

# Citizen's Perception of Public Services Digitization and Automation

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**Abstract:** The Brazilian government, with the objective of promoting the transformation of its government services into digital services, has published relevant Decrees in recent years. This article aims to characterize public services, especially the Brazilian ones, in the context of digital transformation and proposes a model/process of digitization of public services focused on the needs of the citizen that can be used by any Government Agency that wishes to digitize its services, being adaptable and flexible, according to its needs. In addition, this paper presents the results of a survey in the scope of the Federal Public Administration to try to identify the expectation of the citizen and/or public servant with the Digitization of Public Services by the Brazilian Government.

## 1 INTRODUCTION

Digital transformation has emerged as a term that describes the departure from digitization efforts to a full stack revision of the policies, processes and services in order to create simpler user experiences for citizens and front line workers. While previous waves of digitization focused on the transition from analog to digital services to increase efficiency and effectiveness of government services, digital transformation aims to redesign and reengineer government services from the ground up to fulfill changing user needs. At the center of these efforts are users – both internal and external users – of digital services who are included in the digital transformation efforts.

Across the globe governments and government agencies are implementing digital transformation projects and initiatives for a myriad of reasons, of which the satisfaction and experience of a changing citizen is one and cost savings another. These transformations happen on all levels: national, regional, local, supra-national. They also happen beyond governments as such, among others in public sector services such as public transport and national health

care, across various government agency areas and in regulated and semi-regulated or state-sponsored services, which differ per country. With the technological evolution and expansion of the Internet, more governments are adopting Information and Communication Technology (ICT) to provide services (Fang, 2002), the term e-Government stands for electronic Government, and it has been expanding and evolving (Grönlund and Horan, 2005).

In relation to Brazil, the Brazilian government has sought to encourage Brazilian agencies to transform their services into digital services (a public service where it occurs electronically) for access, monitoring and evaluation of citizens. Since 2016, important decrees have been published in this sense, defining a Digital Governance Policy (Moura, 2016) and the Digital Citizenship Platform (da Republica do Brasil, 2016) in the scope of the Federal Public Administration. The Digital Citizenship Platform (da Republica do Brasil, 2016) aims to broaden and simplify the access of Brazilian citizens to digital public services, including through mobile devices.

The Federal Government Service Portal should be a single integrated channel for the provision of information, electronic request and monitoring of public services, whose objective is, in addition to providing practicality and agility for citizens and entrepreneurs, for digital services to reduce the cost to government

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by up to 97%. It is expected that the reduction will eliminate the unnecessary commuting costs of the government service, as well as waiting time in the queues, possible printouts of certificates, and document endorsements. The actions of the Platform are aligned with the Digital Governance Strategy (DGS) (Ministerio do Planejamento, 2016), (Musafir, 2018) that will guide the actions of Information and Communications Technology (ICT) until 2019.

Brazilian ones, in the context of digital transformation, investigating the pricing models of services and analyzing the context of the strategies of the Digital Platform and the Transformation Kit of the Brazilian Government. In addition, it is intended to answer the following question: How to work more closely with citizens and organizations in a context of continuous technological change and budgetary constraints?

## 2 BACKGROUND

In the study presented by (Janowski, 2015), an analysis of the evolution of initiatives for Digital Government is done, and a model with four evolutionary stages is shown: Digitization, Transformation, Engagement, and Contextualization. Each of these stages is analyzed in regards to their impact in three variables of the evolutionary process: the internal transformation of the government, the impact of the transformation on external relationships (Citizens and Government), and if the transformation is specific to the applied context (city, state, country).

Besides his study with the definition of the stages, Janowski (Janowski, 2015) presents a framework of evolutionary analysis for the institutionalization of the Digital Government as a result of governmental innovations executed to alleviate social, political, economic, and ecologic pressures. According to (Janowski, 2015), for each stage of the evolutionary process there are different pressures to be resolved and different available technologies, which lead to specific innovations and institutionalizations of the Digital Government. The impact of technologies in the government is causing a rupture in the digital capacities of the citizen. There are five main areas among the factors that influence and can facilitate digital transformation: **Strategy, Leadership, Workforce Talents, Digital Culture, and Citizen Focus (citizen-driven)** (Eggers and Bellman, 2016).

The steps of the digital evolution foresee that successful public agencies will be more flexible, adapting to the only constant of the digital era: change. This points to the need of reimagining services and of engaging the citizen. While some governments

struggle against change, others will take advantage of the transformation and prosper (Eggers and Bellman, 2016). Worldwide experience and best practices are very important for implementation of digitized services. E-government maturity models can serve as a way for provide best practices and recommendations to implement and move to higher stages of maturity in implementation of services (Fath-Allah et al., 2017).

Backoffice ICT use in Georgia has been a success, as has the introduction of key enablers, relevant registers and standards. Similarly, a number of high-volume, high frequency online services are available. The areas of open data, data reuse in government and eParticipation can be improved, but show some initial promise - particularly in relation to the open data portal. Georgia faces several recurrent challenges, including: limited budget availability; a shortage or underutilization of qualified staff; expensive infrastructure; a lack of some key national standards; data compatibility; and security issues. These challenges are amplified by the vacuum left by an inefficient or missing governance structures to ensure cross-governmental cooperation and joint development and has led to a fragmented ICT framework (Nielsen and Goderdzishvili, 2017).

The work proposed by (Nielsen, 2016) identifies three gaps in current e-government research: Which variables positively effects e-service use and whether these correlations be statistically proven; the degree with which governance and cooperation models ensure successful supply and use of e-services, and; existing stage models for mapping e-government progress only address supply-side, technology and organizational issues. The work concludes by outlining a proposal to address the identified research gaps. The work proposed by (Pieterse et al., 2017) determine how newer generations of service channels interact with existing channels and how these interactions impact the evaluations and success of public service delivery.

### 2.1 Related Works

Digitization, routine automation, robotics, and artificial intelligence affect business structure, organizations, and tasks at the most diverse levels of service delivery. (Jylhä and Syyrimaa, 2019) presents the result of a survey of the 11 largest companies providing outsourced services in Finland. The study identified that with the development of new technologies there will be changes in the profiles of professionals. In addition, it has helped to identify potential benefits from the use of these new technologies, helped to understand new ways of decision making, management

and staff training to adapt with less difficulty to this phase of significant change in the way we work and deliver services, since the spread of digitized services needs to have in its structure professionals able to deliver services and support for the most different user profiles (Jylhä and Syynimaa, 2019).

Simonofski et al. (Simonofski et al., 2017) conducted a systematic literature review to understand citizen participation in the delivery of digitized services. The authors identified four main factors that make up citizen participation in service delivery: 1. Stakeholders, who may be citizens, acting as end users, public servants, politicians, and software developers; 2. Preconditions that can be classified into motivations and barriers; 3. Participation methods, which may be classified as service co-design and service co-execution; 4. Results, which can be classified into traditional e-government information systems.

The Government of Portugal, according to Santos (de Lemos Santos et al., 2019), has been trying to identify ways to meet citizens' needs regarding public services, in order to make them simpler, easier to use and access, especially through mobile devices. Currently public services in Portugal are available through several non-integrated portals that are still in use. To minimize this problem, a Digital Excellence Center, called TicAPP, tries to support the Digital Transformation process of Public Administration. TicAPP follows development with a top-down approach to business architecture and based on the TOGAF ADM methodology. In the final stages of development, which are still running, it is expected to be able to assess the ticAPP maturity level using the Architecture Capability Maturity Model framework included in TOGAF and thus calculate the maturity rating.

The government of Uzbekistan, according to Shin (Sang-Chul and Rakhmatullayev, 2019), aims to achieve the optimization of government and administration units to create a digital government, promote decentralization of administration and create a "single center" that serves citizens and businesses based on integrated and centralized services on a single platform. Specifically, the proposal involves improvements to the technology infrastructure available both within the government and to the population that will have access to the new service delivery format, increase human resources and improve public services, mainly by using interactive service portals, which provide broad and rapid access, thus reaching the maximum digitization of government services, thus achieving the idea of achieving the sustainable development of society.

### 3 DIGITAL GOVERNMENT IN BRAZIL

The digitization of government services is a growing trend today. The digitization of public services has been transforming the relation between governments and citizens throughout the world. This process has been seen as a great opportunity for governments to ensure universal access to public services, offered with more quality and agility, as well as increasing citizen participation in the day-to-day of the public life, thus promoting the effective exercise of the concept of citizenship (Daugherty et al., 2016). Even though the benefits are unquestionable, there are many ways to approach government digitization, and each country adopts distinct, varied practices, according to their goals and possibilities. Therefore, it is a complex task of establishing comparisons between countries in regards to their maturity level in digitization. However, a recent report presented a comparison of the performance of ten countries in regards to their actions towards government digitization.

Brazil was one of the ten countries participating in this survey, and even though the report acknowledges and praises its government's efforts in relation to digitization, the results are lackluster, as the country takes the last place in the ranking of surveyed countries (Masson and Al-Yahya, 2014) (Coelho et al., 2016). Assessing the context of Digital Government in Brazil, some initiatives of the Brazilian government can be seen with the **Definition of Digital Governance and Digital Citizenship Policies**, such as the construction of programs, guidelines, and institutional support.

The Digital Governance Strategy (DGS) (Ministerio do Planejamento, 2016) defines the strategic objectives, goals, and indicators of the Digital Governance Policy, and asserts that its biggest challenge is cultural. With the objective of exploring, potentializing, and orchestrating synergies that promote higher efficacy, efficiency, and economy to the Brazilian Government, the DGS intends to foment a movement of simplification and optimization of public services, with improvements in the business environment and efficiency of public management.

The DGS acknowledges the need of refocusing when it comes to the stage of Electronic Government in Brazil, expanding it towards digital governance, where the citizen becomes a participant in the construction of public policies. Its purpose is, then, to orient and integrate the initiatives relative to digital governance in the Public Federal Administration, contributing to increase the effectiveness of generating benefits for the Brazilian society through the ex-

pansion of access to government information, the improvement of digital public services, and the amplification of social participation” (Ministerio do Planejamento, 2016).

In this scenario of Digital Governance and Digital Citizenship Platform, the Ministry of Planning, Development and Management anticipates that the Federal Government Services Portal will become a single, integrated channel for the display of information, electronic request, and monitoring of public services. To such end, one of the initiatives comprehends a technical solution for the automation of public services and deployment of services in the Government's Digital Citizenship Portal.

The Ministry of Planning, Development and Management (MP) coordinates the strategy of automation of public services together with agencies of the Public Federal Administration (PFA). In 2017, for the Portal of Government Services, they stipulated the sourcing, in the cloud, of a technologic solution for the automation of public services, in the Software as Service model (SaaS) (Pereira et al., 2017). This solution includes the adaptation and automation of the services public, with the use of the available technologic solution, including technical support and training, capable of serving the PFA's agencies in need of automatizing public services.

The Digital Platform (da Republica do Brasil, 2016) is a tool for request and monitoring of public services, which will allow for services to be offered electronically, including the: 1. Identification of public services and its main stages; 2. Electronic request of services; 3. Electronic scheduling, when necessary; 4. Monitoring of requests by stage/progress; and 5. Electronic petitioning of any nature. The platform has the following functionalities: graphic visualization of the demands; digital interaction such as chat and e-mail; and history of service and interactions between citizen and service provider (da Republica do Brasil, 2016). The platform is under construction, under the responsibility of the Ministry of Planning, Development and Management (MP), through a Digital Government program called Transformation Kit (Ministerio do Planejamento, 2017).

## 4 PROPOSED MODEL

Based on the studies carried (Acco Tives Leão and Canedo, 2018) out and in accordance with the Transformation kit of Public Services for the Brazilian Government, a digitization model of services to be tested by the Brazilian Government was proposed. The model proposed to customize the services pro-

vided by the Brazilian Government needs to have the Process centered on the Citizen, where each phase represents the activities necessary to be executed. The first phase, for example, which is to customize it. The goal is to understand citizen), requires the following activities/tasks to be performed:

1. **Map the Stakeholders:** Map the general outline and description of the different individuals, groups and organizations that interrelate, directly or indirectly, with each other.
2. **Identify the Possible Stakeholders:** Conducting a survey or interviewing citizens in a busy location.
3. **Identify Communication Channels:** Verify which communication channels will be used, and can be structured: surveys, interviews; formal unstructured: e-mail, chat; and informal: social networks.
4. **Identify Needs:** Map and classify quantitatively the priorities of services and/or functionalities to be implemented.
5. **Apply Techniques to Identify the Profiles of Citizens:** Profiles related to age group, educational level, economic situation, among others, must be identified for delivery of the adequate volume of information. Profiles related to difficulty of access or deficiency (auditory or visual) should be identified to suit the way the service is delivered.
6. **Provide a Tool to Evaluate the Services Provided:** Services must be continuously evaluated to identify changes or improvements to be developed, access below expected, as well as to perceive infrastructure or security problems.
7. **Apply Improvements in Services Provided:** Improvements or changes must be implemented to fit the perceptions of citizens.
8. **Implement Mechanisms to Maintain and/or Encourage the Use of Services:** The citizen should be encouraged to use the services as if they were part of their daily life.

This model will be implemented in a federal government agency with the purpose of executing all activities of the customize phase, recording all the collected information, as well as the citizens' feedback regarding the proposed model. If the necessity for adjustments is identified at this stage, these adjustments will be made prior to the implementation of the complete model, in order to allow the other phases to be detailed and implemented with the aim to validate the model as a whole and especially the first phase that is

important to understand the profile of the citizen who will consume the digitized services.

## 5 SURVEY

This work carried out a questionnaire survey in several Federal Public Administration (FPA) located in Brasília-DF, with information technology (IT) servers. The research was conducted in this city for being the headquarters of several Brazilian FPA. The IT servers were chosen for bringing a practical, real-world view of the current state of the technologies and infrastructure currently in place. The 15 applied questions were developed aiming to identify the current scenario of the digitization of public services of the APF according to the vision of the servers themselves.

A survey is not just the instrument (the questionnaire or checklist) for gathering information. It is a comprehensive research method for collecting information to describe, compare or explain knowledge, attitudes and behavior. The purpose of a survey is to produce statistics, that is, quantitative or numerical descriptions of some aspects of the study population. The main way of collecting information is by asking questions; their answers constitute the data to be analyzed. Generally, information is to be collected from only a fraction of the population, that is a sample, rather than from every member of the population (Kitchenham and Pfleeger, 2008).

The questionnaire was composed of 15 questions, 14 of which were multiple choice using 5 points in the Likert scale (Completely Agree, Agree, Neutral, Disagree e Completely Disagree) and one which was descriptive, to obtain information on services that have already been digitized by the surveyed Agencies. The applied questions are related to the expectation of the citizen and/or public servant in regards to the Digitization of Public Services by the Brazilian Government.

### 5.1 Results and Analysis

In the application of the questionnaire, 31 people answered the questions. The participants are part of different Agencies of the APF. In Figure 1, the results obtained are presented, with the perception of the user in regards to the economy of resources (such as outsourced workforce, water, telephone, electricity, and number of servants) that can be achieved with the digitization of public services. 90% of the participants hope that there is such economy. It's important to highlight that there were no answers disagreeing with

such affirmative, which is a positive aspect. According to the public needs and government parameters, it's important to have a conscientization of the economy of resources.

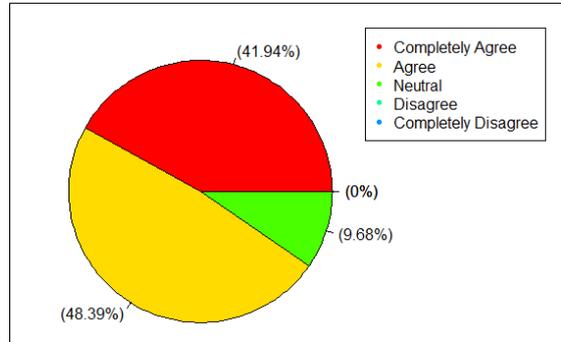


Figure 1: Do you think that the digitization of government services will achieve an economy of resources?

Among the myriad of services labeled as already digitized by the Agencies, the most relevant ones are the following: 1. Military Enlistment; 2. Consulting owed taxes; 3. Expedition of Certificates; 4. Input of documents of processes relevant to the society; 5. Implementation of the Electronic Process of the Electronic Information System (SEI); 6. Expert Reports; 7. Ombudsman Service; 8. Tracking protocol for shipment delivery; 9. Proceedings of documents. In relation to the use of electronic spreadsheets for the pricing of services rendered by an Agency, Figures 2 and 3 summarize the result of these questions. The first one refers to the utility of such spreadsheets, and the second to practicality in its utilization.

The analysis of the results show that the use of such spreadsheets, even if indicated by the MP, are not well known by the servants inside the Agencies - 39% stated that they didn't know there spreadsheets. When the spreadsheets are used, they generate dissatisfaction among some users (13%), which can be considered a point of attention for the process of digitization of services.

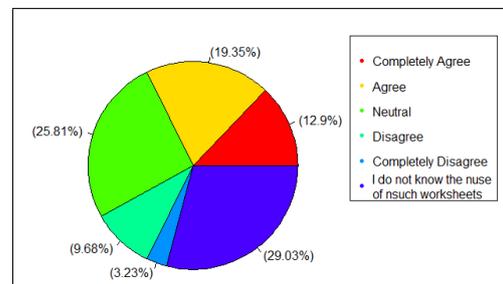


Figure 2: Has the use of electronic spreadsheets for the pricing of the services provided by your agency been useful?

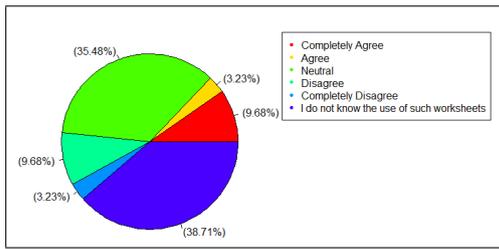


Figure 3: Is the collection of data to compose the electronic spreadsheets used to price digitized services accessible and dynamic?

The results show that 58% of the citizens make daily service requests from the digitized services already offered by the Agency. 10% request it weekly, 3% monthly, and 29% weren't able to inform the frequency with which citizens make requests. Figure 4 shows these results.

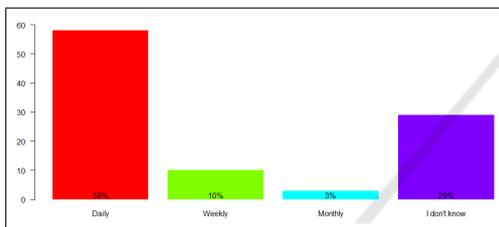


Figure 4: How often do citizens make requests to the digitized services offered by your Agency?

The time to answer these service requests was also evaluated and is shown in Figure 5. In the analysis of results, improvements that must be applied by the PFA in such processes were found, as a significant number of answers (35.48%) pointed to the unawareness of the information, which could indicate a lack of monitoring in that process or failures in the process of disclosing information by the Federal Government.

In regards to the questionnaire related to the average time of service of the requests, there are also opportunities for improvement, as the highest percentual found (22.58%) indicated an average of 15 days to have a request serviced. Such time frame can be improved with an efficient digitization and automation of services, bringing significant gain to the citizens. There are many services that need a faster response time, as waiting for 15 days for the citizen to receive a document can be quite problematic and cause insurmountable damage to the society.

The perception on the time spent by the citizen to request a service and the quality of the digitized services offered by the APF are presented in Figures 6 and 7, respectively. The analysis of these graphs show that these are the biggest factors of dissatisfaction among the participants. 19% of the interviewees

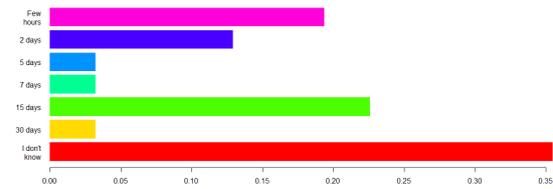


Figure 5: What is the average time to service the requests of citizens made on your Agency's digitized services?

claim that the time spent in current adopted solution is unacceptable and 7% completely disagree. This means that 26% of the interviewees think they spend too much time filling forms. Besides that, 61% of the participants informed that the quality of the digitized services offered is not adequate, and is below the expectations of such services. Again, this result shows a need for improvement in the quality of the services offered by the PFA, be them technical or usability improvements.

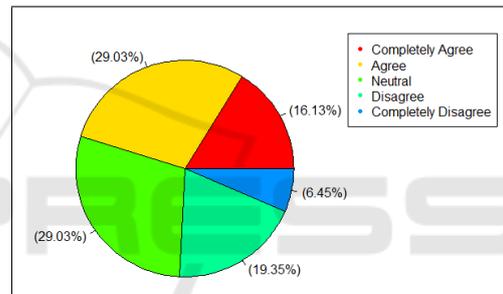


Figure 6: Is the time spent by the citizen to request a service in your Agency acceptable (is the request process fast)?

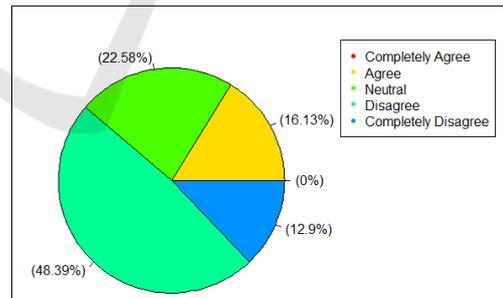


Figure 7: Is the current quality of the digitized services offered by the Agencies of the Public Federal Administration satisfactory?

In regards to the gain in transparency in the servicing of requests, it is possible to identify an expectation by the survey participants that the digitization increases the benefits and brings more transparency and trust to the services provided by the APF. 84% hope for such transparency. This result is shown in Figure 8.

The question related to the possibility of using differentiated technology according to the level of

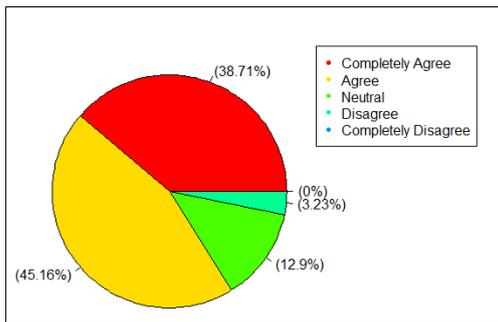


Figure 8: Will the digitization of public services offer more transparency in the services of your Agency?

knowledge of the citizen showed the most agreement by the participants. 87% of them agree that the use of a differentiated technology will bring more acceptance by the citizens. Figure 9 shows this result.

The acceptance and necessity of using new technologies to support the digitization and automation of services by the APF needs to take into account the use of methodologies for gathering the views of citizens/users when elaborating proposals and/or hiring the ones responsible for the development of a solution. Interviews, questionnaires, focal groups, etc. can be used to see the satisfaction or register complaints by users, investigating behaviors, reasons, and experiences, thus identifying the profile of citizens for different cultural levels or social classes. It will be very important to perform this study together with the citizen to identify their profile and propose differentiated solutions, according to the profiles identified (Figure 9).

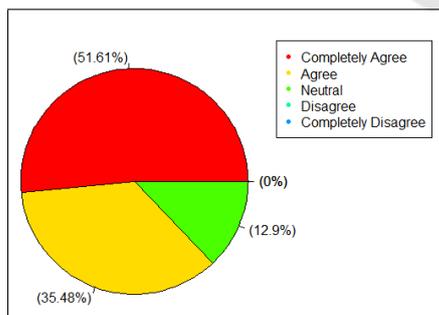


Figure 9: Will a technology differentiated according to the level of knowledge of the citizen have more acceptance by them?

Figure 10 presents the results regarding Public Services Transformation Kit, solution proposed by the Ministry of Planning, Management, and Development to support the digitization of services of the PFA. 55% neither agree nor disagree that the Kit will solve the bureaucratic problem for the services offered by the PFA. 19% believe that the Kit alone won't have con-

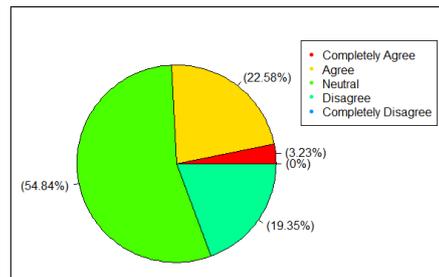


Figure 10: Do you think the Transformation Kit will solve the bureaucratic problem for services offered by the Agencies of the APF?

ditions of solving the bureaucratic problems of the Brazilian public services. 26% claim that the Kit is able to assist in the improvement of the bureaucratic process that often consumes much of the citizen and servant's time.

Other results were obtained with this research. The ones considered relevant were presented in this article.

## 6 LIMITATIONS AND THREATS TO VALIDITY

The limitations in this work are related to the culture of people who work in the Agencies of APF, because they aren't convinced that the Transformation Kit will solve the bureaucracy existing actually. Unfortunately, most part of them are not worried about become the actually process faster or to engage with the cause of digital transformation, they think that what exists is enough. Therefore, the threat to validity this work is change the mind of people who work and use the public services. It is necessary to show that we can improve the services to become better and faster. To reach this, the Government has to invest in qualifying and transparency.

## 7 CONCLUSION

The current situation of the Public Federal Administration of the Brazilian Government regarding the digitization of its services is still flimsy and insufficient, according to international reports and articles/studies analyzed during the development of this research and the carrying out of the survey. The Brazilian Government needs to begin the development of a support tool that assists in the pricing of the public services, seeking a real calculation of the costs of the services provided to the citizen, since the results gathered indicate

a lack of knowledge or dissatisfaction with the spreadsheets indicated by the MP. Besides that, it is necessary to facilitate and optimize the process of collecting the information needed to calculate these costs.

With the tools to support the pricing of services, level of maturity, and user satisfaction, the Brazilian Government may have real feedback on the digitized services it offers to the citizen, as well as perform an improvement in such services, if necessary. Another needed initiative is the development of a support tool to evaluate the level of maturity of the services offered, and the level of satisfaction of the citizen, including resources in the tool that are able to evaluate and make available differentiated services to the citizen, according to their level of knowledge, as well as facilitate the usage of such technologies. Overall, this study shows that the PFA has had initiatives focused on digitizing public services, but much still needs to be done to reach an acceptable level of satisfaction and meet the needs of the Brazilian Citizens.

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