCTION

Development of Information Communications Technology (ICT)[1] in recent decades facilitated by the high-speed data communication links contributed improved communicative networks bridging the temporal and spatial boundaries and correspondingly widened the scope of opportunities for people seeking paid work. The onset of liberalization and globalization in 1990s, paved the way to growth of Indian IT industry as it enjoys natural comparative advantage with large cross section of English-speaking, educated but cheap labour force and Indian Government's policy

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incentives e.g. setting up of several Software technology parks (STPs), providing tax holidays to profit making IT industry etc. The growth of IT sector has inherent spillover benefits such as the creation of employment opportunities for a large section of educated unemployed youths including an attractive option for women, boosting up export earning and a creating new pool of entrepreneurs etc. IT industry has now captured about 51 per cent of the world market. NASSCOM–Mencher Report 2009, however, has revealed that over the years the proportion of women workforce at entry level as well middle level management role has increased comparatively but there is lack of adequate representation of women at the senior level. It appears that with the entry of women at various levels in IT sector has improved their status in the society and the level of empowerment. But, off and on, reports come about the several impediments

and harassments of women who have been involved in such activities and many a times that is also due to the timing of the working hour and prevailing environment at the working place.

Objectives

The current paper tries to address the following two objectives:

1. How far the development of ICT in India has enabled the women to be empowered in this industry?

2. Whether women face any kind of constraints in the workplace?

Methods

Various secondary sources like various published reports, books, Newsletters and Journals provided the frame for the present discussion. Existing information was extracted from various sources to enable us in understanding the roles of women in ICT from various perspectives and the level of status they enjoy in the concerned sector.

Empowerment of Women in IT

Kabeer (1999) defined 'empowerment' is the process by which those who have been denied the ability to make strategic life choices[2] acquire such an ability. She referred to three interrelated dimensions/pathways for empowerment. These are Resources, Agency and Achievements.

a) *Resources* broadly defined by Kabeer (*op cit.*) to include not only access, but also future claims, to both material, human and social resources. According to Dreze *et al.* (1995) female education and female employment are the two most vital resources for gender empowerment as they attempt to reduce gender inequality.

i) *Employment:* Labour force participation of women is a step towards women's empowerment (Clark *et al*, 2007). It is observed

that the percentage of female employees in ICT sector in India has increased, over the years, steadily from 35 per cent to 36 per cent at junior levels (NASCOM-Mencher, 2009).

The important factors that encourage women workforce to participate in ICT sectors are comparatively high salary, easy international mobility, attractive indoor work environment, gender-neutral policy based on knowledge-centric skills they possess, Tele-working, Flexible work routine and physically less demanding white collar job (Kumar, 2001; Upadhya, 2006; Shanker, 2008).

ii) *Education*: ICT industry has high female participation rate. This has raised the claims to have encouraged women into professional, technical and higher education. High employment potentiality in this industry inspired a large number of girls to obtain professional education, especially computer engineering courses. It is evident from the report[3] that 5 to 8 per cent female engineering graduates were in the IT industries during 1980s. This figure has increased drastically to 20 to 30 per cent currently (Nayaar, 2007; NASCOM-Mencher, 2009).

b) *Agency:* It involves capacity to exercise choices and capacity to challenge power relation. Study of IT and ITES (Information technology enabled services) workforce in Delhi and Bangalore explored that women agency in IT/ITES sector has enhanced social mobility of women from seclusion at home. A large number of young women living in other cities away from their male relatives and families for jobs are the direct result of the opportunities offered by IT industry to advance women's career, especially of single women. Apart from increased social mobility and work participation rate of women in IT industry, the nature of work (such as flexi time, teleworking and working from home or from decentralized centres), the tools (such as e-mail and internet) and the individualization of capacities required by IT, enable women to take decisions on their own and offer greater scope to enhance their agency. This constitutes the basis of the redefinition of

traditional gender norms. The studies pointed out that the financial power of women have enhanced their bargaining power within their households (Kelker and Nathan, 2002; Kelker *et al.* 2002).

c) *Achievements* refer to the outcome of well-being and realizing one's 'capabilities'. Again both 'resources' and 'agency' together constitutes 'capability', which determines the 'potential to live life as one wants'. Thus, enhancing women's capabilities will lead to achievements of enhancing status of women in society (Agarwal *et al.* 2006). Studies by Kelker and Nathan (2002), Clark *et al.* (2007) on ICT sector in Bangalore and Delhi revealed that the urban middle class is in a state of transition. The concept of 'male breadwinner' is slowly giving way to gender transformation towards an equal double-income family. Women gradually prefer to work outside home in an attempt to improve upon their social position rather than bearing with family-based dependency and coercion.

In education too, many middle class parents give equal importance to girls' education like that of their boys so that their girls become financially independent rather than being dependent on others in the family for playing the roles of housewives and mothers. IT industry has encouraged women to break into technology field. Young women feel themselves empowered against the backdrop of disempowerment that includes those, including experience of their parents, who were unable to achieve careers they desired, despite having same educational attainments (Upadhya 2006; Clark *et. al.* 2007). The software professionals are considered to be prestigious in Indian society compared to other professions as they have the potential to earn more. Foreign travels, on job, enhance their role model and greater prospects of marriage. Thus, women software professionals attain 'symbolic capital' or prestige apart from economic capital (Shanker, 2008).

But '*achievement*' is selective. Women employees in IT companies in India are in transition with emancipatory powers in public sphere but not in private sphere. It has not been possible for women in the IT sector to challenge structural inequalities and gender relations at work and home. An ongoing struggle brews in on their part to challenge the embedded patriarchal relations and existing structural inequalities. Women constantly seek to balance work and domestic responsibilities with little help from their men (Kelker and Nathan, 2002; Shanker 2008). It raises next part of the question as to what kind of gender relation, women in IT, experience at work place where gender neutral Human Resource Policy is followed.

Glass Ceiling and Feminization Make Gendered Workplace in IT

Studies[4] underline the existence of 'feminization of workforce' or 'glass ceiling' in this industry as the women workforce is mostly concentrated at lower level of job hierarchy in IT sector. The term 'glass ceiling' gained momentum in 1980s when the issue of gender difference in career and under-representation in senior management gained prominence. Arflen *et al.* (2004) defines 'glass ceiling' in organizations as to glass walls that restrict women to certain fields and positions, such as human resource management and other staff duties. Women are held back from corporate advancement due to lack of informal network of communications, prejudiced male preconceptions and stereotyping of women. At the senior level, women representation is only around 5 per cent. The reasons attributed to this are: (a) stereotyping the female professionals, (b) a personal sense of mid-career guilt, and (c) proverbial 'glass ceiling' (NASCOM-Mencher report, 2009). A small percentage of women are in managerial position. A few women work as Software developers, Architectures, Tech leads, Consultants or Project managers. But a bulk of them works at the lower level as testers, programmers or quality assurances and other such low-end jobs. They are, thus, paid less compared to their higher level post-holders and, consequently, they have fewer channels of growth and less chance of going abroad. Women cluster at lower level of job-ladder leading to feminization of certain service activities and segregation. Very few women reach higher level of

managerial jobs (Kelker *et al.* 2002; Upadhya 2006).

Gendering skill: Wajcman *et al.* (2004) found that in Vietnam, IT employers' perception of women's 'skill' was nothing to do with ideological and social constructions than technical competences that are possessed by men and not by women. Consequently, it led to strong gender segregation in software work where women were concentrated in jobs that were considered to be less skilled such as testers and coders while jobs carried out by men are in design and specification. Consequently, a gender gap in pay and training is created. She asserted that neither work experience or technical qualification explained gender segregation; rather it was employers' perceptions of women's *vis-a-vis* men's skills and their suitability for particular types of work. Study by Shanker (2008) in Bangalore echoed the same observation that women professionals were concentrated at the entry and intermediate levels rather than middle and upper positions, thus, creating glass ceiling.

Though Indian BPO/ITES industries predominantly employ female workers yet the senior management is consistently male dominated. Culturally, there is persistence of gender-based stereotypes on the part of male management regarding ideological construction of women's skills in terms of having 'soft skills', good at routine, standard and repetitive works that shapes recruitment practices and, thereby, limit the opportunities for women's promotion. Thus, reinforcement of gender based stereotypes creates a culturally and structurally defined glass ceiling (Abraham, 2008). Actually, women's participation has been evident in the 'IC' or information communication of ICTs but not necessarily in the 'T' or technology is due to inherent gender bias practices resulting in feminization (Morgan *et al.*, 2004). Kelker and Nathan (2002) observed that as the number of women in a sector increases, the prestige attached to it decreases. Kelker *et al.* (2002) also pointed out that gender stereotypical typecast resulted in concentration of female mostly in human resource (HR) sector as women have better interpersonal skills to handle people better than men. Marketing, now-a-days, is a women-dominated sector since women are considered

better at building a rapport with clients and possess better communication skills. In finance sector, women are perceived to be honest, less demanding but hard working and cheaper. A more elaborate definition of the term 'glass ceiling' was given by Wajcman (1998) that referred to the invisible barriers obstructing women's promotion opportunities, impeding upward mobility of women beyond the middle levels of management. 'Glass ceilings' for women were the consequence of a gap between policies and their actual implementation. She further asserted 'glass ceilings' could be determined at the 'structural' level'/formal level i.e. at the level of organizational practices or at symbolic level i.e. 'informal barriers' i.e. in facilities, signs and actions by which gender differences are performed and made visible. Wajcman made distinction between 'formal' and 'informal' barriers in a workplace based on her study on western countries. The paper attempted to use her scheme of framework to contextualize it in Indian context based on the previous studies on Indian software industry.

Formal barriers refers to the explicit gender discriminating policies and practices regarding recruitment and promotion at workplace (Wajcman 1998). Literatures reflect gender differences in vogue in Indian software industry on the following counts:

(i) *Lack of bargaining power:* Higher the position in the corporate ranks, the greater is the gender divide. Female executives earn much less than their male counterparts. The pay scale for a post is only at the starting point; the subsequent remunerations depend on the negotiating capacity of the employee on a lot of perks, stock options etc. In most cases women tend to negotiate for less pay, as compared to their male colleagues as women take lot of factors into consideration such as distance from home, domestic responsibilities, company reputation, job security and other benefits etc.(Shanker 2008).

(ii) *Upgrading skills*: Employees are often forced to constantly upgrade their skills to keep themselves employable since Companies need to be updated with new technology and to stay competitive in business. Skill upgrading may range

from technical intensive practical training in a specific subject matter to simple reading to stay up-to-date with the latest development. While male workers are able to cope with the dynamics of technology and market, women engineers lag behind to technically adapt themselves due to domestic, economic and other social reasons. They, thus, stay back with the exception of a very few skilled and efficient women employees (*ibid*).

(iii) *Longer stay period in a company*: There are many women in team leader and project leader positions (20-25 per cent). They need 8-10 yrs of experience to be in this position. Younger men who shift job faster rise faster. Job hopping is a primary means of career advancement in the IT industry. Constraints by husband's career, locational choices and other domestic issues put women to stay in same company for longer period of time than men creating impediment to women's upward mobility. Despite women are preferred during recruitment, yet they suffer from delayed promotion for staying longer in each job. This explains as to why pay scale of women with 8 years of experience becomes similar to men in the same position having 5 years of experience. Quitting of job after marriage is also responsible for availability of fewer women reaching project manager level (Upadhya, 2006; Shanker, 2008).

(iv)*Intensified nature of work*: High commitment management strategies like teamwork, training and career development, performance appraisals and performance-related pay have negative impact on job-to-home spillover. Increase in working hours and work intensity have made workers to take more responsibility for their own productivity leading to individualization of work linked to long working hours of 12-14 hours and even working over night and weekend when there is a deadline. Increased wage differentials acts as the motivator for individual advancement urging employees to work harder to achieve promotions. Time is a big problem and work becomes demanding of women at all levels (Kelker and Nathan, 2002; Burchell, 2006; Upadhya, 2006).

(v) *Mobility*: Impediment to career growth for women is the requirement of short/long/on-site assignments. Unmarried women are preferred to married ones to such assignments. But unmarried women find difficulty to adjust with male colleagues abroad while married women prefer not to take up these assignments due to domestic and social pressure. Thus, non-availing of assignments/ continuous refusal thereof ultimately affects career growth of women and costs their promotion prospects (Upadhya 2006).

(vi)*Childbirth and rearing*:   Interruptions in women's careers due to childbearing particularly cast adverse effects on their career growth. Women who take break at this stage (at 30+); at the next level of management, if they choose to return to their careers, they find to loose their leadership role given rapid changes in technology and knowledge (Upadhya, 2006 and NASCOM-Mencher, 2009).

Informal barriers: There exists in the workplace historically derived standards set by men, underpinning the notion of 'a career' and the related conceptions, practices and processes constitutive of the workplace practiced at symbolic level.

(i) *Recruitment and promotional filters*: IT industry designs its own recruitment processes to recruit individuals of certain 'social types' who fit the industry and filter out those who do not. Jobs in IT sector demand a lot of spatial mobility within jobs. Thus, there is a distinct preference for young unmarried women and men to enhance 'flexibility' of work force. There is a process of exclusion of married women with children at entry point. Male employees, generally, oppose recruitment of female engineers with the plea that it would lower performance rating of the team. Men are preferred more during promotions. Married women, who look for more stability than mobility, create potential source of conflict with other employees. Hence, obstacles for promotion generate (Upadhya 2006, Shanker 2008).

(ii) *Career vision:* Men strategize to enhance career through networking and building contacts from their social lives since employee referrals spring from such activities. Women comparatively spend less time in networking informally with colleagues due to involvement in household activities and miss a lot (Shanker, 2008).

(iii) *Informal network:* Work culture is a major constraint for women's career growth in this sector. Management policy stresses on 'interpersonal relationship' and 'team spirit' rather than bureaucratic structure that makes women difficult to perform and put them at disadvantage when it comes to appraisal and promotion. Due to social and family reasons, many women are unable to put in as many hours of work as their male counterparts. As a result, they rarely take part in informal socializing at the workplace and are unable to network informally with male dominated social groups. Unmarried men stay late where they find social life and complete their work. Women, at the top, experience loneliness as they feel absence of network amongst women in similar position and male resistance to their authority (Upadhya, 2006; Shanker, 2008).

(iv)*Marginalization of women at workplace*: When project deadline has to be met, male colleagues show resentment for women for not devoting adequate time and tend to marginalize them. These result in negative report on women's appraisal and assignment. Being minority, women may face subtle pressure within team when they do not come up with team expectations. Team Leaders may marginalize women by giving them usually less responsible tasks as they are perceived to be unable /unwilling to handle more difficult and time consuming jobs (Upadhya 2006).

(v) *Flexi time policy*: The extended working hours are legitimized by common policy of 'flexi time'. It gives an employee freedom to choose his or her working hours. But in practice, one needs to work as long as necessary to finish the task at hand. Even when there is no real pressure, engineers tend to stay late in office either due to peer pressure or in their desire to show their boss that they are working hard. Ideas like Flexi-time, telecommuting etc. have yet to catch up in large numbers. Only a few companies have these options/ facilities for their employees and that too on a case-by-case basis (Kelker *et al.* 2002, Upadhya 2006).

(vi) *Lack of mentors*: Preference to men for promotions and in hiring at the senior level of management is the normal trend. Women in high position lack mentors. Again, women in high positions normally treat men and women equally as they do not want to be biased to women (Kelker *et al.* 2002).

Policy Initiatives:

ICT Industry in India adopted best practices in areas of HR to promote the growth and increased employment of women but incidence of feminization and glass ceiling points out to a gendered workplace (NASCOM-Mencher 2009). The situation, therefore, calls for the need of policy formulation towards women-centric special facilities to cater to their needs.

Moser (1989) has coined 'Women's special need Gender planning approach' to take into consideration of different gender needs for men and women as they play different roles in third world society. Gender planning relates to identifying women's triple roles (reproductive, productive and community) and distinction between practical and strategic needs. Women involved in participation of labour force are constrained by triple commitments (practical needs). Strategic gender needs involve abolition of gender division of labor, alleviation of the burden of domestic chores and control of male violence. The training of women in male-dominated work area widens employment opportunities and abolishes the gender division of labor, thereby, fulfilling the strategic gender. Identifying triple roles for women may provide methodological tools for planning *e.g.* provision of off-peak transport facilities may meet practical needs but 'Women only' transport particularly at night provides strategic gender need of countering male violence; provisions of crèche, parenting workshops and women's forums etc. are less common in Indian IT industry.

A comprehensive holistic policy need to be formulated NASSCOM-Mencher, 2009 points out for greater inclusivity and empowerment of women that at all levels of ecosystem can be identified where policy recommendation could be made.

Individual level: Women, as individuals, have the greatest leverage in bringing about desired changes where awareness and willingness can shatter glass

ceilings and stereotypes. Women can raise themselves by recognizing their skills and weaknesses, upgrading their professional skills etc. to reinforce their collective bargaining power and become role models for others.

Societal level: Society plays an important role in shaping beliefs and norms, setting boundaries of conformity. It is the society which shapes access of women to education and workforce participation. In the Indian context, societal level promotes 'multiple role models' for women rather than stressing on redefining gender relations and not just confining women's primary commitment in their homes. Due to societal attitude, career oriented women find work as secondary and feel apologetic and guilty of spending much time at work. They end up being 'stereotypes' aspiring to be good wives, mothers etc. and for that end in view they even leave careers to be perfect wives, mothers and daughters-in-law. So, sufficient change needs to be brought about in societal attitude.

Organizational level: Organization should attempt to have supportive structure for women to realize their capabilities. Organization has provided opportunities to a large number of women, but they have fallen short of empowering them at the leadership level. Policies need to be upgraded to attract women at the preferred level as they have low level of attrition. Women generally leave their jobs due to change of residence, marriage or childbirth. Most women quote personal or domestic reasons for changing their jobs, while men openly accept or leave jobs for monetary reasons (Shanker, 2008). At organizational level a forum for formulating policies against sexual harassment need to be created. Surveys need to be conducted for voicing women's problems and to communicate and create awareness on the best practices of the organization. It should make provision for crèche, practicable flexi-hour policy and also provision for post maternity leave.

Governmental level: Suitable legislation, public policies and laws should be introduced by the Govt. to allow and enable inclusivity and diversity across society. Policies like provision of transport for women, security to night shift workers and forum for redressing grievances of women.

Government provides tax holidays to these profitable industries. It is losing substantive revenue which could better be spent on supporting physical infrastructure, higher education, research in software technology (Kumar, 2001). The immunity from Government that software companies enjoy regarding issue of handling sexual harassment cases should be strictly enforced (Upadhya, 2006).

Concluding Remark

In 1990s and 2000s Information Technology sector has become the largest private sector employing women in India. Due to its employee-friendly/gender neutral human resource policies with emphasis on equality of opportunity and meritocracy, policy like flexi-time and place, Tele-working, internet have attracted many a women to get into technical and managerial positions provided good avenues of employability of women candidates. Consequently, enhanced female participation in public domain has emancipated them from male constriction and raised them to equality claims. Due to high attrition level of workforce in this sector, Software companies have put in place employee-friendly and gender neutral human resource policies with global management practices. Moreover, emphasis on equality of opportunity and meritocracy has encouraged many women who get into technical and managerial position provided good avenues of employability of women candidates i.e. ¼ of workforce (Upadhya, 2006).

ICT sector has provided diverse and significant opportunities to women but IT industry is the destination of the 'privileged' few as its access is limited to certain section of population i.e. young, educated, urban with upper caste background, and belonging to middle class/ upper middle class segment of the society constituting majority of workforce. Urban English speaking elites have constant edge over the rural entrants as preference for English speaking workforce given more weightage. The demonstrative effect of this new development may have wider social implications for upgrading the image of daughters, at least in the minds of their own parents, creating a different family model. This young IT woman with assertive

attitudes and large income earnings may act as a role model to others with less privileged background (Clark *et al.*, 2007). In reality, working conditions and management systems put greater obstacles to women at entry, retention and career growth. Long working hours, high pressure- work atmosphere, unreasonable deadlines and frequent travel abroad force women to leave jobs or to stagnate at the lower end of job hierarchy. Stress for informal networking and teamwork tend to exclude women and reproduction of gendered social relations in the workplace takes place (Upadhya, 2006). Short-term change would lead to long term transformation. In the same way, it assumed meeting the practical needs may lead to satisfaction of strategic gender needs. Thanks to the significant job creation by the IT sector in India. It is responsible for raising income levels of some section of the population. The concluding observations, based on previous studies, are prepared on the basis of published articles of our predecessors. We may add the following observation as follows:

Emergence of IT sector has provided a lot of window opportunities for Indian women are evident from the facts emerged from recent NASSCOM study. Workforce participation ratio of men and women in Indian software industry stands at 76:24. This sector has helped many women to move beyond the traditional roles of wives and mothers. It enables them to seek employment and careers outside the home.

It has also provided platform to question the patriarchal relation at home and to take up profession of their choice. Furthermore, women can now think of alternative professions beyond women exclusive/segregated professions of teachers, nurses, clerks, social workers which used to be conceptualized as 'suitable' profession for middle class women in India. Thus, employment in ICT sector has challenged many notional constrictions previously imposed on women. IT sector, thus, provides an opportunity for career mobility as well as careers in far-flung areas situated out side home for women irrespective of constraints they face in the workplace and Society.

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