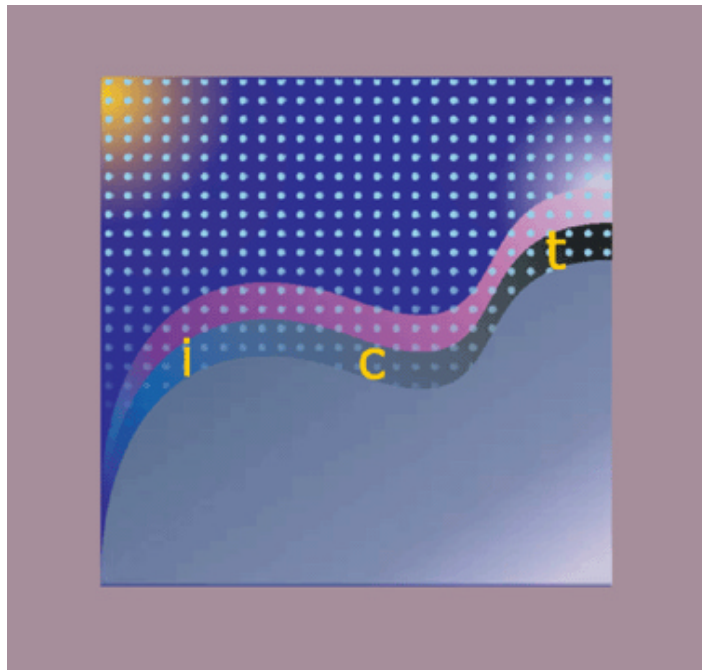


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Chapter 3

GENDER, E-COMMERCE AND DEVELOPMENT

A. The relevance of gender

The role of new information and communication technologies (ICT) and e-commerce in driving the global economy is widely recognized: ICT and the Internet reach many people, have a wide geographical coverage and are efficient in terms of time and cost. They facilitate access to markets, commercial information, new processing technologies and knowledge. But do women have equal access to these new technologies and the Internet? Does e-commerce enhance business opportunities for women, especially in the developing countries? What are some of the promising new employment opportunities for women in the ICT sector, or does it replicate patterns of inequality elsewhere in the job market? And what are the main barriers women have to overcome to participate actively in the digital economy?

These questions are increasingly being addressed by women's advocacy groups and non-governmental organizations (NGOs) working at the grass-roots level in both developed and developing countries, as well as by the international community in general. Among the international organizations, the International Telecommunication Union (ITU) has taken a leading role in bringing the gender dimension into the debate on the digital divide and ICT policy making.¹ Through its Working Group on Gender Issues, and in cooperation with other UN bodies, it is actively working towards integrating the gender perspectives into the World Summit on the Information Society (WSIS), to be held in Geneva (2003) and in Tunis (2005).

Much of the work done at the international level is focusing on how ICT can become a tool for the advancement and empowerment of women, including in areas such as education and training, health, participation in public life and the productive sphere. This chapter will identify the economic opportunities created for women in the developing countries through the use of ICT and e-commerce, as well as the barriers they face when entering the digital economy. Central to this debate is the recognition that the digital econ-

omy poses opportunities as well as challenges for women that are different from those for men, based on their different roles and positions in the family and society. For example, ICT and e-commerce work well for women entrepreneurs (who in many developing countries account for the majority of owners of small, medium and micro enterprises), allowing them to save time and costs while trying to reach out to new clients in domestic and foreign markets. As this chapter will show, new job opportunities created by ICT through outsourcing in the services sector are also benefiting women, who account for significant shares of the workforce in the information technology (IT)-enabled industry in developing countries.

On the other hand, women often face greater barriers than men in receiving education and training that can equip them with computer literacy, foreign language and business skills. In the developing part of the world, parents tend to invest more in the education of the male rather than the female child. Women also often find it more difficult to engage in new forms of self-employment created by ICT, such as telekiosks or cybercafes if they do not have the same access as men to family property or institutional finance. Women make up the majority of the rural poor in the developing countries, where access to ICT infrastructure is less available than in urban areas. Given their increased responsibilities at home, they have less time to access the technologies outside their homes or to enhance their IT, language or other skills required by the information economy. Few women work in the higher-skilled areas of the IT-enabled industry and even those in lower-skilled areas are often hard to retain once they become of childbearing age and social and cultural norms prompt them to leave their jobs and attend to the young and elderly.

This chapter will address these issues in more depth. Section B will critically examine the extent to which e-commerce and ICT provide women with new economic opportunities as small business owners or in ICT-related employment, such as call centres, teleworking or back-office remote/offline work. Section C will focus on one of the key factors affecting women

in the digital economy: skills and training. It will explore what kinds of skills are required by the digital economy and which skills women need to acquire in order to fully participate in the economic and employment opportunities offered by ICT. Section D will address other constraints that women may face, such as access to technologies, availability of finance, foreign languages and cultural obstacles. Section E will provide some conclusions and recommendations for including gender issues in ICT policy-making.

Unfortunately, there is very little research and documentation on the impact of ICT and e-commerce on women in the developing countries. Whatever data and statistics exist, they are often not disaggregated by gender. Nevertheless, this chapter makes an effort to draw from the existing literature and provide as many examples as possible that will give insights into the opportunities and challenges faced by women in the digital economy. Most of the examples cited in this chapter are taken from the Asian region. This is partly explained by the research done so far on the subject, which is heavily focused on Asia, and partly by the fact that certain IT-enabled services have grown exponentially in the Asian region, many of which employ a large number of female workers.

B. Digital opportunities for women

Information and communication technologies provide a number of new job opportunities for women, or businesses opportunities of which women could avail themselves. This section will explore some of these opportunities by looking first at the possibilities which e-commerce could offer to small women business owners, and second at how ICT could create new employment opportunities for women through teleworking and IT-enabled services, both of which employ a significant proportion of female workers.

1. Women as small business owners

E-commerce offers some attractive possibilities for small business owners in the developing countries' business-to-consumer (B2C) or retail sector, many of the enterprises in which are owned by women. Numerous examples have been cited as digital opportunities for women entrepreneurs along the models of telecentres in Senegal and Morocco, phone shops in Ghana, Internet cafes or kiosks in Thailand and Malaysia, and the Grameen Phone in Bangladesh. The

latter has been cited as a successful example of women entrepreneurship, where financing from the Grameen Bank allows women to buy cellphones and provide mobile pay phone services in their shops or local markets at a mutually agreed mark-up with Grameen Telecom.² These IT-enabled businesses have the advantages of low capital and skills requirements (see section D.3).

Aside from telephony services, women's handicrafts could also be developed using B2C, although difficulties in terms of marketing and management skills, and supply and delivery logistics need to be addressed. A number of success stories concerning B2C endeavours are to be found in South Asia, Latin America, Africa and the Middle East. In India, an e-marketplace called IndiaShop eliminated the middlemen in the selling of saris. One woman allegedly sold a silk sari she tailored for \$ 1,100, a price that is way above an average Indian's annual income.³ In Peru, a nationwide network of housewives called Tortasperu, which is involved in baking confectioneries sold over the Internet, showcased lucrative work for women at home taking care of children yet providing the country with much needed foreign exchange.⁴ Ethiopia has opened a gift shop that sells, using the Internet, traditional Ethiopian costumes, food items and spices produced by women.⁵ Finally, handmade products made by women artisans in Egypt, Jordan, Lebanon, Morocco and Tunisia are sold through a virtual shop called Elsouk.⁶

These digital opportunities are particularly significant for women in Asia, considering that women head 35 per cent of small and medium-sized enterprises (SMEs) (Brisco, 2002). It has been reported that in China women initiate about 25 percent of new business start-ups and in Japan four out of five small business owners are women. The main advantage of the Web for small home-based businesses is the information and networking opportunities that would make these endeavours profitable rather than marginal. As Brisco (2002) observes, "The ability of women to earn income at home while raising a family – with the technology to communicate inexpensively with customers around the world, and handle accounting and order processing online – is adding to the attraction of the Internet for women".

Despite these success stories in e-retailing, it will be necessary to evaluate carefully in which segments of e-commerce women's opportunities lie. Women's prospects depend primarily on the trading strength of the countries concerned. In spite of the publicity given to

e-retailing, its scope and spread in the poorer parts of the world have remained small. As discussed earlier in this report (see chapter 1), the volume and value of B2B (business-to-business) trade and commerce far exceed the volume and value of B2C worldwide.

It is also important to remember that women usually sell commodities such as garments or handicraft products, the delivery of which cannot take place online. In such cases, the use of the Internet is confined to advertising, ordering and possibly collecting payments; hence women have to develop strategies to build consumers' confidence in the quality of their goods. The limited evidence available so far shows that some women have also found a market niche in the buying and selling of information rather than tangible goods. In addition to the example of the Grameen Phone cited earlier, women in India and Malaysia use online delivery of their services as freelance journalists to newspapers and other publishers (Mitter, 2001).

2. ICT-enabled services

More promising opportunities for women lie in the B2B segment of e-commerce. The advances in computer and communication technologies have made it possible to transfer digitized data online when there is an adequate supply of infrastructure and bandwidth. Through the use of networking technologies, large amounts of information can be transported at very low cost from the companies' core offices to satellite or subcontracting units. This possibility has led companies to externalize and decentralize non-core sections of business operations to distant and often cheaper locations. The targeted sites are usually the ones that offer the promises of a cheap, skilled computer- and English-literate workforce.

This phenomenon explains why companies in OECD countries outsource service operations to countries such as India or Malaysia (Ng, 2001; Gothoskar, 2000). The International Data Corporation (IDC) estimated that spending on IT outsourcing had reached \$ 56 billion in 2000 and would exceed \$ 100 billion by 2005.⁷ There has been some evidence of companies in developing countries outsourcing operations within the country as well as to other developing countries where wages are even cheaper. Some of the Indian companies, for example, look towards Nepal for the requisite workforce at times of peak demand, particularly from abroad. In Malaysia, subcontracting or outsourcing takes place primarily within national boundaries.

There is a relationship between the availability of a skilled, English-speaking female workforce and where outsourcing normally happens. From this, one can also propose the hypothesis of the existence of a relationship between the availability of a skilled female workforce and foreign direct investment in information processing work in the developing countries. The software services sector in countries such as India and the Philippines could support this hypothesis. The salary differences between the United States and India, or the Philippines, for similar skills are considerable.⁸ Yet these differences cannot fully explain the absence of relocation of software services to countries such as Bangladesh or Uganda where salaries are even lower. In addition to the requisite skills, the success of replicating the experience of India or Philippines depends on creating the right policy framework (ESCAP, 2001).

Software and IT-enabled services could be export-oriented as in the case of India and the Philippines; they could also be domestically oriented as is in the case of Malaysia, China and Brazil. The global expansion of those services has broadened the job prospects of women in new areas. The limited statistics that we have so far indicate that women in some of the Asian and Latin American countries occupy more than 20 per cent of professional jobs in software services. This figure is higher than in any other field of engineering (Arun and Arun, 2002; Ng, 2001, Mitter, 2000, Gaio, 1995).

Recent research and projections have indicated that the prospects for women lie more in the IT-enabled services than in software services. The worldwide demand for IT-enabled services or business process outsourcing (BPO) is expected to grow at a dramatic rate in the coming decade, reaching \$ 611.4 billion by the year 2005.⁹ India hopes to capture a large share of this newly created market. With revenues of \$ 870 million from IT-enabled services in 2000-2001 and an annual growth rate of 66 per cent, it currently has the potential to address 38 per cent of that market.¹⁰ Again, there are no gender-disaggregated statistics on employment arising out of these outsourced IT-enabled services from the developing world. According to the Deputy Director of the Confederation of Indian Industries (CII), in India at least 40 per cent of these newly created jobs are given to, and taken by, women.¹¹

Remote services or IT-enabled services largely consist in the relocation of back-office operations.¹² One has to be cautious about the future, however, given that there are various types of back-office services requir-

ing different levels of skills from women and men. The increasing trend towards outsourcing by major American and European corporations entails jobs ranging from those at the lower end of the skills level where women are mostly employed, such as data entry and

data capture, to those at the higher end such as software programming, geographical information systems (GIS) and systems analysis. There is a discernible trend towards hiring women for operations that require less complex skills (box 4).

Box 4

Gender structure in back-office services (India)

Routine: requiring basic skills – **women predominate**

- Data capture and processing
- Customer call centres – for routine queries, order taking and referrals
- Hotel or rental car reservations
- Virtual service centres (e.g. home delivery pizza companies)

Discretionary: requiring technical training and problem solving – **women predominate**

- Data verification and repair (e.g. optically scanned documents)
- Claims processing
- Mailing list management
- Remote secretarial services
- Customer call centres – account queries and after-sales support

Specialized: requiring specific expertise and managerial authority – **men predominate**

- Accounting, bookkeeping, payroll processing
- Electronic publishing
- Website design and management
- Customer call centres – problem/dispute resolution
- Technical transcription (e.g. medical, legal)
- Medical records management
- Technical online support
- Indexing and abstracting services
- Research and technical writing

Source: Adapted by Swasti Mitter from I.T. Information Technology, vol. 11, no 2, December 2001, EFY Enterprises Pvt Ltd, New Delhi, p. 29.

Box 4, as well as other research carried out in India, indicates that women are concentrated in those areas that need routine or discretionary skills (Mitter and Sen, 2000), whereas women are less visible in specialized areas of back-office operations. It is worth monitoring this gender differential as the next round of technological changes, for example in the areas of voice recognition and image processing by computers, may make some of these skills less saleable in the international market. For the benefit of the women and for augmenting or retaining the competitive advantage of

countries, policy makers need to ensure that women receive the same opportunities and encouragement to acquire skills that could equip them for more complex and specialized jobs.

The Outsourcing Institute, which developed the Outsourcing ICT Index for the United States based on a survey of buyers and sellers, has observed a changing pattern of areas being outsourced to Internet and intranet services such as network management, data centre management, and end-user support and web hosting, owing to the increase in e-commerce activi-

ties.¹³ Thus, if women are to increase their share in the above services, they have to be increasingly exposed to and trained in Internet skills, in contrast to the early phase of the ICT-related task of assembling electronics, as found in Asia and Latin America.

Teleworking: home-based or institution-based?

The outsourcing or externalizing of business processes to distant units within or across the national boundary could range from satellite offices, such as call centres, to homes of employees or vendors or to offices of customers or clients. With the computer and

a modem, a woman can be connected to the head office and can perform her professional work from a distant site such as a neighbourhood centre or her own home. This is possible as long as her work involves storing, processing, retrieving and delivering digitized information. This new mode of working is known as teleworking and has received much attention, particularly in the context of women's career prospects.¹⁴ The use of ICT in itself can, in theory, offer a solution that is attractive both to women and to the corporate sector interested in retaining skilled women employees (box 5).

Box 5

Changing modes of working could be of benefit to the corporate sector

I look forward to the potential of teleworking for retaining our highly trained, highly skilled women employees in business during their childbearing and childbearing stage. In my organisation, we value women's skills and contribution and regret if they have to leave their profession because of the inflexibility in demands made on their time. Perhaps teleworking could find the solution whereby women can keep in touch with the changing technology and perform at least some of the functions from home.

Source: Speech delivered by F.C. Kohli, Vice President of the Tata Consultancy Services, Mumbai, India, at the Final Workshop on Teleworking and Teletrade in India; organized by UNU-INTECH, Maastricht, and the National Centre for Software Technology, Mumbai, December 200.

"Tele" implies distance and teleworking refers to ICT-mediated distant work. The term covers both home-based work or telecommuting and institution-based work as carried out in call centres, neighbourhood centres or satellite offices.

Home-based teleworking could, in theory, enhance the participation of women in the digital economy as it

allows a certain flexibility in both the timing and location of work (Mitter, 2000; Mitter and Efendioglu, 1997). Women with caring responsibilities at home welcome this flexibility, but not without reservation. Whereas some women appreciate the opportunities that teleworking brings, the majority fear that the home-based work will deprive them of the status of working women and hinder their professional or business efficiency (boxes 6 and 7).

Box 6

Some women enjoy teleworking

Exteacher Rani, who majored in the Tamil language, taught for one year, got married, and had a child in 1996. Because she could not obtain any domestic help, she resigned from the teaching profession to take care of her child. She is now teleworking from home, working as a Tamil translator for a multimedia company. She stresses that she is working because she loves to, rather than for the money. She is disciplined in her work and meets deadlines. Rani, who owns her own computer and printer, is happy teleworking as it saves time and energy. "Other things can be done at the same time; there is more control in my work and it is more flexible. I would not have chosen to work if I could not do it from home."

Source: Mitter (2001, p.23).

Box 7

Other women feel concerned

Due to the prevailing notions that home-based work is essentially women's work, it is likely that companies adopting telework systems would prefer women. Women, too, might be tempted to opt for telework as it enables them to manage their multiple roles effectively. While the system provides women with the possibility of managing their homes and earning a living, there is a danger that their contribution to society will remain invisible. It would not change their existing gender inequity in the home or the prevailing stereotypes that domestic work is essentially women's work.

Source: Mitter (2001, p. 23.)

Surveys of home-based teleworking carried out in Mumbai and Kuala Lumpur revealed that women had a preference for institution-based teleworking as in call centres (home-based teleworking accounted for only 1.0 and 0.35 per cent respectively). According to Ng and Khoo (2000), in Malaysia, "interviews with women's groups indicated that the (institution-based) centres, commercial and state sponsored, may be the ideal site for externalised work that will allow women (and men) to combine work with collective childcare facilities; enable women (and men) with peer groups and thus allow them to acquire and improve their tacit skills; and provide facilities for state and corporate sector supported vocational training in the field of computer literacy".

Managerial concerns may also explain the low prevalence of home-based teleworking in India and Malaysia. In a survey of management perception of teleworking in Malaysia, most respondents reported that in Malaysian culture face-to-face interaction was essential (Ng, 2001). In India too, research revealed a cautious attitude on the part of management towards home-based teleworking. In the financial sector, for example, companies find it prudent to outsource work to call centres rather than to teleworkers.

In institution-based teleworking it is easy to monitor and supervise employees in the traditional way, whereas widespread implementation of home-based teleworking will require a fundamental shift in the culture of management from direct supervision to a basis of trust. For self-employed and freelance workers, home-based teleworking will involve self-management and time management skills. It is important for women to acquire these skills in order to avoid being

distracted by household chores or over working while teleworking from home.

There is no uniformity in the preference for types of telework among women in the developing countries. Age and stage of life are key factors in moulding women's choice regarding the type of telework. In Mumbai, while young women work in call centres or offices of foreign airline companies in the export processing zones, older women, with young children, opt for and receive home-based telework. Companies such as Datamatics – a rapidly growing software house – receive assignments from their international clients (box 8). In turn, they pass these to women teleworkers who work from their homes, mostly online and with their own computers. These home-based teleworkers comprise a wide range of women: housewives, doctors, lawyers and chartered accountants. All that they have in common is that they had to give up regular employment at some stage for the sake of their families. Teleworking gives them a welcome and much-needed opportunity to be in touch with the world of work. Yet it is difficult to ensure that these women can progress, with adequate access to training and childcare, to high value-added jobs (Mitter, 2000).

The experience of Malaysia is similar. "The case studies in software, as well as in printing and publishing, indicate that some women often opt for and find satisfaction in home-based work, either as freelancer or as employees. This happens in a particular phase of their life cycle, especially when there are inadequate child care facilities" (Ng and Khoo, 2000). The provision of childcare thus remains a key issue in recruiting, retaining and retraining women in the new economy, as it was in the old economy.

Box 8

Management perception of teleworking (India)

The case of Datamatics, India

Teleworking was introduced in Datamatics in 1990 with 10 teleworkers. Over the last nine years the number of teleworkers has grown to 600, mainly owing to enhanced telecom facilities and network infrastructure.

Datamatics prefers women teleworkers, though the prerequisites for applying for the job are quite strict. However, a recent advertisement placed by Datamatics received an overwhelming response and they received more than 3,000 applications. The company has devised a unique method to monitor the work carried out by the teleworkers. Each type of work is given to two or more people who are unaware of each another. The company uses a software package that compares the completed work submitted by the teleworkers with the original in order to identify if there are any mistakes. Work that is found to be 100 per cent accurate is accepted. Hundred per cent redundancies are built into the system. This method of scrutinising has been found very effective over the years.

Source: Gothoskar (2000, p. 2287).

Call centres

With regard to institution-based telework, call centres have received much attention from policy makers, donor agencies and UN bodies. In some countries, such as India, Malaysia, the Philippines and Jamaica, call centres have already proved to be a success in allowing women to participate in the digital economy.

The proportion of women employed by call centres varies from 40-70 per cent (Gothoskar, 2000; Ng, 2001). They tend to be between 20 and 25 years of age and in most cases this is their first job. In view of the projected growth of these call centres, women are likely to benefit at least numerically from this segment of e-commerce.

However, the question of sustainability needs to be addressed. There are risks of a reduction in demand for outsourcing call centre services to developing countries resulting from the improvement of voice recognition by computers.¹⁵ In addition, changes in technology may alter the volume and the nature of call centre service provision. Instead of providing a central base for teleworking, call centre services may be provided virtually, supported by fast data communication linkages among a network of home-based teleworkers. Again, the deployment of web-based technologies may reduce the market for call centre service provision. In banking, for example, customers may conduct their own transactions. In this new environment,

instead of focusing on a single task, institutions such as call centres or satellite offices will be engaged in multidimensional tasks. Women therefore need to have access to appropriate training and lifelong education in order to retain their share in this changing market.

Second, there is a prospect of “burn out” syndrome. As Ng (2001) reports, “While most call centre workers expressed job satisfaction, there were also complaints about how stressful the job was. One reason given was the highly competitive environment as incentives are given to top performers in call success rates (for example, in debt collection efforts), implying reprimands and threats of dismissals for low success rates. These employees have to deal most civilly with their recipients many of whom tend to be abusive or even hysterical. While the call centre industry has the ability to provide young women with the means of entry into the banking sector, the danger lies with it being a dead-end job, with limited career promotion prospects.”

For women, call centres located on the outskirts of cities reduce the need to commute; for the management they offer the possibility of adequate supervision for ensuring quality control. Call centres, by decentralizing business and work, bring new opportunities for women, away from the city centres, to be included in the B2B segment of e-commerce.

C. Capacity building: rationale for a “gender lens”

The previous examples have demonstrated that ICT and e-commerce can create a number of promising economic opportunities for women in developing countries. They have also pointed to the various obstacles that need to be addressed in order to enhance women’s participation in the information economy. One of the most important impediments to women’s engaging in ICT-enabled employment possibilities

relates to skills and training and will be considered in this section.

Assessing the parity between women and men in the digital economy is a complex task. As table 14 shows, in the software sector, women in Malaysia are becoming numerically almost as visible as men. However, they are generally clustered in the low-skilled end of the hierarchy with little prospect of career progression, while male workers dominate the technical and managerial occupations.

Table 14

Employment pattern of software services companies in Malaysia in 1999

Company	Co. A*		Co. B		Co. C		Co. D		Co. E		Co. F		Co. G		Co. H		Co. I		Co. J		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Level in organization																						
Management	17	0	12	3	10	0	8	5	1	0	7	6	3	0	3	3	1	0	1	0	63	17
Executive	37	22	45	25	12	7	32	18	0	0	6	1	12	5	18	4	23	0	45	6	230	88
Non-executive																						
Technical	7	0	9	0	0	0	58	4	0	0	6	0	0	0	0	0	0	0	0	0	80	4
Administrative	3	17	0	11	0	3	6	20	0	0	0	0	0	0	0	2	10	0	3	1	22	54
Clerical	27	109	0	0	0	0	7	12	0	1	0	3	0	0	0	0	0	0	0	0	34	141
Dispatch	0	0	16	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Total	91	164	66	39	23	10	111	59	1	1	19	10	15	5	21	9	34	0	49	7	430	304

Source: Ng (2001, p. 115).

M = male; F = female

Notes:

1. Management includes directors, managers, consulting managers and assistant managers.
2. Executive includes systems analysts, analyst programmers, executives, network specialists, consultants, Internet technicians, engineers, project leaders, project team leaders, finance personnel and accountants.
3. Non-executive is divided into two categories:
 - i) Technical – technical writers, computer operators and conversion operators;
 - ii) Administration – administrators/supervisors, support coordinators, executive assistants, secretaries and receptionists; clerical (data entry clerks and clerical staff); and dispatch.

* Company A has a total of 92 full-time employees and 163 contract staff (11 supervisors and 152 clerks).

Why is there such an uneven distribution of male and female employees across ICT-related occupations and what could be done to address this? The training policies in developing countries are in theory gender-neutral. In practice, however, they are often geared to the life cycle and aspirations of men. Women, particularly of childbearing age, find it difficult to cope with the training given either by employers or by private sector institutions. The drop-out rate for women even in the high-skilled software services sector has been alarming, even in areas where there is a need for trained personnel (Arun and Arun, 2002; Ng, 2001). A survey undertaken in the software industry in Kerala, India,

documents how women themselves settle for a less demanding position in order to have more time for their family and to maintain the overall quality of life (see box 9).

1. Worldwide demand and supply of ICT-related skills

The major ICT markets are now faced with a serious shortage of IT skills. IDC (2000) estimated a total of 3.7 million IT jobs in 2000 (excluding people who used some IT expertise in their main functions). In

Box 9

Reasons for women leaving highly paid jobs: Examples from software companies in Kerala, India

Normal working hours were eight hours per day for six days a week. However, employees from all categories felt that they spent more time than this in the work place, largely because of tight project deadlines and the need to put in extra hours to meet those deadlines. Both men and women with children and with other domestic responsibilities found these market-driven work practices to be stressful, particularly as teams worked in an extremely competitive way to finish projects before deadlines.

However, the stress of work–life balances seemed to fall disproportionately on female rather than male software staff. For example, around 82 per cent of women felt that domestic responsibilities were affected by longer working hours, whereas only 69 per cent of men felt the same. Respondents reported that, when someone was sick at home, it was women who typically took time off from work. Similarly, many women discontinued software work on becoming pregnant or having children as no support was provided, and they were unable to undertake roles both in the home and the workplace without such support.

Some mothers who gave up careers in software development had continued to try to make use of their skills by taking up more flexible jobs such as teaching in computer training institutes. For those women who continued (or began) working in software after having children, familial support was the major factor enabling continuity of work.

Source: S. Arun and T. Arun (2002, p.4).

2004, the total vacancies for IT positions are predicted to reach 2 million, but the demand and supply for IT workers will be unevenly distributed. Worldwide the skills gap will reach 28 per cent of demand by 2004, with the highest shortage in Latin America (63 per cent), Europe/Middle East and Africa (40 per cent), followed by North America (26.5 per cent) and Asia/Pacific (12 per cent). In absolute figures, IDC estimates the IT labour shortage to be highest in Europe/Middle East/Africa with 1 million, followed by Latin America (425,000), Asia/Pacific (300,000) and North America (235,000). According to IDC, the demand for IT skills will grow highest in the Asia/Pacific region, but as the supply also grows at higher rates, the skills gap will not be as dramatic as in other regions. In fact, the supply of IT skills is the highest worldwide in the Asian region, and is expected to total 2.2 million professionals by 2004 (up from 590,000 in 2000). Asia/Pacific would account for 47 per cent of the global supply of IT professionals in 2004. Brazil, the United States and Germany are expected to be the countries needing most IT professionals by 2004 (705,000), followed by the United Kingdom (175,733), China (136,765) and Mexico (118,848).

Although many technology workers were laid off in the United States after the dotcom crisis of 2000, the demand for IT workers has increased again in 2002:

according to a survey by the Information Technology Association of America (ITAA), there may be as many as 600,000 unfilled IT jobs in 2002.¹⁶

The implications of this prevailing trend in demand for IT skills outstripping their supply are promising for women. For one, women's labour force participation rates have been increasing in developing countries. In East Asia, North-East Asia and South-East Asia, women constitute more than two fifths of the labour force; in China, women's labour force participation is nearly three fourths (Brisco, 2002). Secondly, the shortage of skills in developed countries such as the United States and even in Europe has led many corporate executives to outsource IT work to developing countries, thus offering many digital opportunities for women's employment in the ICT sector (see previous section). Finally, the Internet has the potential to empower women business owners in Asia and other developing regions and could therefore ensure a level playing field for women and men.

2. Activities and skills required by the ICT corporate sector

In order to enhance women's participation in e-commerce at all levels, it is important to identify areas of expertise needed by the corporate sector for e-com-

merce in developing countries. This is particularly so as ICT-related trade in services has led to a dichotomy between ICT-focused and business-focused activities.

For the purpose of monitoring and facilitating women's entry into key occupations, it could be useful to consider the various core activities for conducting e-commerce. IDC divides ICT services industries into two categories (see annex 1 for complete list of categories of the ICT services industry): (a) IT activities primarily targeting information systems and technology-enabled processes; and (b) business activities primarily targeting business processes along the value chain (e.g. primary activities such as manufacturing, marketing and sales and services; and support activities such as procurement and logistics, human resource management, and research and development).

The potential implications for women of this distinction between information technology activities and business activities could be enormous. Many business activities and corporate functions, especially back-office support operations such as typing, scheduling, filing or communications, are now becoming ICT-based and it is women in many, if not all, corporate entities who carry out these functions. Thus, women should learn these required ICT skills to prevent bottlenecks from occurring in the corporate infrastructure. In addition, this framework could be used for benchmarking women's progress, or the lack of it, in key areas of activities related to e-commerce.

3. Few women in high-skilled jobs

Given the scenario of a prevailing IT skills shortage and the increasing trend towards business activities and corporate functions becoming IT-based, another manifestation of the gender digital divide is the lack of adequate representation of women in the higher echelons of IT-related jobs. Few women are actual producers of information technology as Internet content providers, web designers, software programmers or computer troubleshooters (Hafkin and Taggart, 2001).

In the United States, females comprise a minority in mid to upper-level IT-related jobs, notwithstanding the fact that 50 per cent of Internet users in the country are women (Taggart and O'Gara, 2000). For instance, only 9 per cent of engineers, 28.5 per cent of computer programmers and 26.9 per cent of systems analysts in the United States are females. Women, however, reportedly constitute the majority (85 per

cent) of data entry workers. Moreover, there are gender disparities in the salaries between men and women in IT in the United States. According to Taggart and O'Gara, women in IT career jobs earn 67 per cent of what their male counterparts earn. It is to be expected that this disparity would be much wider in developing countries. The authors cite the profile of women trainees in an ICT school in Brazil, which shows more enrolment in word processing courses that would prepare these women for support and secretarial positions. In contrast, the networking or programming courses are predominantly attended by their male counterparts, who would thus obviously be equipped for higher-paying jobs and more remunerative IT career paths. The authors suggest therefore that trends in access to and use of IT are not sufficient indicators for the equitable participation of women in the information society. Instead, what should be looked at is how women use the Internet and what skills they are equipped with, as these would determine their role in and contribution to the digital economy.

In order to meet the impending skill shortages in critical areas, women must therefore be prepared for careers at all levels of the ICT sector, from data entry to software design, network management and IT entrepreneurship. In considering how ICTs and the Internet could benefit women economically and socially, policy-makers should think beyond women selling their crafts via the web, to women selling their skills as website designers, network managers or IT services consultants.

4. Gender differentiation in IT education and training

Women in developing countries do not yet find it easy to obtain suitable jobs or income-generating work in the fields of network management, web design or software development, because they are not equipped with the necessary skills. The explanation does not necessarily lie in discrimination against women in centres of education and training in developing countries. In developing as well as in developed countries, there are difficulties in attracting and retaining women in ICT training and education. An example used by Taggart and O'Gara (2000) from the experience of Cisco's international Networking Academy Program (CNAP) provides some answers to why women's participation in IT training has been minimal (box 10).

Box 10

Women's participation in IT education and training

Cisco Networking Academy Program (CNAP) is an international training program that teaches students to design, build, and maintain computer networks. The CNAP curriculum is offered in over 70 countries and taught through web-based modules facilitated by on-site instructors in secondary schools, technical colleges, universities, and non-governmental organizations. Minimum education requirements are an eighth grade reading and math level. Recent data indicate that overall, 22% of CNAP students in emerging market countries are female. As a result of Cisco's interest in expanding the number of women in CNAP, Cisco Systems is supporting the Academy for Educational Development to conduct research on female participation in the CNAP in order to develop strategies for increasing female enrolment and completion.

Students and instructors in Cisco's program voice a common message that once women are in the programme, they excel, and in fact perform better than male students.

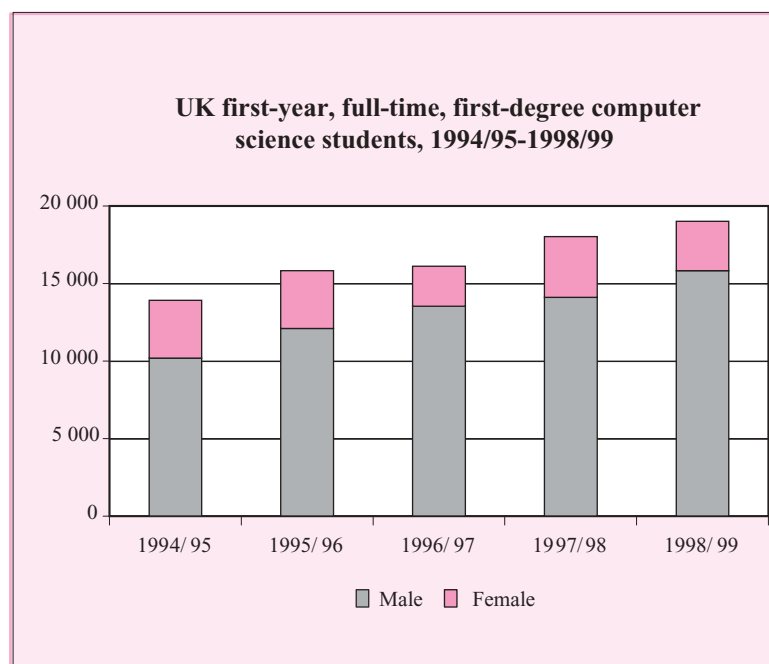
Source: Taggart and O'Gara (2000).

It is not a foregone conclusion that the experiences of developed countries are going to be replicated in the developing ones, where the choice of career and employment opportunities for women is more limited. The IT enrolment gender profiles for the United Kingdom and the Philippines shown in charts 7 and 8 provide a number of interesting insights.

Female enrolment in IT courses is lower in both countries. However, in the Philippines, where employment and career prospects are more limited than in the United Kingdom, opportunities for overseas work depict a higher proportion of women graduating in ICT. While women lag behind their male counterparts in ICT enrolment, they are ahead of males in terms of

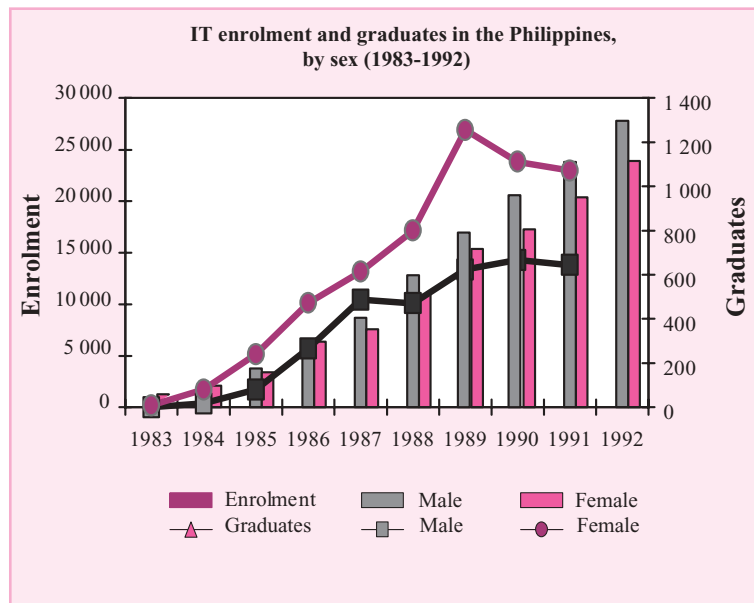
Chart 7

Gender profile of enrolment in IT courses in the United Kingdom, 1994/95-1998/99



Source: Connor et al. (2001).

Chart 8
Gender profile of IT enrolment and graduates in the Philippines, 1983-1992



Source of raw data: Commission on Higher Education, Department of Education, Culture and Sports, Philippines.

the number of computer graduates. The large gap between enrolment and graduation figures in the Philippines, for men as well as for women, is accounted for by the fact that students often find it difficult to continue with training because of its high cost, which is privately borne. In the United Kingdom, as cited by Connor et al. (2001), there is even a declining trend in the percentage of female computer science graduates – 21 per cent in 1998/1999 as compared with 22 per cent in 1994-1997 (Millar and Jagger, 2001).

To increase the number of women in the IT education and training tracks, computers and the Internet should be integrated early on into school curricula to encourage girls to pursue science and mathematics courses. Greater awareness of how ICT skills could lead to a wide range of careers for women will attract them into the ICT field. A study conducted by the Carnegie Mellon University in the United States indicates that early exposure to science and technology could change women's perceptions of IT programmes (box 11).

Box 11 Carnegie Mellon University on attracting women into IT programs

Research by the Carnegie Mellon University (CMU) in the U.S. indicates that adapting science and technology curricula may change women's perceptions of IT programs and consequently, attract more girls and women to this field. For example, CMU's research showed that female computer-science students were more interested than male students in the "context" of computing. 44% of women interviewed, vs. 9% of the men students, link their interest in computers to other arenas. They emphasized the importance of "doing something" with their skills and "connecting computer science to 'real-world problems.'"

Other U.S.-based research has similar findings, drawing the conclusion that "insuring science and technology are considered in their social context...may be the most important change that can be made in science teaching for all people, both male and female." As a result of their research, CMU has adapted their curriculum by, among other strategies, integrating non-science disciplines into their computer-science program and offering a computer science course in which students work with community non-profits to apply their skills to community issues. After 4 years, the number of females enrolled in the computer-science program at CMU increased from 8% in 1995 to 37% in 1999. This idea is not new. Experiential education theory has familiarized us with the notion that learners may respond more favorably to a subject when it is taught with practical application to the 'real world' context. Yet, when applied to IT training, these findings offer some new strategies for expanding the number of girls and young women pursuing science and technology education and careers.

Source: Taggart and O'Gara (2000).

D. Other factors affecting women in the digital economy

Apart from skills and training, there are a number of other constraints that prevent women from fully engaging in the opportunities created by the digital economy. These obstructing factors, described below, are essentially access to Internet technologies, availability of credit or financing, the language of the Internet and other social and cultural barriers.

1. Access to Internet technologies

Many researchers and policy makers have expressed concern that inequality in access to Internet technology will increase the existing polarity between countries as well as between groups within a country. In such discussions on the digital divide, gender issues have received attention. The ITU (1999) gave a timely warning on impending cyber sex discrimination, since it viewed cyberspace as a predominantly male area where the technical and managerial roles are assumed by men. Its World Telecommunication Development Report 2002 (WTDR) portrays a different and more optimistic future. The spread of very small aperture terminal (VSAT) technology and mobile telephony has considerably narrowed the teledensity gap between the developed and developing world.¹⁷ Also, the third-generation mobile telephone promises to bring networking technology in a cost-effective way to women who are not privileged, even in the rural areas.

Access to infrastructure alone, in the absence of access to market and skills, will not enhance participation in e-commerce.¹⁸ Human resource development issues that focus on technical and marketing skills should perhaps feature as prominently as infrastructure in a policy framework. The cost of infrastructure, however, is likely to remain a major issue for both women and men, particularly in the poorer countries. In Bangladesh, for example, the cost of a computer equals nearly two years' salary for a professional person, and a modem costs more than a cow (Mitter, 2001).

The collective use of telephone and Internet facilities to some extent helps, or might help, traditionally disadvantaged groups, such as women, to overcome the challenges of infrastructure constraints. The use of cyberkiosks and Internet cafes are examples of collective use facilities that come from the market-oriented private sector. Telecentres present possibilities of collective use with subsidies and support from donor agencies and the public sector.

Concerns about bandwidth are often overlooked in the discussion of collective use. To conduct e-commerce in a sustainable and efficient way, it is not enough to have connectivity – the right amount of bandwidth is also needed. Developing countries generally lag behind the developed ones in a dramatic way in terms of access to bandwidth. According to the ITU (2002), there is an uneven distribution of bandwidths among countries – for example, the 400,000 citizens of Luxembourg between them have more international Internet bandwidth than Africa's 760 million citizens. Given their position in the economy and in society in poorer parts of the world, it is likely that women more than men will have problems in having access to adequate bandwidth necessary for conducting e-commerce. This is an issue that policy makers should be concerned with.

The gender digital divide

Disaggregation of Internet usage by gender is difficult to obtain, especially from developing countries, and if available the data are not very reliable and comparable. However, even if the figures are not reliable, the numbers of women Internet users are very likely to be small in developing countries, considering that statistics that are not even disaggregated by gender show already a very small or insignificant proportion of Internet access for the entire population. Some preliminary indicators provided by Hafkin and Taggart (2001) show that of the total number of Internet users in 2000, women accounted for 22 per cent in Asia, 38 per cent in Latin America and 6 per cent in the Middle East. No figures were given for the African region as a whole. These data were based on marketing studies compiled by e-commerce consulting firms (table 15).

What is borne out by these statistics is the apparent absence of a correlation between female Internet users and female GDP¹⁹, female literacy, or the percentage of female technical and professional employment, as well as of gender empowerment as represented by the Gender Development Index (GDI).²⁰ As explained by the authors of the study, these figures support their hypothesis that women Internet users in developing countries come mainly from the educated, urban elite, and are hence not representative of women in the entire country.

Home access to the Internet in many developing countries is a rare phenomenon. The woman lawyer referred to in box 12 is an example of women professionals in developing countries who encounter diffi-

Table 15
Women's Internet usage in selected countries

Country	Women as % of Internet users, 2000	Total women Internet users in 000s	Total number Internet users in 000s	Internet users as % of total population	Population in 000s	Female prof. & tech. workers as % of total	Female literacy rates	Female GDP per capita (\$)	GDI rank 1/174
United States	51.1	83 479	170 280	60	283 800	53.1	99	23 540	3
Philippines	51.0	76.5	150	0.6	77 726	65.1	94.3	2 510	65
South Africa	51.0	645.6	1 266	4.2	42 835	46.7	83.2	4 637	84
Brazil	43.0	1 075	2 500	2.1	169 807	63.3	83.9	3 813	67
Croatia	42.0	63	150	4.3	4 672	n.a.	96.4	3 557	50
Mexico	42.0	567	1 350	2.5	98 553	45.2	87.9	4 594	48
Estonia	38.0	57	150	14.1	1 421	66.8	99	4 236	49
Russian Federation	38.0	4 560	12 000	1.8	146 861	n.a.	98.8	3 503	61
Zambia	37.5	1.13	3	0.2	9 461	31.9	67.5	753	125
Uganda	31.5	4.73	15	0.1	22 167	n.a.	35	944	131
China	30.4	6 840	22 500	0.7	1 265 530	45.1	74.5	2 485	79
India	23.0	115	500	0.2	983 377	20.5	39.4	902	112
Poland	18.7	295.6	1 581	5.4	38 607	61.2	99	5 061	40
Ethiopia	13.9	0.83	6	0.1	58 390	n.a.	29.2	349	172
Slovakia	12.0	60	500	13.0	5 393	59.7	99	6 366	39
Czech Rep.	12.0	48	400	6.8	10 286	54.1	99	7 952	34
Senegal	12.0	0.90	7.5	0.3	9 723	n.a.	24.8	1 253	127
Lithuania	10.0	7	70	2.9	3 600	67.5	99	3 323	55
Jordan	6.0	3.7	60.8	1.8	4 435	n.a.	81.8	1 429	n.a.

Source: Hafkin and Taggart (2001).

culties in accessing the Internet not because they do not own computers but simply because they do not even have telephone lines, which is a basic Internet infrastructure. Unlikely to have computers at home, most women in developing countries also cannot

afford to use public access sites. User fees charged for Internet access at public venues may not be affordable for women, who are generally less able than men to pay fees (averaging \$1 to \$3 an hour) (Hafkin and Taggart; 2001).

Box 12

Accounts of difficulties in accessing basic Internet infrastructure

A woman lawyer in Uganda recognises the importance of international Internet connectivity for information, support and advocacy, but has not been able to afford or obtain a separate phone line. To use e-mail, she drives 20 kilometers to the University library, presents a copy of the information to be sent either in manuscript or diskette, and pays one US dollar per page to send a message and 50 US cents per page to receive a message. She has to wait two days to pick up replies, but most e-mail she sends never arrive at their destinations, because the addresses are keyed in wrongly by the library personnel.

Source: Huyer (1997).

When women do have access in developing countries, it is usually in the workplace. This creates a dichotomy between the use of ICT by women as tools of production (e.g. routine office work, data entry, programming) and tools of communication (e.g. creation and exchange of information). As to the latter, women working for non-governmental organizations have used the Internet mainly for political advocacy to protect women's rights and women's causes ranging from domestic violence issues to sexual slavery.

2. Availability of finance

Apart from access to infrastructure and education (skills), lack of capital is the third key obstacle facing women (especially women entrepreneurs) wishing to engage in e-commerce and e-business. To start up ICT-enabled businesses or to employ ICT tools to enhance existing businesses, women will need capital from special financial institutions in developing countries that lend specifically to women entrepreneurs who have no collateral, and who work mostly in the informal sector. The most likely source of the necessary financial capital could be microcredit schemes that specifically target women because of high take-up and repayment experiences and social dividends reaped from lending to them (Hafkin and Taggart, 2001). In this sense, ICT-enabled businesses are no different from other traditional microenterprises in which women in developing countries are engaged. They both involve light-based manufacturing, trade, or service activities; employ about five people or less, mostly family members; have low barriers to market entry; are home-based; and require less professional experience and knowledge than those of their male partners. The only differentiating factor is the use of new technologies.

The microfinance or microcredit programmes are aimed at empowering women beyond just the setting up or expansion of microenterprises. Specifically, microcredit schemes increase women's income levels and their economic independence, enhance their autonomy over household decisions about expenditures, promote positive attitudes to women's social and political roles in communities, and provide them with information and support networks to protect their individual and collective interests at the local and macro levels.

The outreach of the world's largest microcredit schemes shows a varied performance ranging from a 100 per cent outreach in countries such as India, Malaysia, Bangladesh and Mali to less than 50 per cent

in Uganda, Nigeria, Ethiopia, Nepal and France (see annex 2 for a detailed description of the 34 largest microfinance schemes). These schemes could be useful entry points for policy makers in a programme aimed at facilitating women's opportunities in ICT-related business.

In the case of ICT-enabled businesses, the Grameen Phone Project in Bangladesh described in section B stands out as a best practice model combining lending to women's microenterprises with literacy training and skills development. As described by Hafkin and Taggart (2001), among the two million borrowers of the Grameen Bank, who received wireless phones as an in-kind loan to village phone operators, 75 per cent are women. The operators resell the mobile phone service to fellow villagers, earning an average annual income of \$300 as against the national average per capita income of \$286. About 90 per cent of the women operators are married and have no formal education. The phone business can be managed simultaneously with another business or while doing household chores. The major advantages of this type of ICT-enabled enterprise are the minimal educational requirements (just some basic mechanical aptitude), and the small capital needed, enough to be supported by microcredit schemes. There are positive externalities also in accelerating rural development where telecommunication density is sparse.

Another successful example of ICT-enabling business with a microfinancing component is the use of smart cards by Indian women milk collectors in Rajasthan. The smart cards were used to record the quality, fat content and sales of milk to distributors and served as their bankbook, thereby empowering them to make spending decisions and increasing their profits while eliminating the middlemen (called *dhudhwala*).²¹

3. Language of the Internet

The dominance of English as the language of the Internet represents a serious problem for the majority of the world's population, which does not speak English. Women without access to formal schooling that allows them to learn foreign languages are again marginalized, but so are men in countries or regions where English is not "the" language, such as Latin America, the Middle East, French-speaking Africa and Eastern Europe. According to Hafkin and Taggart (2001), language was among the main barriers to Internet usage that women cited in their response to the Association for Progressive Communications (APC) Women's Networking Survey in 1996. Even where women do

have equal access to formal schooling, they may need to receive additional training in foreign language skills, for which time and resources will be scarce.

Hafkin and Taggart (2001) also noted that “even users with basic proficiency in English experience discomfort that discourages Internet use when using other than their native language”. They cited a technical training programme conducted in Mexico, which discovered that users with a low English proficiency level were reluctant to access online help centres simply because it was in English.

While the predominance of English is a threat to the social inclusion of non-English-speaking women in the digital economy, the increasing trend towards multilingual content provides a digital opportunity in terms of language translation in software development and in web design in native languages. As with other

remote services (see section B.2), this could work well for women wishing to combine household responsibilities with income-earning activities.

The other implication of the predominance of English as the Internet language is the close correlation of outsourcing and English proficiency. Earlier in this chapter, it was indicated that outsourcing trends will be on the increase (see section B). Since the top two outsourcing markets – the United States and the United Kingdom²² – are both English-speaking, those developing countries that would want to tap those markets would have to learn English. English proficiency has been mentioned by outsourcing companies as one of the key requirements (see box 13). This gives rise to some policy implications for improving the schooling and literacy of women where a second language – English – should be learned.

Box 13

Opportunities in offshore outsourcing and English proficiency

American companies unable to find, hire, and retain skilled IT workers at home are finding a vast pool of highly educated technology savvy, English-speaking workers available overseas. “These companies are sending IT projects offshore to compensate for the limited pool of talent available in the United States”, according to Cynthia Doyle, research manager for IDC’s IT and Offshore Outsourcing Strategies Programme.

IDC believes India is best positioned to capture a large part of the offshore outsourcing opportunity. However, other regions have potential to develop as major sources of offshore outsourcing, including Canada, Mexico, the Caribbean, South Africa, Israel, Ireland, and Eastern Europe.

“To be a successful provider of outsourcing services, a region must demonstrate fluency in English, a vast pool of IT talent, a solid infrastructure, and experience doing business with Western companies”.

Source: IDC, “Offshore outsourcers are getting involved in increasingly complex IT projects”, downloadable from www.idc.com/getdoc.jsp?containerId=pr50223

4. Social and cultural factors

Many of the previously discussed factors affecting women’s participation in the information economy are directly linked to the roles and positions of women in society and the family. In low-income families, parents tend to give priority to the education of boys rather than girls.²³ Also, women often have less control over family income (in particular if men are the main income earners), which makes it more difficult for them to pursue (fee-based) training in IT-related fields or spend family income on ICT access and use. Prevailing gender stereotypes discourage girls from pursuing science, technology or engineering careers in

many developing countries, especially in Africa, where the numbers of female students in these fields are particularly low (UNESCO, 1999).

In some cultures, women’s presence in public is restricted. Women may not be able to travel to undergo training or attend courses by male teachers, while at the same time few female teachers in the IT and engineering fields may be available. Also, women may not be allowed to use public Internet access centres or telecentres and hence will depend more heavily on home-based access. Lack of interaction with the public also restricts women’s opportunities to practise foreign language skills. Even in societies where women’s presence in public is not restricted, the cur-

rent predominance of male customers in cybercafes in many countries discourages women from using these public access places (Hafkin and Taggart, 2001).

Time is another constraint particularly felt by women, given that they assume most household and childcare responsibilities, often also caring for elderly family members. While home-based Internet access allows women to save time in their business activities, generally they have less free time to spend using the technologies (at home, at work or in public access centres) or to attend IT, language or other e-business-relevant training.

E. Conclusions and policy recommendations

This chapter has attempted to shed light on the way e-commerce and the digital economy impact on women and men in developing countries. Using examples from the countries concerned, it has described the opportunities offered to women as well as the constraints they face in taking full advantage of the potential of ICT and e-commerce. In this process, policy makers will have to play a key role in creating an environment favourable to the participation of women in the digital economy. The following draws some conclusions and outlines areas of possible policy intervention. Annex 3 lists a set of policy options identified by an UNCTAD intergovernmental expert meeting on gender.

The review of the literature has shown that with regard to women's taking advantage of e-commerce and ICT-enabled work, the implications for policy point to access to education and schooling, Internet infrastructure and technologies, financial capital, and the promotion of e-business and IT-enabled employment opportunities. Improving women's access to Internet technologies requires extensive infrastructure building of basic telecommunications (including wireless and satellite) in rural and peri-urban areas, which are currently underserved in many developing countries. This should involve common facilities such as telecentres and phone shops that offer public Internet services and are located in venues which women frequent, such as markets, churches, health clinics, schools and post offices. Microcredit programmes should target the poorest, marginalized women, improving delivery mechanisms that involve men so as to increase their perception of the intervention as supplementing family income instead of being a threat to status. Women should be allowed greater control over their incomes

and be given greater powers of decision about family expenditures. A perhaps more radical implication would be the empowerment of women by allowing them titles to conjugal assets so that they could eventually be able to qualify for financing from the formal financial sector.

In the area of job creation, policy makers need to promote IT-enabled employment such as teleworking. The discussions in this chapter have shown that in developing countries institution-based teleworking generally appears to be a more attractive option than home-based teleworking, both for working mothers with young children and for management. For relatively highly skilled women, for example in software programming and the media, home-based teleworking, at certain stages of their lives, could provide a solution to problems of combining childcare responsibilities with those of ICT-related professions. But even for these women, policy makers need to ensure better provision of childcare facilities so that they do not settle for home-based and/or less challenging occupations because there is little choice. In other words, a policy framework needs to take into account the complexities of women's aspirations and life cycles with regard to enhancing their participation in all segments of e-commerce.

It is crucial to highlight the role and importance of the informal sector in the developing countries, given that the majority of the workforce work either as employees in non-contractual jobs or as miniscule or small-scale entrepreneurs. Again, women make up the largest share of workers in the informal sector in many developing countries. Women in small-scale business face additional hurdles as regards making use of ICT either for marketing or for advertising because of their limited access to market information, finance, assets and infrastructure. This is where the real challenge lies for policy makers in their efforts to bridge the (gender) digital divide and include the poorest segments of the population.

Need for women in ICT decision-making

Women should participate more in ICT policy-making in order to ensure that gender issues are being addressed. However, there is a lack of women in decision-making structures in information technology policy-making and governance in developing countries. Hafkin and Taggart (2001) found that only 5.5 per cent of senior government officials responsible for information and communication technologies in developing countries were women, although these few

were in top positions, such as ministers of communication or telecommunication (in Mali, South Africa and Colombia) and deputy ministers of communication (in Angola, Belarus, the Czech Republic, Ghana, Kyrgyzstan and the United Republic of Tanzania). These women could have an influence on the course of information and technology development in their countries and in regional and global forums. Hafkin and Taggart also looked at the number of women in ITU Study Groups in major areas of communications and technology development; such groups can influence the direction of the development of information and communication infrastructure and standards in developing countries. Out of 51 persons, there were only two women, and no women from Africa, Asia or Latin America. Similarly, at the Internet Corporation for Assigned Names and Numbers (ICANN), there are no women from the developing world among the 19 directors. Policies should thus be geared towards including more women in ICT decision-making positions at the highest levels.

Finally, the question of gender in relation to e-commerce has to be placed among the wider issues of development and growth. As we have seen, the current share of developing countries in both B2B and B2C is minute. Asia is the leading region in the developing world in e-commerce, followed by Latin America. The share of African and other developing countries is virtually nil. Even within Asia, these are concentrated in a handful of countries such as India, Malaysia, China and the Philippines. Therefore, the question of gender should not be addressed solely from the distributive point of view at this stage. Rather, it has to be addressed as a strategy for harnessing women's potential skills along with men's in endowing countries with comparative advantages for participating in e-commerce and e-business, nationally and globally.

1. Policy recommendations for enhancing skills and training

Education is by far the most important policy intervention for improving the ability of girls and women in developing countries to participate in the information society. Apart from ensuring equal access for girls and boys to primary and secondary schooling, women also need to get better access to business and technical education, especially at tertiary levels. This could be addressed by both the public and private sectors in the following manner:

- A key strategy would be to focus attention on generating demand for IT education from women themselves through awareness programmes. Exposing girls to computers and the Internet and to science and mathematics disciplines at early stages should be initiated by Governments, particularly education ministries, before gender stereotypes start to influence female attitudes.
- A second key element would entail follow-up training on ICT-related courses for women already in the workforce. It may be of benefit for companies to sponsor women in ICT training programmes, since women are potential sources of scarce skills for occupations and functions that are now being enabled by computers and the Internet. For women in the informal sector, Governments or the private sector should build IT training institutes which charge affordable tuition fees and are flexible with respect to women's time constraints.
- A third element would be ensuring that women acquire the right IT skills. Training must go beyond teaching women how to use a word processor or how to enter data, towards actual IT creation and production such as hardware and software development, web authoring and design, network management and computer troubleshooting. Women will also need business and entrepreneurial skills in order to apply these IT skills: if they are to use ICT in managing their small businesses, they need to be trained in how to develop business plans, conduct market surveys, and search for information on funding sources and the like. Women engaged in remote processing and distant work need to receive appropriate training in order to stay in employment and business as and when skill requirements alter in response to changes in technologies. And women, particularly young women, need to be provided with opportunities to learn foreign languages (especially English).

2. Other policies to enhance the participation of women in the digital economy

- Providing common access facilities, such as community centres, that reduce the commuting time of professional and business women; and public Internet services in venues that women frequent, such as markets, churches, health clinics, schools and post offices;

- Creating an appropriate environment where new modes of working – such as teleworking – could enhance women’s participation in e-commerce as employees or freelancers, by improving their access to Internet technologies in rural and peri-urban areas;
- Providing facilities for childcare so that women can continue working in the IT-enabled sector;
- Raising awareness in the corporate sector of the advantages of teleworking for female employees as well as for companies;
- Developing and publicizing the availability of a critical mass of multilingual and computer-literate female workforce to attract customer care services work from national as well as transnational companies.
- Supporting the establishment of telecentres as incubators and facilitators of small business in information and communication services;
- Helping to develop multilingual websites in order to make it possible for women, with less access to education and English literacy, to surf the Internet for market and business information that includes legal procedures and regulatory frameworks;
- Highlighting and, when possible, rectifying legal and cultural practices that constitute barriers to women’s entry into the e-economy;
- Promoting business and entrepreneurial prospects for women in the e-economy by offering venture capital and micro finance to women entrepreneurs to set up small businesses in ICT-related and remote processing services;
- Evaluating microcredit programmes for bringing the poorest, marginalized women into the orbit of e-commerce;
- Strengthening the advocacy power of NGOs that lobby for women to have greater control over their incomes and over decisions on family budgets and expenditures.

Notes

- 1 Many other United Nations bodies have started to mainstream gender in their work programmes on ICT and development. In particular, the UN Division for the Advancement of Women (DAW), in collaboration with the ITU and the UN ICT Task Force, is organizing an Expert Group Meeting on the role of ICT for the advancement and empowerment of women, to be held in the Republic of Korea in November 2002. The UN Commission on the Status of Women (CSW) will consider the same subject at its 47th session in March 2003. The outcome of both meetings will contribute to the WSIS.
- 2 See www.worldbank.org/gender/digitaldivide/interventionsasia.htm
- 3 Ibid.
- 4 See www.tortasperu.com
- 5 See www.ethiogift.com
- 6 See www.elsouk.com
- 7 www.idc.com
- 8 In India the average annual salary of a computer programmer is less than one sixth of that of a programmer in the United States. In the Philippines it is one seventh. The average annual salary of a medical transcription secretary is \$1,200 in India compared with \$25,000 per annum in the United States. See Mitter and Sen (2000, pp. 2263-2268).
- 9 Communique India (2002); www4.gartner.com; see also chapter 9 (on e-services).
- 10 www.nasscom.org
- 11 Interview by Swasti Mitter with Sushanto Sen, Deputy Director of CII, on 8 March 2002.
- 12 Back-office operations are the offsite delivery of a range of non-core service functions, including routine administration tasks, customer service and technical support. They involve the use of an outsourcing base in another country (Communique India, 2002).

- 13 www.outsourcing.com
- 14 Although the concept has received most attention in developed countries, the United Nations University Institute for New Technologies (UNU-INTECH), in Maastricht, carried out two research projects in India and Malaysia, exploring the potential and spread of teleworking in developing countries. See Mitter (2000) and Ng (2001).
- 15 “Voice recognition aims to lower call-center costs”, 22 October 2001, www.informationweek.com/story/IWK20011018S0084; “Smarter voice recognition technology will cut call center costs”, 28 May 2002, *Speech Technology Magazine*, www.speechtechmag.com/cgi-bin/udt/im.display.printable?client.id=speechtechmag-news&story.id=778-4k-I; “Coming soon: web sites with a voice”, November 2000, www.internetwk.com/story/INW20001109S0005.
- 16 “Study sees IT worker shortage in 2002”, 6 May 2002, www.news.com.com/2100-1017-899730.html
- 17 In 1991 total telephone penetration (fixed-line plus mobile telephones) stood at 49.0 in developed nations, 3.3 in emerging nations and 0.3 in the least developed countries (LDCs). A decade later, the corresponding levels were 121.1, 18.7 and 1.1. The ratio between developed and emerging nations dropped by more than half from 15.1 to 6.1, while the gap between developed and LDCs dropped from 171.1 to 112.1. Emerging nations have done particularly well and, if anything, there is a growing gap between them and the LDCs. The gap between emerging nations and LDCs rose from 12.1 to 17.1 (ITU, 2002, p. 17).
- 18 The reason for women or men not using the Internet is, according to the WTDR, not so much related to cost as to lack of relevance. A survey undertaken by Ipsos-Reid and incorporated in the WTDR indicates that only 12 per cent of respondents gave “cost” as the reason for not using the Internet, as compared with 40 per cent who felt there was no need to use it (p. 26). Since the survey does not clarify the characteristics and geographical coverage of the sample, it is difficult to generalize from the findings.
- 19 Based on the UNDP Human Development Indicators, female GDP is roughly derived on the basis of the ratio of the female non-agricultural wage to the male non-agricultural wage, the female and male shares of the economically active population, total female and male population, and GDP per capita (PPP \$). For further details see hdr.undp.org.
- 20 The GDI, developed by UNDP, simply adjusts the Human Development Index to take account of inequalities between men and women in life expectancy, literacy and income. For a definition, see UNDP Human Development Reports.
- 21 World Bank (2002).
- 22 United States-based companies alone are projected to increase outsourcing spending threefold to over \$17.6 billion in 2005 from under \$5.5 billion in 2000. In Europe, the United Kingdom is becoming the leading outsourcing market, capturing 22 out of the 34 mega contracts (worth over \$1 billion) that went to the region.
- 23 Girls comprise two thirds of school-age children in the developing world without access to basic education (Hafkin and Taggart, 2001, p. 27).

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ANNEX 1

Table 16
IDC's services industry IT activity groupings

Planning	Implementation	Operations	Maintenance and support	IT Education and training
Process improvement	Site preparation	Asset management	Telephone support	IT/technical skills training
Operations assessment	Project management	Procurement	Parts support	Desktop skills training
Benchmarking	Test and debug	Administrative and operations	Remote network monitoring	Professional certification
Needs assessment	System configuration	Media duplication and replication	Remote diagnostics	Learning augmentation
Strategy	Installation	Systems management	Electronic support	
Capacity planning	Software re-engineering	Performance tuning	Software maintenance	
Change management	Custom software development	Network management	On-site maintenance	
Maintenance planning	Packaged software customization	Back-up and archiving	On-site software support	
Design	Application interfacing and integration	Business recovery	Preventive maintenance	
Supplier analysis	Relocation services			
	Systems migration			
	Documentation			
	User experience design and analysis			

Source: IDC (2001), www.idc.com/getdoc.jsp?containerId=26051&pageType=PRINTFRIENDLY

Table 17
IDC's services industry business activity groupings

Planning and design	Implementation/deployment	Support	Business skills training	Execution/operations
Strategy	Custom content development	Telephone support	Training delivery	Asset management
Process improvement	Rules specifications	Compliance	Professional certification	Procurement management
Process re-engineering	Project management	Electronic support	Learning augmentation services	Pick and pack
Operations assessment	Quality assurance/testing		Learning administration	Special handling
Benchmarking	Environmental assessment			Profiling
Needs assessment	Business documentation			List/database
Change management	Relocation support			Verification
Designer	Site selection and preparation			Lead qualification
Supplier analysis				Lead distribution
Organizational design				Support seminars
Cultural assessment				Marketing campaign analysis
Global brand positioning				Marketing campaign reporting
Global trade assessment				Telesales
Skills assessment				Prospecting
Legal and regulatory assessment				Order processing

Planning and design	Implementation/deployment	Support	Business skills training	Execution/operations
Capacity planning				Invoicing
				Shipping
				Inventory management
				Contract management
				Shipment management
				Employee performance management
				Credit refunds
				Time and attendance tracking
				Employee records/data management
				Cheque processing
				Tax and regulatory filing
				Payment processing
				Records storage and management
				Benefits open enrolment
				Corporate communications
				Benefit administration
				Job posting
				Candidate identification
				Skills and behavioural assessment
				Candidate interviews
				Background checks
				Candidate selection and negotiation
				Candidate hiring
				Recruiting process reporting
				Risk management and site recovery
				Equipment maintenance
				Facilities management
				Administration and operations
				Media duplication and distribution

Source: IDC (2001), www.idc.com/getdoc.jsp?containerId=26051&pageType=PRINTFRIENDLY

ANNEX II

Table 18

Women reached by 34 largest microfinance schemes

Institution	Total number of poorest borrowers reported 1998	Total number of poorest women reported 1998	Percentage poorest women reported 1998	Total number of poorest borrowers 1997	Total number of poorest women 1997	Growth of women borrowers
Grameen Bank, Bangladesh	2 400 000	2 280 000	95	2 270 000	2 156 500	123 500
Association of Asian Confederation of Credit Unions, Thailand	1 699 292	900 625	53	1 425 262	726 883	173 742
BRAC, Bangladesh	1 040 000	1 040 000	100	900 000	900 000	140 000
Association for Social Advancement (ASA), Bangladesh	720 208	669 793	93	571 859	548 985	120 808
Proshika Manobik Unnayan Kendra, Bangladesh	640 000	358 400	56	420 000	231 000	127 400
Caribbean Confederation of Credit Unions	400 000	260 000	65	370 000	222 000	38 000
Agricultural Development Bank, Nepal	218 153	59 992	27.5	200 183	50 045	9 947
Caritas, Bangladesh	207 473	130 708	63	125 250	80 160	50 548
Debit Credit and Savings Institution, Ethiopia	168 954	64 202	38	76 257	29 740	34 462
Crédit Mutuel, France (worldwide)	162 271	19 448	12	106 884	11 757	7 691
Working Women's Forum, India	162 000	162 000	100	148 700	148 700	13 300
Swanirvar Bangladesh	137 490	103 118	75	110 800	80 884	22 234
Country Women's Association of Nigeria	126 000	113 400	90	90 000	81 000	32 400
People's Bank of Nigeria	108 000	70 200	65	92 500	64 750	5 450
Amhara Credit and Saving Institution, Ethiopia	94 004	47 002	50	46 647	23 323	23 679
Fight Against Poverty Organisation, Nigeria	75 000	74 250	99	35 500	35 145	39 105
Kafo Jiginew, Mali	67 871	67 871	100	56 899	56 899	10 972
South East Sadish Krishi Samabay Samittee Ltd., Bangladesh	62 000	55 800	90	45 000	40 500	15 300
FINCA International, United States (worldwide)	61 480	57 791	94	65 000	62 400	(4 609)
Amanah Ikhtiar Malaysia	56 087	56 087	100	55 666	55 666	421
Uganda Cooperative Savings and Credit Union, Ltd.	51 935	13 347	26	52 097	13 024	323
Thengamara Mohila Sabuj Sangha, Bangladesh	45 000	45 000	100	20 542	20 542	24 458
National Bank of Cambodia	40 570	32 450	80	26 160	20 930	11 520
Buro, Tangail, Bangladesh	39 000	37 050	95	32 413	30 792	6 258
Association for Rural Development of Poor Areas in Sichuan, P.R. China	37 800	20 790	55	11 827	9 580	11 210
Sri Lanka Business Development Center	37 500	22 500	60	22 500	13 500	9 000
IREC, Zimbabwe	35 000	28 000	80	30 000	24 000	4 000
Alliance of Philippine Partners in Enterprise Development	31 193	30 257	97	23 017	21 867	8390
Fédération des Caisses Populaires du Burkina Faso	30 806	29 266	95	12 095	12 095	17 171
Heed, Bangladesh	30 630	22 972	75	25 862	18 103	4 869
Microcredito Santa Fe de Guanajuato, Mexico	27 817	24 200	87	11 517	10 596	13 604
ACLEDA, Cambodia	25 964	25 704	99	9 099	8 917	16 787
Nigerian Agricultural and Cooperative Bank	24 780	4 460	18	27 777	3 888	572
Fundación para la Promoción y Desarrollo de la Microempresa (PRODEM), Bolivia	24 000	15 600	65	21 000	14 070	1 530
TOTAL	9 088 278	6 942 283	76	7 538 313	5 828 241	1 114 042

Source: www.gdrc.org/icm/wind/summit.html

ANNEX III

Mainstreaming gender in ICT policy

Policy options identified at the UNCTAD Expert Meeting on Mainstreaming Gender in Order to Promote Opportunities, Geneva, 14-16 November 2001

Expert Meetings are convened by UNCTAD's Commissions in order to provide specialized technical expertise on specific issues within the purview of the relevant commission. Experts are nominated by the Governments of member States, but they participate in the meeting in their personal capacities.

Policy options identified for consideration by the Commission on Enterprise, Business Facilitation and Development

1. Recognizing the public goods nature of knowledge and the Internet, Governments should ensure rapid, equitable and affordable access to the Internet and ICT for women by taking all appropriate measures such as:
 - (a) Establishing an appropriate infrastructure (through telecentres, Internet cafes, etc.) in order to facilitate women's access to the Internet;
 - (b) Providing computers and telecommunications at affordable prices to low-income families and specifically women entrepreneurs, as demonstrated by countries such as Pakistan;
 - (c) Involving local governments (in addition to the national Government) in reaching out to rural communities;
 - (d) Creating broad awareness-raising programmes using mass media and targeting rural areas;
 - (e) Offering computer and language skills training specifically targeted at women; focusing on distance education at home or community centres; and offering training courses to women in telecentres at low cost;
 - (f) Training women in the methods and scope of setting up e-businesses and developing e-commerce;
 - (g) Promoting the capacity of women as managers and owners of telecentres;
 - (h) Introducing the appropriate language courses in primary schools;
 - (i) Providing Internet databases in local languages;
 - (j) Creating public – private partnerships to facilitate access via the Internet to foreign markets and potential business partners for women entrepreneurs.
2. They should enhance the number of women in the IT industry by:
 - (a) Increasing the enrolment of female students in ICT-related courses through specific promotion campaigns and scholarships;
 - (b) Ensuring the participation of women in the design and development of new technologies;
 - (c) Ensuring the representation of women in ICT policy making bodies.
3. They should support organizations and grassroots groups involved in assisting women with access to and usage of the Internet and ICT.

Possible work areas for consideration by the international community and UNCTAD

1. The international community and UNCTAD could contribute towards greater participation of women in the digital economy by:
 - (a) Mainstreaming gender in their overall work on ICT and e-commerce;

- (b) Promoting ways in which ICT and e-commerce can create new economic opportunities for women and thus contribute towards increasing the competitiveness of developing countries;
 - (c) Identifying gender-specific opportunities of the digital economy through analytical and case-study-based work, including on such issues as: (i) the level of employment provided to women in ICT-related services sectors; (ii) the extent to which these sectors are involved in export; and (iii) the type of employment foreign firms provide in these services sectors, from a gender perspective;
 - (d) Collaborating with Governments and the private sector to incorporate the findings from their analytical work into policy dialogue and decision-making;
 - (e) Developing programmes to facilitate women's access to and use of ICT and e-commerce tools, specifically through transfer of technology and competitive scholarships;
 - (f) Promoting ways to facilitate women's access to information and the use of ICT in local government development, and the establishment of information management systems.
2. The Commission on Science and Technology for Development should formulate guidelines on increasing the participation of women in IT during the course of its work on its new substantive theme: Technology development and capacity building for competitiveness in a digital economy.