



# QR Code for Legal Metrology Applications

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# Initial Motivation

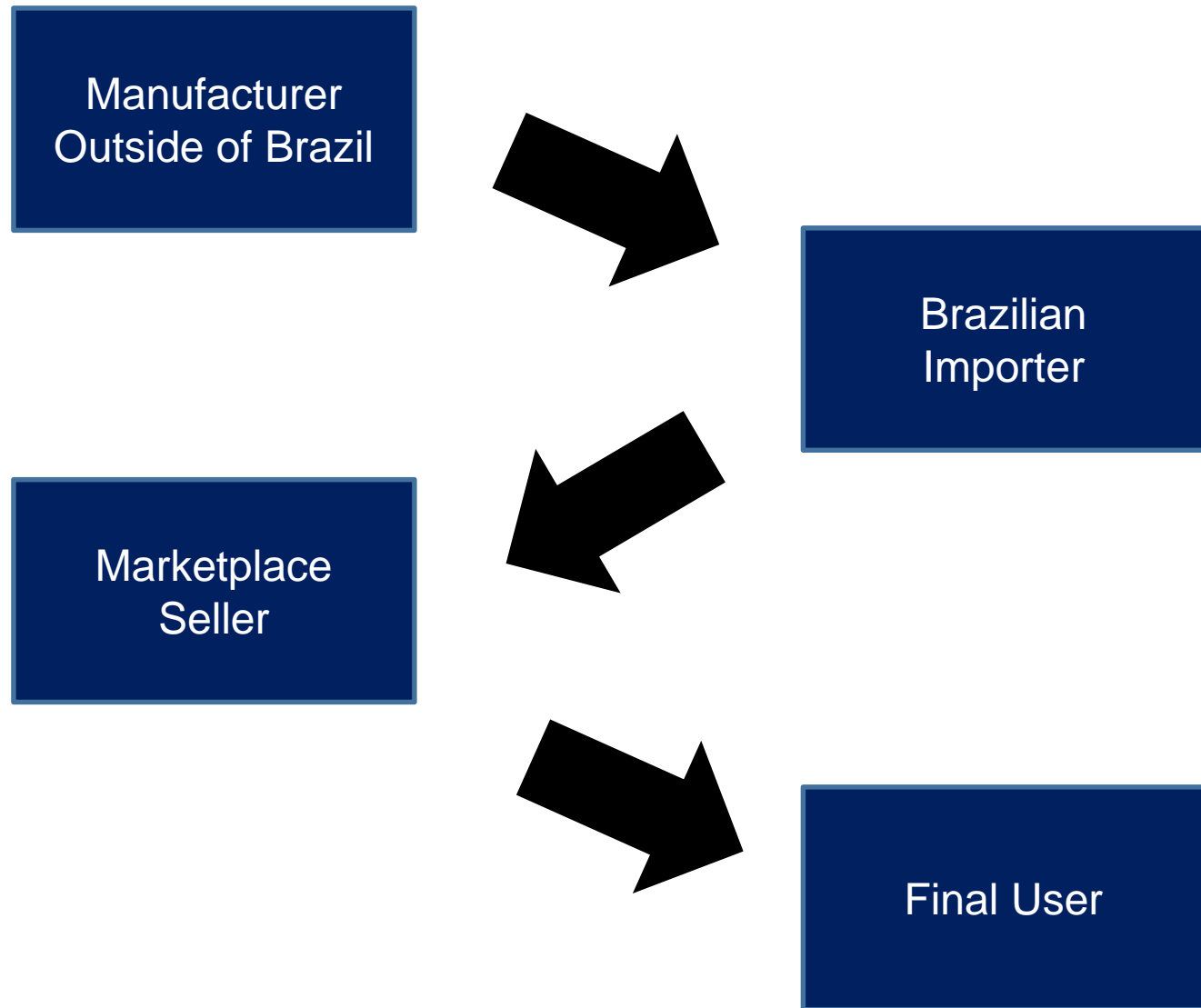


The screenshot shows the Amazon.com.br website interface. At the top, the search bar contains the text "balança comercial". The navigation menu includes categories like "ELETRÔNICOS", "Mais Vendidos", "Ofertas", "Celulares e Comunicação", "Computadores e Informática", "TV, Áudio e Cinema em Casa", "Áudio e Vídeo Portáteis", "Câmeras e Foto", and "Dispositivos Amazon". A promotional banner for "Fim de Ano" (End of Year) is visible. The main product listing is for a "Balança Eletrônica Digital Comercial 40kg Bivolt Bd001" by the brand "BD". The price is listed as R\$ 279,90, with a note that it will be delivered before Christmas. The product specifications are: Marca: BD, Peso do produto: 2800 Gramas, Limite de peso: 40 Quilogramas, and Dimensões do item: 40 x 40 x 15 centímetros. The product image shows a silver and black digital scale with a red LED display and a keypad. The display shows "0.000" and "0.000". The keypad has buttons for "7 8 9", "4 5 6", "1 2 3", "0", "M1 M2 M3 M4", and "ON/OFF".

## Irregular sale of scales without type approval

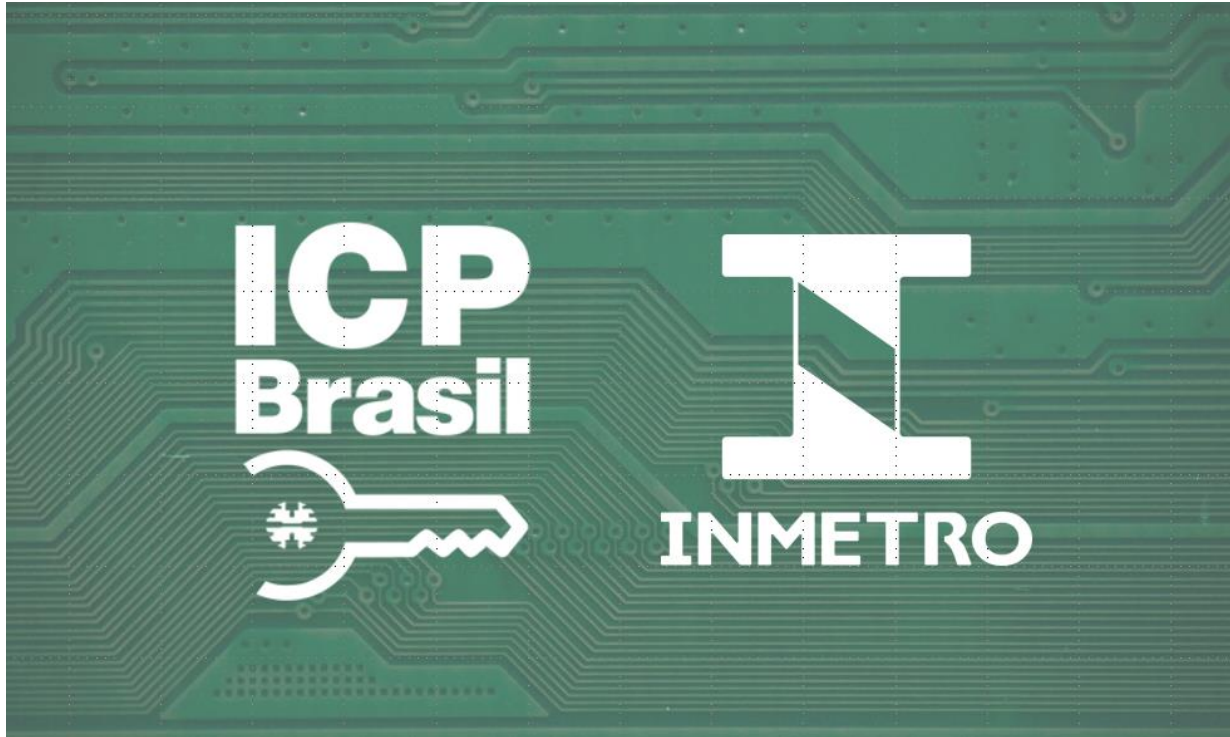
- Usually sold on marketplace websites
- Used at street markets and small businesses

# Lifetime of a Scale Without Type Approval



## First Idea

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- Use a digitally signed measurement and verified with a certificate from C.A. Inmetro.
- Strongest solution but too expensive.

# Cost Challenge

R\$279,90\*



R\$765,00\*

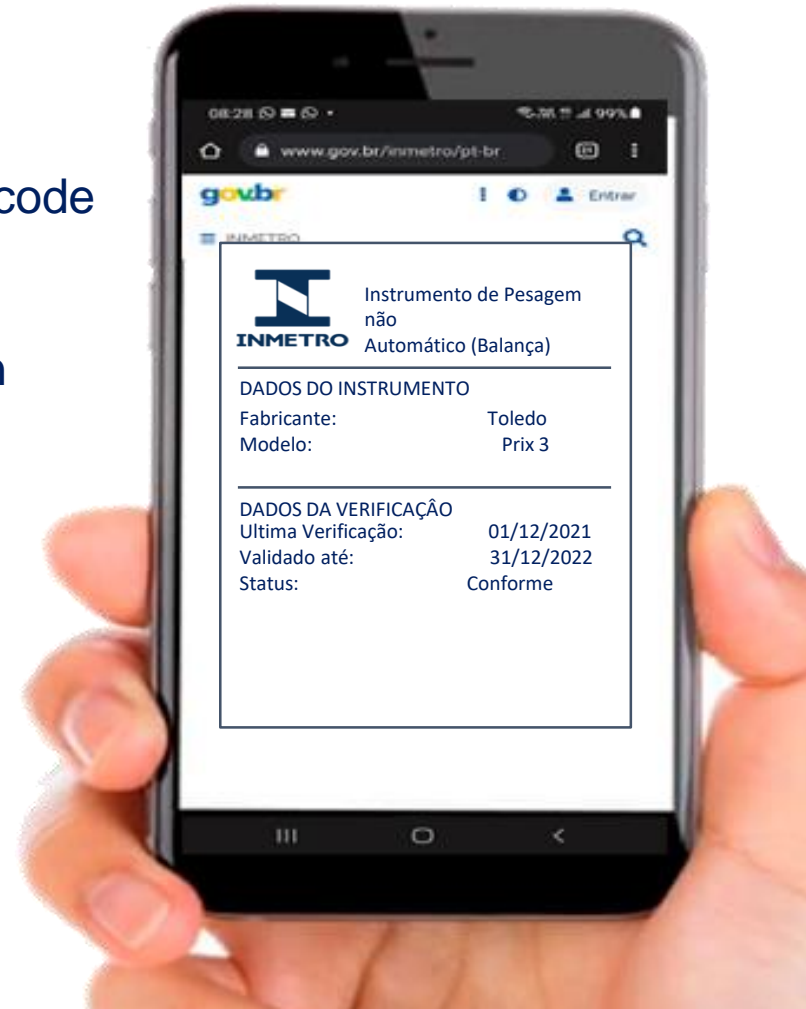


\* Prices searched on 22/02/2022 at amazon.com.br

- The scale with type approval is 3 times more expensive
- If we use an expensive solution, we will stimulate the sale of scales without type approval

## Creation of a Website with Instrument Information

- Search by instrument inventory code
- Low-cost design for instrument manufacturers
- Encouraging citizen participation





## Current Label



# Proposal

## Replacement of current inventory labels with QR Code labels

- Technology update (easy to read on mobile, more resistant)
- Encouraging citizens to look for the inventory tag
- Possibility of other uses for the label





## QR Code Label

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Labels that will be used from June 2022



<http://inmetro.gov.br/instrumentos?14772484>

# Operation

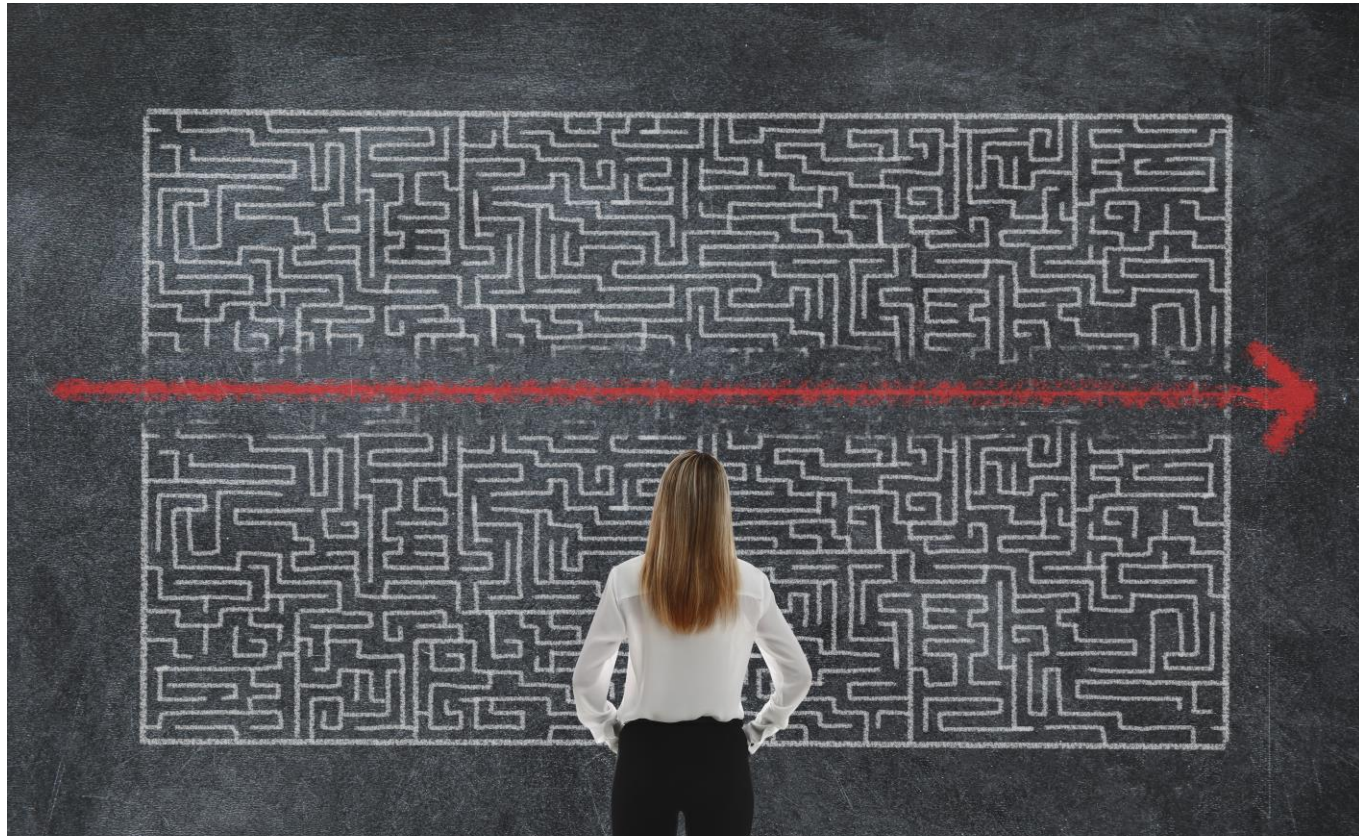


# Simple Project



## First Website Version

- Data from Inmetro's database
- Instrument Model
- Last verification date
- Instrument authorized to operate





# Challenge

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## Fake Labels

- Photos of the Instrument
- Instrument geolocation data



# Derived Projects

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## Projects that can arise from the QR Code

- Digital certificate reading
- Instrument geolocation
- Inmetro App
- Etc...



# Other Uses in Legal Metrology

## Verification Certificates

- Used to check document authenticity

 <b>MINISTÉRIO DA ECONOMIA</b> INSTITUTO NACIONAL DE METROLOGIA, QUALIDADE E TECNOLOGIA - INMETRO		
<b>CERTIFICADO DE VERIFICAÇÃO: 14276</b> EXECUTOR: SURRS - Superintendência do Inmetro no Estado do Rio Grande do Sul		
Instrumento ETILÔMETRO	Marca INTOXIMETERS	Modelo ALCO-SENSOR IV
Dados Complementares Marca de Verificação: 6647558 Data de Verificação: 08/10/2021 Tipo de Serviço: <input type="checkbox"/> Verificação Inicial Metodologia e Padrões Utilizados: <input checked="" type="checkbox"/> <b>Material de Referência Líquido</b> <input type="checkbox"/> <b>Material de Referência Gasoso</b> DIMCI 0070/2021 DIMCI 0071/2021 DIMCI 0075/2021 DIMCI 0079/2021		Número de Série: 090774 Número do Inmetro: 13561050 Código Serviço: 244 Valor R\$: 591,01 Número do Documento de Arrecadação: 294103202000389296
Proprietário Nome/Razão Social: CNPJ/CPF: Endereço: Bairro: Município: Cep:		Agente Metrológico   <hr/> FERNANDA FERNANDES DE SOUZA
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