

# Developing the Strategic and Master Plan for Information and Communication Technology at the IT Agency of the State of Tocantins

Vanessa Tavares Nunes <sup>a\*</sup>, Claudia Cappelli <sup>b</sup>, Cristiane Oliveira<sup>c</sup>

<sup>a</sup> Institute of Technology and Leadership (Inteli), São Paulo, Brazil, vanunes@gmail.com, 0000-0002-5043-0207.

<sup>b</sup> State University of Rio de Janeiro, Rio de Janeiro, Brazil, claudia.cappelli@gmail.com, 0000-0003-1699-3492

<sup>c</sup>Information Technology Agency of the State of Tocantins (ATI/TO), Palmas, Brazil, crpoliveira@gmail.com, 0009-0005-8611-3093.

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**Abstract.** The rapid evolution of digital governance necessitates strategic planning to ensure efficiency, transparency, and adaptability in public service delivery. This paper presents the development of the Strategic and Master Plan for Information and Communication Technology (PEDTIC) at the Tocantins State Information Technology Agency (ATI/TO), a pivotal initiative aimed at strengthening digital transformation efforts in Tocantins, Brazil. The PEDTIC was built upon three foundational diagnostic assessments: the Governance of ICT, the Strategic IT Plan (PDTI), and the ABEP-TIC Index evaluation. These diagnostics provided a comprehensive analysis of ATI/TO's digital service capabilities, governance structures, and alignment with state objectives. The methodological approach combined situational assessments, regulatory reviews, management interviews, and benchmarking against national best practices. The findings highlighted gaps in IT governance, data integration, and digital service effectiveness. By aligning ATI/TO's strategic vision with the broader objectives of the Tocantins government, the PEDTIC establishes a framework that prioritizes structured governance, risk management, and the enhancement of public digital services. This study discusses the lessons learned from the diagnostic phase, emphasizing the importance of clear communication, cross-department collaboration, and proactive risk management in digital transformation. The PEDTIC provides a structured action plan with clearly defined objectives, performance indicators, and accountability mechanisms to ensure continuous improvement and adaptation. The results of this initiative have already led to a significant improvement in ATI/TO's ranking in the ABEP-TIC Index, demonstrating tangible progress in digital governance. Additionally, this paper explores the implications of ATI/TO's transformation towards a more strategic operational model, shifting from purely technical functions to a leadership role in state digital governance. The conclusions drawn highlight the critical need for structured digital strategies, ongoing capacity-building initiatives, and stakeholder engagement to sustain long-term advancements in public digital services. The PEDTIC serves as a case study for other government institutions aiming to implement structured and scalable digital transformation initiatives.

**Keywords.** Digital Governance, IT Strategic Planning, Government Digital Transformation, Public Sector Innovation, ICT Governance, PEDTIC, ABEP-TIC Index.

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# 1. Introduction

In the face of rapid technological advancements, the public sector must undergo significant digital transformation to meet the evolving expectations of citizens. This transformation is critical for embracing public and digital governance (Kitsios et al., 2023), where efficiency, transparency, and accessibility are paramount. The Tocantins State Information Technology Agency (ATI/TO) plays a crucial role in this transformation within the state of Tocantins, Brazil. The agency's efforts culminated in the development of the Strategic and Master Plan for Information and Communication Technology (PEDTIC), which serves as a comprehensive framework to guide the agency's digital initiatives.

The foundation for the PEDTIC was established through three diagnostic documents: the Governance of ICT, the Strategic IT Plan (PDTI), and the assessment of the ABEP-TIC Index. These documents provided a detailed analysis of ATI/TO's current state regarding digital transformation, IT governance, and alignment with the state's strategic objectives. The diagnostics involved a thorough review of existing regulations, interviews with management, and benchmarking against best practices from other states, highlighting both the strengths and areas needing improvement in the agency's digital service delivery.

The project aimed to identify the needs, challenges, and opportunities for ATI/TO, ultimately leading to the creation of a robust action plan to enhance its digital capabilities. The results from the diagnostic assessments revealed critical gaps in service delivery, integration of digital solutions, and data governance practices, which are essential for enhancing public service efficiency. Furthermore, by analysing the agency's performance against the ABEP-TIC Index, the diagnostics pinpointed specific areas for growth and improvement.

The lessons learned from this comprehensive diagnostic process are invaluable, providing insights into effective strategies for navigating the complexities of digital transformation in the public sector. The PEDTIC outlines clear actions, goals, and responsibilities, positioning ATI/TO to adapt and thrive in an increasingly digital landscape.

This introduction frames the importance of digital transformation in public governance, sets the context for the challenges faced by ATI/TO, and underscores the significance of the PEDTIC as a strategic response to these challenges. The subsequent sections will delve into the specific methodologies employed in the diagnostics, the findings that informed the PEDTIC, and the actionable strategies that will guide ATI/TO in achieving its digital transformation goals.

# 2. Context

In this section, we outline the methodology that was employed to assess the Tocantins State Information Technology Agency (ATI/TO) and develop the Strategic and Master Plan for Information and Communication Technology (PEDTIC).

The approach consisted of four key steps presented in the following four sections: the first (Section 3.1) focuses on a situational assessment of digital service delivery at ATI/TO, highlighting strengths, weaknesses, and areas for improvement. The second (Section 3.2) evaluates the existing IT governance practices, emphasizing the need for enhanced frameworks to align IT strategies with the state's broader objectives. Section 3.1 benchmarks ATI/TO against best practices from other states and organizations, providing insights into successful digital transformation strategies. Finally, Section 3.4 details the development of the PEDTIC, which presents a comprehensive action plan with defined goals and responsibilities aimed at guiding ATI/TO in its digital transformation efforts. Together, these sections provide a cohesive view of the main assessment processes and the strategic planning necessary for effective public sector digital transformation.

The methodology and findings presented in the subsequent sections align closely with the seven dimensions of ICT readiness assessment proposed in Alghamdi et. al. (2011), providing a structured approach to evaluating and enhancing ATI/TO's digital transformation efforts. In this paper, the authors define organizational requirements that are necessary for the adoption of e-government to resolve the delay of ICT readiness in public sector organizations in developing countries.

The situational assessment of digital service delivery (Section 3.1) corresponds to the user access and ICT infrastructure dimensions, as it evaluates the agency's ability to deliver accessible and efficient digital services while identifying gaps in technological capabilities. The assessment of IT governance practices (Section 3.2) addresses the e-government organizational ICT strategy and business process and information systems dimensions, emphasizing the need for alignment between IT strategies and state objectives, as well as the importance of process reengineering and interdepartmental collaboration. The benchmarking against best practices (Section 3.3) reflects the e-government program dimension, ensuring that ATI/TO adopts proven strategies for digital transformation. Finally, the development of the PEDTIC (Section 3.4) integrates all seven dimensions by providing a strategic roadmap that encompasses ICT architecture, human resources, and risk

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### 3. Approach

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#### **3.1 Diagnosis - Situational Assessment of Digital Service Delivery at ATI/TO**

The Situational Assessment of Digital Service Delivery at ATI/TO (in Portuguese: "Diagnóstico Situacional sobre Índice ABEP-TIC na ATI/TO") evaluates the current state of digital services offered by the Tocantins State Information Technology Agency (ATI/TO) as assessed by the ABEP-TIC Index (<https://abep-tic.org.br/pesquisa-indice-abep-tic/>). This diagnostic, applicable to all Brazilian states, focuses on the agency's capabilities in delivering digital public services and highlights key strengths and weaknesses in its operations.

Structured around the ABEP-TIC Index methodology, which consists of 35 criteria divided into three dimensions—Digital Service Offering Capabilities, Digital Service Delivery, and Regulatory Framework for Modernization—this assessment identified the effectiveness and efficiency of services provided. Following improvement actions between annual assessments, Tocantins State improved its ranking from 19th in 2023 to 9th in 2024.

Key findings indicate significant gaps in the implementation of digital services, which hinder the agency's ability to meet growing citizen demands for accessible public services. The assessment also underscores the need for better integration among various digital platforms to enhance user experience.

This assessment was important for aligning ATI/TO's strategies with the state's digital transformation objectives, serving as a foundational document for developing targeted strategies to enhance the agency's performance and service quality.

#### **3.2 Diagnosis - Situational Assessment for the Development of the PEDTIC at ATI/TO**

The Situational Assessment for the Development of the PEDTIC at ATI/TO (in Portuguese: "Diagnóstico Situacional para Elaboração do PDTIC da ATI/TO") analyzed current IT practices and governance frameworks within the agency. This assessment identified strengths, weaknesses, and opportunities, including benchmarking against other states to adopt successful strategies.

The evaluation emphasized the alignment of ATI/TO's IT practices with state objectives and the need for a cohesive

technology management approach. Key insights reveal that while a foundation for IT governance exists, improvements are necessary in communication and collaboration among departments, as silos limit information sharing and efficiency. Enhancing interdepartmental communication can facilitate a more integrated approach to service delivery and ensure that all teams are aligned with the agency's strategic objectives.

The assessment also highlighted the need for a structured framework for performance measurement and accountability, recommending the implementation of robust Key Performance Indicators (KPIs) for better tracking and decision-making. Ongoing training and capacity-building initiatives are essential for staff to adapt to rapidly changing technologies. Establishing a continuous professional development program may empower employees, enhance their competencies, and therefore improve the agency's ability to respond to the demands of digital transformation.

This assessment goes directly into the need for the development of the PEDTIC, providing a framework for actionable strategies to strengthen governance and enhance the agency's effectiveness in supporting digital transformation objectives. An Action Plan was formulated to address identified improvements, serving as a roadmap for necessary changes in digital service delivery and IT governance. Each objective within the plan is accompanied by specific actions, timelines, and assigned responsibilities to ensure accountability and facilitate effective progress tracking.

### ***3.3 Diagnosis - Situational Assessment for IT Governance and Digital Government Strategy at ATI/TO***

The Situational Assessment for IT Governance and Digital Government Strategy at ATI/TO (in Portuguese: "Diagnóstico Situacional para Governança de TI e a Estratégia de Governo Digital da ATI/TO") analyzed the current IT governance practices and strategic framework for digital government within the agency. This assessment identified strengths, weaknesses, and opportunities related to governance and alignment with broader digital transformation objectives.

The evaluation highlighted the importance of a robust governance structure to support digital initiatives. It examined current governance mechanisms, decision-making processes, and policies promoting transparency and efficiency. Key findings indicate that while progress has been made, improvements are needed in defining roles and enhancing stakeholder collaboration, which complies with the previous two Diagnostics.

The assessment also emphasized the need for a comprehensive risk management approach and compliance with regulations. Establishing a structured risk management framework will help ATI/TO proactively address challenges, ensuring alignment with state and federal guidelines. Fostering a culture of innovation and continuous improvement is also determinant for success, with ongoing training enhancing staff adaptability and skills.

This assessment serves as an important input for developing a cohesive IT governance framework and digital government strategy. It offered actionable insights and recommendations to strengthen governance practices and align digital initiatives with state objectives.

### ***3.4 PEDTIC Development***

The Strategic and Master Plan for Information and Communication Technology (PEDTIC) at ATI/TO is a framework that synthesizes the insights gained from the three situational assessments conducted. These diagnostics have highlighted the agency's strengths, weaknesses, and opportunities in the realms of digital service delivery, IT governance, and digital government strategy. By leveraging the findings from these assessments, the PEDTIC aims to create a comprehensive roadmap that aligns with the strategic objectives of the state and enhances the effectiveness of digital public services.

Creating a PEDTIC, as opposed to a traditional PDTI (Plano Diretor de Tecnologia da Informação), was chosen for several reasons. Firstly, the PEDTIC emphasizes a strategic approach that integrates both the operational and strategic dimensions of ICT, ensuring that technology initiatives are closely aligned with the overall goals of the organization and the needs of citizens. A comprehensive strategic plan like the PEDTIC facilitates a more proactive approach to technology management, enabling organizations to effectively anticipate future challenges and opportunities. Secondly, the PEDTIC encompasses a broader scope, addressing not only the technical aspects of IT governance but also the organizational, cultural, and societal dimensions of digital transformation. This holistic perspective highlights the importance of understanding the interplay between technology, people, and processes within the context of public service delivery.

ATI/TO PEDTIC is organized into sections, each designed to provide a comprehensive understanding of the agency's strategic direction and initiatives.

**Strategic Diagnosis:** It provides a comprehensive analysis of the current state of the Tocantins State Information

Technology Agency (ATI/TO). This analysis includes a SWOT analysis, generated based on the three previous Diagnostics, allowing the agency to understand its strategic positioning. The diagnosis reveals critical areas needing improvement, such as the integration of digital services and communication between departments. Additionally, it identifies strategic objectives that ATI/TO should pursue and offers practical recommendations to strengthen governance and enhance the delivery of digital services to citizens.

**Strategic References:** It establishes the guidelines that will direct ATI/TO in its initiatives and objectives. This section defines the agency's mission, which is to modernize public services through information technology, and its vision, which describes its aspiration to become a leader in digital governance. Furthermore, it presents the core values that will guide the agency's operations, such as transparency and innovation. The framework also includes strategic guidelines to ensure that all decisions and actions of ATI/TO are aligned with its mission and vision, promoting a collaborative and results-oriented work environment.

**Strategic Objectives:** It outlines the key goals that ATI/TO aims to achieve as part of its strategic planning. These objectives were designed to enhance the agency's capacity to deliver effective digital services and improve overall governance. Each objective is aligned with the findings from the situational assessments and emphasizes critical areas such as digital service modernization, data security, and stakeholder engagement. The section provides a clear framework for prioritizing initiatives that will drive the agency's digital transformation efforts, ensuring that all actions taken are focused on meeting the needs of citizens and enhancing public service delivery. We used the Balanced Scorecard methodology, but we adapted for public organizations.

**Action Plan, Goals, and Responsibilities:** It details the specific initiatives and actions that ATI/TO will undertake to achieve its strategic objectives. This section outlines measurable goals for each initiative, providing timelines and assigning responsibilities to ensure accountability (see an example in Figure 1). It emphasizes the importance of cross-departmental collaboration and sets forth a roadmap for implementing changes that will enhance digital service delivery and governance practices. By clearly defining actions, timelines, and responsible parties, this section ensures that the agency can effectively track progress and make data-driven decisions to adapt its strategies as needed, ultimately improving the quality of services offered to the citizens of Tocantins.

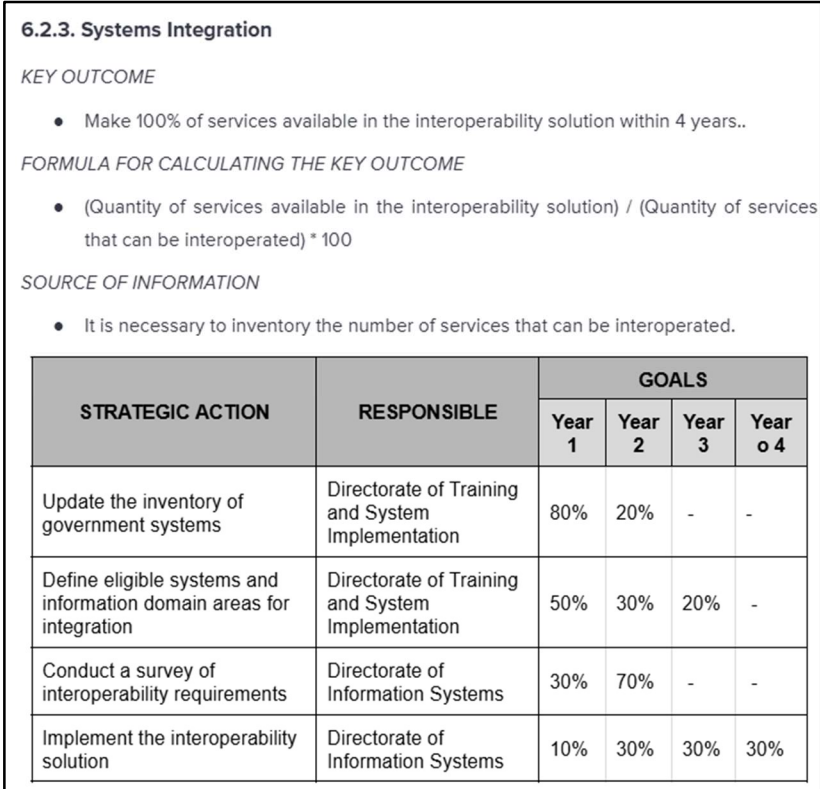


Fig. 1 - BSC Internal Processes -

Systems Integration.

**Risk Management Plan:** It outlines the strategies and processes that ATI/TO will implement to identify, assess, and mitigate potential risks associated with its digital initiatives and operations. It begins by identifying various types of risks, including operational, technical, and compliance-related risks, and assesses their potential impact and likelihood of occurrence (see Figure 2 and Figure 3). It emphasizes the importance of establishing a structured risk management framework that enables continuous monitoring and evaluation of risks. The plan includes specific mitigation strategies for each identified risk, detailing the actions that will be taken to minimize their

impact. Additionally, it assigns responsibilities for risk management tasks to appropriate personnel within the agency, ensuring accountability and effective oversight. By implementing this Risk Management Plan, ATI/TO aims to foster a culture of risk awareness and resilience, enhancing its ability to achieve its strategic objectives and deliver high-quality public services to citizens.

Risk Probability and Impact Matrix		IMPACT			
		Very High	High	Medium	Low
P R O B A B I L I T Y	Possível	<b>HIGH RISK</b> - Occurrence of a large-scale cyber attack that results in the interruption of systems and services	<b>MODERATE RISK</b> - Inadequate or insufficient technological infrastructure - Ineffective strategic planning	<b>MODERATE RISK</b> - Acquisitions or procurements not completed in a timely manner	<b>LOW RISK</b> - Ineffectiveness in communication with other areas and other agencies
	Improvável	<b>MODERATE RISK</b> - Unavailability of services due to the use of outdated technology	<b>MODERATE RISK</b>	<b>LOW RISK</b>	<b>LOW RISK</b>

Fig. 2 - Risk matrix.

<b>7.2.8 Risk: Occurrence of a large-scale cyber attack that results in the interruption of systems and services</b>
Risk Probability: Possible
Risk Impact: Very High
Mitigation Plan:
<ul style="list-style-type: none"><li>• Acquisition and procurement of security equipment and services</li><li>• Conducting penetration tests periodically</li><li>• Raising awareness among staff in the use of the corporate environment</li></ul>

Fig. 3 - Risk Description.

**Monitoring and Evaluation Plan:** It outlines the framework that ATI/TO will use to assess the effectiveness and impact of its initiatives and strategies outlined in the PEDTIC. This plan is important for ensuring that the agency remains accountable and can adapt its actions based on performance data and feedback. It establishes clear metrics and key performance indicators (KPIs) that will be used to evaluate progress toward achieving the strategic objectives. It details the processes for regular monitoring, including the frequency of evaluations and the methods that will be employed to collect data. It emphasizes the importance of involving stakeholders in the evaluation process to gather diverse perspectives and insights. Additionally, the plan outlines how the findings from monitoring activities will be communicated to relevant parties, ensuring transparency and fostering a culture of continuous improvement.

By implementing this Monitoring and Evaluation Plan, ATI/TO aims to create a dynamic feedback loop that informs decision-making, enhances operational effectiveness, and ultimately improves the quality of digital services provided to the citizens of Tocantins. This proactive approach allows the agency to make necessary adjustments to its strategies in response to changing needs and circumstances, ensuring that it remains aligned with its mission and objectives.

4. Results and Lessons Learned

The initiatives developed under the PEDTIC framework have significantly increased visibility regarding the necessary demands within the agency, fostering a deeper understanding among all stakeholders involved. By providing a clear and organized path forward, the PEDTIC has laid the groundwork for transitioning ATI/TO from operational tasks to a more strategic focus. This shift is fundamental for discussing the transformation of ATI/TO into a public enterprise, which is expected to enhance the dynamism and efficiency in executing necessary actions

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and initiatives. Furthermore, positioning itself strategically allows ATI/TO to be perceived differently within the State, among peer institutions, and in relation to the State Government. These early results demonstrate the potential for more streamlined processes and improved governance, setting the stage for future advancements in digital service delivery.

Additionally, by aligning its initiatives with themes related to Digital Transformation, by including challenges and opportunities in the public sector, ATI/TO is strategically positioned to foster future participation as a key entity in the long-term, medium-term, and short-term Government Plans. This alignment not only enhances the agency's relevance but also ensures that it plays a critical role in shaping policies and initiatives that drive technological advancement and improve public service delivery.

In approaching the seven dimensions proposed by Alghamdi et al. (2011), the methodology for assessing ATI/TO and developing the PEDTIC was designed to address both technical and human factors. The “e-government organizational ICT strategy” was evaluated through the situational assessments, which identified gaps in IT governance and the need for alignment with state objectives, leading to the formulation of a cohesive strategic framework in the PEDTIC. “User access” was analyzed in the ABEP-TIC Index assessment, which highlighted the need for better integration of digital platforms to enhance service delivery and user experience. The “e-government program” dimension was addressed by benchmarking ATI/TO against best practices from other states, ensuring that the agency's initiatives align with successful digital transformation strategies. “ICT architecture” was considered through the evaluation of existing IT infrastructure and the recommendation of scalable, interoperable solutions in the PEDTIC. “Business process and information systems” were examined in the situational assessments, which emphasized the need for process reengineering and improved interdepartmental collaboration. “ICT infrastructure” was a focal point in the PEDTIC, with specific recommendations for enhancing hardware, software, and connectivity to support digital services. Finally, the “human resources” dimension was addressed through the identification of training needs and capacity-building initiatives to ensure that staff are equipped to support the agency's digital transformation efforts.

Although the implementation of the PEDTIC is still in progress, some important lessons have already emerged. First, the importance of clear communication and collaboration among departments has been underscored, as breaking down silos is essential for fostering a cohesive working environment. Establishing regular interdepartmental meetings and communication channels will be vital in maintaining this collaborative spirit moving forward. Second, the need for adaptability has become increasingly evident. As ATI/TO navigates the complexities of digital transformation, remaining flexible and responsive to new challenges will be essential. Continuous training and capacity-building initiatives for staff will be necessary to equip employees with the skills needed to embrace these changes effectively.

Lastly, engaging stakeholders, including citizens and other governmental entities, has proven determinant for the success of digital initiatives. Actively seeking feedback and involving stakeholders in the decision-making process will enhance the relevance and effectiveness of the services provided.

## 5. Conclusion

The implementation of the PEDTIC framework represents a significant step forward for ATI/TO in its journey towards enhanced digital transformation and IT strategic governance. The early outcomes have demonstrated the agency's ability to increase visibility regarding necessary demands, foster collaboration among stakeholders, and establish a clear path for transitioning from operational tasks to a more strategic focus.

There is a clear necessity to implement the recommendations outlined in the diagnostics, which emphasize the development and application of a comprehensive digital government strategy, improvement in the ABEP-TIC Index results, and the effective execution of the PEDTIC. By addressing these key aspects, ATI/TO aims not only to rectify existing gaps but also to establish a resilient and agile framework capable of responding to future challenges in the digital landscape.

As ATI/TO positions itself as a key player in the public sector, aligning its initiatives with themes of Digital Transformation will not only enhance its relevance but also enable it to participate actively in shaping future Government Plans. The insights gained from this process underscore the importance of clear communication, adaptability, and stakeholder engagement, which are essential for navigating the complexities of digital advancement.

Moving forward, ATI/TO is well-equipped to leverage these lessons learned to foster continuous improvement in its service delivery and governance practices. By maintaining a proactive approach and embracing the opportunities presented by digital transformation, ATI/TO can significantly enhance its contributions to the State of Tocantins, ultimately benefiting its citizens and ensuring a more efficient and effective public service. With this vision and political openness, PEDTIC has been approved in its totality and its implementation is programmed to

already fully start in 2025.

## Contributor Statement

All of the authors were professionals that developed this project.

## Use of AI

During the preparation of this work, the authors used chatgpt and Claude to proofread in order to ensure the readability of the text. After using this tool/service, the authors reviewed, edited, made the content their own and validated the outcome as needed, and take full responsibility for the content of the publication.

## Conflict Of Interest (COI)

There is no conflict of interest

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