

# THE ICELANDIC STATE'S E-INVOICING PROJECT

Mrs. Thorhildur Jetzek  
*Skyrr*

Mr. Bergthor Skulason  
*FMA*

## Executive Summary

This paper discusses the e-Invoicing solution chosen and implemented by the Icelandic State.

After observing the success of the Danish government in a similar project and reviewing their own business case, the Icelandic State decided to implement an e-Invoicing solution to complement their Oracle Applications purchasing and payables systems.

The aim of the project was to be able to receive and send invoices of a certain XML standard to and from the Oracle Applications Finance system used by the State. The State chose to use an open standard, the NES (Northern European Subset) implementation of UBL 2.0. This open standard is a result of the cooperation of several Northern European countries in order to support domestic and cross border electronic trade. Incidentally the Icelandic State was the first of the Scandinavian countries to actually use invoices based on this standard, but the Danish government had for two years successfully used a very similar standard, OIO-XML.

The chosen solution is a custom made module that receives XML invoices and maps them to the correct columns in the AP interface tables in Oracle Applications. To add to the potential cost savings, the State also chose to create an accounting engine that uses a predefined logic to create an accounting string based on information in the XML invoice, thus saving time for the end user. They also chose to simultaneously implement an electronic approvals system based on Oracle AME.

The State chose the Icelandic IT company Skyrr as an implementation partner, but Skyrr had six years earlier implemented Oracle e-Business Suite for the State and has continued to service the system and create new solutions since then.

The project is in a roll-out phase today and has been a success, even if there's still a lot of ground to cover before the procurement process becomes fully automated.

## Project Background

### Iceland - statistics:

Population 1 January 2008	313,376
Labor force participation 16-74 years, %	81.7
Unemployment 16-74 years, %	1.9
Economic growth 2006, %	4.2
GDP per capita in USD, current exchange rate	54,764

### About the Icelandic State

The Icelandic State is not a very big organization in comparison with many US entities, with around 20.000 employees, but it is separated into 520 institutions which adds to its complexity. The FMA (Financial Management Authority) is a government entity under Ministry of Finance and is responsible for running most of government accounting and finances. The State has been using Oracle eBusiness Suite since 2002. It uses around 40 modules and has about 3.000 users within the system. Most organizations do their own finances but FMA also runs a service center for smaller institutes. FMA is also responsible for paying government employees and is responsible for tax collection systems.

The FMA decided to implement an e-Invoicing solution to complement their Oracle Applications purchasing and payables systems in the year 2006. This project had actually been on the agenda for some years but various issues had prevented its realization. But in 2006 the landscape had changed and it was decided to go ahead. The aim was to be able to receive and send electronic invoices to and from the Oracle Applications Finance system used by the State.

### Standard for electronic invoices

The estimated number of invoices received by the state is close to one million invoices a year. Even if the total number is low, the complexity is as great as within any other government. Therefore the selected standard must support flexibility and simplicity – and at the same time be able to support complex information. Most invoices received by the State are simple invoices like utility bills for electricity, water, phone etc. There is also a lot of invoices for all kind of services rendered based on an existing contract. Then there is quite a number of small invoices for goods ordered informally, fx by phone. Only a small portion of invoices are a response to a formal order originating in the purchasing module.

In Iceland there is a vibrant community of companies using EDI based solutions within the procurement chain. The Icelandic State looked at the possibility of using such a solution for receiving invoices in electronic form. The conclusion was that it would not be practical. The reason is that EDIFACT solutions are costly to set up and run and therefore require a substantial amount of invoices to be practical. Also, while the government was looking for a general, simple, adaptable solution, EDIFACT tends to be implemented point to point within each industry.

It was therefore decided to go for an XML based standard. UBL is an open, free standard for simple invoices & orders and has been used in Denmark since February 2005 when a Danish law required all suppliers to send invoices in an electronic format to the Danish State. Based on that experience, a cooperation of Scandinavian governments developed a subset of UBL called NES (Northern European Subset) focusing on government purchases and the SME's. The NES invoice is small, not bigger than 230 elements.

## Business case

Paper based Invoicing is a time-consuming and error prone process. The list of things that can go wrong is a long one; Invoices get lost, the employee makes a mistake when keying in and overpays, the process cycle time is too long, resulting in interest on overdue payments. According to the Aberdeen Group (2007), the transaction processing costs of manual methods are 74-89% higher than that of automated processes.

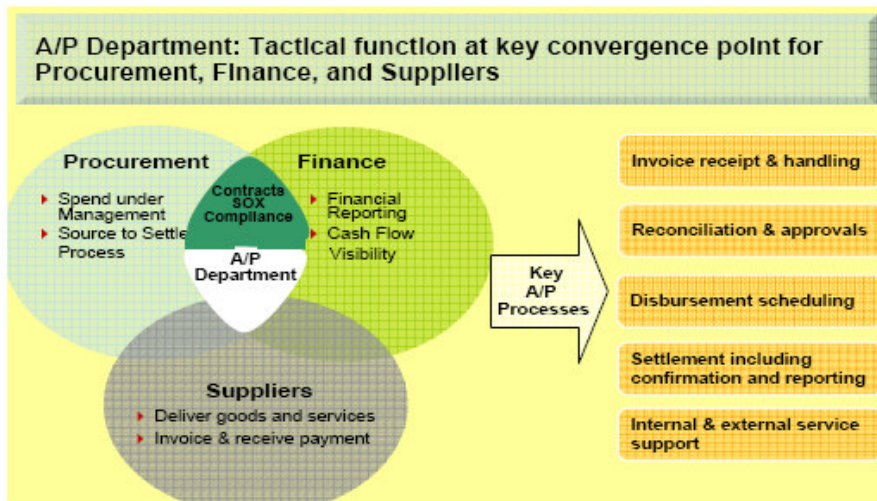
The Icelandic State was well aware of the potential savings but also of the pitfalls of such projects, having some years earlier implemented the use of procurement cards. The procurement card was to be used mainly for lower cost purchases to get rid of paper based requisitions. But the reality of the situation was that the procurement card was first and foremost used for regular invoices where there was no requisition to begin with, so savings remained minimal. The risk in such projects is prevalent, and in most cases it's the human factor that goes wrong: The personnel involved simply does not adapt to the changed processes.

It's a well known fact that the total cost of goods purchased is higher than the actual price. After accounting for all the transaction costs, the total cost of relatively cheap goods can be more than double the original price.



**Figure 1. The total cost of goods purchased**

If we look at the purchasing process as a whole, as in the picture from Aberdeen Group below, we can divide it into Procurement (the actual act of purchasing), Suppliers (deliverance of goods and invoice deliverance/payment acceptance) and Finance (accounting, financial reporting).



Source: AberdeenGroup, September 2007

**Figure 2: Procurement tasks**

The procurement process of the Icelandic State was partly automated in some of the bigger institutions and the financial reporting side was also satisfactory. The most labor intensive and time consuming part of the process was on the other the Invoice handling, and thus they decided to focus there.

We can furthermore divide the task of the AP department into the five main processes shown above:

- 1) Invoice receipt and handling
- 2) Reconciliation and approvals
- 3) Disbursement
- 4) Settlement, including confirmation and reporting
- 5) Internal and External Service Support

While disbursement was automated for the most part of the State’s Institutions, the invoice receipt and handling and approvals process were both very manual and labor intensive. It was clear that there was a great deal of improvement possibilities and potential savings to be found.

Even time saved on 1) and 2) could be well spent on items 4) and 5), resulting in a better service and less errors that finally results in savings. The larger institutions could as well spend more time on other value-added processes if they managed to save time spent on items 1) and 2).

Performance Area	Average Result
Invoice processing cost (all invoice types)	<b>\$21.86</b>
Days payable outstanding	<b>39.9 days</b>
Exception rate	<b>7.8%</b>
Time to process invoice and schedule payment	<b>19.3 days</b>
Payments made on-time	<b>69.9%</b>
On-time payments that earn discount	<b>51.3%</b>
Invoices received electronically	<b>22.7%</b>
Payments settled electronically	<b>35.4%</b>

In Table 1 we can see some average metrics from an Aberdeen Group research. The Icelandic State was in a significantly better shape regarding electronic payments, but received very few invoices electronically.

Source: [AberdeenGroup](#), September 2007

**Table 1: Accounts Payable Metrics - Performance**

The cost savings following the automation of invoice processing:

- lower invoice processing costs
  - Less time spent on manual tasks, like keying in
  - Less time spent on corrections due to wrong input
- reduction in cycle times for invoice processing
- improved days payable outstanding
- increased discounts attained
- increased invoice transaction volumes
- reduction in the percentage of and the amount of time employees spend on inquiries (for reconciliation)

- fewer late payments; and lower associated fees:
  - Less penalty interest payments (invoices don't get lost)
  - Less paper cost (in Iceland the supplier charges the buyer up to \$4 to cover paper and posting)
  - Less likelihood of dispute as it is known exactly when the invoice was received

Based on more timely and accurate information the State gets:

- more effective purchasing agreements
- more effective planning and budgeting

The Icelandic State decided to use the low end of estimates where the potential cost savings range from \$7.5 to \$30<sup>1</sup> pr. invoice, depending on which research you quote. The State receives approximately 600 thousand invoices pr. year. If they succeed in their project and receive every invoice automatically the year 2010 they could be looking at possible minimum of 4.5 million USD savings pr. year.

---

<sup>1</sup> According to Aberdeen Group, a business case involving a large company with \$1.5 billion yearly revenue, the average cost saving of moving to an electronic invoice processing is around \$11 pr. invoice.

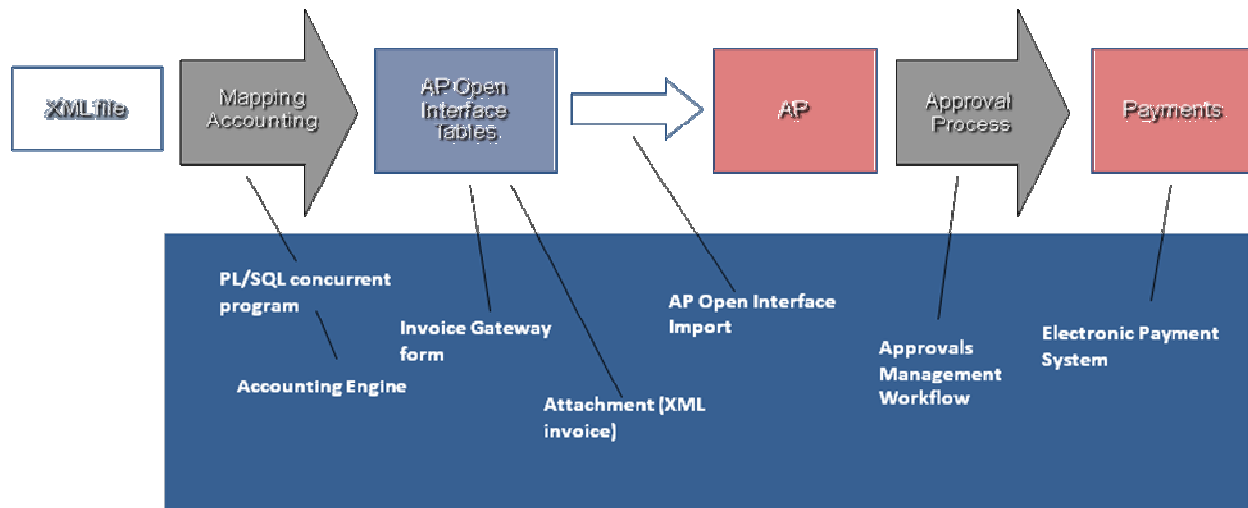
## Technical Solution

The Icelandic State made some requirements regarding the XML invoice solution. The solution chosen by the Icelandic State had to support the NES XML subset and it had to be fully integrated with Oracle AP. The solution should be easy to maintain and the implementation time had to be reasonable. It was also expected that the automated process would indeed save time and simplify work procedures.

Before the project was formally started, representatives from the FMA and Skyrri visited the City of Copenhagen, which had in 2004/2005, with the help of an independent consultant, implemented a fully functional XML invoice solution in only 3 months. Their solution did support a standard used by the Danish Government, OIO XML – which is a predecessor to the UBL NES subset. The City of Copenhagen is also an Oracle finance user and their solution is fully integrated with Oracle AP. Their number of invoices and users is also very similar to that of the State.

Other benefit of this solution was that it didn't require a lot of customization of Oracle Applications, it was not too complex and was more transparent for the State than Fx XML Gateway.

It was decided to take a similar approach as the City of Copenhagen and build a custom made solution, with some add-ons and changes.



**Figure 3: e-Invoices process**

The State's solution consists of six main components:

- 1) CP1: A process that looks for invoices in an inbox and transfers them into a custom made table in Oracle Applications.
- 2) An accounting engine that looks through the invoice and generates accounting codes based on predefined logic. The accounting engine also collapses invoice lines that have the same accounting codes, thus simplifying the invoice for the end user.
- 3) CP2: A process that runs through the XML invoice in the custom table and maps the fields to columns in the AP invoices interface table. It also verifies that the invoice is true to the UBL standard and thus a "legal" invoice.
- 4) A custom made form, XML transactions, was made for the super-users who can look up the invoices waiting in the custom made table and see what invoices end up with errors after CP1 and CP2 have been run.
- 5) A custom made form, EAN numbers, designed to map invoices and control security.

- 6) A customized version of the AP Quick Invoice form where the end user is able to look up unaccounted invoices and prepare them for import into AP.

### **Process description**

- Suppliers are asked to send XML invoices to a predefined location.
- The XML invoice is received in the Inbox and stored there.
- Once a day CP1 loads XML data into a custom table in Oracle Applications. It also stores the XML documents in an archive where it remains unchanged. This is for auditing purposes, so that the State's employees can always look up the original documents.
- Once a day CP2 goes through the custom table and loads data to the interface table, using business logic to map data from XML to AP interface tables (see chapter on mapping). If an error occurs such that the invoice cannot be loaded into the interface table, a message is raised in the form XML transactions (see below) and a manual process is used to resolve the error. When the error has been resolved, the invoice is loaded into the interface tables the next time CP2 is run.
- The end users review those invoices that need modification in the customized Quick Invoices form.
- As often as needed the process "Payables Open Interface Import" is run. This process loads all valid invoices from the interface tables to the AP tables. It's also possible for the users to press the button "Create Invoices" in the Quick Invoices form and run the process themselves. The import process is a standard Oracle process and has not been modified.
- Invoices that are subject to approval will be routed automatically to the approval process (Oracle AME), the approver depending on the cost center in the accounting string.
- Approved invoices are paid according to the payment info defined in the XML document.

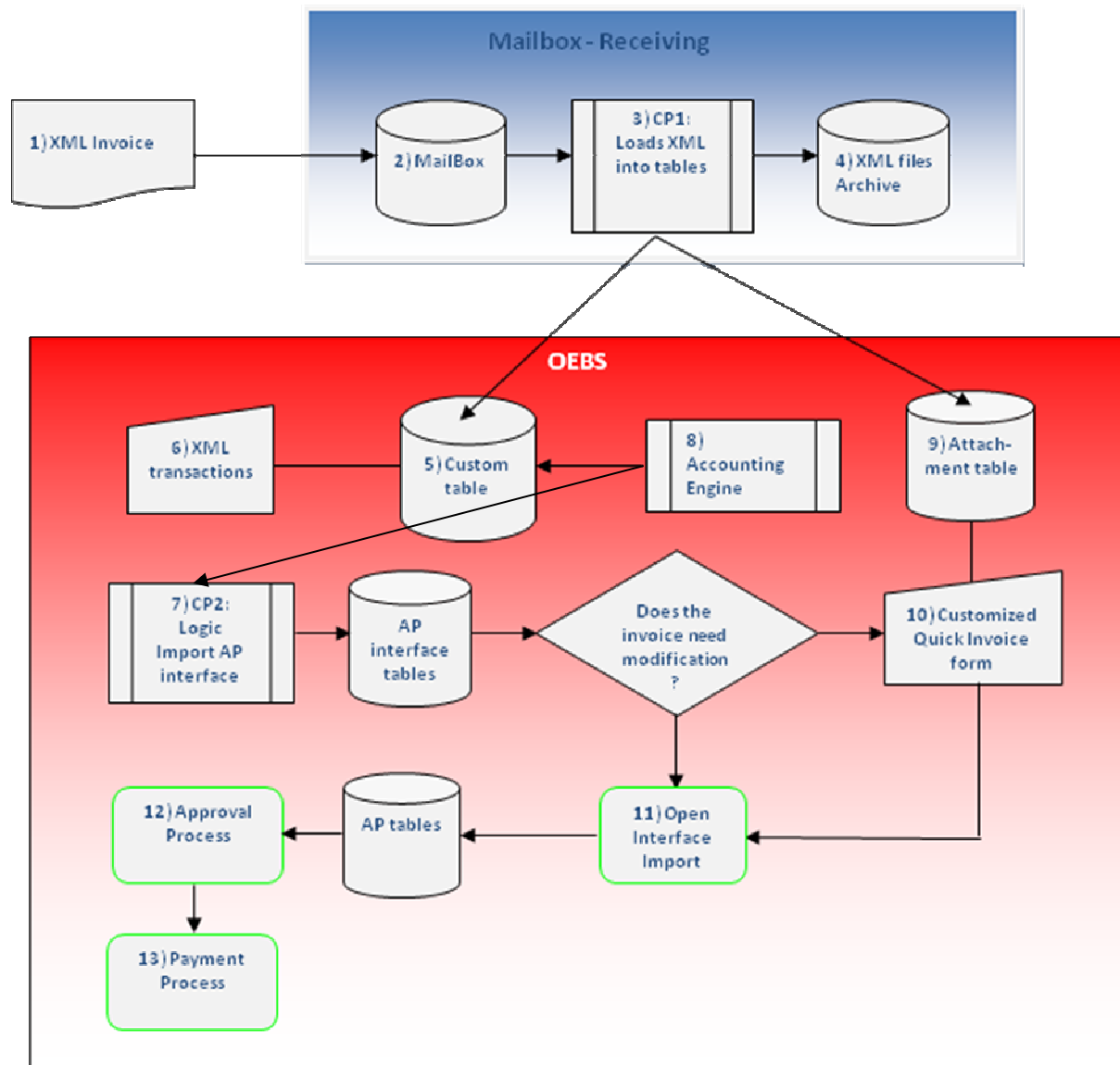


Figure 4: The State's e-Invoicing process: Closer look

**Further description of figure 4:**

- 1) XML file: UBL 2.0, standalone, simple invoice profile from NES subset.
- 2) Inbox: The inbox is located on a Windows server.
- 3) CP1: A module that uses ftp to get XML-documents from the Inbox, archives them and loads into a custom table.
- 4) XML Archive: Used to store XML files unchanged for audit purposes.
- 5) OEBS custom table: Used to store XML data until it's loaded into AP interface tables.
- 6) XML transactions form: Used to show the user the status of incoming files, the transaction history and the XML invoice that was originally sent to the inbox. It also gives the user the means to manually test the validity of an XML file and to cancel the invoice, if necessary.



- 7) CP2: A module that imports data from the Custom table to AP interface tables. Business logic is used to map XML tags to columns in the interface table. CP2 also does the XML validation and parsing, using XDB.
- 8) Accounting Engine: A module where the FMA and/or the institution can create logical mappings that create the accounting string. The string itself is generated pr. invoice line, or a group of lines that are collapsed, during CP2.
- 9) Oracle Attachment table: XML invoice is stored with the invoice in AP as an attachment. When the user opens the attachment, the XML document is viewed via a custom made Invoice stylesheet.
- 10) Customized Quick Invoices form: A modified version of the standard Oracle Quick Invoices form that is be used to handle the invoice (key in the accounting string, view messages and make changes if necessary).
- 11) Import into AP tables: Standard import process is used.
- 12) Approval Process: The Approval Process routes invoices with attachments (XML+stylesheet, optionally a picture) to the approvers of the cost center involved.
- 13) Payment of invoice: Same (electronic) payment process as for every other invoice.

## Individual modules

### Mapping:

The solution had to address the following issues of special complexity in the Icelandic State's setup:

- The State has multiple operating units.
- Some operating units have subledger security applied. Subledger security is also used for the institutions that don't have their own AP and are being serviced by the FMA.
- In one institution in particular, there are multiple supplier sites per operating unit, basically with same information, but often related to different internal locations (therefore with different bill\_to\_location\_id and ship\_to\_location\_id's configured). There can be other valid reasons for having created other supplier sites. Most suppliers have a default site per org, which can be used in most cases. But if an operating unit has defined other sites for a particular supplier, there should be a way for them to set up the system to generate invoices for these particular sites.

The main challenge of the mapping program is to be able to identify :

- a) What institution is the receiver of the invoice (security).
  - b) What supplier site to use.
- a) To solve this problem, the suppliers will be asked that the invoice contains an EAN number (GLN-Global Location Number) for identification of the receiver. The GLN is a unique, 13 digit number that is more detailed than the 10 digit social security number and thus can be used to identify the receiver of the invoice with more accuracy. The EAN numbers are published by the international institution GS1 and should work as identification in international trade as well as within Iceland.

Subledger security group has to be applied to the invoice before it's imported to AP. The query used by the modified Quick Invoices form also has to identify to which subledger security group the Oracle responsibility belongs and show only the invoices belonging to that SLS group. The solution was to use an empty column in the interface table to store the subledger security group id. The id is stored with the EAN number of the receiver and copied to the interface table by the mapping program.

If only for security reasons, the minimum number of GLN will be as many as there are Operating Units and subledger security groups (around 600). If, for other reasons such as identification within organizations (fx for identifying a cost center or a location within an institution), a more detailed structure is later needed, the architecture should not hinder this.

- b) In Iceland, the social security number system is widely used to identify suppliers and in the Oracle setup for the Icelandic State, supplier number equals social security number. It's therefore not difficult to locate the correct supplier if the invoice contains his social security number. A problem arises only if the institution has more than one supplier site pr. supplier it becomes difficult to find out which site is the correct one, even if both the social security number of the supplier (supplier id) and Oracle's internal org\_d of the institution are known.

What can be done is to use location id to identify which site to use, because the only reason to have more than one supplier site is for procurement purposes. Thus, location is usually the only difference between different sites for the same vendor.

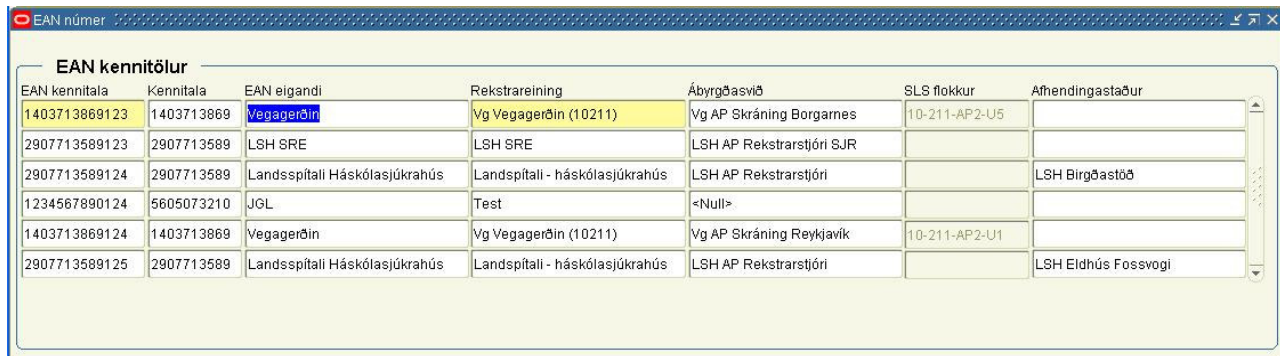
According to analysis, there are at this time no other institutions that use different supplier sites systematically.

## EAN numbers:

The solution to the problem of where to store the EAN numbers and how to figure out who is the receiver and what site to refer to is to use a custom table and form: *EAN numbers*. It is used to store the EAN number of the institution, the org\_id and subledger security group, if needed. It's also a possibility to keep the location\_id in the cases where there are different locations/supplier sites. In that case the institution would need to have different EAN numbers for different locations. If nothing is stored in the location\_id column the logic automatically points to the default supplier site for the supplier in question.

The users will maintain the information in a custom made form. The only required columns are EAN number and Operating Unit (org\_id). Subledger security group and location are not required. To be able to select the SLS-group the user needs to choose the correct responsibility. Two additional columns are for Social security number and the name of the Institution (EAN owner) but for information purposes only.

This form will only be visible in a super-user responsibility and maintaining it will be a central role, probably done by the FMA.



EAN kennitala	Kennitala	EAN eigandi	Rekstrareining	Ábyrgðasvið	SLS flokkur	Afhendingastaður
1403713869123	1403713869	Vegagerðin	Vg Vegagerðin (10211)	Vg AP Skráning Borgarnes	10-211-AP2-U5	
2907713589123	2907713589	LSH SRE	LSH SRE	LSH AP Rekstrarstjóri SJR		
2907713589124	2907713589	Landsspítali Háskólasjúkrahús	Landspítali - háskólasjúkrahús	LSH AP Rekstrarstjóri		LSH Birgðastöð
1234567890124	5605073210	JGL	Test	<Null>		
1403713869124	1403713869	Vegagerðin	Vg Vegagerðin (10211)	Vg AP Skráning Reykjavík	10-211-AP2-U1	
2907713589125	2907713589	Landsspítali Háskólasjúkrahús	Landspítali - háskólasjúkrahús	LSH AP Rekstrarstjóri		LSH Eldhús Fossvogi

Figure 5: EAN numbers – form for mapping and security

## XML transactions form:

To help super-users monitor the status of the incoming XML files, a custom table and form: *XML transactions*, was created. In this form the super-users are able to track the status of the invoices and view the transactions logs and the original XML files.

The screenshot shows a web application window titled "XML sendingar". It contains a table of XML transactions with columns: Dags. Lesið, Dags. Sent, Skránr., Hætt við, Reikningsnr., Viðhengismlestur staða, Tulkun staða, Interface staða, XML villur, Skrár nafn, and Skrár tegund. Below the table are several buttons: Saga (loggur), Saga (Upplýsingar), XML prófun, Ýmsar aðgerðir, Hætta við, Skoða viðhengi, and Skoða xml. Callouts identify "CP1 log" pointing to the "Saga (loggur)" button, "CP2 log" pointing to the "Saga (Upplýsingar)" button, "Cancel XML invoice" pointing to the "Hætta við" button, and "View XML invoice" pointing to the "Skoða xml" button.

Below the buttons is a log table with columns "Línu nr" and "Texti":

Línu nr	Texti
2467	Load from unix: upload_req_id, cvals.FULL_FILE_NAME, vfile_id: 861   A64B511809185C38D8AE7B575A3B19E8.xml   722
2468	Lesa inn xml skráin
2469	Tokst að lesa inn xml skráin A64B511809185C38D8AE7B575A3B19E8.xml
2470	Keyra AP_IS_XML_ATTACHMENT.ExtractAttachments 722
2471	Búið að keyra AP_IS_XML_ATTACHMENT.ExtractAttachments 722

Below the log table is a table titled "Niðurstöður reiknings" (Results of calculation) with columns "Lína", "Skilaboðategund", and "Skilaboð":

Lína	Skilaboðategund	Skilaboð
0	Error	5: ORA-31154: invalid XML document ORA-19202: Error occurred in XML processing LSX-00266: missing required attribute "mimeCode"
1	Error	Fann ekki skilyrt svæði: /cac:InvoiceLine/cac:Price/cbc:PriceAmount
2	Error	Fann ekki skilyrt svæði: /cac:InvoiceLine/cac:Price/cbc:PriceAmount
3	Error	Fann ekki skilyrt svæði: /cac:InvoiceLine/cac:Price/cbc:PriceAmount
4	Error	Fann ekki skilyrt svæði: /cac:InvoiceLine/cac:Price/cbc:PriceAmount
0	Warning	5: Bókunardagsetning reiknings er hugsanlega ekki rétt: 31.01.2008
0	Warning	5: Summa lína sem reiknaður er 24,50 vsk af (4.972,00) stemmir ekki við summu gefna i haus: 4.973,00

Figure 6: XML transactions form

XML sendingar

Dags. Lesið	Dags. Sent	Skrámr.	Hætt við	Reikningsnr.	Viðhengismlestur staða	Tulkun staða	Interface staða	XML villur	Skrár nafn	Skrár tegund
19.02.2008	19.02.2008	749	25.02.2008	R8084099		Lesið	Error		A64B511831B269A9BBC	INVOICE
19.02.2008	19.02.2008	748	25.02.2008	R8078200		Lesið	Error		A64B511831B2543DB7F	INVOICE
19.02.2008	19.02.2008	747	25.02.2008	R8075662		Lesið	Error		A64B511831B23FABB7E	INVOICE
19.02.2008	19.02.2008	746	25.02.2008			Lesið	Error		A64B511831B22BC6B3	INVOICE
19.02.2008	19.02.2008	745	25.02.2008	R8090721		Lesið	Error		A64B511831B217D0B0E	INVOICE
19.02.2008	19.02.2008	744	25.02.2008			Lesið	Error		A64B511831B1FDD0BC	INVOICE

Saga (loggur) Saga (Upplýsingar) XML prófun Ýmsar aðgerðir Hætta við Skoða viðhengi Skoða xml

**OEBS UBL 2.0 Xml Test input**

Senda inn Hreinsa

Test Input – Manual send

```

<?xml version = '1.0' encoding = 'ISO-8859-1'?>
<?xml-stylesheet type="text/xsl" href="/UBL20STYLESHEET/UBL_20_INV_NES_R1.xsl"?>
<Invoice xmlns="urn:oasis:names:specification:ubl:schema:xsd:Invoice-2"
xmlns:cac="urn:oasis:names:specification:ubl:schema:xsd:CommonAggregateComponents"
xmlns:cbc="urn:oasis:names:specification:ubl:schema:xsd:CommonBasicComponents-2"
xmlns:ccts="urn:un:unece:uncefact:documentation:2"
xmlns:udt="urn:un:unece:uncefact:data:specification:UnqualifiedDataTypesSchemaMoc"
xmlns:qdt="urn:oasis:names:specification:ubl:schema:xsd:QualifiedDatatypes-2"
xmlns:ext="urn:oasis:names:specification:ubl:schema:xsd:CommonExtensionComponents"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <cbc:UBLVersionID>2.0</cbc:UBLVersionID>
  <cbc:CustomizationID>NES</cbc:CustomizationID>
  <cbc:ProfileID schemeID="Profile"
schemeAgencyID="NES">urn:www.nesubl.eu:profiles:profile4:ver1.0</cbc:ProfileID>
  <cbc:ID>R7846708</cbc:ID>
  <cbc:CopyIndicator>>false</cbc:CopyIndicator>
  <cbc:IssueDate>2007-10-31</cbc:IssueDate>
  <cbc:InvoiceTypeCode listID="1001 Subset"
listAgencyID="NES">380</cbc:InvoiceTypeCode>
  <cbc:Note languageID="IS"/>
  <cbc:DocumentCurrencyCode listID="ISO 4217 Alpha"
languageID="ISK">ISK</cbc:DocumentCurrencyCode>
  <cac:InvoicePeriod>
    <cbc:StartDate>2007-10-01</cbc:StartDate>
    <cbc:EndDate>2007-10-31</cbc:EndDate>
  </cac:InvoicePeriod>
  <cac:AdditionalDocumentReference>
    <cbc:ID>R7846708</cbc:ID>
    <cbc:DocumentType>SpanBirting</cbc:DocumentType>
  </cac:AdditionalDocumentReference>

```

Figure 7: Transaction from – Manual send possibility

## Accounting Engine:

It was decided in the design phase that the FMA and/or the institutions should have the ability to generate rules according to a certain logic that would automatically create accounting strings for the XML invoices. The purpose here is to make it possible for those invoices not matched to purchase order to be transferred all the way through the process without manual input, thus maximizing potential cost savings from the project.

The logic could for instance be that all invoices from a certain supplier belong to a certain natural account. Or that all invoices from a phone company containing a number from a certain series of phone numbers should go to a predefined cost center.

The screenshot shows the 'OAPROD : RIKI AP MANAGER (Payables)' application window. The main form is titled 'Regla 52700 Rafmagn með 24,5% VSK'. It contains several sections:

- Heiti reglu:** 52700 Rafmagn með 24,5% VSK
- Viðskiptamaður:** Orkuveita Reykjavíkur
- Gildistími:** 18.10.2007 (dropdown), **Til:** (empty dropdown),  **Virk**, **Forgangur:** 1
- Bókun:** A table with columns: Viðfang, Stofnun, Tegund, Bókunart, Kennitala, Vidd1, Vidd2, Vidd3, Millid. The row contains: (empty), (empty), 52700, 0, 5512983029, (empty), (empty), 0, 0.
- Reglur:** Lýsing reiknings (dropdown), and (dropdown), = (dropdown), Lýsing: RAFMAGN, Filter +, -

Figure 8: The Accounting Engine

## Quick Invoices Form:

The standard Quick Invoices form in OEBS Accounts Payable needed to be modified for the purposes of this project. The modifications needed are as follows:

- 1) The user has to be able to get the XML invoices waiting for accounting and transferring.
- 2) The form should work with subledger security.
- 3) The form should make matching an invoice to purchase orders possible.

Other modifications involve moving fields and creating a Invoice Lines folder that suits the purpose of this form.

**Quick Invoices**

**XML reikningar**

Type: **Standard**      Date Invoice Received: **21.02.2008**      Invoice Num: **20080325365**

Invoice Date: **14.02.2008**      Document Category: **99100-XML**      GL Date: **14.02.2008**

Supplier: **Orkuveita Reykjavíkur**      Date Goods Received:      Supplier Num: **5512983029**

Site: **STOFNOSPJALD** [ ] 05L03      Pay Group: **MI**      Invoice Amount: **57.715**

Invoice Curr: **ISK**      Exchange Date: **26.02.2008**      Invoice Total: **57.715**

Description: **HEITT VATN**      Lines Total: **57.715**

Status:      Workflow: **To be Processed**       Pay Alone

PO Number:      Terms Date: **14.02.2008**      Terms: **20 daga greiðsla**

Payment Curr: **ISK**      Exchange Rate Type: **User**      Source: **XMLINVOICE**

Payment Rate Date:      Exchange Rate: **1**      Quick Invoices Batch: **xml20080226\_98**

---

**Invoice Lines**

**Standard-línur**

Line Number	Type	Amount	Account	1099 Type	Account Segment	Balance
1	Item	57.675	0998010108-09980-52713-0-5512			
2	Item	40	0998010108-09980-57132-0-5512			

**Quick Invoices**

Source:      Batch:      **Create Invoices**      Rejections      Save and Next

Línu athugasemd:      **Tilbúið**      **Skoða XML**      **Skoða Viðhengi**      **Skoða Villulýsing**

**Rafrænn Reikningur**

Sendandi  
Orkuveita Reykjavíkur  
5512983029  
Bæjarháls 1  
Reykjavík 110

Víðtakandi      Upplýsingar

Lögreglustjórnin á höfuðb  
Hverfisgötu 113  
Reykjavík 101

Reikningsnr: 20071762125  
Gjalddegi: 02.11.2007  
Eindagi: 05.12.2007  
Pöntun:  
Gjaldmiðill: ISK  
Gjaldmiðill VSK:  
Heldarupphæð: 536.064,00  
Þar af vsk: 103.758,00

Lýsing	Magn	Einingaverð	Eining	VSK	Upphæð	(Upphæð m vsk)
<b>Dráttarvextir</b>	0,00	8.803,00		0,00%	8.803,00	8.803,00
Húsvéitunúmer: 101206 Notkunarstaður: Hverfisgötu 113 Fastanúmer: 101206 Mælisnúmer: 6902264						
<b>Notkun</b>	64.454,00	74.122,00	KWH	24,50%	74.122,00	92.282,00
Húsvéitunúmer: 101206 Notkunarstaður: Hverfisgötu 113 Fastanúmer: 101206 Mælisnúmer: 6902264						
<b>Fast gjald</b>	31,00	3.261,00	DAY	24,50%	3.261,00	4.060,00
Húsvéitunúmer: 101206 Notkunarstaður: Hverfisgötu 113 Fastanúmer: 101206 Mælisnúmer: 6902264						
<b>Notkun</b>	64.454,00	23.848,00	KWH	24,50%	23.848,00	29.691,00
Húsvéitunúmer: 101206 Notkunarstaður: Hverfisgötu 113 Fastanúmer: 101206 Mælisnúmer: 6902264						
<b>Afþverð</b>	-143,60	-335.583,00		24,50%	-335.583,00	-417.801,00
Húsvéitunúmer: 101206 Notkunarstaður: Hverfisgötu 113 Fastanúmer: 101206 Mælisnúmer: 6902264						
<b>Afþverð</b>	152,00	424.997,00		24,50%	424.997,00	529.121,00
Húsvéitunúmer: 101206 Notkunarstaður: Hverfisgötu 113 Fastanúmer: 101206 Mælisnúmer: 6902264						
<b>Notkun</b>	64.454,00	126.846,00	KWH	24,50%	126.846,00	157.923,00
Húsvéitunúmer: 101206 Notkunarstaður: Hverfisgötu 113 Fastanúmer: 101206 Mælisnúmer: 6902264						
<b>Afþverð</b>	-143,60	-398.701,00		24,50%	-398.701,00	-496.383,00
Húsvéitunúmer: 101206 Notkunarstaður: Hverfisgötu 113 Fastanúmer: 101206 Mælisnúmer: 6902264						
<b>Afþverð</b>	152,00	504.713,00		24,50%	504.713,00	628.368,00
Húsvéitunúmer: 101206 Notkunarstaður: Hverfisgötu 113 Fastanúmer: 101206 Mælisnúmer: 6902264						
<b>Samtals með VSK:</b>	193.410	432.306,00			432.306,00	536.064,00

Figure 9: Quick Invoice Form and XML stylesheet

## Implementation

The project is to be implemented in three dimensions:

- 1) Technical roll-out.
- 2) Rollout to suppliers.
- 3) Rollout to institutions.

All dimensions occur simultaneously, but the technical roll-out is preferably one step ahead.

The technical roll-out is divided into five phases:

**Phase 1:** Ability to receive electronic invoices of the UBL NES standard. In this first phase vendors can only send invoices to a certain file folder located on a Windows server. The invoices are imported unaccounted into Oracle where the end user will account them and transfer to AP. This phase started in June 2007.

**Phase 2:** In this phase the FMA and the institutions are able to create accounting rules where certain fields in the XML invoice generate certain accounting strings. The invoices that match the logic come fully accounted, thus saving time for the end user. This phase started in September 2007.

**Phase 3:** In this phase the FMA changes the mechanism where the invoices are received to so that the invoices will be sent to a web service where they are automatically error checked and either accepted or rejected with an automated answer to the sender. This will stop erroneous invoices from being imported into Oracle and thus cut out the manual process now needed to handle incorrect invoices (when the error is within the document, that is, not due to an incorrect setup in Oracle). This phase is scheduled for summer 2008.

**Phase 4:** Ability to send electronic invoices and orders supporting the UBL NES standard. This phase is scheduled for fall 2008.

**Phase 5:** Full support of the procurement process, including use of iProcurement and matching e-Invoices to Oracle Purchase Orders. The technical solution should be ready before year-end 2008.

Rollout to suppliers and institution is an ongoing process that will last through the year 2010.

## Conclusion

The technical solution has proved to be the easily maintained and flexible solution the State required and there have been no specific problems regarding technology so far.

As expected, some users are more willing or able to adapt to a new way of working than others. Even if the process change is not too drastic it does seem difficult for some users to exist without paper. It has also proven to be very important to map and analyze the old processes to make sure that every step is accounted for and the correct personnel is involved in implementing the new process. But most users are very positive and managers are well aware of the potential benefits.

It has also been important to monitor the process from start to end. In some cases there has been a glitch somewhere in the process chain which has resulted in invoices not been paid on time. As suppliers usually give around 14 days to pay, the monitoring has to be constant and reaction time has to be short.

So far no direct savings have been measured, mostly due to the following reasons:

- 1) There are still very few suppliers in Iceland that are able to send XML-NES invoices. Because of this, the number of invoices has not increased very much since the project started.



- 2) Today the users have to use two different ways of handling invoices, the old manual process and the new automated one, making the learning curve a little steeper. The bulk of the cost savings will occur when then institutions can handle most of their invoices electronically.
- 3) When a new solution is implemented it is to be expected that users take longer to use the new solution for the first couple of months.
- 4) It's is still time-consuming to communicate with the suppliers to make sure the invoices are in the right format.
- 5) To gain full benefits, the State has to support the whole procurement process, from order to payment. Today some institutions have iProcurement, others have electronic approval system and a few get electronic invoices. This picture has to be completed.

Still, the solution offers an enormous potential of financial and other benefits that remain to be harvested by the Icelandic State and it's institutions. The goal is that no invoices will be entered manually in the Oracle system in the year 2010. The benefits of the process improvements will come to realization within 2-3 years.

## About the NES subset

A cooperation of Northern European Countries has agreed on a common implementation of the eProcurement standard [UBL 2.0](#). Public administrations of Denmark, Sweden, Norway, Iceland and Finland have formed, with the contribution of the United Kingdom, a cooperation in order to support domestic and cross border electronic trade. The name of the collaboration is [NES \(Northern European Subset\)](#) and its aim is to simplify the use of eProcurement for buyers and suppliers, especially among SMEs.

The participating countries have identified the urgent need for an open XML based standard covering the entire procurement process from catalogue to invoice. Such a standard is a prerequisite to reaping the benefits of a full electronic procurement cycle. The open international eProcurement standard UBL 2.0 from OASIS is seen by NES as the standard that can fulfill this at present.

The NES countries have therefore made a northern European implementation of UBL 2.0 in order to create a common platform for eProcurement. Implementation guides, business rules and processes show how the participating countries plan to apply UBL. A description of the implementation has just been made available for public review and can be found at the NES website <http://www.nesubl.eu/>. The plan is to publish the final versions of the documents in February 2007.

The NES countries see UBL as a stepping stone to a unified eProcurement standard within UN/CEFACT, and are therefore actively involved in the work of converging UBL with UN/CEFACT. UBL and the UN/CEFACT Supply Chain Group (TBG1) began the Convergence Project in July 2006 and have already converged on business requirements for seven documents, including the cross industry invoice.

NES also sees a unified European eProcurement standard as an instrument for achieving the goals set in the European Action plan i2010 and is therefore encouraging other European countries to join the cooperation and make the implementation available for use in all EU countries.

Development of NES is inspired by two years of active deployment in Denmark that legalized use of UBL under the banner OIOXML. Denmark also published in November 2006 an implementation of UBL 2.0 called OIOUBL. Since the work in NES and in Denmark has taken place in parallel, there is already alignment between OIOUBL and NES in the areas where they overlap. ERP-vendors in Denmark have already begun work to implement the standard in their systems and pilot testing has started.