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## I. INVOICetoROefact



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# 1 INVOICetoROefact

## **Cuprins:**

- [INVOICetoROefact](#)
  - [Componentele si facilitatile sistemului](#)
  - [Date identificare](#)

Acest sistem va asigura incarcarea facturilor emise in sistemul [ANAF E-Factura](#) ([https://www.anaf.ro/anaf/internet/ANAF/despre\\_anaf/strategii\\_anaf/proiecte\\_digitalizare/e.factura](https://www.anaf.ro/anaf/internet/ANAF/despre_anaf/strategii_anaf/proiecte_digitalizare/e.factura)) .

## 1.1 Componentele si facilitatile sistemului

Sistemul ofera urmatoarele componente:

- [xl2roefact](#) - procesarea facturilor in mod linie de comanda
- [web2roefact](#) - procesarea facturilor din interfara web
- [xl2roefact python library](#) - procesarea facturilor prin cod / program (development propriu)
- [invoice template](#) - model / sablon factura in Excel

[Descrierea tuturor acestora poate fi accessata aici.](#)

## 1.2 Date identificare

- p/n: 0000-0095
- code-name: api\_to\_roefact
- commercial name: **INVOICetoROefact**

- [site web \(https://invoicetoroefact.renware.eu/\)](https://invoicetoroefact.renware.eu/)
- [git repository \(https://github.com/petre-renware/api\\_to\\_roefact\)](https://github.com/petre-renware/api_to_roefact)
- copyright: RENware Software Systems
- author: Petre Iordanescu (petre.iordanescu@gmail.com)
- [general system license](#)

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## 2 Componentele sistemului

### Cuprins:

- [Componentele sistemului](#)
  - [Componente](#)
    - [xl2roefact](#)
    - [xl2roefact Python library](#)
    - [web2roefact](#)
    - [invoice template](#)
  - [Criterii de clasificare](#)
  - [Note](#)

Sistemul consta din mai multe componente toate avind acelasi obiectiv central: **emiterea de facturi si procesarea facturilor emise existente deja**. Faptul ca sunt mai multe componente asigura *mai multe cai alternative* de a atinge obiectivul central, cai ce pot fi utilizate in paralel (concurrent, in acelasi timp) in functie de "dotarea tehnica" a fiecaruia, de afinitatea fiecaruia la un "gen" de sisteme sau pur si simplu de preferinta de moment a fiecaruia.

### 2.1 Componente

Sistemul ofera urmatoarele componente:

- **xl2roefact** - procesarea facturilor in mod linie de comanda
- **xl2roefact Python library** - procesarea facturilor prin cod / program (development propriu)
- **web2roefact** - procesarea facturilor din interfara web
- **invoice template** - model / sablon factura in Excel

Facilitatile generale ale fiecareia din acestea sunt prezentate in continuare.

#### 2.1.1 xl2roefact

Aplicatie *linie de comanda* pentru procesarea facturilor. Facilitati ([vezi "Criterii de clasificare"](#)):

- Operare: **CLI**
- Introducere si import factura (INp):

 XLSX

 JSON



☐ FORM

- Export si salvare factura electronica (EXp);

☒ JSON☒ XML☒ EXCEL (pentru recipisa incarcare ROeF)☒ PDF☒ Ready to Run☒ ROeF[Descriere detaliata aici](#)

## 2.1.2 xl2roefact Python library

Pachet (biblioteca) public *Python* utilizabil pentru dezvoltare / extindere aplicatii proprii. Facilitati ([vezi "Criterii de clasificare"](#)):

- Operare: **din cod software**

- Introducere si import factura (INp):

☒ XLSX☒ JSON☐ FORM

- Export si salvare factura electronica (EXp);

☒ JSON☒ XML☒ EXCEL (pentru recipisa incarcare ROeF)☒ PDF☐ Ready to Run☒ ROeF[Descriere detaliata aici](#)

## 2.1.3 web2roefact

Aplicatie web pentru procesarea facturilor. Facilitati ([vezi "Criterii de clasificare"](#)):

- Operare: **WEB**

- Introducere si import factura (INp):

☒ XLSX☒ JSON☒ FORM

- Export si salvare factura electronica (EXp);

☒ JSON☒ XML☒ EXCEL (pentru recipisa incarcare ROeF)☒ PDF☒ Ready to Run☒ ROeF

## 2.1.4 invoice template

Sablon factura in format *Office Excel*. Facilitati ([vezi "Criterii de clasificare"](#)):

- Operare: **din aplicatie Office Excel**

- Introducere si import factura (INp):

☒ XLSX☐ JSON☐ FORM

- Export si salvare factura electronica (EXp);

☐ JSON☐ XML☒ EXCEL☒ PDF (din aplicatia Office Excel)☒ Ready to Run☐ ROeF

[Descriere detaliata aici](#)

## 2.2 Criterii de clasificare

In scopul identificarii mai usoare a componentelor necesare acestea sunt clasificate dupa urmatoarele criterii:

- **Operare** interfata de operare al componentei:
  - **CLI** linie de comanda (din consola tip "command prompt" sau terminal)

- **WEB** web din browser
- din cod software
- din aplicatia locala Office Excel
- **INp** modul de introducere si import a facturii:
  - **XLSX** import dintr-un document `Office Excel` unde a fost deja introdusa anterior preluarii. Ca si instrument de introducere poate fi folosit oricare din cele ce permit salvarea / exportul in format `XLSX` (alte formate, in special cel anterior - `XLS` nu sunt importabile - ci trebuiesc "convertite" la formatul `xlsx`)
  - **JSON** import din format `JSON`
  - **FORM** factura se poate introduce manual direct in sistem, acesta punind la dispozitie un formular dedicat acestei operatii
- **EXp** formatul de exportare si salvare a facturii electronice<sup>1</sup>:
  - **JSON** format folosit pentru interschimbarea, interfatarea datelor cu sisteme standard `REST` (de exemplu *Oracle EBS*)
  - **XML** format folosit pentru interschimbarea, interfatarea datelor cu sisteme standard `SOAP`<sup>2</sup> (de exemplu *RO eFact, SAP*)
  - **EXCEL** format Office Excel `xlsx`
  - **PDF** format Adobe PDF tiparibil
- **Ready to Run** specifica faptul ca acea componenta poate fi folosita ca atare, fara o instalare prealabila ("ready to run") altfel aceasta trebuie instalata inainte de utilizare
- **ROeF** specifica faptul ca acea componenta permite incarcarea automata<sup>3</sup> a facturii in sistemul *ANAF SPV RO eFact*

## 2.3 Note

1. Exportul facturilor in formatele `EXCEL` si respectiv `PDF` se face utilizind *formatul vizual al documentului din componenta invoice template* ↩
2. schemele XML respectate sunt: `"xmlns": "urn:oasis:names:specification:ubl:schema:xsd:Invoice-2", "xmlns:cbc": "urn:oasis:names:specification:ubl:schema:xsd:CommonBasicComponents-2", "xmlns:cac": "urn:oasis:names:specification:ubl:schema:xsd:CommonAggregateComponents-2", "xmlns:ns4": "urn:oasis:names:specification:ubl:schema:xsd:CommonExtensionComponents-2", "xmlns:xsi": "http://www.w3.org/2001/XMLSchema-instance", "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"` ↩
3. incarcarea automata a facturii in sistemul `ANAF RO eFact` este conditionata de configurarea respectivei componente cu credentialele necesare autentificarii in acest sistem (altfel aceasta informatie va fi ceruta utilizatorului pentru introducere manuala) ↩

## II. xl2roefact

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## 3 xl2roefact

- Pentru accesul la toate link-urile din acest document vizitati [site-ul dedicat](https://invoicetoroefact.renware.eu/) (<https://invoicetoroefact.renware.eu/>) acestui sistem.
- Pachetul pe *PyPi* (<https://pypi.org/project/xl2roefact/>)
- Pachetul pe *GitHub* ([https://github.com/petre-renware/api\\_to\\_roefact/xl2roefact/](https://github.com/petre-renware/api_to_roefact/xl2roefact/))

### 3.1 Facilitati

MSI installer YES format JSON YES format XML YES format PDF YES format RO eFact YES

Aceasta componenta este "totul despre crearea de facturi electronice" din formatul Excel office (xlsx). Aplicatia poate genera factura in format JSON, XML, PDF si o poate incarca in sistemul *RO E-Fact*<sup>1</sup>.

Aceasta componenta ofera urmatoarele facilitati (acestea fiind obiectivele fundamentale ale componentei):

- **transformarea facturilor din Excel in formatul XML** cerut de catre sistemul ANAF RO E-Fact pentru incarcare
- **incarcarea acestora** in sistemul ANAF RO E-Fact<sup>1</sup>
- **transformarea facturilor din Excel intr-un format JSON** intermediar, independent de platforma si care permite integrarea acestora cu alte sisteme (standard *REST*)
- **generarea facturii in format PDF** pentru transmiterea acesteia catre client, semnarea electronica, tiparirea si arhivarea acesteia in format fizic (in general manipularea facturii in format "*human readable*")

Componenta ofera doua instrumente pentru realizarea si indeplinirea acestor obiective:

- `xl2roefact` o **aplicatie de tip linie de comanda** (disponibila pentru sistemele de operare Windows, Linux si MacOS)
- `xl2roefact` *PyPi* o **biblioteca standard Python** utilizabila pentru dezvoltari proprii in scopul extinderii altor sisteme existente (*custom development*)

### 3.2 Instalarea aplicatiei xl2roefact

Pachetele de instalare sunt [disponibile aici](#). Pachetele disponibile contin in numele lor versiunea de aplicatie utilizata si sistemul de operare pentru care sunt disponibile:

- `MSI` pachet instalare pentru *Windows*
- `DEB` pachet instalare pentru *Linux Debian* (verificati disponibilitatea pentru varianta sistemului de operare folosit de dvs)

- `EXE` executabil *Windows in format "portabil" (un singur fisier)*
- **Pachet Python pe PyPi** (<https://pypi.org/project/xl2roefact/>) este de fapt biblioteca xl2roefact care poate fi folosita ca si script independent de sistemul de operare daca aveti Python 3 instalat

*NOTA 1:* pentru echivalent utilizare *portabila pentru Linux* se va instala biblioteca Python ([vezi sectiunea xl2roefact PyPi library](#)) dupa care devine utilizabil scriptul Python "ca orice alta comanda Linux"

*NOTA 2:* pachetul `MSI` pentru *Windows* este disponibil in orice variante / versiuni al sistemului. Optiunile pentru *Linux* sunt mult mai flexibile si astfel celelalte pot lipsi insa pot fi disponibile gratuit, la cerere.

### 3.3 Configurarea aplicatiei xl2roefact

Parametrii de configurare a aplicatiei se gasesc in fisierul `config_settings.py`. Acestia sunt sub elaborati in limbaj Python prin utilizarea conventiilor de constante conform recomandarilor PEP (numele capitalizat) si sunt acompaniti de linii de explicatii privind aplicabilitatea lor.

Configurare aplicatiei se poate face interactiv si din aplicatie. Pentru a obtine help referitor la detaliile comenzi se va folosi

```
xl2roefact settings --help
```

### 3.4 Comenzile aplicatiei

Interfata aplicatie este realizata utilizind conventiile si practicile uzuale pentru aplicatii tip linie de comanda consola. Pentru informatii privind comenzile se poate folosi optiunea de **help**, disponibila atat la nivelul general:

```
xl2roefact --help
```

cit si la nivel detaliat pentru fiecare comanda

```
xl2roefact [COMMAND] --help
```

#### Lista comenzilor:

- **about** - Afiseaza informatii despre aceasta aplicatie (copyright, scop, etc)
- **settings** - Afiseaza parametrii de configurare a aplicatiei. [Vezi sectiunea de configurare a aplicatiei](#)
- **xl2json** - Transforma fisierul (fisierele) Excel in forma JSON pentru utilizare ulterioara ca forma de date standardizat pentru schimbul de informatii cu alte sisteme electronice

#### Comenzile detaliate:

#### 3.4.1 xl2roefact

function called when no command is invoked and to provide only application version (for external users to test it!).

Usage:

```
x12roefact [OPTIONS] COMMAND [ARGS]...
```

Options:

```
--version          show application version
--install-completion  Install completion for the current shell.
--show-completion    Show completion for the current shell, to copy it or
                    customize the installation.
```

### 3.4.1.1 about

provide a short application description.

Usage:

```
x12roefact about [OPTIONS]
```

### 3.4.1.2 settings

display application configuration parameters and settings that are subject to be changed by user.

Args: `rules`: show recommended rules to follow when change application configurable settings (available in both RO & EN languages). Defaults to `False`.

Usage:

```
x12roefact settings [OPTIONS]
```

Options:

```
-r, --rules  show settings recommended update rules
```

### 3.4.1.3 x12json

extract data from an Excel file (save data to JSON format file with the same name as original file but `.json` extension).

Args: `file_name`: files to process (wildcards allowed). `files_directory`: directory to be used to look for Excel files. Defaults to `invoice_files/`. NOTE: if default directory does not exists will consider current directory instead `verbose`: show detailed processing messages". Defaults to `False`.

Usage:

```
x12roefact x12json [OPTIONS] [FILE_NAME]
```

## Options:

```
[FILE_NAME]          files to process (wildcards allowed)
                      [default: *.xlsx]
-d, --files-directory DIRECTORY
                      directory to be used to look for Excel files
                      (if default directory does not exists will
                      consider current directory instead).
                      [default: invoice_files/]
-v, --verbose         show detailed processing messages
```

### 3.5 Practici si regului referitoare la continutul facturilor din Excel

Acest capitol se refera la modul in care este "tratata" continutul fisierului Excel cu factura, mai exact la modalitatea in care informatia facturii este cautata, identificata si gasita in scopul de a fi salvata in oricare din formatele de "factura electronica / E-Fact".

Utilizarea sablonului de factura Excel ce este livrat impreuna cu aplicatia **ESTE O VARIANTA DE LUCRU RECOMANDATA**, dar nu obligatorie. Chiar si in cazul utilizarii acestuia, prin modificarea "structurii" acestuia, informatia poate ajunge *nerecognoscibila / neidentificabila* total sau partial daca nu sunt urmate regulile expuse.

In general trebuie facuta diferenta intre datele facturii si modul in care aceasta va fi tiparita (va aparea la tiparire / previzualizare).

Mai exact **continutul informational** al facturii nu trebuie nici confundat si nici mixat cu **formatul de afisare al acesteia** (layout). Pentru acesta din urma se recomanda a fi folosite cu precadere *regulile de formatare* din Excel si nu cele stocare a datelor. Un exemplu este un numar zecimal oarecare unde:

- una este valoarea introdusa intr-o celula (de ex cu 3 zecimale) si
- alta este valoarea afisata (cu 2 zecimale) - aceasta din urma trebuie obtinuta prin formatarea celulei respective de a afisa 2 zecimale prin rotunjire insa valoarea efectiva trebuie sa fie cea originala cu 3 zecimale, lucru (diferenta) care se poate vedea la editarea continutului celulei.

### 3.6 Tutorial utilizare aplicatie

#### 3.6.1 Organizarea informatiei

Aplicatia *xl2roefact* "promoveaza" structurarea informatiei procesate astfel incit sa fie evitata situatia "*de aglomerare*" a directorului curent cu fisiere ce trebuiesc identificate si izolate in situatia in care se fac *procesari in masa* (pe mai multe fisiere / facturi sursa).

Astfel, aplicatia se asteapta ca fisierul Excel sursa (*adica facturile de procesat*) sa fie copiate in directorul `invoice_files/` de unde vor fi citite si tot aici vor fi create fisierul rezultate (JSON, XML, etc). Acest director este relativ la directorul curent de unde este lansata aplicatia si considerat "*implicit*" cu acest nume dar daca se doreste un alt director acest lucru poate fi facut folosind parametrul `--files-directory` (sau prescurtat `-d`) la lansarea aplicatiei astfel:



```
xl2roefact -d "calea si numele directorului dorit"
```

**Nota**

Ghilimelele sunt necesare numai daca numele si calea ( `path` ) contin caracterul spatiu.

**Exemple:**

- pentru stabilirea directorului curent ca sursa pentru fisierele factura Excel:

```
xl2roefact -d ./
```

- procesarea tuturor facturilor facturilor din luna *iunie*, copiate intr-un director dedicat sub directorul curent:

```
xl2roefact -d ./facturi_iunie/
```

### 3.6.2 Exemplu de procesare a unei facturi

- se creaza directorul recomandat pentru stocarea facturilor in Excel:

```
md invoice_files
```

- se copiaza factura `factura_A.xlsx` in acest director apoi se revine in directorul anterior daca acesta a fost schimbat pentru efectuarea copierii
- se lanseaza aplicatia:

```
xl2roefact xl2json
```

In urma acestor operatii, in directorul `invoice_files` vor rezulta:

```
invoice_files/  
├── factura_A.xlsx # fisierul Excel original  
└── factura_A.json # fisierul JSON rezultat in urma procesarii
```

- `factura_A.xlsx` ca fiind fisierul Excel original cu factura
- `factura_A.json` acesta fiind fisierul format JSON rezultat in urma procesarii si ce poate fi folosit pentru interschimbarea electronica a informatiei intre sisteme

## 3.7 Aspecte tehnice referitoare la formatul fisierului JSON aferent facturii

Acest fisier este cel generat de catre aplicatie in urma executiei acesteia cu comanda `xl2json`. Formatul JSON are urmatoarra structura de baza:

```
{
  "Invoice": {...},
  "meta_info": {...},
  "excel_original_data": {...}
}
```

Cheile de la primul nivel contin:

- **Invoice** - datele efective ale facturii
- **meta\_info**
  - informatii referitoare la procesarea facturii si mapa de conversie a cheii `Invoice` din formatul `JSON` in formatul `XML` cerut de sistemul *RO E-Fact*
  - harta de ajutor in conversia formatului `JSON` in formatul `XML` acceptat de sistemul *RO E-Fact* (cheie `meta_info.map_JSONkeys_XMLtags`) si definitiile `XML` aferente (cheie `meta_info.invoice_XML_schemes`)
  - alte informatii despre fisierul Excel prelucrat (numele, worksheet cu factura, data si ora procesarii, CRC pentru verificare, etc)
- **excel\_original\_data** - informatiile originale din fisierul Excel, asa cum au fost ele identificate si gasite precum si locatia (adresele celulelor). Aceste informatii sunt utile in cazul in care exista neclaritati in urma procesului de conversie pentru "a intelege" de unde si cum arata informatiile originale din fisierul Excel

Pentru detalii suplimentare despre formatul `JSON` trebuie consultata componenta referitoare la [biblioteca xl2roefact destinata dezvoltarii software](#).

## 3.8 Descarcare (download) aplicatie xl2roefact CLI

- [Pachet instalare aplicatie Windows](#)
- [Pachet instalare script Python](#)

## 3.9 Date identificare

- part number (p/n): `0000-0095-xl2roefact`
- producator si copyright: RENWare Software Systems
- author: Petre Iordanescu (petre.iordanescu@gmail.com)

## 3.10 License

## 3.11 Note

- 
1. Toate interactiunile cu sistemul *ANAF RO E-Fact* necesita o *conexiune la internet* si un set de *credentiale ANAF RO E-Fact ale companiei* pentru care se incarca factura. In lipsa acestora, fisierul **XML** generat de aplicatie poate fi incarcat ulterior (de ex de catre departmentul contabilitate) [↔](#) [↔](#)

### III. web2roefact

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UPCOMING...

## IV. xl2roefact python library

## 5 xl2roefact python library

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### 5.1 System modules

`xl2roefact` main and basic modules are:

- `rdinv` read an Excel file and extract invoice data to a JSON file format
- `wrxml` write, convert the JSON invoice file to a XML file format, respecting schemes required by *RO EFact* standard
- `chkxml` check generated XML file
- `ldxml` load an invoice (ie, its XML associated file) to *ANAF SPV system*
- `chkisld` check if an invoice is already loaded in *ANAF SPV system*
- `config_settings` define system settings & parameters mainly used in invoice info / data detection and extract from invoice Excel format file
- `app_cli` contains the code for `xl2roefact` application command line (CLI) format

Below is presented the ***skeleton logic*** of those modules which and where is relevant ie meaning where is not enough obvious from code or code complexity exceed usual limits (*for example more than 100 lines of code per function*). For more technical details and specification regarding modules [see API Reference](#)

#### 5.1.1 rdinv module logic

Main function of `rdinv` module is `rdinv(...)` which has the following logic sections which are in ***strict sequence in presented order***:

- *search of `invoice_items_area` sub-table*. This area is expected to contain invoice lines and is "processed" first because it is more structured and easier to identify; after its identification the header area is considered upper of it and footer area below it
- *solve `invoice_items_area` in 2 step....* In this step the code-data-variables of items area will be initialized in order to hold information that will be found
- *localize and mark areas for...* section that follows natural the previous one by initializing code-data-variables for header and footer areas to hold their corresponding information
- *solve `invoice_header_area`* detailed initialize of header area code-data-variables
- *ReNaSt -RegNameStrategy* section that identify and extract the legal registered name of invoice customer
- *section to ( Excel data )---->( JSON ) format preparation and finishing* section which prepare Excel original data found to be saved as JSON as a more "electronic interchangeable" structure
- for more details about code logic description and presentation, please contact [RENware Software Systems \(http://www.renware.eu\)](http://www.renware.eu)

## 5.2 Install library

Library can be installed using 2 methods:

- install from PyPi
- install from distribution packages

### 5.2.1 Install from PyPi

The library installation should be done using standard Python instruments:

```
pip install xl2roefact
```

### 5.2.2 Install from distribution packages

To install from distribution packages first download the package version intended to install ([see download section](#)), choose the package type (if you have no special option, then choose `WHEEL` format) and install it using `pip` as any other Python library installation (*detailed in Python official documentation*).

## 5.3 Working directories

Below is a short description of most important directories that will (can !) be found on local development environment.

- `invoice_files/` default directory for Excel files which is intended to be processed



- `build/` this directory which will contain intermediary files resulted from building CLI application, library distribution parts, etc. Directory is subject of `.gitignore`
- `dist/` package files (wheels, dist), Windows executables, etc, generally all files subject of "public" distribution and download
- `test_*/` contains test invoice samples (from client, a RENware one, a 3rd party one) and some useful specs in dev & test process

## 5.4 Aspecte tehnice referitoare la formatul fisierului JSON aferent facturii

Acest fisier este cel generat de catre aplicatie in urma executiei acesteia cu comanda `xl2json`. Structura de baza a acestui fisier este:

```
{
  "Invoice": {...},
  "meta_info": {...},
  "excel_original_data": {...}
}
```

Cheile de la primul nivel contin:

- **Invoice** - datele efective ale facturii
- **meta\_info**
  - informatii referitoare la procesarea facturii si mapa de conversie a cheii `Invoice` din formatul `JSON` in formatul `XML` cerut de sistemul *RO E-Fact*
  - harta de ajutor in conversia formatului `JSON` in formatul `XML` acceptat de sistemul *RO E-Fact* (cheie `meta_info.map_JSONkeys_XMLtags`) si definititiile `XML` aferente (cheie `meta_info.invoice_XML_schemes`)
  - alte informatii despre fisierul Excel prelucrat (numele, worksheet cu factura, data si ora procesarii, CRC pentru verificare, etc)
- **excel\_original\_data** - informatiile originale din fisierul Excel, asa cum au fost ele identificate si gasite precum si locatia (adresele celulelor). Aceste informatii sunt utile in cazul in care exista neclaritati in urma procesului de conversie pentru "a intelege" de unde si cum arata informatiile originale din fisierul Excel

An [example of JSON generated file is available here](#)

## 5.5 API Reference

## 5.6 Download xl2roefact library

- [Pachete instalare biblioteca Python formate WHEEL si DIST](#)

## 6 xl2roefact python library API Reference

- [xl2roefact python library API Reference](#)
- [app\\_cli](#)
  - [about](#)
  - [settings](#)
  - [xl2json](#)
  - [called\\_when\\_no\\_command](#)
  - [run](#)
- [chkisld](#)
- [chkxml](#)
- [config\\_settings](#)
  - [DEFAULT\\_SUPPLIER\\_COUNTRY](#)
- [ldxml](#)
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  - [dict\\_sum\\_by\\_key](#)
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  - [mk\\_kv\\_invoice\\_items\\_area](#)
  - [get\\_invoice\\_items\\_area](#)
- [wrxml](#)
- [\\_\\_init\\_\\_](#)
- [\\_\\_main\\_\\_](#)
- [\\_\\_version\\_\\_](#)

## 7 app\_cli

`app_cli`: the command line application for all `xl2roefact` functionalities.

Identification:

- copyright: (c) 2023 RENWare Software Systems

- author: Petre Iordanescu (petre.iordanescu@gmail.com)

### 7.0.0.1 about

```
@app_cli.command()
def about()
```

provide a short application description.

### 7.0.0.2 settings

```
@app_cli.command()
def settings(rules: Annotated[
    bool,
    typer.
    Option("--rules", "-r", help="show settings recommended update rules"),
] = False)
```

display application configuration parameters and settings that are subject to be changed by user.

#### Arguments:

- `rules` - show recommended rules to follow when change application configurable settings (available in both RO & EN languages). Defaults to `False`.

### 7.0.0.3 xl2json

```
@app_cli.command()
def xl2json(
    file_name: Annotated[
        str, typer.Argument(
            help="files to process (wildcards allowed)"] = "*.xlsx",
    files_directory: Annotated[
        Path,
        typer.Option(
            "--files-directory",
            "-d",
            exists=False,
            file_okay=False,
            dir_okay=True,
            writable=True,
            readable=True,
            resolve_path=True,
            help=
                "directory to be used to look for Excel files (if default directory does not exists
will consider current directory instead).",
        ),
    ] = "invoice_files/",
    verbose: Annotated[
        bool,
        typer.
        Option("--verbose", "-v", help="show detailed processing messages"),
    ] = False)
```

extract data from an Excel file (save data to JSON format file with the same name as original file but `.json` extension).

#### Arguments:

- `file_name` - files to process (wildcards allowed).
- `files_directory` - directory to be used to look for Excel files. Defaults to `invoice_files/`. NOTE: if default directory does not exists will consider current directory instead
- `verbose` - show detailed processing messages". Defaults to `False`.

#### 7.0.0.4 called\_when\_no\_command

```
@app_cli.callback(invoked_without_command=True)
def called_when_no_command(
    ctx: typer.Context,
    version: Annotated[
        bool,
        typer.Option("--version", help="show application version"),
    ] = False)

```

function called when no command is invoked and to provide only application version (for external users to test it!).

#### 7.0.0.5 run

NOTE: for `run` "reason to be" as copy of `app_cli` see iss `0.1.22b 240216piu_a`

## 8 chkisld

chkisld: modul de verificare a starii de incarcare a unei facturi emise

#### Identification:

- code-name: `chkisld`
- copyright: (c) 2023 RENWare Software Systems
- author: Petre Iordanescu (petre.iordanescu@gmail.com)

#### Specifications:

- document cerinte initiale: `110-SRE-api_to_roefact_requirements.md` section `Componenta x12roefact`
- INTRARI: fisier `f-XLSX` sau numarul / cheia / codul facturii
- IESIRI: valoarea echivalent `TRUE` daca factura a fost deja incarcata sau valoare echivalent `FALSE` daca factura nu a fost incarcata

## 9 chkxml

chkxml: modul de validare a facturii in sistemul ANAF E-Factura

Identification:

- code-name: `chkxml`
- copyright: (c) 2023 RENWare Software Systems
- author: Petre Iordanescu (petre.iordanescu@gmail.com)

Specifications:

- document cerinte initiale: `110-SRE-api_to_roefact_requirements.md` section `Componenta x12roefact`
- INTRARI: fisier `f-XML`
- IESIRI: raport cu eventualele erori de validare

## 10 config\_settings

Configuration and setting parameters.

(en-us) README before making changes:

- each parameter has a short help (lines starting with `#` character) - read it before changing that parameter
- do not change parameters name as specified before equal (`=`) sign
- lists are enclosed in squared brackets (`[ . . . ]`) and items are separated by comma character (`,`)
- strings are enclosed in `"` characters
- if you want to clear a list (for example you do not want any options inside) just let it as `<PARAMETR NAME> = [ ]`  
- do not drop that parameter
- do not add supplementary parameters, they will not be used without software changes (also risk to induce potential errors)
- for calendaristic dates Excel cells use `date` format and change it as display option to show wanted format

(ro) README inainte de a face modificari:

- fiecare parametru are un help scurt (liniile ce incep cu caracterul `#`) - citi-l inainte de a modifica un parametru
- nu schimbat numele parametrilor asa cum este el specificat inainte de semnul egal (`=`)
- listele sunt incluse intre paranteze drepte (`[ . . . ]`) si elementele lor sunt separate prin caracterul virgula (`,`)
- sirurile de caractere sunt incluse intre ghilimele (caracterul `"`)
- daca doriti stergerea unei liste (de ex daca nu doriti nici o optiune pentru acea lista) doar lasati acel parametru cu valoarea `[ ]` - nu stergeti in nici un caz acel parametru

- nu adaugati parametrii suplimentari (altii decit cei specificati aici), acestia nu vor fi utilizati fara a modifica aplicatia (de asemenea riscati sa induceti erori in cod)
- pentru datele calendaristice in celulul Excel a se utiliza formatul standard de data ( `date` ) si modificati formatul de afisare in formatul dorit pe factura tiparibila

#### 10.0.0.1 DEFAULT\_SUPPLIER\_COUNTRY

---

#### NOTE: "pattern-uri" (sabioane) de identificare si regasire a datelor folositi de

\_\_ comanda `x12json` reprezentind functionalitatea de extragere a datelor din Excel si exportul lor in formatul JSON (modulul `rdinv`)\_\_

---

## 11 ldxml

ldxml: modul de incarcare a facturii in sistemul ANAF E-Factura

Identification:

- code-name: `ldxml`
- copyright: (c) 2023 RENWare Software Systems
- author: Petre Iordanescu (petre.iordanescu@gmail.com)

Specifications:

- document cerinte initiale: `110-SRE-api_to_roefact_requirements.md` section Componenta `x12roefact`
- INTRARI: fisier `f-XML`
- IESIRI: raport cu validarea si identificatorul incarcarii

## 12 libutils

general utilities library for all `x12roefact` components and modules.

Identification:

- code-name: `libutils`
- copyright: (c) 2023, 2024 RENWare Software Systems
- author: Petre Iordanescu (petre.iordanescu@gmail.com)

Components:

- `dict_sum_by_key(dict, str) -> float` to sum a dictionary for a given key at all depth levels

- `isnumber(str) -> bool` Test a string if it could be used as number (int or float)
- `find_str_in_list(list, list) -> int` Search more strings (ie, a list) in list of strings

#### 12.0.0.1 dict\_sum\_by\_key

```
def dict_sum_by_key(search_dict: dict | list[dict], sum_key: str) -> float
```

Sum all dictionary (or list of dictionaries) items, at all levels, for a given key.

##### Arguments:

- `search_dict` - dictionary to be searched for
- `sum_key` - key to be searched

##### Returns:

`float` with required sum

#### 12.0.0.2 isnumber

```
def isnumber(a_string: str) -> bool
```

test if a string is valid as any kind of number.

##### Arguments:

- `a_string` - input string.

##### Returns:

- `True` - if input string is valid as any kind of number, otherwise `False`.

#### 12.0.0.3 find\_str\_in\_list

```
def find_str_in_list(list_of_str_to_find: list, list_to_search: list) -> int
```

find a substring from `list_of_str_to_find` in elements of `list_to_search`.

##### Arguments:

- `list_of_str_to_find` - list of strings to search for.
- `list_to_search` - list where to search for substrings.

##### Returns:

- `index` - the index of list item which contains `str_to_find` (first found) or `None` if not found.

# 13 rdinv

rdinv: modul de procesare a fisierului Excel ce contine factura si colectare a datelor aferente.

Formatul acceptat fisier Excel este `XLSX`.

Identification:

- code-name: `rdinv`
- copyright: (c) 2023 RENWare Software Systems
- author: Petre Iordanescu (petre.iordanescu@gmail.com)

Specifications:

- document cerinte initiale: `110-SRE-api_to_roefact_requirements.md` section `Componenta xl2roefact`
- INTRARI: fisier format `XLSX` ce contine factura emisa (cod: `f-XLSX`)
- IESIRI: fisier format `JSON` imagine a datelor facturii (cod: `f-JSON`)

## 13.0.0.1 rdinv

```
def rdinv(file_to_process: str,
          invoice_worksheet_name: str = None,
          *,
          debug_info: bool = False) -> dict
```

read Excel file for invoice data.

Produce a dictionary structure + JSON file with all data regarding read invoice: canonical KV data, meta data, map to convert to XML and original Excel data.

**Arguments:**

- `file_to_process` - the invoice file (exact file with path).
- `invoice_worksheet_name` - the worksheet containing invoice, optional, defaults to first found worksheet.
- `debug_info` - key only, show debugging information, default `False`.

**Returns:**

- `dict` - the invoice extracted information from Excel file as `dict(Invoice: dict, meta_info: dict, excel_original_data: dict)` TODO subject of documentation update.

NOTE ref important variables: \* `db: pylightxl object`: EXCEL object with invoice (as a whole) \* `ws: pylightxl object`: WORKSHEET object with invoice

## 13.0.0.2 get\_excel\_data\_at\_label



```
def get_excel_data_at_label(pattern_to_search_for: list[str],
                           worksheet: xl.Database.ws,
                           area_to_scan: list[list[int]] = None,
                           targeted_type: Callable = str,
                           down_search_try: bool = True) -> dict
```

get "one key Excel values", like invoice number or invoice issue date.

#### Arguments:

- `pattern_to_search_for` - for example for inv number, will pass the `PATTERN_FOR_INVOICE_NUMBER_LABEL`.
- `worksheet` - the worksheet containing invoice (as object of `pyxllight` library).
- `area_to_scan` - area of cells to be searched, default whole worksheet.
- `targeted_type` - what type expect (will try to convert to, if cannot will return str), default `str`.
- `down_search_try` - establish if DOWN search method is tried, default `True`.

#### Returns:

`None` if not found OR `dictionary` containing: \* `"value": int | float | str` - the value found converted to requested `targeted_type` if possible or `str` otherwise; if "out of space" then returns `None` \* `"location": (row, col)` - adrees of cell where found value

#### Notes:

- normal scan order is 1.RIGHT, 2.DOWN (if allowed), 3.IN-LABEL only in given area and pattern.

#### 13.0.0.3 mk\_kv\_invoice\_items\_area

```
def mk_kv_invoice_items_area(invoice_items_area_xl_format)
```

transform `invoice_items_area` in "canonical JSON format" (as kv pairs).

#### Arguments:

- `invoice_items_area_xl_format` - invoice items area in Excel format (ie, DataFrame with row, col, data).

#### Returns:

- `invoice_items_area_xl_format` - dictionary with invoice items in Excel format (ie, rows, columns).

#### Notes:

- for ROefact XML model (& plan) see `invoice_files/__model_test_factura_generat_anaf.xml`.

#### 13.0.0.4 get\_invoice\_items\_area

```
def get_invoice_items_area(worksheet, invoice_items_area_marker, wks_name)
```

get invoice for `invoice_items_area`, process it and return its Excel format.

Process steps & notes: \* find invoice items subtable. \* clean invoice items subtable. \* extract relevant data. \*

NOTE: all Excel cell addresses are in (row, col) format (ie, Not Excel format like "A:26, C:42, ...")

#### Arguments:

- `worksheet` - the worksheet containing invoice (as object of `pyxllight` library).
- `invoice_items_area_marker` - string with exact marker of invoice items table.
- `NOTE` - this is the UPPER-LEFT corner and is determined before calling this procedure.
- `wks_name` - the worksheet name (string) of the `worksheet` object.

#### Returns:

- `invoice_items_area` - dictionary with invoice items in Excel format (ie, rows, columns).

## 14 wrxml

wrxml: modul de generare a fisierului format XML

#### Identification:

- code-name: `wrxml`
- copyright: (c) 2023 RENWare Software Systems
- author: Petre Iordanescu (petre.iordanescu@gmail.com)

#### Specifications:

- document cerinte initiale: 110-SRE-api\_to\_roefact\_requirements.md section Componenta xl2roefact
- INTRARI: fisier `f-JSON`
- IESIRI: fisier format XML conform cerintelor si sistemului ANAF E-Factura (cod: `f-XML`)

## 15 \_\_init\_\_

## 16 \_\_main\_\_

**xl2roefact.main:** Python package standard file to assure run as `python -m xl2roefact`.

#### Identification:

- code-name: `__main__`
- copyright: (c) 2023 RENWare Software Systems
- author: Petre Iordanescu (petre.iordanescu@gmail.com)

- Windows: MSI installer with EXE application.
- Linux: `x12roefact` executable shell as wrapper for `x12roefact.py`.

- command general format: `python -m xl2roefact [OPTIONS] COMMAND [ARGS]...`
- help: `python -m xl2roefact --help`.

```
xl2roefact version info.
```

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## V. invoice template

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# 18 invoice template

- [invoice template](#)
  - [Instalarea sablonului de factura emisa](#)
  - [Recomandari in utilizarea sablonului](#)
  - [Descarcare \(download\) sablon factura](#)
  - [License](#)

versiune curenta 0.1.20 formate suportate XLSX

## 18.1 Instalarea sablonului de factura emisa

Aceasta componenta consta dintr-un director (ce nu necesita instalare speciala ci simpla copiere locala acolo unde va fi utilizat). Acest director contine:

- fisierul pentru factura `invoice_template_CU_tva.xlsx` ce este disponibil pentru [descarcare aici](#)
- directorul `released_packages/` ce contine versiuni anterioare de sablon ce sunt inca suportate
- prezentul document

## 18.2 Recomandari in utilizarea sablonului

Aceasta sectiune se refera la modul in care ar trebui "tratata" continutul fisierului Excel cu factura **in conditiile in care se intentioneaza ca aceasta sa fi procesata ulterior cu sistemul INVOICetoROeFact**. Acest sablon este general valabil (este un fisier Excel ca oricare altul) deci in acest caz este important a "constientiza" faptul ca informatia aferenta facturii din Excel va fi cautata, identificata si gasita in scopul de a fi salvata in formatele de factura electronica (utilizarea acestui sablon de factura Excel impreuna cu sistemul INVOICetoROeFact **ESTE O VARIANTA DE LUCRU RECOMANDATA**, dar nu obligatorie).

Astfel **se recomanda ca acest sablon sa fie utilizat asa cum este livrat**, fara a efectua modificari majore in structura sa cum ar fi:

- modificarea formatelor (de tip de date) celulelor in scopul unei afisari "mai frumoase"
- adaugarea de informatii prin concatenare de siruri de caractere sau orice alte metode de a altera continutul vizibil al celulelor in scopul unei afisari "mai frumoase"
- modificarea locatiilor celulelor prin inserarea sau stergerea de linii, coloane sau celule noi

**In general trebuie facuta diferenta intre datele facturii si modul in care aceasta va fi tiparita (va apareea la tiparire / previzualizare).**

#### DETALII TEHNICE:

Continutul informational al facturii nu trebuie nici confundat si nici mixat cu **formatul de afisare al acesteia** (layout). Pentru acesta din urma se recomanda a fi folosite cu precadere *regulile de formatare* din Excel si nu cele stocare a datelor. Un exemplu este un numar zecimal oarecare unde:

- una este valoarea introdusa intr-o celula (de ex cu 3 zecimale) si
- alta este valoarea afisata (cu 2 zecimale) - aceasta din urma trebuie obtinuta prin formatarea celulei respective de a afisa 2 zecimale prin rotunjire insa valoarea efectiva trebuie sa fie cea originala cu 3 zecimale, lucru (diferenta) care se poate vedea la editarea continutului celulei.

## 18.3 Descarcare (download) sablon factura

- [office Excel XLSX](#)

## 18.4 [License](#)

# VI. Help

## VI.I Manuale web2roefact





**INVOICEtoROefact System**

*(c) 2023 RENware Software Systems*

# 19 Catalogul manualelor de utilizare

## ***Cuprins:***

- [Catalogul manualelor de utilizare](#)
- ...



**INVOICEtoROefact System**

*(c) 2023, 2024 RENware Software Systems*

## 20 Catalogul manualelor de configurare si administrare

### ***Cuprins:***

- [Catalogul manualelor de configurare si administrare](#)
- ...

## VI.II Cerintele sistemului

RENware Software Systems

## 21 Propunere tehnica

### Cuprins:

- [Propunere tehnica](#)
  - [Aria de cuprindere](#)
  - [Considerente generale de securitate](#)
  - [Considerente generale privind bazele de date proprii sistemelor](#)
  - [Considerente generale privind auditarea informatiilor](#)
- Client: n/a - not public
- Data: 2023-Noiembrie



#### Codificarea documentelor

- codificarea numelor documentelor si a proceselor este facuta in conformitate cu metodologia [RENware SDEVEN \(http://sdeven.renware.eu\)](http://sdeven.renware.eu)

### Cuprins:

- [Propunere tehnica](#)
  - [Aria de cuprindere](#)
  - [Considerente generale de securitate](#)
  - [Considerente generale privind bazele de date proprii sistemelor](#)
  - [Considerente generale privind auditarea informatiilor](#)

## 21.1 Aria de cuprindere

Solutiile propuse prin aceasta propunere tehnica sunt:

- **INVOICEtoROefact** (code-name `api_to_roefact` ) integrare Sistemul National de Facturi Emise *RO e-Factura* [descriere si cerinte aici](#)
- **PayValidaBoa** (code-name `payments_validation_board` ) Flux aprobare facturi primite pentru ordonantare la plata [descriere si cerinte aici](#)

In continuare se prezinta o serie de considerente generale valabile pentru toate sistemele din aria de acoperire.

## 21.2 Considerente generale de securitate

- **(RSEC-01)** fisierele de configurare a sistemelor (fiind format text UTF-8 ) vor avea ca owner un utilizator dedicat sistemului respectiv sau utilizatorul root . Numai acesti doi utilizatori pot avea acces RW la aceste fisiere
- **(RSEC-02)** toate documentele de provenienta externa sistemelor vor fi "purtatoare" ale unui certificat digital ce **atesta validitatea documentelor**. Acest certificat va fi de preferinta de tip "semnatura electronica" dar nu obligatoriu calificata. Este suficient un simplu certificat (cheie) tip RSA generat intern si distribuit utilizatorilor autorizati sa emita documentele respective. O copie a certificatului (sau a certificatelor daca se vor emite mai multe) ce atesta validitatea unui document va sta pe server in locatii ce sunt conforme cu RSEC-01

## 21.3 Considerente generale privind bazele de date proprii sistemelor

- **(DBS-01)** bazele de date vor contine o cheie primara "real primara" (adica avind toate caracteristicile tehnice pentru PK in sensul uzual cunoscut din teoria bazelor de date). Aceasta cheie va fi de tip Char(32) reprezentind tipul uuid4 (cunoscut si ca guid ) convertit la sir de caractere UTF-8 si reversibil ca transformare din string in uuid4 . Aceasta cheie va fi generata automat si intretinuta de sistem deservind scopuri pur tehnice de *referintiere si relationare* a datelor. Modificarea manuala nu este permisa putind genera situatii de hazard.
- **(DBS-02)** bazele de date vor contine si o alta "cheie primara uman recongnoscibila" ( AK in teoria bazelor de date) utilizata in scop de **recunoastere si regasire** a informatiei de catre utilizatori. Aceasta cheie va avea urmatoarele catacterisrici:
  - va fi *unica*, tip Char(10) (limitarea lungimii se va aplica la introducerea datelo si nu in baza de date)
  - *agnostic case*, nu se va face diferenta intre litere mari sau mici (pentru a evita confuziile)
  - *obligatorie* iar daca utilizatorul "nu o doreste" se va default-a la PK-ul anterior
- **(DBS-03)** bazele de date vor fi intr-unul din formatele: **(a) relational** sau **(b) JSON standard**. Pentru bazele de date in format relational va fi preferata o solutie de SGBD tip open source matura, intretinuta in urmatoarea ordine de aplicare:
  - 1. [SQLite \(https://www.sqlite.org/index.html\)](https://www.sqlite.org/index.html) pentru baze de date ce nu vor depasi 10,000 de inregistrari
  - 2. [PostgreSQL \(https://www.postgresql.org/\)](https://www.postgresql.org/) pentru baze de date ce se esttimeaza ca vor depasi 10,000 de inregistrari
  - 3. [MariaDB \(https://mariadb.org/\)](https://mariadb.org/) pentru baze de date ce se esttimeaza ca vor depasi 10,000 de inregistrari
  - prima varianta va fi preferata datoritra "portabilitatii datelor"
  - a treia varianta este enumerata ca optiune preferata a utilizatorului la varianta 2 .
- **(DBS-04)** bazele de date vor folosi numai cimpuri formate standard, clasice si elemetare:
  - sir de carectere ( CHAR sau VARCHAR )
  - numere intregi cu semn ( INTEGER )
  - numere reale cu semn ( FLOAT )

- numere combinate a caror valoare poate fi intreg sau real ( `NUMBER` )
- valori logice sub forma intreg cu semn astfel: `1` pentru TRUE si `0` sau `NULL` pentru FALSE
- valori logice sub forma de caracter astfel: prima litera din lista `[Y, y, D, d, T, t]` pentru TRUE si orice altceva inclusiv `NULL` pentru FALSE
- **(DBS-05)** in cazul bazelor de date relationale, integritatile referentiale vor fi evitate la maximum prin intretinerea datelor numai cu ajutorul aplicatiei sau in cazul necesitatii modificarii manuale a datelor, aceasta modificare sa fie efectuata numai de personal calificat
- **(DBS-06)** informatiile de tip data-timp (data, ora, etc...) vor fi stocate de preferinta sub forma de `String` in formatul ISO: `YYYY-MM-DD HH:MM:SS.nnnnn` .
- **(DBS-07)** informatii de data-timp vor fi stocate avind valori agnostice de "Time Zone" adica vor fi considerate `UTC` lucru care va permite comparabilitatea acestora indiferent de locatie / zona de timp de unde au fost generate.

## 21.4 Considerente generale privind auditarea informatiilor

- Cimpurile de audit ce indica utilizatori:
  - **(AUD-01)** pentru informatiile **CONSTIENT** **GENERATE DE UTILIZATORI** (adica generate prin activarea unor controale vizuale, prin lansarea manuala a unei aplicatii, etc), aceste cimpuri vor contine **numele tip `username` al utilizatorului folosit pentru autentificarea in sistem**
  - **(AUD-02)** pentru informatiile **GENERATE DE SISTEM** la rulari automate, periodice, de verificare, de validare, etc, aceste cimpuri vor contine textul `system` (pentru a evita confuzii cu utilizatori reali la nivel de sistem de operare)
- **(AUD-03)** Cimpurile de audit ce indica date calendaristice vor respecta standardul ISO fiind in formatul maximal `YYYY-MM-DD hh:mm:ss`

**INVOICetoROefact System***(c) 2023 RENware Software Systems*

## 22 Propunere tehnica sistem INVOICetoROefact

**Cuprins:**

- [Propunere tehnica sistem INVOICetoROefact](#)
  - [Obiective](#)
  - [Vedere de ansamblu a solutiei](#)
  - [Componenta xl2roefact](#)
    - [Diagrama logica de functionare a componentei](#)
  - [Componenta WEB\\_DASHB](#)
  - [Componenta SYSTEM\\_DB](#)
- p/n: 0000-0095
- code-name: api\_to\_roefact
- commercial name: **INVOICetoROefact**
- url propunere tehnica: [http://apitoroefact.renware.eu/commercial\\_agreement/110-SRE-api\\_to\\_roefact\\_requirements.html](http://apitoroefact.renware.eu/commercial_agreement/110-SRE-api_to_roefact_requirements.html)
- git: [https://github.com/petre-renware/api\\_to\\_roefact](https://github.com/petre-renware/api_to_roefact)

**Cuprins:**

- [Propunere tehnica sistem INVOICetoROefact](#)
  - [Obiective](#)
  - [Vedere de ansamblu a solutiei](#)
  - [Componenta xl2roefact](#)
    - [Diagrama logica de functionare a componentei](#)
  - [Componenta WEB\\_DASHB](#)
  - [Componenta SYSTEM\\_DB](#)

### 22.1 Obiective

Acest sistem va asigura incarcarea facturilor emise in sistemul [ANAF E-Factura](https://www.anaf.ro/anaf/internet/ANAF/despre_anaf/strategii_anaf/proiecte_digitalizare/e.factura) ([https://www.anaf.ro/anaf/internet/ANAF/despre\\_anaf/strategii\\_anaf/proiecte\\_digitalizare/e.factura](https://www.anaf.ro/anaf/internet/ANAF/despre_anaf/strategii_anaf/proiecte_digitalizare/e.factura)) cu respectarea reglementarilor publicate in acest sens (lista contine si legaturi catre fisierele publicate de catre ANAF):

- [Conformarea la modificarile legislative si utilizarea sistemului](https://static.anaf.ro/static/10/Anaf/Informatii_R/Informatii_modificare_CIUS_RO.pdf) ([https://static.anaf.ro/static/10/Anaf/Informatii\\_R/Informatii\\_modificare\\_CIUS\\_RO.pdf](https://static.anaf.ro/static/10/Anaf/Informatii_R/Informatii_modificare_CIUS_RO.pdf))
- [Informatii de interes referitoare la implementarea sistemului național privind factura electronică RO e-Factura](https://static.anaf.ro/static/10/Anaf/Informatii_R/Comunicat_e-factura_aprilie2022_v2_050422.pdf) ([https://static.anaf.ro/static/10/Anaf/Informatii\\_R/Comunicat\\_e-factura\\_aprilie2022\\_v2\\_050422.pdf](https://static.anaf.ro/static/10/Anaf/Informatii_R/Comunicat_e-factura_aprilie2022_v2_050422.pdf))
- [Instrucțiuni de utilizare](https://static.anaf.ro/static/10/Anaf/Informatii_R/API/Oauth_procedura_inregistrare_aplicatii_portal_ANAF.pdf) ([https://static.anaf.ro/static/10/Anaf/Informatii\\_R/API/Oauth\\_procedura\\_inregistrare\\_aplicatii\\_portal\\_ANAF.pdf](https://static.anaf.ro/static/10/Anaf/Informatii_R/API/Oauth_procedura_inregistrare_aplicatii_portal_ANAF.pdf))

## 22.2 Vedere de ansamblu a solutiei

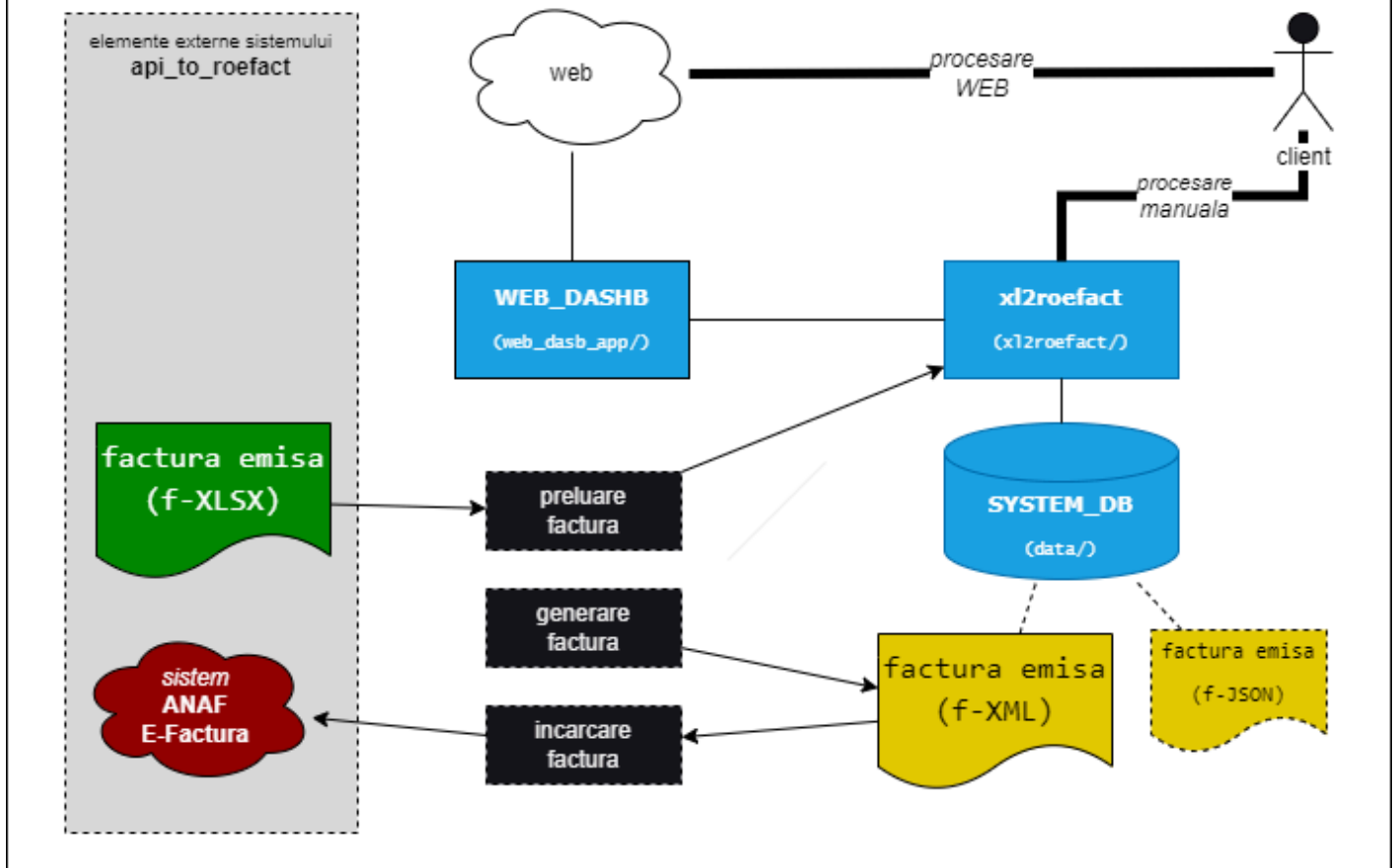
Solutia `api_to_roefact` consta din urmatoarele componente:

- `api_to_roefact` . `x12roefact` aceasta componenta are rolul de a implementa efectiv obiectivele principale ale sistemului **INVOICEtoROefact**. Componenta este capabila sa ruleze atit "*standalone*" (ca linie de comanda CLI) dar si prin utilizarea ei de catre componenta `WEB_DASHB` si astfel utilizarea ei in varianta de sistem prezentat "*over internet / intranet*". [Prezentarea detalita a acesteia se gaseste aici](#).
- `api_to_roefact` . `WEB_DASHB` aceasta componenta are rolul de agrega componentele si de a prezenta solutia **INVOICEtoROefact** "*over internet / intranet*". De asemenea componenta asigura modulele UI necesare pentru administrarea sistemului. [Prezentarea detalita a acesteia se gaseste aici](#).
- `api_to_roefact` . `SYSTEM_DB` .Aceasta componente reprezita baza de date a sistemului **INVOICEtoROefact** atit partea relationala dar si partea `no-sql` a acesteia (utilizata pentru eventuale sincrnizari provenite din utilizarea CLI a componentei `x12roefact` ). [Prezentarea detalita a acesteia se gaseste aici](#).

Figura urmatoare prezinta schematic rolul general al componentelor precum si interactiunea acestora cu mediul exterior sistemului `api_to_roefact` .



## Arhitectura generala a sistemului INVOICEtoROefact (api\_to\_roefact)



## 22.3 Componenta xl2roefact

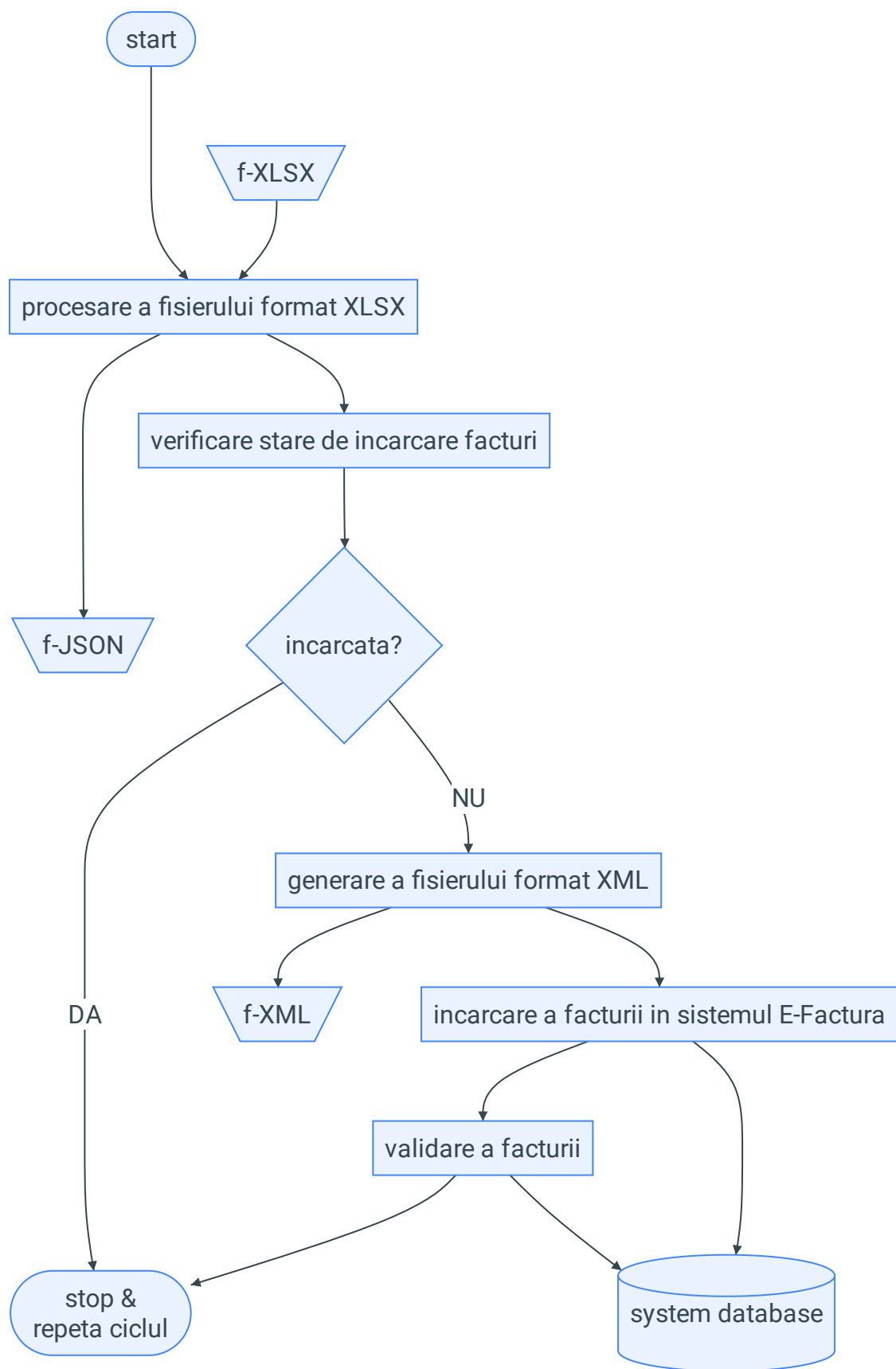
- **(RDINV)** modul de procesare a fisierului format **XLSX** ce contine factura si colectare a datelor aferente
  - **INTRARI:** fisier format **XLSX** ce contine factura emisa (cod: **f-XLSX**)
  - **IESIRI:** fisier format **JSON** imagine a datelor facturii (cod: **f-JSON**)
- **(WRXML)** modul de generare a fisierului format **XML**
  - **INTRARI:** fisier **f-JSON**
  - **IESIRI:** fisier format **XML** conform cerintelor si sistemului **ANAF E-Factura** (cod: **f-XML**)
- **(CHKXML)** modul de validare a facturii in sistemul **ANAF E-Factura**
  - **INTRARI:** fisier **f-XML**
  - **IESIRI:** raport cu eventualele erori de validare <sup>1</sup>
- **(LDXML)** modul de incarcare a facturii in sistemul **ANAF E-Factura**
  - **INTRARI:** fisier **f-XML**
  - **IESIRI:** raport cu validarea si identificatorul incarcarii <sup>1</sup>
- **(CHKISLD)** modul de verificare a starii de incarcare a unei facturi emise

- *INTRARI*: fisier `f-XLSX` sau numarul / cheia / codul facturii
- *IESIRI*: valoarea echivalent `TRUE` daca factura a fost deja incarcata sau valoare echivalent `FALSE` daca factura nu a fost incarcata <sup>2</sup>

**Formatul fisierelor Excel cu factura**

`XLSX` este sigurul format de fisier acceptat

### 22.3.1 Diagrama logica de functionare a componentei



...#FIXME explicatii necesare ?...

## 22.4 Componenta WEB\_DASHB



...INCOMING...

## 22.5 Componenta SYSTEM\_DB



...INCOMING...

- 
1. raportul se scrie in baza de date a sistemului si in fisierul `f-XLSX` intr-un worksheet separat dedicat acestui scop [↩](#) [↩](#)
  2. in cazul valorii echivalent `TRUE` se poate intoarce identificatorul incarcarii daca este disponibil [↩](#)

RENware Software Systems

## 23 Propunere tehnica sistem PayValidaBoa

### Cuprins:

- [Propunere tehnica sistem PayValidaBoa](#)
  - [Obiective](#)
  - [Vedere de ansamblu a solutiei](#)
  - [Cerinte functionale generale](#)
  - [Componenta xxx](#)
- p/n: 0000-0094
- code-name: payments\_validation\_board
- commercial name: **PayValidaBoa**
- url propunere tehnica: [http://apitoroefact.renware.eu/commercial\\_agreement/110-SRE-payments\\_validation\\_board\\_requirements.html](http://apitoroefact.renware.eu/commercial_agreement/110-SRE-payments_validation_board_requirements.html)
- git: n/a

### Cuprins:

- [Propunere tehnica sistem PayValidaBoa](#)
  - [Obiective](#)
  - [Vedere de ansamblu a solutiei](#)
  - [Cerinte functionale generale](#)
  - [Componenta xxx](#)

### 23.1 Obiective

Acest sistem asigura prezentarea unui "dashboard" cu lista facturilor primite si starea lor de **verificare si aprobare internă** in vederea ordonantarii lor la plata.

### 23.2 Vedere de ansamblu a solutiei

Sistemul `payments_validation_board` consta din urmatoarele componente:

- `INV_TOPMNG_BOARD` - aceasta componenta prezinta *pentru MANAGEMENTul tip CFO* lista facturilor primite si starea lor referitor la *validarea si aprobarea lor finala* si un control pentru *APROBARE FINALA sau BUN DE PATA*.

- **INV\_CHK\_BOARD** - aceasta componenta prezinta *pentru VERIFICATORI si APROBABTORI* lista fa/turilor primite si *diverse controale pentru aprobarea si scrierea de diverse note si observatii*.
- **INV\_NOTIF\_BOARD** aceasta componenta prezinta notificari referitoare la *diversele OBSERVATII si NOTE* facturi asupra facturilor primite in diverse stadii de aprobare de catre persoanele care efectueaza verificari asupra lor (prin componenta **INV\_CHK**). Notificarile sunt disponibile atat in interfata aplicatiei iar *unele din ele pot fi transmise prin mail*.
- **INV\_LD\_FOR\_APPRV** - aceasta componenta permite *incarcarea facturilor in fluxul de aprobare*. Optiuni de incarcare:
  - manuala (dintr-un board al aplicatiei)
  - automata dintr-un director
  - dintr-o baza de date externa sistemului (cu "marcarea" facturilor ce vor trebui incarcate)
  - la incarcare (indiferent de metoda) vor trebui specificati (sau dedusi din alte informatii) DESTINATARII ce primesc documentul
- **ADMIN\_CFG** aceasta componenta permite *pentru ADMINISTRATORI* diverse **OPTIUNI DE CONFIGURARE**:
  - lista utilizatorilor ce fac parte din fluxul de aprobare
  - adresele e-mail ale utilizatorilor
  - rolul utilizatorilor in ceea ce priveste fluxul de aprobare facturile primite
  - certificate si semnaturile de certificare a "semnaturilor" de aprobare
  - ...

Figura urmatoare prezinta schematic rolul general al componentelor precum si interactiunea acestora cu mediul exterior sistemului **payments\_validation\_board**.



...IN PROGRESS...

## 23.3 Cerinte functionale generale



...INCOMING...

## 23.4 Componenta xxx



...INCOMING...

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## 24 Optiuni tehnice

### Cuprins:

- [Optiuni tehnice](#)
  - [Optiuni sistem INVOICetoROefact](#)
    - [Recomandari sistem INVOICetoROefact](#)
  - [Optiuni sistem PayValidaBoa](#)
  - [Optiuni generale de implementare](#)

Acest document prezinta posibilele optiuni tehnice la cele doua sisteme, optiuni care vor trebui agreate si (preferabil) planificate cel putin din punct de vedere al prioritatii.

### 24.1 Optiuni sistem INVOICetoROefact



#### Forma de utilizare si interactionare

- ☐ (INVOICetoROefact-RQ-01) - varianta CLI (command line) cu utilizare "individuala"
- ☐ (INVOICetoROefact-RQ-02) - varianta WEB cu utilizare centralizata



#### Configurabilitate

- ☐ (INVOICetoROefact-RQ-03) - varianta in care se prelucreaza un model de fisier Excel in care sunt "fixate si blocate" locatiile celulelor ce contin date relevante
- ☐ (INVOICetoROefact-RQ-04) - varianta in care structura si formatul fisierului Excel contin "cuvinte cheie" ce determina regasirea date relevante (de exemplu textul "Client:" intr-o celula semnifica inceperea unei zone cu datele clientului de la acea celula in jos si pina prima celula necompletata ce va fi gasita)

#### 24.1.1 Recomandari sistem INVOICetoROefact



- varianta (INVOICEtoROefact-RQ-01) este recomandata ca fiind "aproape obligatorie" deoarece chiar si in varianta WEB ea va trebui scrisa intr-o forma neutilizabila direct (sub forma de functie a sistemului). Transformarea acestei functii in varianta CLI va permite o executie portabila ("la purtator") si offline (in situatii extreme se poate folosi doar fisierul XML generat si acesta va putea fi manual incarcat in ANAF-SPV). Informatia privind "starea de incarcare a facturii" va fi oricum salvata si in fisierul Excel aferent facturii si va putea fi preluata de catre varianta WEB pentru centralizarea informatiilor- a se vedea si [modulul LDXML](#) si [notele de subsol aferente](#)
- optiunea (INVOICEtoROefact-RQ-03) este recomandata ca varianta de start deoarece va permite realizarea unei variante OPERATIONALE (de lucru curent si testare) intr-un termen mai scurt, urmind ca aceasta optiune sa fie gradat extinsa si cu optiunea (INVOICEtoROefact-RQ-04). Aceasta "linie de lucru" nu va induce probleme, avind in vedere ca orice optiune / varianta aleasa ca varianta de start si planificata a fi extinsa va implica si MIGRAREA datelor deja produse la momentul extinderii ei

## 24.2 Optiuni sistem PayValidaBoa



### Framework standardizat de orchestrare

- ☐ (**PayValidaBoa-RQ-01**) - utilizarea unui framework specializat de orchestrare si integrare cu alte sisteme "externe"
  - *Implicatii:* poate mari durata de implementare
  - *Avantaje:* utilizarea ulterioara pentru integrare intre sisteme ce prezinta interfata standardizata (REST, SOA, NTFS, EXT4, OAuth, ...)



### Semnare electronica a facturilor verificate

- ☐ (**PayValidaBoa-RQ-02**) - utilizarea de certificat tip "semnatura electronica" pentru autentificarea verificarii facturilor *EMBEDDED IN FACTURA*
- ☐ (**PayValidaBoa-RQ-03**) - utilizarea de certificat tip "semnatura electronica" pentru autentificarea verificarii facturilor *adiacet facturii - disponibil pentru consultare numai in sistemul PayValidaBoa*
- ☐ (**PayValidaBoa-RQ-04**) - verificarea facturilor nu necesita certificat tip "semnatura electronica" ci simpla informatie existenta in sistemul PayValidaBoa este suficienta



### Baza de date 'interna / specifica' sistemului PayValidaBoa

- a se vedea [documentul "Considerente tehnice generale", sectiunea "Considerente generale privind bazele de date proprii sistemelor", item "\(DBS-03\)"](#) pentru optiuni privind baza de date ce va fi utilizata "pentru operatiuni interne si specifice" de catre sistemul PayValidaBoa

## 24.3 Optiuni generale de implementare



Sistemele tip infrastructura ce vor fi utilizate

- ☐ (**general-RQ-01**) - server web-HTTP pentru aplicatiile de tip WEB (*ATENTIE:* sistemele WEB ce vor fi implementate necesita interfata / mod de operare standard `WSGI` )
- ☐ (**general-RQ-02**) - sistem de autentificare utilizat (intern aplicatie, Google, Identity Management propriu, ...)
- ☐ (**general-RQ-03**) - sistemele vor rula pe infrastructura proprie sau acestea vor rula in infrastructuri gazduite



Alte optiuni 'ad-hoc' (in sedinta)

- ...
- ...
- ...
- ...
- ...
- ...

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## 25 Descarcare resurse (downloads)

### 25.1 Format biblioteca Python

#### 25.1.1 Pachetul xl2roefact pe PyPi

Versiunea de pe repository-ul public **PyPi** permite instalarea directa in mediul Python local astfel:

```
pip install xl2roefact
```

In acest mod va fi instalata automat ultima versiune publicata pe **PyPi** (<https://pypi.org/project/xl2roefact/>) . Accesati linkul anterior pentru a putea accesa alte versiuni publicate pe **PyPi** si modul de instalare a acestora.

#### 25.1.2 Pachetul xl2roefact python library format sursa

??? note "0.2"

```
* [ `0.2.1b` invoice values summary WHEEL](../xl2roefact/dist/xl2roefact-0.2.1b0-py3-none-any.whl "download")
* [ `0.2.1b` invoice values summary DIST](../xl2roefact/dist/xl2roefact-0.2.1b0.tar.gz "download")
* [ `0.2.0b` invoice customer info-optional items (bank, email, reg-com, phone) WHEEL](../xl2roefact/dist/xl2roefact-0.2.0b0-py3-none-any.whl "download")
* [ `0.2.0b` invoice customer info-optional items (bank, email, reg-com, phone) DIST](../xl2roefact/dist/xl2roefact-0.2.0b0.tar.gz "download")
```

#### 0.1

NOTA: versiunile 0.1 nu mai sunt intretinute de la 01-Martie-2024 (end of life support).



- [0.1.22b application interface improvements WHEEL](#)
- [0.1.22b application interface improvements DIST](#)
- [0.1.20.dev invoice customer address WHEEL](#)
- [0.1.20.dev invoice customer address DIST](#)

#### 25.1.3 Pachetul web2roefact PyPi library



Nici o resursa disponibila.

### 25.2 Format MSI instalare Windows x64

25.2.1 Aplicatia xl2roefact linie comanda (win64-msi)

 **0.2** 

- [0.2.1b](#) xl2roefact invoice values summary
- [0.2.0b](#) invoice customer info-optional items (bank, email, reg-com, phone)

 **0.1** 



NOTA: versiunile [0.1](#) nu mai sunt intretinute de la 01-Martie-2024 (end of life support).

- [0.1.22b](#) application interface improvements
- [0.1.20.dev](#) invoice customer address

25.3 Format DEB instalare Linux

Nici o resursa disponibila.

25.4 Sablon (template) factura

 **Format XLSX Office Excel** 

- [0.1.20](#) office Excel XLSX
- [0.1.20](#) arhiva ZIP
- [0.1.11](#) arhiva ZIP

## VII. About

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c) Convey individual copies of the object code with a copy of the written offer to provide the Corresponding Source. This alternative is allowed only occasionally and noncommercially, and only if you received the object code with such an offer, in accord with subsection 6b.

d) Convey the object code by offering access from a designated place (gratis or for a charge), and offer equivalent access to the Corresponding Source in the same way through the same place at no further charge. You need not require recipients to copy the Corresponding Source along with the object code. If the place to copy the object code is a network server, the Corresponding Source may be on a different server (operated by you or a third party) that supports equivalent copying facilities, provided you maintain clear directions next to the object code saying where to find the Corresponding Source. Regardless of what server hosts the Corresponding Source, you remain obligated to ensure that it is available for as long as needed to satisfy these requirements.

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```
<one line to give the program's name and a brief idea of what it does.>
Copyright (C) <year> <name of author>
```

```
This program is free software: you can redistribute it and/or modify
it under the terms of the GNU General Public License as published by
the Free Software Foundation, either version 3 of the License, or
(at your option) any later version.
```

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This program is distributed in the hope that it will be useful,
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GNU General Public License for more details.
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```
<program> Copyright (C) <year> <name of author>
This program comes with ABSOLUTELY NO WARRANTY; for details type `show w'.
This is free software, and you are welcome to redistribute it
under certain conditions; type `show c' for details.
```

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## VII.I Despre INVOICetoROefact

## RENware Software Systems

## INVOICEtoROeFact Project

- [CHANGELOG](#)
  - [0.3 \(TODO:\\_next...\)](#)
    - [TODO:\\_next... 0.3.??? xl2roefact invoice taxes summary \(#NOTE: date here...\)](#)
  - [0.2 \(TODO:\\_wip...\)](#)
    - [wip... 0.2.2.dev project development environment improvements \(#NOTE: date here...\)](#)
- [Archived CHANGELOGs](#)
  - [0.2 version](#)
  - [0.1 version](#)

## 26 CHANGELOG

- For version code structure meaning see SDEVEN methodology document
- with (F) are marked those changes that are features in order to be copied in a RELNOTE file and with (B) bug fixes from versions released
- publishing is made under `publishing` branch
- `<PROJECT_ROOT>/doc_src/` is the default starting location in a file path (if not clear from context) (**ATTN** - in production environment is `docs/` )
- `<WEB_ROOT>/` is the HTTP server root directory, as default `docs/` and supposed if no other parent is specified

## 26.1 0.3 (TODO:\_next...)

```

- ---[ #TODO general planning board ]-----
* ai un exemplu complet si complet agnostic (trimis Gigi) de factura format XML si PDF
tiparit ca sa faci: (1) incarcare XML (2) geenrare PDF (3) compararea variantelor si
identificarea schemei XSD + document specificatii ANAF ref sistemul E-Factura (PDF trimis Liviu)
* -#NOTE link Swagger servicii web: `https://mfinante.gov.ro/web/efactura/informatii-
tehnice`
* -#NOTE link specif API incarcare fact:
`https://mfinante.gov.ro/static/10/eFactura/upload.html#/EFacturaUpload/handleRequest`

- ---[ #TODO short planning board ]-----
* left OPEN ISSUES on: `0.1.7` release (and drop them when fixed).
...Aici descrierea pe scurt: in file
`xl2roefact\invoice_files/_PLAN_model_test_factura_generat_anaf.xml`, line 114:_
`<cbc:ID>S</cbc:ID> #FIXME clarify.me_ pare a fi TIPUL PRODUSULUI: (S)erviciu sau ??? (P)roduct
sau ???`
-
* ... FUTURE NEW APP COMMANDS :
* `config` - set `config_settings.py` variables (make it INTERACTIVELY using `Rich
prompt`)
* `xl2json` - crt_wip... (last upd @ 240219piu_a)
* `json2xml` - see module WRXML,
* `json2pdf` - new module. tbd.,
* `xml2roefact` - see module LDXML
* chk for other commands from doc
`https://invoicetoroefact.renware.eu/commercial_agreement/110-SRE-
api_to_roefact_requirements.html#componenta-xl2roefact`
-
* -#NOTE Plan for `rdinv` module:
* [ ] invoice supplier (`<cac:AccountingSupplierParty>`)
* [... wip.`0.2.2b`] invoice taxes summary
-----
-----

```

### 26.1.1 TODO:\_next... 0.3.??? xl2roefact invoice taxes summary (#NOTE: date here...)

- tbd.Must... @RELEASE update version files & follow [/RELEASE-QA\\_checklist.md](#)
- tbd.Should... [piu @\_240126] left in `xl2roefact/setup.py` comments & example ref how to **pre-set MSI build meta information** / parameters (obj: default target dir where install, path registration, icon, ...)
- tbd.Could... define `xl2roefact` entry points and/or scripts. comments in `xl2roefact/setup.py` ref exec scripts with installed package
- tbd.Could... check how use SECRETS in gh actions (ref PyPi publish workflow token used)
- tbd.Must... there is one more summary ref taxes (doc `xl2roefact/invoice_files/_PLAN_model...xml`, lines 91-104):

```

<cac:TaxTotal> #TODO tbd...
  <cbc:TaxAmount currencyID="RON">190.00</cbc:TaxAmount>
  <cac:TaxSubtotal>
    <cbc:TaxableAmount currencyID="RON">1000.00</cbc:TaxableAmount>
    <cbc:TaxAmount currencyID="RON">190.00</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>

```

## 26.2 0.2 (TODO:\_wip...)

### 26.2.1 wip... 0.2.2.dev project development environment improvements (#NOTE: date here...)

- 240229piu01 updated `.../downloads.md` for xl2roefact section to link PyPi for versions `>= 0.2.1b` and let WHEEL & DIST as "Download package source"
- 240228piu04 improved `xl2roefact python library` API Reference document ref to TOC and Title
- 240228piu03 project review, cleanup and update: workflows, useless files, TODO & FIXME comments, etc...
- 240228piu02 FIXED main project for use with PDM. `pdm update` command successfully run. **RESOLUTION: pdm can be used in main project as package manager. Should run locally to create venv and must update it with pdm update.** 10xG!
- 240228piu01 created a mechanism to run adhoc commands *for xl2roefact component*:
  - ✓ skeleton windows-cmd-file to be run by adhoc script (usable as template) `xl2roefact/tests/adhoc.cmd` (NOTE: running OS = Windows)
  - ✓ workflow `adhoc-run.yml` to install pdm environment & run `./tests/adhoc.cmd` & `>./tests/_test_results.txt` (with crt directory `xl2roefact/`) triggered by merge to branch `adhoc`. Run results (stdout) written to `./tests/_test_results.txt`
  - ✓ documented this feature in `/README_git_automation_tools.md`
- 240227piu01 improve xl2roefact package documenting the PyPi link to package (`https://pypi.org/project/xl2roefact/`)
- 240226piu04 published `xl2roefact` package & created automation workflow. Steps;
  - ✓ 0. updated workflow `pypi-publish.yml` to run on brach `pypi-publish`
  - ✓ 1. change workflow code to move `.msi` files in a temporary directory, execute publish then get back moved files
  - ✓ 2. drop directories for versions `0.1.18/` & `0.1.19/`
  - ✓ 3. test packages publish. FAILED.
  - ✓ 4. update `doc_src/.../downloads.md` ref crt item 2.


- ✔ 5. build & publish site
- ✔ 6. update `pyproject.toml` to update classifiers list according to approved standard
- ✔ 7. update workflow to ignore all old / previous packages (not compliant "classifiers" section)
- ✔ 8. TEST PASS, here running messages:

```
Uploading x12roefact-0.2.1b0-py3-none-any.whl = 100%
Uploading x12roefact-0.2.1b0.tar.gz = 100%
```

- ✔ 9. clean workflow code, update `pyproject.toml` with site URL

- 240226piu03 updated root `pyproject.toml` (project `INVOICetoROefact`) ref `x12roefact` dependency and ref development dependencies section
- 250226piu02 created empty /draft workflow `pypi-publish.yml` to be used to PyPi publish `x12roefact` python packages.
  - Project publisher was registered on PyPi @ <https://pypi.org/manage/account/publishing/> for GitHub repository `INVOICetoROefact`.
  - Declared PyPi project name: `x12roefact`
  - PyPi status: Pending publishers @ 240226 06:00
- 250226piu01 improved documentation "visibility" with `INVOICetoROefact` components features

27 Archived CHANGELOGs



27.1 0.2 version

- 0.2.1b invoice grand totals
- 0.2.0b x12roefact invoice customer info-optional items (bank, email, reg-com, phone)



## 27.2 0.1 version

- 0.1.22b xl2roefact application interface improvements
- 0.1.21.post3 cleaned system documentation and site
- 0.1.21.post2 xl2roefact app detailed section with commands & options "--help" like
- 0.1.21.post1 fixed missing links in site root index page
- 0.1.21 rollout news in system portal [invoicetoroefact.renware.eu](http://invoicetoroefact.renware.eu)
- 0.1.20.dev invoice customer address
- 0.1.19.dev invoice customer and partial invoice total values calculations
- 0.1.18.dev invoice customer CUI partial invoice total values calculations
- 0.1.17.dev fixed all application & package running standard ways
- 0.1.16.dev improving Excel kv-data search with "IN-LABEL" method
- 0.1.15 updated solution portal <http://invoicetoroefact.renware.eu/>
- 0.1.14.dev invoice issue date
- 0.1.13.dev invoice currency
- 0.1.12.dev invoice number
- 0.1.11.dev packaging improvements for app & xl2roefact package
- 0.1.10.dev command interface improved, msi package building, invoice template & updated documentation
- 0.1.9.dev xl2roefact.RDINV running executable and distribution kit
- 0.1.8.dev improved application structure and first executable release
- 0.1.7.dev xl2roefact.RDINV invoice items & metadata + *OPEN ISSUES*
- 0.1.6.dev commercial agreement OPTIONS document
- 0.1.5.dev init component xl2roefact for CLI application
- 0.1.4.dev Create system backbone structure
- 0.1.3.dev Enhancing payments\_validation\_board technical proposal
- 0.1.2.dev Enhancing APItoROefact technical proposal
- 0.1.1.dev Elaborating technical proposal
- 0.1.0.dev System raw backbone