

E-procurement implementation in Brazil

Proposition of a theoretical model and
prognosis of the use of AI

Rafael Wallbach Schwind

Renato Ribeiro Fenili

Introduction

```
graph TD; A[Introduction] --> B[2. The concept of public procurement and its dimension of horizontal and vertical diffusion]; B --> C[3. The Brazilian Federative Organization Regarding Public Procurement]; C --> D[4. Historical implementation of public e-procurement (2019 – 2024)]; D --> E[5. Proposition of a theoretical model]; E --> F[Final remarks and the forecast of public e-procurement in Brazil];
```

2. The concept of public procurement and its dimension of horizontal and vertical diffusion

3. The Brazilian Federative Organization Regarding Public Procurement

4. Historical implementation of public e-procurement (2019 – 2024)

5. Proposition of a theoretical model

Final remarks and the forecast of public e-procurement in Brazil

Introduction

```
graph TD; A[Introduction] --> B[2. The concept of public procurement and its dimension of horizontal and vertical diffusion]; B --> C[3. The Brazilian Federative Organization Regarding Public Procurement]; C --> D[4. Historical implementation of public e-procurement (2019 - 2024)]; D --> E[5. Proposition of a theoretical model]; E --> F[Final remarks and the forecast of public e-procurement in Brazil];
```

2. The concept of public procurement and its dimension of horizontal and vertical diffusion

3. The Brazilian Federative Organization Regarding Public Procurement

4. Historical implementation of public e-procurement (2019 – 2024)

5. Proposition of a theoretical model

Final remarks and the forecast of public e-procurement in Brazil



Brazil

- Heterogeneous realities – competencies, physical resources, governance;
 - Legal transition: Law n. 14,133/21;
 - Significant recent evolution of e-procurement (since 2019);
 - Predictors of digital government;
 - Cultural and political barriers.
-



~~Law nº 8.666/93~~

~~Law nº 10.520/02~~

~~Law nº 12.462/11~~

Law nº 13.303/16

Law nº 14.133/21

Only the provisions on **crimes**, of the New Law, also reach the Law nº 13.303/16



Big numbers

US\$ 220 bi/yr

(public procurement - estimated)

4 federative levels

(federal – Federal District - state –
municipal)

5.568
municipalities

US\$ 30,3 bi/yr

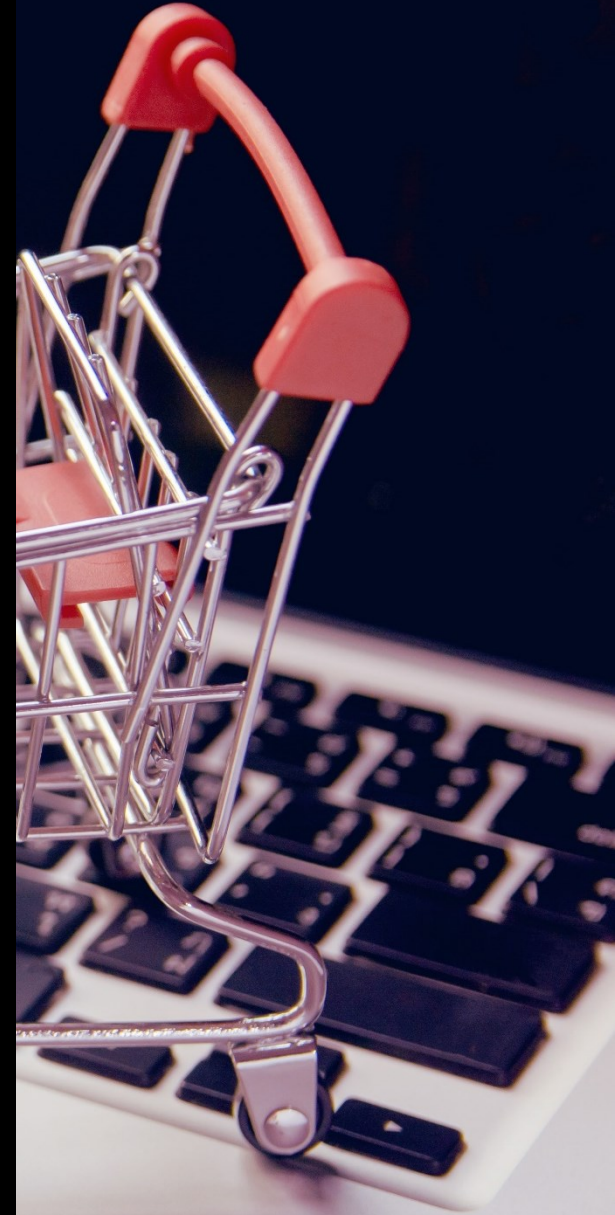
(federal resources
transfers)

2 national
laws

(transition)

Research question

How is the implementation of electronic public procurement taking place in Brazil?





Objective

This article proposes a theoretical model on the implementation of electronic public procurement in Brazil, dedicated to the transformations that have occurred in the logistics landscape since 2019.

Introduction

```
graph TD; A[Introduction] --> B[2. The concept of public procurement and its dimension of horizontal and vertical diffusion]; B --> C[3. The Brazilian Federative Organization Regarding Public Procurement]; C --> D[4. Historical implementation of public e-procurement (2019 – 2024)]; D --> E[5. Proposition of a theoretical model]; E --> F[Final remarks and the forecast of public e-procurement in Brazil];
```

2. The concept of public procurement and its dimension of horizontal and vertical diffusion

3. The Brazilian Federative Organization Regarding Public Procurement

4. Historical implementation of public e-procurement (2019 – 2024)

5. Proposition of a theoretical model

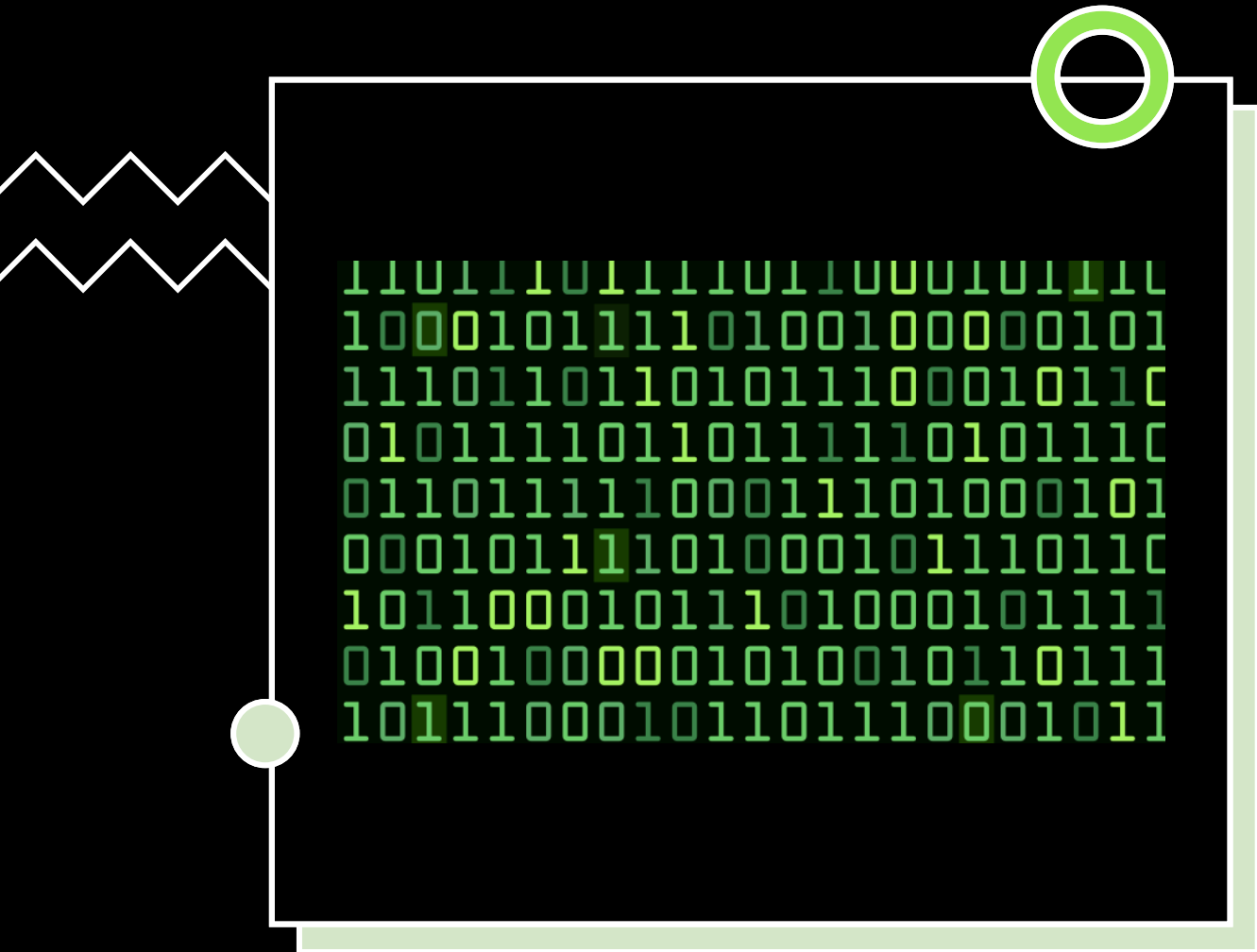
Final remarks and the forecast of public e-procurement in Brazil

E-procurement

E-procurement refers to the use of technology to conduct procurement activities such as supplier registration and selection, contracting, and payment through online platforms. In the public sphere, it relates to a comprehensive process in which governments employ information and communication technology (ICT) systems, usually with internet functionalities, as a way to establish administrative contracts.

KUMAR, P.; KHAN, A. M.; AZIZ, S. Factors Affecting the Integration of E-Procurement in the Public Sector of Pakistan with Emphasis on Combating Corruption. *Dutch Journal of Finance and Management*, v. 6, n. 2, p. 1 – 16, 2023.

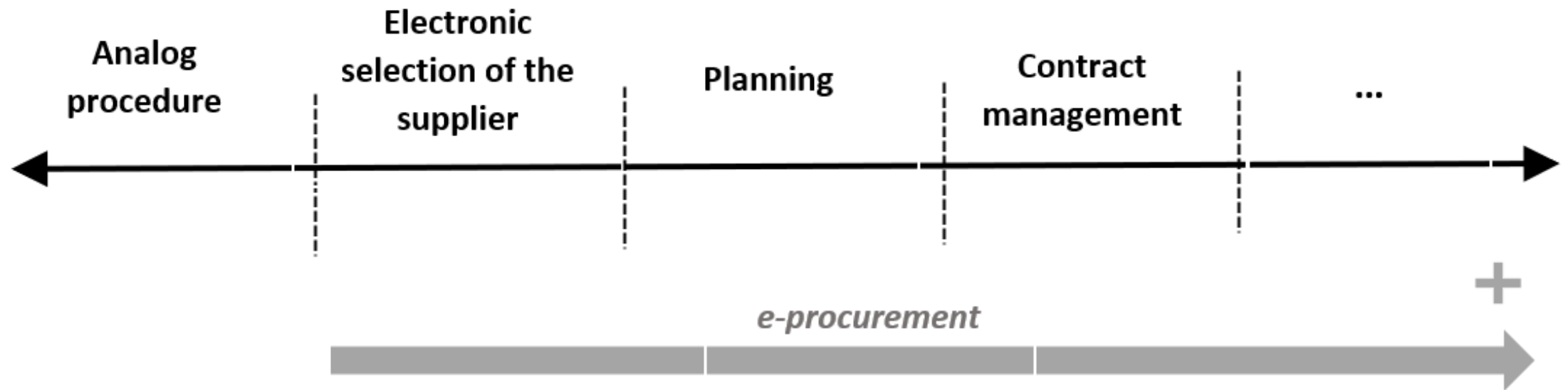




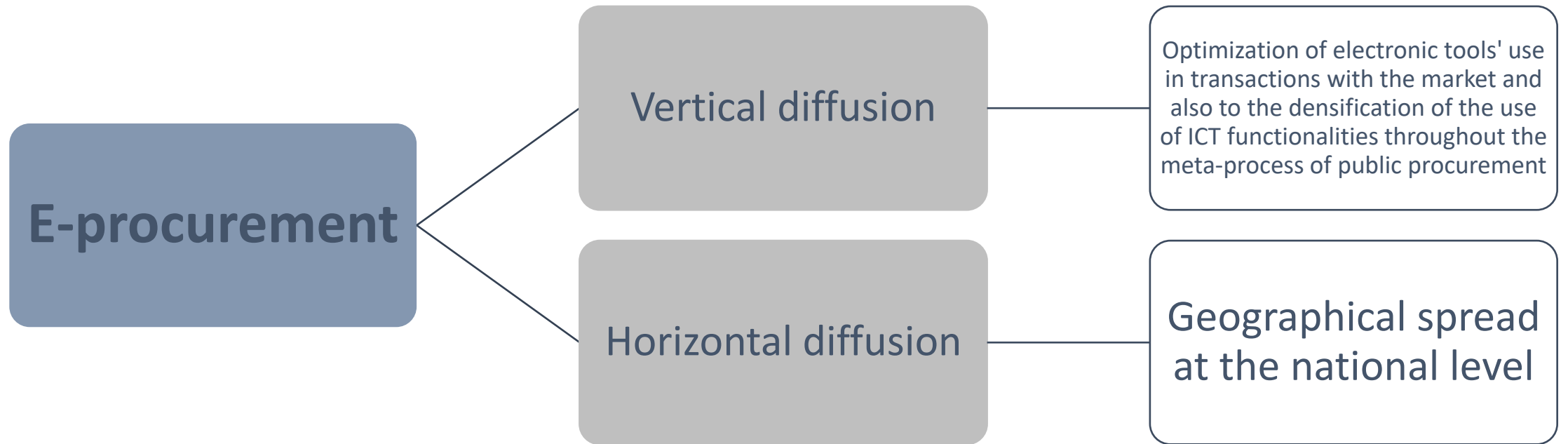
E-procurement
as a non-binary
concept



Figure 1. *Degrees of implementation of public e-procurement*



Vertical and horizontal diffusion



Introduction

```
graph TD; A[Introduction] --> B[2. The concept of public procurement and its dimension of horizontal and vertical diffusion]; B --> C[3. The Brazilian Federative Organization Regarding Public Procurement]; C --> D[4. Historical implementation of public e-procurement (2019 - 2024)]; D --> E[5. Proposition of a theoretical model]; E --> F[Final remarks and the forecast of public e-procurement in Brazil];
```

2. The concept of public procurement and its dimension of horizontal and vertical diffusion

3. The Brazilian Federative Organization Regarding Public Procurement

4. Historical implementation of public e-procurement (2019 – 2024)

5. Proposition of a theoretical model

Final remarks and the forecast of public e-procurement in Brazil

- Financial transfers from the Federal Union to states and municipalities;
- In 2023 – 10,168 voluntary agreements signed (USD 4 billion);
- 95% of municipalities and all the 27 states participate in the terms;
- “My money, my rules” – Federal isomorphism.



Introduction

```
graph TD; A[Introduction] --> B[2. The concept of public procurement and its dimension of horizontal and vertical diffusion]; B --> C[3. The Brazilian Federative Organization Regarding Public Procurement]; C --> D[4. Historical implementation of public e-procurement (2019 – 2024)]; D --> E[5. Proposition of a theoretical model]; E --> F[Final remarks and the forecast of public e-procurement in Brazil];
```

2. The concept of public procurement and its dimension of horizontal and vertical diffusion

3. The Brazilian Federative Organization Regarding Public Procurement

4. Historical implementation of public e-procurement (2019 – 2024)

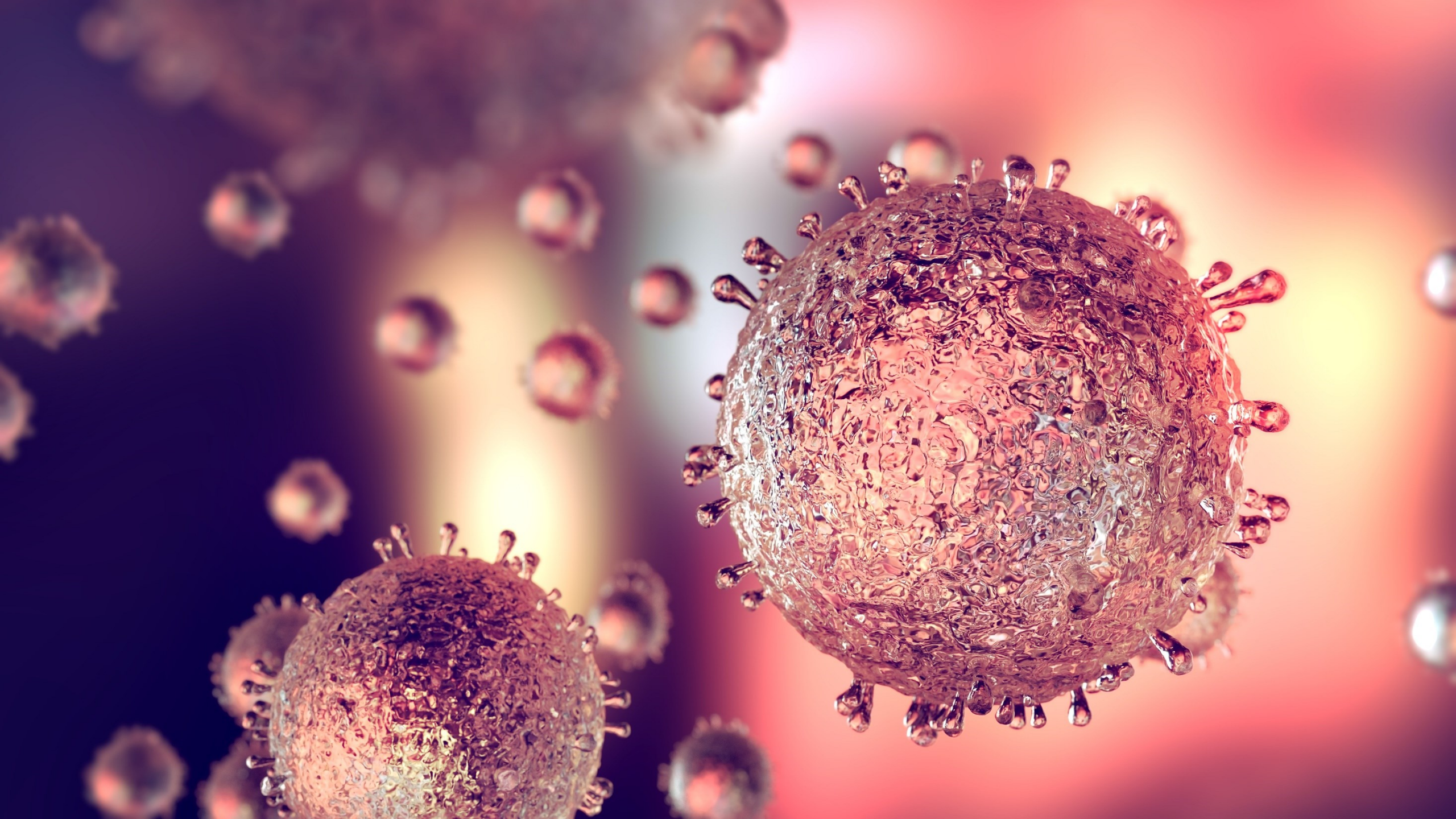
5. Proposition of a theoretical model

Final remarks and the forecast of public e-procurement in Brazil

Horizontal Diffusion

- Federal Decree n. 10,024/19:

*"Art. 1, § 3º: For the acquisition of goods and contracting of common services by federative entities, **using Union resources resulting from voluntary transfers**, such as agreements and transfer contracts, **the use of the electronic auction modality or electronic dispensation shall be mandatory**, except in cases where the law or specific regulations governing the transfer modality provide differently for contracts with transfer resources."*



Horizontal diffusion

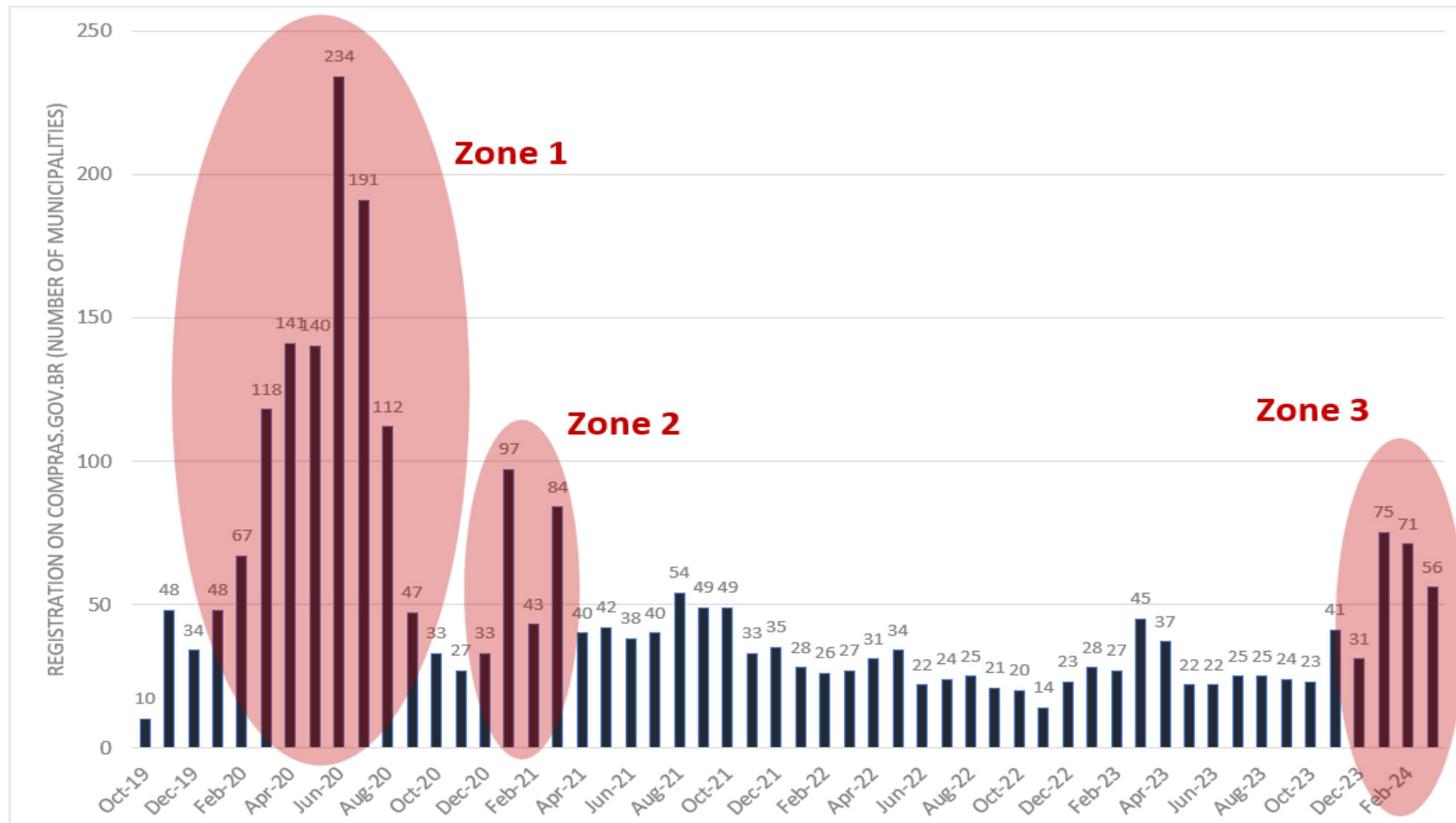
Table 3. Horizontal diffusion timeline of public e-procurement applied to electronic auctions in Brazil

Requirement of using electronic auctions when there's execution of voluntary transfers from the Federal Union	
States and Federal District	Starting from October 28, 2019
Municipalities with over 50,000 inhabitants	Starting from February 3 rd , 2019
Municipalities with populations between 15,000 and 50,000 inhabitants	Starting from May 6 th , 2020
Municipalities above 15.000 inhabitants	Starting from June 1 st , 2020

Source: Developed by the authors, based on Normative Instruction - SEGES No. 206/19.

Horizontal diffusion

Graph 1. Municipal registrations in the Federal Government's Purchasing System.



Horizontal diffusion

Table 2. Logistic options for bidding by the Public Administration on the Federal Government Procurement Portal

Type of procedure	Quantity				Value (BRL)			
	2020	2021	2022	Total	2020	2021	2022	Total
Conventional auction	23.808	28.826	27.859	80.493	23.661.567.134,18	32.864.968.048,01	33.341.941.453,82	89.868.476.636,01
Auction through Price Registration System (SRP)"	25.567	32.776	30.818	89.161	50.131.843.902,35	72.841.446.932,77	66.773.281.205,35	189.746.572.040,47
Conventional bidding	133	116	83	332	879.513.120,69	878.002.151,74	2.849.528.789,11	4.607.044.061,54
Competition through Price Registration System (SRP)"	4	7	4	15	12.090.467,12	22.781.596,14	5.555.056,50	40.427.120,86
International competition	1	1	2	4	611.926,70	85.339,69	19.688.424,97	20.385.691,36
Contest	7	16	4	27	1.360.300,00	847.361,45	249.000,00	2.456.661,45
Bid solicitation	696	474	322	1.492	433.926.711,54	261.718.242,30	209.893.854,24	905.538.808,08
Differentiated Hiring Regime (RDC)"	1.026	1.432	1.642	4.100	3.535.824.187,66	12.048.386.540,47	5.014.736.465,40	20.598.947.193,53
TOTAL	51.242	63.648	60.734	175.624	78.656.737.750,24	118.918.236.212,57	108.214.874.249,39	305.789.848.212,20

*Data from January 2020 to November 2022. Values (BRL) refer to homologated amounts. They represent contracts from federal executive branch agencies and entities, as well as from other federative entities and

Vertical diffusion

Table 1. Key milestones of the vertical diffusion of the Federal Government Purchasing System (from 2019 onwards)

Year	Functionality
2019	PGC System - Planning and Contract Management - module dedicated to the preparation and execution of annual contracting plans
	Mobile application for bidder registration
2020	Digital ETP System - module for the preparation of preliminary technical studies
2021	Electronic waiver - module for conducting direct contracting through bidding exemption
	Risk Management Module - functionality dedicated to the preparation of risk maps
	Purchases Contracts Module - subsystem dedicated to contract management
2022	Digital TR System - module for the preparation of terms of reference
	Price research - tool to assist in conducting price research
	Electronic ineligibility - module for registering the ineligibilities of bidding
2023	Evolution of the mobile application for participation in electronic waivers
	Digital bidding documents module - functionality dedicated to the preparation of bidding documents and notices for direct contracting

Source: Developed by the authors.

Introduction

```
graph TD; A[Introduction] --> B[2. The concept of public procurement and its dimension of horizontal and vertical diffusion]; B --> C[3. The Brazilian Federative Organization Regarding Public Procurement]; C --> D[4. Historical implementation of public e-procurement (2019 – 2024)]; D --> E[5. Proposition of a theoretical model]; E --> F[Final remarks and the forecast of public e-procurement in Brazil];
```

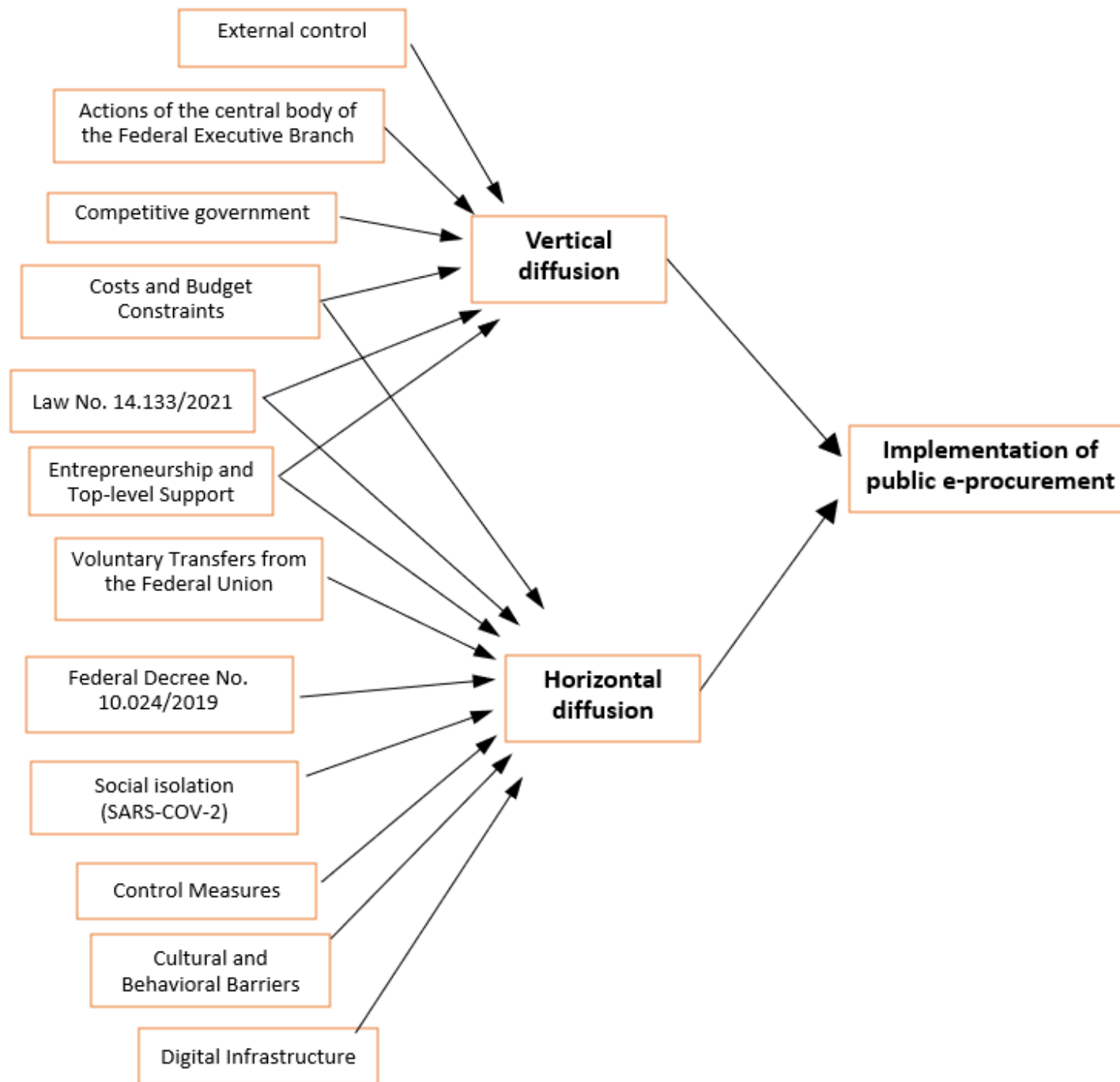
2. The concept of public procurement and its dimension of horizontal and vertical diffusion

3. The Brazilian Federative Organization Regarding Public Procurement

4. Historical implementation of public e-procurement (2019 – 2024)

5. Proposition of a theoretical model

Final remarks and the forecast of public e-procurement in Brazil



Introduction

2. The concept of public procurement and its dimension of horizontal and vertical diffusion

3. The Brazilian Federative Organization Regarding Public Procurement

4. Historical implementation of public e-procurement (2019 – 2024)

5. Proposition of a theoretical model

Final remarks and the forecast of public e-procurement in Brazil

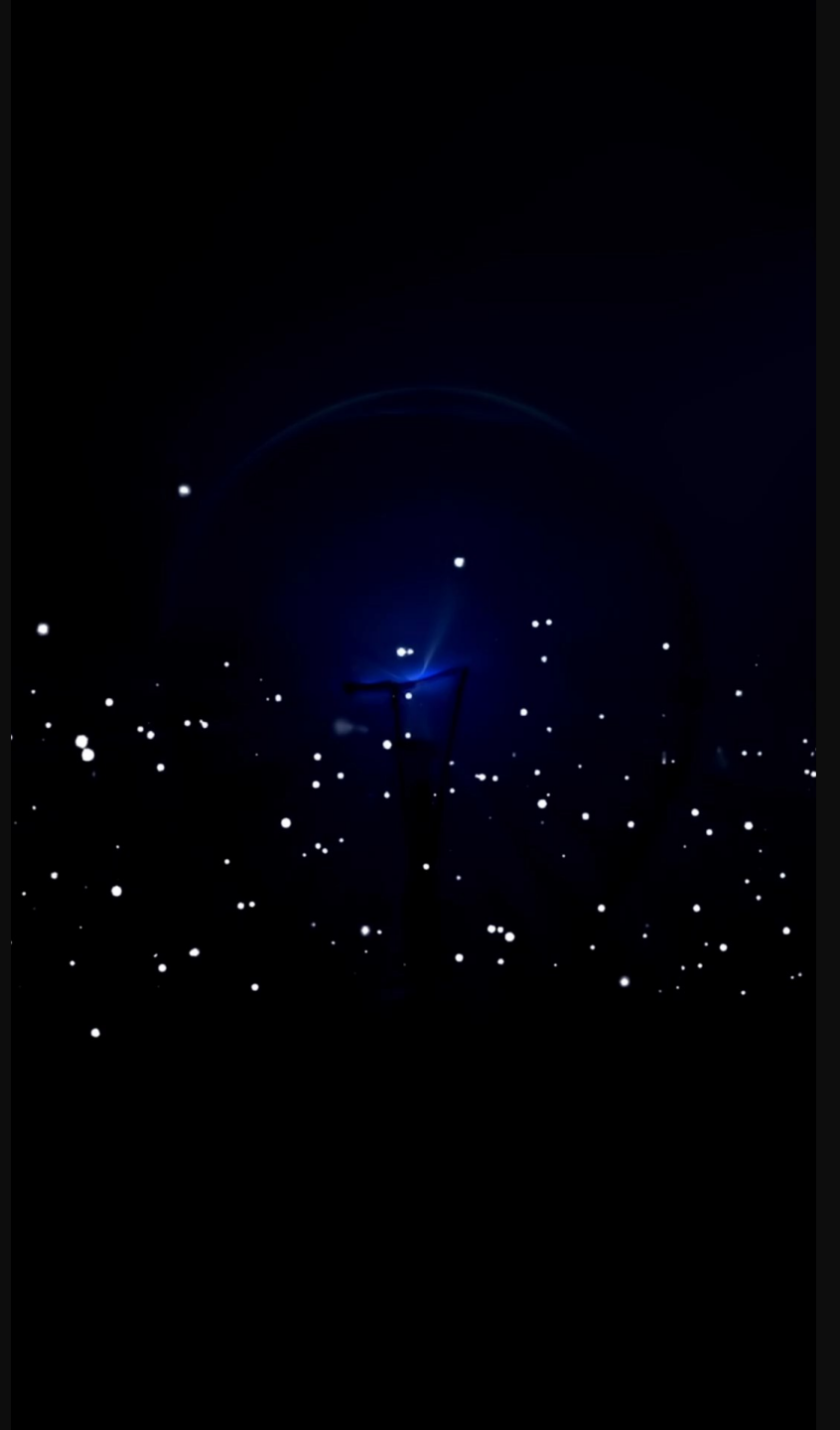
Final remarks

(i) Relevance of the model: The mechanism of clarified coercive isomorphism, specific legal and infra-legal acts, the enforcement action of federal external control, the role of the central logistics body of the Executive Branch and other elements give particular concreteness to the portrayed model

(ii) In this path of technological evolution of public e-procurement in Brazil, two vectors that compose the disruption forecast in the medium and long term are identified:

(a) The development of public procurement marketplaces.

(b) The use of artificial intelligence tools throughout the public procurement process.



Trends in the use of AI in public procurement in Brazil

Table 4. Trends in the use of artificial intelligence in public procurement in Brazil.

Optimization of Control Actions	Use of AI for Document Analysis in the Procurement Process, Identifying Signs of Deviation, Illegalities, and Fraud ³⁴ .
Optimization of Solution Identification	Applicable for use during the preparation of preliminary technical studies, facilitating the exploration of better solutions and contractual models.
Optimization of Document Preparation	Utilization of AI in the drafting of preliminary studies, terms of reference, price surveys, draft bidding documents, etc.
Learning Support Artifact	Employment of AI in legal, sub-legal, and jurisprudential consultation, revealing trends

Research agenda

- (i) Conducting qualitative research to refine the proposed model: within this scope, multi-case studies are proposed, segmented into clusters divided by federative level, so that the infra-legal regulatory framework can be taken as a control variable;
 - (ii) Conducting quantitative research to validate the proposed model, including the construction and validation of a scale for the implementation of public e-procurement in Brazil;
 - (iii) Bibliometric survey on the predictive variables of the implementation of electronic public procurement, especially in emerging economies, establishing a comparative framework.
-



Rafael Wallbach Schwind
rafael@justen.com.br

Renato Fenili
renatofenili@gmail.com