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ON TRADE
AND DEVELOPMENT

DMFAS

Newsletter

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Welcome to the eleventh issue of the DMFAS newsletter. First, we would like to inform you about some important technical developments made by the DMFAS programme: a new version of the system, DMFAS 5.1, was released in August 1998! Many important new features have been introduced, such as a new reporting module and an analysis module, permitting the calculation of the present value of a debt portfolio. Thus, this new version is specifically suited for use in the debt sustainability analysis of heavily indebted poor countries (HIPC).

Secondly, the first interregional DMFAS conference took place in Geneva from 10 to 19 December 1997. The conference presented and evaluated new challenges for debt management in a changing macroeconomic, financial and technical environment. About 200 delegates from over 60 countries participated in the conference, underlining the growing importance of UNCTAD's technical cooperation programmes (see: "DMFAS debt management conference", p. 5).

Thirdly, we are proud to announce that the following countries or institutions have joined DMFAS within the last 12 months: Albania, Burkina Faso, Côte d'Ivoire, El Salvador, Guinea-Bissau, Georgia, the Islamic Republic of Iran, Jordan, Nicaragua (Ministry of Finance), Peru, the Republic of Moldova, the Sudan, Uzbekistan, Venezuela and Yemen. During recent years, the demand for DMFAS software and services has been rising constantly: as at the end of November 1998, 40 countries are using DMFAS, of which 13 have already upgraded to version 5.1. Other country projects are scheduled for the near future. Moreover, the scope for UNCTAD's services is growing. The DMFAS programme has been declared the focal point within UNCTAD for cooperation with the HIPC initiative of the World Bank and IMF. Thus, the development of DMFAS 5.1 has been specifically designed to provide countries with the necessary tools to perform the calculations needed for the analysis. In this context, UNCTAD is also collaborating with the World Bank and the Commonwealth Secretariat in the preparation of a new debt sustainability module, which is scheduled to be released during spring 1999 (see p. 7).

Moreover, the Russian version of DMFAS was installed in the Republic of Moldova in August 1998 and in Uzbekistan in October 1998. Several installations will follow in Belarus, Kazakhstan and other countries of the Commonwealth of Independent States (CIS).

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NEW VERSION 5.1 RELEASED

The DMFAS programme finalized the development of version 5.1 in August 1998. This new version runs on a 32-bit platform, making full use of Windows and Oracle's 32-bit tools. This allows for a better performance of the system and greater stability. Moreover, the speed for calculating projections based on outstanding has been greatly improved.

Its main new features include a new reporting module and a new analysis module. The latter has been specifically designed to calculate projections based on outstanding and the present value of a debt portfolio, which is necessary for debt sustainability analysis in the context of the HIPC initiative. The analysis module enables the user to choose between different parameters and calculation methods, thus allowing the comparison of different scenarios in the HIPC debt analysis.

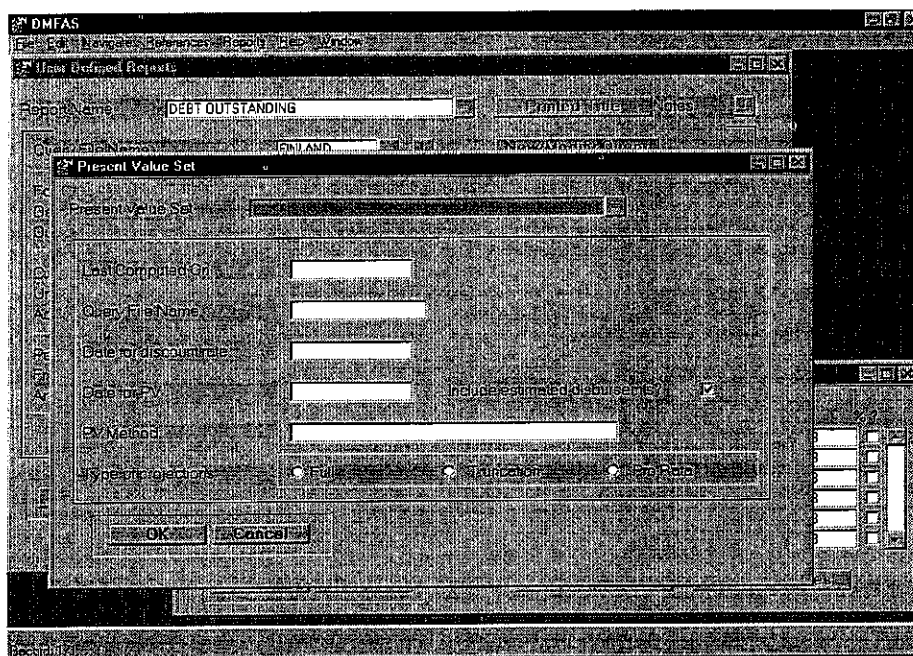


Figure 1: New screen for present value calculations

New user-defined reports module

The reporting module has been adapted following different requests for changes received from the user countries. Moreover, it integrates the comments of different user countries made during the interregional conference in December 1997 (see "DMFAS debt management conference", p. 5). The flexibility of the reporting module has been greatly improved and the production of debt statistics is greatly facilitated. Moreover, the new version contains a set of new standard codes following closely the standards for international debt statistics

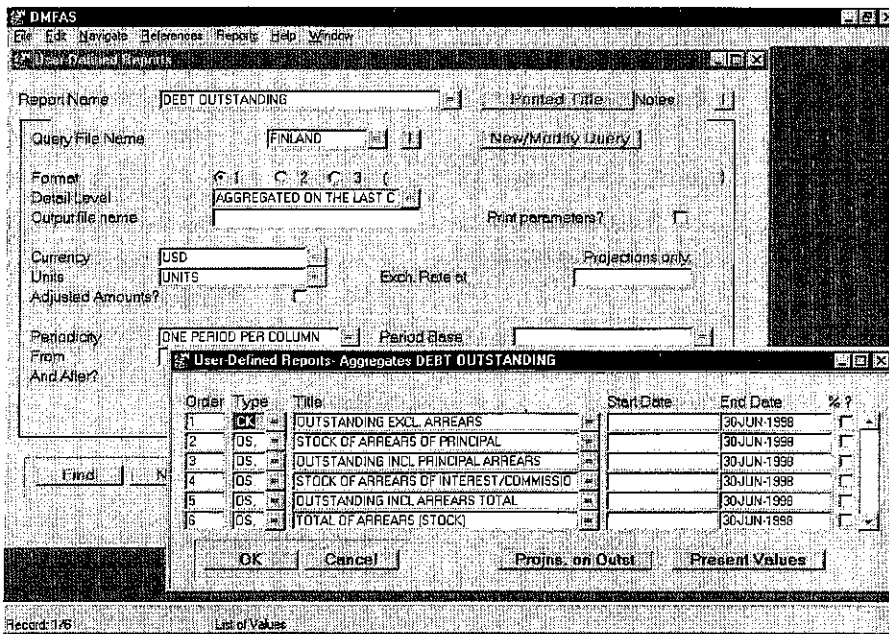
New analysis module

The main new features of the analysis module include the following:

- Calculation of the present value of a loan portfolio.
- Calculation of projections based on outstanding using the pro rata method (in addition to the truncation method already available).
- Reference file for market-based interest rates for HIPC analysis.

The main new features of the reporting module include the following:

- Possibility of producing up to 12 columns for certain report formats.
- Addition of "Exchange rate variation" as a new column.
- Possibility of including percentages as debt totals.
- Inclusion of new sorting criteria: Debt Type, Debtor Administration Type, Debtor Financial Sector, Beneficiary Name, Beneficiary Institution Type, Tranche Economic Sector, Tranche Project.



- Addition of Interest Rate Groups and Maturity Groups, as defined by the user as selection and sorting criteria.
- Template for producing the comparison report between scheduled payments and registered operations.

Figure 2: New screen for user-defined reports

Other features:

In addition, the following features have been added:

- Automatic calculation of principal payments based on percentages when a change to the loan/tranche amount is registered.
- Integration of international standard classifications for the loan/tranche characteristics Financing Source, Financing Type, Credit Terms and Credit Type. A minor conversion from DMFAS 5.0 might be required.
- Availability of the first Russian-language version of the System.

User countries who wish to upgrade to DMFAS 5.1 are requested to contact their DMFAS project officers. The programme also provides a training package on the new features, which can be customized according to the needs of the country. It is recommended that all DMFAS user countries which are eligible for the HIPC initiative upgrade to this version in the coming months to take full advantage of the new analysis features in preparation for the debt sustainability analysis missions.

DMFAS 5.1 was beta tested in the Central Bank of Uganda in July 1998 with the help of the Ugandan staff, to whom we would like to express our gratitude. The final version was released in August and is now routinely installed in new user countries.

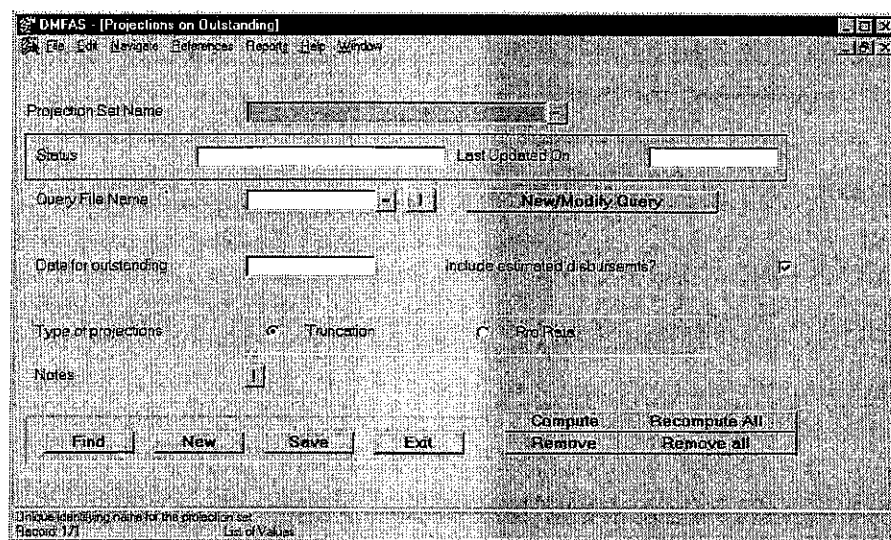


Figure 3: New screen for projections on outstanding

POSSIBLE NEW FUNCTIONAL AREAS OF DMFAS

Results of a questionnaire

As the 5.1 version of DMFAS was released in August, the DMFAS programme had already entered into the stage of designing a new development strategy for the next version of the system. As part of the process of defining the areas in which DMFAS needs to evolve in order to adapt to its users needs, the Programme felt it was essential to get the opinions of DMFAS users on the new functional areas in which they think DMFAS should be improved. Consequently, a questionnaire was prepared and sent to users in August, asking them to give their opinion on a list of possible new functional areas. We would like to take this opportunity to thank all the consultants and country debt offices¹ which responded to the

questionnaire for their cooperation. Their contribution will greatly help us in the elaboration of DMFAS future development strategy.

The questionnaire was divided into two parts, the first one concerning functional areas related to debt management, the second part concerning functional areas related to debt analysis. Users were asked to rate each proposed functional area according to its importance to their organization/institution. They were also asked to classify each functional area by order of priority. Answers to both questions are summarized below.

Functional areas related to debt management:

A clear distinction can be made between areas considered by a majority of users as very important and having priority and areas that are assessed as least important and having least priority.

Functional areas: Most important and having priority (classified by order of priority)

1. Improved reporting features including standard reports
2. Interest capitalization and calculation of accrued interest
3. Domestic debt
4. Bonds
5. Assumed guaranteed debt
6. Handling of currency pool loans
7. Improved security and audit functions
8. Rescheduling
9. Interface linking DMFAS with other financial systems in the client institution/organization
10. Sharing debt data between local institutions in the client country
11. Handling of the euro

Functional areas: Least important and having least priority

1. Handling of recovery of on-lent debt
2. Short-term debt
3. New algorithms of development banks
4. Private debt

¹ Belarus, Bolivia, Costa Rica, Ecuador, Haiti, Honduras, Jordan, Kazakhstan, Lebanon, Panama, Peru, Philippines, Republic of Moldova, Romania, Senegal, Sudan, Ukraine, Uzbekistan, Viet Nam, Yemen and Zambia.

Functional areas related to debt analysis:

The three functional areas proposed were all considered by users as very important and having priority.

**Functional areas:
Very important and having priority
(by order of priority)**

1. Interest and exchange rate variations
2. Averages
3. Grant element

Arabic version of DMFAS

A special questionnaire was sent to Arabic countries containing one question about the Arabic version of the DMFAS. Out of the three respondents, two consider the Arabic version of the system as very important while one considers it as fairly important.

DISCONTINUATION OF 4.1 PLUS SUPPORT

As of 1 October 1999, the DMFAS programme will no longer support 4.1 Plus and older versions. This is necessary because UNCTAD cannot guarantee year 2000 compliance of this Cobol-based software. Instead, the team will put all its efforts into enhancing and further developing its Oracle-based version, 5.1 and further. The more recent versions of DMFAS (5.0 and up), which are based on Oracle RDBMS, use four digits to express the year and will thus comply with the year 2000.

UNCTAD will provide no further upgrades or technical support to 4.1 Plus user countries after October 1999. DMFAS 4.1 Plus user countries can still continue to operate the old version, but they are requested to contact the DMFAS programme in order to discuss the upgrade to version 5.1. A total of 11 countries - Burundi, the Central African Republic, Djibouti, Egypt, Haiti, Honduras, Indonesia, Rwanda, Trinidad and Tobago, Zambia and Zimbabwe - are still using 4.1 Plus. The majority have already signalled an interest in upgrading to DMFAS 5 and are expected to do so in 1999. The DMFAS programme plans to make a special effort to convert all 4.1 Plus user countries

in 1999. This will include the contracting of specific consultants to examine the data and to develop the conversion programs.

DMFAS DEBT MANAGEMENT CONFERENCE

GENEVA, 10 - 12 DECEMBER 1997

At its ninth session, UNCTAD adopted the document entitled "A Partnership for Growth and Development". Paragraph 87 (i) of the document states that "the examination of development challenges will integrate the important development lessons learnt about debt management from UNCTAD's work in this area", and paragraph 97 (i) states that UNCTAD should "provide continued support for debt management". In response to this new mandate and to a high demand from countries presently cooperating with the DMFAS programme, UNCTAD organized a debt management conference, composed of a three-day plenary seminar on new trends in debt management and information technology, followed by a five-day workshop on the reporting and analytical capabilities of DMFAS 5.0.

The conference, which was co-sponsored by the United Nations Development Programme (UNDP), was attended by more than 200 participants from almost 60 countries, as well as representatives from 13 international and regional institutions.

SEMINAR ON THE INSTITUTIONAL ENVIRONMENT FOR EFFECTIVE DEBT MANAGEMENT

The seminar was opened by Mr. Rubens Ricupero, Secretary-General of UNCTAD. He underlined the importance for all countries, whatever their particular debt situation, of having a professional debt management function and highlighted the role of UNCTAD and the DMFAS programme. On behalf of UNDP, co-sponsor of the seminar, Mr. Thord Palmund, Senior Advisor to the Management Development and Governance Division, made a statement emphasizing UNDP's involvement in the area of debt management. He also introduced a recent publication of UNDP,

"Debt management. A report on the joint programme", which gives an account of the joint activities undertaken by UNDP, UNCTAD and the World Bank during the first half of the 1990s.

During the seminar, some 25 debt management experts and professionals exchanged their views on different topics related to debt management and, in particular, new trends concerning institutional practices and information technology. The presentations made during the seminar will be published in book form and distributed during 1999.

WORKSHOP ON THE REPORTING AND STATISTICAL CAPABILITIES OF DMFAS 5.0

Following the seminar, DMFAS users participated in workshops on the reporting and analytical capabilities of the system in order to compile a statistical bulletin on their country's debt. The training included familiarization with the new user-defined reports module and the new coding standards related to it, which are based on international standards. These new features have meanwhile been introduced in DMFAS 5.1. The participants were split into four different language groups (English, French, Spanish and Russian).

ROUND TABLE

As part of the seminar, a round table was held in order to receive feedback from the participants concerning the topics of the seminar, as well as other issues related to debt management. In addition to a number of questions related to advanced information technology and shared databases, the discussions focused on two major issues: the problem of staff turnover in the debt management offices and the need to exchange experience, know-how and information among countries, eventually through the establishment of some kind of international borrowers club or professional association.



DMFAS debt management conference

Many participants were concerned about the high staff turnover in debt management offices. Many comments were made with regard to the disruptions caused by removal of trained and skilled debt management professionals due to political changes or departure of these highly qualified staff for better paid jobs in the private sector. While UNCTAD and UNDP explained that some remedies were possible within the framework of technical cooperation country projects, most intervening participants underlined that the ultimate responsibility for retaining qualified staff was with the Government concerned and that this was not a problem unique to debt management offices. It would therefore be mostly handled through overall civil service reforms. Participants were reminded that this problem also existed in the more advanced industrialized countries and that, for example, Ireland had created an autonomous debt management agency partly in order to be able to attract highly qualified professionals at competitive market-based salaries.

The second major topic of the round table was the establishment of an international borrowers' club or professional association. A proposal in that regard was made by Mr. Roberto J. Dispo, Deputy Treasurer, Bureau of Treasury of

the Philippines, who suggested that, as the UNCTAD three-day seminar had shown, there was a clear need for countries to exchange experiences, know-how and information concerning debt management. Some objections were

raised, especially if the issues handled by such an association would be of a politically-sensitive nature, such as loan negotiations. Some participants also felt that such gatherings would best be handled on a regional basis. After discussion, a general consensus emerged that the association's main objective would be to offer debt management professionals a forum in which to discuss technical matters of common interest and that this could be complemented by regional

events. Mr. Cosio Pascal, after emphasizing that such an association would need funding and some kind of a secretariat, said that UNCTAD was willing to pursue this matter in collaboration with other international institutions and would inform participants about further developments.

CONCLUDING REMARKS

During the last day of the conference, participants were asked to fill in an evaluation form. The evaluations show that both the seminar and the workshop were rated as very good.

These encouraging results give UNCTAD's DMFAS programme enough reasons to organize such an inter-regional event on a regular basis. This could also be done in connection with the international professional association, whose establishment was suggested during the round table.

DSM+ PARTNERSHIP AGREEMENT

Agreement signed between the World Bank, the Commonwealth Secretariat and UNCTAD for the dissemination of DSM+.

On 1 October 1998, UNCTAD, the World Bank and the Commonwealth Secretariat signed a cooperation agreement for the dissemination and further development of the World Bank's Debt Sustainability Model (DSM+).

The DMFAS programme has been cooperating with the World Bank for some time on the development of this analysis module for indebtedness sensitivity analysis. Under the present agreement UNCTAD will integrate the DSM+ into its DMFAS software package and will be responsible for distributing it to all current DMFAS 5.0 and 5.1 users. In addition, UNCTAD will provide training in the use of the DSM+ and contribute to its further development.

The cooperation will be governed by a steering committee that will meet when required, but at least twice every year. The steering committee is composed of the World Bank, the Commonwealth Secretariat and UNCTAD. The

IMF and other organizations will be invited to participate as observers at the meetings.

The signing of the agreement is a historic occasion since it is the first time that the World Bank, the Commonwealth Secretariat and UNCTAD have entered into a partnership together. The implications for UNCTAD are:

- UNCTAD has entered into a strategic partnership with two of the other major players in debt management.
- UNCTAD has obtained the rights to distribute this much needed software free-of-charge to all clients who use DMFAS, thus eliminating the need to incur considerable cost and delay in building a similar module.
- The DMFAS programme is now responsible for disseminating the DSM+ software to beneficiary countries, including giving advice on policy issues in the area of national indebtedness strategies and decision-making, and providing training and support in its operational use.

With regard to future activities, the importance of the DSM+ as a key tool for the Debt Sustainability Analysis for the HIPC initiative makes it crucial that it be made available to client countries as soon as possible. A tight work programme was therefore agreed upon during the last steering committee meeting. This work programme implies that UNCTAD will start distributing DSM+ by 1 March 1999.



JOINT TRAINING PROGRAMME FOR EASTERN EUROPE AND THE CIS

UNCTAD PROVIDES DEBT MANAGEMENT TRAINING TO EASTERN EUROPE AND THE CIS IN COOPERATION WITH UNDP AND UNITAR

UNCTAD's DMFAS programme, in cooperation with UNDP's Regional Bureau for Europe, the CIS and the Legal Aspects of International Economic and Financial Relations Programme of the United Nations Institute for Training and Research (UNITAR), has developed a comprehensive training programme in debt management for countries in Eastern Europe and the former Soviet Union. The workshops included in this programme are to be delivered in 1998 and 1999.

This training programme consists of a series of four workshops, and is intended to be a broad basis upon which more specialized training in the area of debt management may later be built. The workshops have been designed considering the relatively recent establishment of the debt offices in these countries. In order for the workshops to have the intended impact, however, they are seen in the wider context of national capacity-building in the area of effective debt management in the individual participating countries. The training programme therefore also addresses some of the important human resources development issues on the national level, and how UNCTAD, UNDP and UNITAR may assist in this process.

For newly established debt offices the national competence in debt management is not yet as broad-based as it needs to be. The basis for creating a national curriculum in debt management is therefore not yet present and has to be built up over time. To start this process, external workshops and seminars are required in order to learn from and exchange experiences with other countries and international institutions. This knowledge may then be utilized on the national level.

The four initial workshops concentrate on issues of a general nature. Based on a survey

made during the UNCTAD Inter-Regional Debt Management Conference in December 1997, the regional priority training needs were identified as being in the areas of debt strategy formulation, debt analysis and debt recording. During each workshop, round tables are organized in order to receive feedback on the contents of the workshops, which may be adapted accordingly. At all workshops, interpretation in English and Russian is provided. The four workshops are:

1st WORKSHOP - STRATEGY FORMULATION, PLANNING AND POLICY

This workshop took place in Geneva from 29 June to 3 July 1998. It outlined the various elements of a debt strategy formulation and planning cycle and described how to undertake a portfolio review. It addressed strategy formulation, starting with the analysis of the various financial gaps, the Savings Gap, the Balance of Payments Gap and the Fiscal Gap, and analyzed the different resources that may be used to fill the gaps, including external and domestic borrowing.

2nd WORKSHOP - LEGAL ASPECTS OF DEBT AND FINANCIAL MANAGEMENT

This workshop took place in Geneva from 23 to 27 November 1998. The workshop focused on the legal aspects because it has been found that there is insufficient awareness of the importance of legal advice and other legal aspects of debt management among debt managers while negotiating and drafting loan agreements. This has tended to result in loan agreements which were heavily weighted against the interests of the borrowing nations. It is clear that good legal advice can go a long way towards avoiding unmanageable debt burdens and resulting crises. The workshop emphasized the role lawyers should play in all aspects of debt management including loan negotiation, drafting of agreements and, if need be, arbitration.

3rd WORKSHOP - MANAGEMENT OF A DEBT OFFICE

This workshop will take place in March or April 1999, possibly in Tbilisi, Kiev or Tallinn. The workshop will concentrate on the functions of a debt office, i.e. the tasks and how to design the procedures to fulfil these tasks. Closely related to the design of procedures is the legal framework within which the procedures will operate.

4th WORKSHOP - ACCESSING PRIVATE FINANCIAL MARKETS

This workshop will take place in June or July 1999, possibly in Bratislava. The workshop will concentrate on how to access domestic and international private financial markets. It will take the first workshop as a starting point, discussing the planning and execution of borrowings in

domestic and international financial markets, and the interaction between the markets. The role of domestic legislation and the organization of capital markets will be discussed, as well as the different international markets and their financial and legal requirements. The credit rating process will also be covered.

ECONOMIC FOCUS

SUMMARY RESULTS OF THE OFFER OF CURRENCY CHOICE FOR NEW AND EXISTING IBRD LOANS



Mr. Jose Molina,
The World Bank ²

In our previous issue, we wrote about the IBRD's offer to convert outstanding currency pool loans to a specific currency (or currencies) selected by the borrower, or so called single currency terms. The offer concluded on 1 June 1998. This note reports on the results of the offer of currency

choice for existing IBRD loans and the effect on the IBRD's loan portfolio.

The currency pool loan (CPL) conversion offer covered \$146 billion of loans to 357 borrowers in 89 countries. The offer period for requesting conversions extended from September 1996 until 1 June 1998. The choices available to borrowers were:

- To retain the terms of their existing currency pool loans;
- To convert undisbursed loan amounts to single currency loan (SCL) terms; and
- To convert disbursed loan amounts and undisbursed loan amounts (to the extent not converted to single currency loan terms) to

one of four single currency pools (SCPs). SCP terms were offered in USD, DEM, JPY and CHF.

It was each borrower's choice whether to retain CPL terms or request conversion to single currency terms. The Bank's offer was accompanied by an extensive client outreach and information campaign so that borrowers had the information and support they needed to evaluate alternatives in light of their business needs and objectives. All borrowers were given the opportunity to make informed decisions by receiving follow-up support from qualified Bank staff, and the Bank responded to all requests for follow-up discussions from borrowers.

Borrowers from 55 countries converted \$67.2 billion of existing CPLs, of which \$18.6 billion was to SCL terms and \$48.6 billion was to SCP terms, as shown in Table 1. Countries from all six geographical regions where the Bank has lending operations converted, with the Latin America region accounting for the largest volume, with a total of USD 26.7 billion. East Asia and the Pacific followed with USD 21.3 billion, while Europe and Central Asia was third with USD 8.8 billion. They selected USD for 87% of conversions, and LIBOR-based terms for 62% of conversions to SCL terms. A breakdown of these conversions, by product, is given in Table 2.

² Mr. Jose Molina is a Financial Officer at the World Bank's Financial Products and Services Department. He has been with the World Bank since 1984, and previously worked on the Bank's borrowing operations and derivatives. For inquiries on the World Bank's financial products, you may contact Mr. Molina at 202 458-0743 (phone), 202 522-3264 (fax) or jmolina2@Worldbank.org (internet)

SCP conversions took place on three conversion dates: 1 July 1997, 1 January 1998 and 1 July 1999. Loans converted to SCP terms shift to become single currency obligations as the Bank transforms the currency composition of the underlying funding for these loans. The Bank undertook to ensure that each SCP would be at least 90% in the borrower's designated currency by 1 July 1999, subject to funding and swap access being available in the necessary currencies. The Bank stated its intention to shift the currency composition of each SCP to 100% in the designated single currency as soon as practicable.

Borrowers cited several reasons to request conversion of their currency pool loans. In particular, borrowers who have established a so-called "benchmark" (i.e., a target currency composition, interest rate and maturity structure for their debt) which embodies their sovereign debt management objectives used the IBRD's conversion offer to transform their IBRD portfolio's characteristics so that they closely matched the

Table 1. Summary of Conversions to Single Currency Terms, by Region
(at July 1, 1998)
(USDeq. billions)

Region	Total	Converted to	
		SCL Terms	SCP Terms
Africa	1.6	0.1	1.6
East Asia and Pacific	21.3	6.8	14.5
Europe and Central Asia	8.8	2.9	5.9
Latin America and Caribbean	26.7	5.8	20.8
Middle East and North Africa	7.1	1.4	5.7
South Asia	1.7	1.7	*
Total	67.2	18.6	48.6

Totals may not add due to rounding.
* Less than USDeq 50 million

goals set by the benchmark for their overall debt portfolio. Other borrowers considered the offer as an opportunity to create a natural currency hedge by converting into currencies that matched those of their export revenues. Finally, those borrowers with undisbursed loan balances that were eligible to convert the lending rate basis of those balances into LIBOR-based or fixed-rate single currency loan terms cited their preference for market-based lending rates as a reason to convert.

Table 2: CPL Conversions, by Product
(USDeq billion)

	USD	DEM	JPY	CHF	FRF	ECU	Total
Total Conversions	58.3	8.0	0.3	*	0.3	0.3	67.2
Conversions to SCL terms	16.7	1.1	0.2	*	0.3	0.3	18.6
● To LIBOR-based SCL terms	9.9	0.8	0.2	*	0.3	0.3	11.5
● To fixed-rate SCL terms	6.8	0.3	-	-	-	-	7.1
Conversions to SCP terms	41.5	6.9	0.1	0.0	N/A	N/A	48.6
● Converted July 1, 1997	7.4	2.4	-	-	N/A	N/A	9.9
● Converted January 1, 1998	19.5	-	-	-	N/A	N/A	19.5
● Converted July 1, 1998	14.6	4.5	0.1	-	N/A	N/A	19.2

Totals may not add due to rounding.
* Less than USDeq 50 million, or 0.05%.

As a result of the offer of currency choice for new and existing loans, the composition of the Bank's loan portfolio has changed significantly over the last two years (Tables 3 and 4). From 30 June 1996 to 31 August 1998:

- Multicurrency loans' share of disbursed and outstanding loans dropped from 98% to 39%;

- Single currency loans' share of undisbursed loans grew from 17% to 85%; and
- The USD share of total loans (including the USD component of CPLs) grew from 33% to 73%.

**Table 3: IBRD Loan Portfolio, by Product
(US\$ billion, disbursed and outstanding)**

	June 30, 1996		August 31, 1998	
	Volume	%	Volume	%
Total Disbursed and Outstanding Loans	110.2	100	108.2	100
Multicurrency Loans	108.0	98	41.6	39
- CPL Variable rate	96.9	88	37.6	35
- Other Fixed Rate	11.1	10	4.0	4
Single Currency Loans	2.3	2	66.6	61
- SCL Variable Rate	1.0	1	17.5	16
- SCL Fixed Rate	1.3	1	5.4	5
- Single Currency Pool Loans	-	-	43.7	40

**Table 4. IBRD Loan Portfolio, by Product
(US\$ billion, undisbursed volumes)**

	June 30, 1996		August 31, 1998	
	Volume	%	Volume	%
Total Undisbursed Loans	54.5	100	51.4	100
Multicurrency Loans	44.8	82	7.7	15
- CPL Variable rate	44.8	82	7.7	15
Single Currency Loans	9.7	17	43.7	85
- SCL Variable Rate	7.3	13	30.4	59
- SCL Fixed Rate	2.3	4	12.8	25
- Single Currency Pool Loans	0	0	0.5	1

The alternative, and more accurate, way to calculate the present value is, of course, to consider all debt service payments on the date

they actually take place. We call that method the "Constant Discount Factor" method.

DATA REPLICATION AND DMFAS 5

1. Introduction

DMFAS 5 is often installed on a Local Area Network (LAN) in more than one institution in a country, e.g., in the Ministry of Finance (MOF) or the Central Bank (CB). Normally, this means that the handling of the debt data has been decentralized and that each institution is responsible for its own set of loans. In this environment, compared to the one with only one DMFAS 5 installation, additional requirements must be met if the DMFAS software is to be used satisfactorily. Of these, the two main ones are the following: (i) the need to avoid duplication of data entry for some of the common reference data (participants, exchange rates and variable interest rates); and (ii) the need to replicate or combine the data of the institution specific databases for reporting purposes. The purpose of this article is to describe how these requirements can be met.

2. User requirements

The single most important activity to be done before any replication activities are started, is to understand thoroughly all end-user requirements and to carefully plan corresponding system components so that they match those requirements. A typical situation could thus be as follows:

- The loan stock is distributed among two institutions: (i) Ministry of Finance (MOF); and (ii) Central Bank (CB). Each institution is responsible only for its own loans;
- Each institution has a Local Area Network (LAN) and an Oracle database. A dedicated communication line connects the networks of the two institutions;
- DMFAS 5 has been installed in both institutions;
- MOF and CB would, purely for reporting purposes, need to have information available from the combined loan stock of the two

- institutions on a daily basis, i.e., at the Beginning of each new working day;
- The responsibility of keeping the shared reference data up-to-date, i.e., Participants, exchange rates and variable interest rates, lies with MOF and the CB relies for this information on data exported by the MOF.

3. Technical requirements

Before providing the actual solution, it is important to have a clear picture of the technical equipment that must be in place before any replication can be done. Fortunately this is quite straightforward and only requires telephone lines (normally dedicated fast lines) and modems that connect the LANs between the different institutions³. In our case, we would need one line and a modem from the CB to the MOF through which the CB would request data from the MOF, and, one line and a modem from the MOF to the CB through which the MOF would request data from the CB. Once this equipment is in place, Oracle's replication procedures⁴ will handle the corresponding data transfer activities.

4. Replication options

Today's replication technology is widely used by many institutions to place shared data at specific locations throughout an organization. This brings various advantages to the consumers of this information such as faster access to the replicated data by eliminating long-distance connections, or improved management reporting because the activities of data entry and analysis (reporting) have been separated into different locations. In line with this, Oracle's replication options can be loosely grouped into two categories:

- *Simple read-only replication.* This includes read-only table snapshots to support primary ownership replication, an architecture in which one site in the system owns (can read and update) the master table and other sites subscribe to (can only read) the data of the master table snapshot;

³ Note that today it is also possible to establish such communications without a dedicated telephone line. Examples of this are sending of data through wireless radio, or by satellite. Actually these options are not as uncommon as they might seem.

⁴ Included in Oracle's RDBMS 7.2 (or later) with the distributed option.

- *Advanced, update-anywhere symmetric replication.* This includes updateable table snapshots and multimaster replication to support a number of different replication models. Regardless of the model to be implemented, the primary reason for using a symmetric-replication system is to provide multiple points of update access to replicates of the same table.

The reason for classifying replication options into these two groups is because simple read-only replication environments are easy to configure and manage relative to the symmetric replication options. Note that, as easy as some people try to make symmetric replication sound, the recommendation is that it is not something that one should get involved in unless it is really needed. Furthermore, in real-life situations, application requirements normally only call for primary ownership replication architectures, i.e., distributed database systems that employ easy-to-use, read-only table snapshot configurations.

5. Technical solution

In line with user requirements and the background information on replication technology, the recommended technical solution will be based on the simple read-only replication in the form of table snapshots⁵. Due to the fact that it is relatively simple to implement, it has also the advantage that it can be implemented even in institutions where resident technical staff, who will be responsible for the implementation, have little previous knowledge of this subject. Within this framework, the following activities describe how the replication environment will be created:

- First, a separate replication area in the form of two new Oracle tablespaces is created in the database of both institutions. This area will house all the replicated debt tables as well as all reference and work tables needed for the corresponding report preparation, i.e., the replication area of the MOF would contain read-only snapshot copies of all debt tables from the CB as well as read-only snapshot copies of all debt and reference tables from the MOF itself. Similarly, the replication area of the CB would contain read-only snapshot copies of all debt tables

from the MOF as well as read-only snapshot copies of all debt and reference tables from the CB itself. For reporting, both replication areas would have their own set of worktables that they can both read and write into. Finally, a replication specific new user, DMFASREP, is created in the database of MOF and CB. Note that this user is the owner of all objects in the replication area.

- After this, database links are created in both institutions between the databases of MOF and CB. These links will allow the local database of MOF to make a snapshot copy of the debt data from the remote CB database and vice versa. Next, a database link is also created on the local database in both institutions in order to replicate the institution's own debt data into the replication area. Finally, in both institutions another new user, DMFASLINK will be created with SELECT rights on all debt and reference tables that will be replicated. It is under this account that all database links will log into the remote databases (in the other institutions).
- With the replication areas prepared and the required database links in place, the relevant CREATE SNAPSHOT commands are registered into the database of both institutions. Note that these commands also automatically fill all snapshot tables with data. A refreshing interval and method is next set up for each snapshot. In line with this, in MOF all snapshot tables would normally be refreshed (transmitted) with new data from the CB at 18.00 every evening and those at the CB would be refreshed with new data from the MOF at 19.00. Possible options for refreshing include full refreshing where all data in a table are sent, partial refresh using snapshot logs where only changed data are sent. Refreshing can be done at predefined intervals or manually at any time.
- To conclude, it is on top of their respective replication areas that MOF or CB will run the DMFAS 5 software when they want to prepare reports on debt data covering the combined loan stock. Note that this environment is automatically recognized by the system as soon as a user connects to DMFAS under user account DMFASREP.

⁵ I.e., each snapshot table is an exact copy of the original table.

As mentioned above, the responsibility for keeping the common reference files (participants, exchange rates and variable interest rates) up-to-date lies with MOF and the CB relies for this information on data exported by the MOF. The procedure for achieving this is based on the above-described database links and is as follows: (i) every morning when the MOF has entered the new daily rates into its exchange rate file in DMFAS 5, it would, using a database link, replace the existing exchange rate file at the CB site with the data from its own updated exchange rate file; and, (ii) when a change is registered in either the participants or variable interest data, MOF would inform the CB of this and agree on a time at which to use the database link to replace the corresponding data in the CB database with the changed data from the MOF. Note that for these three files it is always the actual tables of DMFAS that are updated, and not the snapshots of these tables.

6. Summary

As has already been mentioned, a replicated database environment can enable institution-wide access to shared data. The benefits of this approach include local access and highly available applications across the

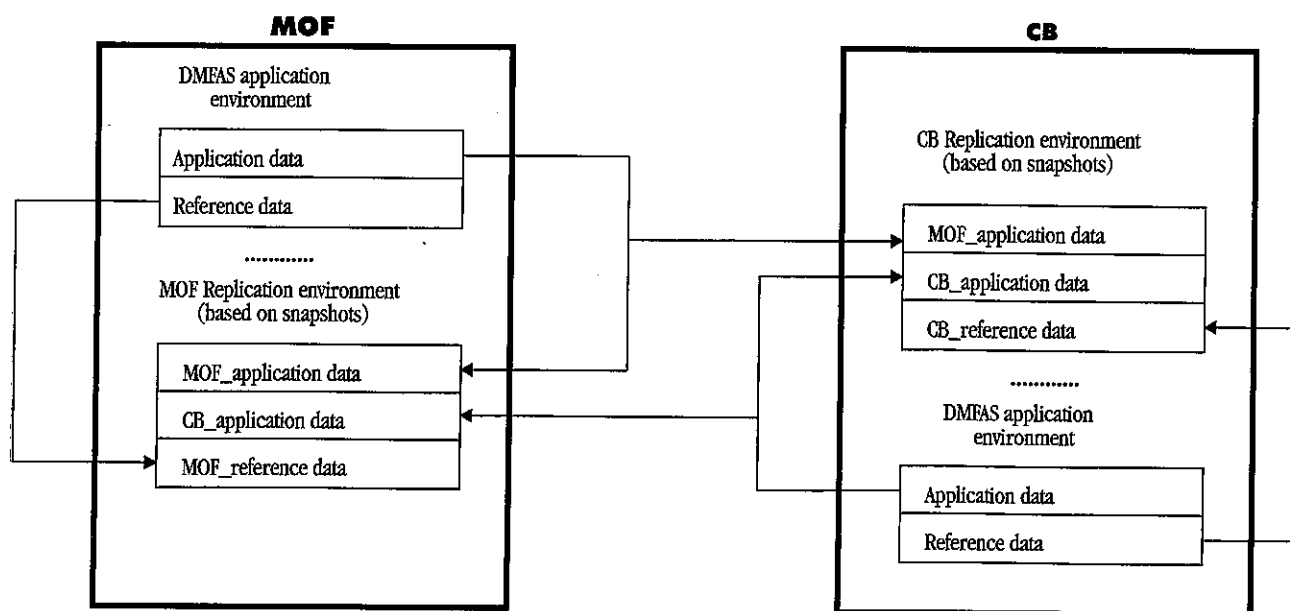
global organization. Now that this paper has made the issues surrounding Oracle's replication options more familiar, the DBA should be in a better position to design and build a corresponding replication environment in line with the needs of the institution(s) where DMFAS 5 has been implemented. Finally, it is also worth mentioning that of current DMFAS 5 installations, Kazakhstan, the Republic of Moldova and Romania are already replicating their debt data using snapshots.

7. Where to go from here

The document "Data replication and DMFAS 5: A case study" (DBASNAP.DOC) is a good source for more information on this topic. It is a step-by-step description of how the above-described replication areas are created and used, including all the required Oracle scripts for this. This document is available in MS-Word format from the DMFAS 5 installation CD in directory ADMIN\CREATE\SNAPSHOT. For a broader view of the replication technology itself, the following Oracle manuals may be helpful:

- Oracle7 Server Distributed Systems, Volume 1: Distributed Data
- Oracle7 Server Distributed Systems, Volume 2: Replicated Data

Fig. 1 Structure of application and replication areas



QUESTIONS TO THE DMFAS

Q: Is DMFAS 5.1 year 2000 certified?

A: The DMFAS 5.1 software has been tested and found to be year-2000 compliant. The suppliers of the supporting software upon which DMFAS is dependent in order to operate in a Windows/network environment (Microsoft, Oracle, network operating system vendors, etc.) have assured their users that their products are also year-2000 compliant although UNCTAD, for obvious reasons, cannot guarantee this.

Q: Is DMFAS 5.1 compatible with Windows 98?

A: We are currently running DMFAS 5.1 on several machines with Windows 98 in the DMFAS team and have not encountered any problems. However, the compatibility is not officially confirmed.

Q: How should errors be reported to the DMFAS team?

A: UNCTAD provides a hotline and an e-mail

account for reporting errors. However, it is absolutely necessary that all errors be reported in writing by fax or by e-mail. Therefore, the user or DBA reporting the bug should take screen captures of the error message by simply pressing the keys alt print screen and pasting the picture into a word document, which contains a detailed description of the error encountered and the situation in which it was encountered. In some cases, it might be recommended to take screen captures of the whole process until the error was encountered. Moreover, when encountering the error message, the user should take a screen capture of the menu option "Debug" and include it in his report. Errors so reported can be solved more rapidly by the team, since it saves much testing and guesswork by the programmers.

TECHNICAL CORNER

In the technical area, DMFAS staff give tips for troubleshooting specific problems when running DMFAS 5.

Tip 1: Invalid objects

When you encounter any of the problems listed below, it is likely that there are invalid objects in the DMFAS system:

- When running user-defined reports, you get this message: "No report will be printed because it would contain only zeros M-2539", even though you expect some results.
- The user-defined reports, particularly projections on outstanding and present values, or the loan account statement, generate blank or unexpected values.
- Lists of values, such as debt totals, are empty.

To fix the problem, click on the existing

DMFAS shortcut named *Check Status of Objects* to see if there are any INVALID objects. If there are, as shown on the SQLPlus screen, then recompile the said objects by clicking on the existing shortcut *Recompile Objects*. Enter the SYSTEM password when prompted for it. After this, click on the shortcut *Check Status of Objects* again to double-check that no more INVALID objects exist.

In case you do not have the said shortcuts, create them, under folder DMFAS 5, with the following properties⁶:

- Description : SQLPlus (Check Status of Objects)
Target: c:\orawin95\bin\plus33w.exe /nolog
@p:\dmfas51\sqlbat\status.sql
Start-in : p:\dmfas51\work

⁶ In the statements below, we use the p: drive as location for the DMFAS programmes. Depending on the installation, however, they might be located in another drive, as decided by the local DBA or with the installation mission.

- Description : SQLPlus (Recompile Objects)
Target : c:\orawin95\bin\plus33w.exe /nolog
@P:\dmfas51\admin\create\objects\metascr
i\compobj2
Start-in: p:\dmfas51\work

If you need further help, send us the log file, STATUS.LOG, created in the shortcut's working or "start in" directory, p:\dmfas51\work, in the above case.

Tip 2: Getting more information on an ORACLE error

What can you do when you get ORACLE messages such as : "Unable to INSERT (UPDATE/DELETE) record" or "Unable to perform query"?

You can get further details on the error as follows:

- Click OK on the displayed ORACLE message.
- Then, click on menu option *Help -> Display Error*
- You may see messages such as: "Insert into tablename...ORA-01632: max # of extents (120) reached in index DMFAS.DSO-IND2".

Tip 3: Cannot attach the library file

What can you do when you invoke DMFAS and you immediately get the error: "FRM-40034: Cannot attach the library file"? Ensure that you have these lines in the ORACLE Registry:

```
FORMS45_PATH=P:\DMFAS51\FORMENU;
P:\DMFAS51\LIBRARY
REPORTS25_PATH=P:\DMFAS51\REPORT;
P:\DMFAS51\LIBRARY
```

Furthermore, be sure that the logged in network user has access to directory P:\DMFAS51.

Tip 4: Invalid REPORTS25_PATH

You click on a report and nothing seems to be happening. In this case, check the log on the Reports Server (a minimized window which appears on the Windows Task Bar whenever an ORACLE report is invoked). Do this by maximizing the Reports Server window, then clicking on *Action -> Show Log*.

You may see messages such as:

```
Starting report PDT063
REP-0110: Unable to open file 'PDT063'.
REP-1070: Object store failure occurred.
```

```
REP-0110: Unable to open file 'PDT063'.
End report PDT063
```

In the sample case, the report PDT063 cannot be located. It is either physically not available or the REPORTS25_PATH setting in the ORACLE Registry is not correctly pointing to the physical location of the libraries (i.e., files with .PLX extension).

Tip 5: COBOL calculations

When calculating the amortization table or creating estimated disbursements, you do not get the DOS black screen display, and it seems like the DMFAS system is hanging. In this case, ensure that the COBOL display is ON (5.1 only) so that you can see the error messages. This is done as follows:

- Abort the hanging system by pressing <Ctrl -Alt-Del>, then clicking <End Task> from the Task Manager screen.
- Next, restart DMFAS and from menu option *Support -> System Parameters*, tick the field *Display Cobol* screen.
- Repeat the process that was previously hanging and note down errors appearing on The DOS black screen.

Tip 6: Clear work tables

You decide to abort the DMFAS system in the middle of a user-defined report generation. If you do this, be sure to clear the report work tables. Otherwise, the next time around, you might get a user-defined report with staggered and unpredictable totals.

To empty the report work tables, simply click on the shortcut, *Clear Work Tables*, after which you can proceed with generating a user-defined report.

In case you do not have this shortcut, create it under folder DMFAS 5, with these properties:

- Description : SQLPlus (Clear Work Tables)
Target : c:\orawin95\bin\plus33w.exe /nolog
@p:\dmfas51\sqlbat\truwrk.sql
Start-in: p:\dmfas51\work

N.B. For countries with a replication environment, use this target statement:
Target : c:\orawin95\bin\plus33w.exe /nolog
@p:\dmfas51\sqlbat\truwrk2.sql

MISSION ROUNDUP

Albania: From 21 to 25 April 1998, a mission took place to install DMFAS 5.0 in the Ministry of Finance. A resident consultant provided DMFAS training and supervised the building up of the database.

Bolivia: DMFAS 5.1 was installed in the Central Bank of Bolivia (BCB) in August 1998. The objective of the installation was to provide the tools for the Government to perform calculations for the debt sustainability analysis for the HIPC initiative. Bolivia is eligible for the HIPC initiative and reached completion point in September 1998. The Central Bank staff was trained in the use of the new features in Buenos Aires, by staff of the Argentine Ministry of Finance. Moreover, staff of the BCB received an advanced training mission in May 1998.

Costa Rica: A data validation mission took place in August 1998. The objective of the mission was to conduct an audit of the Central Bank of Costa Rica's (BCCR) database to ensure its quality before definitely converting over to DMFAS 5.1. Two technical staff of the BCCR participated in a technical training seminar in July 1998.

Ecuador: Ecuador upgraded to DMFAS 5.1 in August 1998. The new version was installed in the Ministry of Finance and the Central Bank. A resident Chief Technical Advisor (CTA) is providing the training in the new features after being trained himself at Geneva headquarters.

Ethiopia: A mission was fielded to Addis Ababa in October this year in order to install DMFAS version 5.1 in the Credit and Investment Department (CID) of the Ministry of Finance, to convert the existing DMFAS data to version 5.1 format and to provide training in the use of the new version of the software. Ethiopia is eligible for the HIPC initiative and requires DMFAS 5.1 for its preparations.

Islamic Republic of Iran: In February 1998, a mission took place to the Central Bank of Iran with the objective of providing advanced training in the use of DMFAS reporting features and to coordinate the ongoing development of the financing of the Foreign Documentary Credits

(FODOC) application. The FODOC will enable the Central Bank of Iran to monitor Documentary Credits more efficiently. The Iranian Central Bank staff visited Geneva headquarters in August 1998 to test the FODOC application jointly with the DMFAS IT team and to give feedback for its development.

Nicaragua: DMFAS 5.1 was installed in the Ministry of Finance of Nicaragua in June 1998 as a first-time installation. The Ministry of Finance will manage its domestic debt with the system. In addition, DMFAS will be interfaced with the Nicaraguan Financial Administration System. For this purpose, the installation in the Ministry will be linked with the one in the Central Bank, thus enabling the Ministry to access the external debt database managed by the Central bank since 1985. Nicaraguan computer staff are currently installing the replication mechanism.

Panama: UNCTAD fielded a mission in December 1998 to validate the link with the Panamanian Integrated Financial Administration System, SIAFPA. The mission ensured the correct exchange of data and the good functioning of the link and, which has been developed by staff of the Panamanian Ministry of Planning and the SIAFPA project.

Peru: DMFAS 5.0 was installed in the Ministry of Economics and Finance in June 1998. A three-week training mission took place in July 1998. Preceding the installation, an UNCTAD systems analyst held a technical workshop for MEF staff in Lima to plan the link of DMFAS with the local module, which will produce the payment order. As part of the project, which started in February, the debt data were conciliated under the supervision of a CTA. The project is jointly funded by a Japanese grant, administered by the World Bank and the Government of Switzerland.

Philippines: Almost a year after the former president of the Philippines, Mr. Fidel V. Marcos, inaugurated the new DMFAS room in the Bureau of the Treasury in October 1997 (see above picture), a DMFAS mission installed DMFAS 5.1 in the Treasury and trained the users in the system's



DMFAS mission meets Mr. Fidel Ramos, former President of the Philippines

new functionalities. The three-week mission also participated in the project's Tripartite Review Meeting under the National Economic and Development Authority's (NEDA) chairmanship during which the activities of the extension of this two-year UNDP-funded project were discussed.

Republic of Moldova : DMFAS 5.1 in Russian was installed in the Ministry of Finance in August 1998.

Sao Tome: Two DMFAS missions were undertaken to Sao Tome during 1998, an installation/training mission in May during which the installation of an important single-user upgrade of DMFAS 5.0 was made and in November, when the objective was to finalize the difficult constitution of the debt database. The work of the DMFAS consultants was made easier by the presence of the Debt Relief International debt management advisor, responsible for assisting the Government in preparing the country to qualify for the HIPC initiative.

Uganda: A DMFAS 5.1 installation mission took place in July 1998. The objective of the mission was to carry out the beta testing of the new version. At the same time, the users were trained in the use of the new features, which were utilized to carry out the debt sustainability analysis for the HIPC initiative.

Uzbekistan: The Russian version of DMFAS 5.1 was installed in October 1998 in the Ministry of Finance.

Venezuela: In September 1998, DMFAS 5.1 was installed in the Ministry of Finance of Venezuela. A training seminar took place in October 1998 and a

resident CTA is supervising the establishment of the database. DMFAS will be integrated with the Ministry's Financial Administration system.

Viet Nam: Three missions took place in 1998 in Vietnam. The first, in March, organized a successful debt management retreat for high government officials close to Hanoi which dealt with, among other topics, the drafting of Government decrees for the management of foreign loans and debt payments, the use of government guarantees and proposals

to create a National Debt Council. The second and third missions in May and August concentrated on the further training of officials from the Ministry of Finance in DMFAS 5.0 and on the elaboration, together with the different relevant government agencies and interested donors, of an ambitious and comprehensive new three-year debt management project to commence in 1999 involving all functional aspects of debt management and all interested government institutions.

ASEAN secretariat: At the invitation of the Association of South East Asian Nations (ASEAN), the DMFAS programme undertook a mission to Jakarta to elaborate a draft regional project aimed at establishing an ASEAN broad-based economic monitoring mechanism system. This mechanism is meant to ensure that the region would be alerted at an early stage to potentially destabilizing trends and to allow member countries to adopt preventive policy measures designed to minimize the possibility of future financial and economic crisis. The UNCTAD proposal concentrated on the medium- to long-term objectives of reinforcing the secretariat's capacity to monitor all types of debt flows - both private and public, short- and long-term - into the region, involving all functional aspects of debt management. It has not yet been decided what UNCTAD's role will be in the implementation of this regional project, if any. The mission took advantage of its presence in Jakarta to discuss with government officials the details of the new DMFAS project in Indonesia to be launched in 1999.

DMFAS TEAM UPDATE

DMFAS Central Team

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Ms. Mabel Triguis, Programmer, Ms. Manno Jansen, Programmer, Mr. Dagfinn Vaksvik, Computer Expert, Ms. Jacqueline Booker, Programme Officer, Ms. Gaby Morales, Secretary and Ms. Virginia Bregger, Secretary, left the DMFAS team during 1998. We wish them all a successful continuation of their careers and we would like to thank them for their good work and team spirit they brought to the programme.

Mr. Marcelo Abalos, Programmer, joined the team in June 1998. Mr. Abalos

previously worked in the Ministry of Finance of Argentina and participated in the development of the link between DMFAS and the Argentine Financial Administration system. Ms. Marina Silberman joined the team to replace Ms. Manuela Jander, during her maternity leave. Ms. Silberman previously worked at Arthur Andersen, Buenos Aires, and had accomplished several internships with UNCTAD's technical cooperation programmes.

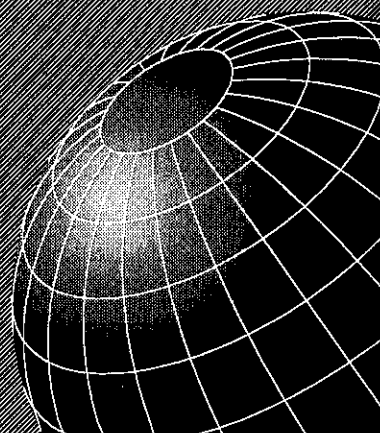
DMFAS consultants

The DMFAS team would like to introduce its consultants and thank them at this point for their collaboration:

Name	Nationality	Name	Nationality
Mr. Rosa Acevedo	Peruvian	Mr. José Flores	Honduran
Mr. Fernando Archondo	Bolivian	Ms. Roula Katergi	Lebanese
Mr. Jorge Alamo	Chilean	Mr. Nguyen Phuoc Don	Vietnamese
Mr. Balliram Babal	Trinidadian	Mr. Elahi Rizwan	Canadian
Mr. Jacques Baert	Belgian	Mr. Marcelo Tricanco	Argentine

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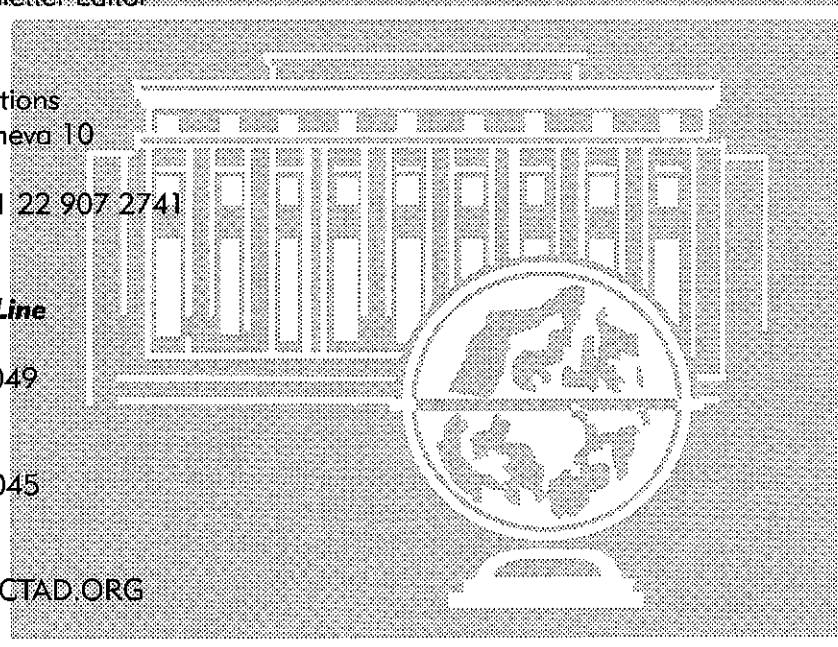
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