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Topic III: Innovations in data collection and exchange

**ELECTRONIC DATA INTERCHANGE (EDI) METHODS IN DATA COLLECTION**

**Contributed paper**

Submitted by the Hungarian Central Statistical Office<sup>1</sup>

**I. INTRODUCTION**

1. State management, industrial, commercial, financial and international organisations often turn to the results of statistical data processing in the process of decision making. Statistical data processing can provide an accurate picture of social and economic progress only if they rely on a large number of reliable and new input data. The data collection and dissemination of the custom tailored data are almost impossible to carry out by means of the classical data collection and forwarding methods.

2. Even though progress in communication has made it possible to link the data collection, processing and forwarding systems to accelerate the data exchange, uniform rules had to be established concerning data interchange between partners. The standardisation process aims to create a set of electronically forwarded standard documents, to facilitate both national and international electronic data interchange (EDI).

3. In the Hungarian Central Statistical Office (HCSO), the development of EDI began in 1997, as a result of which three different software products may be used for sending and receiving electronic messages in the institute. Two of these have been operating already for more than a year as a subsystem of live applications.

4. The purpose of this paper is to give a brief overview of the operational systems in HCSO which have EDI as a subsystem, and the intentions to adapt the EDI centre to the needs of HCSO based on operating experience.

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## II. THE EDI-BASED DATA COLLECTION AND FORWARDING METHODS OF HCSO

5. The current applications of HCSO operating on an EDI basis use various methods and systems both for data collection and for data transfer. An outline of the essential characteristics of the three systems which have been taken into account in the development of these systems is provided below.

6. For messages in the **Mandatory Private Pension Fund System (MPPF)**, special care has been paid to:

- verification by the sender,
- encryption before sending to a communication network,
- archiving prior to processing,
- traceability of processing.

The system contains an EDI client software on the data-suppliers' side.

7. For the managing of **UN/EDIFACT RDRMES based statistical data (EDISC)**, it has been a fundamental requirement that:

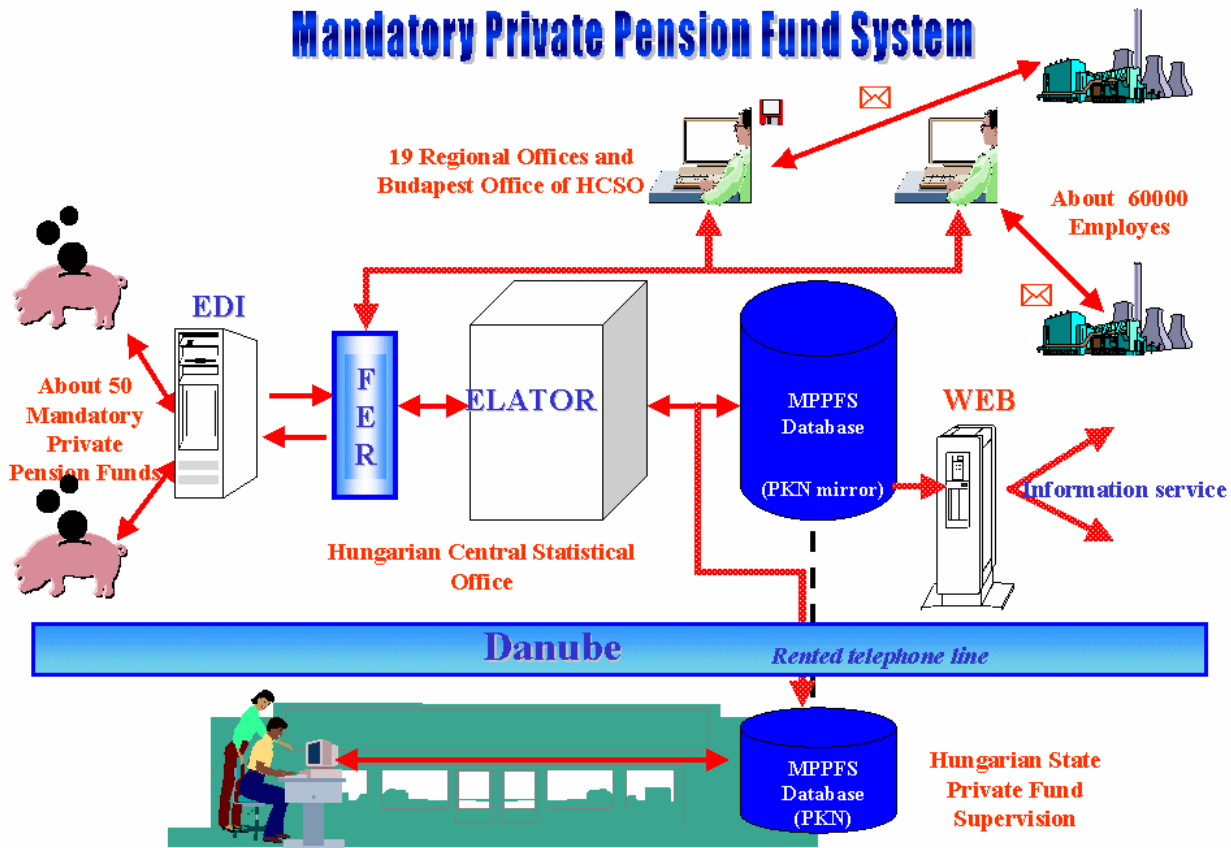
- the developed system be generally applicable for preparing statistical reports,
- the data providing environment should not be modified for the annual modification of the statistical reports or when including a new report in the system,
- those clients who do not possess their own EDI system can still forward the data obtained from their internal system,
- sending EDI messages be possible in more than one way (X400, direct line connection).

8. In a **Statistical EDI pilot project (SEPP)**, following discussions, the data exchange was based on a method in which:

- the structure of tables involved in data exchange is invariably determined by the sender,
- the type identification of the table is unambiguous both for the sender and the recipient.

### II.1 Mandatory Private Pension Fund System (MPPFS) [1]

9. MPPFS operates as a data collection and forwarding system. By appointment of the Hungarian State Private Fund Supervision (HSPFS), the HCSO processes the messages received in an EDI form from the MPPF and in electronic form through the national institutional network of HCSO from the employers, and forwards them to the processing system (PKN) of HSPFS. The answers to the processed messages are sent back to the MPPF as EDI messages. The system is built as follows:



10. One of the data collection channels of the system is an EDI-based data providing system, which collects 5 different types of messages containing more than 2 million EDIFACT compatible messages from 50 data providers.

11. The EDI system consists of the EDI client software installed at the data provider, the registration server performing the automatic version tracing and configuration, the FTP server providing the files for version control and exchange of encryption keys, the mail server receiving and sending the data, the EDI server processing the message and of the encryption key managing server.

12. The messages received on the EDI line are archived in original form following the removal of encryption, and the processing of the data in the messages begins. Following checks in the Supervisory Unit (FER) the data are forwarded by FER to the ELATOR (database) system. The final checks and processing of the data are done in the system (PKN) of the HSPFS. The faulty data are returned in the form of EDI data to the sender of the message.

13. In the operation of the system, the forms provided by the employers for regional offices of HCSO are on paper or on floppy disk. The regional offices of HCSO forward these data in electronic form, through the national network of HCSO to the Supervision Unit (FER) of the system. This data collection channel will be easily integrated into the future EDI centre of HCSO.

## II.2 Statistical data collection based on UN/EDIFACT RDRMES [2]

14. The need for big data providers in Hungary to send statistical data in electronic form as an EDI message has ever more frequently emerged. Data collection is carried out by means of the EDI system of HCSO created for statistical data collection, according to the UN/EDIFACT RDRMES standard recommended and adopted by the

UN and by the RDRHUN subset taking into account the special needs of Hungarian statistical data collection. The system receives monthly and quarterly statistical reports from three big data providers.

15. The data collection process is essentially the following:

- ♦ The data providers enter or import their data in the Excel files received from the HCSO, or if they have their own EDI system, then they prepare the module implementing the RDRMES based statistical data service.
- ♦ If these data are entered in an Excel file, then an EDI conversion program converts the data into a standard EDI message.
- ♦ Through a communication channel (X400 provider) the message is sent to HCSO.

In the event that a possible annual modification of statistical reports or a new report is included in the system, HCSO will hand out a new Excel file for the data provider with a new structure, but with a different content for each report.

### II.3 GESMES/ECOSER messages [3]

16. In the third EDI application, HCSO emerges as primarily a data provider. The system works as a pilot system in two outstanding areas:

- ♦ Domestic EDI based data exchange between National Bank of Hungary (NBH) and HCSO for some statistical time series.
- ♦ EDI based data provision for international statistical institutions (EUROSTAT, UN).

17. Within the framework of the pilot project, the domestic data exchange employs the GESMES/ECOSER standard developed for UN/EDIFACT standard statistical data communication. The time series chosen in EDI form are tables containing aggregated statistical data available in electronic form in the statistical information system STADAT of HCSO.

18. At the international level, HCSO publishes data for EUROSTAT in the quarterly PRODCOM table which is suitable for sending quarterly industrial statistics data.

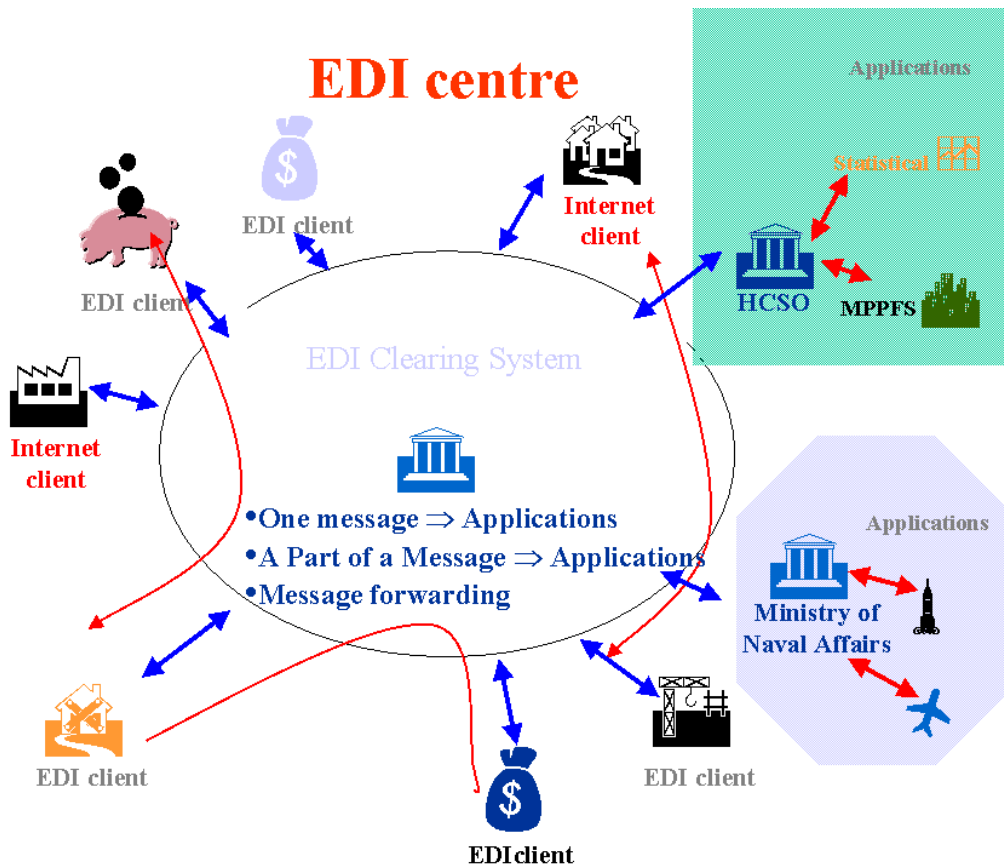
19. With a view to increasing participation of Hungary in the exchange of data of European institutions, the third application provides the greatest impetus for making uniform and developing the EDI applications in HCSO, and ensuring that the Office can work as an EDI centre in the coming years.

### III. EDI DEVELOPMENT PLANS

20. From the experience gained in the management of the applications already operating in HCSO, and from the ever growing use of electronic data exchange, we may draw the conclusion that EDI development in HCSO must be carried out within a unique system.

21. Almost all requirements from the system to be designed can be found in the working systems (EDIFACT standard, authentication, encryption, safety, client software, collaboration with other EDI systems etc.). Hence from a methodological point of view, the methodological solutions to be found in the existing systems can be taken over, with very little change, to the new system. The way in which the new system must differ is that it should be capable of receiving, processing and forwarding any kind of data, and should be able to manage a safe, controllable data communication among the data providers, the HCSO and the institutions receiving the raw or processed data.

22. The structure of the future EDI system is presented in the figure below.



### III.2 General requirements

23. The general requirements for the system are that:

- ◆ It must be based on UN/EDIFACT standards;
- ◆ It should ensure the authenticity, safety and secrecy of EDI messages;
- ◆ Users of electronic data communication should smoothly change to the new system;
- ◆ It should be capable of cooperating with other standardised EDI systems;
- ◆ It should be possible to integrate it in the internal electronic data processing system of HCSO;
- ◆ It must possess client software.

### III.3 Requirements for the server software

24. The server side of the future EDI system plays a significant role in the management of the system. In the following list we indicate only the most important parts which are indispensable for the future EDI role of the centre.

- The server software, using the computation-technology facilities of HCSO, must run in a UNIX environment, based on an ORACLE database.
- The communication interface must be separate, should manage several kinds of communication protocols, should be able to send and receive messages at least according to the SMTP; X400 and HTTP protocols.

- It should provide data communication via the Internet, because the smaller data providers and customers use a special centre for EDI and the information can be sent and received most conveniently through this channel. In this context, the system must yield registration and acknowledging functions.
- It should collaborate with the communication servers of the local network.
- It should have a register independent of the EDI server about the users of the system.
- On the initiative of the user, the authentication and encryption procedures should work automatically.
- The transit messages and their logging information should be archived automatically.
- The system should be inspected regularly. A given message should be traced from the moment it enters the system through to when it exits in the application.
- The system should be easily extended with new kinds of messages.
- The system should be endowed with EDI clearing functions, that is, the system should receive data not pertaining to HCSO, and it should forward these data to the recipient.
- Remote managing of clients should be available.
- For the various users a programme administering and supervising the full system and an administration interface is required.
- Since the system can link to electronic business via the Internet (data provision for the business sphere) the system must support accounting with users.
- Finally it should be suitable for preparing statistics on the turnover of the system.

#### **III.4 Requirements for the client software**

25. If an institute running the EDI centre wants the largest possible number of users to draw on their services, it should be capable of offering an EDI client programme for users turning to the centre with an 'average requirement'. In addition to the requirements of the central server, the requirements of the client software are as follows:

- It should be easy to install.
- It should support automatic registration, software updating from the centre, encryption, data compression and introduction of new message types.
- It should support conversion between in-house files and EDIFACT-standard messages (syntax check, testing, amendments).
- It should support sending, viewing, editing and verifying for the authorised user.
- Messages can be sent both from the screen and from batch files.
- Messages can be unambiguously identified and traced in the system.
- The answers to the messages sent can be received from the server or by requesting the sent messages.

26. The list of general, server and client requirements can never be complete, since the growth of customer demand, technological and information changes can bring methodological changes indispensable for the operation satisfying both the operators and the users.

## References

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