

INSTALLATION AND USAGE MANUAL FOR ZATCA QR CODE ON SALES INVOICES

pibiCo

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1. PibiCut Invoice ERPNext Custom App

1.1. Introduction

This guide explains how to install and use the custom app for ERPNext (pibicut_invoice) to produce QRCode for Sales Invoices as per ZATCA Tax Invoices QRCode Creation Specifications (<https://zatca.gov.sa/en/E-Invoicing/SystemsDevelopers/Documents/QRCodeCreation.pdf>)

1.2. Installation Procedure

1.2.1. Requirements

It is imperative to have access to the server's command line with enough rights and permissions to install the custom app.

Apart from the above, a Frappe/ERPNext server instance is required (refer to <https://github.com/frappe/frappe> and <https://github.com/frappe/erpnext>), and also QR Code (refer to <https://github.com/lincolnloop/python-qrcode>).

1.2.2. Compatibility

PibiCut_Invoice has been tested and programmed for Frappe/ERPNext version-13 only.

1.2.3. Detailed Installation

From the frappe-bench folder execute the following commands from the command line.

```
$ bench get-app pibicut_invoice https://github.com/pibico/pibicut_invoice.git
$ bench install-app pibicut_invoice
```

If you are using a multi-tenant environment, use the following command

```
$ bench --site site_name install-app pibicut
```

1.2.4. Update

Run updates with:

```
$ bench update
```

In case you update from the sources and observe errors, make sure to update dependencies with

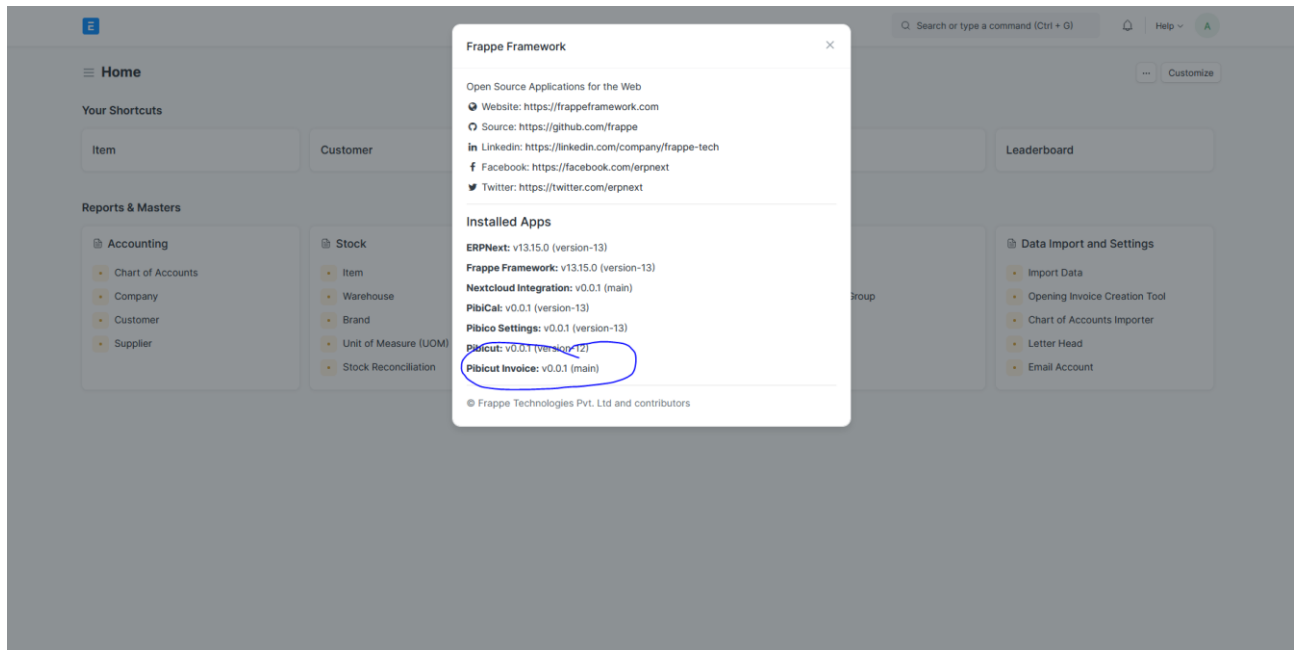
```
$ bench update --requirements
```

1.2.5. Features

Once installed, new custom fields are created into Sales Invoice Doctype, POS Invoice Doctype and Company Doctype. Those custom fields are related to QR Code encoded in Base64 as per ZATCA Requirements and QR Code Image and QR Preview, to use it on Printed or PDF Sales Invoices or Receipts. (<https://zatca.gov.sa/en/RulesRegulations/UnderConsultations/Pages/implementing-E-invoicing.aspx>)

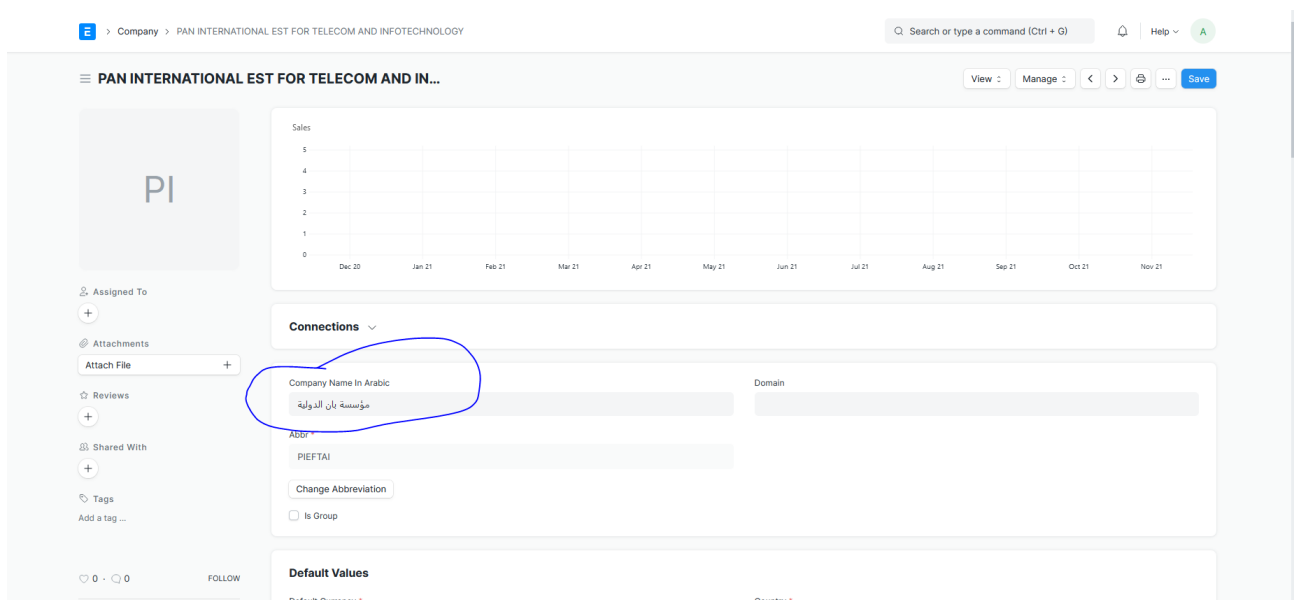


In order to check if the custom app is available, you can go to Help > About to see all the Custom Apps installed in your ERPNext Instance



1.3. Usage

First custom field is related to Company Name in Arabic. To fill in this field, you go to **Accounting > Accounting Masters > Company** and Select the Company to name in Arabic. You can fill this custom field. In case that the Company Name in Arabic is not filled in, the QR Code will encode the Standard Company Name.



The following custom fields are related to Sales Invoices. We can go to **Accounting > Accounts Receivable > Sales Invoice** to create a new Sales Invoice.

The Company Name in Arabic is shown if it has been filled in. Also the custom fields Base64 Data and TLV QR Code Image are shown. Those custom fields are automatically filled whenever the



Sales Invoice is saved. The QR Code produced takes into consideration the ZATCA Specifics filling the following tags with the Sales Invoices Data already saved.

ZATCA QR Code Specifications

Field Definition for the QR Code

Description	Tag	Due Date
Seller's name	1	4th Dec 2021
VAT registration number of the seller	2	4th Dec 2021
Time stamp of the invoice (date and time)	3	4th Dec 2021
Invoice total (with VAT)	4	4th Dec 2021
VAT total	5	4th Dec 2021
Hash of XML invoice	6	1st Jan 2023
ECDSA signature	7	1st Jan 2023
ECDSA public key	8	1st Jan 2023
For Simplified Tax Invoices and their associated notes, the ECDSA signature of the cryptographic stamp's public key by ZATCA's technical CA	9	1st Jan 2023

Accounting > Sales Invoice > new-sales-invoice-1

Search or type a command (Ctrl + G) Help

New Sales Invoice Not Saved Fetch Timesheet Get Items From Save

Series * ACC-SINV-YYYY- Company * PAN INTERNATIONAL EST FOR TELECOM AND INFOTECHNOLOGY

Customer Customer Name In Arabic Company Name In Arabic مؤسسة بان الدولية

Company Tax ID 310436592200003

Date * 26-11-2021

Posting Time 20:59:46

Include Payment (POS) Is Return (Credit Note) Is Debit Note

Base64 Data

TLV QR Code Attach

Payment Due Date *

Accounting > Sales Invoice > new-sales-invoice-1

Search or type a command (Ctrl + G) Help

New Sales Invoice Not Saved Fetch Timesheet Get Items From Save

Items

No.	Item	Quantity	Rate (SAR)	Amount (SAR)	
1	ksa_example_item	1.000	3,788.18	3,788.18	Edit

Add Multiple Add Row Download Upload

Time Sheet List

Total Quantity 1 Total Net Weight 0

Total (EUR) € 900.00 Total (SAR) 3,788.18 ر.س

Sales Taxes and Charges Template KSA VAT 15% - PIFETA Shipping Rule

Tax Category

Sales Taxes and Charges

No.	Type	Account Head	Rate	Amount	Total	
1	On Net Total	VAT 15% - PIFETA	15	568.23 ر.س	4,356.41 ر.س	Edit



If you want a logo in the middle of the QR Code, you can upload an image file (extension .jpg) squared with no more width than 512 pixels and white background (not transparent). In case you upload your logo, the QR Code will show it, in case not logo is provided, the QR Code will not show the centered image.

Whenever the Sales Invoice is saved, the QR Code is produced and can be seen attached to the Sales Invoice.

The screenshot shows a draft invoice for Asturiana de Aleaciones SA (ALEASTUR). The form is titled "Asturiana de Aleaciones SA (ALEASTUR) - Draft". It includes a search bar at the top right with the text "Search or type a command (Ctrl + G)". The form is divided into two main sections: "Asturiana de Aleaciones SA (ALEASTUR)" and "PAN INTERNATIONAL EST FOR TELECOM AND INFOTECHNOLOGY". The first section contains fields for Customer Name, Tax ID, and Base64 Data. The second section contains fields for Company Name, Company Tax ID, Date, Posting Time, and Payment Due Date. A QR code is displayed on the right side of the form.

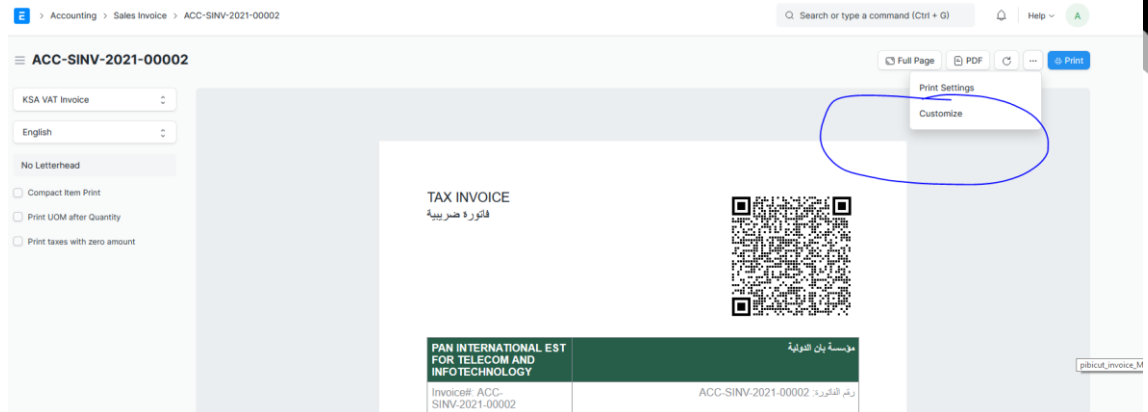
Now, we can print produce the pdf file just printing the Invoice. On the Custom Print Templates we will use ours or just the Standard KSA VAT Invoice.

The screenshot shows a draft invoice for ACC-SINV-2021-00002. The form is titled "ACC-SINV-2021-00002". It includes a search bar at the top right with the text "Search or type a command (Ctrl + G)". The form is divided into two main sections: "KSA VAT Invoice" and "English". The "KSA VAT Invoice" section contains a "Print" button and a "Full Page" button. The "English" section contains a table with the following data:

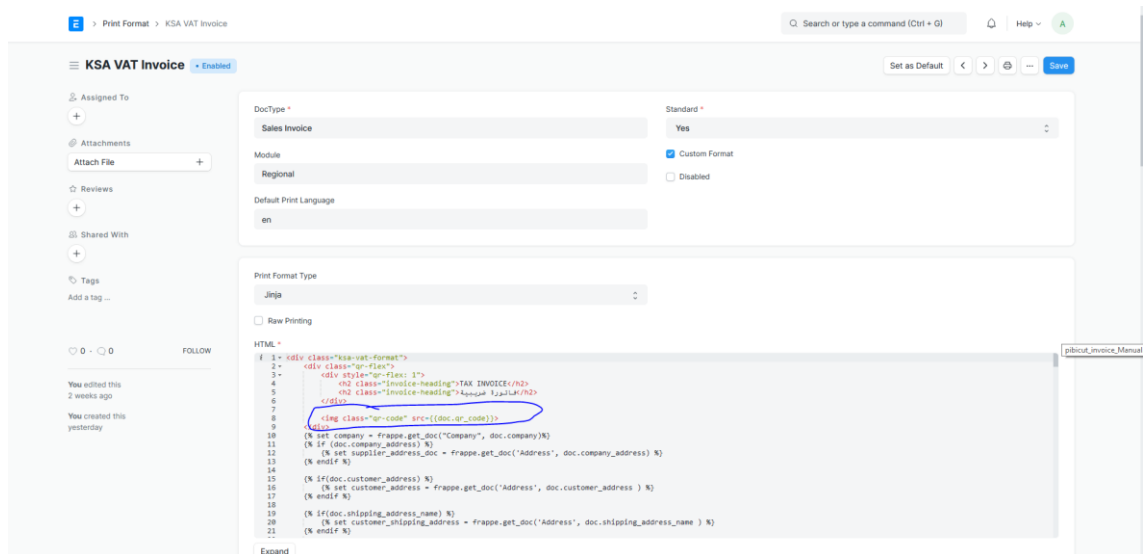
PAN INTERNATIONAL EST FOR TELECOM AND INFOTECHNOLOGY	
Invoice# ACC-SINV-2021-00002	ACC-SINV-2021-00002
Invoice Date: 2021-11-26	26-11-2021
Date of Supply: 2021-11-26	26-11-2021
Supplier:	
Supplier Tax Identification Number:	310436592200003
PAN INTERNATIONAL EST FOR TELECOM AND INFOTECHNOLOGY	مؤسسة بان الدولية
CUSTOMER:	

If we need to attach the generated QR Code to our Custom Print Format for Sales Invoice. For that purpose, we select the Customize Menu to modify the template.





And, in the HTML we can add the piece of code `` wherever we need to show the QR Code.



Now, it's time to check if the QR Code is compliant with ZATCA Rules.

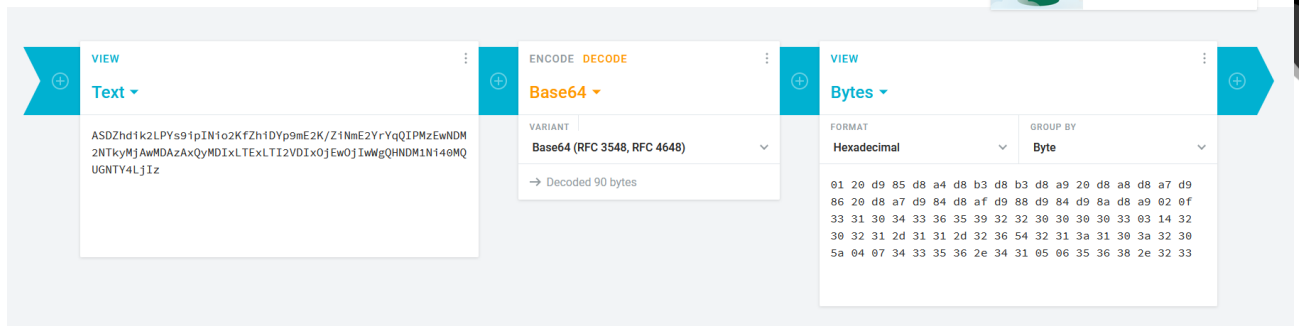
First of all, we will read the QR Code and get the Base64 string. This string is the one in the Base64 Data Field.

```
ASDZhdik2LPYs9ipINio2KfZhiDYp9mE2K/ZiNmE2YrYqQIPMzEwNDM2NTkyMjAwMDAzaXQyMDIxLTExLTI2VDI
xOjEwOjIwWgQHNDM1Ni40MQUGNTY4LjIz
```

This code we can decode to binary array in <https://cryptii.com/> choosing text on first window and pasting the above code.

In second window we choose Decode and base64 encoding. And in third window we choose Bytes in hexadecimal group by Byte.





VIEW Text

ASDZhd1k2LPYs91pIN1o2KfZh1Dyp9mE2K/Z1NmE2YrYqQIPMzEwNDM2NTkyMjAwMDAzaXQyMDIxLTExLTI2VDIxOjEwOjIwWgQHNDM1N146MQUGNTY4LjIz

ENCODE DECODE Base64

VARIANT Base64 (RFC 3548, RFC 4648)

→ Decoded 90 bytes

VIEW Bytes

FORMAT Hexadecimal

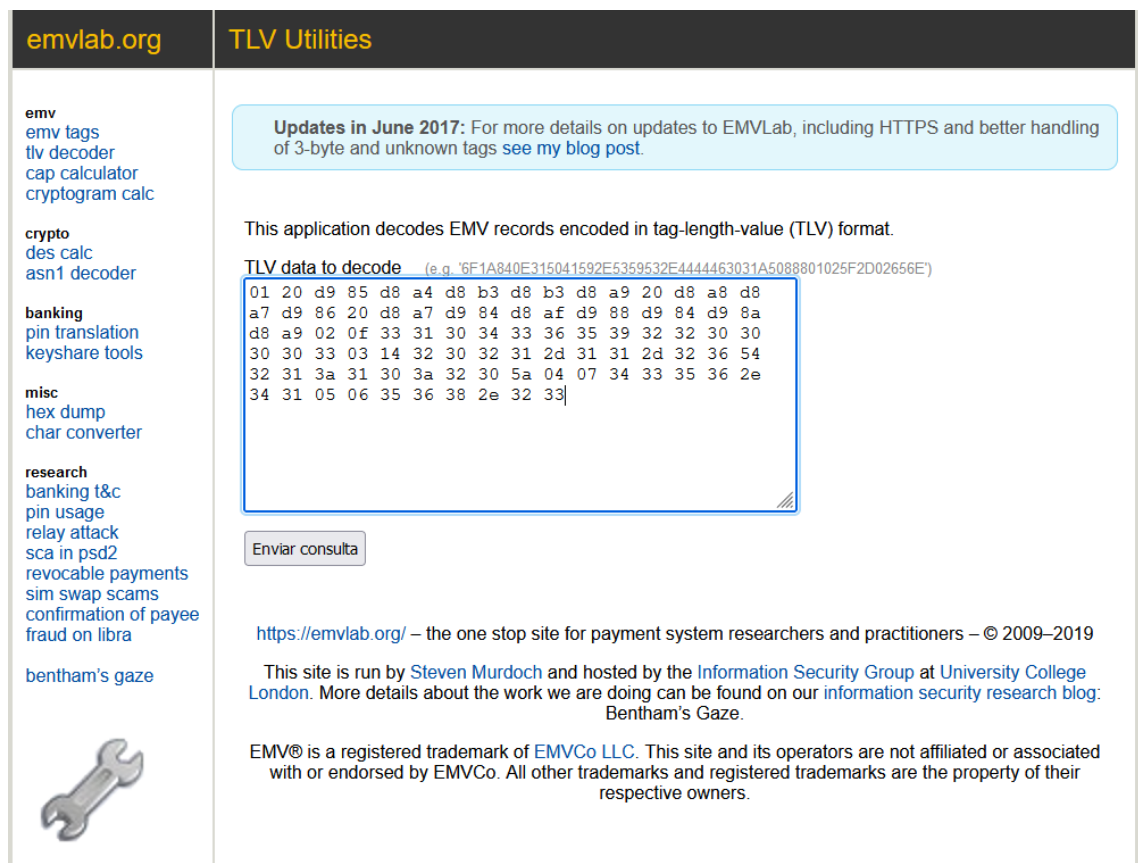
GROUP BY Byte

```
01 20 d9 85 d8 a4 d8 b3 d8 b3 d8 a9 20 d8 a8 d8 a7 d9 86 20 d8 a7 d9 84 d8 af d9 88 d9
84 d9 8a d8 a9 02 0f 33 31 30 34 33 36 35 39 32 32 30 30 30 30 33 03 14 32 30 32 31 2d
31 31 2d 32 36 54 32 31 3a 31 30 3a 32 30 5a 04 07 34 33 35 36 2e 34 31 05 06 35 36 38
2e 32 33
```

We get the decoded hexadecimal byte array

```
01 20 d9 85 d8 a4 d8 b3 d8 b3 d8 a9 20 d8 a8 d8 a7 d9 86 20 d8 a7 d9 84 d8 af d9 88 d9
84 d9 8a d8 a9 02 0f 33 31 30 34 33 36 35 39 32 32 30 30 30 30 33 03 14 32 30 32 31 2d
31 31 2d 32 36 54 32 31 3a 31 30 3a 32 30 5a 04 07 34 33 35 36 2e 34 31 05 06 35 36 38
2e 32 33
```

That can be read in a TLV reader as the one in <https://emvlab.org/tlvutils/>



emvlab.org TLV Utilities

Updates in June 2017: For more details on updates to EMVLab, including HTTPS and better handling of 3-byte and unknown tags [see my blog post](#).

This application decodes EMV records encoded in tag-length-value (TLV) format.

TLV data to decode (e.g. '6F1A840E315041592E5359532E4444463031A5088801025F2D02656E')

```
01 20 d9 85 d8 a4 d8 b3 d8 b3 d8 a9 20 d8 a8 d8 a7 d9 86 20 d8 a7 d9 84 d8 af d9 88 d9
84 d9 8a d8 a9 02 0f 33 31 30 34 33 36 35 39 32 32 30 30 30 30 33 03 14 32 30 32 31 2d
31 31 2d 32 36 54 32 31 3a 31 30 3a 32 30 5a 04 07 34 33 35 36 2e 34 31 05 06 35 36 38
2e 32 33
```

Enviar consulta

<https://emvlab.org/> – the one stop site for payment system researchers and practitioners – © 2009–2019

This site is run by [Steven Murdoch](#) and hosted by the [Information Security Group](#) at [University College London](#). More details about the work we are doing can be found on our [information security research blog](#): [Bentham's Gaze](#).

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And if is correctly formed we obtain the tags.



emvlab.org

emv

emv tags

tlv decoder

cap calculator

cryptogram calc

crypto

des calc

asn1 decoder

banking

pin translation

keyshare tools

misc

hex dump

char converter

research

banking t&c

pin usage

relay attack

sca in psd2


revocable payments

sim swap scams

confirmation of payee

fraud on libra

bentham's gaze



TLV Utilities

Updates in June 2017: For more details on updates to EMVLab, including HTTPS and better handling of 3-byte and unknown tags see [my blog post](#).

01 Unknown tag

D985D8A4D8B3D8B3D8A920D8A8D8A7D98620D8A7D984D8AFD988D984D98AD8A9

02 Unknown tag

333130343336353932323030303033

03 Unknown tag

323032312D31312D32365432313A31303A32305A

04 Unknown tag

343335362E3431

05 Unknown tag

3536382E3233

back to TLV decode

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This site is run by [Steven Murdoch](#) and hosted by the [Information Security Group](#) at [University College London](#). More details about the work we are doing can be found on our [information security research blog](#): [Bentham's Gaze](#).

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We will decode the strings for each tag through <https://onlineutf8tools.com/convert-hexadecimal-to-utf8> finally obtaining:

TAG 01 – Seller


D985D8A4D8B3D8B3D8A920D8A8D8A7D98620D8A7D984D8AFD988D984D98AD8A9



ONLINEUTF8TOOLS


Like 51K

Online UTF8 Tools



hexadecimal to utf8 converter world's simplest utf8 tool

World's simplest browser-based hexadecimal to UTF8 converter. Just import your base 16 numbers in the editor on the left and you will instantly get decoded UTF8 text on the right. Free, quick, and very powerful. Import base 16 – get UTF8. Created by geeks from [Team Browserling](#).



announcement check out our new project!

We just launched a new site – [Online GIF Tools](#) – a collection of utilities for quickly editing GIFs. Check it out!

hexadecimal

D985D8A4D8B3D8B3D8A920D8A8D8A7D98620D8A7D984D8AFD988D984D98AD8A9

Import from file

Save as...

Copy to clipboard

utf8

مؤسسة بان الدولية

Chain with...

Save as...

Copy to clipboard

TAG 02 – SELLER's VAT NUMBER


333130343336353932323030303033

hexadecimal

333130343336353932323030303033

utf8

310436592200003



TAG 03 – INVOICE POSTING DATE
323032312D31312D32365432313A31303A32305A

hexadecimal

323032312D31312D32365432313A31303A32305A

utf8

2021-11-26T21:10:20Z

TAG 04 – INVOICE TOTAL (WITH VAT)
343335362E3431

hexadecimal

343335362E3431

utf8

4356.41

TAG 05 – VAT
3536382E3233

hexadecimal

3536382E3233

utf8

568.23

Thus, it has been demonstrated that the generated QRCode by pibicut_invoice is ZATCA Compliant.

Base64 Data

ASDZhdik2LPYs9ipINio2KfZhiDyp9mE2K/ZINmE2YrYqQIPmZEWNDM2NTkyMjAwMDAzAxQyMDixLTExLTIZVDIxOjEwOjIwQHNMD1Ni40MQUGNTY4LjIz


21:10:20


☐ Edit Posting Date and Time

Payment Due Date *

26-11-2021

TLV QR Code





data:image/png;base64,iVBORw0KGgoAAAANSUHEUgAAAMwAAADMCAIAAACwQNuIA... Clear

Accounting > Sales Invoice > ACO-IRAV-2021-00003

Search or type a command (Ctrl + G) Help

Asturiana de Aleaciones SA (ALEASTUR) > Draft

Fetch Timesheet Create Get Items From < > Submit

FOLLOW

You edited this 9 hours ago

You created this 9 hours ago

Customer

Asturiana de Aleaciones SA (ALEASTUR)

Customer Name in Arabic

Tax ID

A33072711

☐ Include Payment (POS)

☐ In Return (Credit Note)

☐ In Debit Note

Base64 Data

ASDZhdik2LPYs9ipINio2KfZhiDyp9mE2K/ZINmE2YrYqQIPmZEWNDM2NTkyMjAwMDAzAxQyMDixLTExLTIZVDIxOjEwOjIwQHNMD1Ni40MQUGNTY4LjIz

TLV QR Code

data:image/png;base64,iVBORw0KGgoAAAANSUHEUgAAAMwAAADMCAIAAACwQNuIA... Clear

Company *

RAN INTERNATIONAL EST FOR TELECOM AND INFOTECHNOLOGY

Company Name in Arabic

مؤسسة رائد الدولية

Logo

%/files/pibico_comfy.png Clear

Company Tax ID

31043859220003

Date *

27-11-2021

Posting Time

10:11:33

☐ Edit Posting Date and Time

Payment Due Date *

29-11-2021

