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Challenges and strategies for Information Systems in the decision-making process to face the COVID- 19 pandemic

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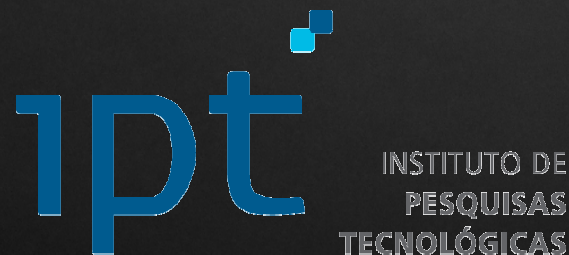
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Challenges and strategies for Information Systems in the decision-making process to face the COVID-19 pandemic: The São Paulo case

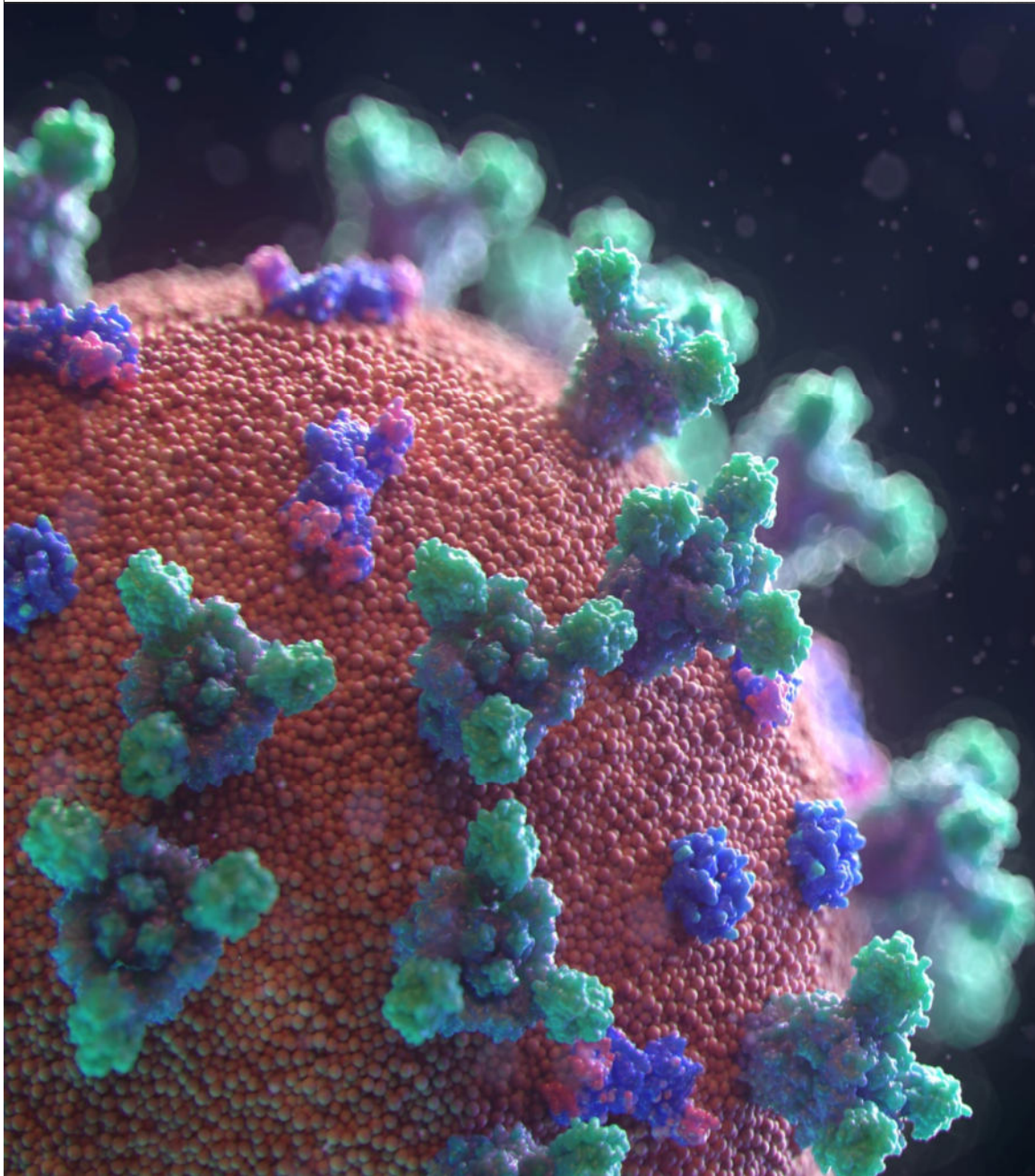
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COVID-19 in the world



- High impacts in Economy, HealthCare and humanitarian aspects
- Actions
 - Stablish public policies for rapid response
 - Create crisis committees
 - Monitor the dissemination and impacts

Latin America scenarios



- Mobility monitoring
 - Argentine, Chile, Mexico, Peru, Brazil, and others
- Legal issues delimited the level of monitoring
 - Local laws similar to GDPR(Europe)

Using Data Science to face COVID-19



Situation room

- Biggest state and start point in Brazil
- Information Systems and Intelligent Monitoring
- Using agile methods for fast deployment in 3 perspectives
 - Mobility (isolation and traffic flows)
 - Economy
 - Healthcare

Mobility monitoring approach

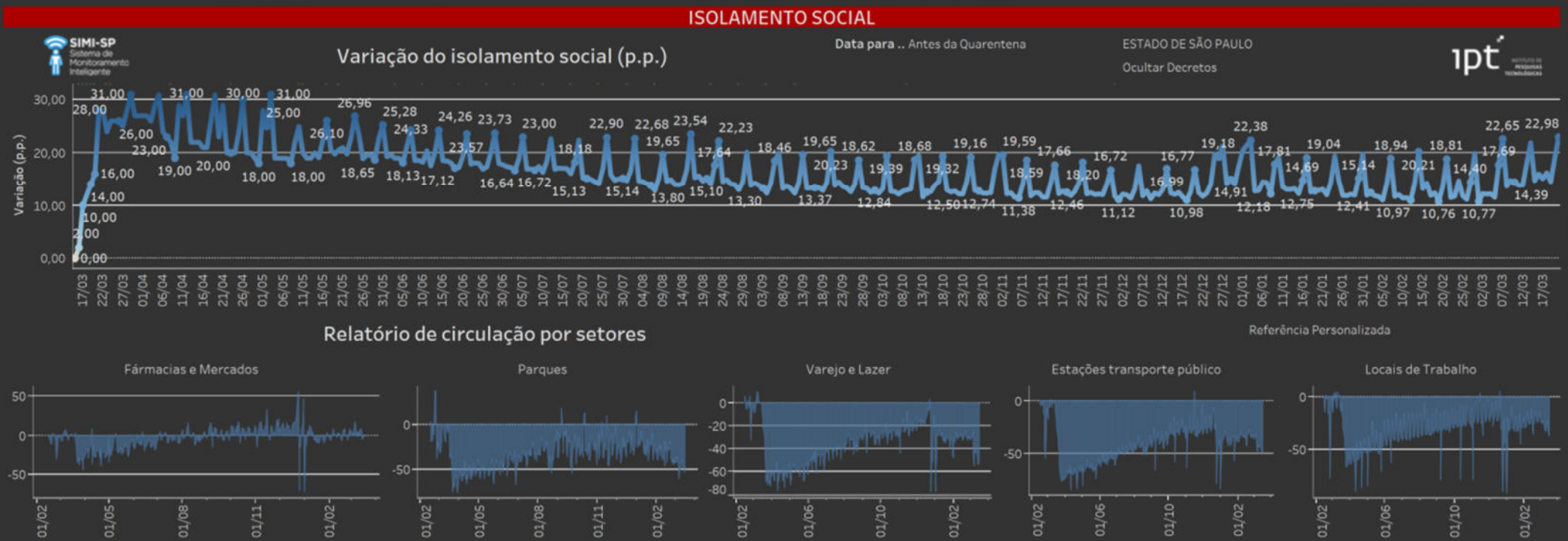
- Adequate to local regulations
- Identify tendency and behaviour
- Establish triggers to move in escalator level
- Define the mobility restrictions



Escalator approach for mobility monitoring

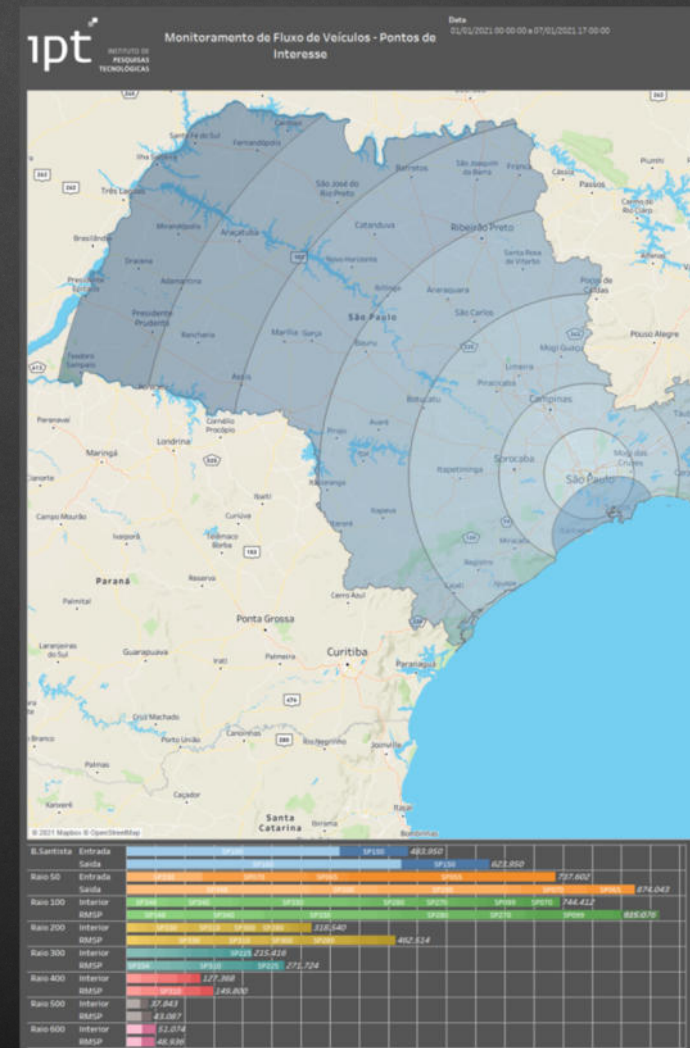
Mobility - Isolation index

- Using big data from telecommunications infrastructure
- Anonymized data from cell towers
- Useful:
 - To check if restrictions policies were effective.
 - Virus dissemination analysis and correlation of mobility



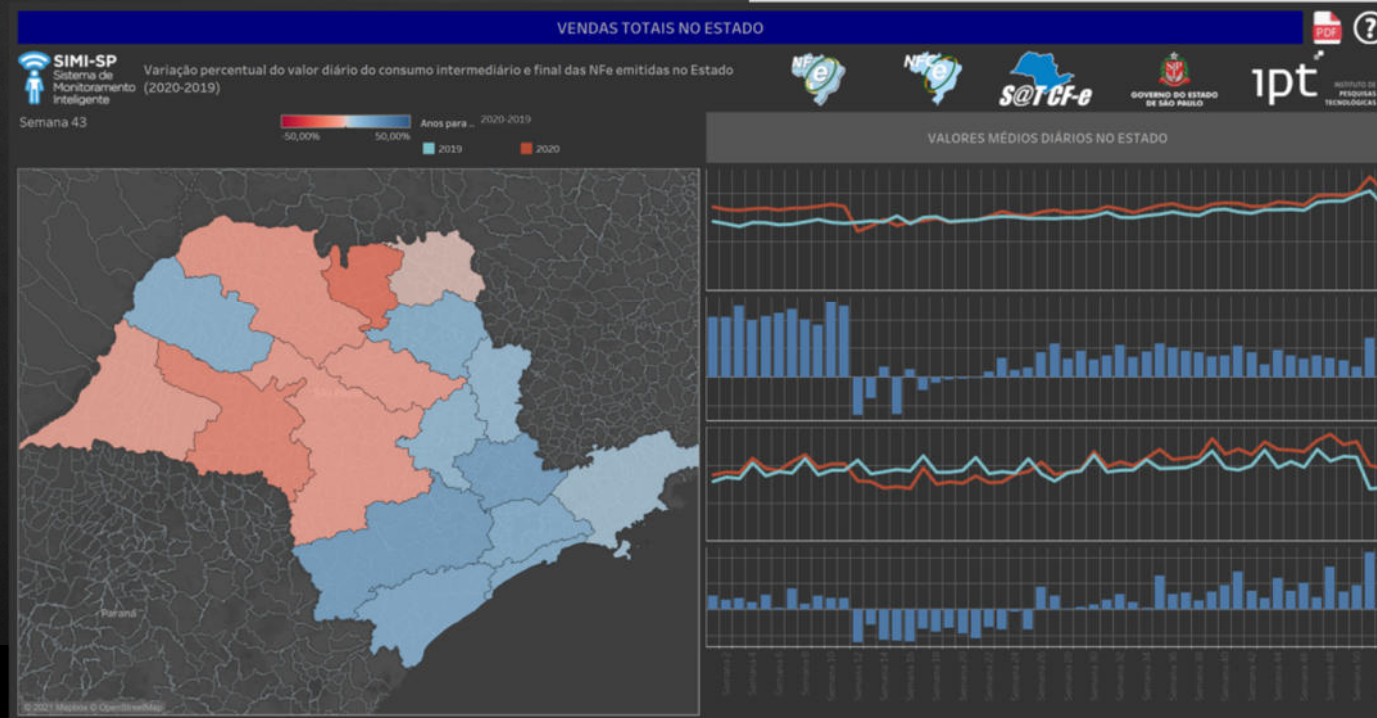
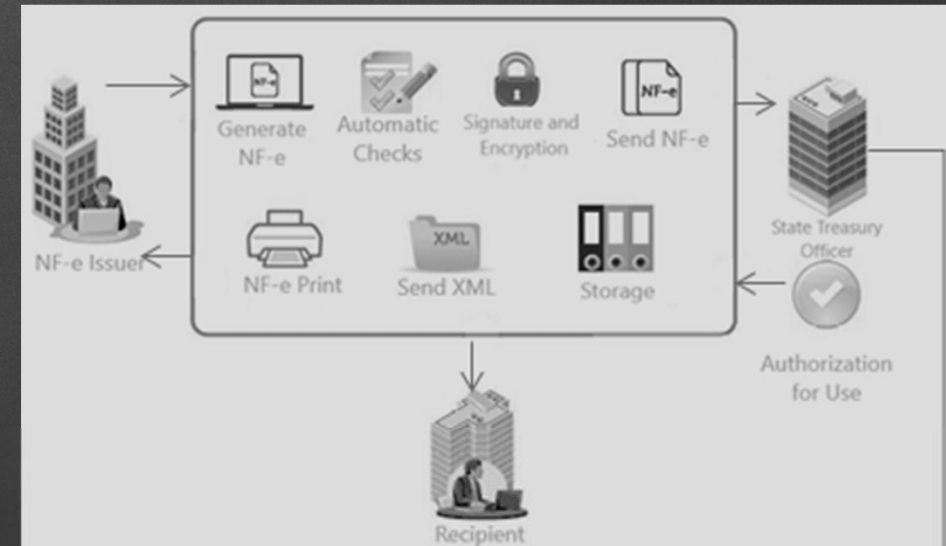
Mobility – Traffic flows

- Using IoT device inside road infrastructure
- Vehicle counters (volume) and RFID tags for Origin-Destination mapping
- Useful for analysis in:
 - virus spreading from capital (epicenter) to country
 - economic impacts based in mobility pattern

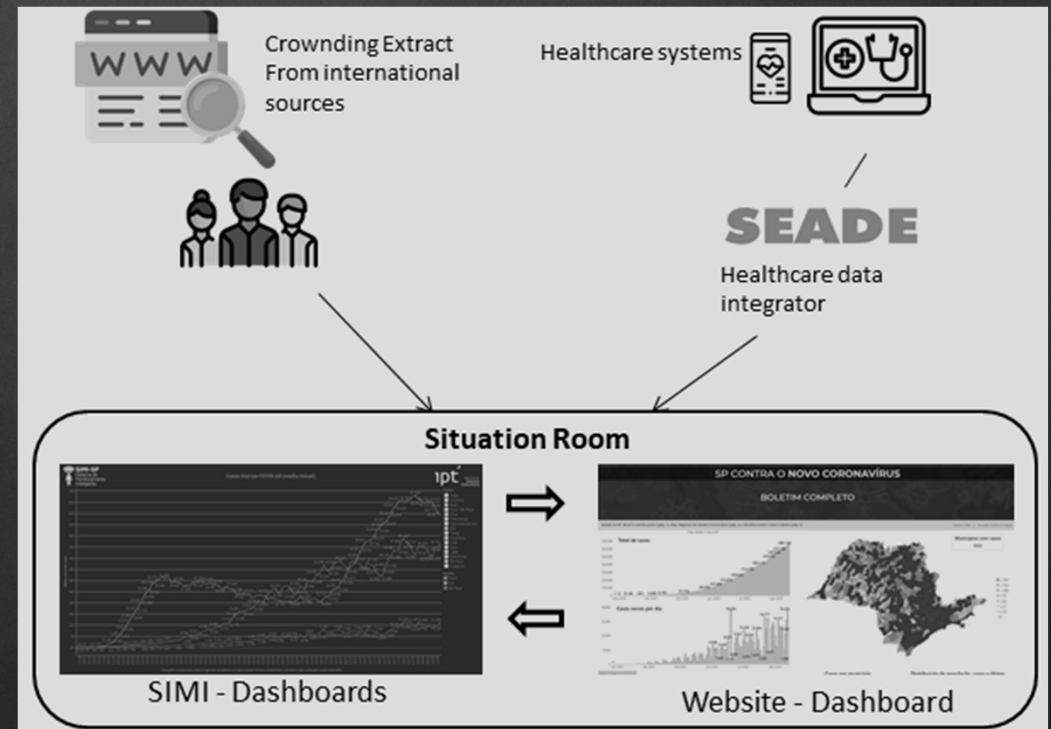


Economy

- Using electronic ticket in treasury office
- Anonymized and segmented by sectors
- Useful for analysis in:
 - Restrictions X economy activity
 - Identify sector more impacted and action for subsistence



- Number cases and deaths
- Hospital capacity
- Correlation with mobility scenarios



Conclusions

- Data science became more clear the situations and views from pandemic scenario
- Rapid feedback from actions to face the COVID
- Multidisciplinary teams and data integration were essential to aggregate and subsidize government officials in evidence-based decision-making to face

Escalator level	Modus operandi
Isolation Index and Density	The Cellular Operators offer the index using anonymous connections in Cell site, as well as the density maps. Big Data scenario
Origin-Destination Matrix	The Highway Operators offer the anonymous flows and tags from Automatic Vehicle identification to OD-Matrix. IoT Scenario
Profile and behaviour	Google offers community mobility reports, which are used by SIMI dashboards to show relative mobility to 4 classes. Besides, the monitoring of electronic invoice promotes an understanding of economic rescue, and in the case of retail could reflects the acquisition of goods and services in these locations. Business Intelligence scenario
Individual tracking	São Paulo did not use this feature

Thank you

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Open data: <https://www.saopaulo.sp.gov.br/planosp/simi/dados-abertos/>