



BUILDING A GROWTH-FRIENDLY TAX ENVIRONMENT

# The 4th Belt and Road Initiative Tax Administration Cooperation Forum

— Improving Tax Environment

Tbilisi Georgia

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BUILDING A GROWTH-FRIENDLY TAX ENVIRONMENT

# Topic 6 Application of digital technology in optimizing the tax business environment:

## The role of digital technology in tax administration



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# The use of digital technologies in tax administration

1. **Background:** current developments on tax administration and technology (ISORA, OECD Inventory of Tax Technology Initiatives -ITTI-, CIAT INDITEC, Inter-American Development Bank (IDB) Digital Maturity Model, etc.).
2. **New technologies to track commercial transactions** data (e-reporting; e-invoice; digital cash registers; products and services classification coding; etc.)
3. **Making tax compliance easier** through technology (pre-filled tax returns; digital taxpayer services; digital economy taxation; etc.)
4. **Enforcing tax compliance** via tax data analysis (risk assessment and audit selection via big data analysis, social networks analytics, machine learning and artificial intelligence, etc.)
5. **Other issues** to implement new technologies for tax compliance (data governance; security of information; confidentiality; ethical use of AI; etc.)
6. **CIAT'S job** on digital technologies and tax administration

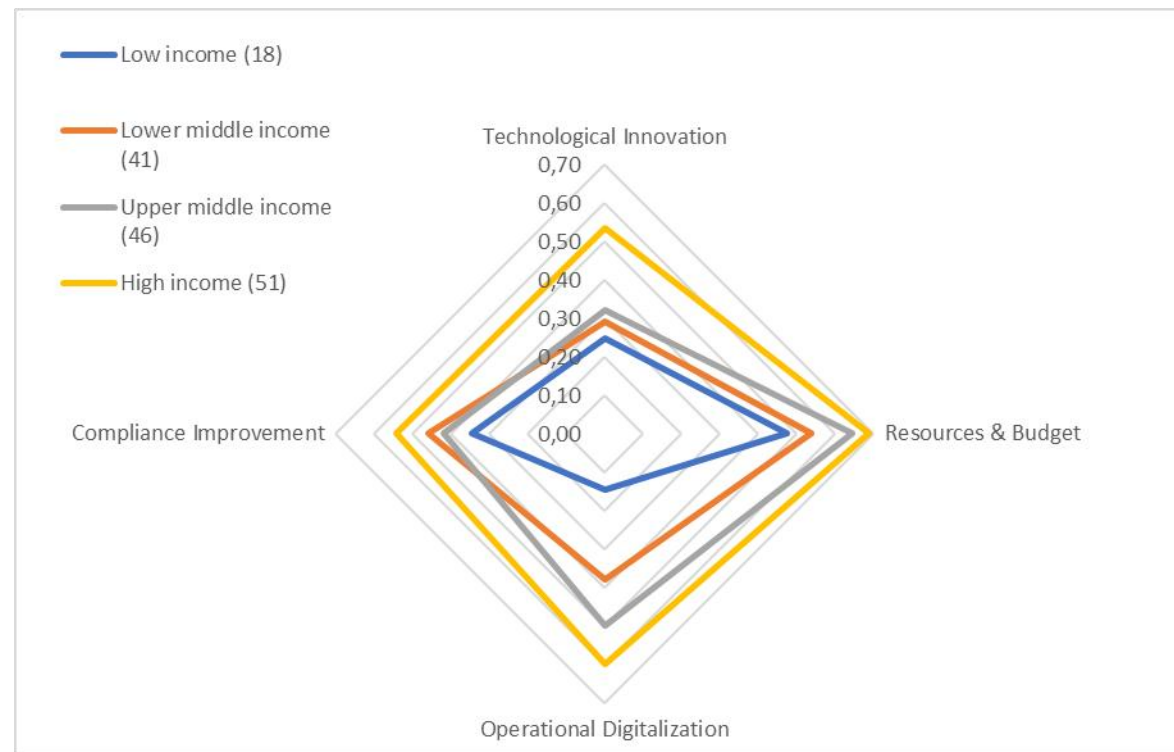
# 1. Background: current developments on VAT and technology

- The International Survey of Revenue Administrations (ISORA)
- Innovation, Digitalization & Technology Index (CIAT's INDITEC)
- OECD's Inventory of Tax Technology Initiatives (ITTI)
- OECD's Digital Transformation Maturity Model
- IDB's Digital Maturity Index (DMI)
- Others: TADAT, Tax Diamond, etc.



# 1. Background: current developments on VAT and technology

Figure1. Innovation, Digitalization & Technology Index (INDITEC) for Tax Administrations around the world (2019; based on ISORA Survey 2020)





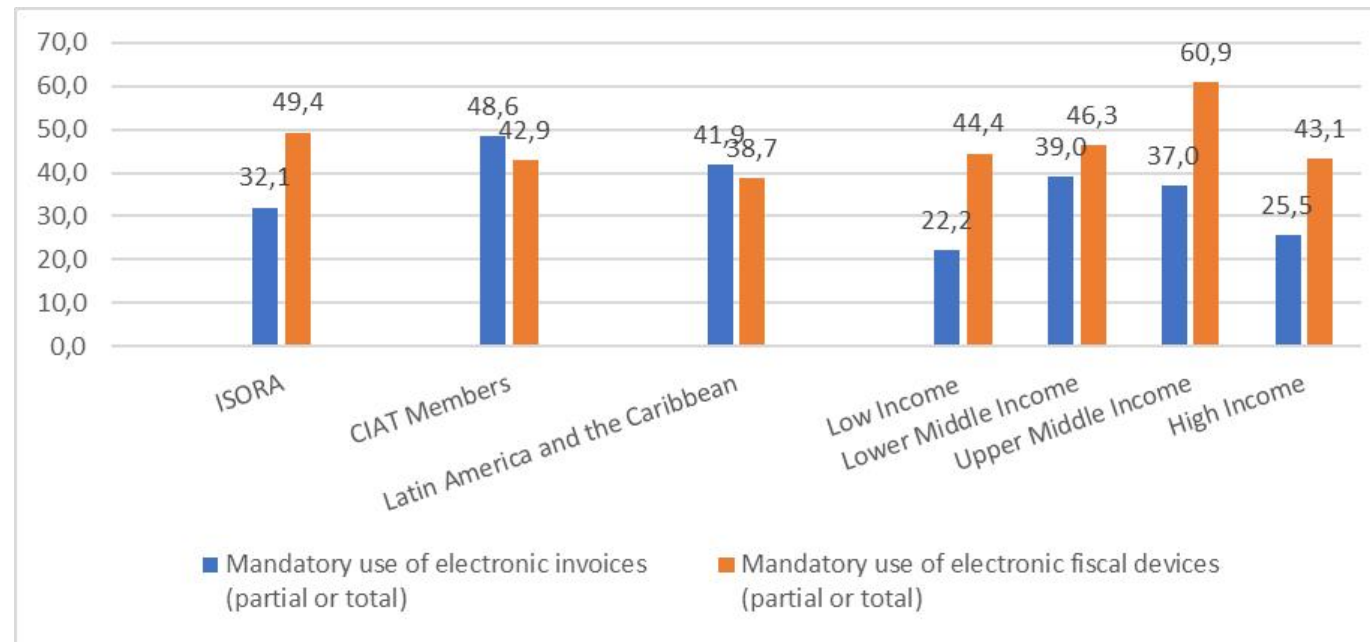


## 2. New technologies to track commercial transactions data

- **E-invoicing system:** taxpayers are required to issue a structured - according to a machine-readable standard- electronic invoice with a specific format established by the authorities and the e-invoice (or a set of data from it) must be transmitted to the tax administration
- **E-reporting:** any digital reporting system that does not require the existence of a predefined e-invoice but focus on establishing the obligation to transmit digitally a set of data of the transactions that is relevant to the tax administration, periodically or in real time
- **Digital (or electronic) cash registers:** evolution of traditional cash registers to include a sales register, that cannot be erased, and that is accessible to the tax administration, even on-line in real-time basis.

## 2. New technologies to track commercial transactions data

Figure 2. Mandatory use of electronic invoices and fiscal devices. (2019 data; based on ISORA Survey 2020)



The implementation of national systems of electronic invoicing in Latin-America is a well-known trend, with early adopter and leader countries in the use of the technology like Chile (2003), Brazil (2006), Mexico (2005, 2011) and Argentina (2006)

# 3. Making tax compliance easier through technology

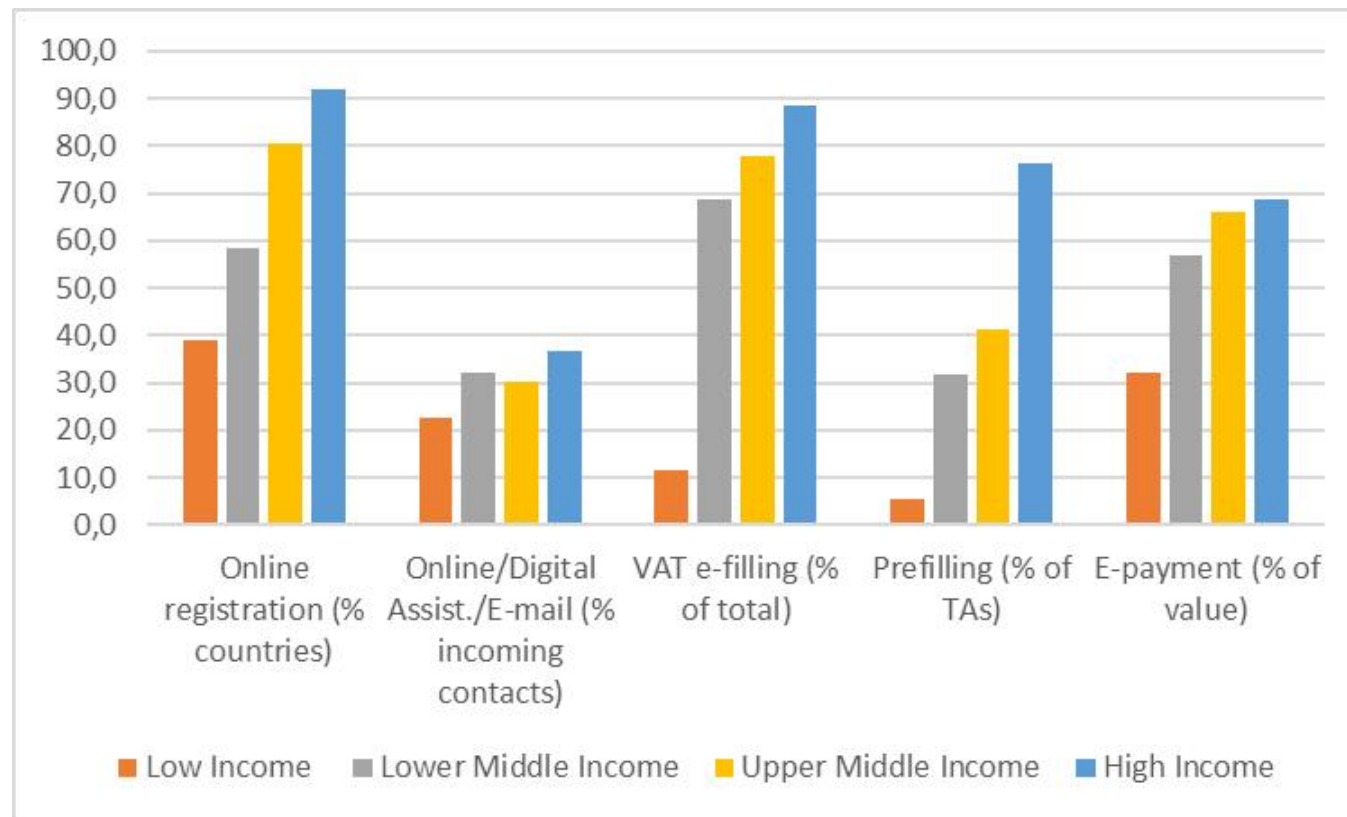
- Registration, digital identity, digital mailbox and address, virtual office
- Assistance: Web page, 24/7 virtual office services, mobile phone applications, electronic mailboxes, virtual assistants and chatbots guided by AI, and “Frequent Questions” systems
- Tax returns filling stage: prefilled tax returns and digital channels
- Digital payment options
- Prevention of disputes
- Taxation of digital economy





# 3. Making tax compliance easier through technology

Figure 3. Technology innovations by level of income. (2019 data; based on ISORA Survey 2020)



# 3. Making tax compliance easier through technology

- Other complementary advantages and services:
  - Brazil has developed the Public System of Digital Accounting (SPED )
  - Brazil e-invoice information on prices: (i) final consumer price consultation applications; and (ii) the setting of maximum prices to be accepted in public procurement
  - Ecuador: the traceability of e-invoice has allowed identification and analysis of value added and market composition, improving national accounting
  - Chilean tax administration: electronic invoices factoring service
  - Chile: input and output registries for all VAT taxpayers; pre-filled VAT returns
  - ETC....





## 4. Enforcing tax compliance

- Registry: checking information (e-tax address and digital mailbox) and economic sector activity classification with the help of e-invoicing
- Mitigating tax returns and payments' risks through digitalization
- Implementation of preventive measures, sending automatic reminder messages
- Massive and automatic digital audits
- Risk assessment and case selection for desk and field audits assisted by AI and Social Network Analysis
- Data management innovations, data bases interoperability, data import and analysis, search, and visualization tools
- Other disruptive new technologies (blockchain, IoT, etc.)



# 4. Enforcing tax compliance

Some examples:

- Blockchain in Tax Administration in Brazil to share Registry data
- Use of AI to identify real state in France
- Integration of big data analysis and data analytics in Bolivia
- On-line monitoring of transit of goods in Brazil
- Machine learning induced nudges when filing tax returns in Spain
- Identification of false e-invoices issuers in Chile combining big data analysis, machine learning and dynamic dashboards
- Implementation of electronic audits in Mexico
- Electronic virtual audits in India or Spain
- Machine learning and big data analytics CIAT's software: e-IAD (e-Invoice Anomalies' Detector)



## 5. Other issues to implement new technologies for tax compliance

- Data governance
- Data quality
- Security of information
- Confidentiality
- Ethical use of AI
- Etc....





## 6. CIAT'S job on digital technologies and tax administration

- Cooperation among tax administrations: international meetings, networks, assistance, consultation, etc.
- Data bases and studies (CIATData; Publications)
- Training
- Technical assistance
- CIAT's Center for Advanced Analytics and Artificial Intelligence

# 6. CIAT'S job on digital technologies and tax administration



## Digital Economy Compliance

Developed by CIAT / NORAD

# 6. CIAT'S job on digital technologies and tax administration



## DEC implementation:

- Free software for non-resident e-businesses taxation, open code for tax authorities
- Installed, tested, trained: Bolivia, Guatemala, Panama, Nigeria and Honduras. (waiting for regulations to support parameterization adjustments)
- In negotiations: Angola, Paraguay.
- Submitted to OECD, LAC, ATAF, WATAF, NTO, Addis Ababa Tax Initiative, Australia, New Zealand and others.
- Technical meetings with Chile, Australia and New Zealand and some digital service providers
- Face-to-face training in Guatemala and a local technical assistance in Nigeria.

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Launch informations, videos

<https://www.ciat.org/ciatblog-la-economia-digital-la-cooperacion-noruega-y-el-ciat-una-herramienta-clave/>

HANDBOOK DEC

<https://biblioteca.ciat.org/opac/book/5772>

Users Manual Taxpayer DEC

<https://biblioteca.ciat.org/opac/book/5790>

Users Manual Administrator DEC

<https://biblioteca.ciat.org/opac/book/5789>

# 6. CIAT'S job on digital technologies and tax administration



Costa Rica



Argentina



Agencia Tributaria

Spain



Receita Federal

Brazil



Guatemala



Chile



SAT

Mexico

## Electronic Invoicing Anomaly Detector



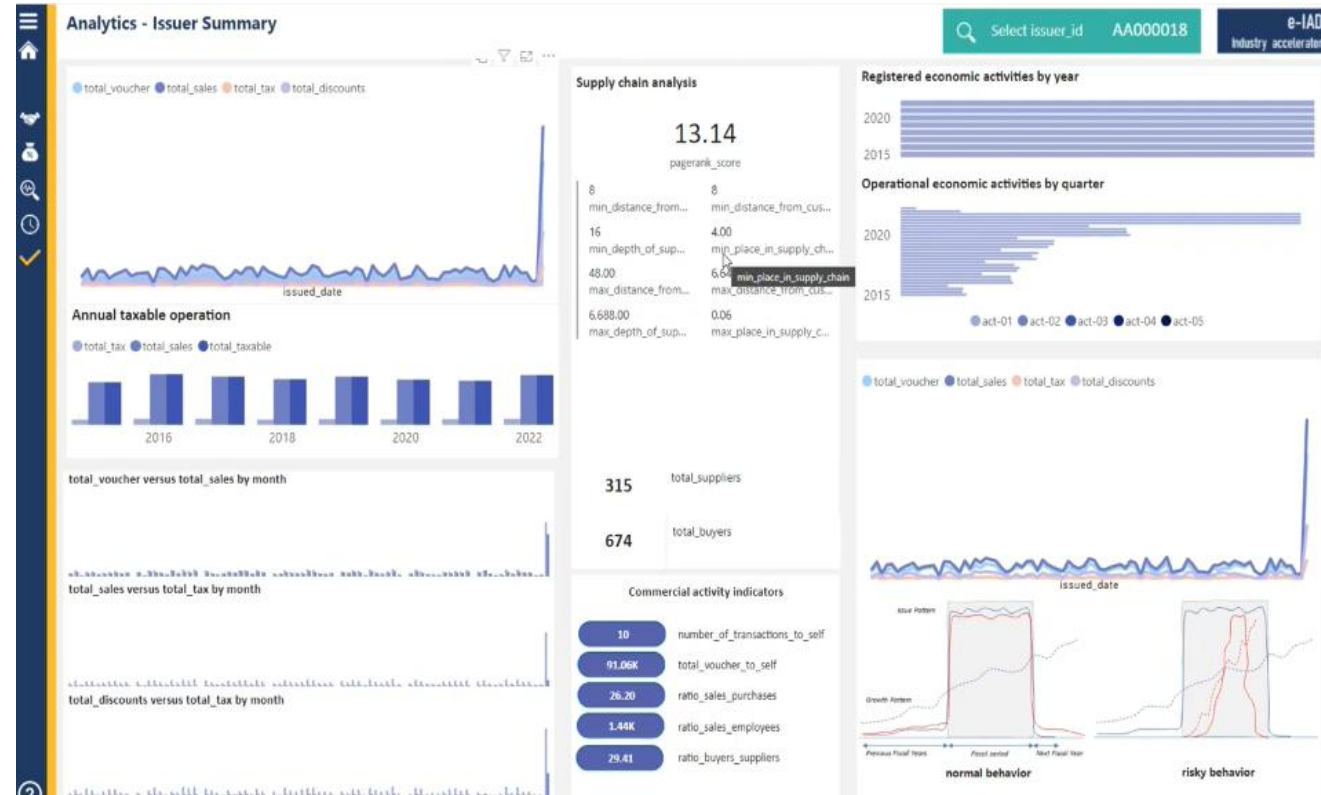


# Electronic Invoicing Anomaly Detector Definition

This solution allows to identify, select, and prioritize cases of taxpayers with unusual behavior, by applying **unsupervised machine learning models** to the data of the electronic invoice, the taxpayer's registry and the tax returns.

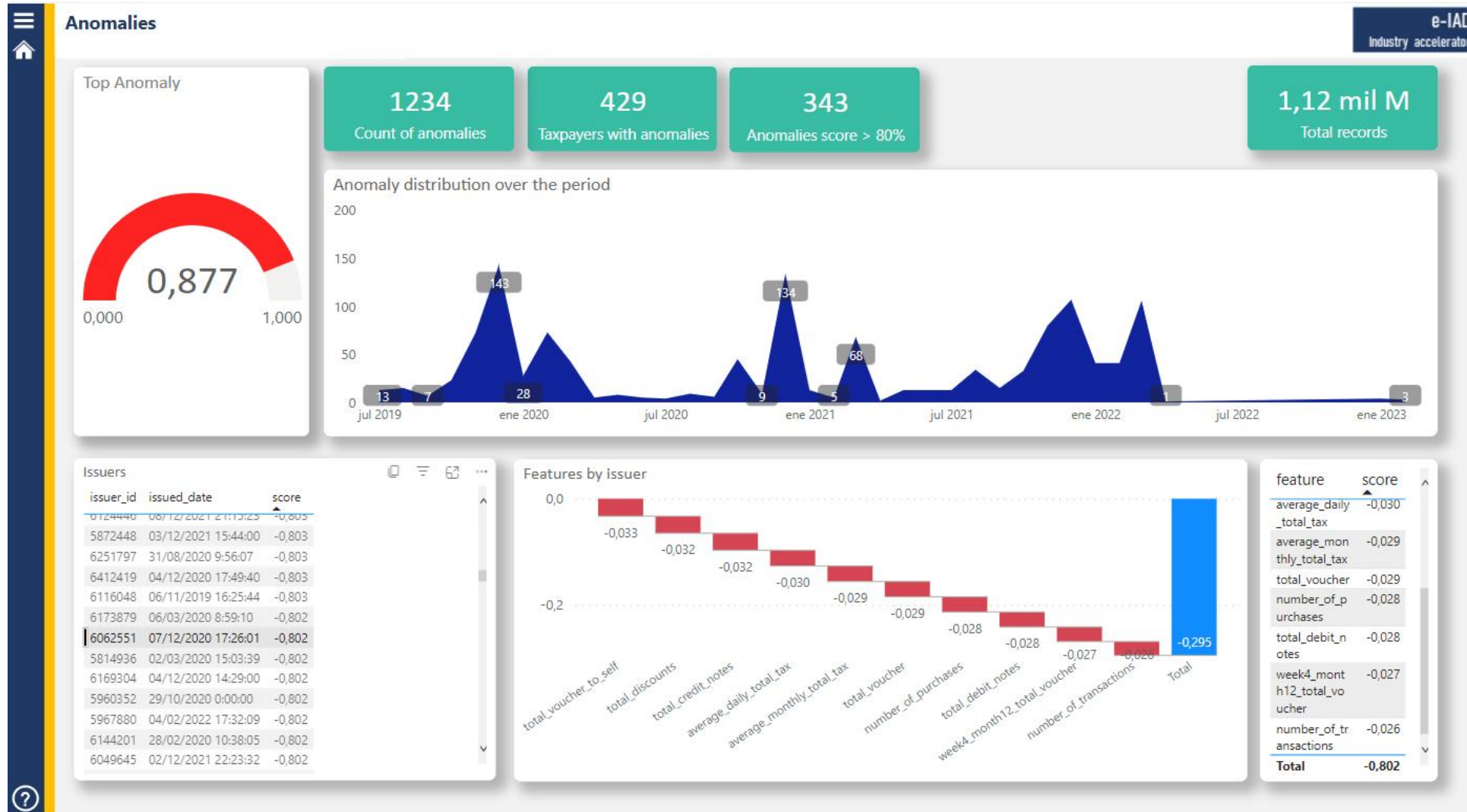
Examples of anomalies that may be detected

- 1 Taxpayers with non-existent or simulated operations (suspicious invoicing)
- 2 Taxpayers receiving income for unusual behavior



**The Costa Rican case: 1.12 billion records processed in less than seven hours (thirty-three months of data)**

# Electronic Invoicing Anomaly Detector Functionality



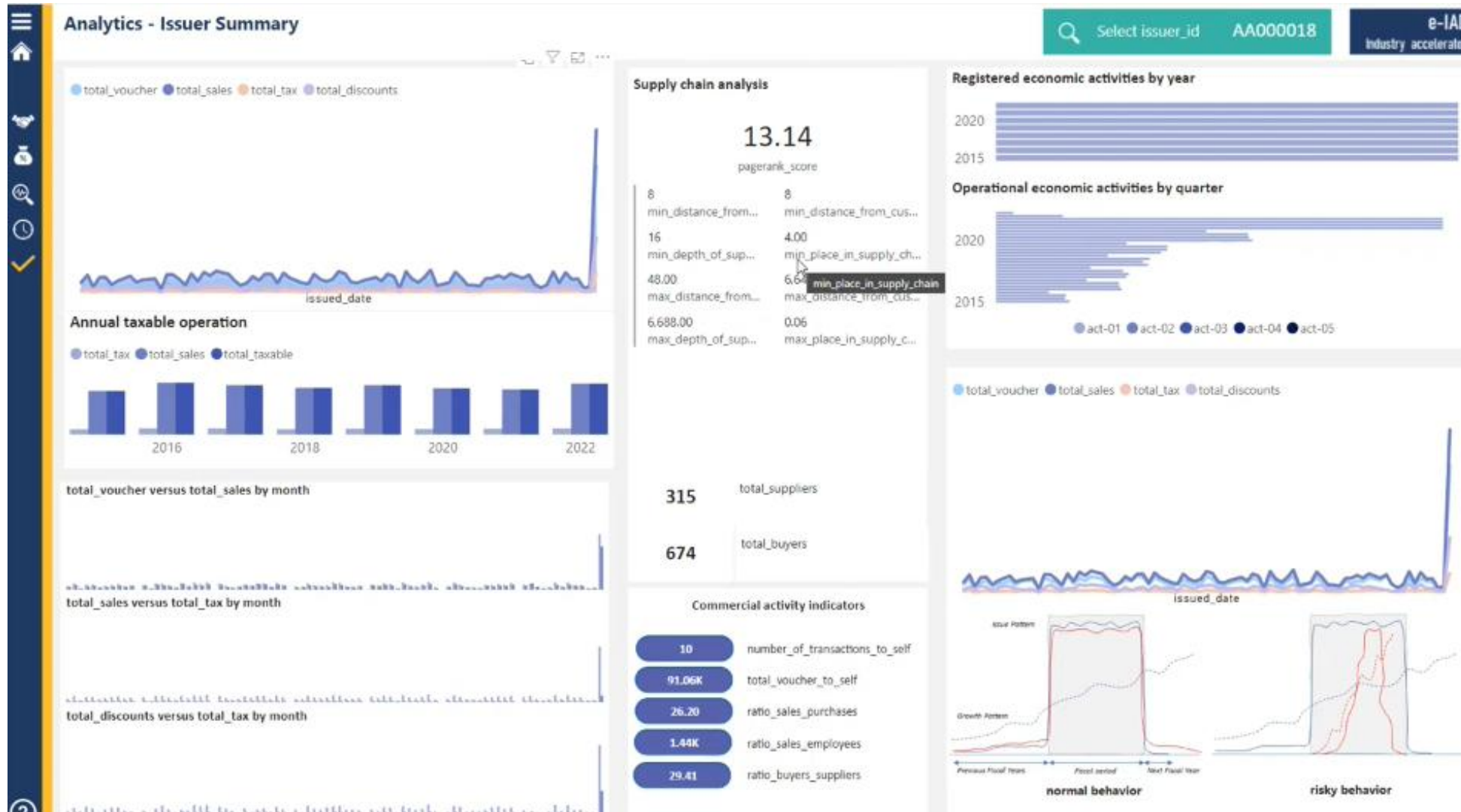
The system prioritizes cases through an anomaly index, similar to a risk ranking.

# Electronic Invoicing Anomaly Detector Functionality



- Prioritize the analysis to taxpayers with extreme values.
- Analyzes economic activities and regions

# Electronic Invoicing Anomaly Detector Functionality



The prioritized taxpayers are analyzed through descriptive statistics and graph theory (study of relationships between entities).

# Electronic Invoicing Anomaly Detector

## Ongoing implementations



### 1. Ministry of Finance of Costa Rica

The deployment was **completed on March 22, 2023**. The results are currently being analyzed.



### 2. Superintendency of Tax Administration of Guatemala

The implementation is scheduled to be completed in September 2023. The deployment and analysis of the data that will be used has been completed.



### 3. Directorate of National Taxes and Customs

The analysis and definition of the project scope was completed in June. The deployment will be completed in October



Experiences that drive a continuous improvement of the product



# 6. CIAT'S job on digital technologies and tax administration



## **ICT as a Strategic Tool to Leapfrog the Efficiency of Tax Administrations / 2020**

<https://biblioteca.ciat.org/opac/book/5696>

## **Data Governance for Tax Administrations: A Practical Guide / 2022**

<https://biblioteca.ciat.org/opac/book/5815>

## **WP-02-2022: Innovation, Digitalization and Technology Index (INDITEC): A tool for benchmarking Tax Administrations at the international level (Based on data from ISORA 2020 Survey) / 2022**

<https://biblioteca.ciat.org/opac/book/5801>



# The role of digital technology in tax administration

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[www.ciat.org](http://www.ciat.org)

# THANK YOU



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**THANKS**

