WORKING WITH MICROCOMPUTER USERS IN DEVELOPING COUNTRIES
- cases from Tanzania, Micronesia and the Maldives

Jaana Holvikivi

Abstract

The paper reports working experiences of a microcomputer expert with United Nations' projects and offices in three third world countries. The phase of office computerization and environment for computer use are described. The social, cultural and organizational conditions for training and systems development are found to vary from country to country. The position of women as computer users is discussed.

1 BACKGROUND

1.1 Country descriptions

The three countries presented here are all tropical, although located in different parts of the world. All of them have a poorly developed economy which is strongly dependent on external sources of money. The majority of the population makes a living from agriculture or fishing. Tanzania and the Maldives belong to low-income countries. The level of salaries is very low, for instance the highest government salaries in Maldives are about 200 USD per month. Prices of imported commodities are still quite high. Micronesia is among the middle-income economies. Computerization had just started when I worked in these countries. There were no expensive, large scale systems in use, only some minicomputers had been installed.

But, despite the similarities already mentioned, these countries differ from each other in most aspects. I describe them here one by one.

Tanzania

Tanzania is an East-African country with a vast and beautiful land area and a population of 20 million. It is one of the few African countries with a peaceful post-independence history, lead by one political party. Among the achievements of Tanzanian socialism is a high literacy rate, equally distributed poverty, a country-wide health care system (very rudimentary, though) and a disastrous economy, which was at its worse around the time of my stay in 1983-85.

The population consists of numerous tribes, and the range of languages and religions is wide. The majority of highly educated Tanzanians are Christian originating from Chagga and some other prominent tribes. The Indian population is not very large but is influential in business and industry. The common languages are Swahili, which is a Bantu-based lingua franca, and English. Consequently, all well-educated people know at least three languages: their own tribal language, Swahili and English. English was the language of the colonial administration, and it is still used in education at college and university levels. Many Tanzanians have degrees from foreign universities, for instance from Britain, India or Scandinavia.

Tanzania has been one of the favourite countries of aid donors. Development aid has a considerable importance for the economy. The aid comes from many different sources which do not co-ordinate their efforts, nor is the government able to do that efficiently. The economic policies are drawn by the government itself, however, and the government was strong enough to resist World Bank demands for a long time.

The Federated States of Micronesia

The small islands of Micronesia are spread over a large area in the middle of the Pacific Ocean. Since the World War II the country was part of the Trust Territory of the Pacific which was administrated by the United States. The Federated States were formed recently in free association with the United States. The American influence is still very strong. A major part of the government spending is financed by the United States. In the compact of free association a large sum of money was promised to the development of the country during the following 15 years, as a compensation for the neglect of the islands during United States' rule.

The Federated States of Micronesia have chosen English as the language of administration because of the variety of native languages spoken in the area. The population has a low education level, and the recently formed administration relies much on expatriates, mainly Americans. Many businesses are run by expatriates, as well. The population was converted to Christianity in the middle of 19th century, and the missionaries of different sects and churches still seem to like the islands very much.

The Republic of Maldives

The Maldives is a long chain of atolls south-west of India. The population of 200 000 lives on small overpopulated islands on a subsistence level. It is an Islamic country where the religious leaders have the last word on political decisions. The economy is firmly in the hands of a few ruling families, the former aristocracy.

The country is undergoing a rapid change because of expanding tourism, foreign aid from e.g. Japan and fellow Moslems, and liberal economic policies. The government is fully independent of outside influence but it faces several problems in formulating development policies and administering the aid. In a nutshell: the country is too small for the amount of aid-money and consultants flowing in.

The Divehi language is related to Sinhala spoken in the neighbouring Sri Lanka, but it has a writing system of its own. The elder population learnt Arabic at school but the younger are taught in English and Divehi. Divehi is the language of government, however, and most of the documents are handwritten. The level of education is still very low, and there are no colleges or universities in the country. Part of the labour force comes from neighbouring countries, for instance teachers and construction workers.

1.2   The cases

My own background is in the Finnish government where I held different posts in six different offices. The longest periods I worked with the Data Processing Service of the Technical Research Centre and with the late National Board of Health. I specialize in office data processing and microcomputers, from systems development and selection of equipment to users' training and support.

In Dar es Salaam, Tanzania (83-85), I was attached to a UNIDO (United Nations Industrial Development Organization) project which assisted in establishing the Tanzania Industrial Research and Development Organization (TIRDO) (Holvikivi 85). My task was to introduce microcomputers to the organization and to develop applications. The microcomputers were of Apple II type which is less powerful than IBM compatible personal computers. Software included Wordstar word processing, Visicalc spreadsheet, Visitrend/Visiplot for analysis and graphs and some minor programs. The applications developed included production of a

newsletter, mailing lists and library catalogues for the Information Department, laboratory statistics for the Chemical Department and project monitoring and graphs for engineering and management information purposes. Some more complicated applications were considered, but the limitations in the processing capacity and quality of software made them less appealing. In addition, a good deal of effort was required to cope with maintenance problems.

In Pohnpei, Micronesia (89-90), I worked as a consultant to a United Nations' project which supported the Office of Planning and Statistics (Holvikivi 90). The office had a number of IBM/AT type microcomputers in a dedicated computer room. The largest applications were census processing, trade statistics and word processing. The main users were local staff who did not have computer background. However, all earlier applications were developed by expatriates. Among the main users there was a strong interest in having the applications fully under their own control. It was a pleasant task to support these efforts. I assisted in systems development for a couple of systems, helped in installations, gave some training courses and took part in everyday operations.

In Male', Maldives (90), I conducted voluntary study circles for beginners in computer use. They were women from the UNDP and UNICEF offices, and some expatriate women who had a computer at home. None of them had had any formal training before, even though many of them were working with computers every day. The subjects of the study circle covered the most common uses of PCs, namely the operating system, word processing and spreadsheets.

As can be seen, the goal of the two first assignments was to produce practical results within development projects. However, the working environment in Dar es Salaam was so different from Finnish conditions, that I felt a strong need to systematically analyze it to be able to improve working methods. For that purpose I kept a diary of my observations from the very beginning. This paper is based on those "field" notes.

I present here my personal findings on the work. For further information, there is an excellent overview to the present situation of computerization in East Africa in Mayuri Odedra's paper presented in Dublin in July 1990 (Odedra 90). To my knowledge, there is no other situation analysis about computerization in Micronesia or the Maldives. The conclusions drawn in this paper can be extended to other developing countries only with careful consideration, as many countries differ widely from the countries discussed here.

2 OFFICE COMPUTERIZATION

2.1 The practice of computer use

In countries with poorly developed economies, only a few if any computer suppliers have operations. Prices are high compared to prices in the United States or mail order prices, maybe even higher than in Finland. The standard of service and support is low. Most of the repairs have to be done overseas which severely complicates maintenance.

Traditional main frame based computing never got a proper start in the least industrially developed countries. It was all too expensive, in the first place, and, secondly, the weak infrastructure made it almost futile: very unstable power supply, poor telecommunications, unreliable transport, lack of qualified personnel and office supplies, and so forth. The weakness of electricity supply shows itself in unstable voltages and frequent power-cuts. During power-cuts computers cannot be operated nor can air-conditioners. Temperature in tropics rises quickly, and humidity and dustiness increase, all of which cause the environment of computer equipment to deteriorate. Last but not least, the working conditions for operators worsen, as well, and their

productivity goes down.

In Tanzania, there was a shortage of everything, starting with soap and sugar, at the time of my stay. It affected use of computers as well: office supplies were of high value and hard to get. Because most of the manual typewriters in the office were broken, there was additional pressure to use the computers for word processing. The photocopying machines did not have enough capacity, and they were often waiting for repair. Large volume duplicating had to be done using stencils. Printing on stencils with a dot-matrix printer was quite an effort. Thefts were another problem caused by the shortages, which in turn increased need for control and bureaucracy.

Microcomputers are the first data processing equipment ever used in many places. In small countries, microcomputers can be used for almost all office computing tasks, even for census data processing. Because of the small investment cost and because there is no need for trained personnel, microcomputers have spread quickly in many poor countries.

Microcomputer purchases are mainly done by mail order from the United States (or, in case of Maldives, from Singapore). Mail ordering does not cause problems as such if one knows what to order. The mail ordered computers are of amazingly good quality, in fact, I have encountered more problems with PCs bought in Finland. Often the computers arrive with their basic software perfectly installed. If installations have to be done locally, they may sometimes look rather odd: I have seen configuration files and opening menus copied from other micro-computers which are inappropriate to the installation currently using them.

Software is usually pirated. There are no manuals or other supporting materials, and sometimes the program files are not complete. Problems with software viruses occur, as well. The selection of locally available training courses is usually very narrow. Users often get very little training and, therefore, their knowledge is very limited and the use of computers remains simple.

Microcomputer use is often perceived to be easy and to have few problems. Consequently, microcomputer installations are extended to local area networks (LANs). This is a fundamental mistake, because in terms of the complexity of the system, a LAN is like any medium-size computer installation. The operating systems of LANs are rather complicated, and cannot be adapted by untrained personnel. An operator is needed for tasks like file management, security control and other network administration. For example, in the Maldives Electricity Board I saw a LAN installation, which was only in partial use because of the lack of data processing professionals. Reports from other locations in Asia show similar difficulties.

2.2 Training

Certain basic principles are followed throughout my training courses: The most important principle is that human beings are individuals able to think themselves and able to understand information processing. As far as possible, the process of data processing and computer operations is explained in its entirety. Operating skills are meant to be achieved through a wider understanding of the applications. The training is always a combination of theory and practical exercise. This is more time-consuming than the hands-on drills offered by many commercial trainers, but the resulting self-reliance and ability to cope with different situations is extremely important for people in developing countries.

The use of microcomputers looks very simple, especially compared to the use of large-scale machines. But even so, many basic concepts have proved to be difficult for beginners: for example the relation between the operating system, application software and data; the location of

a document during editing: is it in the memory, on the floppy disk or on the hard disk? It is essential to understand the concepts of memory, storage devices, hardware and software in order to be able to properly save, retrieve, edit and copy data. The majority of the difficulties, which new users have, are related to this understanding, regardless of what country they are in.

The need for computer training is usually underestimated everywhere. In profit-oriented organizations training is seen as a waste of productive time. But even in the government and within United Nations' organizations, it is difficult to persuade the decision-makers to allot time for training. Perhaps the users may appear to operate their computers fluently, but when problems arise, they are helpless. In addition, the way they operate their machines may be very inefficient. Women, in particular, are well aware of their limitations and one very often hears that "I don't know anything about computers". In practice, I have not noticed any difference in favour of men in the ability to learn to use office microcomputers. Nor are there any differences between nationalities.

As already mentioned, one must be fluent in three languages to achieve higher education in Tanzania. The education system is basically egalitarian, and talented girls have the opportunity to get higher education. The competition is severe, though. Unfortunately for the technical fields, the education and selection seem to favour language skills. This could be seen clearly in the computer classes: people were very clever but their understanding of western technology was weak, even if they had a degree in science. It did not cause many problems with computer use, but there were serious problems with engineering, project formulation and in the electric workshop. Project proposals and cost estimates produced by young engineers could include impossible initial values and assumptions, or errors in decimal places.

One explanation of the problems faced in the scientific thinking is unsuitable education. This is also referred to in Odedra (Odedra 90). Scientific American (Dewney 90) reports a lack of basic mathematical understanding among American students as well, thus, this kind of problem occurs in many educational systems.

But education about the technological environment is not given only by the schools, it is learnt in every day life from early childhood. For example, I had a visitor in my house in Dar es Salaam who came from a village. This boy saw electricity and tap water for the first time in his life. He loved to switch all lights on every night, and he sat for long hours in the bathtub water running. His sister is a textile engineer. Most of the people are like them, they have no experience of electricity, machines or use of money from their childhood, such factors are not a part of their cultural background. Training to use high technology must stress need for maintenance and care for the equipment, as well as good working practices in general.

The cultural patterns of behaviour may differ greatly from one country to another. In conducting training courses this must be taken into account. In Micronesia people hate to face difficulties and they are afraid of making mistakes in front of others. Two secretaries who were supposed to start word processing fell ill when they were scheduled to participate training courses. When the participants of a course were asked to present their home work, all of them felt too shy to start although they had done it well. They also got exhausted very quickly: two hours of training in a day was the maximum one could plan. After programming lessons the main operator started programming himself. I asked him to show me his programs for discussion and improvements. He felt extremely embarrassed when I pointed some errors even though I tried to be discreet and stressed that nobody produces perfect programs at once. Compared to Micronesian students Finnish people can be treated really roughly.

2.3 Systems development

Turn-key systems are seen as a solution to avoiding systems development work when the future users have no computer experience, and professionals are not available. A turn-key system is supposed to be ready when it is installed. It is supposed to be so easy to operate that anybody can learn it in a few days. This approach is very common in developing countries. However, the reality does not work in that way. The environments change, there are always adjustments needed, requests for new printouts and so on. The programs may still have faults, and physical failures occur from time to time. Because the users of turn-key systems are not supposed to understand the system, just to operate it, they can become extremely frustrated with these problems.

A large accounting and book-keeping application for the federal government was under implementation at the time of my stay in Pohnpei, Micronesia. It was a turn-key package, which did not produce data for planning and budgeting, as far as I understood. It was obvious that the same data had to be maintained in several systems in order to get all the results needed in the federal administration.

It seems to be very human to want to influence one's own working environment and working conditions. I saw another turn-key application in Micronesia which was brought in by a regional development project. Some of the local staff had been trained to use it, but after the developers left, nobody touched the program. When I tried it, I noticed that there were errors which sometimes stopped the program. Moreover, it was clumsy to use. Thus, the local staff went on developing their home-made system which they already knew well, without calculating the amount of work that would be needed.

In Tanzania, as well, the applications developed on the site, preferably on the initiative of users, seemed to be the most successful. The Information Department for example produced its TIRDO Newsletter with the Apples for many years although to me the process looked clumsy and tedious.

Unfortunately, systems development on site, by the users themselves, is likely to fail for many reasons, the most important being the users' lack of experience and skills.

3 IMPLICATIONS OF INFORMATION TECHNOLOGY

3.1   Social aspects

The aid projects are responsible for many of the microcomputers brought into developing countries. Foreign experts in the projects are used to having personal computers in their own countries and demand them. Therefore, development aid in form of computers is usually not driven by local needs. Even the data processing systems created may serve the statistical and planning needs of international organizations or other donors more than the needs perceived by the third world countries themselves.

Statistical systems imposed on third world countries may not be able to improve the quality of data, even if the processing is done with advanced technology. Firstly, the data collection process can be unreliable and give very rough estimates. Secondly, if the need for data is not felt in the country, the motivation to produce good results may not be there. Thirdly, it could be in the interest of the government to give out false or misleading statistics, for example a country depending on tourism would be likely to hide reports on epidemic diseases.

Salaries in developing countries are usually very low, and computer expertise is rare in

many countries. (It should be noted that this does not apply to all developing countries: for example in India there are millions of highly educated people.) Some of the users see their computer skills as a way to higher or better paid posts. Among my students I encountered a well motivated group with such ambitions.

In those two small countries, Micronesia and the Maldives, the census was processed with PCs. In the census one could see how Western values are imposed on other cultures. The ways of defining households and families come from the Western nuclear family culture. How is such a concept explained to the enumerators who live in extended households? (In fact, the enumerators who came to our household in Male' were so perplexed by our nuclear family of two adults and one child that it took them more than one hour to complete the questionnaire.) And how can one decide who is the head of a household in a Maldivian family where the mother has been married four times and now lives separately from her present husband with her father's family? She may have children from her previous marriages, some of them living with her. She is not employed but gets support from different husbands and other relatives. Numerous problems like this arise when statistics are made in "our way" in "their countries".

Many third world countries use non-Latin characters for writing their languages. Documents and newspapers are handwritten or printed, because typewriters do not fit the character system. The IBM type microcomputers, which are dominant in the third world market, have so far only been good for processing English texts. But the recent development of word processing technology for IBM PCs suggests that any language could soon be typed using them.

3.2   Influence on women's work and position in work

In traditional computer environments, there is a wide gap between professional system operators and programmers, and clerks who do simple tasks like data entry. However, in offices where microcomputers are used the difference between jobs is rather vague. Even an ordinary user could penetrate into the professional world if she is motivated and talented. In this way she could enrich her work and maybe improve her status, as well. In the developing countries the chances are even better because clerical skills are appreciated more than in industrial countries. On the other hand, insufficient training and badly designed systems may cause feelings of stress and frustration for women who have to use computers in their work.

Sometimes women are able to get better jobs because of their computer experience. For example in Tanzania, the secretaries in TIRDO were hoping to move to better paid posts in the private sector because of the word processing skills they had acquired, and one of them indeed changed employment very soon.

All the third world societies discussed in this paper are in strong transition from traditional culture to westernized or modernized culture. The changes in the society are so fast that there is no time for a peaceful development of new values and new ways. Traditional values and "modern" values are in a conflict which causes confusion in the society. The position of women has been deteriorating in the recent past, in Tanzania since the colonization (Swantz 83) and in the Maldives since the introduction of Islam 1153 (Maloney 80). The Maldives even had female Sultanas before Islam but nowadays almost all high government positions are held by men. The question of women's status in these countries is a most interesting one, but it is too complicated to be fully discussed in this context. Nevertheless, women are working as paid employees almost everywhere in the world these days, which could have many consequences. But it is hard to predict which way power structures will work: will women be able to improve their status or not?

Formal leadership positions belong to men in most traditional societies, and this practice has been transferred to government offices despite of the different character of the power structures. I do not expect this attitude to be overcome very soon. Anyway, when women have valued skills, they feel more confident and become more demanding. A woman who was one of the main computer users in the Office of Planning and Statistics in Micronesia complained bitterly about the male dominance in the government. Very obviously she was more competent than her male colleagues, and she was given the most demanding tasks. But she was kept outside the decision-making process and on a low salary level.

4 TO BE A WOMAN EXPERT IN DEVELOPING COUNTRIES

I am convinced that my experiences in my working life, and in developing countries, are different from the experiences men usually have. Many computer professionals are systems-oriented. In my view, a more human-oriented attitude brings professionals into a closer interaction with their counterparts and helps them to understand each other better. Female experts, especially in technical fields, are still rare and that affects the way people react to me as a consultant or expert.

In some aspects it is easier to be a woman. For instance in Tanzania, I started from a situation where a man had tried to introduce computers to the organization in a rather rough way which, I was told, upset the users. When I arrived, all the women in TIRDO were strongly against computers. After having worked together with my counterparts for some months, I had gained their confidence. They knew that their opinions were respected and that I had the time and the will to teach them. We became good personal friends and the co-operation went smoothly until the end of the mission. As women usually feel uncertain with modern technology, their attitude may change when they see that it is another woman who is the expert in this field. They start to believe that they are able to master it as well. The most striking cases were my friends in Male', three women who each had a husband with a home computer. Two of the husbands were skillful users themselves and they had tried to introduce their wives to computers. But with no success, because they did not have the patience to explain slowly in plain English what to do, and to repeat the basic operations. They decided too quickly that their students were too stupid to learn. After having attended some study circle sessions, all three women were eager to use computers and they were already typing their letters with computers.

The Maldivian women who participated in the study circle benefitted from the all female concept as well. In their society women are usually shy and quiet in presence of men, and men dominate meetings and office gatherings. In the absence of men the women felt free to express their views and to talk about their problems. A similar kind of experience of all female study groups is reported in Vehviläinen (Vehviläinen 90), and it was this report that encouraged me to start all female study circles in Male'.

There are, of course, many aspects which make it more difficult to be a woman in male-dominated aid projects. As a Finnish woman I am used to relatively equal relationships with male colleagues. But the men in the development projects were Irish, British, Dutch, Hungarian and so on, and often I had to work hard to prove that I could be accepted as equal partner in the project. In the Islamic cultural area it was even more difficult to be accepted. My impression was that my competence was not doubted, they just did not want to have a female professional among them.

5 CONCLUSIONS

Microcomputer use in third world countries faces many problems because of insufficient infrastructure and lack of people with data processing training. However, microcomputers are more suitable to these conditions than large scale systems. The special requirements of third world use are easy maintenance, durability and versatile language processing capabilities.

Third world countries are by no means the same as each other; the social, economical and cultural conditions vary from country to country. The specific conditions of a country and of a particular organization must be taken into account when systems development and training are planned.

The majority of microcomputer users in offices are often women. If their skills are appreciated, and their needs for adequate systems and training are fulfilled, it benefits both the organizations and the women.

6 REFERENCES

Dewney, A.K., Mathematical Recreations, Scientific American, 5 (Vol 263), (Nov 1990), pp 142-145

Holvikivi, Jaana, Associate Expert to the Chief Technical Adviser, Terminal Report 7.6.1985, Project URT/81/037, UNIDO, Dar es Salaam (unpublished)

Holvikivi, Jaana, Consultant in Computer Programming/Systems Analysis, Final Report 5.1.1990, United Nations/ Department of Technical Co-operation and Development, Kolonia, Pohnpei, Federated States of Micronesia (unpublished)

Maloney, Clarence, People of the Maldive Islands, Orient Longman, Madras 1980

Odedra, Mayuri, Information Technology Transfer to Developing Countries - Is it really taking place?, in Proceedings of Information Technology Assessment, Dublin 1990

Swantz, Marja-Liisa, Tansanian nainen (Tanzanian Woman), Transactions of the Finnish Anthropological Society No. 13, Suomen Antropologinen Seura, Helsinki 1983

Vehviläinen, Marja, Gendered Relations in Information System Development - is there room for feminist practices in Finland? in Simonen, L.(ed.) Finnish Debates on Women's Studies, Tampereen Yliopisto, Yhteiskuntatieteiden tutkimuslaitos, Naistutkimusyksikkö, Working Papers 2/1990