

### Introduction

Since more than 12 years we have developed a CRM system named “business manager” (bm). But this system includes more than a usual CRM system. E.g. it includes a webmail module, an invoicing module and a support module.

We have started to develop a client-server application but later we decided to re-design the app and to develop a web-based system. Since many years the bm is in production now and many customers are using it as a “Software as a service” (Saas). Although it is possible to use bm as an in-house solution all of our customers are using the web application, we are hosting and supporting on [www.bm-od.com](http://www.bm-od.com).

Our customers are happy about the functionality. So since some years we have reduced our effort to add more functionality. Also we missed to update to new version of underlying software, which means our CRM currently is not running on up-to-date underlying software.

Now we have to change our developing team and we are searching for a new one. We have a list of tasks, mainly changes in functionality and updating to new versions. But the first task will be to add functionality in invoicing module, because that new functionality is needed by our customers. These changes are described later in this document. As written we are thinking about updating the system, but this is not part of this project now. So the described changes have to be developed using not up-date technology.

The used technologies are:

- Java 7
- Java script
- MySQL 5.1
- JBoss 5.1
- Bootstrap
- Ajax
- Jasper Reports

## Specification of changes in invoicing module

The invoicing module of business manager (bm) currently gives the possibility to create PDF files (invoice document) based on the data of the invoice (database tables INVOICE, INVOICEPOSITION, ...) and a MS Word template, which defines the layout and content of the invoice document (PDF).

More and more the customers (Invoice receivers) in Germany want to save time, which is needed to administrate incoming invoices. The idea is to get invoices in such a form, that it is possible import them electronically. This requires that not only the PDF is sent to the customer but also additionally the information about the content of the invoice. Currently in Germany there are two defined ways to do this:

- “Zugpferd”, PDF-A  
Here we are talking about an enhanced PDF format, which gives the possibility to include structured data into a PDF document
- “XRechnung”  
This possibility requires an additional XML file to be generated and added to the PDF.

This project is about the second possibility to generate **XRechnung** XML files. In the following we will describe the current status of the bm and the required changes.

## 1. Possibility to create an “XRechnungen” XML file for any invoice

bm

Home Contacts Campaigns Products Sales Finances Webmail Scheduler Support Projects Reports Configuration Administration

Invoice: 2020-1001

Detail Positions Reminders Payments

Save Generate Open Send via mail Cancel

### Update invoice

|                        |              |                     |                        |
|------------------------|--------------|---------------------|------------------------|
| Number                 | 2020-1001    | Title               | bm 1 weiterer Benutzer |
| Type                   | Invoice      | Invoice date        | 12/03/2020             |
| Contact                | Aarhus-Hotel | Payment date        | 12/19/2020             |
| Contact person         |              | Next reminder date  | 12/20/2020             |
| Contact to send        |              | Last reminder level |                        |
| Contact person to send |              | Pay condition       | 14 Tage netto          |
| Invoice address        |              | Template            | Rechnung bm            |
| Total amount net       | 720.00       | Calculate price as  | Net price              |
| Total amount gross     | 856.80       | Currency            | Euro                   |
| Open amount            | 856.80       | Service date        | 09/30/2020             |

Notes

VAT

|                        |        |                  |
|------------------------|--------|------------------|
| Normale USt ( 19.00% ) | 136.80 | 19.00% on 720.00 |
|------------------------|--------|------------------|

Save Generate Open Send via mail Cancel

On this screen shot you see the basic data of an invoice (module “Finance”, function “Invoices”). This tab “Details” shows the basic data of an invoice. A second tab “Positions” contains the details about the invoice positions. Clicking on button “Generate” generates the already mentioned PDF invoice document. Clicking on “Open” downloads this PDF file and clicking on “Send via mail” creates an email and opens the webmail module of the bm showing this created email having the PDF files as an attachment.

### Changes:

- We need an additional button “XRechnung”, which creates the required XML file and downloads it. This file will not be saved in the database.

## 2. Customer info

The screenshot shows the 'Customer info' tab selected in the 'Contacts' module of the 'bm' software. The interface includes a top navigation bar with various modules like Home, Contacts, Campaigns, Products, Sales, Finances, Webmail, Scheduler, Support, Projects, Reports, Configuration, and Administration. Below this, a breadcrumb trail indicates the current location: Organization: PSC team Hamburg professional solutions & consulting / D - Hamburg. The 'Customer info' tab is highlighted, and a 'Save' button is visible. The main content area displays a form for customer information with fields for Customer number (72001), Customer type (Partner), Priority, Branch, Address source, Pay Condition (14 Tage netto), Pay morality, Responsible employee (Penning, Friedhelm), Expected turn over, Number of employees, Tax number, Partner (with a search icon), Contact to invoice, Contact person to invoice, Invoice address, and Invoice shipping (highlighted in yellow).

This screenshot shows an example of the customer information. This is part of the address (contacts) module of the bm. The contacts module mainly contains the information about a contact (address). If the contact is a (potential) customer a tab "Customer info" is opened showing data which are relevant for customers as you can see in the screenshot. One of this information is how the customer wants to get an invoice ("Invoice shipping"), via common letter or via email.

This close-up shows the 'Invoice shipping' dropdown menu. The menu is open, displaying two options: 'Via email' (highlighted in blue) and 'Via letter'. Below the menu, the date '2010/05' is visible.

This information is important for the function "Sending invoice via mail", which is described later.

### Changes:

- We need to add the item "Via email + XRechnung" into the list box. If this item is selected and the data are saved then customer.invoiceshipping=3 must be set.
- We need an additional field "Leitweg-ID" (customer.referenceid), type varchar(40), before field "Invoice shipping"

### 3. Company settings

Company: business manager AG (bm)

Preferences Layout Logo

Save Edit company info

#### General preferences

Max attach size (MB) 10

Rows per page 50

Time out (Minutes) 60

Time zone +01:00 Europe/Berlin

Route page url [http://maps.google.de/?hl=@elwis\\_locale&saddr=@elwis\\_sstreet@elwis\\_shousenr,@elwis\\_scountry@elwis\\_szip@elwis\\_scity&daddr=@elwis\\_dstreet](http://maps.google.de/?hl=@elwis_locale&saddr=@elwis_sstreet@elwis_shousenr,@elwis_scountry@elwis_szip@elwis_scity&daddr=@elwis_dstreet)

Default salutation Damen und Herren

Default media type Email

#### Finance preferences

Days to send an invoice 2

Invoices number rule YYYY-NNNN

Credit notes number rule YYYYMM-NNNNN

Calculate price as Net price

Contract end date reminder email

Template for sending invoice via email Rechnungsversand bm

This is a screen shot of company setting (module “Home”, function “Company settings”, tab “Preferences”).

#### Changes:

- Before field “Days to send an invoice” a new field must be added, named “Company tax ID” (German “USt.-ID”), company.taxid, varchar(40)

#### 4. Sending one invoice via email

Invoice: 2019-1033

Detail Positions Reminders Payments

Save Generate Open Send via mail a.w@dr.achimwulff.de Cancel

### Update invoice

|                        |                  |                     |               |
|------------------------|------------------|---------------------|---------------|
| Number                 | 2019-1033        | Title               | 100 Kekse     |
| Type                   | Invoice          | Invoice date        | 09/11/2019    |
| Contact                | Wulff Consulting | Payment date        | 09/27/2019    |
| Contact person         |                  | Next reminder date  | 09/28/2019    |
| Contact to send        |                  | Last reminder level |               |
| Contact person to send |                  | Pay condition       | 14 Tage netto |

This screenshot shows again a part of the detail page of an invoice (this time another invoice). If the user presses the button “Send via mail” the following page is opened:

bm

Wednesday, May 19, 2021 - (time)

Home Contacts Campaigns Products Sales Finances Webmail Scheduler Support Projects Reports Configuration Administration

Mailboxes

- Inbox (1)
- Sent items
- Draft items
- Trash (248) (empty)
- Outbox
- User

Search messages

Search

From

Inbox

Advanced search

Send Save as draft Cancel

### Send new e-mail

From d.moeller@bmokamall.com

To Wulff Consulting

Cc

Bcc

Subject Rechnung 2019-1033

Template Rechnung 2019-1033 Import Clear

Attached files

Invoice\_2019-1033.pdf

Drag & drop files here ...

Browse ...

File Edit Insert View Format Table

Formats B I U Text Color Background Color Link Unlink

Verdana 10pt

bm

business manager AG, Odenkstraße 38, 10559 Hamburg

This is the webmail module of bm. The selected mail address is used and a pre-defined mail body template is used to create this mail. And as you can see the PDF invoice document is added as an attachment of this new mail. The user now can change the body and send by pressing “Send”.

#### Changes:

- In case related customer.invoiceshipping=3 additionally to the PDF the XRechnungen XML file must be generated and added to the mail as a second attachment, having the name Invoice\_<invoice number>.xml.

## 5. Sending multiple invoices via mail

bm<sup>5</sup>

Home -> Contacts -> Campaigns -> Products -> Sales -> **Finances** -> Webmail -> Scheduler -> Support -> Projects -> Reports -> Configuration -> Administration ->

Sending invoice via email

Contact:  Invoice date: from  to

Number: from  to  Open amount: from  to

Go

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z All

Send selected invoices Send all

|                          | Number       | Title | Contact                    | Currency | Invoice date | Total amount net | Total amount gross | Open amount |
|--------------------------|--------------|-------|----------------------------|----------|--------------|------------------|--------------------|-------------|
| <input type="checkbox"/> | 2009-1009    |       | Netzwerk Navigation        | Euro     | 03/25/2009   | 1,060.00         | 1,261.40           | 1,211.40    |
| <input type="checkbox"/> | 2009-1010    |       | Netzwerk Navigation        | Euro     | 03/25/2009   | 1,160.00         | 1,380.40           | 1,076.40    |
| <input type="checkbox"/> | 2009-1018    |       | Zero Systems Ltd.          | Euro     | 05/06/2009   | 2,620.00         | 3,117.80           | 3,117.80    |
| <input type="checkbox"/> | 2009-1019    |       | Zero Systems Ltd.          | Euro     | 05/07/2009   | 2,250.00         | 2,677.50           | 2,677.50    |
| <input type="checkbox"/> | 200912-01001 |       | Netzwerk Navigation        | Euro     | 12/14/2009   | 200.00           | 238.00             | 0.00        |
| <input type="checkbox"/> | 2010-1006    |       | A.Merkel Consulting & T... | Euro     | 02/11/2010   | 850.00           | 1,011.50           | 1,011.50    |
| <input type="checkbox"/> | 2010-1007    |       | A.Merkel Consulting & T... | Euro     | 05/10/2010   | 600.00           | 714.00             | 714.00      |
| <input type="checkbox"/> | 2010-1018    |       | Zero Systems Ltd.          | Euro     | 09/13/2010   | 1,800.00         | 2,142.00           | 2,142.00    |
| <input type="checkbox"/> | 2011-1001    |       | A.Merkel Consulting & T... | Euro     | 01/01/2011   | 1,200.00         | 1,428.00           | 1,428.00    |
| <input type="checkbox"/> | 2011-1029    |       | A.Merkel Consulting & T... | Euro     | 02/15/2011   | 600.00           | 714.00             | 714.00      |
| <input type="checkbox"/> | 2011-1040    |       | A.Merkel Consulting & T... | Euro     | 07/04/2011   | 600.00           | 714.00             | 714.00      |

This screenshot shows the function “Sending invoice via email” (module “Finances”). The user here has the possibility to change the selection of the invoices (selection criteria in upper part). Then he selects some of the shown invoices and presses “Send selected invoices” or to press “Send all”, which executes the function for all shown invoices. After pressing one of both buttons a new page is shown in which the user can select a telecom type and the mail account to be used for sending the invoices via mail.

Sending invoice via email

Total invoices to send 2

Telecomtype of Mail: eMail

Sender mail account:

Send Cancel

Pressing the “Send” button a mail for each selected invoice is created and sent the default mail address of the invoice recipients. In this case of course the user has not the possibility the change anything of the mails, especially not the body or attachments, because the mails are sent full automatically.

### Changes:

- Only in case the value of customer.invocieshipping=3 of each invoices recipient there must be added the XRechnungen XML file as a second attachment (additionally to the PDF file) to the mail. It is important to note that for some of the mails the XML file must be added for others may be not, depending on related customer.invocieshipping.

## 6. Description of XML file format

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| <?xml version="1.0" encoding="UTF-8"?><br><ns0:Invoice<br>xmlns:ns0="urn:oasis:names:specification:ubl:schema:xsd:Invoice-2"<br>xmlns:cac="urn:oasis:names:specification:ubl:schema:xsd:CommonAggregateComponents-2"<br>xmlns:cbc="urn:oasis:names:specification:ubl:schema:xsd:CommonBasicComponents-2"<br>xmlns:cec="urn:oasis:names:specification:ubl:schema:xsd:CommonExtensionComponents-2"><br><cbc:CustomizationID>urn:cen.eu:en16931:2017#compliant#urn:xoev-de:kosit:standard:xrechnung_2.0</cbc:CustomizationID> | fix                                                                                                         |
| <cbc:ID> <b>invoice number</b> </cbc:ID>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Invoice number = invoice.number                                                                             |
| <cbc:IssueDate> <b>invoice date</b> </cbc:IssueDate>                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Invoice date = invoice.invoicedate using format YYYY-MM-DD                                                  |
| <cbc:DueDate> <b>due date</b> </cbc:DueDate>                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Due date = invoice.paymentdate using format YYYY-MM-DD                                                      |
| <cbc:InvoiceTypeCode> <b>type code</b> </cbc:InvoiceTypeCode>                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Type code =<br>380 if invoice.type=1<br>381 if invoice.type=2                                               |
| <cbc:DocumentCurrencyCode> <b>currency code</b> </cbc:DocumentCurrencyCode>                                                                                                                                                                                                                                                                                                                                                                                                                                                | Currency code = currency.label<br>(invoice.currencyid →<br>currency.currencyid)                             |
| <cbc:BuyerReference> <b>buyer reference</b> </cbc:BuyerReference>                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Buyer reference =<br>customer.referenceid<br>(invoice.addressid →<br>customer.customerid)                   |
| <cac:AccountingSupplierParty><br><cac:Party><br><cac:PostalAddress><br><cbc:StreetName> <b>seller street</b> </cbc:StreetName>                                                                                                                                                                                                                                                                                                                                                                                             | Seller street =<br>address.street + ' ' +<br>address.housenumber<br>(current companyid → address.addressid) |
| <cbc:AdditionalStreetName> <b>seller address add line</b> </cbc:AdditionalStreetName>                                                                                                                                                                                                                                                                                                                                                                                                                                      | Seller address add line =<br>address.addaddressline<br>(current companyid → address.addressid)              |
| <cbc:CityName> <b>seller city</b> </cbc:CityName>                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Seller city = city.cityname<br>(current companyid → address.addressid,<br>address.cityid → city.cityid)     |



|                                                                                                                                          |                                                                                                                                                                                                                                                                           |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <cbc:PostalZone> <b>seller zip code</b> </cbc:PostalZone>                                                                                | Seller zipc code = city.zip<br>(current companyid → address.addressid,<br>address.cityid → city.cityid)                                                                                                                                                                   |
| <cac:Country><br><cbc:IdentificationCode> <b>seller country code</b> </cbc:IdentificationCode><br></cac:Country><br></cac:PostalAddress> | Seller country code = country.areacode<br>(current companyid → address.addressid,<br>address.countryid → country.countryid)                                                                                                                                               |
| <cac:PartyTaxScheme><br><cbc:CompanyID> <b>seller id</b> </cbc:CompanyID>                                                                | Seller id = company.taxid<br>(current companyid<br>→company.companyid)                                                                                                                                                                                                    |
| <cac:TaxScheme><br><cbc:ID> <b>tax scheme</b> </cbc:ID><br></cac:TaxScheme><br></cac:PartyTaxScheme>                                     | Tax scheme =                                                                                                                                                                                                                                                              |
| <cac:PartyLegalEntity><br><cbc:RegistrationName> <b>seller name</b> </cbc:RegistrationName>                                              | Seller name = address.name1 + ' ' +<br>address.name2 + ' ' + address.name3<br>(current companyid → address.addressid)                                                                                                                                                     |
| <cbc:CompanyID> <b>seller id</b> </cbc:CompanyID><br></cac:PartyLegalEntity>                                                             | Seller id = company.taxid<br>(current companyid<br>→company.companyid)                                                                                                                                                                                                    |
| <cac:Contact><br><cbc:Name> <b>contact name</b> </cbc:Name>                                                                              | Contact name = address.name2 + ' ' +<br>address.name1<br>(current userid → elwisuser.userid,<br>elwisuser.addressid → addressed)                                                                                                                                          |
| <cbc:Telephone> <b>contact phone number</b> </cbc:Telephone>                                                                             | Contact phone number =<br>telecom.telecomnumber<br>(current userid → elwisuser.userid,<br>elwisuser.addressid →<br>telecom.contactpersonid,<br>current companyid → telecom.addressid,<br>telecom.telecomtypeid →<br>telecomtype.type='PHONE'<br>telecomtype.determined=1) |

|                                                                                                                                            |                                                                                                                                                                                                                                                                           |
|--------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <cbc:ElectronicMail> <b>contact mail address</b> </cbc:ElectronicMail><br></cac:Contact><br></cac:Party><br></cac:AccountingSupplierParty> | Contact mail address =<br>telecom.telecomnumber<br>(current userid → elwisuser.userid,<br>elwisuser.addressid →<br>telecom.contactpersonid,<br>current companyid → telecom.addressid,<br>telecom.telecomtypeid →<br>telecomtype.type='EMAIL'<br>telecomtype.determined=1) |
| <cac:AccountingCustomerParty><br><cac:Party><br><cac:PostalAddress>                                                                        | fix                                                                                                                                                                                                                                                                       |
| <cbc:StreetName> <b>buyer street</b> </cbc:StreetName>                                                                                     | Buyer street = address.street + ' ' +<br>address.housenumber<br>(invoice.addressid → address.addressid if<br><i>invoice.sentaddressid is null</i> ,<br>invoice.sentaddressid →<br>address.addressid if <i>invoice.sentaddressid</i><br><i>is not null</i> )               |
| <cbc:AdditionalStreetName> <b>buyer address add line</b> </cbc:AdditionalStreetName>                                                       | buyer address add line =<br>address.addaddressline<br>(invoice.addressid → address.addressid if<br><i>invoice.sentaddressid is null</i> ,<br>invoice.sentaddressid →<br>address.addressid if <i>invoice.sentaddressid</i><br><i>is not null</i> )                         |
| <cbc:CityName> <b>buyer city</b> </cbc:CityName>                                                                                           | buyer city =city.cityname<br>(invoice.addressid → address.addressid if<br>invoice.sentaddressid is null,<br>invoice.sentaddressid →<br>address.addressid if invoice.sentaddressid<br>is not null,<br>addressed.cityid → city.cityid)                                      |

|                                                                                                                                                       |                                                                                                                                                                                                                                                           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <cbc:PostalZone> <b>buyer zip code</b> </cbc:PostalZone>                                                                                              | buyer zip code =city.zip<br>(invoice.addressid → address.addressid if<br>invoice.sentaddressid is null,<br>invoice.sentaddressid →<br>address.addressid if invoice.sentaddressid<br>is not null,<br>addressed.cityid → city.cityid)                       |
| <cac:Country><br><cbc:IdentificationCode> <b>buyer country code</b> </cbc:IdentificationCode><br></cac:Country><br></cac:PostalAddress>               | buyer country code = country.areacode<br>(invoice.addressid → address.addressid if<br>invoice.sentaddressid is null,<br>invoice.sentaddressid →<br>address.addressid if invoice.sentaddressid<br>is not null,<br>addressed.countryid → country.countryid) |
| <cac:PartyLegalEntity><br><cbc:RegistrationName> <b>buyer name</b> </cbc:RegistrationName><br></cac:PartyLegalEntity>                                 | buyer name =<br>address.name1 + ' ' address.name2 + ' ' +<br>address.name3<br>(invoice.addressid → address.addressid if<br>invoice.sentaddressid is null,<br>invoice.sentaddressid →<br>address.addressid if invoice.sentaddressid<br>is not null)        |
| <cac:Contact><br><cbc:Name>buyer contact name</cbc:Name><br></cac:Contact><br></cac:Party><br></cac:AccountingCustomerParty>                          | buyer contact name =<br>address-name2 + ' ' + address.name1<br>(invoice.contactpersonid →<br>address.addressid)                                                                                                                                           |
| <cac:PaymentMeans><br><cbc:PaymentMeansCode>30</cbc:PaymentMeansCode><br><cac:PayeeFinancialAccount><br><cbc:ID> <b>bank account number</b> </cbc:ID> | bank account number =<br>bankaccount.iban<br>(current companyid → address.addressid,<br>address.bankaccountid →<br>bankaccount.bankaccountid)                                                                                                             |

|                                                                                                          |                                                                                                                                                                                                                                                              |
|----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <cbc:Name> <b>bank account name</b> </cbc:Name><br></cac:PayeeFinancialAccount><br></cac:PaymentMeans>   | Bank account name =<br>bankaccount.accountowner<br>(current companyid → address.addressid,<br>address.bankaccountid →<br>bankaccount.bankaccountid)                                                                                                          |
| <cac:PaymentTerms><br><cbc:Note> <b>payment condition</b> </cbc:Note><br></cac:PaymentTerms>             | payment condition =<br>paycondition.conditionname<br>(invoice.payconditionid →<br>paycondition.payconditionid)                                                                                                                                               |
| <cac:TaxTotal><br><cbc:TaxAmount currencyID=" <b>Currency code</b> "> <b>VAT amount</b> </cbc:TaxAmount> | Currency code = currency.label<br>(invoice.currencyid →<br>currency.currencyid)<br><br>Vat amount = invoice.totalamountgross –<br>invoice.totalamountnet (using "." as<br>decimal separator and always two digits<br>after decimal separator, example: 6.70) |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <pre> &lt;cac:TaxSubtotal&gt;   &lt;cbc:TaxableAmount currencyID="Currency code"&gt;taxable amount&lt;/cbc:TaxableAmount&gt;   &lt;cbc:TaxAmount currencyID="Currency code"&gt;tax amount&lt;/cbc:TaxAmount&gt;   &lt;cac:TaxCategory&gt;     &lt;cbc:ID&gt;tax id&lt;/cbc:ID&gt;     &lt;cbc:Percent&gt;tax percentage&lt;/cbc:Percent&gt;     &lt;cac:TaxScheme&gt;       &lt;cbc:ID&gt;VAT&lt;/cbc:ID&gt;     &lt;/cac:TaxScheme&gt;   &lt;/cac:TaxCategory&gt; &lt;/cac:TaxSubtotal&gt; </pre> | <p>!!! This part must be generated for each related record in table invoicevat with invoice.invoiceid → invoicevat.invoiceid</p> <p>Currency code = currency.label<br/>(invoice.currencyid → currency.currencyid)</p> <p>taxable amount = sum<br/>(invoiceposition.totalprice) with invoiceposition.invoiceid → invoicevat.invoiceid and invoiceposition.vatid → invoicevat.vatid</p> <p>tax amount = invoicevat.amount</p> <p>tax id = "S"</p> <p>tax percentage = invoicevat.vatrate (using "." as decimal separator and always two digits after decimal separator)</p> |
| </cac:TaxTotal>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | fix                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <pre> &lt;cac:LegalMonetaryTotal&gt;   &lt;cbc:LineExtensionAmount currencyID="Currency code"&gt;total net&lt;/cbc:LineExtensionAmount&gt;   &lt;cbc:TaxExclusiveAmount currencyID="Currency code"&gt;total net&lt;/cbc:TaxExclusiveAmount&gt;   &lt;cbc:TaxInclusiveAmount currencyID="Currency code"&gt;total gross&lt;/cbc:TaxInclusiveAmount&gt;   &lt;cbc:PayableAmount currencyID="Currency code"&gt;total gross&lt;/cbc:PayableAmount&gt; &lt;/cac:LegalMonetaryTotal&gt; </pre>            | <p>total net = invoice.totalamountnet</p> <p>total gross = invoice.totalamountgross</p> <p>(both amounts using "." as decimal separator and always two digits after decimal separator)</p>                                                                                                                                                                                                                                                                                                                                                                                |
| <cac:InvoiceLine>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | fix                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

```

<cbc:ID>line id</cbc:ID>
<cbc:InvoicedQuantity unitCode="quantity code">quantity</cbc:InvoicedQuantity>
<cbc:LineExtensionAmount currencyID="currency code">amount</cbc:LineExtensionAmount>
<cac:Item>
  <cbc:Name>name</cbc:Name>
  <cac:SellersItemIdentification>
    <cbc:ID>seller item identification</cbc:ID>
  </cac:SellersItemIdentification>
  <cac:ClassifiedTaxCategory>
    <cbc:ID>tax code</cbc:ID>
    <cbc:Percent>tax percentage</cbc:Percent>
    <cac:TaxScheme>
      <cbc:ID>VAT</cbc:ID>
    </cac:TaxScheme>
  </cac:ClassifiedTaxCategory>
</cac:Item>
<cac:Price>
  <cbc:PriceAmount currencyID="EUR">1000</cbc:PriceAmount>
</cac:Price>

```

!!! This part must be generated for each related record in table invoiceposition with invoice.invoiceid → invoiceposition.invoiceid

line id = invoiceposition.number

quantity code =

quantity = invoiceposition.quantity (using "." as decimal separator and always two digits after decimal separator)

Currency code = currency.label  
(invoice.currencyid → currency.currencyid)

amount = invoiceposition.totalprice  
(in case invoiceposition.totalprice=null:  
amount = invoiceposition.totalpricegross /  
vatrate.vatrate)  
invoiceposition.vatid → invoicevat.vatid  
and  
invoiceposition.invoiceid →  
invoicevat.invoiceid

name =

seller item identification =

tax code = "S"

tax percentage = vatrate.vatrate  
(invoiceposition.vatid → invoicevat.vatid  
and  
invoiceposition.invoiceid →  
invoicevat.invoiceid)

|                                      |     |
|--------------------------------------|-----|
| </cac:InvoiceLine><br></ns0:Invoice> | fix |
|--------------------------------------|-----|

Here is an example of such an XML file:

```
<?xml version="1.0" encoding="UTF-8"?><ubl:Invoice xmlns:ubl="urn:oasis:names:specification:ubl:schema:xsd:Invoice-2"
xmlns:cac="urn:oasis:names:specification:ubl:schema:xsd:CommonAggregateComponents-2"
xmlns:cbc="urn:oasis:names:specification:ubl:schema:xsd:CommonBasicComponents-2" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:qdt="urn:oasis:names:specification:ubl:schema:xsd:QualifiedDataTypes-2"
xmlns:udt="urn:oasis:names:specification:ubl:schema:xsd:UnqualifiedDataTypes-2"
xsi:schemaLocation="urn:oasis:names:specification:ubl:schema:xsd:Invoice-2 http://docs.oasis-open.org/ubl/os-UBL-2.1/xsd/maindoc/UBL-Invoice-2.1.xsd">
  <cbc:CustomizationID>urn:cen.eu:en16931:2017#compliant#urn:xoev-de:kosit:standard:xrechnung_2.0</cbc:CustomizationID>
  <cbc:ID>INV-08154711</cbc:ID>
  <cbc:IssueDate>2021-05-19</cbc:IssueDate>
  <cbc:DueDate>2021-06-02</cbc:DueDate>
  <cbc:InvoiceTypeCode>380</cbc:InvoiceTypeCode>
  <cbc:DocumentCurrencyCode>EUR</cbc:DocumentCurrencyCode>
  <cbc:BuyerReference>04011000-1234512345-06</cbc:BuyerReference>
  <cac:AccountingSupplierParty>
    <cac:Party>
      <cac:PostalAddress>
        <cbc:StreetName>Musterstraße 1</cbc:StreetName>
        <cbc:AdditionalStreetName>Zusatz</cbc:AdditionalStreetName>
        <cbc:CityName>Musterstadt</cbc:CityName>
        <cbc:PostalZone>12345</cbc:PostalZone>
        <cac:Country>
          <cbc:IdentificationCode>DE</cbc:IdentificationCode>
        </cac:Country>
      </cac:PostalAddress>
      <cac:PartyTaxScheme>
        <cbc:CompanyID>DE 123 456 789</cbc:CompanyID>
        <cac:TaxScheme>
          <cbc:ID>VAT</cbc:ID>
```

```
</cac:TaxScheme>
</cac:PartyTaxScheme>
<cac:PartyLegalEntity>
  <cbc:RegistrationName>Musterfirma</cbc:RegistrationName>
  <cbc:CompanyID>DE 123 456 789</cbc:CompanyID>
</cac:PartyLegalEntity>
<cac:Contact>
  <cbc:Name>Max Mustermann</cbc:Name>
  <cbc:Telephone>+49 1234 / 56 789 - 10</cbc:Telephone>
  <cbc:ElectronicMail>Max.Mustermann@Musterfirma.de</cbc:ElectronicMail>
</cac:Contact>
</cac:Party>
</cac:AccountingSupplierParty>
<cac:AccountingCustomerParty>
  <cac:Party>
    <cac:PostalAddress>
      <cbc:StreetName>Beispielstraße 2</cbc:StreetName>
      <cbc:AdditionalStreetName>Zusatz</cbc:AdditionalStreetName>
      <cbc:CityName>Beispielstadt</cbc:CityName>
      <cbc:PostalZone>54321</cbc:PostalZone>
      <cac:Country>
        <cbc:IdentificationCode>DE</cbc:IdentificationCode>
      </cac:Country>
    </cac:PostalAddress>
    <cac:PartyLegalEntity>
      <cbc:RegistrationName>Beispielkunde</cbc:RegistrationName>
    </cac:PartyLegalEntity>
    <cac:Contact>
      <cbc:Name>Otto Kontakt</cbc:Name>
    </cac:Contact>
  </cac:Party>
</cac:AccountingCustomerParty>
<cac:PaymentMeans>
```



```
<cbc:PaymentMeansCode>30</cbc:PaymentMeansCode>
<cac:PayeeFinancialAccount>
  <cbc:ID>DE00 1234 5678 0000 1234 56</cbc:ID>
  <cbc:Name>Musterfirma</cbc:Name>
</cac:PayeeFinancialAccount>
</cac:PaymentMeans>
<cac:PaymentTerms>
  <cbc:Note>14 Tage netto</cbc:Note>
</cac:PaymentTerms>
<cac:AllowanceCharge>
  <cbc:ChargeIndicator>>false</cbc:ChargeIndicator>
  <cbc:AllowanceChargeReason>Neukundenrabatt</cbc:AllowanceChargeReason>
  <cbc:Amount currencyID="EUR">5.00</cbc:Amount>
  <cac:TaxCategory>
    <cbc:ID>S</cbc:ID>
    <cbc:Percent>19.00</cbc:Percent>
    <cac:TaxScheme>
      <cbc:ID>VAT</cbc:ID>
    </cac:TaxScheme>
  </cac:TaxCategory>
</cac:AllowanceCharge>
<cac:TaxTotal>
  <cbc:TaxAmount currencyID="EUR">6.70</cbc:TaxAmount>
<cac:TaxSubtotal>
  <cbc:TaxableAmount currencyID="EUR">35.25</cbc:TaxableAmount>
  <cbc:TaxAmount currencyID="EUR">6.70</cbc:TaxAmount>
  <cac:TaxCategory>
    <cbc:ID>S</cbc:ID>
    <cbc:Percent>19.00</cbc:Percent>
    <cac:TaxScheme>
      <cbc:ID>VAT</cbc:ID>
    </cac:TaxScheme>
  </cac:TaxCategory>
```

```
</cac:TaxSubtotal>
</cac:TaxTotal>
<cac:LegalMonetaryTotal>
  <cbc:LineExtensionAmount currencyID="EUR">40.25</cbc:LineExtensionAmount>
  <cbc:TaxExclusiveAmount currencyID="EUR">35.25</cbc:TaxExclusiveAmount>
  <cbc:TaxInclusiveAmount currencyID="EUR">41.95</cbc:TaxInclusiveAmount>
  <cbc:AllowanceTotalAmount currencyID="EUR">5.00</cbc:AllowanceTotalAmount>
  <cbc:ChargeTotalAmount currencyID="EUR">0.00</cbc:ChargeTotalAmount>
  <cbc:PrepaidAmount currencyID="EUR">0.00</cbc:PrepaidAmount>
  <cbc:PayableRoundingAmount currencyID="EUR">0.00</cbc:PayableRoundingAmount>
  <cbc:PayableAmount currencyID="EUR">41.95</cbc:PayableAmount>
</cac:LegalMonetaryTotal>
<cac:InvoiceLine>
  <cbc:ID>1</cbc:ID>
  <cbc:InvoicedQuantity unitCode="C62">0.5</cbc:InvoicedQuantity>
  <cbc:LineExtensionAmount currencyID="EUR">35.00</cbc:LineExtensionAmount>
  <cac:Item>
    <cbc:Name>Reparaturdienstleistung in Stunden</cbc:Name>
    <cac:SellersItemIdentification>
      <cbc:ID>REP-012</cbc:ID>
    </cac:SellersItemIdentification>
    <cac:ClassifiedTaxCategory>
      <cbc:ID>S</cbc:ID>
      <cbc:Percent>19.00</cbc:Percent>
      <cac:TaxScheme>
        <cbc:ID>VAT</cbc:ID>
      </cac:TaxScheme>
    </cac:ClassifiedTaxCategory>
  </cac:Item>
  <cac:Price>
    <cbc:PriceAmount currencyID="EUR">70.00</cbc:PriceAmount>
  </cac:Price>
</cac:InvoiceLine>
```

```
<cac:InvoiceLine>
  <cbc:ID>2</cbc:ID>
  <cbc:InvoicedQuantity unitCode="C62">3</cbc:InvoicedQuantity>
  <cbc:LineExtensionAmount currencyID="EUR">5.25</cbc:LineExtensionAmount>
  <cac:Item>
    <cbc:Name>Material</cbc:Name>
    <cac:SellersItemIdentification>
      <cbc:ID>MAT-987</cbc:ID>
    </cac:SellersItemIdentification>
    <cac:ClassifiedTaxCategory>
      <cbc:ID>S</cbc:ID>
      <cbc:Percent>19.00</cbc:Percent>
      <cac:TaxScheme>
        <cbc:ID>VAT</cbc:ID>
      </cac:TaxScheme>
    </cac:ClassifiedTaxCategory>
  </cac:Item>
  <cac:Price>
    <cbc:PriceAmount currencyID="EUR">1.75</cbc:PriceAmount>
  </cac:Price>
</cac:InvoiceLine>
</ubl:Invoice>
```

## 7. General

- Take care that the new texts must like “Via email + XRechnung” must be fetched from existing resource files and must be available for all supported languages (English, German, Spanish, French). These texts will be defined and resource files delivered by pirAMide Germany.
- There are some tools in order to validate the correctness of an XRechnung XML file:
  - <https://www.epoconsulting.com/erechnung-sap/xrechnung-validator>
  - <https://ecosio.com/de/peppol-und-xml-dokumente-online-validieren>
  - set of schema and xsl files