USE OF MICRO-COMPUTERS IN STATISTICAL WORK

Report prepared by the United Nations Conference on Trade and Development

Statistical systems in UNCTAD have been designed and developed for the mainframe computer and practically all statistical work is carried out using the software available on the mainframe. Although UNCTAD has been using micro-computers for development of several computerized systems in the technical assistance programme since the early 1980s, micro-computers are not available for statistical work in UNCTAD, with the exception of one machine in the Shipping Division. This micro-computer (IBM-PC/XT in an early version with 640 KB memory and a 10 MB hard disk) is being used for spreadsheets and regression analysis (LOTUS 1-2-3) and for graphical presentation (CHARTMASTER). Spreadsheets are used to record the container movements for different country groupings based on information from trade publications. Regression analysis has been used to determine formulas relating ship volume to gross registered tonnage for work on harmonization of port tariffs.

Many users in UNCTAD have requested the availability of micro-computers for statistical work, preferably in a distributed processing mode. Arguments raised in favour of such a policy are, among others, a greater flexibility of the system, possibility of use of larger variety of software than available on the mainframe computer, and the avoidance of expensive time-sharing charges for the many tasks which can be carried out on micro-computers instead of on the mainframe. This concept has not yet been adopted as a policy objective by secretariat management.

In the technical assistance programme, two major UNCTAD projects are using micro-computers for monitoring of customs operations and debt management in developing countries. Both systems are already operating in several countries. The software has been designed as a series of separate modules which can be tailored according to individual circumstances and introduced at the pace suited to the user countries. In the past year, several new modules have been developed and will be added to the systems in 1988.

The Automated System for Customs Data (ASYCUDA) processes custom declarations and produces related trade, revenue and economic statistics. Workstations are installed in main customs offices, where data for both imported and exported goods are entered. The system is designed to be user-friendly, flexible and easily maintained and can thus provide a reliable, low-cost tool allowing developing countries to rapidly produce accurate statistics on trade in accordance with international trade classifications. It further provides facilities for economic forecasting and offers modules for the control of import/export licensing requirements. The use of internationally agreed
standards (data elements, codes, etc.) offers the possibility of data exchange either on magnetic media or via telecommunication. Three new modules will be added in the near future. A port management module will capture and process data from manifests to produce shipping information and port due data; a generalised function for the extraction, saving and archiving of data will considerably improve the flexibility of the system; an improved statistical module will provide improved data aggregates and comparative series. The software was originally developed on Bull/Micral 9050 hardware and presently runs on the very latest ranges of powerful IBM-compatible micro-computers linked into a local area network. The system has been operating under PROLOGUE. In response to the trend towards standardisation on UNIX as an operating system, and in order to make the system available for use on both mini and mainframe machines, a UNIX software will be introduced in 1988. For further information on this system, see the attached ASYCUDA newsletter.

The Debt Monitoring and Financial Analysis System (DMFAS) software package consists so far of three integrated modules. The first module, the Debt Monitoring System (DMS), used for compiling and maintaining the debt data base, is written in COBOL ANSI-74 and uses the Microsoft COBOL compiler. The second module, the Debt Aggregation System (DAS), a flexible table generator, is implemented in dBASE III Plus. The third module, the Debt Projections and Balance-of-payments Linkage System (DPS) is implemented in LOTUS 1-2-3. The entire package is designed for installation on micro-computers using the PC-DOS disk operating system and having 640 KB of memory and a 20 MB hard disk. Installations have been made on Compaq, IBM, Goupil, Micral and Wang personal computers. The first module (DMS) is also available in a mainframe version. A micro-computer/mainframe link permits downloading of data stored by the DMS on the mainframe to a micro-computer for further analysis using the DAS and DPS system modules. Two new modules will be added to the system by the end of June 1988. The first will provide information on loans and grants disbursements by project, the second will monitor the technical assistance provided by donor countries and agencies for training, seminars, etc. Both modules will be developed in CLIPPER (compiler for dBASE III Plus) under PC-DOS using a Compaq 386.

UNCTAD’s Shipping Division has been using a micro-computer since 1983 for development of software for use by developing countries’ shipping companies and multimodal transport operators. Three packages investigating the potential profitability of a shipping service (boat acquisition, chartering) have been developed or are under development. A fourth package is under consideration.

The UNDP-financed training programme TRAINMAR, located inside the Shipping Division, is using IBM, Osborne and other micro-computers for the development of training material related to shipping (text, exercises and management games).

UNCTAD’s Manufactures Division has recently started to work on SMART (Software for Market Analysis and Restrictions on Trade), a joint UNCTAD - World Bank project. The SMART software is designed for micro-computers and will be used by member countries for the analysis of market access conditions, such as tariff and non-tariff trade measures. The results of this analysis can play an important role in international trade negotiations of the Uruguay Round. The system will operate under PC-DOS and the software is being developed in PASCAL with EASYVIEW, a panel management tool. The system should be operational by the end of 1988.
Installation perspectives

One of the major objectives has always been to ensure Administrations can take over and run the computernised systems for themselves both in terms of physical maintenance and the training of personnel on an ongoing basis. The training course, which lasts some fourteen weeks, contains separate modules relating to system management and "training for trainers" as well as for the applications themselves.

The training course is supported by technical assistance from UNCTAD experts both prior to and during implementation who advise on changes required to the administrative infrastructure and ensure proper installation of the physical system. This is particularly important since, while the day-to-day user will find the individual activities particularly easy to use, the installation of a computerised system requires meticulous planning and attention to detail in terms, for example, of documentation, Customs law and procedures, instructions to staff and the trade.

Construction of the software is also vital. The package has been deliberately designed as a series of separate modules which are tailored according to individual circumstances and which are introduced at the pace suited to the User. This modern, flexible approach to the introduction of the system has proved to be very important to successful implementation.

Nine national and sub-regional projects have now either started or are about to start (Togo, Mauritania, Mali, Niger, Cap Vert, Central African Republic, Guinea Bissau, Haiti and the ECOWAS regional centre). Other projects are in the early stages of planning in Madagascar, Mauritius, Comores, Zaire, Benin, Cyprus, Paraguay, Sudan and for the Member countries of the Organisation of Eastern Caribbean States. Moreover, many other countries are now aware of the potential of ASYCUDA through support from organisations like the Customs Co-Operation Council and donors, like the World Bank, who have a special interest in the facilities that the system provides for Developing countries. Consequently, UNCTAD also has many requests for demonstrations of the system to countries in East Africa, Asia and the Pacific regions which will be carried out during 1988.

One extremely important factor is that the software is offered free to Governments and their regional organisations. Development costs of such software is very high (ASYCUDA has itself taken some 30 man years to develop) and thus installation of the UNCTAD package, which is universal in its application to Customs Administrations, represents a major saving right at the outset. Furthermore, substantial economies of scale can be obtained from the implementation of a programme regionally through, for example, shared technical assistance and training.

Simplification and Standards

The production of a standardised system, which uses all the norms contained in the Recommendations and Conventions of international bodies working in the field of foreign trade and Customs, has been fundamental in the design of ASYCUDA.

The application of harmonised, standardised and simplified procedures, regulations, data elements and coding required for ASYCUDA leads to the reduction of administrative delays at ports, airports etc. Overhead costs which adversely affect the cost of imports and the price of exports are reduced to a minimum.

The introduction of ASYCUDA is already creating the ability to transfer, consolidate and compare information at the international level. In the future, with the advent of reliable telecommunications, this ability is bound to increase.

Forthcoming changes to the system

In 1988, the UNCTAD team hope to add three further enhancements to the application software:

- a port management module which will capture and process data from manifests to produce shipping information and port dues data;
- a generalised function for the extraction, saving and archiving of data from the system which will add considerably to flexibility;
- an improved statistical module to provide improved data aggregates and comparative series.

On the technical side, ASYCUDA presently runs on the very latest ranges of powerful IBM-compatible micro computers linked into a local area network. This was deliberate policy to ensure resilience in climates not normally regarded as suitable for the operation of the new technology, and it has been very successful. However, in response to the trend towards standardisation on UNIX as an operating system, and to requests to make the system available for use on mini and mainframe machines, a UNIX version of the software will be introduced in 1988.

Further information on ASYCUDA can be obtained by writing to

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COMPUTERS IN CUSTOMS

Since this issue of the ASYCUDA newsletter will be the first of many, it is worth taking a little time to set out the origins of the ASYCUDA system and the progress so far, in addition to providing news of forthcoming events.

In 1981, on the basis of a request from the Member countries of the Economic Community of West African States (ECOWAS), UNCTAD set about the task of developing a computerised system to manage Customs operations for commercial traffic and to produce trade and fiscal statistics for national Governments and international economic groupings. The name given to the system is ASCUDA viz.

Automatic System for Customs Data

The present software package is now working well in several ECOWAS countries and is, naturally, the result of close co-operation between the UNCTAD team, the Users and the various donor agencies involved in funding. As a result, the facilities incorporated in ASYCUDA reflect accurately the needs at both national and international level.

ASYCUDA is available currently in English, French and Portuguese, and will shortly be available in Spanish.

It has to be said that the results to date have far exceeded our original expectations.

The functions in brief

As one would imagine, the automatic facilities offered within ASYCUDA cover the basic Customs functions of

- input and writing off of manifested cargo;
- input and validation of the Customs declaration;
- duty calculation;
- control of deposit, guarantee or deferred duty accounts;
- cashier;
- accounts;
- goods examination control;
- warehousing and suspense regimes;
- application of the tariff and Customs Law.

In addition, the system permits

- control of foreign trade through the input of import and export licence data; and
- the production of a series of consolidated trade and revenue data for statistical analysis, forecasting etc. including, notably, the trade balances.

Substantial benefits for Users

One of the most rewarding aspects of the system on the ground has been the tangible benefits enjoyed by Users. Not only is the system able to produce accurate and timely statistics, as was envisaged, for the purposes of coherent economic planning, but the increase in revenue receipts as a result of the controls imposed by the computer has, in some cases, been quite dramatic.

In addition, the system provides the means to monitor losses of revenue due to preference arrangements, the basis on which to enter into international trade negotiations with confidence and to apply arrangements for trade compensation schemes.

It is for these reasons primarily that two recent independent audits of the ASYCUDA system by both ECOWAS and the United Nations Development Programme, have enthusiastically recommended expansion of the project.