IAOS Satellite Meeting on Statistics
for the Information Society
August 30 and 31, 2001, Tokyo, Japan

# *Management Challenges for Statistical Offices offered by emerging ICT; Synthesis on Basis of Experiences in Europe, Asia and the Pacific*

**BOON, Maarten**
*United Nations Statistical Institute for Asia and the Pacific, Japan*

## Abstract

The national and international organizations dealing with the compilation and dissemination of official statistics are increasingly confronted with the influences of modern Information and Communication Technology (ICT). In the Information Society they see more demand for timely and qualified statistics and -in the same time- they are fortunately getting more opportunities and better access to the acquisition of technical systems for meeting these changing requests. Developing countries have the advantage that they now may apply the state of art techniques without having to go through the same laborious phases that more developed countries passed in the last decades in their attempts to stay on line with the fast evolving technological developments.
This paper explores the organizational and technological specificities of the National Statistical Offices (NSO's) in Europe and Asia and the Pacific. The digital divide shows here obviously its contours, but some optimism for a soon equalization of the situation is on its place. The first condition is that the management of the NSO's of developing countries gets (and takes) the opportunity to learn from the positive and negative experiences of the developed countries. And secondly, a (better coordinated and structured) transfer of technologies, tools, expertise and material support of donor countries and international organizations could act as the necessary catalyst for the less advanced countries.

## 1 Introduction

The National Statistical Offices thank their existence and relevance to the needs of the society for official aggregated quantitative data collected from huge masses of individual units in the various statistical populations. Being -per definition- a collection of information processing systems on their own, the statistical institutes are heavily affected by the fast evolutions in ICT (Information Communication Technology). The underlying paper starts in paragraph 2 with a short inventory of the various technologies, which are nowadays applied in the environment of official statistics. The most likely future directions of the technological evolution and the implications on the corporate strategy and the process-design of the NSO's form part of this balance sheet. The following paragraph (3) contains a qualitative assessment of the 'technological' situation of the NSO's in the regions of respectively the United Nations Economic Commission for Europe (ECE) and the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP). This evaluation is based on the author's lengthy experience in the technological field in the European Statistical System and a close involvement in the Asian/Pacific statistical environment in more recent years. Country reports, technology seminars papers/presentations and many discussions with officials from nearly all ESCAP-countries gave a good insight in the dimensions of the technological divide compared with the situation in the ECE-region. Arrears may always be made up and especially in the situation that this can be done while taking into account the fall-and-emerge history of others. Transfer of knowledge and technology in combination with other forms of financial, material or technical assistance may additionally contribute to the alleviation of the divide. The challenges, which this imposes on the management of donor *and* receiving organizations and institutes who are involved in Official Statistics, are elaborated in paragraph 4. The last paragraph gives some summarizing conclusions (paragraph 5).

## 2. ICT trends affecting National Statistical Organizations

The fast evolution in information and communication technology is paired with a sharp decline of the prices of the various components. The resulting price/quality ratio is progressively decreasing, which makes the processing and communication power of computers and their peripherals better accessible to all sectors in the society. Although at the global level the 'digital' divide between the advanced and lesser advanced regions evokes serious concerns, we see that more and more backward countries are embracing and introducing the wealth of ICT for the gain of their communities. The so-called Information Society is may-be not manifest everywhere in the world, but its steadily spreading around the globe is un-stoppable.

The National Statistical Offices are confronted with partners who are already, at least to a certain extend, affected by ICT. For instance, the respondents -and especially those in the business related segments- are eager to lower their statistical response burden by the transition of traditional paper forms by electronic reporting. In some technologically more advanced countries even an increasing number of private individuals transmit their statistical forms (for population censuses) via Internet. The statistics users, on the other hand, are pressing for more timely data with more details and in a format, which enables them to reprocess micro-data for their own reporting. This does not only apply on the national users, like politicians, ministries, news media, universities and research centers, but also on the international community. In addition to these external pressures, many NSO's are politically enforced to demonstrate a better performance under better usage of available, limited, resources. And that appears to be the compelling factor for the NSO's to use technology for a more cost-effective set up of their internal processes.

Although in many cases the indirect appeal by the by ICT-affected 'clients' acts as the primary driving force behind the implementation of new technologies in NSO's, we will in this paper mainly focus on the tools and systems which are momentary at the disposal of statistical organizations for the support of their daily operations. Before addressing the specific, to the statistical process related, technologies, we have to discuss two major 'general' trends, which already led in many NSO's to a complete redesign of their processes.

The first trend is the migration from centralized, mainframe processing to distributed, client/server processing with application of modern (object-oriented) Database Management Systems (DBMS). The modern set-up of computer configurations is the so-called three-tier client/server architecture in which relative small components are directly connected with each other in easily expandable Local Area Networks. Program applications run on 'application servers' while the databases are stored, maintained and updated on the 'database servers'. Workstations are 'thin' clients who, nevertheless, benefit of the full power of all connected components.

Parallel with this evolution in the hardware, a complete revolution took place with regard to the methodology of data base management. Nowadays, modern, relational or object-oriented database management systems (DBMS) are widely operational. The data are defined independently from the applications and the values of the variables are separated from the descriptions of the properties/characteristics of the variables. The latter ones are the so-called meta-data, which deserve a spill position in the production processes of official statistics. Originally exclusively mentioned in relation with statistical data dissemination, a growing awareness arises that meta-data have to be seen as *the* integrating element in the whole chain of statistical sub-processes.

Compared with the traditional file processing systems on mainframes the new database concepts combined with the client/server architecture offer the advantages of more flexibility, distributed processing with improved data sharing through the organization (with eventually dislocated staff), minimal data redundancy and improved productivity of application development.

The second major IT development, which will certainly have profound implications on the future processing in statistical organizations, is the evolution in communication technology. At the global level the communications infrastructure is widely improved by the worldwide introduction and installation of the technology of fiber optical cables and wireless communication via radio and satellites. This enables the transfer of (larges quantities of) information between connected computers regardless their physical location. The techniques and means for the access to information and the exchange of data are mostly available for everybody at no or relatively low costs. The flexibility of the free Web-browser systems will certainly get a boost because of the growing influence of E-commerce (think for instance on ebXML).

The improvements in the communication infrastructure and access technologies are not only relevant for the communication with the external world (respondents and users), but can also be used within the inter-organizational environment of the NSO's. Web-browser technology is suitable for the information interchange between and within all levels of the (traditional) hierarchy and for the improvement of the accessibility of relative complex applications. Examples are browser enabled SQL searches on databases, web enabled groupware applications, workflow management and Intranets.

After this short expatiation on major trends, we move to the investigation of the technologies, which are specifically applicable on the statistical processes of the NSO's. Table 1. shows a structured overview of relevant technologies, grouped by the sub-processes in which they are implemented. Some explanatory clarifications are given in the following.

*Technologies affecting the statistical input-process*

The transfer of the information on paper questionnaires into computer systems can be done in various ways. The first group of applicable technologies consists of the automated transfer of information The most elementary way is the so-called 'imaging' in which a digitized picture (image/copy) is made of the form. A next technology is that of the 'reading' of the forms, either or not after a first imaging. Respectively Optical Mark Reading (OMR), Optical Character Recognition (OCR) or Intelligent Character Recognition (ICR) may do this. The differences between these techniques are the complexity of the signals that can be recognized. OCR only reads bars ('marks'), while ICR is even able to interpret information in handwriting.

In many cases the input of data from paper has to be done manually by data entry staff. The software solutions for computer assisted data-entry are numerous and extend from specific, for statistical processing developed, software like CSPro, PC Edit and Blaise to more generic (data base) software like Microsoft Access.

One of the substitutes for the data collection via paper-based statistical questionnaires is the so-called computer assisted interviewing, either via personal interviewing (CAPI) or telephone interviewing (CATI). The essence of this methodology is that a computer-device (generally notebooks) including immediate checking and automatic routing.

A step further on the ladder of data collection is the so-called Electronic Data Reporting (EDR) in which the respondent himself reports via electronic means his statistical data. The techniques used for EDR extend from touchtone data entry and voice recognition by phone, fax transmission, electronic forms to Electronic Data Interchange (EDI). Electronic forms are software applications providing the questionnaire together with user assistance and the functionality of online transmission of the data. Traditionally being stand-alone applications, the electronic forms are nowadays more and more integrated in the newest and most promising technology for the next decade: the web-based data collection, using web-browsing, applets and scripts as user interface.

Electronic forms still require the manual filling in of the questionnaire. Theoretically, this activity could be replaced by fully automated extraction of data on computer systems of the respondents. In that case we speak of 'strict' Electronic Data Interchange (EDI), which means information interchange between computers without human interference.

*Technologies affecting the statistical throughput process*

The primary tools for the throughput-process are mostly application programs for computer assisted data editing: either separate packages or sub-programs within the specific or generic software applications as used for the input-process. Imputation and automatic correction are newer technologies, which will most probably get more than proportional interest in the statistical world because of the exponential growth of the application of modern database management.

*Technologies affecting the statistical output process*

In the world of official statistics Electronic Publishing is on its way to become the preferred way for the dissemination of large quantities of statistical data. Internet publishing gets the most attention, because it enables the quick and relative cheap dispersion of statistical data to a broader public. The two options are static publishing of standard tables and the provision of interactive access to output-data bases. Publications on CD-Rom offer the same possibilities, but can additionally be used for the distribution of micro data and for the historical archiving. Tailor made production of statistical results on electronic media for special clients is another option.

For computer assisted data analysis and tabulation many tools are on the market. Partly, these are specialized commercial applications, like SAS, SPSS, SuperSTAR and Beyond20/20. The more generic office and database applications offer also a good alternative for data (base) analysis, tabulation and reporting. And lastly we see some freeware applications as Xtable, the IMPS and CSPro suites and Statline, who are developed for the processes in official statistics.

The growing concern of the statistical world on statistical disclosure is inherent to new publication techniques with large masses of data. Solutions are offered by special software applications (like ARGUS) and disclosure options in specialized statistical tabulation software.

Data warehousing and data mining are relatively new techniques in the environment of official statistics. The principle of data warehousing is that a collection of different statistical output-bases is connected with each other.

This opens the way to integrate data selections from various databases on basis of common variables. Data mining systems contain mathematical algorithms, applied in Online Analytical Processing (OLAP), for the revelation of hidden interdependencies in data in a database or a data warehouse.

**Input process:**

*Automated transfer from paper based forms into electronic format:*

- Imaging; electronic image of the form
- Optical Mark Reader (OMR); reading of bars on the form
- Optical Character Recognition (OCR) & Intelligent Character Recognition (ICR); reading of numbers and letters

*Manual transfer from paper based forms into electronic format:*

- Computer Assisted Data Entry; interactive keying procedure incl. checks and coding/classification assistance

*(Paperless) Computer Assisted Interviewing:*

- Computer Assisted Personal Interviewing (CAPI); enumerator types the responses straight in into a computer
- Computer Assisted Telephone Interviewing (CATI); same as CAPI but now interview by phone

*(Paperless) Electronic Data Reporting:*

- Computer Assisted Self Interviewing (CASI) with electronic forms or touch-tone / voice recognition phone
- Web-forms; the respondent fills the questionnaire in (on- or off-line), which is made available via Internet
- Electronic Data Interchange (EDI); automated data extraction from computer system of the respondent

**Throughput process:**

- Computer assisted data editing; coding and classification combined with record checking in interactive processing
- Automated correction; automated adjustment for erroneously processed data
- Imputation; automated filling in of data records for non-respondents or of partially missing variables

**Output process:**

*Electronic Publishing:*

- Internet publishing; provision of statistical data via a Web-site (static or dynamic)
- CD-Rom publication; provision of statistical data on CD-Rom including retrieval/search software
- Other electronic media; tailor-made selections of statistical tables, which are provided via electronic media

*Others:*

- Computer assisted data analysis and tabulation
- Automated disclosure; automated reduction of disclosure of individual (confidential) statistical data
- Data warehousing & data mining; access to related and unrelated statistical data, stored in various databases

**Other trends (associated with more basic processes):**

- Distributed processing with modern DBMS, groupware, workflow control, Intranets
- Meta data management systems; including classification/coding exchange mechanisms
- Geographic Information Systems (GIS); for support of field operations and graphical display of geographic data
- Process Control; techniques used for the control of the workflows, input of resources and survey planning
- Quality Management; techniques and methodologies for systematic quality control

Table1: Overview of emerging technologies as implemented in statistical processes

*Other technologies, relevant for the combined statistical process*

The last group to be discussed is the 'other' technologies, which cannot be allocated under (only) one of the three statistical sub-processes. Distributed processing with modern DBMS is already described earlier, as is also the case for the important meta data systems.

Geographic Information Systems are used on a large scale in many NSO's. The principle is, that the statistical observation territory is displayed in a set of maps, built up in layers giving 'information' on geographic units (like provinces, districts, municipalities). One of the applications of GIS in statistics is the graphical display of statistical output. This way of charting appears to be very efficient for the revelation of statistical differences between geographical units. A completely different, but already widely used, application concerns the support of census and sampling survey operations. By the mapping of the enumeration areas the completeness of a census may be monitored and, in the case of sampling procedures, the selection of the sample units can be supported.

A growing number of statistical offices is paying attention to process control and quality management. The complexity of the statistical processes and the specifics of data quality in official statistics (relevance, accuracy, timeliness, accessibility, interpretability and coherence) makes it necessary to apply systematic approaches for continuous planning, evaluation and incremental improvement.

If we now look to the future directions and implications of ICT in National Statistical Organizations, then we can sketch the following most likely scenario. At the strategic level we may expect that operating in the Information Society inevitably leads to a reformulation of the mission of many NSO's, expressing the intention to provide better quality data to a broader public and to apply technology in order to avoid a more than proportional increase of the burden for the respondents. The internal IT structure continues its path into the implementation of distributed processing, based on object-oriented modern DBMS, in networked environments with client/server architecture. This includes the application of scalable hardware and software components in open systems with maximal interconnectivity. The preferred processing approach goes most probably in the direction of integrated, standardized systems, based on generic commercial application software, combining database processing with workflow monitoring, internal communication exchange and office applications. Process Control and Quality Management will be better incorporated in the day-to-day operation and statistical meta data management might, finally, get the prominent place that its deserves.
Specific technologies in the statistical processes are expected to become the multiple mode data collection and dissemination with a clear priority for Internet and Web-enabled technologies. Data warehousing will get a higher interest in the statistical world and disclosure technologies are consequently becoming more important.
The organizational structure of the NSO's is on the longer term moving into the direction of a flatter hierarchy with broader spans of control and networked coordination mechanisms. Shared authority and decision-making and increased vertical / lateral interaction are inevitable consequences. Matrix organization structure around survey projects might replace the traditional strictly hierarchical/functional structures. New positions are arising from ICT, like network and database administrators and webmasters. The existing IT staff is getting other roles: instead of system builders they will become enablers and supporters of the statisticians, who -on their turn- take over the self-sustained development of processing systems with standardized application software.

## 3. Technological situation in the NSO's of the ECE and ESCAP region

A comparison between the regions of the United Nations Economic Commission for Europe (ECE) and the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) is a comparison between two tremendously diverging entities: the first one with a majority of developed countries and the second one with mainly developing and even less developed countries.
Outside the level of development there are other large differences in the environments of official statistics. Europe knows its European Statistical System (ESS) with the 15 member countries of the European Union and the partner countries of the European Economic Area. A powerful driving force in the ESS is the 'central EU authority' Eurostat, the Statistical Office of the European Communities. The partners in the ESS work -already for long years- closely together in the fields of harmonization of statistics, development of information exchange standards and classifications, knowledge interchange on processing technologies, etc. In the last decennium the cooperation is extended with candidate EU countries, the Mediterranean non-EU countries and TACIS/Phare-countries (Eastern Europe and Central Asia). The collaboration is not only restricted to the junction on intellectual acquaintances, but comprises also substantial financial and technological support plus assistance in the human capacity building. The Commission of the European Union and the individual EER-members have provided relatively large funds for the support of the technological enhancement in the European statistical network. Furthermore, international cooperation at the methodological and technological level finds place in the Conferences of European Statisticians (secretariat by UN-ECE) and the workgroups of the OECD.
Within the area of ESCAP, the European type of large-scale cooperative partnerships is practically not realizable. In the technological field ESCAP's statistics division entertains useful initiatives in workshops, seminars, courses and technical assistance. Statistical institutes of developed countries provide technological support to individual countries, like is also done international organizations as ADB, World Bank and SIAP. But all these efforts are on a much more modest scale and with much less involvement of financial support than in the European situation. The lack on resources is one reason, but

most probably, the priority given to the development of new statistical observations and the methodological improvement of the existing ones are even weightier motives.

If we first look to the technological circumstances in the ECE region, then it will not be surprising that *on average* the conditions are really favorable for a modern way of processing. This does not mean that all connected NSO's have an equal level of technological development. A small group of NSO's is recognized to be the leaders and pioneers in the European statistical system. Amongst these: the Finland, Sweden, The Netherlands and United Kingdom. On the other side of the line is another, somewhat larger group of mainly eastern countries, which may be categorized, in the technological sense, as developing areas.
Although it is difficult to give an objective assessment of the technological advancement without a deep-going empirical study, we may draw some general conclusions on broad tendencies. In Europe already much effort is given to the replacement of paper questionnaires by either computer assisted interviewing, electronic reporting or (secondary) administrative sources. The typology of most of the processing systems is therefore already more focused on paperless production. Reading devices, like OMR and OCR, were quiet quickly abolished after disappointing experiences in the seventies. The progress in recent years of reliable ICR-technology has, however, brought a revival of automatic reading. Electronic reporting is especially for business surveys becoming a common practice. The usage of Internet, however, is just in its start phase but its potentiality urges many NSO's to start pilots in this field. In person- and household surveys the computer assisted interviewing is widely spread and a possible substitution by self-reporting (for instance for expenditure surveys) via Internet of email is in many countries at least under consideration. In the throughput process most NSO's use, in distributed network environments, generic data base applications or specialized own developments like Blaise. Wherever appropriate generic imputation techniques are applied and the statistical analysis of data is mostly done with one of the major commercial statistical software packages. Electronic publishing is again a common practice, but the provision of access to statistical (output) databases on the Internet is only applied by a small group of countries.
Real 'hot issues' in the European statistical area are data warehousing, quality management and the standardization of electronic data interchange procedures and protocols. In the EDI standardization the interest moved in recent years clearly from Edifact towards Internet-related standards like (eb)XML. Automated disclosure techniques are not widely applied, while data mining is not further than the phase of incidental theoretical research.

In the ESCAP-region the situation is, as already stated, quiet different from the European one. Here too, however, there are the pioneering leading countries with a technological level comparable with the top in the European system. Amongst the leaders are Australia, New Zealand, Japan and Singapore. Some countries are following on a certain distance but with a technological level that may certainly compete with the European 'average'. Examples are Indonesia, Malaysia, Philippines, and Republic of Korea. The majority of the other countries is, as far as concerns the implementation of ICT, distantly lying behind.
In addition to the analysis of the technological situation of the NSO's in the ESCAP region as given in another paper for the Satellite Meeting, we may give a short (objective) qualitative-total overview. The greater part of the countries already has LAN-systems in place, but these are not always spread over the whole organization and their technological potentiality is mostly not fully exploited. In the 2000-round of population censuses several countries used 'reading' devices with relatively satisfying results. For the remaining processing IMPS/CSPro is the favorite (free) application. Electronic publishing (of static content) on Internet is growing, like also the provision of statistical data on CD-Rom. Both techniques are, at least to a certain level, applied in a large majority of the countries.
Most of the Pacific countries show another dimension, because their statistical organizations are very small (staff of non more than some tenths of persons) in accordance with the scale of their statistical populations. These NSO's appear to be able to complete their whole statistical processing with standard 'office' software applications.
Without discriminating the 'world-players' like Australia and New Zealand, special attention could be given to some appealing and successful technological implementations of other countries: the Internet accessible database (Kosis) of the Republic of Korea, the high grade of Internet data collection in Singapore, the cost effective use of handheld devices for the labor force survey in the Philippines and the census-processing system of Cambodia which realized speedy results, including sets of good accessible

data on CD-Rom.

## 4. The management challenges

*Challenges for the management of the, in technological sense, developing NSO's*

Many National Statistical Organizations have firstly to rethink, and may-be to redefine, their primary mission in order to bring this more in terms with the external environment of the Information Society. Secondly it would be recommendable to start a reflection on the most likely necessity of a revision of the organizational structure. The implementation of new ICT requires, as is explained in paragraph 2, organizational structures, which are completely different from the traditionally hierarchical ones. Organizational redesign has also a profound impact on the work-culture within the NSO's. And that is, most probably, the heaviest and most difficult challenge for their management teams. Many 'advanced' countries went already through such a process and have experienced that the success-factor of technological innovations depends on the stage of realization of well-done reorganizations with inclusion of the transformation of the work-culture. The lesson, learned by these countries, was that each investment in Technology has to be assessed with respect to the consequences on the Human Resources. In order to reach manageable change processes, the choice of a gradual and incremental transformation is for most NSO's evidently the best approach. A careful, moderate and partial reorganization with subsequent implementation of new technologies is recommendable in order to give the staff the possibility to get used to another way of working and to build up the necessary experience.

As far as concerns the selection of technological solutions, various other management challenges appear on the horizon. Here again some lessons that may be learned from experiences out of the European Statistical System. Firstly, it is recommendable to select expandable, open systems with good interconnectivity and modular architecture. In the sphere of application software, the recommended strategy tends to go in the direction of high grades of standardization. Modern Data Base Management System applications should form the kernel for the statistical process, while -in the meantime- applying groupware systems with internet- and web-technology as user interface. An aspect that certainly not has to be neglected, is the necessity to consider the whole range of statistical sub-processes. The interoperability of IT-systems within the organization is a prerequisite for a smooth operation of the statistical process as a whole. Another important point concerns the timely training of staff before new technology effectively is implemented. A last finding with regard to IT tools is, that many European organizations in the ESS have experienced the negative consequences of too ambitious 'own' application building from scratch off. That approach has in general proven to be very expensive and only on the longer term successful. In the last decennium there were mostly no other alternatives, but nowadays the development of applications with specialized on-the-shelf software gives faster, and mostly even more reliable results.

The 'new' ways of working, inherent to the application of modern ICT, requires -as another management challenge- the full incorporation of Process Control and Quality Management. The complexity of the sub-processes with all their interrelations becomes such elevated, that additional measures are inevitable. Systematic introduction of Quality Management could lead to the necessary, incremental improvement of the processes. As far as concerns the intrinsic statistical data control, one of the appropriate pre-conditions is a structured metadata-management through over the whole process. In Europe, for instance, the Conference for European Statisticians has decided to give top priority to metadata systems in the regional ECE work-program with regard to the 'management of information technology infrastructure'.

*Challenges for the management of the other actors in the environment of official statistics*

Many national and international organizations are directly or indirectly operating in the field of financial and technical assistance to NSO's in developing or less developed countries. And of course, each contribution is welcome and will have its effluences. The only complaint of receiving countries is that in many cases the solutions offered for ad-hoc problems are too partial and sometimes even contradictory with each other (for instance as far as concerns the advises on the most suitable software applications). Better coordination between donor-institutes and more attention for integrative solutions is recommendable. The PARIS21-initiative (PARtnership In Statistics for development in the 21st Century), which aims to build statistical capacity as the foundation for effective development activities, could may-be act play a role as coordinating network enabler.

The transfer of technological knowledge should also get special attention of the management of the

donors. The website on best practices in statistical ICT applications and transfer of know-how, as recommended by a recent ECE/Eurostat meeting, could turn out to become one of the connecting bridges between the two sides of the digital divide. The only condition would be that the presenters of the 'best practices' stay realistic and not too over-enthusiastic in the outlines of their success-stories. The initiative of the United Nations Statistical Institute for Asia and the Pacific to start a system of distance education in combination with a knowledge base on methodologies and technologies for official statistics, could equally contribute to the necessary wide spread of knowledge and know-how.
The last challenge for the technologically advanced countries is to search for more possibilities to transfer portable self-developed ICT-solutions to the less advanced countries. In many cases complete processing systems could be easily transferred into the situation of another organization (think for instance on SPROCET of Statistics New Zealand).

## 5. Conclusions

The digital divide is certainly manifest in the application of ICT in the world of official statistics, but its abolishment could be reached within a reasonable time limit. That requires, however, a substantial effort of the management of the less developed organizations, because large change processes have to be set en-route. By acquiring knowledge on the technologies used by the advanced countries and by learning from the laborious paths the latter went through in the past, they are not burdened with the negative aspects of being ahead. Relatively cheap technologies are now, in the 21st century, outrageously available and that will certainly promote the implementation of ICT.
The assistance and support of the advanced countries and international organizations is unquestionably necessary for a soon solution of the divide. The main messages for these donors are: try to integrate the assistance programs in larger networks, don't focus too much on partial solutions, be realistic -and especially on the pitfalls you encountered in the past and finally: look carefully to the possibilities of the employment of your own (portable) technologies. The circumstances may be different in the various countries, but the basics of all statistical surveys and censuses are the same everywhere in the world.