Web-forms for Intrastat

Preface

This book has been produced within the framework of the EDICOM programme[1]. It surveys the web-forms, currently operational or soon to be released, which can be used to make Intrastat declarations. Our objective in writing it has been to spread the knowledge which has been acquired in a few administrations through the experience of developing web-forms for Intrastat, so that other administrations might benefit.

The book describes in some detail the different systems developed, but also tries to draw out the similarities and differences between them and to identify the lessons which can be learnt from these experiences.

We hope the book will be of interest to anyone who is concerned with the collection of raw data for statistical purposes. It should also be of interest to anyone who is concerned with how the new technologies of the internet and the World Wide Web can be used for the mutual benefit of the public and administrations. But it should be of particular relevance to those who are involved in Intrastat, and to those who are planning to develop a web-form for data collection.

Acknowledgements

This book has been written after interviews with Jon Walmsley and Kevin Price, HM Customs and Excise, for the UK; Pekka Tanhua, Tullihallitus, National Board of Customs, and Marcus Gustafsson and Hannu Pelkonen, Finland Post Ltd., for Finland; and Antoine Egea, Direction Générale des Douanes et Droits Indirects, for France. The chapter describing the German system was provided by Fritz Pfrommer, Statistisches Bundesamt.

We are very grateful to them for their contributions of time and effort, not only during the interviews, and in the case of Herr Pfrommer the drafting of a chapter, but also in quality reviewing drafts of the document. However, we must point out that any faults remaining are our responsibility.

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[1] Council Decision 96/715/EC of 9 December 1996 on inter-administration telematic networks for statistics relating to the trading of goods between Member States (EDICOM). OJ L 327, 18.12.1996, p. 34.

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Introduction

Ever since the introduction of Intrastat on 1 January 1993 there has been pressure to increase the number of declarations made electronically. Electronic data capture seems to offer advantages to everyone involved. For the declarant it is faster, and therefore cheaper, while the tools used can also make the job easier by giving look-up tables, checking the data input, and so on. For the administration it can improve the accuracy of the data received and reduce the cost of capturing the data by eliminating traditional data keying.

Until recently the tools available to declarants for electronic declaration fell into two categories. In the first were the stand-alone packages, distributed to them on CD or diskette, which they installed on their PC and which would produce an Intrastat declaration which they could then send electronically to the administration. In the second were modules integrated into business management software which would help them complete the declaration partly from data already held in their business systems.

The recent boom in internet usage by both administrations and the commercial world has opened the door to a new possibility – the use of web-forms. A number of administrations have already started work to provide electronic forms on the internet which traders can use to make their Intrastat declarations. This book surveys the systems currently available or soon to become available (as at December 1999). Our objective in writing it has been to spread the know-how acquired by the administrations who have already done some work in this area so that others who are thinking of doing something similar can see what is possible, what works well and what response they might expect from the users.

Structure of the book

The core of the book consists of the four chapters describing the Intrastat web-forms developed in the UK, Finland, Germany and France. Although there are four chapters, five systems are described because two systems are under development in France. The order of the chapters reflects the order in which the systems became, or will become, operational.

Each chapter describes the various aspects of one of the systems. They are looked at from the different points of view of the user and the administration, and the technical and project management aspects are also considered. We have given an assessment of the take-up and the cost/benefit of the systems, and have identified lessons learnt where this is possible. Immediately following the core chapters there is a Summary Table, which presents the basic details of the systems to assist comparison.

The next chapter describes an experiment in which an electronic Intrastat form was developed using XML. XML is widely thought to be the future for web-forms, and this annex presents an initial evaluation of the advantages and disadvantages of using it for Intrastat data collection.

A glossary of technical terms used is given at the back of the book.

Key differences between the systems

Intrastat web-forms are already operational in the UK, Finland and Germany and are being tested in France for release during 2000. The declared target users for all these systems are small and medium-sized enterprises making small declarations, typically up to about 30 lines. But in fact, the experience shows that such systems are not only attractive to low volume declarants. The UK has found that the average number of lines submitted is 260, and the largest number of lines in a single declaration has been 2900. Future projects to develop web-forms will need to consider carefully whether their form really will be used only for very small volumes or whether for something larger, as this effects the design of the system.

The technology used in the systems surveyed varies. Finland, Germany and France have developed on-line forms using Java or Javascript, while the UK system is an off-line form using Java. On-line means the declarant has to be connected to the internet all the time he is working on the form. Off-line means the application is downloaded by the declarant and resides on his own PC. He only has to connect to the internet to upload the completed declaration.

The off-line solution as developed in the UK offers some advantages over traditional off-line electronic forms distributed on magnetic media or CD-ROM. It enables automatic version control and distribution of software so that the user can be certain of always using the most up-to-date version of the software and any validation checks or reference code lists that are used. It also has the advantage over an on-line form that it gives short connection times because the lengthy process of completing the returns is carried out while disconnected from the internet and the user only has to connect for the relatively short time it takes to send the completed declaration. But it also has the disadvantage that it is difficult to make one application work with all browsers and with different versions of Java.

On-line forms offer their own advantages. There is no need for version control of the software, since the user is always using the latest version available on the server. Also, there is no long initial download time because the user does not have to transfer a program to his PC. Nor is there any need for the user to set up the program on his PC, which can save a lot of calls to a help desk. Very importantly, an on-line form offers the potential for complex validation of the input data, which can even include validation against a mainframe database. Balanced against these advantages is the main disadvantage of long connection times. These increase the cost to the user – and this might be significant – and also increase the load on the administration's server.

The functionality of the different systems is broadly similar, of course. All enable the basic operations of completing declarations and sending them. But there are some significant differences. The German and UK systems both enable the import of data from other systems. In the case of the UK this is accepted in the common CSV format and has proved enormously popular. In fact, more data is received via the CSV facility than via the 'normal' web-form facility. Another key difference is that the Finnish and French systems enable the user to interrogate the CN8 whilst completing his declaration whereas the UK and German systems do not. For a survey which relies on the CN8 classification of goods, this seems a very useful feature to include. Finally, it is worth pointing out that correction of previously sent returns is allowed by one of the French systems and is under development for the Finnish system, but is not included in any of the others. This function has potential to improve the quality of data received by the administration.

Three out of the five systems surveyed have been developed on what might be called 'classic' lines. That is, they have been developed by the administration as system owner, project manager and service provider. But in France and Finland alternative models have been used. In Finland the

development was carried out as a partnership between Finnish Post and the Finnish Customs, while in the French WebEDI system the whole development is a commercial project launched by France Telecom. The role of French Customs in the project is limited to advising France Telecom of the technical details of Intrastat and giving approval to the final system. The whole cost of development and service provision is taken on by France Telecom. This is a very interesting model as it clearly reduces the cost to the administration to the minimum. But perhaps more importantly, it also moves the administration out of the 'software supplier' role, and therefore solves the problem of the continuing maintenance costs of the system. Anyone who is considering developing a web-form should consider these models carefully – if they have been shown to be possible in Finland and France, why not elsewhere?

Costs and savings

The five systems looked at have demonstrated that an Intrastat web-form can be implemented quickly and cheaply. The developments took between 5 and 12 months and required between 1.2 and 5 staff.years. As an indication of the on-going costs, the UK system is requiring three staff for a help desk plus one full-time developer to work on system enhancements. To balance this the UK, whose system was the earliest to become operational, has calculated that the system already saves about 0.5 staff.year per month in reduced data keying time, which means that it took only about 6 months to pay for itself. The cost/benefit can be expected to improve as more users start to use the system regularly for their Intrastat declarations. It will be interesting to see whether similar savings will be realised by the German and French systems when they become fully operational.

Savings are related to the degree of take-up of the new systems. Take-up for the two full operational systems, in UK and Finland, have been broadly similar – 3.5% of the users in UK and 4% in Finland at June 1999. But this figure has shown very rapid growth in the first few months of operation, and can be expected to continue to grow for some time. It is impossible to guess at what level it will settle, but if the web-forms are eventually used by about 10% of declarants (and this has already been exceeded in Finland), this will be a significant contribution to improved speed of production and quality of the end-product statistics.

The future

In such a rapidly developing area it would be a shame not to cast a quick look to the future. But it would also be unwise to attempt to predict too precisely the course of events. The integration of a CN8 look-up facility in the systems that do not already have it and in new systems seems a logical development, in view of its usefulness to the user. The future use of XML is something that is already being considered by Germany and France, and this also seems logical given the improved data management it can offer.

Integration of the systems with existing national systems is likely to be a challenge for all administrations. As administrations become more involved in electronic commerce they will be forced to adopt standards such as single point of entry, common look and feel, data sharing across applications (so that a user is 'recognised' by the various systems of the administration with which he interacts), and so on.

It is also an unwritten assumption that the use of web-forms such as these for the collection of Intrastat and other administrative data will become far more widespread very quickly. Otherwise there would be no point to this book. We hope that this book will contribute to that growth and help to make it more homogeneous so that users in different member states will have access to the same

sorts of facilities, and so that administrations in different Member States are able to benefit from some exchange of experience and know-how.

The UK Intrastat web-form

Jonathan Bates, from an interview with Jon Walmsley and Kevin Price, HM Customs and Excise, United Kingdom.

Overview

The UK Intrastat web-form is a Java applet which is downloaded by a user from the HM Customs and Excise website onto his or her own PC. It can then be used off-line to prepare Intrastat declarations, which are subsequently up-loaded to the HM Customs and Excise web-server, which passes them on to the mainframe statistical processors. It can also accept a CSV file produced by another piece of business software as input.
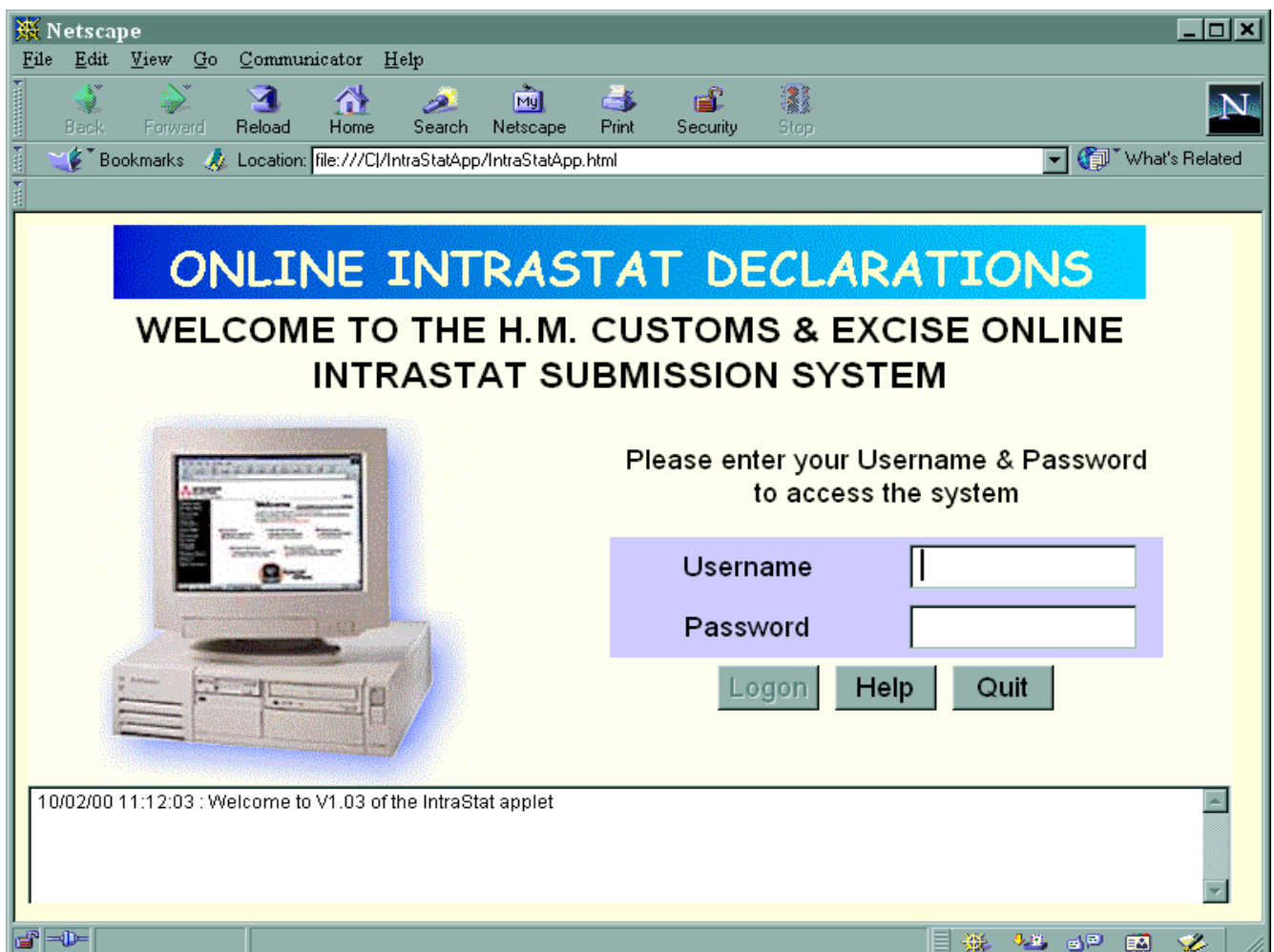

Figure 1: First page of the UK Intrastat web-form

Security is achieved by a system of direct person-to-person contact and registration, with the assignment of user names and passwords.

Implementation took a total of 2.5 staff.years over an elapsed time of less than a year. The system has been running live since January 1999.

The introduction of the form has been a great success and take-up by users has been rapid. About 1200 users registered to use it in the first 4 months of availability. By the end of May 1999 about 3% of the total number of items were declared using the web-form. By the end of 1999 the number of users had risen to 1735.

Functionality

The main functions offered are:

- user authentication,

- create a new Intrastat declaration (arrivals and despatches, or 'nil'),

- edit an existing or partially complete declaration,

- submit a declaration via the internet,

- import a CSV file and submit it as a declaration,

- on-line validation of data input,

- on-line help,

- updating of user information (VAT number, status, etc.),

- on-line validation that the user is using an up-to-date version of the software.

A more detailed description of these is given below.

The user's view

First information

The user can find information about the form via the HM Customs and Excise home page at http://www.hmce.gov.uk (or by following the link from the UK government home page at http://www.open.gov.uk). Links from this page take him to the Intrastat page and the 'Intrastat Supplementary Declaration via the internet' page. From here there are further links to pages for 'Off-line Electronic Form', 'Comma Separated Values (CSV) File' and 'How to use the Electronic Form or the CSV File'. Figure 2 gives an overview of the basic interactions in the system.

Registration

To get any further than the 'information' screens, the user must contact the Tariff and Statistical Office Help Desk by e-mail or telephone.

The Help Desk verifies that the applicant is a genuine registered Intrastat trader and assigns him a user name and password. The user name comprises the first three characters of the trader's name followed by his VAT registration number. The password is an eight-character string of their choice with at least one of the characters being numeric. He is also given instructions on how to obtain and use the form and the CSV file facility.
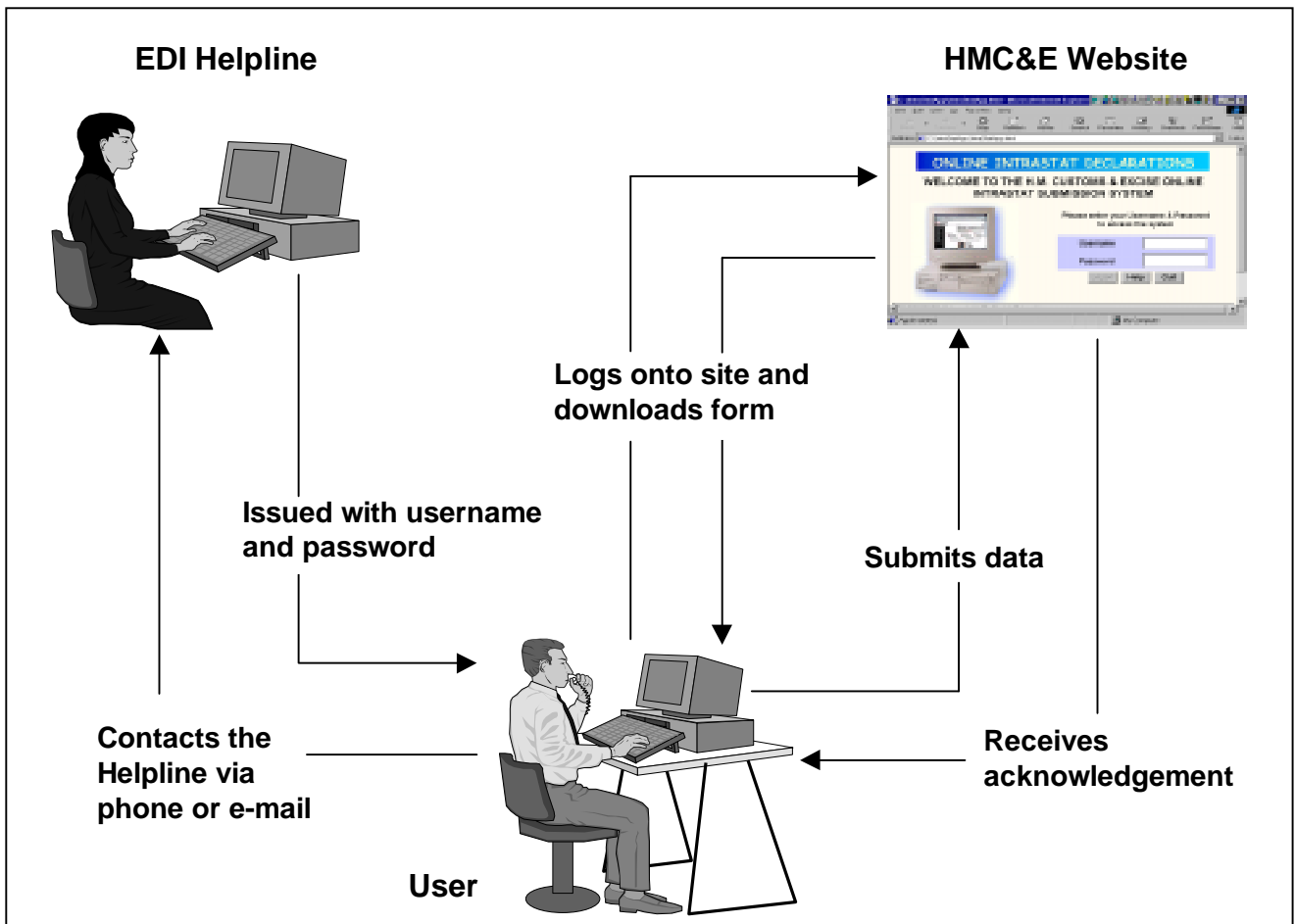
Figure 2: The user's view of the UK Intrastat web-form

Off-line electronic form

The off-line electronic form is a Java applet which is down-loaded from the HM Customs and Excise website to the user's PC. It enables the user to input their Intrastat declaration to an electronic form whilst not connected to the internet and then to connect to the internet and send the declaration. This minimises the cost of connection time for the user and reduces the load on HM Customs and Excise's web server.

Comma Separated Values (CSV) File option

The CSV file facility enables a user to up-load bulk data to the Intrastat web-form using a Comma Separated Values (CSV) file, again whilst not connected to the internet, and to later connect and send the declaration. This is of particular use to businesses using business software from which they can easily extract the data required for the Intrastat declaration as a CSV file.

The website gives a full definition of the structure of the CSV file which must be submitted.

Installation

Using the user name and password the user can download the electronic form from a different part of the website. The files are quite small (a total of 800KB), and this is quite quick. During this process the user is prompted to give permissions to the application to perform certain operations on his PC,

and a degree of risk is stated for each of these. If any of these permissions is not given, the electronic form can not work.

The downloaded file is a self-extracting application which installs itself on the PC. The user is encouraged to bookmark the login page (which is a file resident on their c: drive) in their browser. It is also advisable to set up a short cut so that the application can be run directly from the desktop. When this short cut is invoked, the application on the PC is started and the user is again asked for permissions. Again, to use the form these permissions have to be granted. There is an option to 'remember' the granting of permission, so that the user is not prompted every time the form is used.

Permissions

The permissions required are:

- 'Reading information stored in your computer, such as your user name' (low risk).

- 'Reading, modification or deletion of any of your files' (high risk).

- 'Contacting and connecting with other computers over a network' (high risk).

On-line help

A small Help window is provided to assist new users. The Help application is held on the PC so there is no delay for connection to the HM Customs and Excise server each time help is requested. A 'Help button' is also included on each screen.

Logging on

Before they can go any further, the user has to log on, giving their user name and password. At this point the application automatically connects to the HM Customs and Excise server via the internet and the server validates the user and checks that the version of the electronic form application resident on the PC is up-to-date. This is a very quick process. If the software is not up-to-date, a series of dialogues leads to the downloading of the latest version of the software before the declaration can be proceeded with. In this way, version control of the electronic form is ensured.

If the user name, password and version are correct control is returned to the Java application on the PC and the user can choose to break their internet connection and work off-line.

Functions offered

The user can now choose to create a new declaration, edit an existing declaration, submit a declaration or import a CSV file. There are also options for user administration (such as locking the application with a password).

When creating a new declaration the user specifies either Arrivals or Despatches and is presented with the appropriate input form (pink for Arrivals, green for Despatches, to mimic the paper forms) which permits lines of trade to be entered.

The user can save the declaration when it is partially complete and return at any other time to edit it and add further items. In this way, a return can be compiled daily if required during the course of the month, and submitted when complete at the end of the month. Declaration files are held on the user's PC in 2 folders ('Pending' and 'Processed') and can be kept for historical purposes for as long as needed, or returned to for correction later if necessary.

Validation

The Java applet permits a certain amount of validation of the input data for correct format and acceptable values, and for cross-field checks. Invalid fields are highlighted on the screen by colour and by a system message. An item containing invalid fields can not be saved and therefore can not be submitted.

The administration's view

From the administration's point of view there are a number of important features about this development.

The objective of the system could be stated simply as 'to increase electronic submission of Intrastat data'. But this expression includes a number of factors which are relevant:

- Submission via the internet was a facility being asked for by the users.

- The introduction of the facility has helped HM Customs and Excise to justify the removal of the facility to submit declarations as plain paper schedules.

- The increase in electronic transmission reduces the cost of keying Intrastat data for HM Customs and Excise. It is estimated that the system is saving about half a staff.year per month of keying resources. At this rate it will only take about 6 months to pay for itself.

- The validation function built into the system improves the quality of the declaration submitted by preventing invalid data from being sent.

- The system has been regarded as a pilot for other potentially much larger applications, such as the VAT declaration, which also come within the responsibility of HM Customs and Excise.

- The system solves the problem of version control and distribution of an electronic form.

- The nature of the technology involved made it possible to complete the development quickly and cheaply.

Technical view

The basic architecture of the system is best represented diagrammatically in figure 3.

Implementation language

The whole system is implemented in Java – there is no Javascript and no HTML. Normally Java runs in a 'Java virtual machine' (also known as the 'sand box') within the PC and can not perform any operations outside this. However, for a successful off-line form, the applet must be able to work outside the 'sand box'. For example, it needs to be able to create and update files on the c: drive and it needs to be able to connect to, and communicate with another computer over a network.
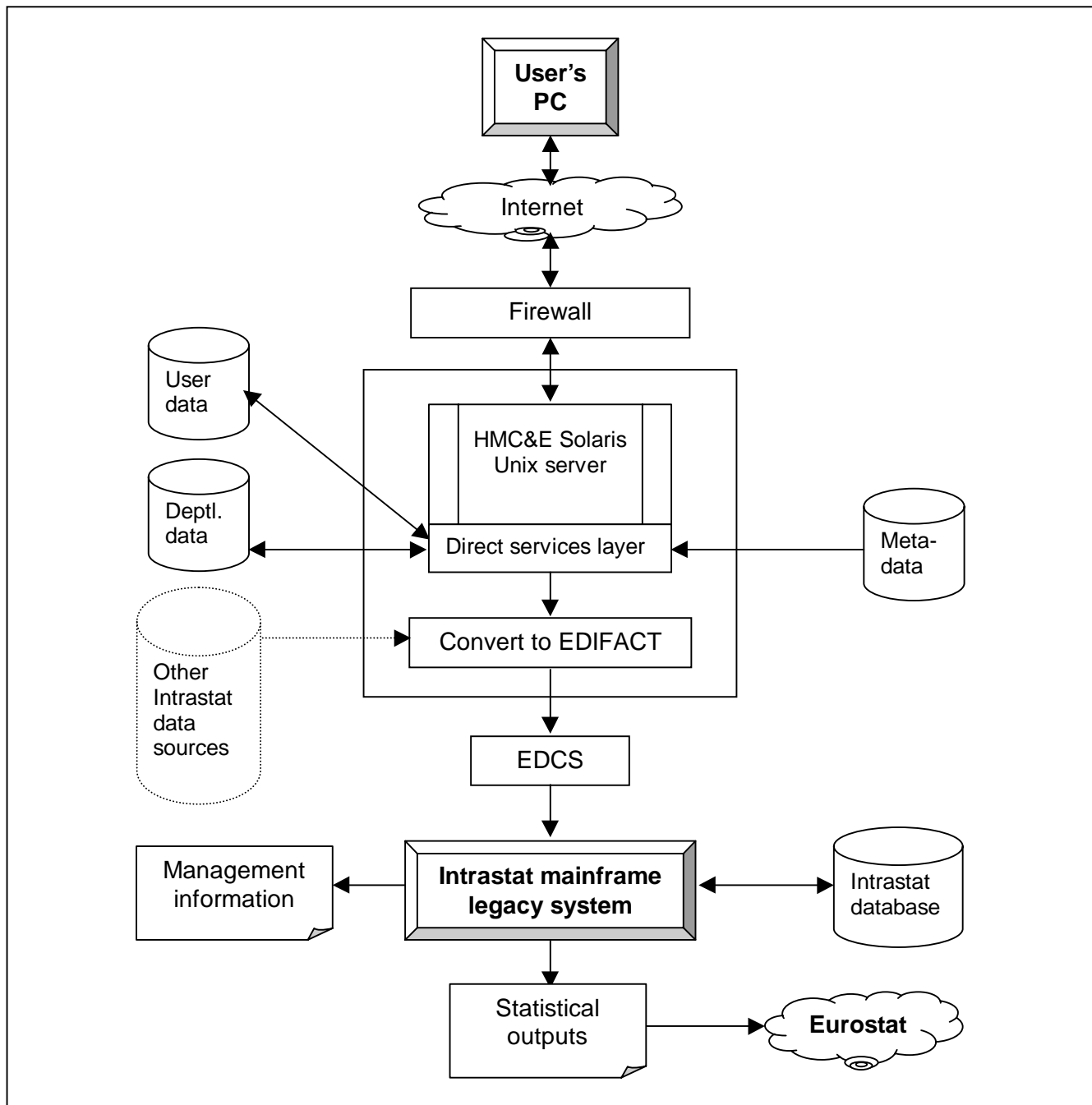
Figure 3: The basic technical architecture of the HMC&E off-line electronic Intrastat form

Minimum system requirements

The minimum system requirements to use the off-line electronic form or the CSV option are:

- 32-bit bit PC,

- Windows 95 (or above) or Windows NT,

- Internet access,

- Netscape Navigator version 4.5 (or above) or Internet Explorer version 4 (or above),

- a screen resolution of 800 x 600 (recommended minimum),

- if access is through a proxy server or firewalls, the port needs to be opened to 44544 as well as port 80.

HM Customs and Excise have consciously decided not to use the latest state-of-the-art hardware and software to make the form accessible to as wide a range of users as possible.

Trusted applets

The solution to this problem is 'applet certification'. The Java applets are approved and certified by Verisign. Verisign is a body which independently authenticates the source of the code and the *bona fides* of the deliverer (i.e. in this case HM Customs and Excise); they then issue a certificate certifying that HM Customs and Excise asserts that the content is safe. The Java applets are then known as 'trusted applets'.

It is important to stress that Verisign do not inspect the code. They only verify that it really does come from HM Customs and Excise, and that HM Customs and Excise say that it is safe. So, it really is a matter of trust – if the user trusts HM Customs and Excise, they will be confident that the application will not corrupt their PC and will decide to down-load it. If they do not trust HM Customs and Excise, they will decline to use the system.

Use of XML

XML is currently not used. The developers are considering how to use it for the European Sales Listing. They expect XML to be more useful for web infrastructure and interfacing with legacy systems (e.g. fetching the user's name and address from a mainframe system when a VAT registration number is keyed into a web-form).

They also expect it to be very useful for increased validation and credibility checking of input data.

Another potential application is external data passing, i.e. using XML instead of EDIFACT. This development is expected to be trader driven if it happens, rather than HM Customs and Excise driven.

Security

Encryption is not used and this has not caused any problems, either technically or with users concerned about the safety of their data. There are plans to implement SSL (Secure Socket Layer) security in a future release.

Validation

The Java application permits a certain amount of validation of the input data for correct format and acceptable values, and for cross-field checks. Invalid items can not be saved, and therefore can not be submitted. This means that returns submitted via this system are guaranteed to contain valid data (not, of course, guaranteed to contain correct data!). This validation is fairly limited though, and does not include reference to the CN8, for example. HM Customs and Excise intend to strengthen this aspect of the application in future developments and this is an area where the use of XML could potentially help.

The project view

Approach

The project has been run as a small-scale development by in-house specialists with some assistance from contract staff. From the start the volatility of the technical environment and the need to use rapid development methods was appreciated. The total elapsed time between starting the project and making the first version of the application available on-line was less than a year. Table 1 below gives a few key project milestones.

Initially the Intrastat web-form was developed by an external consultant under in-house management, on an *ad hoc* basis, in order to test the feasibility of the idea. This produced an electronic form as a Java-based application which could be transferred from machine to machine via floppy disk. The next stage was to convert this to a web-form, so that the Java applets could be delivered via the internet, and at this stage the project started to be managed on a more formal basis.

Resources

The project has used between 1 and 3 staff full time at different stages of the development. The total resources required for implementation were 2.5 staff.years. In addition, there is an ongoing requirement for 1 developer to work full time on further developments and enhancements to the service and on system maintenance. The breakdown of this is shown in table 1.

Project timetable and resources

Project milestone	Date	Resources
Start	February 1998	
Java version on floppy disc	July 1998	2 full time developers
Web version	December 1998	3 full time developers
CSV option	January 1999	
Live	January 1999	
Ongoing	Development and maintenance	1 full time developer

Table 1: Project timetable and resources (UK)

Take-up

The web-form was originally targeted at smaller traders, who already had a PC with internet access, but who were not large enough to have been able to justify the purchase of bespoke or off-the-shelf software to help them make Intrastat declarations. It was argued that the minimal cost of downloading the software would encourage many traders in this category to submit their returns electronically. The benefit to the user was seen as ease and convenience, while for the administration the advantages are a reduction in the cost of collecting the data (by keying) and an improvement in the quality of the data received (as a result of pre-submission validation checks).

Initially they have mainly targeted traders who were submitting plain paper schedules, of which there were about 6000. The take up by July 1999 was 1500. They do not plan to extend coverage to the

other 25,000 potential Intrastat traders until they can be assured that they have a reliable system to offer, and that the mainframe gateway has sufficient capacity.

The implementation has been a great success and take-up has been good. In the early months there were more requests to register than the new Help Desk could process and there was therefore a waiting list of new users. By the end of May 1999 about 1200 users had registered to use the system. This represents about 3.5% of the total number of Intrastat traders, and therefore a higher percentage of the potential users, as the form is not targeted at all Intrastat traders. About half the registered users used the system to submit their Intrastat declaration in May 1999, totalling over 150,000 lines, or about 3% of the total number of lines received. By 31 December 1999 the number of users who had been given approval to use the system had risen to 1735.

The average number of lines submitted per user was about 260 and the highest number of lines under a single header was nearly 2900. This indicates a high use of the CSV facility and possibly also indicates that the system is attracting more relatively large traders than was anticipated.

Lessons learnt

The lessons learnt from this implementation can be divided into 'technical' and 'non-technical'.

Technical lessons

The principal technical lesson which has been learnt concerns the port used for connection to the internet. The developers chose to use a specific dedicated port (44544) as a TCP/IP socket, rather than a standard HTTP socket (on port 80). The reason for this was that this is faster and more efficient for data transfer in volume.

While this has worked well for a user who is using a stand-alone PC with direct access to the internet, it has caused major problems for those who access the internet through a proxy server and firewall. Although these problems have been solvable on an individual basis, this single factor is thought to have been a major barrier to take-up.

Furthermore, the problem is not proving very easy to resolve – it is not easy to use HTTP for large file transfers!

The developers also found problems in writing code which took into account the frequent new releases of Java and net browsers.

Non-technical aspects

Apart from the technical implementation of the computer systems, there have been a number of non-technical impacts of introducing the new system.

Help Desk

The new system has required the formation of a completely new Help Desk to support it. This involved an internal re-organisation in order to make 3 staff available to run it, and these staff have needed training. A complication was that the load of the job was difficult to anticipate and as the Help Desk is responsible for registering all new users it is a potential bottleneck. However, as it is also the 'shop window' for potential new users it can therefore have a very important effect on the take-up of the system.

The daily workload of the Help Desk at the height of the promotion was about 30-40 phone calls, 20 e-mails and a few letters, but by the end of 1999 this had dropped to about one phone call and seven e-mails per day, and only about two letters per week. It was found that IT specialist staff were required. They need to have considerable knowledge of not only the e-form but also all other types of EDI, Intrastat and the internet. They are also finding that they are having to educate the traders in how to use software packages like Excel to enable them to use the CSV option.

Office procedures

The operation of the Help Desk and their liaison between the public, the information technologists and the statisticians, has required the development of new working procedures.

Publicity

A considerable publicity effort has been required to make sure that all potential users of the system are aware of the new facilities and their benefits. The project used mailshots, articles and advertisements in certain commercial publications, exhibitions, and information on the HM Custom and Excise website. Seminars, and now workshops, for the Outfield staff were also organised.

The most successful of these was the mailshot.

Need for an overall strategy

The Intrastat web-form is the first of its type developed by HM Customs and Excise (and possibly the first in UK government services). It has been regarded as a test bed for potentially far larger applications, such as the VAT declaration.

With a view to the likely future expansion of this method of offering services, HM Customs and Excise is trying to create a generic framework for e-commerce. This means generalising the technical architecture to make it extensible to cover other applications.

These investigations are exposing questions such as:

- The need for a common user interface – the Department wants to present a single face to the public, with a common 'look and feel'.

- The need for a single point of access, or 'front door', so that the public can easily find the service they need.

- The integration of e-commerce with e-publishing – for example, the help facility for an electronic form can be implemented as hyperlinks to guidance already published electronically elsewhere on the website.

This work is also indicating a number of core technical functions which can be implemented once and used many times, such as:

- log-on,

- security,

- archiving,

- audit trail.

Future plans

Plans for the immediate future include:

- to bring the system into line with future electronic systems, including the VAT100,

- to share common modules which will control aspects such as, security and archiving,

- to improve usability (e.g. provide a function to allow the printing of returns, and improve the retrieval of archived files),

- to implement an on-line form (announced on the website as 'coming soon'),

- to include validation against CN8,

- to give on-line access to CN8,

- to implement Secure Socket Layer security (SSL),

- to migrate the form to XML.

There are no concrete plans yet for:

- improved validation against data held in 'back office' mainframe systems,

- extending file input options to cover other file formats such as EDIFACT,

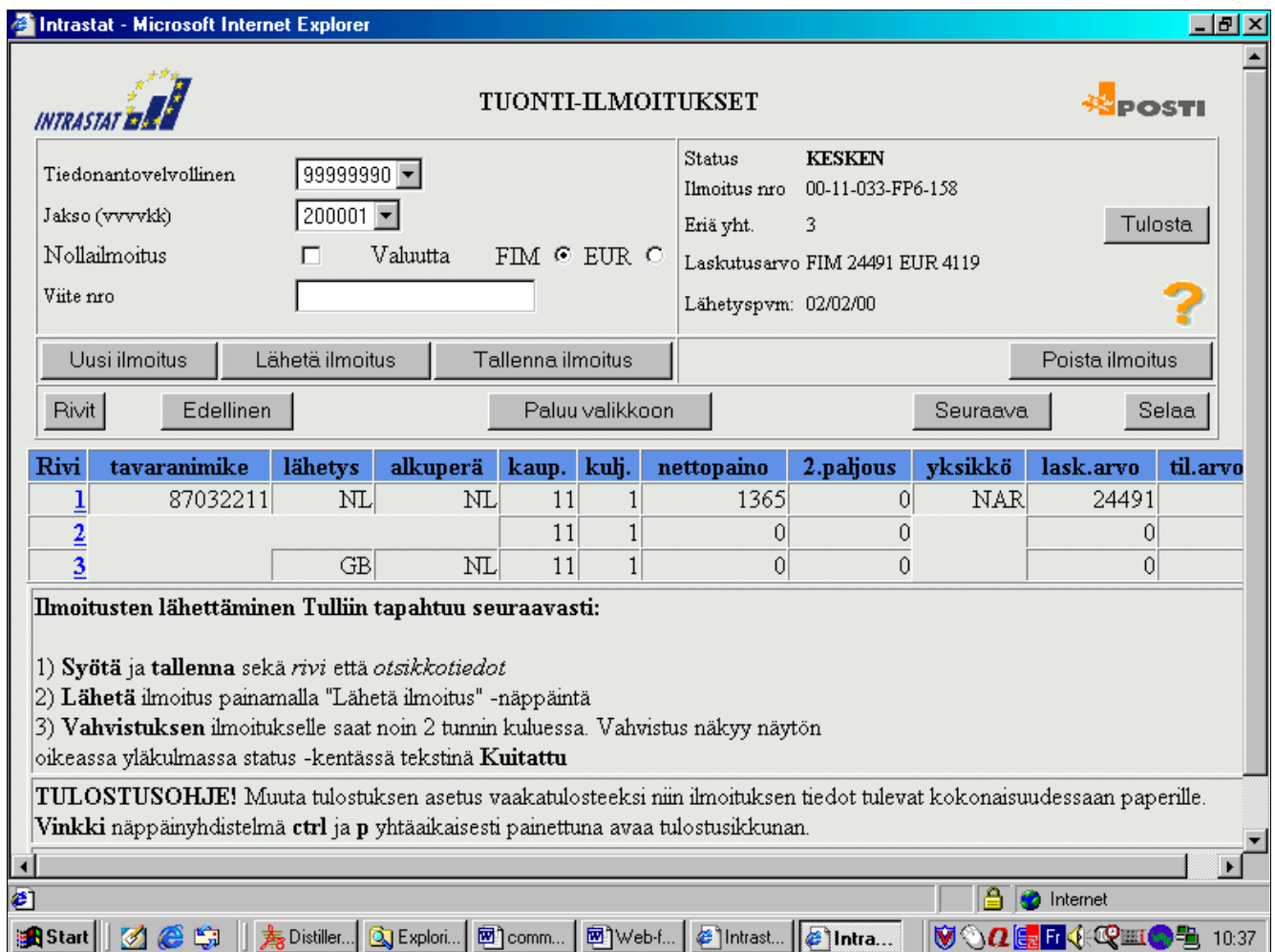although these are all possible developments.

In the long term it is possible that they may drop EDIFACT entirely, since with the electronic form they know what data is coming in without needing the full EDIFACT protocol to identify it. But this would require a rewrite of the legacy processes which at present require their input data to be in EDIFACT format. However, it is worth noting that the next version of the electronic form for the VAT declaration is expected to be non-EDIFACT.

"Sähköinen Intrastat-lomake": The Intrastat web-form in Finland

Sylvie Colas, from an interview with Pekka Tanhua, Tullihallitus, National Board of Customs, and Marcus Gustafsson and Hannu Pelkonen, Finland Post Ltd., Finland.

Overview

The web-form for Intrastat in Finland is a new service which started on 22 March 1999. This system is produced in co-operation between Finnish Customs and Finland Post Ltd. The Intrastat web-form is one part of a larger web-form service provided by Finland Post Ltd. The address of the service is https://intrastat.finpost.net/.

Figure 4: Input page of the Intrastat web-form in Finland

Companies providing statistical information which declare fewer than 30 lines can fill in this Intrastat web-form, which requires only a small infrastructure and an internet connection, and pay only the costs of telecommunications. The declaration is completed on-line by the declarant on the Finland Post web server, is afterwards translated into the EDIFACT message CUSDEC/INSTAT and is then transmitted from Finland Post to Finnish Customs.

This system is cheaper and faster for making declarations, and is a great success for companies which are currently providing Intrastat declarations on paper. In December 1999, 14 % of Finnish providers used this system to report 1.2 % of the declarations. Finnish Customs finance the system (excluding the declarant's telecoms costs) and derive benefit from the improved quality of the received data and a decrease in the costs of data processing.

Functionality

The main functions offered are:

- on-line registration,

- user authentication,

- arrivals declaration form,

- dispatches declaration form,

- management of the declarations,

- user feedback function,

- management of a list of clients (for agents),

- management of company information (address, contact person, password),

- multilingual support (Finnish, Swedish).

A more detailed description of these features is given below.

The user's view

The system is targeted at third declaring parties or companies providing statistical information, who have fewer than thirty lines per declaration and used paper forms or had recourse to an agent before. This system is free of charge, but the users pay the costs of telecommunications.

A company which wants to use this system has to register with the administration. The user has to fill in a form on the Finland Post web server to request access rights to the Intrastat web-form. This is then sent to Finnish Customs who have the authority to grant access. Finnish Customs send back their acceptance of access rights to the web server of Finland Post Ltd. This server automatically prints an e-letter which is sent by conventional mail to the user, containing his user ID and password.

To use the system the user has to give his user ID and password on the access screen. The user authentication control is executed on the web server. At present the web-form is only offered in Finnish, but after March 2000, the user will be able to select his preferred working language (Finnish or Swedish).

When creating a new declaration the user selects either the arrival or dispatch function and is presented with the appropriate input form. Then he must input header information such as his VAT number, the period of reference and the currency used before filling in the lines. The user can save the declaration when it is partially complete, in which case it is stored in a declarations database on the server. The user can manage his temporary stored declarations by listing, modifying or deleting them. All these actions including filling in the web-form are carried out on-line, the user PC remaining connected to the web server during the entire transaction.

The necessary code lists and validation criteria are integrated into the HTML page and each item is displayed with its self-explanatory text. To look up a CN8 code, the user has to type the complete code or part of it or to select the code from the CN8 table. When it exists the code of the supplementary units is automatically displayed. This system permits only simple searches of CN8 codes in order to avoid time consuming complex routines.

When his declaration is completed, the user can submit it to the Finland Post web server. If he wishes to contact the system administrator at Finland Post Ltd., the system includes a feedback function which permits him to send an e-mail.

If the user is an agent making declarations for a number of traders, there is a facility to allow him to manage his list of clients. The agent has to know the VAT registration number and password of the company to be added to the list of his customers.

From the user point of view, the system reduces the number of errors and is cheaper because they can make faster declarations and do not need to use an agent anymore for filling in their declarations. Users requested improved on-line help and a way to correct previously sent declarations. The improved on-line help was provided in October 1999, and the correction function is being tested and is scheduled for implementation in March 2000. Until then, corrections have to be sent by fax to Finnish Customs.

The system can be seen and tested by visiting https://intrastat.finpost.net/ and using "demo" for both the user name and the password. For those not able to understand Finnish, tables 2 and 3 give a brief glossary of the key terms in the dialogues.

Finnish	English
Tullin päävalikko	*Main menu of Customs*
Kirjautuminen	Login
Käyttöoikeuden haku	Access Rights
Paluu pääsivulle	Return to main menu
Sisäänkirjautuminen	*Login menu*
Käyttäjätunnus	User name (Write "demo")
Salasana	Password (Write "demo")
Toimintovalikko	*Function menu*
Ilmoitustoiminnot	Declaration functions
Tuonti-ilmoitus	Import Declaration
Vienti-ilmoitus	Export Declaration
Ylläpitotoiminnot	Maintain functions

Table 2: Glossary of the key Finnish terms – First screens

Finnish	English
Tuonti-ilmoitukset	*Import declaration*
Return header	
Tiedonantovelvollinen	Statistical provider (VAT registration number)
Jakso (vvkk)	Period (YYMM)
Nollailmoitus	Nil declaration
Valuutta	Currency, FIM or EUR
Viite nro	Reference
Status=Kesken, Lähetetty, Kuitattu	Status="Under modification", "Sent", "Received"
Ilmoitus nro	Return number
Eriä yht	Sum of lines
Laskutusarvo	Total invoice value
Lähetyspvm	Date of sending
Function keys	
Uusi ilmoitus	New Return
Lähetä ilmoitus	Send the return
Tallenna ilmoitus	Save the return
Poista ilmoitus	Delete return
Korjaa tämä	Correct this return
Korjaa muu	Correct another return
Rivit	Return lines
Edellinen	Previous
Paluu valikkoon	Return
Seuraava	Next
Selaa	Scan
Return lines	
Rivi	Row
Tavaranimike	CN8 code
Lähetys	Country of consignment
Alkuperä	Country of origin
Kaup.	Nature of transaction
Kulj.	Mode of transport
Nettopaino	Weight in kilos
2.paljous	Quantity in supplementary units
yksikkö	Supplementary unit
lask.arvo	Invoice value
til.arvo	Statistical value

Table 3: Glossary of the key Finnish terms – Import declaration

The administration's view

The service is provided by Finland Post Ltd., who take care of the technical environment and day-to-day operation of the service. Finnish Customs pay all expenses and the service is supplied free of charge to the agents and declarants. The benefits to Finnish Customs are:

- a decrease in the number of paper declarations, and therefore a reduction in the cost of data capture,

- faster collection and processing of the declarations,

- a reduction in the number of corrections of errors due to paper declarations, and therefore an improvement in the quality of the data sent by the SMEs still working on paper forms,

- an improved customer service for companies providing statistical information, especially for small companies.

In this system, the role of Finnish Customs is to maintain the database of users, update exchange rates and accept new users. They can also control the status of a declaration by listing all returns on the server and their status ('under modification', 'sent' and 'received'). In the case of returns which have been entered but not yet sent Finnish Customs advise the user by phone on how to correct the return.

Finnish Customs receive the EDIFACT CUSDEC/INSTAT message from the web server, and therefore have not needed to change the existing system of collection of Intrastat declarations.

The Help Desk Service has been combined with the IDEP/CN8 Help Desk in Turku, and is responsible for some of the maintenance tasks in addition to normal help desk functions, such as acceptance of new users and updating of exchange rates. The two help desks share some of the same staff. In August the Help Desk Service received 10 to 15 phone calls per week, but by December this had risen to about 75 calls per week.

No special training has been offered, but some presentations of this system were made in order to promote it.

Technical view

The system architecture has two main parts:

- front office – the part between the user and the Finland Post web server, in which the Intrastat web-form is filled in on-line via the internet. Security is achieved by SSL.

- back office – the part between the Finland Post web server and Finnish Customs, in which for each completed declaration, the web server generates the EDIFACT message CUSDEC/INSTAT and sends it to the Finnish Customs, via X.400. The system does not use XML currently.

The basic architecture is shown in figure 5.
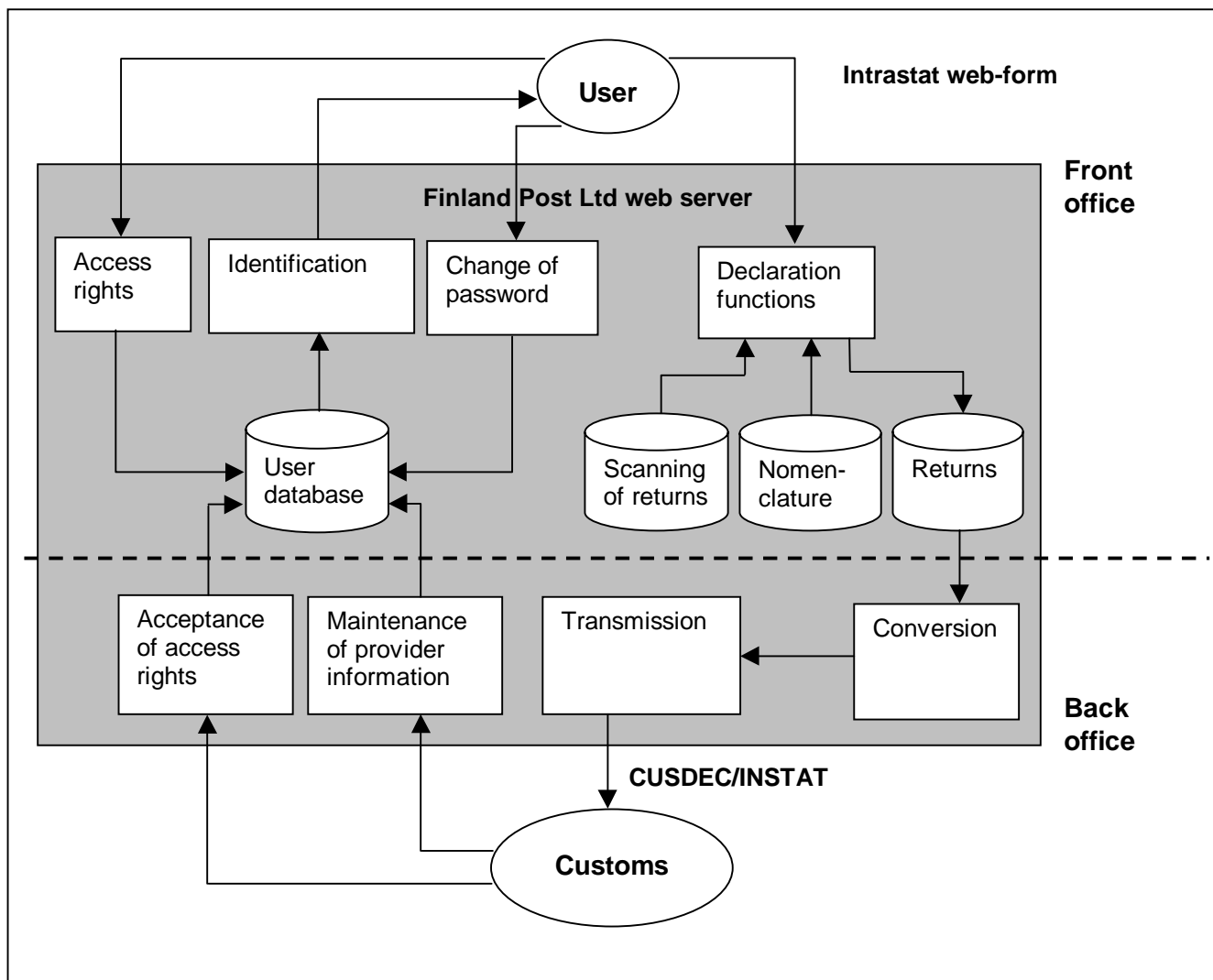
Figure 5: Technical architecture of the Finnish Intrastat web-form

The minimum system requirements for the user to work with the system are:

- 32-bit PC,

- Windows 95 (or above) or Windows NT,

- Internet access,

- Netscape Navigator version 4.04 (or above) or Internet Explorer version 4 (or above),

- screen resolution of 800 x 600 (recommended minimum).

The user interface or client side is composed of dynamic HTML pages associated with programs in Javascript for the input and the validation of the data. More complex functions like looking up the CN8 are executed on the web server. The placing of these functions on the web client or on the web server has been chosen to optimise performance, taking into account the speed of the user's modem of the client and the size of the web-form. Some difficulties were encountered in displaying all the data on 15-inch screens.

Decisions had to be taken to balance the functionality offered on the client side and the burden of supporting various web browsers. Web browsers are being developed very fast and there are several new releases by different software companies annually. This requires an ongoing testing of compatibility of service.

A 'Server Certificate' is used to enhance security by providing identification information about the service provider. A third company (certification authority) verifies the credentials of the service provider and generates the electronic certificate.

Project view

This service is only part of a larger administrative service, which contains other administrative forms, such as the VAT declaration. Finland Post Ltd. is the owner of the service.

The project required a team of four people composed of one person from Customs for two months and three people from Finland Post Ltd for three months (i.e. a total of 14 staff.months). The project took 5 months, starting on the 4 November 1998 and ending on the 31 March 1999. The skills and the role of each participant were as follows:

- Project leader, planning and management – Finland Post Ltd.

- Technical expert, design and programs, help lists, testing – Finland Post Ltd.

- Marketing of service – Finland Post Ltd.

- System planner, specifications, lists of codes, nomenclature, tests – Finnish Customs.

Take-up

80% of Finnish companies have an internet connection but most of the targeted companies using the Intrastat web-forms were in the remaining 20%. Difficulties were encountered with old versions of browsers or other incompatible web clients.

In June 1999, 4% of Finnish providers used this system for reporting 1% of the declarations. Promotion brochures were sent to all users towards the end of 1999 and this resulted in several hundred new users. By December 1999 the take-up had risen to 14% of Finnish providers using the system to report 1.2% of the declarations.

Lessons learnt

Although the system was implemented very quickly, the conclusion in Finnish Customs is that such a system is not easy to build and test. Tests in particular must be done very carefully before release to avoid problems which result in rejection by the users.

Although presentations were given to promote the system, the users declared a need for training, courses and on-line help.

Companies providing statistical information want this kind of service because it is cheaper, statistical declarations are made faster and they do not have to rely on agents anymore.

Future plans

The improvements scheduled for March 2000, are:

- to implement the correction function,

- to provide a copy function,

- to translate the system into Swedish (the second official language in Finland).

When this has been done there will be a special campaign to promote it to Swedish speaking users. In addition, an on-going programme of presentations and a marketing campaign are scheduled.

The W3stat project in Germany

Fritz Pfrommer, Statistisches Bundesamt, Germany.

Overview

The W3stat service provided by the Federal Statistical Office *(Statistisches Bundesamt)* enables companies to submit Intrastat declarations via the Internet. System functions and a description are accessible on the web at http://w3stat.statistik-bund.de/.
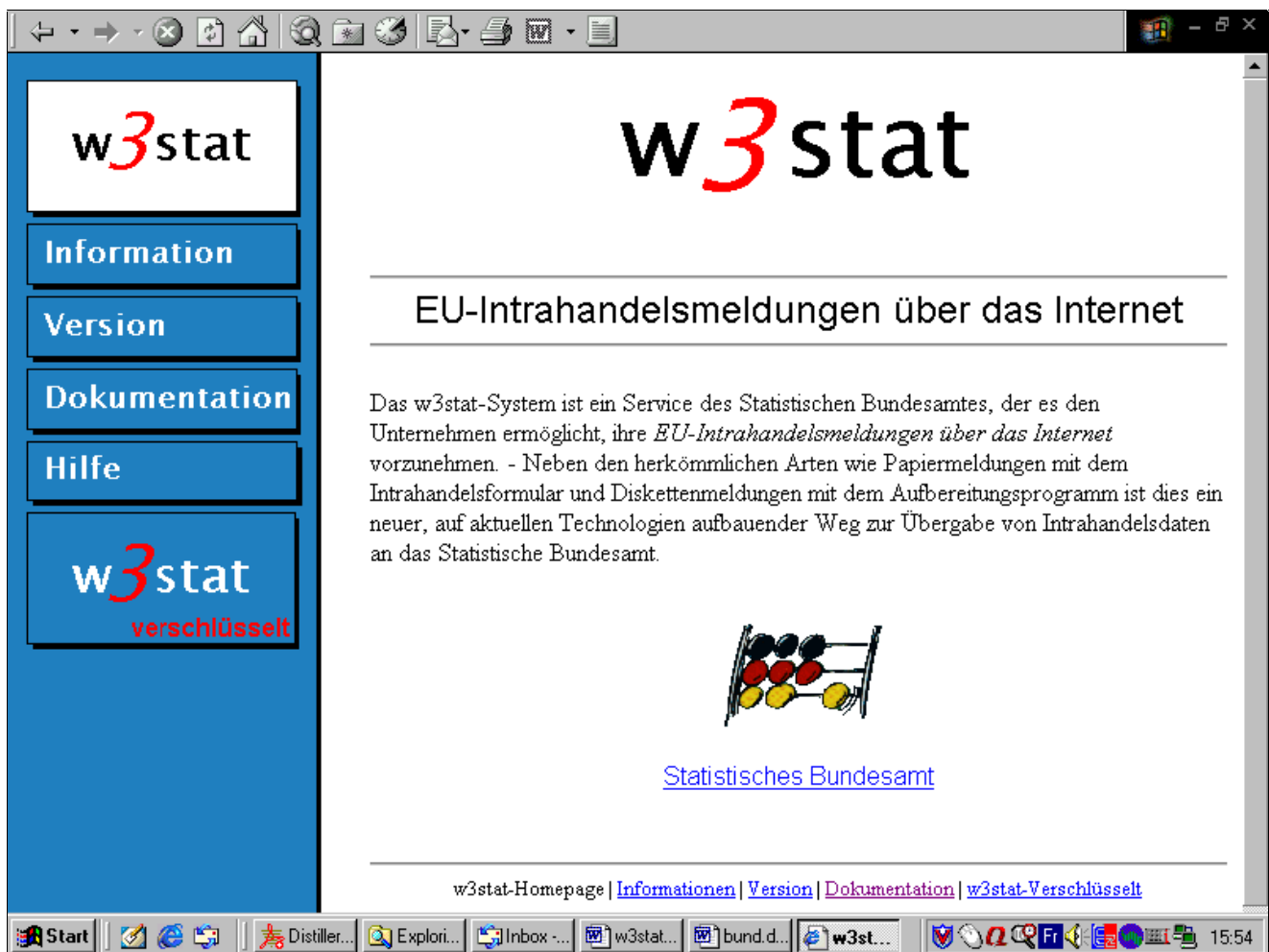
Figure 6: W3stat homepage

Once all the planned functions have come on stream, W3stat will offer providers of statistical information (PSIs) the following options for transmitting their returns to the Federal Statistical Office*:*

- on-line declarations with direct browser-level input of data onto forms,
- transmission of externally prepared declaration files in all permissible formats,
- transmission of data generated using a new W3stat data-capture system.

- W3stat is being introduced in two phases:

- initially, only the on-line declarations facility and the option of transmitting externally processed data will be available,

- in the second phase, the new data-capture and transmission system will be made available.

Phase I of the project

In the first phase, a pilot version of the server was brought into operation at the beginning of 1999. Since mid-1999, a production version has been available for application testing with pilot users. This initial version of the W3stat web-server already features the following functions:

- on-line documentation on Intrastat and CBS-IRIS,

- guest access enabling users to try out the system,

- help functions for users (FAQ and support),

- user registration,

- downloading of CBS-IRIS,

- on-line forms for direct submission of returns,

- transmission of CBS-IRIS-generated files,

- data encryption.

During pilot testing, the transmission procedure was tried out with selected companies in parallel with the existing transmission system. Initially, some 60 companies took part. Since the reporting month of January 2000, the filing of parallel returns on physical data media has been dispensed with.

Phase II

In the second phase, these capabilities will be supplemented by a comprehensive data-capture and transmission system whose functions are comparable with those of the CBS-IRIS interactive data-capture system used in Germany. This software is currently at the development stage and is scheduled for completion by mid-2000. The aim is for all components to come fully on stream as from the reporting year 2001. The data-capture software for W3stat will be completely Java-based and will also enable declarations to be prepared off-line.

In addition to the client-side functions supporting data input, the W3stat system also includes a full range of data-transmission security features both at the PSI end and at the Federal Statistical Office. All PSI data are encrypted upon transmission, and sender authentication is guaranteed in each case. Data are accepted into the Federal Statistical Office's in-house network under secure conditions and are protected from unauthorised access right the way through to the processing stage.

The W3stat system ensures that W3stat returns are integrated into the automated processing of intra-Community trade data (ASI system) and thus makes for rapid and efficient processing of return data.

W3stat functions

PSI registration and authentication

It is essential that the Federal Statistical Office know for certain the identity of the person submitting a declaration. Every information provider therefore has to be registered before he or she can use W3stat. The sender of a declaration can then be authenticated. Pending sufficiently widespread use of the Internet's future standard for authentication by user certificates, user names and passwords are being employed for now as a means of identifying W3stat users.

Users register on-line via the Internet using a special registration form. When a PSI initiates a registration inquiry via an encrypted W3stat page and this is accepted by the Federal Statistical Office, he or she is sent a letter containing an anonymous user name with password. These have to be entered for each W3stat session and are the sole means of identifying the PSI up to the point at which the data are accepted into the processing system.

On-line returns

The mechanism for filing returns on-line is geared to PSIs who have to make only a few declarations per reporting period. Separate forms are provided for arrivals and dispatches, and the layout is very similar to that of the paper forms.

For each movement of goods, a form has to be completed and submitted. When preparing the next declaration in the same session, the user can draw on the data in the previous form. For the future, it is planned to provide a standard data record. Straightforward credibility checks are carried out.

Transmission of declaration files

If a PSI prepares a declaration on diskettes using CBS-IRIS (maybe having downloaded this program from the W3stat site), the declaration files thus prepared can be transmitted to the Federal Statistical Office via W3stat. However, all other proprietary formats which are permissible for returns to the Federal Statistical Office are also supported, as are standard data compression program formats (such as .zip). In Phase II, it is planned to extend coverage to include CSV format, CUSCDEC/INSTAT and XML.

A straightforward file dialogue facility is provided which enables the user to select the declaration file on his or her local computer. File transmission can subsequently be activated. From the W3stat server, the files are passed through the firewall to the ASI system, where the declarations are accepted and then decrypted.

The on-line data and the data which are later acquired by the processing program are fitted into the current mechanism (pre-checking by the specialist department). The input protocols on the data submitted via W3stat are made available in the W3stat administration database.

Administration of PSIs and declarations

The W3stat administration database (Verwaltungsdatenbank - VDB) administers PSIs who use the W3stat service. It stores all the necessary information relating to registration inquiries from approved PSIs and is a means of identifying these information providers. PSIs can access the database and change entries such as address and contact person, where necessary. For the purpose of processing registration inquiries, there is a link to the intra-Community trade register, and a letter of confirmation is drawn up assigning a user name and password to an approved PSI.

After the W3stat server has received a valid PSI declaration (anonymous user name), protocol data such as the time of filing (not the content) are entered in the W3stat administration database (VDB). In this database, the processing status of a declaration can be tracked from computerised storage of the protocol data in the W3stat-VDB right the way through to data input into the ASI system. If the PSI so wishes, an e-mail can be automatically generated confirming that the return is being processed.

W3stat data-capture system

This component is designed to enable information providers to collect the reportable data either on-line or off-line and transmit them to the Federal Statistical Office. It offers the following functions:

- off-line input and data storage comparable with the CBS-IRIS program used hitherto,

- user-friendly Windows interface with on-line help and supporting user functions integrated into Web access, as well as access to on-line documentation,

- complete administration of updates and versions via the Federal Statistical Office's W3stat web-server and straightforward installation from the Net,

- import functions for standard data formats such as CSV, CUSDEC/INSTAT and other data formats used in Germany,

- credibility checks for off-line and on-line data input, link-up to administration database (VDB),

- compression using standard compression algorithms, and cumulation of individual declarations.

W3stat technology

System design

The W3stat architecture is a distributed system spanning three levels, each featuring different hardware and software components:

- general data input server in the in-house network of the Federal Statistical Office serving as an interface to the internal processing system (ADES) and to the administration database (VDB),

- web-server in the 'demilitarised zone' of the Federal Statistical Office for Intrastat data input (W3stat),

- user's PC workstation with web-browser and Java components installed.

Technologies used

The implementation of W3stat, only uses standard Internet technology. The aim is to ensure that the system is cost-efficient and future-proof, while minimising the technical requirements at the user's end.

The basic technologies are:

- HTTP using standard browsers (Netscape Navigator, Microsoft Internet Explorer),

- Java to create the client components,

- standard encoding/encryption techniques.

"DEB sur le Web" and "WebEDI" in France

Sylvie Colas, from an interview with Antoine Egea, Direction Générale des Douanes et Droits Indirects, France.

Overview

In France, two different systems are being implemented which use web-forms for the collection of Intrastat declarations:

- "DEB sur le Web" (Intrastat declaration on the web). This system is being developed internally by the IT service of French Customs. It is the migration to the internet of the existing French videotex system (Minitel) for Intrastat data collection.

- "WebEDI". This project is the implementation of an internet server for access to local administrative information in the Chalon sur Saône region and the first web-form is for the Intrastat declaration. Unlike "DEB sur le Web", WebEDI is a private initiative where French Customs are in partnership with commercial and local government bodies. The role of French Customs is to provide specifications, validate results and give approval for the system to become operational.

Other projects in this perpetually changing domain are expected in the future. French Customs encourage all initiatives on the development of Intrastat web-forms.

Since 1993, French law has allowed the Intrastat declaration to be sent in electronic format and the French government chose this declaration as the pilot for any trial on Electronic Data Interchange, including the projects on web-forms.

These projects follow a governmental action programme for the entry of France into the information society (PAGSI). The objectives of this programme are to simplify the life of the users and to improve the quality of the transmitted data. This will be done by providing electronic forms on the internet to facilitate electronic commerce and administrative procedures.

Before sending an electronic declaration the declarant is required by French law to sign an interchange agreement with French Customs. This agreement ensures the legal and technical security aspects of the interchange, by the exchange of the following information:

- an agreement number identifying the declarant,

- a personal password for the person responsible for the declaration, to enable authentication,

- an acknowledgement sent by French Customs to the declarant indicating the acceptance or the rejection of the declaration, with the number of lines and the total amount of the invoice values, to ensure the integrity of the data.

In the future, in compliance with the European directive on a common framework for electronic signatures, the declarant will have to present a certificate provided by a certification authority. The certification authorities will first be agreed by the French Ministry of Finance.

DEB sur le Web

"DEB sur le Web" (Intrastat declaration on the web) is being developed internally by the IT service of French Customs. It is the migration to the internet of the existing French videotex system (Minitel) for Intrastat data collection. The internet user interface is new but the existing internal programs have not changed. The system is in the development phase and will come into service as a pilot with a hundred companies on 1 March 2000. Companies which are already reporting their Intrastat declarations via Minitel will be the first to migrate to internet.

Figure 7: Input page of "DEB sur le Web"

Functionality

Most of the functions exist already in the Minitel system:

- user authentication,

- creation of a new declaration,

- management of declarations,

- validation and acknowledgement of the declaration,

- printing of declarations,

- looking up a country code,

- looking up a CN8 code,

- downloading the country code file,

- downloading a CN8 code file,

- correction of a recorded declaration.

A more detailed description is given below.

The user's view

The system is targeted at third declaring parties or companies providing statistical information, including those using the Minitel system, who have fewer than ten lines per declaration. This new system changes neither the organisation nor the work of the companies already using the Minitel system, and will be free of charge. The system also allows users making declarations of more than 10 lines to download IDEP/CN8 as a supplementary option.

A company which wants to use this system has to register with the administration. The user has to:

- contact French Customs in order to establish an interchange agreement,

- fill in a pre-registration form with the IT service of French Customs for the usage of the system.

When the interchange agreement is signed between the two parties, the user receives his identification and password by sealed letter and is registered with the IT service of French Customs in a user database. The text of the interchange agreement and the pre-registration form can be downloaded from the web server.

To use the system the user has to log on giving his identification code and password. The user authentication control is done on the web server. Companies already reporting their Intrastat declarations with the Minitel system will keep their current identification code and password when they migrate to the internet.

The web-forms are filled in on-line, the user's PC remaining connected to the web server during the entire transaction. When the user wishes to create a declaration, he must first input the flow, the threshold and the statistical procedure in order to display the appropriate input form with the useful fields to be filled in. He can save the declaration when it is partially complete, and it is stored in a temporary database on the server. The user can manage his temporary stored declarations by listing, modifying or deleting them.

The necessary code lists and validation criteria are integrated into the HTML page. The function for looking up a CN8 code includes a complex search of the CN8 codes by key-words or synonyms. The downloading of the CN8 and country code files, and on-line searching of these files, are also available as separate options.

When his declaration is completed the user can validate it, and it is then recorded on the web server. An automatic acknowledgement is displayed to the user before being sent to him by e-mail. This acknowledgement contains the declaration number, flow, period, threshold, number of lines, total invoiced amount and the certification number.

The correction function existing in the Minitel system will be implemented. It permits the user to correct a previously validated and processed declaration.

The lesson learnt from the Minitel system was that it is easier for the user to do a declaration with an electronic form. The internet web-form has further advantages. Compared with Minitel, the ergonomics of the user interface are much better, and will give the opportunity for access to other administrative services on the internet. However, it has also been found that internet tools still need promotion and the SMEs need more education about their use.

The administration's view

The objective of the collection of Intrastat declarations by web-forms is to:

- decrease the number of paper declarations, and therefore the cost of keypunching or OCR processing,

- reduce the number of errors due to paper declarations, and therefore to improve the quality of the data sent by the SMEs.

An important factor for French Customs is that this project requires almost no finance because the office procedures, help desk and many of the programs have already been implemented for the Minitel system.

Promotion and courses about the system are not yet scheduled. But it is planned to send mailings in September 2000 to Minitel users and companies which declare fewer than 10 lines per month on paper. An example of an Intrastat web-form will be stored on the server for demonstration; such a form already exists in the Minitel system.

Technical view

This new architecture is well integrated with the existing videotex server. The new system uses the same machines and the same programs for access to the databases; only the user interface has changed. The team which implemented the Minitel server is now working on the web-form server with the same partners and the same associated applications.

The "DEB sur le Web" server is a Unix machine. Two different firewalls ensure protection between the internet and the private network against non-authorised accesses and viruses. The protection between the web server and the internal system (databases) is achieved by separating the web server from the Information System of the administration and ensuring secured transfers of data by a proprietary protocol similar to FTP.

This basic architecture is presented in figure 8.

The minimum system requirements for the user are:

- 32-bit PC,

- Windows 95 (or above) or Windows NT,

- Internet access,

- Netscape Navigator version 4 (or above) or Internet Explorer version 3 (or above),

- screen resolution of 800 x 600 (recommended minimum).
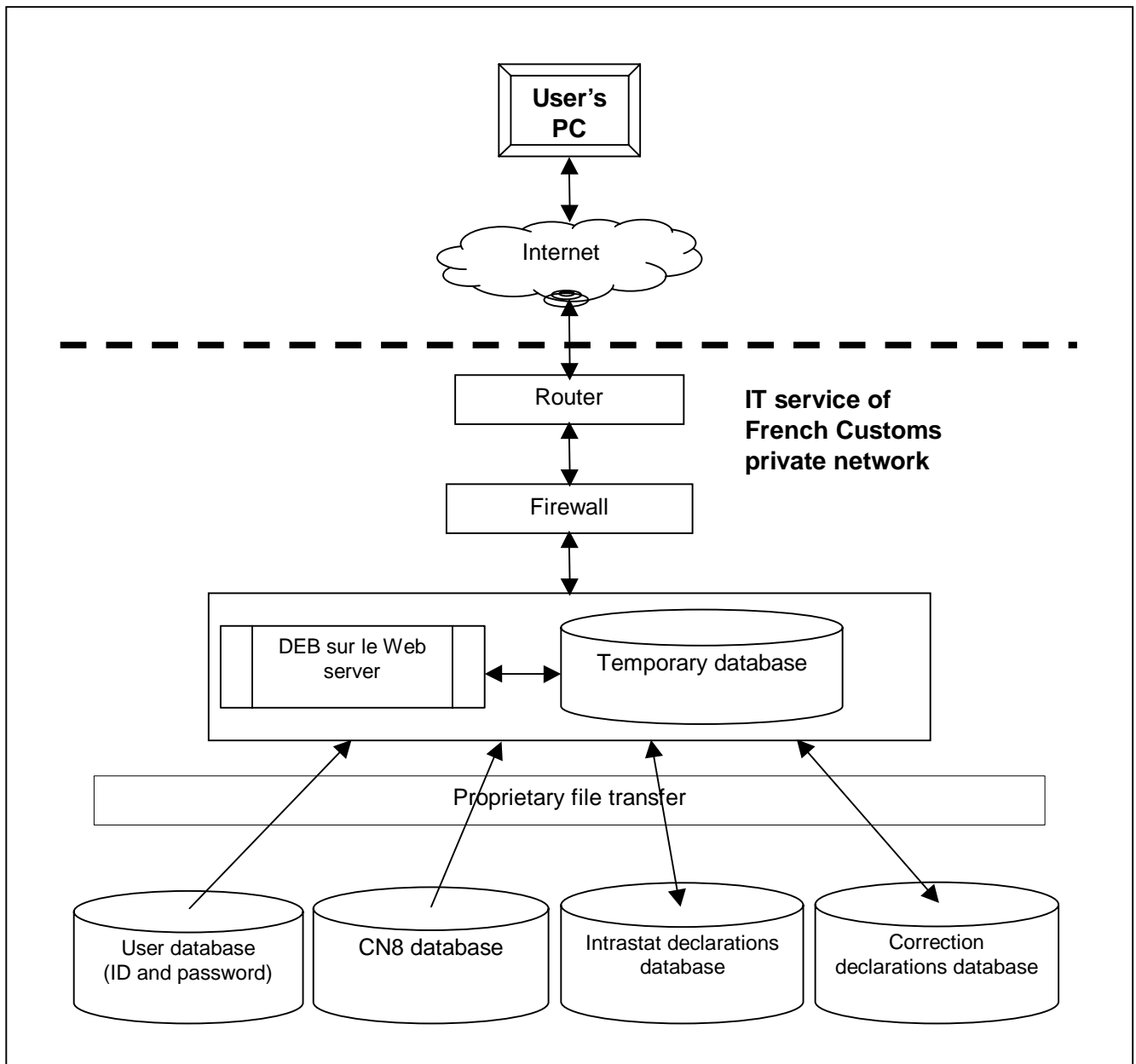
Figure 8: Technical architecture of "DEB sur le Web"

The user interface or client side is composed of HTML pages associated with programs in Javascript for the input of data and the validation of the data against the lists of acceptable codes. Inputs and some validations are executed in the user's browser; more complex functions, like looking up a CN8 code, are executed on the server side. On the server side the existing programs written in C

programming language for the Minitel system have not changed. For example, the function for looking up a CN8 code uses the same program as the Minitel system which includes a complex search of the CN8 codes by key-words or synonyms.

As with the existing Minitel system, once the declaration has been validated, the data are sent in in-house format to the database without translation into EDIFACT. XML is not currently used but will be considered in the future.

Project view

The Ministry of Finance is responsible for the good implementation of specifications of the Intrastat declaration. One project leader and two programmers from the IT service of French Customs (DNSCE in Toulouse) are working on this project. Some skills have already been gained with the Minitel system, for example programming in C. Courses in Java and HTML were organised for this project. An external consultancy is used for security aspects and ergonomics. The total resources required are three staff.years and the expected duration is twelve months. The project timetable is shown in table 4.

Task	Duration
Function description	February-March 1999
Validation	April-July 1999
Definition of conditions of opening of the site	July 1999
Publication of specification for security issue	August 1999
Programming	November 1999
Implementation of the local security system	Second quarter 2000
Integration of the remote security system	Second quarter 2000
Testing	April 2000
Opening of the service	June 2000

Table 4: Project timetable of "DEB sur le Web"

Take-up

The new system will be tested by around a hundred companies who are already working with the Minitel system. Since it is similar to the Minitel system, the take-up by these users should be easy.

The number of users expected to use "DEB sur le Web" is estimated as:

- 1500 users/month in 2000,

- 3000 users/month in 2001,

- 5000 users/month in 2002,

- 10,000 users/month in 2004.
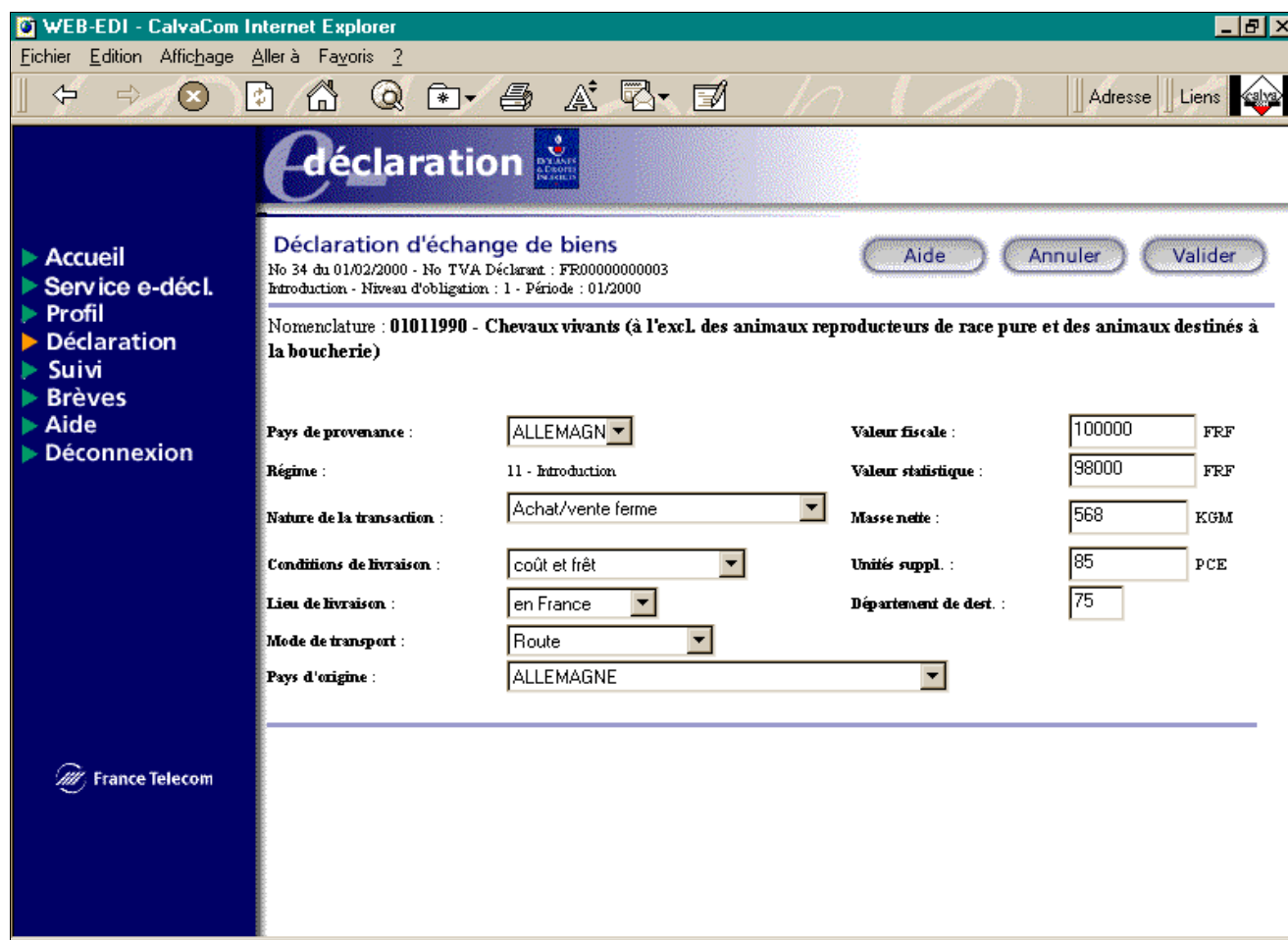
Lessons learnt

It is not possible to come to a firm conclusion before June 2000, when the system has been fully implemented. Nevertheless, it is possible to say that the development of this system has been facilitated by the existing implementation of the French videotex system called Minitel, because most of the specifications are similar; the biggest difference is the user interface. New security aspects linked to the internet must be studied and strengthened between the administration and the companies.

It has also become clear already that high service quality and good availability of the system are very important. Any reduction in these will result in rejection by the users.

WebEDI

This is a private initiative developed by France Telecom/Transpac with the objective of linking large organisations with small enterprises using the internet. The first project is the implementation of an internet server for access to local administrative information in the Chalon sur Saône region (Communauté des Communes de Chalon sur Saône) and the first web-form is for the Intrastat declaration. The role of French Customs in this project is to supply the specifications, validate the results and give approval for the system to become operational. This system, tested by twenty companies from June to December 1999, has to be approved by French Customs before being operational.

Figure 9: Input page of WebEDI

Functionality

The main functions offered are:

- user authentication,

- creation of a new declaration,

- management of declarations,

- validation of declarations,

- archive of declarations,

- printing of declarations,

- multilingual support (French, English).

A more detailed description is given below.

The user's view

Like the "DEB sur le Web" system, the system is targeted at third declaring parties or companies providing statistical information, who have fewer than ten lines per declaration. These companies already filling in the Intrastat declarations on paper may now use the internet. They must be well trained in these new technologies. At least during the trial period, the use of this system is free of charge.

A company which wants to use this system has to register with the administration. The user has to:

- contact French Customs in order to establish the interchange agreement,

- send a registration form to France Telecom.

When France Telecom receives the form, it creates a user account with a connection on the WebEDI server, updates the user profile database and sends a connection kit to the user. This kit contains information necessary for connection to the WebEDI server, and an instruction booklet.

When the interchange agreement is signed between French Customs and the user, the user receives his identification and password in a security envelope and French Customs ask France Telecom to permit the user to enter his declarations on the WebEDI server.

To use the system the user has to log on giving his identification and password and to choose his working language (French or English). The user authentication control is executed on the WebEDI server and the application is presented in the selected language.

Like the "DEB sur le Web" system, the web-forms are filled in on-line, the user PC remaining connected to the web server during the entire transaction.

When the user creates a declaration, the header of the declaration is partially pre-completed with some information from the user profile database, once the header is complete, the appropriate input form is presented (depending on the flow, threshold, statistical procedure). The user can save the declaration when it is partially complete, and it is stored temporarily in his PC.

The necessary code lists and validation criteria are integrated into the HTML page. The function for looking up a CN8 code includes a key-word search, the functionality of management of CN8 codes is similar to that in IDEP/CN8.

When his declaration is completed, the user can validate, print and archive it. The validation of the declaration implies its submission to the WebEDI server (front office), the automatic generation of the EDIFACT message CUSDEC/INSTAT and the sending of this message to the regional centre of Intrastat data collection of French Customs (back office).

The regional centre of data collection processes the received message and sends an acknowledgement by fax to the declarant. This acknowledgement contains the declaration number, flow, period, threshold, number of lines, total invoiced amount and the certification number.

No function is available for the moment for the correction of previously validated and sent declarations.

As with 'DEB sur le Web', the advantages of an internet web-form are the ergonomics of the user interface and the access to other internet services. The user can be connected to other EDI platforms via this WebEDI server without any supplementary equipment. Again, as with "DEB sur le Web", WebEDI still needs promotion, and the SMEs need more education about its use.

The administration's view

WebEDI is a commercial solution financed by the government and developed by France Telecom. So far, the use of the system is free of charge, the Intrastat declaration being a loss leader. After the test period, when the system works and is mature, the assumption is that somebody will pay for the usage of this server but this has not yet been defined. It will fall to either the Chamber of Commerce, the declarants or French Customs.

French Customs do not finance this project, and have no control on its development but hope to get some benefit, if this system achieves the following objectives:

• decrease the number of paper declarations, and therefore the cost of keypunching or OCR processes,

• reduce the number of errors due to paper declarations, and therefore improve the quality of the data sent by the SMEs.

French Customs are not responsible for the infrastructure implemented for the Intrastat data entry. They work with the EDIFACT CUSDEC/INSTAT message received from the WebEDI system. This data collection system is no different from the existing system in which Intrastat declarations are generated as an EDIFACT CUSDEC/INSTAT message by IDEP/CN8, or by another EDIFACT translator of the user.

During the test period, French Customs did not process these declarations and did not provide any help desk. The trial being finished, French Customs are now working on the approval of the system. Once it is approved, they will grant a conformity label certifying that the EDIFACT message CUSDEC/INSTAT generated is correct and that the used codes are valid. This label does not include any aspects of service quality: user interface, ergonomics, elapsed time, connection security and access controls.

France Telecom is responsible for the promotion of the system and has scheduled media presentations for when the system goes live. Test web-forms are stored via the URL of the Chalon sur Saône Chamber of Commerce.

Technical view

The system architecture has two main parts:

- front office – the part between the user and the WebEDI server, in which the Intrastat web-form is exchanged via the internet. Security is achieved by the HTTPS protocol (SSL v.2).

- back office – the part between the WebEDI server and the regional centre of Intrastat data collection of French Customs, in which for each validated declaration, the web server generates the EDIFACT message CUSDEC/INSTAT and sends it to the regional centre of Intrastat data collection, via X.400. The system does not currently use XML but this format will be considered in the future.

France Telecom supplies the X.400 system called ATLAS400, the WebEDI server and the tele communication infrastructure. It has not been possible to obtain from them precise information about the WebEDI server. The basic architecture is presented in figure 10.
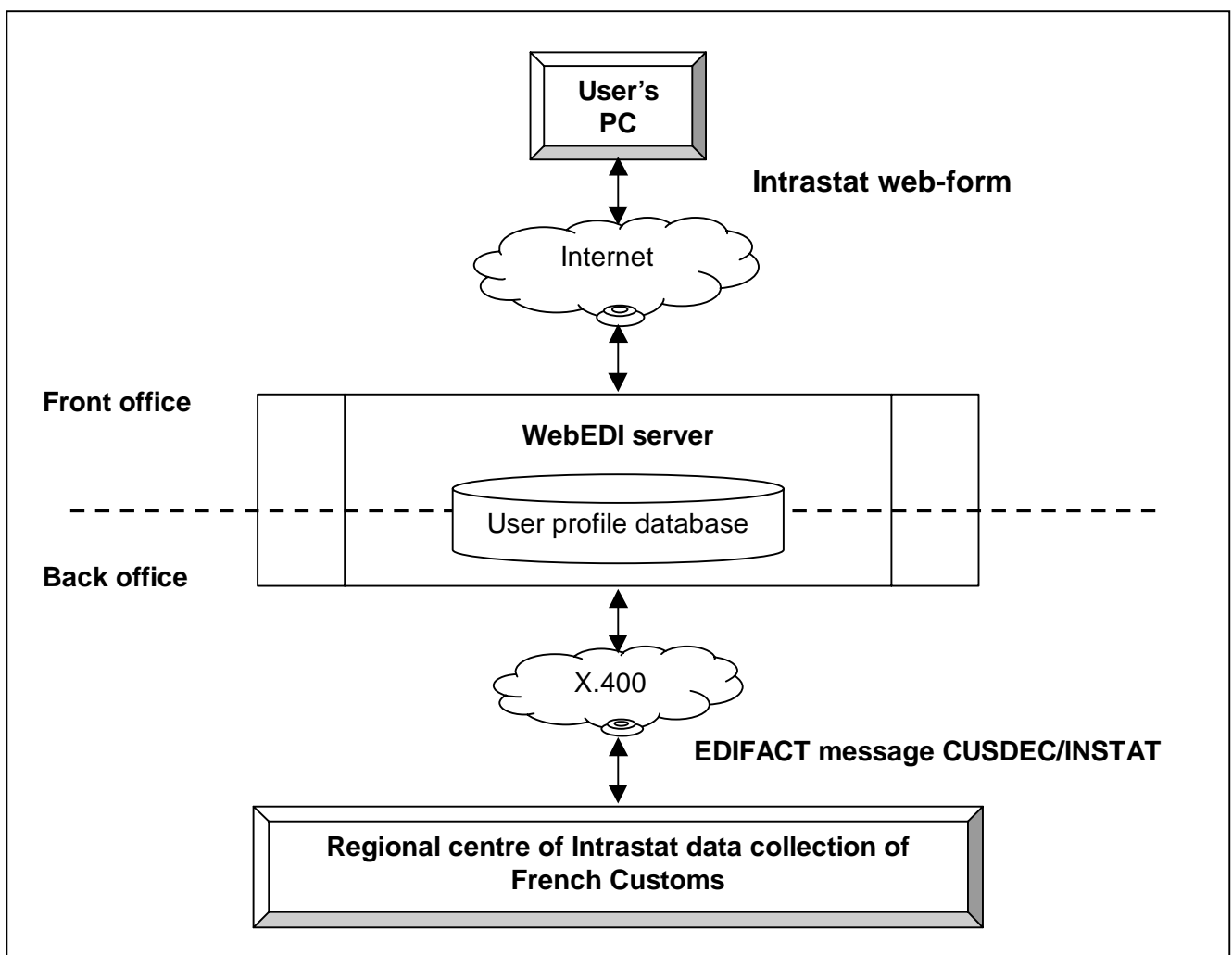

Figure 10: Technical architecture of WebEDI

The minimum system requirements for the user are:

- 32-bit PC,

- Windows 95 (or above) or Windows NT,

- Internet access,

- Netscape Navigator version 4 (or above) or Internet Explorer version 3 (or above),

- screen resolution of 800 x 600 (recommended minimum).

The user interface or client side is composed of HTML pages associated with programs in Javascript for the input of data and the validation of the data against the lists of acceptable codes. Inputs and some validations are executed in the user's browser; more complex functions, like looking up a CN8 code, are executed on the server side.

Project view

The companies in charge of the development did not provide information about the size, the resources and the skills required for the project.

The only available plan covers the period of tests and trials, as shown in table 5.

Project milestone	Date
Beginning of tests of Intrastat data entry by 20 declarants	July 1999
Beginning of tests with real declarations (*)	End of August 1999
End of tests with real declarations (*)	January 2000

(*) During these periods a real declaration is submitted electronically, but the declarant has also to provide a paper declaration in parallel.

Table 5: WebEDI milestones

Now that the tests are finished, French Customs are working on the approval of the system.

As being the contracting authority, France Telecom is in charge of the co-ordination of this project with other software houses. The different partners taking part in this project are:

- Prime contractor: Communauté des Communes de Chalon sur Saône and the Chamber of Commerce.

- Contracting authority: France Telecom.

- Financing: From PAGSI programme (Governmental action).

- Specification, validation and certification of the system: French Customs.

Take-up

Twenty companies used the system up to 10 January 2000, the end of the test period. The tests showed that connexion times are long and losses of connexion are frequent. This will need to be improved before usage of the system is extended. Nevertheless, the Intrastat declarations generated as EDIFACT messages CUSDEC/INSTAT have been found to be valid and the pilot

companies will continue to use WebEDI without having to wait for the approval of the system by French Customs.

Lessons learnt

Perhaps the most interesting feature of this project is the use of a third party. By not managing the development themselves but instead entering into a partnership with a telecoms service provider, French Customs have been able to take advantage of the new facilities the World Wide Web has to offer, but at the cost of only a small investment for the administration.

Future plans

For France Telecom, the future plans are to generalise the usage of web-forms for the Intrastat declaration, and to extend the concept to cover every administrative or private web-form.

For French Customs, this system is regarded as the same as any other system providing Intrastat declarations to be collected in the EDIFACT message CUSDEC/INSTAT. If this pilot is successful, they will approve the system with a view to extend this service to every company in the region. The technical problems regarding service quality will need to be addressed by the service provider, but do not prevent the approval of the system.

Summary table

Intrastat web-form system	UK Intrastat web-form	Finnish Intrastat web-form	German Intrastat web-form "W3stat"	French Intrastat web-form WebEDI	French Intrastat web-form "DEB on the Web"
Member State Intrastat rules implemented	United Kingdom	Finland	Germany	France	France
User language	English	Finnish Swedish March 2000 English intended	German	French English	French
Target users	SMEs declaring on paper form	SMEs declaring less than 30 lines per declaration on paper form	Online form for SMEs declaring few lines only, file transfer also for bigger declarations	SMEs declaring less than 10 lines on paper form	SMEs using Minitel (videotex system) or declaring less than 10 lines on paper form
Date of implementation	December 1998	March 1999	Mid-1999 (pilot test)	January 2000	June 2000
Take-up	3.5% of the providers, 3% of Intrastat declaration lines (06/1999)	14% of the providers, 1,2 % of the declarations (12/1999)	About 60 pilot users	About 20 users (01/2000)	
Service provider	UK Customs	Finland Post Ltd.	Statistisches Bundesamt	France Telecom	French Customs
Resources for development					
• **Staff.years**	2.5	1.2	2.0	Figures not available	3
• **Duration**	12 months	5 months		Figures not available	12 months
Service owner	UK Customs	Finnish Customs	Statistisches Bundesamt	To be defined	French Customs
Payment for telecommunications	User	User	User	User	User
Web address	http://www.hmce.gov.uk	https://intrastat.finpost.net/	http://w3stat.statistik-bund.de/		

Intrastat web-form system	UK Intrastat web-form	Finnish Intrastat web-form	German Intrastat web-form "W3stat"	French Intrastat web-form WebEDI	French Intrastat web-form "DEB on the Web"
Contact person	Jon Walmsley (HM Customs and Excise) Jon.Walmsley@hmce.gsi.gov.uk	Pekka Tahnua (Finnish Customs) Pekka.Tanhua@tulli.fi	Fritz Pfrommer (Statistisches Bundesamt) Fritz.Pfrommer@statistik-bund.de	Antoine Egea (French Customs) dnegea@tedeco.atlas.fr	Antoine Egea (French Customs) dnegea@tedeco.atlas.fr
Technology					
• **Type of e-form**	Off-line downloaded Java applet	On-line HTML pages associated with Javascript programs	On-line HTML pages with Java applet Off-line downloaded Java applet	On-line HTML pages associated with Javascript programs	On-line HTML pages associated with Javascript programs and CGI.BIN
• **Transfer between the web server and Intrastat mainframe**	EDIFACT message CUSDEC/SEMDEC	EDIFACT message CUSDEC/INSTAT	File transfer	EDIFACT message CUSDEC/INSTAT	File transfer between the temporary database on the web server and the mainframe databases
User's system requirement					
• **PC**	Minimum 32-bit	Minimum 32-bit	Minimum 32-bit	Minimum 32-bit	Minimum 32-bit
• **Operating system**	Windows 95 (or above) or Windows NT	Windows 95 (or above) or Windows NT	Windows 95 or above or Windows NT	Windows 95 (or above) or Windows NT	Windows 95 (or above) or Windows NT
• **Browser**	Netscape Navigator version 4.5 (or above) or Internet Explorer version 4 (or above)	Netscape Navigator version 4.04 (or above) or Internet Explorer version 4 (or above)	Netscape Navigator version 4 (or above) or Internet Explorer version 3 (or above)	Netscape Navigator version 4 (or above) or Internet Explorer version 3 (or above)	Netscape Navigator version 4 (or above) or Internet Explorer version 3 (or above)
• **Recommended minimum screen resolution**	800 x 600	800 x 600	800 x 600	800 x 600	800 x 600
Functionality					
• **Creation/modification of a partially completed form**	Yes	Yes	Yes	Yes	Yes
• **Validation of codes**	Yes	Yes	Yes	Yes	Yes

Intrastat web-form system	UK Intrastat web-form	Finnish Intrastat web-form	German Intrastat web-form "W3stat"	French Intrastat web-form WebEDI	French Intrastat web-form "DEB on the Web"
• **Upload of data from other business information systems**	Yes, using CSV format	No	Yes	No	No
• **Integration of CN8**	Future release	Yes, function similar to IDEP/CN8	No	Yes, function similar to IDEP/CN8	Yes, complex function including key-word and synonym searching
• **Correction of previously sent declarations**	No	Under development	No	No	Yes
• **On-line help**	Yes	Yes	Yes	Yes	Yes
• **Intended use of XML**	Yes	No	Yes	Yes	Yes
• **Possibility to download off-line forms**	Java applet	No	CBS-IRIS new off-line data capature system under development	No	IDEP/CN8
Security					
• **Registration procedure: secure delivery of the user's identification and password**	User ID and password given by phone or e-mail	E-letter with user ID and password	Confidential mail with user ID and password	Signature of interchange agreement Confidential mail with user ID and password	Signature of interchange agreement Confidential mail with user ID and password
• **User authentication**	User ID and password	User ID and password	User ID and password	User ID and password	User ID and password
• **SSL**	Future release	Yes	Yes	Yes	Yes
• **Applet certification**	Java applet approved and certified by Verisign				
• **Acknowledgement of the declaration**	No	No	E-mail if requested	Sent by fax	Displayed on-line and sent by e-mail
• **Use of electronic signature**	No	No	Intended	Intended	Intended

Using XML for the Intrastat declaration: A preliminary trial

Several Member States intend to migrate to an XML implementation of their Intrastat web-form. The potential advantages of XML are that it can describe the data, rather than simply its presentation, and this could make it easier to interface the data collection system with existing databases. This could bring benefits to the administration, where ease of interfacing could enable validation of input data against existing mainframe databases, and also to the data provider, where it could facilitate automatic extraction of data from existing business information systems. This section gives a brief report on a prototype XML questionnaire for the Intrastat declaration, evaluated by Working Group 5 of EEG6.

Polyvalent XML Questionnaire (PXQ)

The Polyvalent XML Questionnaire (PXQ) is a prototype developed by Anders Tornqvist within the framework of EEG6 Working Group 4 "New Ways of Collecting Raw Statistical Data". It was demonstrated and distributed in the February 1999 EEG6 meeting in Geneva. The objective of PXQ is to enable any questionnaire to be presented as an XML document.

This prototype allows a user to:

- edit an electronic form template,

- complete an electronic form,

- send it by e-mail,

- complete information about the declarant such as:

  - the identification, name and address of his company,

  - information about the person responsible for the declaration,

- complete information about the document such as:

  - reference number,

  - priority,

  - dates of creation, update, submission …

At the moment the form is delivered by a floppy disk, but it would be a relatively simple matter to deliver it via the Internet.

Creation of an electronic form in XML

Using PXQ the user can create an electronic form in XML format that contains:

- display information (colours, etc ...),

- pictures,

- tables,

- information format,

- text of the questions,

- information concerning the responses, such as:

    - response tags,

    - response properties (alpha, numeric, length, range, etc.)

    - code lists linked to the response.

The underlying object model is derived from the RDRMES questionnaire object model. Consequently the basic XML elements are 'row', 'cell' and 'response', and every item of information is considered as a response to a question inserted in a table containing rows and cells.

For the moment, the respondent has to use PXQ to open a questionnaire file in XML format, using the associated data type definition (DTD). When the standard browsers are able to handle XSL, it should be possible to open the questionnaire file directly using one of them.

Tests with an Intrastat declaration

An Intrastat declaration was created in XML containing a header and three lines using PXQ. The following fields were used:

- flow, threshold, PSI ID, TDP ID, period of reference (header level),

- item number, goods code, nature of transaction, MS of arrival, country of origin, invoiced amount, statistical value, net mass, quantity in supplementary units, mode of transport, terms of delivery (line level).

At the moment it is not possible for the user to add a new line to the declaration so it is recommended to include a table of medium size with a fixed number of lines. Adding a new line should be possible in the next release of PXQ.

This Intrastat electronic form in XML was created quickly and easily.

First conclusions

Size of the file generated

The XML electronic form created by PXQ can be rather large. It contains display information, questions, responses, code lists, and other things. In the Intrastat experiment the file that was generated for transmission was 17 Kbytes; the equivalent EDIFACT file was 800 bytes, or about 5% of the size.

In production, it would not be realistic to collect Intrastat declarations with display information, questions, and code lists etc. Ideally, electronic Intrastat declarations should have the same format whatever their origin, whether that be IDEP/CN8, a web-form, an accounting database or whatever. An operational system would need to return the Intrastat information without display information or the questions.

Intrastat rules and object model

It was not possible to implement the full Intrastat rules, as found in IDEP/CN8, in the experimental system. Only the code lists and validation of the format of the data (type of information and length) were included. This was because the object model used by PXQ is the generic QST object model and not a specific Intrastat object model, and because the PXQ software would have had to be extended to enable the complex validation tests.

In the QST model a piece of information is called a 'response' and is expressed as a 'cell' within a 'row'. So the data from an XML e-form using QST consists of responses included in rows and cells. In the Intrastat model, the pieces of information are known as 'flow', or 'nature of transaction' and so on. So, more investigation is needed to establish how to insert the QST format data into an Intrastat object model or relational database.

Future developments

This experiment suggests two directions for future investigations:

- To evaluate available off-the-shelf XML tools such as parsers, interfaces between XML and databases, XSL for displaying XML documents.

- To develop a stable and independent object model of the Intrastat declaration which integrates and improves the Intrastat rules developed for IDEP/CN8, to enable the derivation of any format used in EDI, e.g. EDIFACT, XML.

Any administration considering developing an XML web-form for Intrastat will need to include these activities in its development programme.

Glossary

Name/Acronym	Definition
Applet	See Java applet.
ASI	[DE] Automatisierte Sachbearbeitung der Intrahandelsstatistik. Automated Intrastat processing system of StBA.
ATLAS 400	Commercial name of X.400 in France.
Browser	See web browser.
C	A programming language.
CBS	[NL] Centraal Bureau voor de Statistiek. Statistics Netherlands.
CBS-IRIS	Interactive Registration for International trade Statistics. Software package developed by the CBS, used for collecting Intrastat data.
Certificate (or qualified certificate)	Digital attestation which links a signature verification device to a person and confirms the identity of that person.
Certification authority (or certification service provider)	Person who or entity which issues certificates or provides other services related to electronic signatures to the public.
CGI	Common Gateway Interface. Standard for running external programs from a web server.
Client/server architecture	A network architecture in which each computer on the network is either a client or a server. Servers are dedicated to centralised tasks such as managing disk drives (file servers), printers (print servers), or network traffic (network servers). Clients are PCs or workstations on which users run applications using resources managed by servers.
CN8	Combined Nomenclature at 8 digit level. Classification of goods used for Intrastat declaration.
Communauté des Communes de Chalon sur Saône	Community of towns and villages of the Chalon sur Saône region (Bourgogne, France).
CSV	Comma-Separated Values. Data format for any kind of data; data items are separated by commas.
CUSDEC	EDIFACT message format for customs declaration.
CUSDEC/INSTAT	EDIFACT message format for Intrastat declaration, subset of CUSDEC. Maintained by EEG6/WG5. Accepted in all EU Member States.
CUSDEC/SEMDEC	Single European Market Declaration. EDIFACT message format, subset of CUSDEC. Used in the United Kingdom for Intrastat declaration.
CUSRES	EDIFACT message format, response message to CUSDEC.
CUSRES/INSRES	EDIFACT message format, subset of CUSRES. Response message to CUSDEC/INSTAT.

Name/Acronym	Definition
DEB	[FR] Déclaration d'Echanges de Biens. Name of the Intrastat declaration in France.
DEB sur le Web	DEB on the Web. Intrastat web-form being implemented in France.
Declarant	Company providing statistical information (see PSI), or an agent doing this for other companies (see TDP).
DGDDI	[FR] Direction Générale des Douanes et des Droits Indirects. French Customs.
DNSCE	[FR] Direction Nationale des Statistiques du Commerce Extérieur. French administration for Foreign Trade Statistics.
DTD	Document Type Definition. Type of file associated with SGML and XML documents that define how the mark-up tags should be interpreted by the application presenting the document.
E-letter	Electronic letter. E-mail delivered on paper and sent by mail.
E-mail	Electronic mail. Transmission of messages over communication networks.
EBES	European Board for EDI Standardization. EBES standardization work is carried out by a number of EBES Expert Groups (EEG). See for example EEG6.
EDCS	Electronic Data Capture System. Data collection system implemented in United Kingdom.
EDI	Electronic Data Interchange.
EDIFACT	Electronic Data Interchange for Administration, Commerce and Transport. UN and ISO standard.
EEG6	EBES Expert Group 6. Statistical Experts Group within EBES. EEG6 studies are primarily carried out by Working Groups (WG), each group concentrating on a particular aspect relating to the collection or the dissemination of statistics. Example: EEG6/WG5 – Exchange of External Trade Statistics.
Electronic signature	Signature in digital form in, or attached to, or logically associated with, data which is used by a signatory to indicate his approval of the content of that data.
FAQ	Frequently Asked Questions (with answers).
Firewall	Computer system designed to prevent unauthorised access to or from a private network.
FTP	File Transfer Protocol. Internet standard.
HMC&E	Her Majesty's Customs and Excise. Customs in the United Kingdom.
HTML	HyperText Markup Language. Language to describe web documents, based on SGML.

Name/Acronym	Definition
HTTP	HyperText Transfer Protocol. Protocol for the access to web documents.
HTTPS	Secured version of HTTP. Also known as S-HTTP.
Hypertext	System of links to another place in the same document or to an entirely different document; these links are chosen by the author.
IDEP/CN8	Intrastat Data Entry Package with the Combined Nomenclature at 8 digit level. Software package for Intrastat declaration, currently used by more than 35,000 companies in 12 EU Member States.
Internet	Global network connecting millions of computers. Services offered by the internet include e-mail, file transfer, WWW, etc.
Intrastat	Intra-Community Trade Statistics. Statistical system relating to the trading of goods between EU Member States.
ISO	International Organization for Standardization.
IT	Information Technology.
Java	A platform-independent programming language.
Java applet	Small Java program that can be attached to a web document and executed by a web browser.
Javascript	A programming language, not to be confused with Java.
Minitel	Videotex system in France.
OCR	Optical Character Recognition. Recognition of printed or written characters by computer.
PAGSI	[FR] Programme d'Action Gouvernemental pour l'entrée de la France dans la Société de l'Information. Governmental action program for the entry of France into the information society.
PSI	Provider of Statistical Information.
PXQ	Polyvalent XML Questionnaire. Software developed by EEG6/WG4 group to generate XML questionnaires.
SGML	Standard Generalized Markup Language. Language to describe documents and their layout. ISO standard.
SME	Small and Medium sized Enterprise.
SSL	Secure Sockets Layer. Protocol for encrypted communications on the Internet.
StBA	[DE] Statistisches Bundesamt. Statistics Germany.
Tag	Command inserted in a (SGML, HTML, XML, …) document that specifies how the document, or a portion of the document, should be formatted.
TCP/IP	Transmission Control Protocol/Internet Protocol. Internet standard protocols for data transmission.
TDP	Third Declaring Party.

Name/Acronym	Definition
Transpac	Subsidiary of France Telecom in charge of X.25 and X.400 systems.
UN	United Nations.
URL	Uniform Resource Locator. Standard for specifying the location of an object in the Internet. Example: http://europa.eu.int/comm/eurostat
VAT	Value Added Tax.
VDB	[DE] Verwaltungsdatenbank. W3stat's administration database.
Videotex	Interactive service which provides for users of videotex terminals to communicate with data bases and other computer based applications via telecommunications networks. The most successful example is the French Minitel.
W3stat	Web-form for Intrastat project in Germany.
Web browser	Software application to access the World Wide Web.
WebEDI	Project developed by France Telecom/Transpac in order to link important organisations with small enterprises via the World Wide Web.
Web-form	Electronic form on the World-Wide Web.
WG4, WG5	See EEG6.
World Wide Web	Also known as "the Web". Internet service offering access to multi-media documents (web pages, web documents) on remote computers (websites, web servers) through a specific web-access software (web browser).
WWW	World Wide Web.
X.25	Packet switched data network protocol for the exchange of data between a user device (host) and a network node.
X.400	Set of standards for message handling systems (e-mail).
XML	eXtensible Markup Language. Data format for structured document exchange on the World-Wide Web.
XSL	eXtensible Style Language. A language used to create stylesheets for XML.