The implementation of an integrated education data system at national level: the Sistema Gestão Presente.

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Abstract. This article analyzes the implementation of the Sistema Gestão Presente, an initiative of NEES (UFAL) in partnership with the Ministry of Education for the interfederative integration of educational data, with the aim of optimizing data management and supporting educational programs at a national level. This study highlights the main challenges faced during the process of implementing this system, using as a repertoire the discussion about data governance, which has already existed in Brazil for some decades. Based on focus groups, one-on-one meetings, discussion groups and experience reports, the article brings together challenges and strategies in four categories: 'Programa Pé-de-Meia business rules challenges', 'Service challenges', 'Follow-up and monitoring challenges' and 'Technological challenges'.

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1. Introduction

Digitalization has become a strategic priority for many governments around the world, especially about data governance and the implementation of public data management systems. The integration of educational data, in particular, has proved to be a complex but crucial challenge for improving public policies in the education sector. In Brazil, one of the most recent and significant examples of this attempt at digital transformation is the Sistema Gestão Presente, an initiative aimed at the interfederative integration of educational data at a national level. Developed by the Núcleo de Excelência em Tecnologias Sociais (NEES/UFAL) in collaboration with the Ministry of Education (MEC), this system seeks to optimize the management of educational information and subsidize important programs, such as the Programa Pé-de-Meia.

However, implementing such a comprehensive and complex system is no simple task, and various challenges arise along the way. Interfederative integration between states, municipalities and the federal government, which is necessary for the Sistema Gestão Presente to be fully operational, requires harmonization of data, standards and protocols that are often difficult to establish, given the diversity of local realities and the lack

of adequate infrastructure in some regions. Furthermore, implementing digital systems in public contexts involves overcoming obstacles related to political, cultural and organizational issues. In this scenario, understanding the challenges faced by subnational governments (states, municipalities and other federative entities) and the strategies adopted to overcome them is fundamental to the success of digital transformation in the education sector.

The aim of this article is to identify the main challenges faced in implementing the Sistema Gestão Presente and to report on the strategies developed to deal with them. Through this case study, which takes on the characteristics of an action research project, the experiences of the different actors involved in the process were analyzed, with an emphasis on the follow-up and monitoring methodologies, meeting local demands, and the specifics of the qualification criteria for the Programa Pé-de-Meia. This study is part of the broader context of digital transformation in the public sector and contributes to understanding the obstacles and solutions applied in the process of educational data governance between the different federal levels of government.

The methodology adopted for the research is mostly qualitative, with a case study of the Sistema Gestão Presente. For data collection, focus groups were used, as well as one-on-one meetings, discussion groups and experience reports from the system users. The data was analyzed using content and discourse analysis techniques, allowing for a deeper understanding of the dynamics involved in implementing the system and the different strategies developed to overcome the challenges identified. The analysis also made it possible to identify lessons learned and good practices that can be applied in similar contexts.

The results obtained show that various strategies have been implemented to ensure the effectiveness of the Sistema Gestão Presente. Data visualization tools were created, such as Business Intelligence (BI) and reports aimed at different actors, with a view to continuous monitoring and follow-up. General and specific training was provided, as well as individualized support according to the needs of each case. In the context of the Programa Pé-de-Meia, specific functionalities were developed, such as the identification of people deprived of their liberty and new functionalities aimed at Youth and Adult Education (Educação de Jovens e Adultos - EJA). Finally, the system now has additional features, such as the ability to activate and inactivate enrolments and send data in .xsl file format, optimizing the management of educational information.

2. Methodology

The fact that this research team also manages the implementation of these policies means that the process of identifying the challenges and defining the strategies to solve them has the characteristics of 'action research'. According to Foster (1971), this is a

> type of applied social research, which differs from other varieties by the immediate involvement of the researcher in the action process and where the intention of the parties is to get involved in the change that comprises the properties of the system itself.

This methodology aims to investigate and solve a problem at the same time, in other words, “it has a dual commitment: to find and implement solutions to problems” (Drago, 1989, p. 66). The action research that led to the reflections and improvements listed in this article is in line with the in itinere evaluation process that management and monitoring coordination carry out during the policy implementation stage. This is the category of evaluation that takes place during implementation and corresponds to monitoring, the purpose of which is to monitor processes and make the necessary adjustments to policies (Secchi, 2015).

Each of the challenges listed in this text (Programa Pé-de-Meia business rules challenges; Follow-up and monitoring challenges; and Technological challenges) had its own techniques for collecting data and identifying problems, as well as methodologies for structuring strategies to solve or mitigate them. In general, the vast majority used qualitative survey techniques, with the exception of the Follow-up and Monitoring Challenges, where qualitative and quantitative data analysis techniques were combined. The table below systematizes the techniques used by each of the fronts:

Fig. 1 - Research techniques used in each of the axes of analysis.

Analytical axis	Mapping the challenges	Definition of strategies
Business rules challenges of the Programa Pé-de-Meia	One-on-one meetings and discussion groups between consultants and operators.	Focus groups, participant observation and discourse analysis of technical reports.

Follow-up and monitoring challenges	Discussion groups with consultants and federal managers, as well as ex-post monitoring of implementation (clustering and analysis of quantitative data).	Discussion groups with federal managers, implementation teams and data scientists and dynamic mapping of user experience of interaction with the tools.
Technological challenges	One-on-one meetings and discussion groups between consultants, operators and federal managers.	Discussion groups between the technological development team, the implementation team and federal managers, followed by technical action to implement improvements to the system.

In the case of the Programa Pé-de-Meia Business Rules Challenges, in typical action-research fashion, data and information were collected during the implementation process by the implementing agents themselves - consultants who have constant contact with the Secretariats during the 15-day data submission window each month. The difficulty was detected through contact with the operators of the networks that offer EJA, in one-on-one meetings and discussion groups held between August 26 and September 13, 2024. To define the strategies for incorporating EJA into the PDM system and business rules, focus groups were held with all the state networks, online, between September 19 and 24, 2024.

The groups were divided so that there were three state networks in each room, with the exception of the state of Rio Grande do Sul, which had to be interviewed individually due to unforeseen circumstances. The rooms were divided as follows: (1) Acre, Paraíba, Goiás; (2) Amapá, Rondônia, Minas Gerais; (3) Rio Grande do Norte, Roraima, Sergipe; (4) Pernambuco, Paraná, Tocantins; (5) São Paulo and Maranhão; (6) Rio Grande do Sul; (7) Alagoas, Pará, Rio de Janeiro; (8) Amazonas, Distrito Federal, Mato Grosso; (9) Ceará, Mato Grosso do Sul and Santa Catarina. Subsequently, a discourse analysis of the meeting minutes, participant observation and a technical report were carried out.

As with the previous challenge, the identification of the Follow-up and Monitoring Challenges comes from the experience of the researcher-authors themselves, who work in and manage the policy implementation process. Therefore, the action-research process itself made it possible to map out these challenges, either through the demands for data received in discussion groups with the implementation consultants and the Federal Managers, or through the in itinere evaluation inherent in the policy cycle. The implementation process itself, therefore, and its actors, raised the need for monitoring, clustering and analysis of the data received by the System. In order to overcome this challenge, discussion groups were held with federal managers, implementation teams and data scientists between October 2024 and February 2025, in addition to mapping the user experience of interacting with the data visualization tools created. The process of creating the tools began in August 2024, and the stages of delivering the monitors and dashboards have already begun, with all the products expected to be delivered by the end of the first half of 2025.

In the case of the Technological Challenges, the process has different characteristics from the others, mainly because it involves direct changes to the system itself. The consultants continued to be key players in mapping the challenges, in addition to the group meetings and technical reports issued. These challenges were identified in individual meetings between the consultants and the networks and in discussion groups with the networks, held daily during the 15-day window for sending data in the month. These moments of collective discussion with the networks take place online, are led by the implementation team and are open to all those who have signed up to the Sistema Gestão Presente.

The demand to improve the system's ability to receive files in .xls format arose during the first data submission window, which took place from April 3 to 12, 2024, but gained momentum during the following window, between May 2 and 10 of the same year. On the other hand, the improvement in viewing multiple enrollments was not directly raised by the Networks, but was observed in the operators' reports to the consultants in the individual meetings and collective discussions of the June (June 1-14, 2024) and July (July 29-August 9, 2024) windows.

The solutions to the problems identified were already clear during their mapping. However, it took an effort on the part of the technological development team to implement these changes in the system. After opening an internal protocol on these demands for improvements, various discussion groups were held between the technological development team, the implementation team and federal managers, leading to technical action to implement improvements to the system. From the detection of the challenge, through the discussion stages, to the system improvements, it took five months of work on each demand.

The methodological procedures used both for mapping the challenges and for defining the strategies reinforce the

importance of combining action research and in itinere analysis of the public policy implementation process. Although each of the challenges listed here has its own particularities in terms of the techniques used, all the strategies have a common goal: inducing the use of the system by the adhering Networks and improving the platform's user experience.

3. Data Governance in Brazil

According to ENAP (2019) "the government is an information institution": it consumes information and produces information. "Its performance, in all areas, is linked to this information". From this understanding, and in view of the digital revolution that processes, data and functions have experienced in the last 50 years, trends and changes in previously established management models have emerged. Along these lines, Enap (2022) cites the "New Public Governance" as a model that "seeks to meet the demands of an increasingly complex society from a network approach with various actors to govern" (Enap, 2022, p. 4), and which involves aspects such as the promotion of e-government, the intention of open government and the integrated development of services together with the government.

In this ecosystem, one of the strands linked to NPG is identified as "Digital Age Governance" (DEG) and represents a trend developed from the facilitation of ICTs (Information and Communication Technologies). This strand is characterized by "the incorporation of various political, cultural and institutional systems" (Fraga, 2020). It is in the context of this administrative reform, based on an innovative context such as digital transformation, that new governance practices are being designed and implemented. A major challenge for public institutions in this scenario is not to repeat, in the virtual environment, the shortcomings of physical structures, such as confusing government information that is ill-prepared to meet new social demands (Nogueira Junior, 2019).

Within the scope of the Digital Age Governance (DAG) fronts, a specific approach is being developed for data management in the context of digital transformations, e-government and open government. The term "Data Governance" is used to describe this approach. According to Enap (2019, p. 5),

> in short, Data Governance is responsible for managing the principles of organizing and controlling data and information. This management involves interfacing with various other functions and establishes corporate policies and guidelines for governing data, as well as assigning roles and responsibilities.

Data Governance covers a very broad scope, going beyond simply defining norms and standards, or controlling and allowing access to information. It also involves a more detailed approach to the organization's strategic data, analyzing and designing the processes that produce and consume it. In this vein, Enap (2019, p. 5) further defines Data Governance as the set of policies, processes, people and technologies that have the "objective of improving the efficiency of management processes and data quality, in order to promote operational efficiency, as well as guaranteeing the reliability of information that supports decision-making".

In Brazil, digital government actions began to be structured in the 2000s. With the aim of prioritizing the use of ICTs to democratize access to information, expand popular participation in the construction of public policies and improve the quality and effectiveness of services to citizens, the "Electronic Government" (e-Gov) was built. This project was a milestone in the development of e-government in the country, materialized in the adoption of digital platforms and the availability of public services online, and represented Brazil's accompaniment of international trends in the digitalization of public administration, aligning itself with global initiatives to promote greater transparency, efficiency and digital inclusion.

The development of Data Governance strategies in Brazil by the federal government has become increasingly important in recent years, with the aim of guaranteeing the efficient and secure management of public information. The creation of national policies, such as National Open Data Policy[1] and the Lei Geral de Proteção de Dados Pessoais (LGPD) (National Open Data Policy and the General Data Protection Law)[2], for example, illustrate the commitment to promoting transparency in access to data and guaranteeing the privacy and security of personal information. Figure 2 shows the timeline of actions involving Data Governance in Brazil, within the scope of the Federal Government:

Fig. 2 - Timeline: evolution of Data Governance in Brazil.

2000	2001	2002	2003	2004

[1] A set of guidelines and strategies established by the Brazilian government under Decree No. 8,777 of May 11, 2016, to promote transparency and make public data available in an accessible, structured and open way to the population.

[2] The Lei Geral de Proteção de Dados Pessoais (LGPD) (The General Personal Data Protection Law), Law No. 13,709, was sanctioned on August 14, 2018 and came into force in September 2020. It establishes rules on the collection, storage, use, processing and sharing of personal data in Brazil, with the aim of guaranteeing citizens' rights to privacy and the protection of their personal data.

- Policy E-gov - Social Information Program - Electronic Government Executive Committee (CEGE)	- Public Infrastructure Keys - E-Government Portal	- Website Rede Governo	- Infovia Brasília Network Communications - Management Committee for the Internet in Brazil	- Portal da Transparência (Transparency Portal)
2005	**2006**	**2007**	**2008**	**2009**
- E-governo Interoperability (e-ping) - Website E-procuração - National Program for Public Management/ Debureaucratization	- Portal da Inclusão Digital (Digital Inclusion Portal) - Survey of the Evolution of Services with e-Government Indicators	- Electronic Government Accessibility Model (eMAG) - Accessibility Site Evaluator (ASES)	- Web Standards (ePWG) - National Spatial Data Infrastructure (NSDI) - General Information Technology Strategy (EGTI)	- Citizen's Decree: simplification and integration of public services
2010	**2011**	**2012**	**2013**	**2014**
- National Broadband Program - ICT e-Government Survey	- Interministerial Committee for the National Open Government Action Plan	- Accessible websites for people with disabilities - Access to Information Act - National Open Data Infrastructure (INDA) - Brazilian Open Data Portal	- Digital Cities Program - Decree no. 8.135: Data communication with the federal government	- Civil Rights Framework for the Internet - VLibras (automatic digital translator of Libras through the Brazilian Sign Language) - Digital Government Identity - Decree No. 8.243: Social Participation in National Policy - Portal Participa.
2015	**2016**	**2017**	**2018**	**2019**
- Brazil Much Simpler Program - National Electronic Process (PEN)	- Decree No. 8.638: Digital Governance Policy - Digital Governance Strategies (EDG) - Decree 8.777: Open Data Policies - Digital Citizenship Platform - Decree No. 8.789: Federal Data	- Decree No. 9.094: Simplification of the Public Service - Decree No. 9.203: Federal Governance Policy - Govdata platform launched - Forecast of services using "Brazilian Citize"	- Decree No. 9.319: National Digital Transformation System and Brazilian Strategies for Digital Transformation (EDigital) - Order no. 107: revised version of the Digital Governance Strategies (DGS) - General Data Protection Law (Law No. 13.709/2018)	- Decree No. 10.046: Data Sharing Governance and Citizen Base Register and the Central Data Governance Committee - Decree No. 9.723: establishes the CPF as a sufficient instrument and substitute for the presentation of other documents - Decree No. 9.929: National Civil Registry Information System – Sirc
2020	**2021**	**2022**		
- Decree No. 10.332: Digital Government Strategy for the period 2020 to 2022 - 18 strategies and more than 50 initiatives with a portfolio of more than 1000 digital transformation projects - Decree No. 10.403: Governance in Data Sharing and the Citizen's Base Register and the Central Data Governance Committee.	- Law 14.129/2021: Digital Government to increase public efficiency	- Decree No. 10.996 of March 14, 2022, amends Decree No. 10.332 of April 28, 2020, which establishes the Digital Government Strategy for the period 2020 to 2022 - brings GovTechs closer to the country's digital transformation actions.		

It is on the path (and in the qualification) of these technologies that the Sistema Gestão Presente emerges. At the same time as establishing government policies and guidelines for collecting and sending educational data at national level, the partnership between NEES and MEC develops and strengthens the management of this data, with the aim of qualifying and guaranteeing the reliability of the information that supports important decision-making. Data interoperability and cross-referencing with other government databases (Gestão Presença,

CadÚnico, Receita Federal, Inep, Ideb) are just some of the innovations proposed by the SGP, which has undoubtedly drawn on many lessons learned at the forefront of Data Governance in Brazil.

Interoperability frameworks, digital identity systems and data infrastructure are among the most common key enablers mobilized to promote an environment conducive to the dynamics necessary for the growth of digital government.

The Sistema Gestão Presente

Developed by the Center of Excellence in Social Technologies (NEES/UFAL) for the Ministry of Education, the Sistema Gestão Presente (SGP) is the latest innovation in data governance in Brazil. Recently institutionalized by Mec Ordinance No. 234, of April 2, 2025, the SGP is part of the "MEC Gestão Presente - Basic Education Data Platform", which aims to

> foster and adopt digital government instruments in the management of basic education policy, at federal, state, district and municipal levels, in order to ensure that school information is collected and shared in a standardized and effective manner (BRASIL, 2025).

The formalization of the Sistema Gestão Presente in the Ordinance confirms the commitment in Brazil, mentioned by OECD (2018, p.116), to develop digital government through "legislation that regulates the use of digital technologies in the public sector, the economy and society". The platform gathers data related to education across the country, integrating state, municipal and federal networks, from basic education to higher education. The aim of the system, in addition to becoming a robust database of education in Brazil, is to enable school administrators to monitor the educational trajectory of the students in their networks, support school management and mitigate school dropout.

Currently (as of April 2025), the system receives registration data on students and their legal guardians, as well as data related to school enrollment and attendance. The scope and quantity of data gathered in the SGP also reinforces another major objective of the initiative: the integration of education data with various public policies (federal, state and municipal). In this sense, the SGP aims to simplify the process of sending and receiving education information related to various educational policies.

The implementation of the Sistema Gestão Presente was strategically aligned with the launch and implementation of the Programa Pé-de-Meia, an initiative to encourage the permanence and completion of high school for students enrolled in the public education network, launched by the Ministry of Education in 2024. To guarantee students' access to the incentives, which is directly linked to student attendance data, state and municipal Departments of Education, as well as federal education systems, must send student enrollment information via the SGP. In the Pé-de-Meia module, the platform verifies the student's eligibility to receive the incentives by comparing data sent by the education networks and systems with data from the Ministry of Social Development (MDS) and forwarding the information for account opening and payment to Caixa Econômica Federal (Federal Savings Bank).

In addition to integrating education data (basic and higher education), simplifying the process of sending and receiving information for public policies, and supporting educational and school management, the implementation of the Sistema Gestão Presente facilitates access to information (both by public administration and the general population) and relieves the burden on civil servants of the Departments, who, before the system, had to send the same data to different channels related to the various existing public policies. It is envisioned that, with the SGP, all policies will be "fed" by the same system, avoiding cumulative and disorganized data processes.

4.1. SGP Implementation: Challenges

Implementation is the phase in which the outlined alternatives are executed, transforming laws and guidelines into actions. According to Howlett, Ramesh, and Perl (2013), implementation is the phase of putting previously made decisions into practice, involving the actions of bureaucrats and the use of necessary instruments. The implementation phase is crucial, as the execution of a policy determines its effectiveness. According to Pires (2017), the way implementation occurs can affect individuals' access to public goods and services, impacting the overcoming of social inequalities. However, implementation is complex, interactive, and often uncontrollable, as it needs to adjust to the reality of situations, which can diverge significantly from what was planned (LOTTA, 2019).

To implement the Sistema Gestão Presente, the greatest need is data. How can all educational networks in Brazil be induced to send data on their high school students? To this end, a combination of strategies was designed by the public policy management of NEES, in dialogue with the Ministry of Education. The benefit granted by the Programa Pé-de-Meia undoubtedly already induces a large part of the networks to send information. But what processes are carried out for this sending? How is the sending done? By whom is the sending done?

The school networks (municipal, state and federal) appoint up to five employees who will be responsible for sending the data to the Sistema Gestão Presente. They are called “operators”. These professionals will be registered on the Simec[3] portal and, consequently, the SGP development team will add them to the system's users. Operators will enter the platform using their login already used in the Gov.br system[4]. With this access, the operator will be able to send data, monitor the processing of this data, check the status of enrollments and students eligible for the Programa Pé-de-Meia.

Taking advantage of the dialogue with the Programa Pé-de-Meia - which is based on students' monthly attendance - the Sistema Gestão Presente receives monthly data from the education networks. For approximately 15 days of each month, the system is “open” for receiving student data: from student registration, enrollment, attendance, transfers and completion. The data sent in during these 15 days will be processed in the remaining 15 days of the monthly cycle and will release student payments. The Sistema Gestão Presente receives data in two ways: by spreadsheet and by API. The strategy is to be able to cover departments with different structures and technologies and, at the same time, make the operator's job as easy as possible.

In order to cover the diversity of secretariats and make the operator's job easier, assistance and support strategies have been developed within the scope of the Sistema Gestão Presente. The main ones are the team of consultants, the training schedule and the support materials. The team of consultants was designed to support the networks and provide more personalized support, with a close eye on the realities and needs of each one. These consultants have been divided by region and state and are on call to answer questions and guide public managers and operators during the 15-day “data submission window”, but remain available for the rest of the month.

These same consultants are responsible for conducting training and on-call sessions for operators during the data submission window. The training sessions offered cover all the data submission processes in the Sistema Gestão Presente (registration, submission of frequencies and reporting of transfers and conclusions), for the two submission formats (spreadsheet and API) and the business rules of the Programa Pé-de-Meia (general rules, eligibility and payment). During these moments, the step-by-step processes are presented and the main doubts about each one are listed. In addition to this, there are also moments specifically for “questions and answers”, where any questions the operators may have been answered.

A series of support materials on the SGP was developed to provide support to operators outside of the training and on-call sessions and to concentrate the consultants' demands on the most complex cases. The most complete and requested material is the “Sistema Gestão Presente Manual”. This document details every step-by-step involved in each of the system's processes, listing the most frequently asked questions and pointing out exceptions and points of attention. The material, made available in PDF format to all operators, also provides various other secondary materials, such as screen recording videos of the processes and guides for filling in each column of the spreadsheets that are received in the System.

Even if various strategies are developed, both in terms of policy design and implementation, there will always be unexpected situations and challenges along the way. In the case of the Sistema Gestão Presente, this was no different. Although various processes, plans and procedures were created to facilitate its implementation, a number of challenges were faced in its first cycle of operation. The next section will deal specifically with these challenges, listing the solutions developed to overcome each one.

4.2 Challenges Faced

Brazil is a federative republic made up of three levels of government: municipal, state and federal. Federative units have the organizational autonomy to manage available resources and establish efficient processes and routines, develop strategies and implement policies according to the local reality. As a result of this autonomy, the lack of a unified education system in Brazil represents a major challenge, as each school network has the autonomy to organize itself pedagogically and administratively. Along these lines, the OECD (2019) has already mentioned the importance, for the coherent and sustainable implementation of digital government policies, of “coordinated public sector efforts across all sectors and levels of government”. But this autonomy, which is essential for dealing with the diverse educational and administrative realities of different contexts, can represent a challenge when implementing educational policies at national level.

The challenges encountered in implementing the Sistema Gestão Presente (SGP) were classified into four main categories to facilitate their analysis and understanding. These are: 'Programa Pé-de-Meia business rules challenges', 'Service challenges', 'Follow-up and monitoring challenges' and 'Technological challenges'. The first

[3] Simec is the Integrated System for Monitoring, Execution, and Control of the Ministry of Education (MEC), a platform that monitors and manages the federal government's budget and proposals in the area of education.

[4] The gov.br is a Federal Government portal that gathers services and information for citizens, as well as being a digital identification tool that allows access to digital public services.

refers to the adaptations and strategies developed to adapt the Sistema Gestão Presente to particularities that arose during the implementation of the Programa Pé-de-Meia, and which helped to qualify the data on the platform. The second category, 'Service challenges', covers difficulties related to communication and technical training of the system's data operators and the activities developed to overcome them. As part of the follow-up and monitoring challenges, the tools developed for controlling and analyzing the data received by the system are described, as well as the relevance of this process for implementing the policy. The last category lists some of the challenges experienced by the systems development team in inducing the use of the SGP and the interaction of users (operators) with the platform, and the improvements implemented to address them.

4.3 Business Rules Challenges for the Programa Pé-de-Meia

During the process of implementing public policy, it is expected that some unexpected situations will lead to its redesign, to adapt to different contexts. In this sense, the initial linking of the implementation of the Sistema Gestão Presente to the Programa Pé-de-Meia helped to qualify the collection of student, enrollment and educational institution data. The strategies developed aim to deal with the challenge of covering the diversity of high school scenarios and offers in Brazil. To illustrate this point, we mention one of the situations we have experienced, which is linked to changes in the business rules of the Programa Pé-de-Meia and data collection in the Sistema Gestão Presente: the inclusion of Education for Young People and Adults (EJA)[5].

The inclusion of the "Education for Young People and Adults" (EJA) teaching modality in the Programa Pé-de-Meia panorama of beneficiaries led to the need to redesign the business rules of both the Program and the SGP. In the case of the SGP (our focus in this text), it was necessary to create strategies that encompassed (and did not harm their respective students) the various forms of offer and modality of EJA (face-to-face, semi-presential and non-presential offer). The modalities of provision directly affect the calculation of student attendance, as several educational institutions did not even collect student attendance data, and in others, attendance was only collected at a face-to-face meeting offered every one or two months.

In order to take account of these realities and ensure that EJA students were not disadvantaged by them (or that those eligible to receive the benefit stopped receiving it), a change was made to the attendance calculation carried out by the Sistema Gestão Presente, which now takes into account the workload offered by the educational institution. The formula used by the SGP to calculate the student's monthly attendance percentage is now: Present workload/Offered workload *100. This means that the student's attendance percentage will only be calculated taking into account the hours offered to them by the educational institution.

In addition to this, another particularity of the EJA that has led to changes in the Sistema Gestão Presente (both in data collection and management) involves the timing and duration of each stage/cycle in relation to regular high school. There are educational institutions where the complete EJA cycle (which corresponds to full secondary education) lasts six months, others a year, others a year and a half... With these cases in mind and the importance of collecting this data, a field was inserted to identify the total workload planned for the course in which the student is enrolled. Containing the options "First third of the workload of the EJA offer"; "Second third of the workload of the EJA offer" and "Third third of the workload of the EJA offer", this field helps to estimate which stage of secondary school the student is in.

In this way, the changes implemented in the Sistema Gestão Presente highlight the difficulties and adaptation needs that a platform that sets out to encompass all Brazilian education data goes through during its implementation period. By restructuring parameters such as the calculation of attendance and the identification of the stage taken, the system is molded to the particularities of this modality, guaranteeing greater precision in the collection and interpretation of data.

4.4 Follow-up and Monitoring Challenges

In order for us to identify the challenges and consequently plan actions to overcome them, the process as a whole needs to be monitored and followed up. In this sense, how can we design monitoring strategies in a policy that is constantly in flux, both in terms of actions and players? How can we identify the main difficulties and errors in sending data, beyond the operators' reports (even because of the difficulty in contacting some of them)?

Monitoring is an essential activity that supports decision-making, involving production, recording, monitoring and critical analysis of information, with a view to effective management and continuous improvement of the services offered to the population (Jannuzzi, 2013). On this path, the greatest (and most complex) thermometer of the assertiveness of the implementation is obtained through data: in this case, data that indicates the sending of information by operators. In the first few months of implementation, we began to develop incipient

[5] Mode of education established by Law nº 9,394/96 (Law of Directives and Bases of National Education), aimed at individuals who did not have access to or continuity of studies in elementary and high school at the appropriate age.

tools for monitoring the sending of data, which provided information on frequencies sent by Network (state, municipal and federal). This is the basic concept for monitoring the success (and critical cases) of the implementation of the Sistema Gestão Presente, as it shows how easy or difficult it is to operate the platform and send the data it requires.

Using this data (frequency sending), it is possible to identify, in a basic and general way, which networks have already sent a high percentage of data in relation to the number of students enrolled, and those that have not sent or have sent a quantity of frequencies that represent a low percentage in relation to the whole network. Since the first months of the SGP's implementation, during the data submission windows, this daily monitoring of submissions has been carried out, which, through the figures, directs the consultants' work to the most critical cases (networks that have submitted a low percentage of data).

As the process in the system became more complex (more functions and procedures) and the data provided by the networks increased (student profile data, characteristics of the modality offered), both the consultants and the implementation coordinator felt the need to improve monitoring of the induction to use the SGP and, consequently, to send data to the system. In order to qualify this monitoring, various strategies were developed, with the different actors who demand data from the system in mind. In general, the strategies involved monitoring panels, BIs (Business Intelligence)[6] and reports.

The strategies developed can be categorized by monthly period (during the data submission window and after the window closes) and by the actors they are aimed at (consultants, implementation managers and coordinators and Ministry of Education managers). For this analysis, we will use the monthly period criterion to describe the initiatives, as illustrated in Figure 4:

Fig. 3 - Data monitoring strategies and tools developed.

Monthly period	Strategy	Target audience
Monitoring during the data submission window (15 days per month)	Daily monitoring bulletins for data sent by the Network (2 to 3 bulletins/day)	Consultants
	Data visualization tool (BI) to monitor the sending of data from the window (hourly update)	SGP and PDM managers and coordinators and MEC managers
Monitoring after the data sending window has closed	Report consolidating data from the closed window	MEC managers
	Sistema Gestão Presente data visualization tool (updates after the data submission window closes)	Managers and coordinators SGP and managers MEC

Source: prepared by the authors

As can be seen in the figure above, different strategies have been developed, each geared towards a specific demand and target audience. The daily monitoring bulletins are an essential tool for the data submission windows, as they allow consultants to keep track of the networks they are responsible for and to prioritize critical cases, identifying those with low submission rates.

In addition to this short daily summary, a visualization tool was developed for SGP managers and coordinators and MEC managers, with the aim of monitoring in "real time" (with one hour of processing). This tool brings together more qualified data on enrollments and students (active, registered and valid enrollments, enrollments per student and reclassifications and transfers) and attendance (lack of attendance information by state and daily evolution of attendance sent by administrative dependency). The data presented in the tool allows for a more in-depth analysis of critical cases and the networks that need to be activated during the window.

Strategies were also developed for monitoring consolidated data after the end of the sending periods. The tool created for monitoring the Sistema Gestão Presente by managers gathers a larger and more qualified amount of data compared to the tool for monitoring data sent during the window. In this panel, it is possible to check, in addition to student registration data, consolidated attendance and profile data for students registered in the SGP. In the case of attendance, it is possible to view the information sent by month, average attendance by state, evolution and number of attendances above 80% and below 80% and unreported attendance. On the student

[6] BI (Business Intelligence) is a set of tools and technologies used to collect, analyze, and transform data into actionable information, helping managers make more informed strategic decisions.

profile screen, you can view information by gender, color/race and disability, as well as the number of students enrolled in regular or EJA modalities. All the data visualization tools also have filters that can be applied to all the indicators displayed on the screen: administrative dependency, UF, municipality, modality, reference month, teaching stage and organizational unit.

The last monitoring product strategically developed, this time just to provide the Ministry of Education's management with information, was the consolidated window reports. These materials, as the name suggests, compile the results of the main indicators collected during each submission period in the Sistema Gestão Presente, as well as giving feedback on the actions that were carried out in the implementation and induction axis during the window. This material also presents the critical cases - networks with the least amount of data submitted. As well as reinforcing the importance and results of the policy's implementation work, the reports support decision-making and the creation of new strategies by the MEC.

The development of these strategic products, which are widely used by their target audiences, reiterates the importance of monitoring and following up the implementation of public policies, whatever they may be, so that routes can be recalculated and results can be even more assertive. In the case of the Sistema Gestão Presente, these products are essential for qualifying the data collected and improving the data collection process itself.

4.5 Technological challenges

Many of the changes to business rules, as well as difficulties reported by operators to service consultants, lead to changes in the Sistema Gestão Presente - as well as adjustments to support documents linked to the system, such as the spreadsheets used to send data. In most cases, these changes are linked to three challenges: adapting to the different Brazilian educational contexts, the technical knowledge of the operators and improving the experience of the system's users.

To illustrate these changes, we have selected some (of the many) implemented in the 2024 cycle, focusing on improvements to the user experience, also related to the different levels of technical knowledge reported by the operators of the Education Networks. We won't go into the changes to the fields in the spreadsheets, which are the tools used to send the data (by those who don't use the API), and which are linked to changes in the business rules of the policies and their adaptation to the various high school offers in Brazil. Some of the adjustments involve the inclusion of fields to identify students in deprivation of liberty (PPL) and social name information.

The focus of this section, therefore, is on the strategies developed to deal with “everyday” challenges, which may often seem “small” - but which, when it comes to the amount of data sent by each network, can lead to major problems and, consequently, result in the disqualification of data, the lack of data and even the loss of benefits for students eligible for the Programa Pé-de-Meia. Against this backdrop, we will briefly describe two adjustments that were implemented with a focus on inducing use of the system and improving the user experience in the SGP: expanding the accepted spreadsheet file format and visualizing multiple enrollments. It is important to note that each of the changes to the system generated specific training for operators, in order to describe and demonstrate the step-by-step process and resolve doubts.

One of the biggest challenges for operators when sending data was handling the pre-formatted spreadsheets for this process. Their templates (“blank”) were downloaded directly by the system in .csv[7] format, and it only accepted uploads of files in the same format. Many operators reported difficulties in using this type of document and, in August 2024, it was implemented that spreadsheets could also be uploaded in .xls (the most common file format in Microsoft Excel programs). This change, which may be “simple” for those reading this description, was extremely important for the networks, as well as for encouraging the use of the system and broadening and facilitating the sending of data.

The second improvement developed within the scope of the Sistema Gestão Presente, with a focus on supporting its use and qualifying the data, was the ability to view students with multiple registrations, followed by the possibility of activating and inactivating registrations directly in the SGP. The SGP's data management flow faced a challenge not previously foreseen (or at least not to this extent): student transfers between different educational institutions. It is relatively common for students to transfer from one school to another during the school year, for any number of reasons.

This is another “commonplace” situation that has brought challenges for the SGP. In order for a student's transfer process to be consolidated, it is necessary for (I) the school of destination to enroll the student from the date they entered the institution and (II) the school of departure to report the transfer between institutions, based on the spreadsheets that are sent to the system. This process, however, presents mismatches and, in several cases, the student has two (or more) active enrollments in the Sistema Gestão Presente. At the start of implementation,

[7] CSV (Comma Separated Values) is a type of text file used to store data in a structured table format, separating the values with commas. These files can be created and edited in various programs, such as: Microsoft Excel, LibreOffice Calc, OpenOffice Calc, Google Sheets.

viewing and correcting these duplicate registrations was only done via spreadsheets (by downloading and sending documents).

To help in the induction of the system, make the work of the operators less complex and more practical and mitigate the cases of multiple registrations in the SGP, new functionalities were designed, developed and implemented on the platform. In general, with this improvement, operators are able to check, directly on the front-end, which students have multiple registrations, as well as view the other institutions in which the student is enrolled.

In addition to this, another new feature has been incorporated into the SGP regarding the scope of multiple enrollments. In addition to viewing the information relating to their multiple enrollments, operators can now confirm or inactivate the enrollment directly on the front-end. Those responsible for interaction with the system on the part of the Networks can also check whether the other Network to which the enrollment is linked has also confirmed the existence and permanence of that enrollment in their Network. The two functions, which are accessed in a "Multiple enrollments" section in the SGP, are interconnected and allow the operator to review the enrollments linked to a student (CPF) and inactivate or confirm this information.

To conclude, the changes made are mainly aimed at inducing more efficient use of the Sistema Gestão Presente and improving the user experience, considering the daily challenges faced by operators. Adjustments such as expanding the accepted file format and displaying multiple enrollments are examples of how the changes seek to simplify the data entry process and make it easier to navigate the system. These adjustments, although they may seem simple at first glance, are of great importance in practice, as they have a direct impact on the quality of the data sent by the education networks and on compliance with the program's requirements. Ultimately, these changes are essential to ensure that the system is adapted to different educational contexts and to improve the effectiveness of student data management.

4. Conclusions

The implementation of the Sistema Gestão Presente, focused on integrating educational data between different levels of government, reinforces the Federal Government's commitment to the Estratégia Federal de Governo Digital (EFGD), which promotes the acceleration of the government's digital transformation, and consolidates the vision of a government that is "innovative and collaborative in its efforts to promote the digitalization of its economy and society" (OCDE, 2018, p.38). The initiative aims, among other things, to subsidize public policies aimed at educational inclusion, such as the Programa Pé-de-Meia, and to provide greater efficiency in the management of educational data at a national level. However, as has been identified throughout this study, the implementation of digital systems in a public context faces multifaceted challenges.

During the process of implementing the Sistema Gestão Presente, strategies to mitigate these challenges were designed and adopted. These strategies have a direct link to the concept of data governance, which involves creating effective practices, policies and processes to guarantee the integrity, transparency, accessibility and security of information within a public system. Data governance is a central element for the effectiveness of any information management system, especially when it involves integration between different levels of government. Through visualization tools, specific functionalities and service strategies, the Sistema Gestão Presente is moving towards more efficient data governance, which ensures that educational data is used strategically and transparently to formulate public policies. However, data governance is not limited to implementing technologies; it also requires strengthening institutional capacities and building a culture of collaboration and trust between the different actors involved. The ability to deal with the complexities of data in a government environment requires not only technological innovations, but also a deep understanding of local political and social dynamics.

Throughout the implementation, it was possible to see that the Sistema Gestão Presente, although challenging, can serve as a model for other digital transformation initiatives in the public sector, especially about data integration between different levels of government. The strategies of monitoring, personalized service and adaptation to local needs offer important lessons on how to overcome obstacles related to the decentralization of management and the diversity of realities in Brazil. The experience with the SGP also highlights the importance of continuous monitoring and effective communication between the different actors involved, from technical teams to managers and decision-makers. Ongoing training and personalized support, such as general and specific training, are key to ensuring the system's long-term effectiveness.

However, the successful implementation of the Sistema Gestão Presente depends on constant evaluation and adaptation. Although it has been possible to overcome a number of challenges, the evolution of the system and the improvement of data governance require a continuous commitment to innovation and the improvement of information management practices. The role of technology in the digital transformation of the public sector is undeniable, but it must be borne in mind that the real transformation takes place to a large extent through the integration of technology and public policies. OCDE (2018, p. 48) also reinforced the convergence between

technology and public policies, analyzing the Brazilian scenario: “The Brazilian programmes on e-government and digital government reflect the country's path, its main priorities and goals in different periods, and most of all, it shows Brazil's progressive policy consolidation and growing maturity in addressing key issues associated with the digitalization of the public sector”.

In the case of the Sistema Gestão Presente, this integration implies careful data management, which takes into account local specificities, information security and, above all, the social impact of the policies implemented.

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