# EDIFACT REPORTING OF BALANCE OF PAYMENTS DATA

Lasse Nordquist, Rauno Toivonen
1.9.1994

EDIFACT Seminar, Vienna 30 September 1994

EDIFACT REPORTING OF BALANCE OF PAYMENTS DATA

**Introduction of BOPDIR message in Finland**

## 1. General

In February 1993, Kesko Oy, a large Finnish
wholesale company, and the Bank of Finland entered
into discussions on the introduction of the
EDIFACT standard in the direct reporting of
Kesko's foreign transactions to the Bank of Fin-
land. Later that spring, Kesko and the Bank of
Finland launched a pilot project for the introduc-
tion of EDIFACT reporting of balance of payments
data.

Kesko Oy already uses EDIFACT messages to a large
extent in invoicing, ordering, transport and
customs clearance. The company plans to introduce
the EDIFACT message standard in all its standard
form communications.

The Bank of Finland compiles Finland's balance of
payments. For this purpose, the Bank collects data
on all payments between Finnish residents and non-
residents and conducts surveys covering the major
financial institutions, enterprises and securities
broking firms (Annex 1).

In the Finnish balance of payments reporting sys-
tem the major part of firms' foreign payments
information is reported by the transferring banks.

In the EDIFACT reporting system Kesko daily
transmits an itemized list of all its foreign pay-
ments using the BOPDIR message. Kesko Oy is
therefore the only company in Finland to report
all its foreign payments directly to the Bank of
Finland rather than via a bank. This direct
reporting arrangement is widely used eg in France
and, to a minor extent, in Holland.

However, several hundred firms report information
on netting payments, foreign payment accounts,
foreign assets and liabilities and direct
investments directly to the Bank of Finland.

The BOPDIR message used in the reporting has been developed by the Eurostat/Balance of Payments Working Party/Task Force 3 ('EDI-BOP'). Using this message, non-bank residents can report transactions on resident and non-resident bank accounts, as well as information on foreign assets and liabilities and on BOP-related surveys directly to the BOP compiler. In the Finnish pilot project the use of the message was confined to Kesko's reports on transactions made via bank accounts held with a resident bank. The branching diagram for the part of the BOPDIR message used is shown in Annex 2.

## 2. Project stages

The project was divided into the following stages:

### 1. Definition of the information

The reporting data required by the Bank of Finland was specified in the BOPDIR message. In practice, this meant that the record description used by the Bank of Finland was broken down into the segments and data elements of the BOPDIR message. At the same time, national data requirements and the use of various qualifiers were specified. This stage produced a detailed (national) message implementation guide (MIG) for the BOPDIR message. As this was also the first MIG to be generated for BOPDIR at the international level, this stage was quite time consuming. In addition, the MIG was maintained in both Finnish and English.

### 2. Implementation

A study was made of the necessary investment in equipment and software and the on-line transmission technique to be applied. A fairly simple PC-based EDIFACT translator was acquired by the Bank of Finland. The BOPDIR message was defined to the translator so as to be enable the EDIFACT syntax to be converted to ASCII format. Three persons from the Bank of Finland's data processing department participated in a two-day course arranged by the Finnish EDI software company.

An intermediary program for application of the EDIFACT translator had to be set up at the Bank of Finland. This was done using the MS/Access program. The program converts the translated message to the data format that is used in the Bank of Finland's foreign payments data processing system, which runs on a Unisys mainframe. During this process some checking of the reported information is carried out by the Access program.

As the X.400 data network was already used by Bank of Finland in the transmission of data, no

additional investment was required. Similarly, Kesko already used all the necessary EDI and network technology. Only the message definition had to be made to their EDI translator in accordance with the MIG drafted in the first stage of the project. In addition, the links necessary for the payments data to be reported had to be created between Kesko's ledger systems and the EDI translator.

## 3. Testing software and networks

After installation all the techniques had to be carefully tested. This was first done within the Bank of Finland (and Kesko) and later on using actual reporting data from Kesko.

The first test report was received from Kesko in September 1993. All the techniques seemed to work quite well from the beginning. The problems which arose were connected mainly with the substance of the reporting data (eg date values, country codes or reference numbers were missing or wrongly placed).

Major delays were caused by the changes made by the Task Force to the original BOPDIR message during the test phase. However, many of the changes made were requested by Finland, so we had to accept the delays. At the moment, the message is stable and status 1 will be obtained in September 1994.

## 4: System start-up

The BOPDIR message was taken into production in early June 1994. No problems have been encountered during the time it has been running.

Now that the pilot project with Kesko has been completed, EDIFACT reporting will be offered as an option to other interested Finnish companies and banks during autumn 1994.

# 3. Technical solutions

## 3.1 General

Kesko Oy creates an EDIFACT message and sends it to the Bank of Finland as X.400 mail. In practice, the message is first transmitted through the privately-owned Elisa network to the state-owned Mailnet network, from where it is passed on to the Bank of Finland. At the Bank of Finland, the message is transmitted to the recipient's (pseudo-user's) mailbox. From the mailbox, the message is then read into the user's workstation, where the EDI translator processes it into a file. The program extracts the information required by the

Bank of Finland and the user transmits it to the database of the Bank of Finland's mainframe.

The workflow is described in more detail in Annex 3.

At the Bank of Finland, the system involves some manual operations. The programs and runs require start-up. At the same time the user checks that the transmission takes place and that the data are appropriate. It would be possible to automate these operations, but the manual aspect was preferred for the initial testing stage.

## 3.2 Products used in the project

Except for the translator program, which had to be acquired for the project, all the other products were already being used by the Bank of Finland:

- the X.400 gateway is the OpenServer by Retix,
- the internal mail system is WPmail,
- the connection with Mailnet is the X.25 link,
- the workstation is a 386 PC,
- the translator program is the EDISON EDIFACT modem developed by MultiCom Software, Finland,
- the intermediary program was done using MS/Access relational database management system
- the transmission program for the UNISYS A Series mainframe is PCTCP developed by Ftp Inc.

## 3.3 EDIFACT message security

It was agreed with Kesko not to use any encryption software for the time being, because the encryption program normally used by the Bank of Finland was not suitable. This encryption program is DOS-based while Kesko uses Mainframe/UNIX systems.[1] Moreover, the EDIFACT translator program did not offer any encryption possibilities.

The security aspects will be implemented at a later stage after a general international solution and recommendation has been given by the Eurostat/EDI-BOP Task Force. The technique itself is not considered to be a problem.

---

[1] The Bank of Finland encryption algorithm is DES (symmetric keys). The sender and the receiver are using the same secret key, which contains 8 characters. The Bank of Finland gives the key to the sender. The senders' secret keys and IDs are written in the encrypted key file, which is encrypted with the receiver's own secret key. When an encrypted message is decrypted the receiver only has to know his own secret key, because the decryption program reads the sender's secret key from the key file.

# 4. Project costs

The only direct costs at the Bank of Finland were the acquisition and training costs incurred in connection with the translator program, which totalled some FIM 15 000 (approx. ECU 2 400).

Some three man-weeks (including meetings between the Bank of Finland and Kesko) were spent on clarifying and implementing the message definitions. Learning to use the EDI translator and participating in the EDI course took approximately one man-week.

The development of the necessary intermediary program for application of the EDIFACT translator, together with the related documentation, took approximately five weeks, including the clarification of operating procedures.

The project costs by activity in the Bank of Finland are given in Table 1 (see also Annex 4). The project costs and time spent on different stages in KESKO Oy are shown in Annex 5.

Table 1: **Project costs (concerns the Data Processing Department of the Bank of Finland):**

| Activity | Stage | Hours |
|---|---|---|
| Write User Implementation Guidelines (Finnish & English versions)  *) | I | 150 |
| Select Communications Method | II | 20 |
| Software Functional Specification | II | 70 |
| Install/Develop/Test Software | II | 120 |
| Set up & Document User Procedures | II | 30 |
| EDIBOP User Training | II | 25 |
| Test | III | 65 |
| Pilot EDI Exchanges | III | 10 |
| Review progress | III | 30 |
| Revise systems **) | III | 80 |
| TOTAL | | 600 Hours |

Internal price/h 370 FIM: 370 * 600 = 222,000 FIM
EDI Translator incl. training        =  15,000 FIM
                                     ---------------
                                        237,000 FIM
                              (= approx. 40,000 ECU)

---

*) The original structure of the BOPDIR message changed constantly during 1993, in addition to which the MIG was maintained in two languages.

**) Initially, a DOS-version a of the intermediary application between the EDIFACT translator and the Data System for Foreign Payments was developed. The application was later transfered to Microsoft Access, because the user interface in the Bank of Finland was changed to Windows.

## 5. Experiences and future plans

KESKO Oy

The main advantage of EDIFACT reporting to Kesko is the savings in bank charges that arise when payments are transmitted abroad through a bank in the form of a lump sum rather than as several individual payments.

With the extension of EDIFACT to Balance of Payments reporting, Kesko is one step closer to a complete changeover to EDIFACT communication. Kesko already uses EDIFACT for ordering, invoicing, transport and customs clearance; it plans to implement EDIFACT in payment orders in autumn 1994. For a big firm, this kind of automation of routines means major cost savings in the long run.

Bank of Finland

The main reason for initiating the project was to gain experience of EDIFACT in general and the techniques used in this kind of communication. The project offered a good opportunity for this in collaboration with a highly experienced partner. Further, it was foreseen that the total costs would be fairly small.

The EDIFACT arrangement with KESKO will, however, increase the number of stages involved in receiving reports at the Bank of Finland. There are plans to automate the process of receiving and processing the data. These operations are considered to be the bottlenecks of the system, especially saving messages from mailboxes.

In the future, an EDIFACT management program could be used which could transfer processed message files to the application server. The application at the Bank of Finland could be executed say once an hour, prompted by the operating system's timer. The application could transfer the formatted input file to the mainframe using the File Transfer Process (TCP/IP). Investments of this kind would, however, require far more communication in EDIFACT format to be worthwhile.

Following the successful test with Kesko Oy, it is planned to offer the EDIFACT reporting method to other companies as well. At the moment, there are approx. 50-100 enterprises that can be regarded as potential EDIFACT reporters in the future. The promotion will take place during 1994 and 1995. The reporting banks will also be informed of the new technique.

From the beginning of 1995, the Bank of Finland will start reporting aggregated balance of payments data to Eurostat (EU statistical central office) in EDIFACT form. This comunication method will also be studied in connection with IMF and BIS reporting.
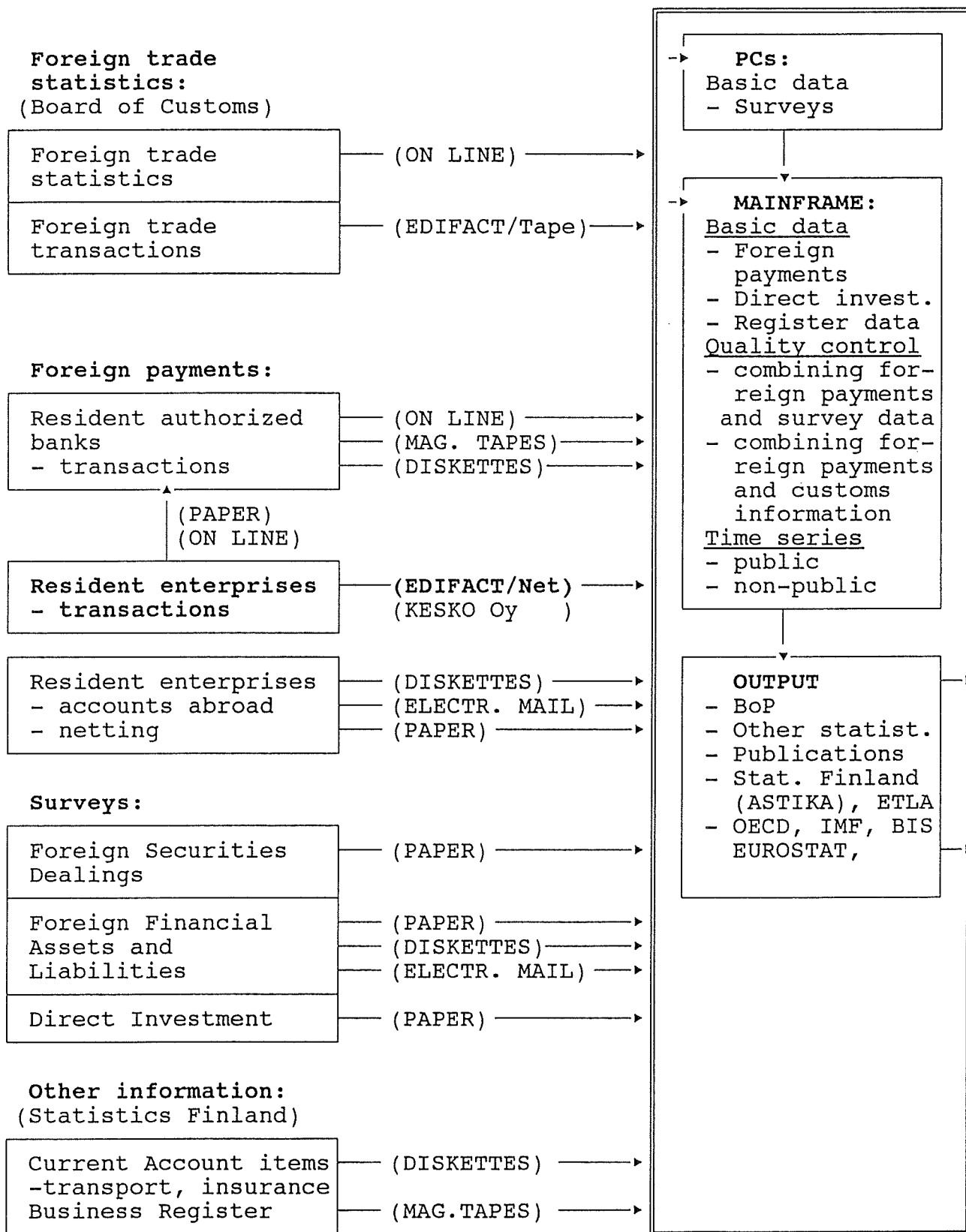
**For further information, please contact**

Mr. Lasse Nordquist
Bank of Finland
Information Services Department
P.O.Box 160
FIN-00101 HELSINKI, Finland
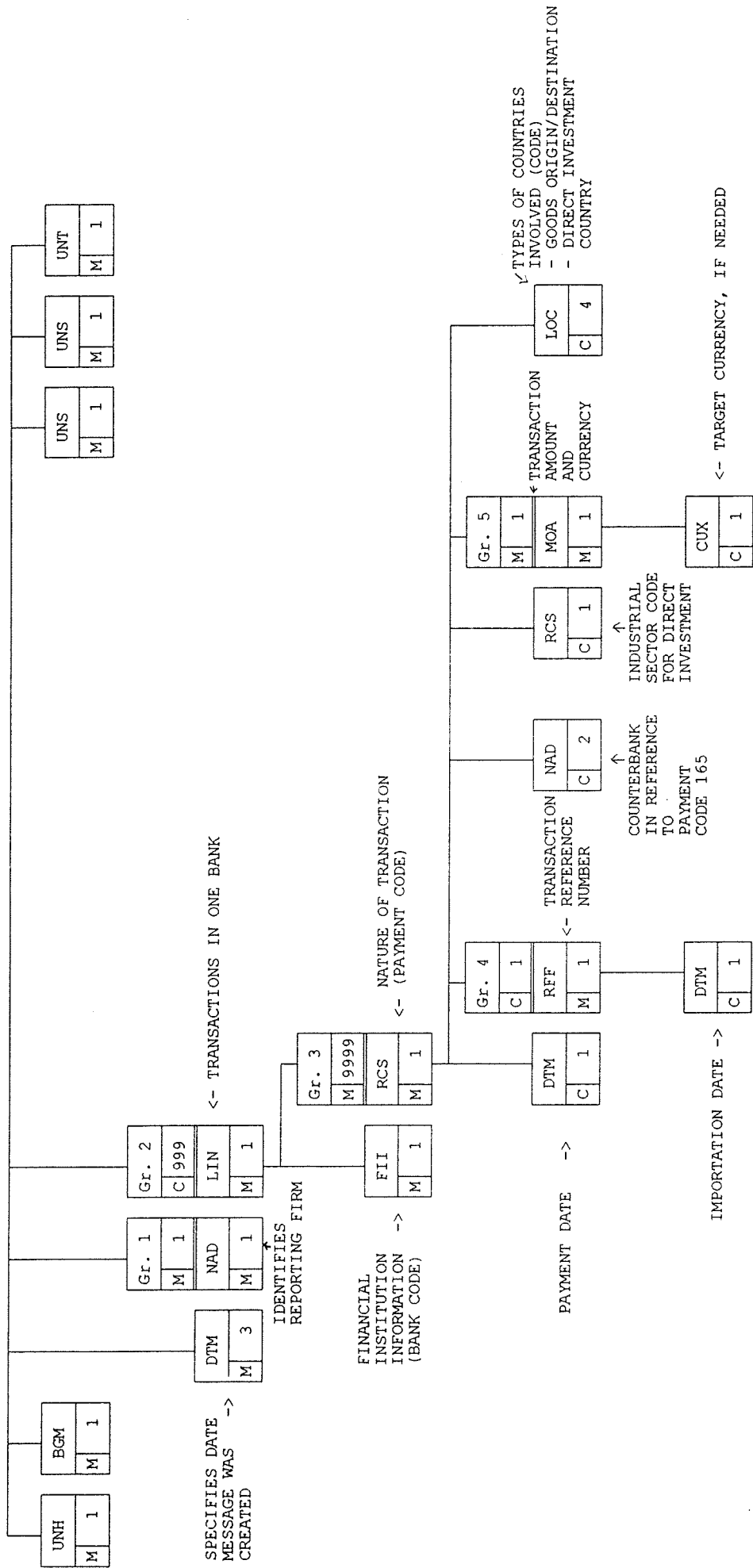 phone: + 358 0 183 1
 fax:   + 358 0 662 546

Mr. Osmo Marttila
KESKO Oy
Information Communications
Kruunuvuorenkatu 4
FIN-00160 HELSINKI, Finland
 phone: + 358 0 198 289 9
 fax:   + 358 0 665 628

**BALANCE OF PAYMENTS REPORTING FLOWS, GENERAL DESCRIPTION:**

**BANK OF FINLAND**
Information Serv. Dept.

**Foreign trade statistics:**
(Board of Customs)

| Foreign trade statistics | — (ON LINE) ——————► |
| Foreign trade transactions | — (EDIFACT/Tape)——► |

PCs:
Basic data
- Surveys

MAINFRAME:
Basic data
- Foreign payments
- Direct invest.
- Register data
Quality control
- combining for-reign payments and survey data
- combining for-reign payments and customs information
Time series
- public
- non-public

**Foreign payments:**

| Resident authorized banks<br>- transactions | — (ON LINE) ——————►<br>— (MAG. TAPES)———►<br>— (DISKETTES)———► |

(PAPER)
(ON LINE)

| **Resident enterprises**<br>**- transactions** | —(EDIFACT/Net) ——►<br>(KESKO Oy    ) |

| Resident enterprises<br>- accounts abroad<br>- netting | — (DISKETTES) ——►<br>— (ELECTR. MAIL) —►<br>— (PAPER) ———► |

OUTPUT
- BoP
- Other statist.
- Publications
- Stat. Finland (ASTIKA), ETLA
- OECD, IMF, BIS EUROSTAT,

**Surveys:**

| Foreign Securities Dealings | — (PAPER) ———► |

| Foreign Financial Assets and Liabilities | — (PAPER) ———►<br>— (DISKETTES)———►<br>— (ELECTR. MAIL) —► |

| Direct Investment | — (PAPER) ———► |

**Other information:**
(Statistics Finland)

| Current Account items<br>-transport, insurance<br>Business Register | — (DISKETTES) ——►<br>— (MAG.TAPES) ——► |

# BRANCHING DIAGRAM (BOPDIR, FINLAND, 9 August 1994)

UNH 1 / M

BGM 1 / M

UNS 1 / M

UNS 1 / M

UNT 1 / M

DTM 3 / M — SPECIFIES DATE MESSAGE WAS CREATED ->

Gr. 1 1 / M — NAD 1 / M — IDENTIFIES REPORTING FIRM

Gr. 2 C 999 / LIN 1 / M — <- TRANSACTIONS IN ONE BANK

FII 1 / M — FINANCIAL INSTITUTION INFORMATION (BANK CODE) ->

Gr. 3 M 9999 / RCS 1 / M — NATURE OF TRANSACTION <- (PAYMENT CODE)

DTM C 1 — PAYMENT DATE ->

Gr. 4 C 1 / RFF 1 / M — TRANSACTION REFERENCE NUMBER <-

NAD C 2 — COUNTERBANK IN REFERENCE TO PAYMENT CODE 165

RCS C 1 — INDUSTRIAL SECTOR CODE FOR DIRECT INVESTMENT

Gr. 5 M 1 / MOA 1 / M — TRANSACTION AMOUNT AND CURRENCY

LOC C 4 — TYPES OF COUNTRIES INVOLVED (CODE)
- GOODS ORIGIN/DESTINATION
- DIRECT INVESTMENT COUNTRY

DTM C 1 — IMPORTATION DATE ->

CUX C 1 — <- TARGET CURRENCY, IF NEEDED

# TECHNICAL IMPLEMENTATION OF THE BOPDIR PILOT PROJECT AT THE BANK OF FINLAND
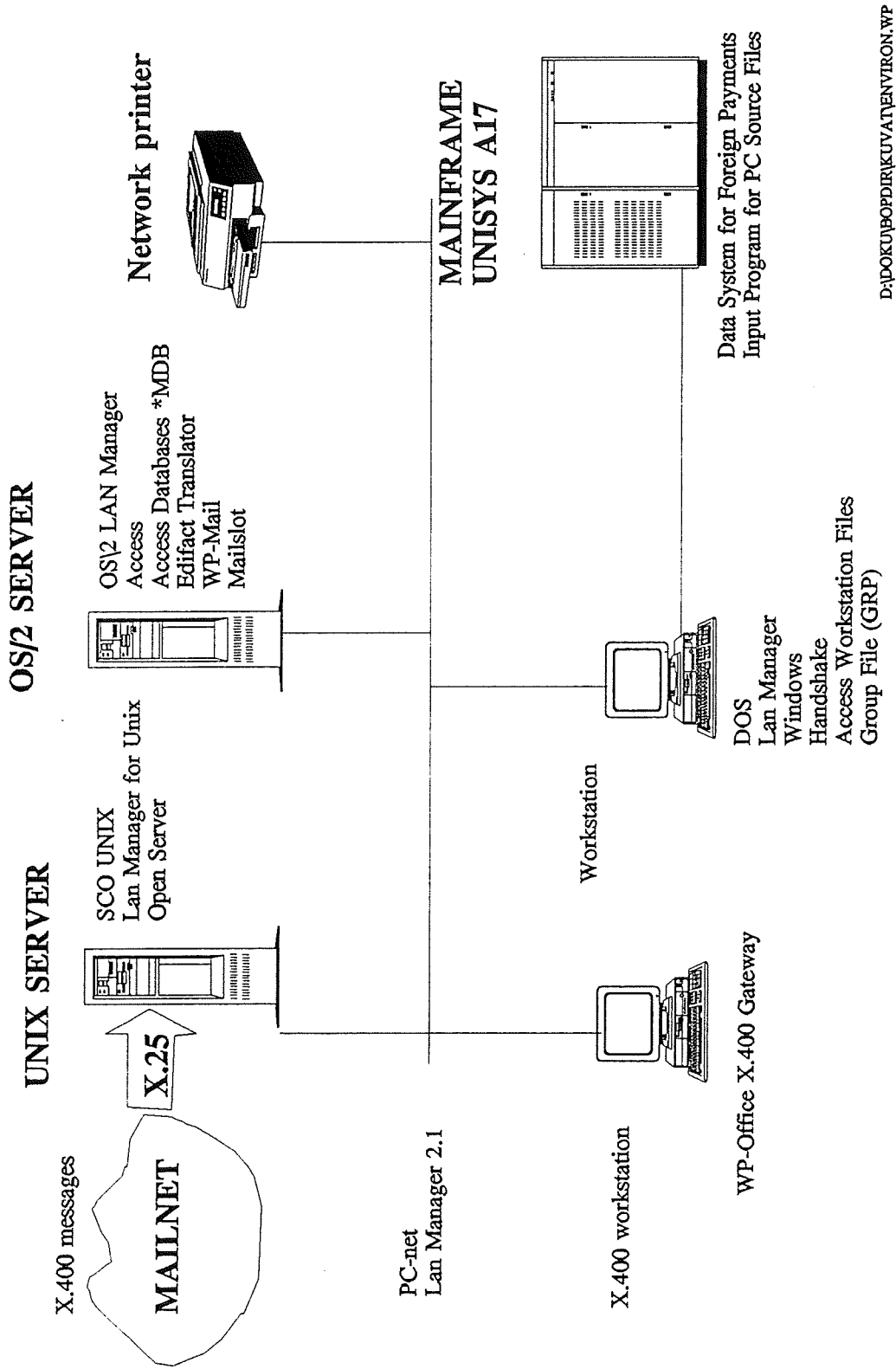
## OVERVIEW OF COMMUNICATIONS
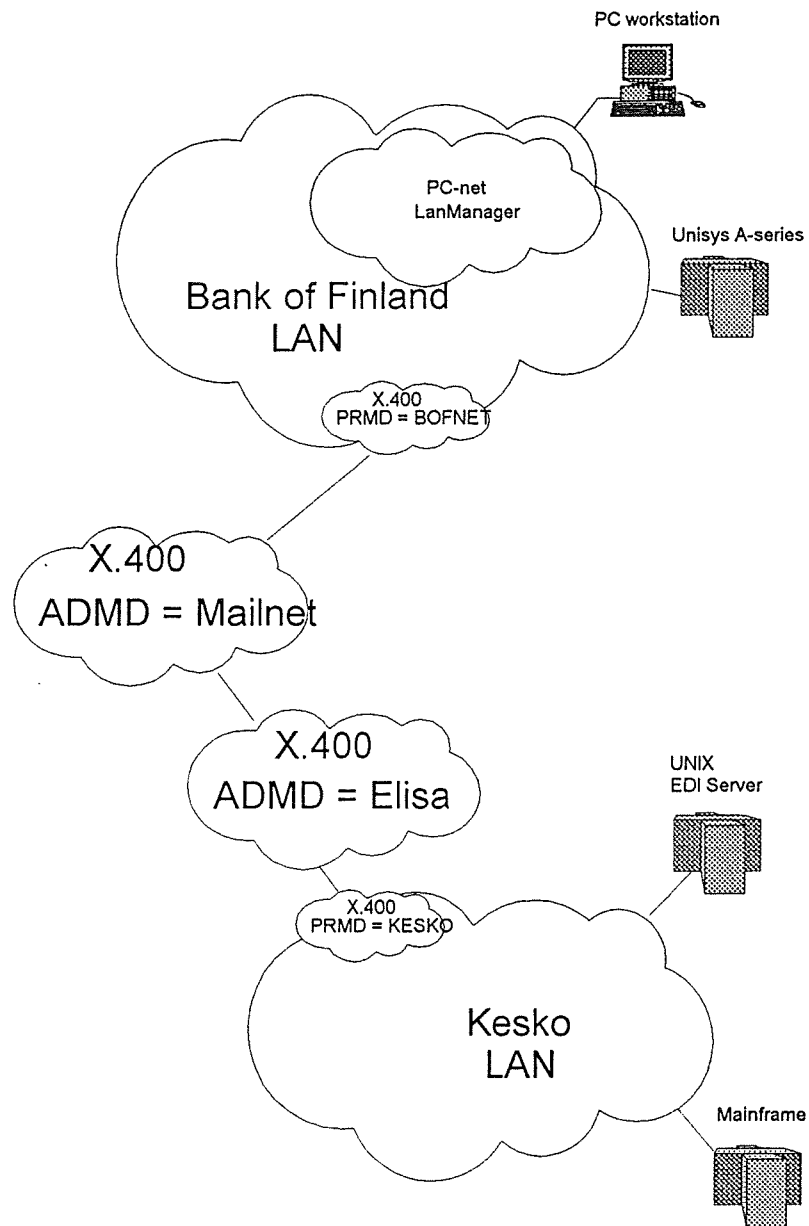


ADMD = Administration Management Domain
PRMD = Private Management Domain (part of X.400 Address)

Bank of Finland
Data Processing Dept.
Rauno Toivonen                          9.8.1994
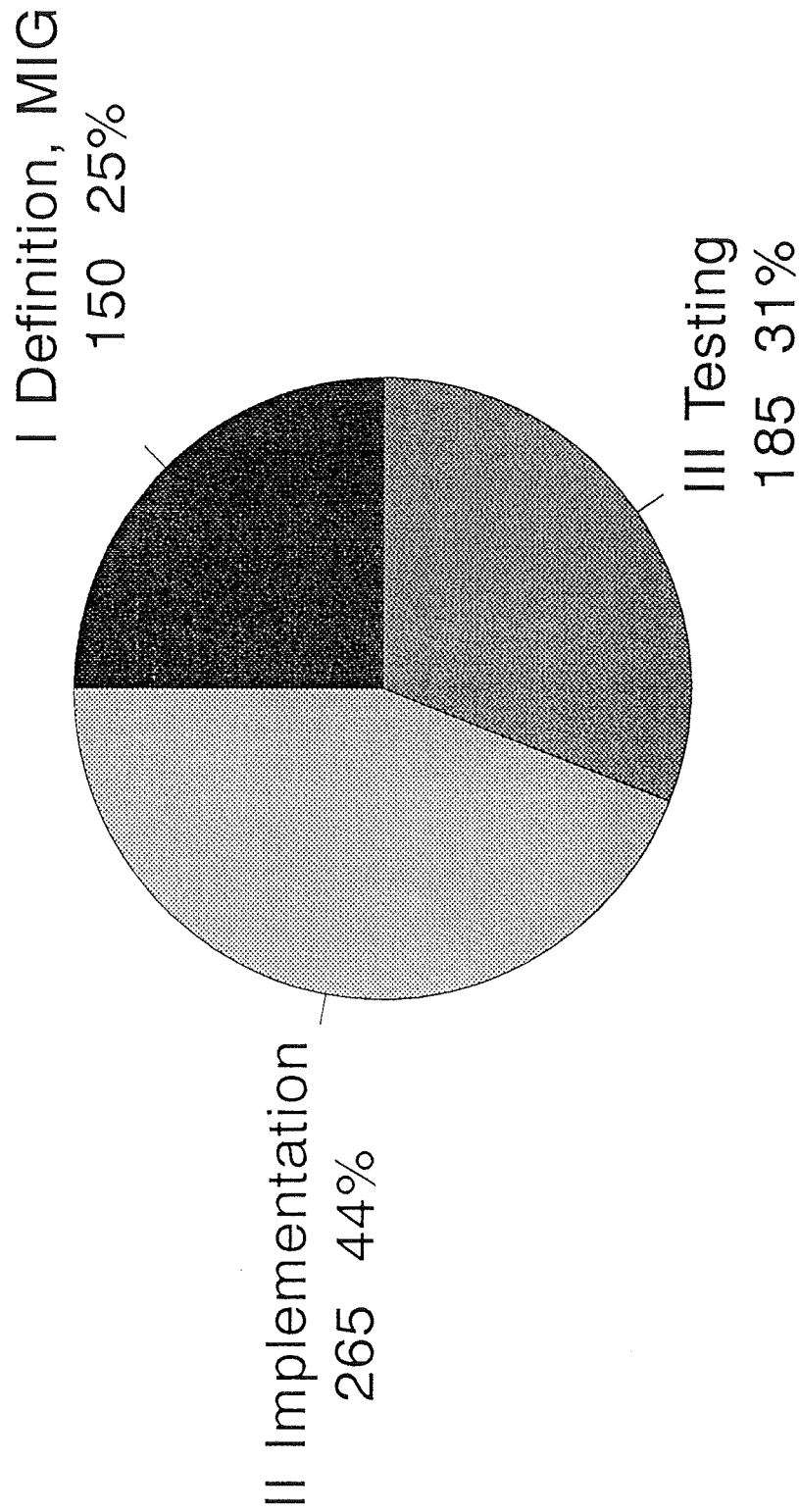
**EDIFACT WORKFLOW AT THE BANK OF FINLAND (see diagrams)**

1) KESKO (the reporting firm) generates an input file for the EDIFACT translator from its own system (Mainframe). The UNIX EDI server creates an EDIFACT message from the input file. The EDI server sends the message as an X.400 transmission through the ELISA network. ELISA is a public e-mail network, which is maintained by the local telephone companies. Kesko sends messages daily.

2) The message is transmitted from the ELISA network to MAILNET. MAILNET is maintained by a state-owned tele-operator (TELE). The Bank of Finland has an X.25 link to MAILNET. The message is transmitted from MAILNET to the recipient's mailbox. The Retix Open Server program handles X.400 communications. The SCO UNIX server is dedicated for this purpose. The SCO UNIX machine is connected to the local area network (Microsoft's Lan Manager 2.1) with Lan Manager for Unix. WordPerfect Corp's Windows-based e-mail, ie WP-Mail, is used in the Bank of Finland. WordPerfect's X.400 Gateway product is in the dedicated workstation. The program reads the files made by the Open Server program and converts them to the WP-Mail format. The X.400 Gateway program also converts the X.400 address to the WP-Mail address.

3) The user saves messages once a week from the mailbox for the application server. E-mail messages are deleted after two weeks.

4) The user starts the MS/Access application and selects the messages to be transferred to the database. All saved messages are processed. Access is a Microsoft relational database management system for Windows. The application is in the OS/2 server. Only the application group file and Access workstation files are in workstations.

5) The Access application starts the EDIFACT translator with the message file. The message file is then translated to the ASCII file in the server. The EDIFACT translator is EDISON, made by Multicom of Finland. If there are any errors in the message, the translator does not write the output file. The EDIFACT translator also writes a log file from the translation process. If no errors occurred, the Access application does other checking (Reporting firm's ID is valid etc.) and writes the data in the Access database. The application then deletes the processed message file.

6) The Access application then formats the information for the input program for PC source files, which are part of the Data System for Foreign Payments (UNISYS mainframe). The source file format is general for all PC information sources. The user starts the input program, which reads the information into the mainframe database.

TECHNICAL ENVIRONMENT AT THE BANK OF FINLAND

UNIX SERVER

OS/2 SERVER

Network printer

MAINFRAME
UNISYS A17

X.400 messages

MAILNET

X.25

SCO UNIX
Lan Manager for Unix
Open Server

OS\2 LAN Manager
Access
Access Databases *MDB
Edifact Translator
WP-Mail
Mailslot

Data System for Foreign Payments
Input Program for PC Source Files

PC-net
Lan Manager 2.1

Workstation

DOS
Lan Manager
Windows
Handshake
Access Workstation Files
Group File (GRP)

X.400 workstation

WP-Office X.400 Gateway

D:\DOKU\BOPDIR\KUVAT\ENVIRON.WP

# BOPDIR pilot project in Finland

## Time spent on different project stages, hours

### Bank of Finland

I Definition, MIG
150  25%

III Testing
185  31%

II Implementation
265  44%

Total time spent 600 hrs.

bop_hour/ln 24.8.1994

# BOPDIR pilot project in Finland
## Project Costs, ECU
### Bank of Finland

Definition, MIG
9400 24%

Investments
2400 6%

Testing
11600 29%

Implementation
16600 42%
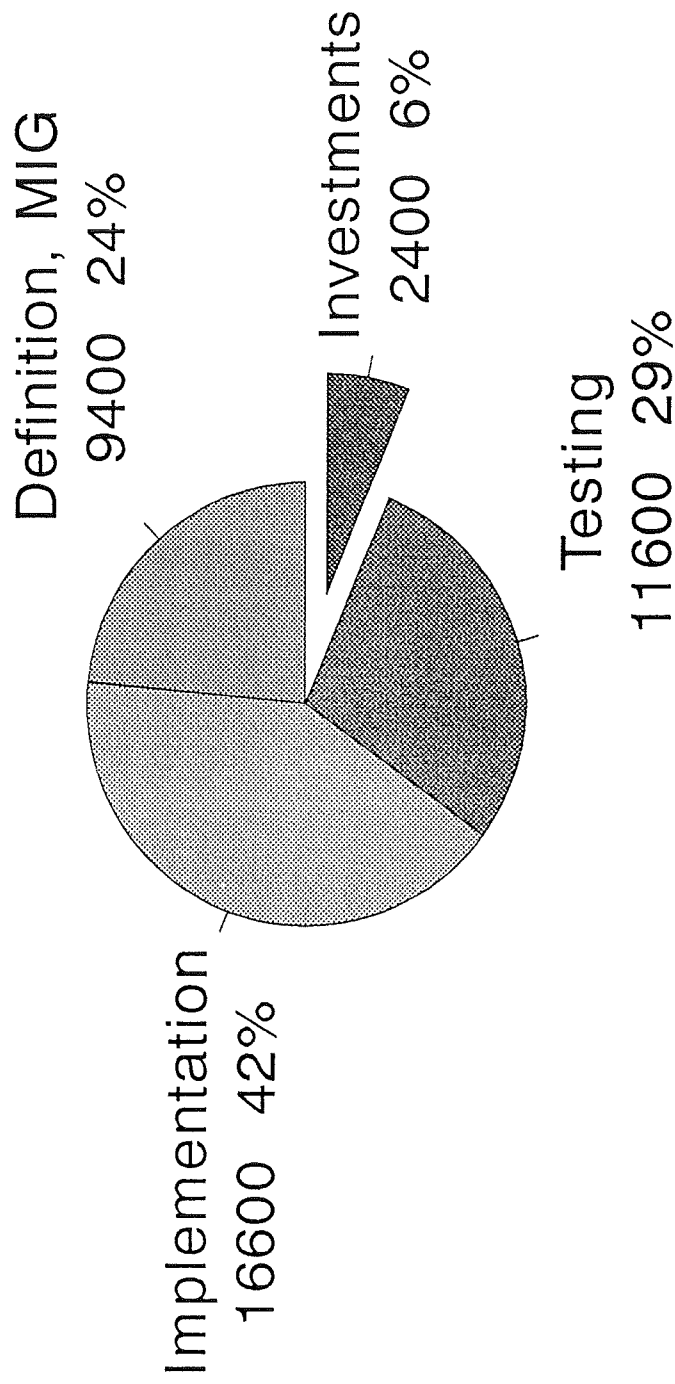
Total cost ECU 40 000

bop_ecu/ln 24.8.1994

# BOPDIR pilot project in Finland
## Time spent on different project stages, hours
### KESKO OY

Negotiations
30  17%

Definition
8  4%

Testing
20  11%

Implementation
120  67%
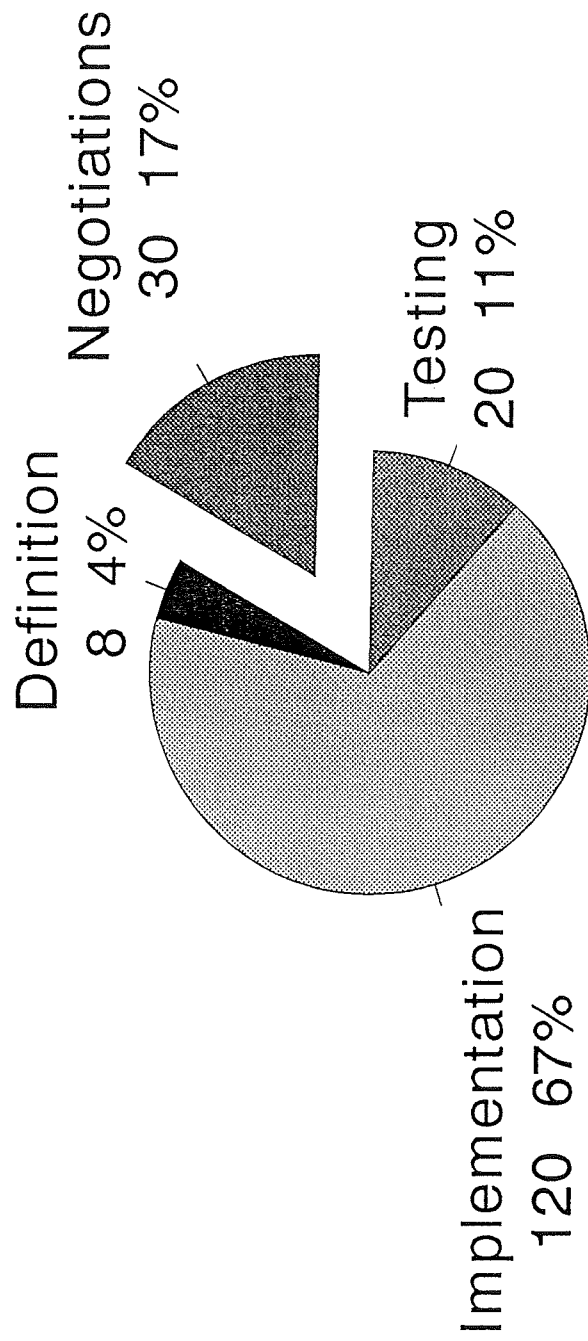
Total time spent 180 hrs.

bop_hou1/thl  24.8.1994

# BOPDIR pilot project in Finland
## Project costs, ECU
### KESKO Oy

Negotiations
2 000  17%

Testing
1 400  12%

Definition
600  5%

Implementation
8 000  67%
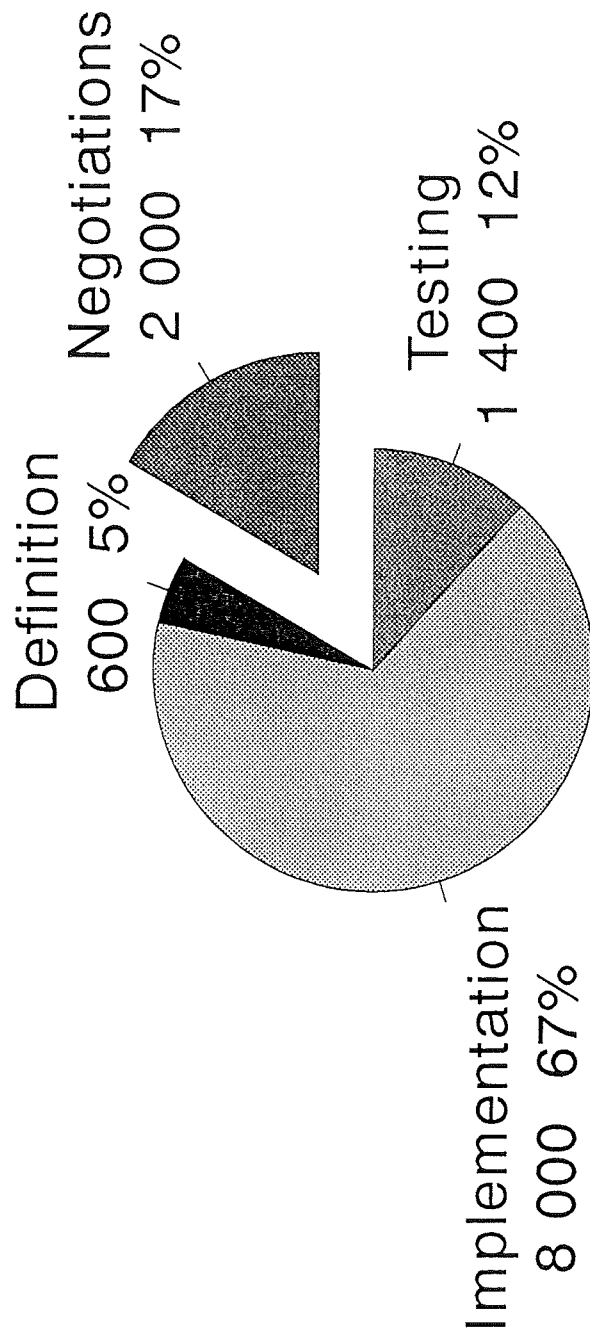
Total costs ECU 12 000

bop_ecu1/thi 24.8.1994

BOPDIR pilot project in Finland

Background information

* Project start in April 1993

* Partners: KESKO Oy and Bank of Finland

* KESKO is leading wholesale company in Finland

- Turnover FIM 26 bill. (ECU 4.2 bill.)

- Much experience of EDIFACT

* Bank of Finland compiles the balance of payments

* BOPDIR developed by EDI-BOP task force

* Only part of the message used

# BOPDIR pilot project in Finland

## Project stages

1. Definition of the information

2. Implementation

3. Testing software and networks

4. System start-up

# BOPDIR pilot project in Finland

## Stage 1: Definition of the information

* What to report

* Relation between BoF record description and BOPDIR

* What part of the message to use
* MIG (Finnish & English versions)
* Modifications to BOPDIR, MIG

# BOPDIR pilot project in Finland

## Stage 2: Implementation

* Investment in equipment

* Select communication methods

* Software functional specification

* Install/develop/test software

* Set up & Document user procedures

* User training

# BOPDIR pilot project in Finland

## Stage 3: Testing

* Testing software and networks

   * Pilot EDI Exchanges

      * Reviewing progress

         * Revising systems

# BOPDIR pilot project in Finland

## Stage 4: System start-up

* BOPDIR was taken into daily use in June 1994

 * No problems

 * Pilot successful

BOPDIR pilot project in Finland

Experiences

KESKO:

- Savings in Bank charges
- Changeover to EDIFACT

BANK OF FINLAND:

- Good Experience of EDIFACT
- Manual operations exists
- Automation in the future if more partners

bop_expe/ln 24.8.94

## BOPDIR pilot project in Finland

### Future plans

KESKO:

\* Implementation of Payment order (PAYORD)

BANK OF FINLAND:

\* Promotion to other potential users in 1994-1995

- Direct reporting Enterprises
- Banks (?)
- EUROSTAT, (IMF)