

DECWEB - Internet Fiscal Statement Submission

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Abstract: The latest technologies are used not only in business, considered the most dynamic field of activity, but also in Governmental strategies of interaction with the civil society and the business environment. The governmental functional and technological requirements created new concepts and approaches of electronic business (G2G, G2B, and G2C). In Romania, the Ministry of Communications and Information Technology was the trend setter. It developed a large number of proofs of concept and pilot projects covering a wide area of services that needed to evolve electronically. Together with the Ministry of Public Finance, it defined the requirements and specifications for DECWEB, the programme that allows companies to submit their fiscal statements via Internet.

DECWEB system is a keystone programme for the Ministry of Public Finance on its way towards moving administration and services for society to information age. Highly awarded, the first DECWEB initiative was a successful proof of concept and it needed to be upgraded to a new professional version with extended functionalities, higher flexibility and advanced security mechanisms. This paper describes the DECWEB project and how technology and professional services enhanced Governmental activities, why the project was such a success and how it will evolve.

Keywords: Fiscal Submission, Internet payment, digital invoice.

1. Project Overview and Objectives

The latest technologies are used not only in business, considered the most dynamic field of activity, but also in Governmental strategies of interaction with the civil society and the business environment. The governmental functional and technological requirements created new concepts and approaches of electronic business (G2G, G2B, and G2C).

Once the trend was set, many of the Governments were keen to adhere to it. From e-Procurement solutions to e-Administration and new electronic services to enhance the communication and interaction with the society, they begin to define requirements, to interconnect systems, to ask for standards and to make the industry interested to get involved in this process.

In Romania, the Ministry of Communications and Information Technology was the trend setter. It developed a large number of proofs of concept and pilot projects covering a wide area of services that needed to evolve electronically. Together with the Ministry of Public Finance, it defined the requirements and specifications for DECWEB, a G2B system that allows companies to submit their fiscal statements via Internet.

Goals:

- Transparency and efficiency for the activities of the Ministry of Public Finance
- Efficient and standardized work procedures
- Decreasing public expenses and bureaucracy
- Assurance of a very high security and trust environment for performance of public funds administration activities
- Automatic and faster submission, taking over, processing and interaction between Companies and Fiscal Administration office
- Eliminated fraud or subjectivism
- Encouraged introduction of IT and integrated applications for finance and accounting at Company level, independent of their size

As a result and a benefit of the project, the Ministry of Public Finance can now better concentrate its resources and activities for the primary purpose of verifying, balance sheet synthesis, budget planning, instead of investing important resources of public servants in teller's work, data key in, verifications of correlations and solving frequent situations of incorrect information into forms.

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From the security point of view, DECWEB is a major challenge, the information inside is highly sensitive and the system is exposed to all type of attacks, from denial of service to social engineering and personnel persuasion.

One major threat for balance sheet submission operations is represented by the risk of processing malformed information for which there is no guarantee regarding its authenticity and integrity. This is a major problem from a legal point of view:

- if the Company is not able to prove the information authenticity and integrity there may be charges caused by the submission of forged documents
- if the MoPF is not processing the correct data, it may begin legal actions against Companies without sound pieces of evidence; this may lead to important image and trust damages for both the Ministry and the Company

Special attention was paid to this issue during DECWEB design phase as MoPF was concerned about the problems that may rise. The proposed controls consisted of digital signatures on all submitted documents together with the delivery receipts to notify companies about transmission errors or forged messages. Moreover, the successful delivery receipts were the evidence that the company submitted the correct documents on time and in compliance with MoPF requirements.

2. Project Details

DECWEB is an integrated system, designed with a built in high availability architecture, ensuring a high level of system security, the system being a mixture of proprietary and open-source technologies.

The project consisted of:

- Definition of a standard needed to set up secured communications and information transmission between fiscal administration offices and the companies/tax-payers
- Setting up a secured portal for the access of companies to the Ministry of Public Finance application and for the Financial Inspectors, to access the data submitted by the companies
- Implementation of a Certification Authority within the Ministry of Public Finance to support authentication based on digital certificates and advanced encryption
- Setting up an assistance software for the generation, verification and electronic signature of balance sheets

The system has two categories of users: companies that submit their balance sheets and financial inspectors that verify the submitted documents. All the users were confident and comfortable with the paper-based submission mechanism and reluctant to changes.

There were specific demands to allow parallel submission of the balance sheets (paper-based and electronically) and to provide a graphical interface for the electronic forms identical with the image of the printed ones.

An intensive user awareness program was initiated to explain the differences between the systems, the benefits of the electronic techniques and the basic knowledge about electronic signatures and information protection.

Technical headlines of the system:

- High availability and scalability to face heavy loading periods before submission deadlines
- Advanced security characteristics which ensure confidentiality, authenticity, integrity and non-repudiation
- Open solution, flexible, scalable, and able to interface with other systems.

2.1. System architecture

The architecture is multi-tier model, with a central level (Ministry of Public Finance – MoPF) and local levels (Financial Administrations – FA). There are two types of communication with different security controls:

- Internet, to enable the communication between Companies and the MoPF portal
- Intranet, for communication between MoPF and FAs

The system architecture is shown in figure 1.

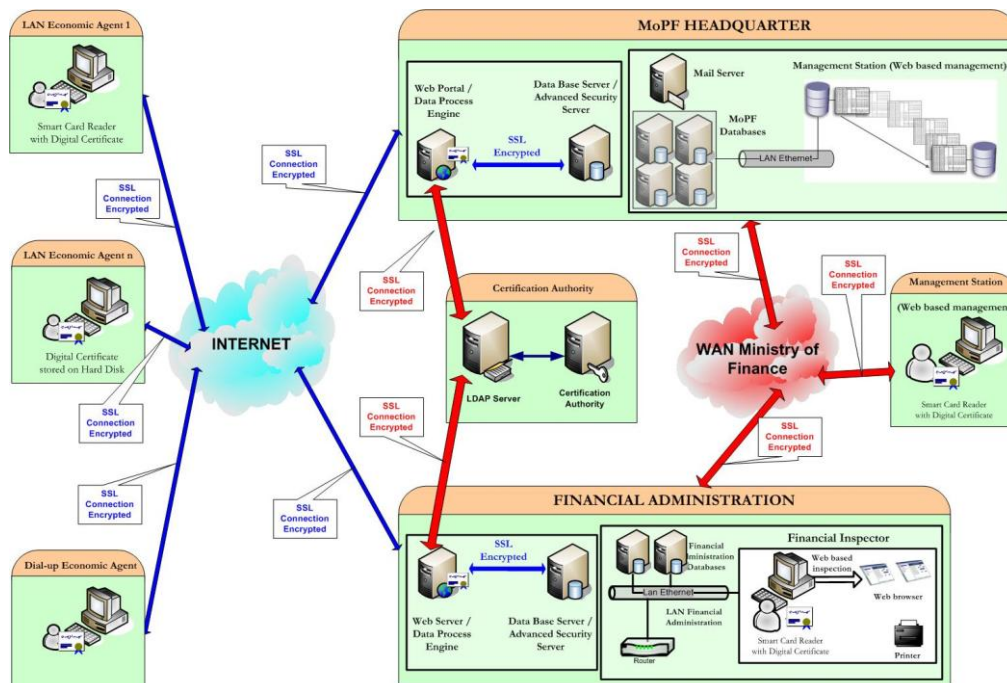


Fig. 1. System Architecture

2.2. User authentication

In order to submit the Financial Statements, the Company has to access via Internet the MoPF portal where it authenticates using its digital certificate; a 128 bits SSL connection is established between the portal and the Company computer. Then, based on company's access rights, the MoPF server opens a link via MoPF Intranet to the local FA to which the Company is affiliated, using a SSL tunnel between the servers. The submitted declarations are stored first in the FA databases and then the information is updated in the central database. Thus, the application provides a single point of access and, simultaneously, local management of statements at the FA level while redirection is performed transparently for the Company.

The Financial Inspectors use the same portal, via MoPF Intranet, and mechanisms to authenticate within the system, each of them being redirected to access the information of interest for the Fiscal Administration he/she belongs to.

Prior to user authentication, the portal identifies with its WEB server certificate; when a user presents its digital certificate the portal queries a LDAP server to check the certificate status. The digital certificate can be issued by the DECWEB project CA or by other CA that has an agreement with the MoPF, as the system is open standard compliant and designed to allow interconnection with other entities. As a result, when the National Electronic System was implemented, DECWEB services were available also through www.e-guvernare.ro portal.

2.3. Balance sheet submission and control

The success of DECWEB project was determined by the feedback of the users regarding the new mechanism of balance sheet submission. The system had to provide a ground breaking solution to demonstrate its efficiency and to convince users to choose it as the preferred way to send documents to the MoPF.

The flow of the submission process from the company perspective is described in figure 2.

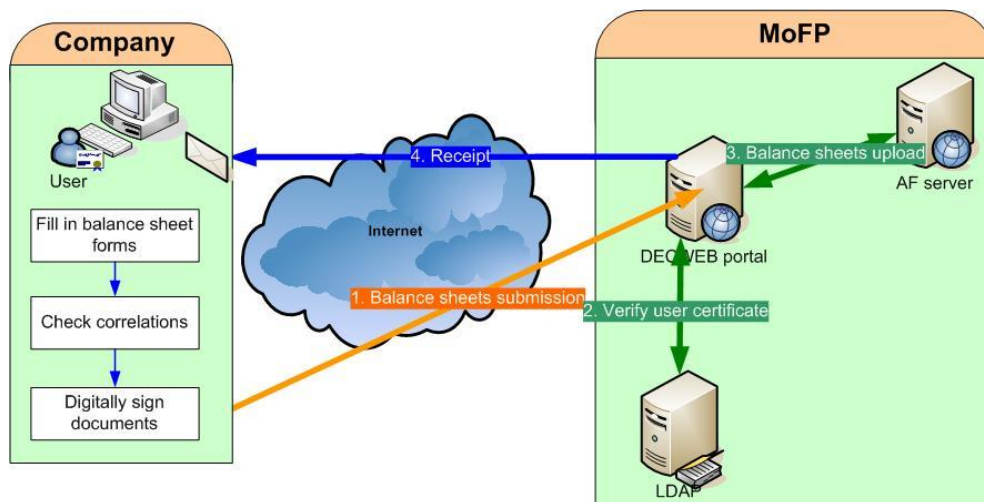


Fig. 2. Balance sheet submission flow

The assistance application that helps Companies to fill in the balance sheet files is the main contact between the system and the end-user. The use of the assistance software provides the following advantages:

- easy to get (download from the Ministry of Public Finance site) and easy to use

- easy to use interface
- direct copy from Microsoft Excel tables or ERP (enterprise resource management) applications
- verification of correlations and explicit display of errors
- verification of the application integrity for each use
- digital signature on balance sheet documents
- easy display and printing for the documents the balance sheet consists of (What You See Is What You Get – WYSIWYG)

The balance sheets must be submitted twice a year and their structure is evolving. The application was designed independent of the structure of balance sheet files and, in order to be able to send the correct information to the MoPF, Companies need to download solely the balance sheet definition file, in XML format, signed by the MoPF and to fill in the new forms. The application self checks its integrity and the integrity of the XML files at start-up and allows user to sign the documents and prepare them to be submitted, only when all the mathematical correlations are correct and all the files contain valid information; this is a very convenient mechanism for end users and financial inspectors as they don't need to double-check and compute the correlations by hand.

When receiving the documents, the application engine from DECWEB portal checks the integrity of the files, verifies the status of the signing certificate and the correspondence with the certificate of the logged-in Company and then stores the data into the database of the Fiscal Administration where the Company is affiliated to. All the actions are logged and at the end of the submission process the Company receives a receipt as proof of successful operations or notification of the transmission errors.

Once a balance sheet is submitted, the Financial Inspector can verify the documents (analyze them versus other submitted documents, Company's financial history, etc.) and notify the Company if they need more details, supplementary information or if the balance sheets need to be submitted again.

The Companies can log-in anytime into the portal and check the status of their documents (submitted, reviewed/not reviewed by a Financial Inspector) and the messages from the inspectors.

3. The Impact of the Project

The project represents a corner turn for the MoFP, as it changes the paper-based way of conducting activities with a state-of-the-art system that allows the organization to decrease its front office manned operations and to have a better focus on the core business of the Ministry.

The main impact of DECWEB was over the human element of the system. As everything within the balance sheet submission was changed, it was needed a sound system able to gain the confidence of the users that no data is lost, operations are faster and more reliable, the integrity and confidentiality of information is preserved, everything with less effort and lower costs.

At a glance, the advantages of using the DECWEB system are:

- The Ministry of Public Finance work patterns are preserved.
- The activity of companies is simplified.
- The operation is legally similar (the same legal value) as the classic document system.

The solution assures IT control requirements needed to adequately protect information: availability, authorization, authenticity, confidentiality, integrity, non-repudiation and privacy. For such a demanding program, it was not enough to integrate COTS (Commercial Off-The-Shelf) products, but a great deal of research, analyses and product customization was also needed, while keeping the interoperability and following the standards. When the DECWEB system went live, it had an impressive information security infrastructure and tools at the hands of its operators and its clients:

- PKI architecture: certSAFE Certification Authority offering, besides the digital certificates management, the possibility to further implement key recovery, time-stamping and online digital certificate status and validation modules. It was provided with dedicated hardware security devices (HSM) for key management and policies, practices and procedures tailored for DECWEB and the needs of the Ministry of Finance.
- Authentication and authorization system: gateSAFE, a versatile and feature-rich identity management product for user log-in on portal, covering the following functionalities: PKI enabling of legacy applications, secure connection over insecure lines (Internet/Intranet), SSO, SSL Acceleration, OSI level 7 load balancing, accounting and virtual WEB server, web services security, identity control
- Mechanisms to offer IT security controls for information protection on user side: offline application to fill in, check and digitally sign the balance sheets
- User training, documentation and security awareness programs

User training and support was a key element for the success of the project, as long as they needed to be able to understand the characteristics and functionalities of the new system. As they became aware of the new mechanisms, they became confident in using DECWEB.

If in the beginning the electronic signature was nothing more than a scanned hand signature pasted into a document, after a short time the Companies began to ask the MoFP if they could sign e-mails and contracts using the digital certificates provided for DECWEB.

DECWEB is a modern system, with an open architecture, able to support the development of new functionalities and modules.

As a consequence of DECWEB success and upon the request of the companies, the Ministry of Public Finance decided that the system needs to be developed and extended year by year and it became a "de facto" "standard" when the Ministry set the requirements for new systems implementations.

4. Outlook

One of the first steps forward for DECWEB was the integration within the National Electronic System, a unified access point to and electronic service provider for G2B and G2C activities.

The project needs to be further developed to keep the pace with evolving technologies. There are two approaches to achieve this: introduction of new services within DECWEB or creating a new and more complex system that includes and develops DECWEB functionalities; the evolution of DECWEB must be analyzed from the point of view of the technology and from the point of view of the services it offers to its clients and it requires from third parties.

The elements needed to keep DECWEB on the frontline of Romanian Governmental on-line services should include:

- time stamp mechanisms to enhance the benefits of digital signatures
- certificate validation services for the MoPF Certification Authority and open standards requirements for third parties to be able to offer such services when issuing digital certificates to DECWEB users
- electronic series system to assign a unique serial number to each submitted document, as required by the legal framework
- electronic notifications mechanisms to offer a reliable and secure way to exchange electronic messages between Companies and MoPF
- electronic forms workshop to allow MoPF to design any type of forms and other documents that will be filled in and submitted by tax payers
- electronic payment system, to allow Companies to pay their fiscal debts on-line
- enhanced receipts issuance system, using digital signature and time stamp mechanisms
- archiving system to store the submitted documents for the period of time required by the legal framework

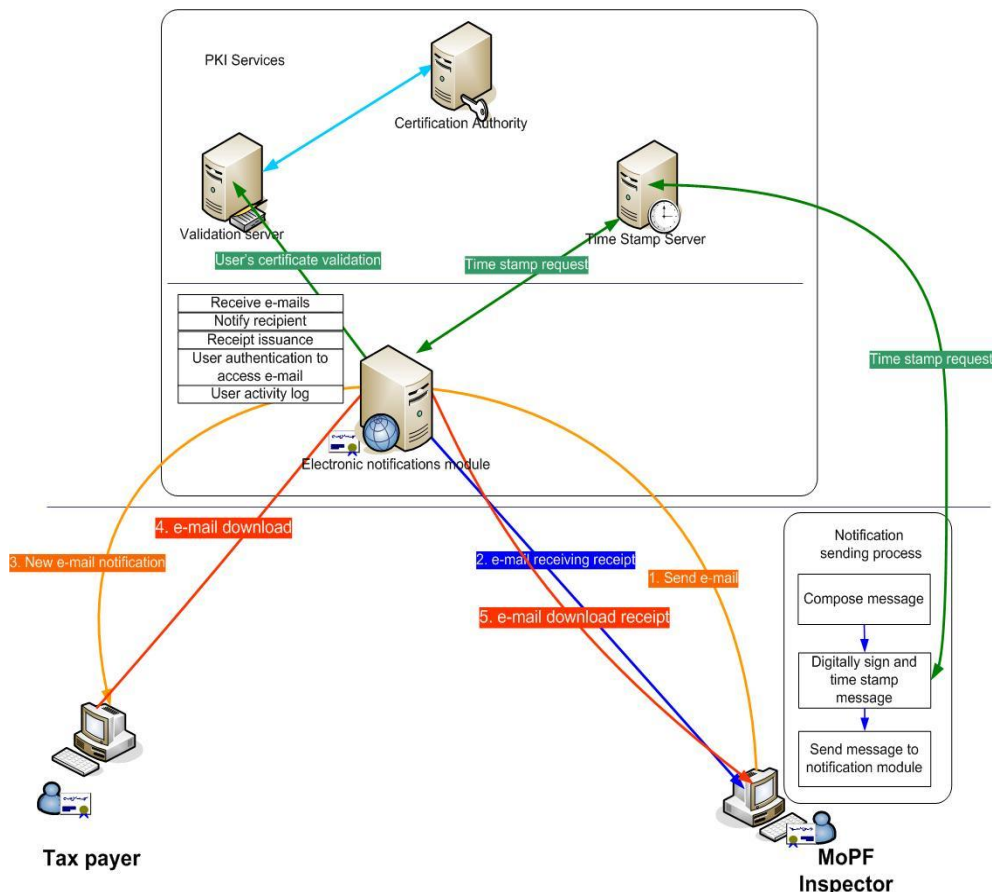


Fig. 3 Electronic notifications mechanism

The electronic notification system described in figure 3 is a functionality needed by MoPF to be able to send electronic messages to tax payers and to receive delivery receipts with legal value. Moreover, the Ministry needs such a system to be able to receive electronic offers for its bids, as this is able to provide all the functional characteristics as the paper-based bids (proof of bid submission before certain time, confidentiality and integrity of the offer, authenticity and non-repudiation of the bidder, etc.).

The analysis to implement these elements already began and there is a positive feedback from the MoPF, as they are interested to create framework to be available for the electronic services they plan to develop and to set the basic references for other systems that will be connected in the future with MoPF to exchange information or offer services.

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