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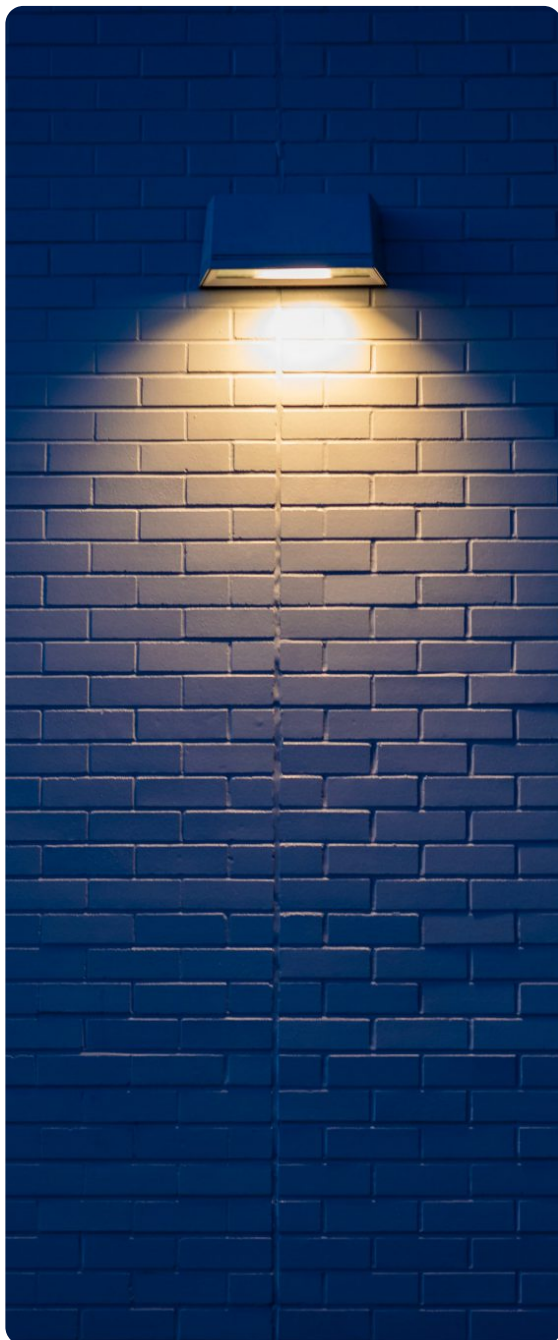
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# How internal audit can help get rid of bottlenecks: Applying consulting techniques and Artificial Intelligence tools to improve federal transfers in Brazil

September 23, 2020

by [Sergio Neiva](#)

**TAGS:** ARTIFICIAL INTELLIGENCE, CONSULTING, INTERNAL AUDIT

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**Highlights**

- The use of artificial intelligence has been expanding in the private sector with positive impacts on fraud prevention and increasing efficiency and effectiveness of the work performed by auditors. However, despite the potential, its use in the public sector is still at the starting line.

In Brazil, the lack of operational capacity to analyse the transfer of public funds from the federal level to states, municipalities and Non-Government Organisations is a critical issue. Challenges mainly occur during the ex-post control, particularly during the “accountability analysis”, i.e., when the transfers are made publicly available and the federal public issuing agencies (e.g. the Ministries of Health, Education, etc.) have to either approve or reject the transfers, by checking whether the receiving entity has used the public funds in accordance with laws and regulations.

Given the high volume of transfers and limited resources for the accountability analysis, there is typically a backlog of cases awaiting approval. In August 2018, there were over 15,000 federal transfers, amounting to R\$ 16.7 billion (~US\$ 3 billion), pending a decision to approve or reject (see figure 1).

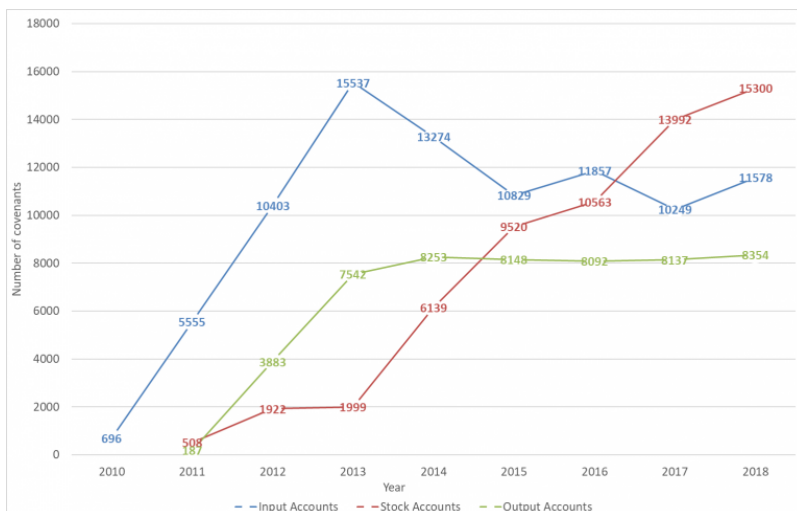


Figure 1 – Overview of federal transfers analysis. “Input

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transfers” represents the number of transfers entering the accountability stage; “Output Transfers” are the number of transfers analysed, and “Stock Transfers” are the transfers pending analyses.

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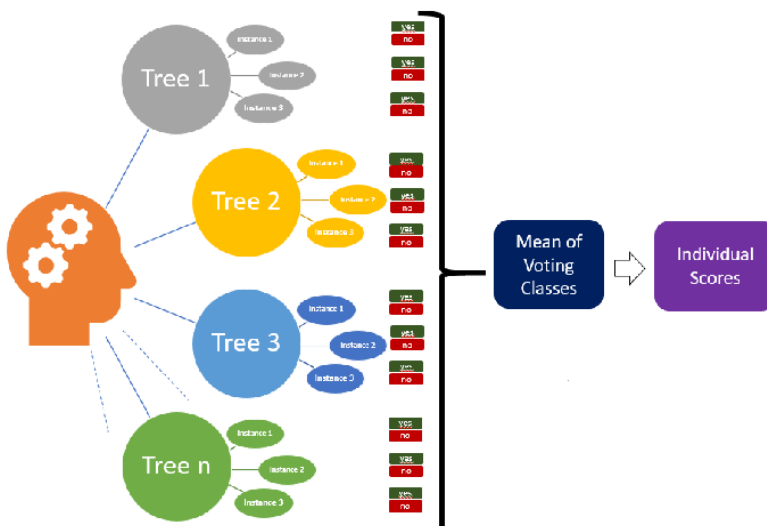
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This situation has led to an urgent need to find ways to speed up the identification and investigation of possible irregularities in federal transfers. In this context, Brazil’s Comptroller General (*Controladoria Geral da União*, the CGU) mobilised its strategic advisory efforts to find a solution for public sector managers—a predictive model based on artificial intelligence (AI), the Transfers Analysis Tool (*Malha Fina de Convênios*).

The Transfers Analysis Tool provides public sector managers with a comprehensive and innovative alternative to address certain issues more efficiently than conventional audits. The tool allows, with a certain degree of confidence, public sector managers to infer whether the agency’s analysis of the transfer will lead to its approval or rejection.

## How does the Transfers Analysis Tool work?

The tool uses unsupervised machine learning (see figure 2), an application of AI that enables the system to learn, without human intervention, based on pattern analysis of federal transfer data. The tool was built based on the characteristics of the more than 61,000 federal transfers that issuing agencies had already analysed. These transfers, analysed between September 2008 and December 2017, have provided a satisfactory amount of data for the underlying algorithm to learn, providing results with accuracy and precision.



## Figure 2 – Random Forest unsupervised machine learning used for the Transfers Analysis Tool

The algorithm assigns an individual score for each analysed transfer, ranging from zero to one. The closer the score is to zero, the greater the chance of approval. Conversely, a score closer to one signals a greater chance of rejection. Each federal issuing agency must then establish the individual threshold, between zero and one, which will determine the approval or rejection of the transfers. This threshold is calculated based on each agency's own risk appetite. All transfers whose score is above this threshold, as calculated by the algorithm, are labelled as "rejected," and therefore must be further analysed by the relevant agency.

## Changing the mind-set

A shift in the logic of internal audit work has enabled the development of the Transfers Analysis Tool. That is to say, the requirements imposed by control bodies, notably CGU, (e.g. evidence requirements and proof of expenses), contributed to inefficiencies in the accountability analysis stage, resulting in a backlog of requests. CGU's Transfers Analysis Tool helped to reduce this backlog immediately. After one year, the tool has helped to approve more than 3,000 transfers submitted to 14 federal agencies, thereby reducing the number of pending analyses. This has also allowed auditors to save their efforts and concentrate their work on the transfers with a higher probability of irregularities.

Finally, although CGU has led the development, the Transfers Analysis Tool was only possible due to a joint effort with public sector managers, and it represented a shared approach to problem solving with line ministries. The tool helps to automate well-defined and repetitive tasks, freeing auditors from doing monotonous and low-judgment audit tasks, consequently enabling them to focus on tasks that require qualification, sophistication and greater professional-judgment. Ultimately, these efforts will help to improve efficiency and effectiveness in the public sector.

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Sergio Neiva is a Brazilian public civil servant at Controladoria-Geral da União – CGU (Brazilian Comptroller General). He is a Federal Auditor since 2012 and he has occupied different positions at CGU’s Internal Control Secretary as a general manager. He is a telecommunication engineer, specialist in IT governance and holds a Master’s degree in public administration. Before working in the public sector, he worked in the telecommunications industry as a consultant at Accenture and later as an engineer at Telecom Italia Mobile (TIM). Sergio is an expert in handling highly critical platforms and in assessing internal controls, governance and risk management. Currently, his main project at CGU involves the use of data science, machine learning and artificial intelligent in the improvement of Brazilian public agencies efficiency.

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