

Economic Benefits of Public Service Digital Transformation: The Case of the City of São Paulo

Prepared for the Inter-American Development Bank by:

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ECONOMIC BENEFITS OF PUBLIC SERVICE DIGITAL TRANSFORMATION

The Case of the City of São Paulo

Bruna Pizzolato Gonçalves
Rafael Venijio Maggion

ABSTRACT*

The digital transformation of public services is a Brazilian Federal Government strategy supported by initiatives underway in various states and municipalities. Among these initiatives, the case of the city of São Paulo is the country's main reference point. The aim of this study is to evaluate and measure the economic benefits to both the municipal administration and to society as a whole, generated by the digital transformation of public services implemented by the municipality of São Paulo. As part of the study, and with a view to comparing the scenario before and after digitization, a methodology was developed that considered the main costs associated with providing assistance to citizens and to processing the demand for public services. The analysis concluded that digital transformation led to an average 73.9 percent reduction in the unit cost of public service requests for society as a whole (citizens and firms) and an average reduction of 39.9 percent for the municipal administration in the unit cost of satisfying public service requests. In the 12-month period following digital transformation of the set of services analyzed, the estimated rate of return was 27.1 BRL for each real invested.

JEL Codes: D61, H7, H83, O32, O33

Keywords: Brazil, citizen assistance services, digital government, digital transformation, municipalities, public services, São Paulo

*The aim of this study is to evaluate the economic impacts of the digital transformation of public services in the municipality of São Paulo. It is the result of a partnership between the Inter-American Development Bank (IDB) and the Municipality of São Paulo, represented by the Municipal Secretariat for Innovation and Technology (Secretaría Municipal de Innovación y Tecnología, or SMIT), with the support of the Vanzolini Foundation. The study was made possible by the collaboration of the public agencies and secretariats responsible for the services analyzed, which included the Municipal Health Secretariat (Secretaría Municipal de Salud, or SMS), the Municipal Secretariat for Mobility and Transport (Secretaría Municipal de Movilidad y Transporte, or SMT), the Treasury Secretariat (Secretaría of Hacienda), SPtrans (São Paulo Transporte S.A.), the Municipal Secretariat for Green Spaces and the Environment (Secretaría Municipal de Espacios Verdes y Medio Ambiente), the Attorney General (Procuraduría General del Municipio), the Municipal Government Secretariat (Secretaría del Gobierno del Municipio, or SGM) and the Municipal Secretariat for Sports and Leisure (Secretaría Municipal de Deportes y Ocio, or SEMEL). The authors would like to acknowledge the valuable contributions made by the following IDB experts: Mariano Lafuente, Alejandro Pareja, Gastón Pierri, Miguel Porrúa, Benjamín Roseth, Julieth Santamaría, Phil Keefer, and Bruno Aragaki, as well as the Vanzolini Foundation, through its consultant Daniel Annenberg.

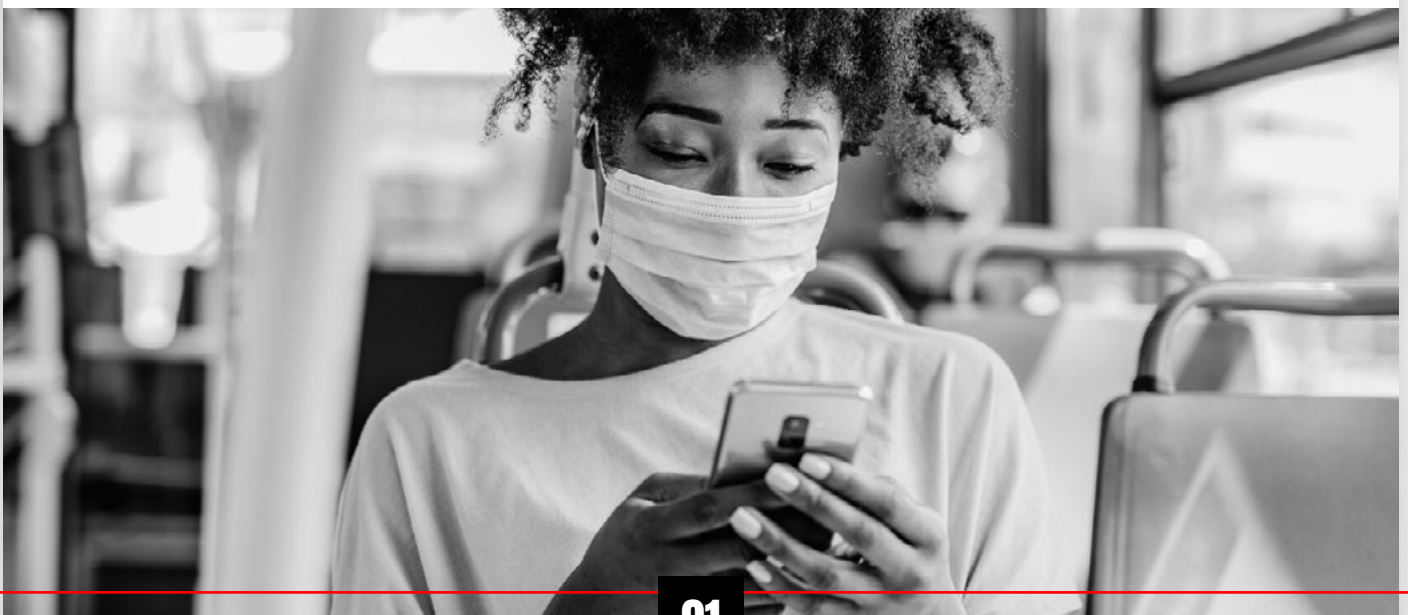
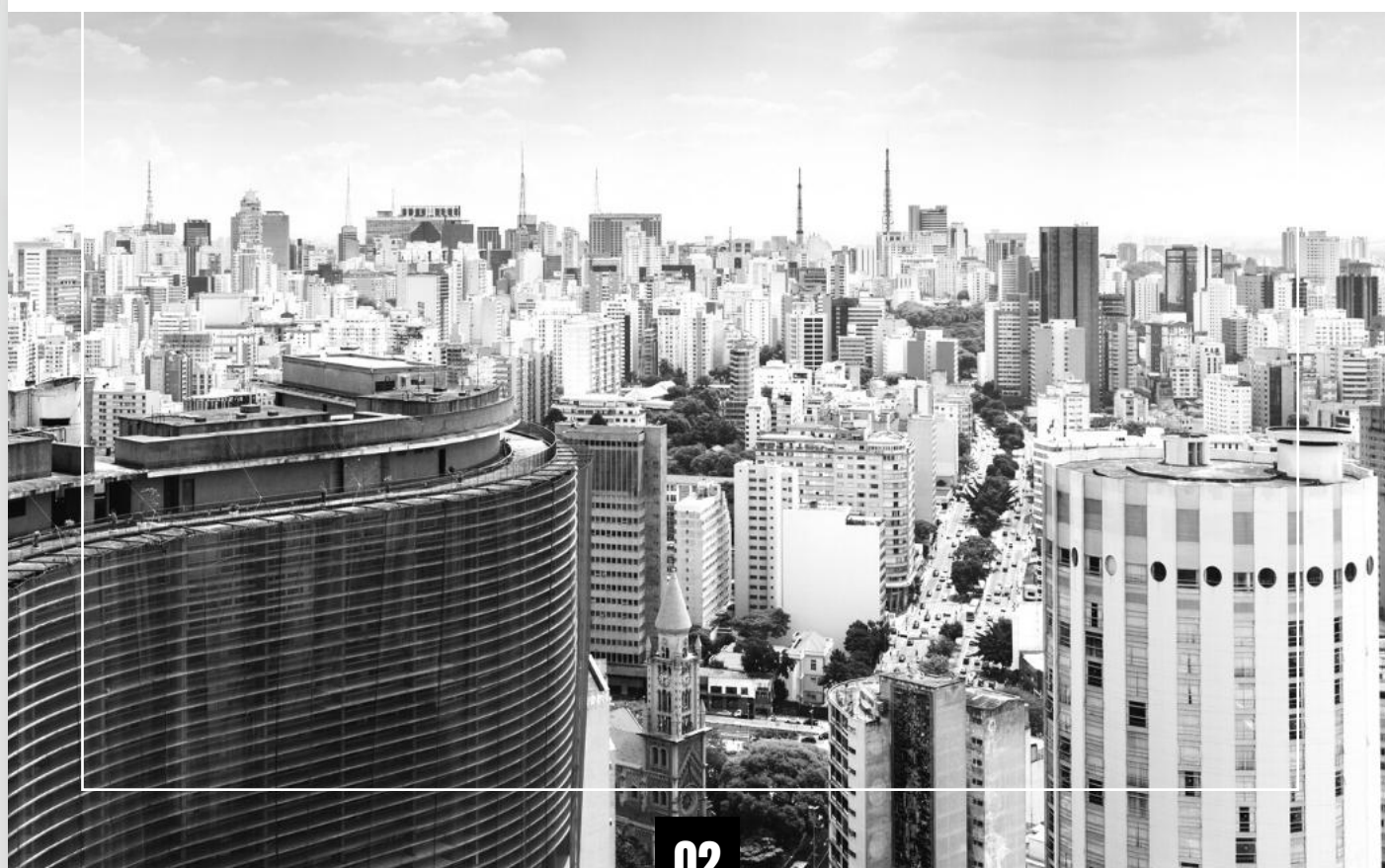


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Acronyms

CACISP - Citizen Assistance Services and Public Service Innovation Coordination (Coordinación de los Servicios de Atención al Ciudadano e Innovación en los Servicios Públicos) (Initials in Portuguese)

CASP - Citizen Assistance Services and Public Service Modernization Coordination (Coordinación de los Servicios de Atención al Ciudadano y Modernización de los Servicios Públicos) (Initials in Portuguese)

E-Digital - Brazilian Digital Transformation Strategy

EGD - Digital Government Strategy (Estrategia del Gobierno Digital) (Initials in Portuguese)

PDM - Goal Plan (Plan de Metas) (Initials in Portuguese)

NP - Natural person

PGM - Office of the Attorney General (Procuraduría General del Municipio) (Initials in Portuguese)

LP - Legal person

SEME - Municipal Secretariat for Sports and Leisure (Secretaría Municipal de Deportes y Ocio) (Initials in Portuguese)

SEMPLA - Municipal Planning, Budget and Management Secretariat (Secretaría Municipal de Planificación, Presupuesto y Management) (Initials in Portuguese)

SF - Finance Secretariat (Secretaría de Finanzas) (Initials in Portuguese)

SGM - Municipal Government Secretariat (Secretaría del Gobierno del Municipio) (Initials in Portuguese)

SIGRC - Citizen Relations Integrated Management System (Sistema Integrado de Management de las Relaciones con los Ciudadanos) (Initials in Portuguese)

SinDigital - National Digital Transformation System (Sistema Nacional de Transformación Digital) (Initials in Portuguese) (Initials in Portuguese)

SMIT - Municipal Secretariat for Innovation and Technology (Secretaría Municipal de Innovación y Tecnología) (Initials in Portuguese)

SMS - Municipal Health Secretariat (Secretaría Municipal de Salud) (Initials in Portuguese)

SMT - Municipal Secretariat for Mobility and Transport (Secretaría Municipal de Movilidad y Transporte) (Initials in Portuguese)

SPtrans - São Paulo Transport Company (São Paulo Transporte S.A.)

SVMA - Municipal Secretariat for Green Spaces and the Environment (Secretaría Municipal de Espacios Verdes y Medio Ambiente) (Initials in Portuguese)

EXECUTIVE SUMMARY

According to an evaluation carried out by the United Nations (UN) (2020), Brazil is one of the 20 best countries in the world when it comes to the provision of digital public services by the federal government, and it holds seventh place among the 198 countries listed on the World Bank digital government maturity index (Government of Brazil, 2021). By May 2022, nearly 78 percent of the 4,900 services offered by the federal government had been fully digitized and, according to Ministry of Economy estimates, this process generates around 4.5 billion BRL in yearly savings (Brazil. Ministry of Economy, 2022). These are just some of the results of the Brazilian Digital Transformation Strategy (E-Digital) that the federal government put into operation in 2018 with the aim of offering public services of a higher quality and a lower cost to all its citizens (Brazil Ministry of Science, Technology, Innovation and Communication, 2018).

Federal government actions have been accompanied by initiatives developed in states and municipalities (IDB, 2021a). In this context, the case of the municipality of São Paulo is an important reference point. In 2020, the city ranked 15th among 86 cities evaluated as part of the UN Local Online Service Index, ahead of cities such as Tokyo, Toronto, and Sydney (UN, 2020). By May 2022, 52 percent of the 1,100 services registered in the municipality's service catalogue had been digitized.¹

São Paulo has also institutionalized digital transformation as a strategy. In 2017, the digitization of services became part of the project to modernize the SP156 citizen assistance channels, and was included as a government goal in the municipality's Goal Plan for the period 2017-2020. The initial goal was to offer 120 new services online. However, this number was surpassed, since 176 new services underwent a process of digital transformation and were incorporated into Portal SP156.² In addition to offering services through digital channels, some processes were also mapped and redesigned to make service provision more efficient and more in line with the needs of the users.

This study seeks to evaluate and measure the economic benefits, both to the municipal administration and to society as a whole, of the digital transformation of public services carried out by the municipality of São Paulo, since the impact of this process is as yet unknown in detail. As part of the study and with a view to comparing the scenario prior to digitization of the service with the subsequent scenario, a methodology was developed that included the main costs associated with providing assistance and processing public service demands. The methodology is based on the International Standard Cost Model, a quantitative method that seeks to measure the administrative burden imposed on firms by regulation (SCM Network, 2004).

To determine the savings to society, the number of requests for services received and finalized (before and after digital transformation) was considered in each service analyzed, as well as the costs associated with trips, wait times, fees, and the printing and sending of documents, to determine the unit cost per request before and after digital transformation.

¹ Information provided by e-mail by persons of reference at the Municipal Secretariat for Innovation and Technology (SMIT) (2022).

² Ibid.

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Likewise, to determine the savings generated for the government, the costs associated with the human resources allocated to in-person public assistance were considered, as well as the human resources allocated to processing requests, expenditure on physical facilities, system costs, and the cost of printing and sending documents, as well as the investment in digitization of the service.

The data were obtained from public databases, from an online questionnaire answered by representatives in public secretariats and agencies responsible for providing the services analyzed, and from information provided by civil servants at the Municipal Secretariat for Innovation and Technology (SMIT). The data from 15 selected services were analyzed, bearing in mind the following criteria: number of requests (low, medium, and high), the type of target public (citizens and firms), process mapping and redesign (with and without), responsible public agencies, and the availability of information. In the fourth quarter of 2021, the services selected represented 22 percent of the total number of requests received.

The analysis concluded that digital transformation generated an average reduction of 73.9 percent of the unit cost of a public service request for society (citizens and companies). Services requested solely by individuals recorded an average reduction of 82.5 percent, while for services requested by companies, the reduction was 66.5 percent. When analyzing the variations in each category considered, an average reduction of 82.1 percent was observed in the cost for inhabitants of the municipality with respect to trips, a reduction of 77.6 percent with respect to time spent waiting at in-person assistance centers, and a reduction of 15.9 percent in fees paid during the service request process. Furthermore, the cost of printing and sending documents fell by 138.3 percent, including browsing time on digital platforms.

With respect to the impact on the government and on the set of services considered, the unit cost of a public service request fell by an average of 39.9 percent following a digital transformation process. When the variations in the categories considered are analyzed, the cost of human resources allocated to providing direct assistance to the public fell by an average of 49.9 percent, and human resources allocated to processing requests fell by an average of 18.6 percent. The cost of printing and sending documents fell by an average of 46.9 percent. The average costs related to physical facilities increased by 21.8 percent, and system costs increased by an average of 61.5 percent.

Considering the reduction in the unit cost per request and in the average service requests received following digital transformation, it is possible to calculate the savings to society in general and to the government over the short, medium, and long term following digitization of the 15 services analyzed. It is estimated that, after just one month, there will be a savings of more than 4.3 million BRL to society, and that this amount will increase to nearly 52 million BRL in one year, 261 million BRL in five years, and 523 million BRL in 10 years. With respect to the government, it is estimated that, at the end of one year, there will be a savings of 534 million BRL, 2.7 billion BRL after five years, and 5.5 billion BRL after 10 years.

³ Estos ahorros fueron posibles porque los servicios que fueron digitalizados y que tuvieron su atención presencial eliminada migraron para el programa Descomplica Digital, que consiste en efectuar la solicitud de forma digital con el apoyo de asistentes. Cuando una persona llega a una unidad de atención presencial, será orientada para utilizar las computadoras disponibles y solicitar el servicio y, en caso de dudas, podrá consultar al personal de atención al público designado. El costo de esta atención no puede ser cuantificado porque el personal está disponible para apoyar cualquier servicio provisto por el municipio, el Estado o el Gobierno federal. Por otro lado, por ejemplo, están siendo considerados los costos de mantenimiento y sostenibilidad de los canales digitales y los costos de recursos humanos para la gestión de las solicitudes realizadas por los canales digitales, entre otros.

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A simple extrapolation of the analysis of all digital services offered by the municipality leads to an estimated savings to society of approximately 237.8 million BRL at the end of the first year, 1.1 billion BRL after five years, and 2.3 billion BRL after 10 years. The savings to the government could reach approximately 2.4 billion BRL by the end of the first year, 12.5 billion BRL after five years, and 25.1 billion BRL after 10 years.

Analysis of the cost-benefit ratio of digitization, calculated as the ratio of government investment in digital transformation to the respective saving generated, reveals that one year after digitization of the 15 services analyzed, every real invested generates a return of 27.1 BRL, and that this amount increases to 139.4 BRL after five years and to 279.7 BRL after 10 years. These results of the cost-benefit analysis demonstrate that digital transformation generates significant returns, which improve and increase over time.

From the economic point of view, digital transformation always benefits society, since both in average terms and in terms of the individual analysis of each service, it reduces the cost to society of satisfying a public service request. In addition to the economic benefit, digital transformation facilitates access to services by increasing the number of channels available and offers users the possibility of requesting services remotely, thereby reducing the time spent waiting for the service to be delivered. This occurs because digitization facilitates information processing, with greater control of internal flows and procedures, and makes it possible to build digital and structured databases. This allows the government to identify bottlenecks, monitor execution, and more efficiently and assertively plan its service provision via the use of data and indicators.

While cost saving is a positive externality of digital transformation for citizens, firms, and government, it is not necessarily its principal aim. For this reason, digitization of some services does not necessarily lead to savings to the government, since the State is responsible for making the investments that enable citizens to effectively exercise their rights. However, digital transformation, when planned and implemented as a State strategy and including a wide range of services, leads to overall savings of government resources, since the savings generated by some services exceed the additional spending required for the digital transformation of others.

Consequently, the study demonstrated that the economic benefits of the digital transformation of public services in the city of São Paulo were significant, with savings in financial resources. The benefits accrued to the municipal administration and to society and firms. This means that digital transformation should be a State policy, to be encouraged and adopted by many other cities and governments in Brazil and throughout Latin America and the Caribbean.

INTRODUCTION

The development of information and communication technologies (ICTs) is transforming the way in which governments provide services and interact with citizens, civil society, and other administrative areas, while strengthening the concept of digital government. Moreover, the benefits of digital transformation have made digital government a priority for many countries around the world (Deloitte, 2015a; Deloitte, 2015b; OECD, 2014). These benefits include enhanced quality and efficiency in the provision of public services and higher citizen satisfaction with the government, alongside greater access and accessibility, more transparency, and the chance to severely limit possibilities for corruption.

The Brazilian government closely tracks innovations in the area of digital government and has adopted strategies related with the digital transformation of public services. The drive to increase efficiency in the use of public resources, freeing up or relocating civil servants, as well as creating savings for citizens who need to access public services, are arguments in favor of using these strategies and are often used to justify investments in digital transformation (IDB, 2021; Ferreira 2021). Moreover, providing access to services via digital channels increases accessibility to public authorities, given that people with reduced mobility can request services more easily, with little or no need to travel.

01. Federal Government

In 2018, the federal government established the National Digital Transformation System (Brazil. Decree No. 9319, 23 March 2018). It established a structure of governance that enables implementation of the Brazilian Digital Transformation Strategy (E-Digital) and provided continuity to the actions initiated in 2016 (Brazil. Ministry of Planning, Development and Management, 2018). The aim of this initiative is to offer higher-quality public services at lower cost to citizens via the digital transformation of government. The proposed goal was to digitize 100 percent of federal government services by the end of 2022 (Brazil. Ministry of Science, Technology, Innovation and Communication, 2018).

By May 2022, nearly 78 percent of the 4,900 services provided had been totally digitized (GOV.BR, 2022; Oliveira, 2021). According to federal government estimates, this achievement led to annual savings of 4.5 billion BRL, of which nearly 3.4 billion BRL were savings to society and more than 1 billion BRL corresponded to savings to the federal administration (Brazil. Ministry of Economy, 2022). The results of this strategy could already be observed in an evaluation carried out by the United Nations (UN), which found that the Brazilian federal government is among the top 20 countries in the world offering the best range of digital public services. Brazil ranks seventh among 198 countries on the World Bank's digital maturity index (UN, 2020; Brazil. Government of Brazil. Digital transformation, 2021).

On the demand side, most Brazilians are open to the idea of receiving more and better digital services. A survey published by the IDB at the beginning of 2021 revealed that 86 percent of Brazilians had already adapted to the digital world or had adapted with little difficulty. The report also revealed that 95 percent of the population responded

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that they accessed the Internet via their mobile telephones, while 87 percent did so via their household Wi-Fi connection. The groups less-well adapted to the digital world and with lower connectivity were those age 60 and over, people with less formal education (who had not completed primary education), or those with a monthly income of below two minimum salaries (IDB, 2021a).

02. State Governments

At the state government level, in 2019, only 4 percent of services had been digitized and only 31 percent of the states could confirm that the service most used by their citizens over the last year was available entirely in digital format (CETIC, 2020). As in other countries in the region, the crisis caused by the COVID-19 pandemic accelerated digital transformation of the public sector in Brazil. Restrictions on in-person assistance resulted in greater digitization of services in the states starting in 2020, as was the case of *Río Grande do Sul* which in 2021 offered 61 percent its services in digital format. However, the digital maturity of other states is much more varied. For example, in 2021, *Bahia* offered 25 percent of its services in digital format, while states such as *Alagoas* and *Ceará* offered only 7 percent.³

03. Municipal Governments

There is little information available regarding advances in the digitization of Brazil's municipalities. According to IDB (2021a), digital municipal services were the least well known by the population. Only 56 percent of those consulted were familiar with their municipality's citizen assistance portal, while 70 percent were aware that a citizen assistance portal existed at the federal level and 66 percent at the state level. With the exception of certain state capitals with high levels of service digitization, the vast majority of Brazil's 5,570 municipalities boasted only incipient levels of digitization in 2022.

04. Digital Transformation in the São Paulo City Hall

With respect to municipalities, in addition to being the largest city in Brazil in terms of population and one of the largest cities in Latin America and the Caribbean, São Paulo was one of first to implement digital transformation projects for municipal services. By May 2022, 52 percent of municipal services had been digitalized and made available to the population electronically.⁴

In 2017, the municipality initiated its public service digitization strategy as part of a project called *Solução de atendimento SP156*, creating the *SP156* citizen assistance

³ These statistics coincide with the results of a recent diagnostic (ABEP, 2021), in which only one state was classified as being "excellent", whereas eight were classified as "very good", eight as "good", ten as "average" and one as "poor." These results also coincide with those reported by the IDB (2021b).

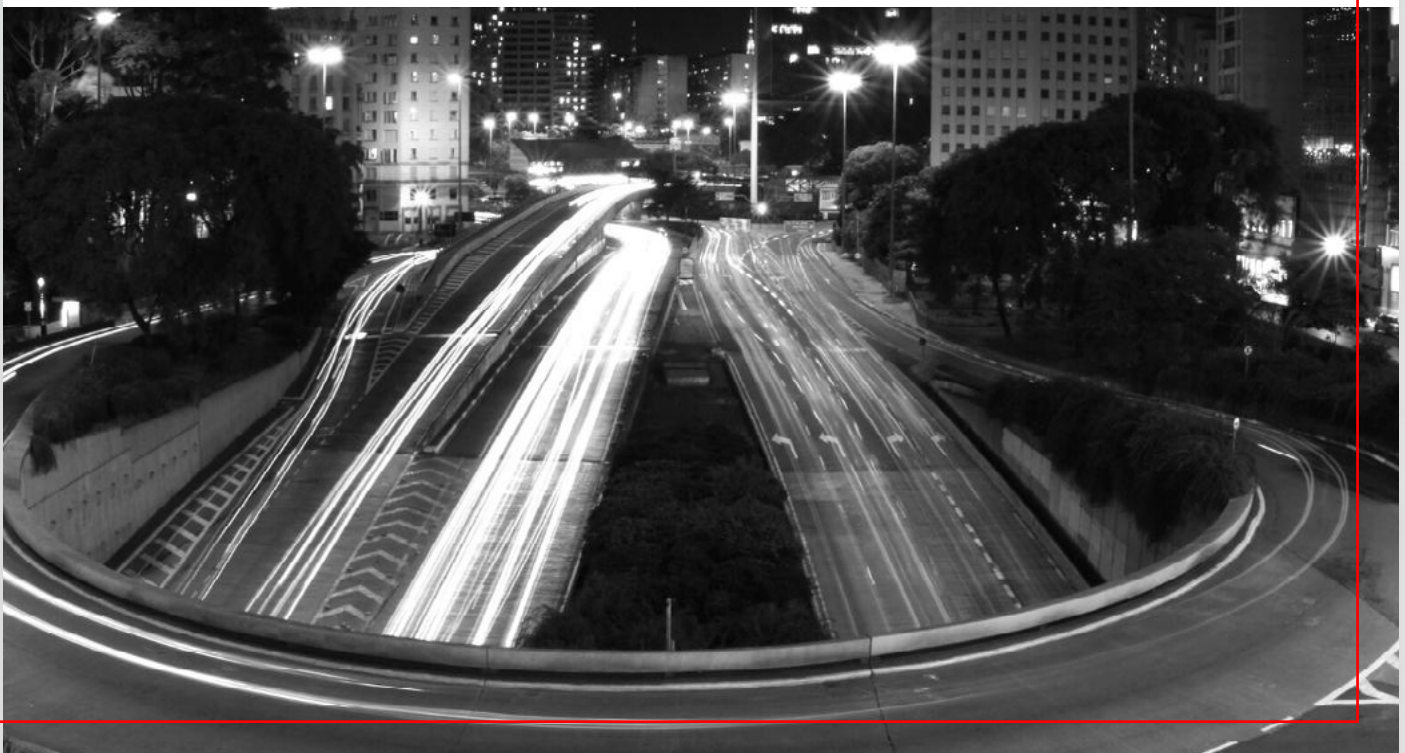
⁴ Information provided by e-mail by persons of reference at the Municipal Secretariat for Innovation and Technology (2022).

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portal and developing the SP156 application. The strategy also included implementing an integrated request management system (SIGRC), and subsequently integrating it with the municipality's most important systems that manage demands for municipal services, such as consultancy and auditing.

Due to its potential for enhancing efficiency in the use of public resources, in addition to improving customer service to all citizens, both male and female, the digitization of public services began to be part of the city of São Paulo's Goal Plan (Municipality of São Paulo, 2018), and it currently leads the way in public municipal service digitization. In 2020, the city achieved an outstanding ranking in the United Nations Local Online Service Index. It ranked 15th among the 86 cities evaluated, ahead of Tokyo, Toronto, and Sydney (UN, 2020).

Despite the acceleration of the digital transformation of public services in Brazil, driven in part by the social distancing measures imposed during the COVID-19 pandemic and by the success in achieving the strategic goals at both the national and the subnational level, there are very few studies that highlight the ex post results in terms of the efficiency of digitization strategies in Brazil, or in Latin America and the Caribbean.



THE CASE OF THE CITY OF SÃO PAULO

01. The Beginning of Digitization via the New SP156 Portal

Service digitization in the city of São Paulo emerged on the basis of a previous guideline that fostered citizen services with the aim of increasing access to information, transparency, and the effectiveness of citizen assistance services at the municipal level. Although the initiative was launched and began to gather strength in 2017, the structural framework for developing the digital transformation of public services in São Paulo was implemented in 2014 through the creation of the Citizen Assistance Services and Public Service Innovation Coordination (CACISP) at the Municipal Planning, Budget and Management Secretariat (SEMPLA).

This new agency was charged with coordinating the actions related to citizen assistance and the development and implementation of technological innovations, as well as the maintenance of the municipality's online service request platform. Consequently, a new platform called the Citizen Relations Integrated Management System (SIGRC) was established to provide assistance to the public, and the SP156 project got underway.

The SP156 tool evolved into a multi-channel platform (telephone call center, online portal, chat center, and mobile application) for requesting services, and also for receiving and sending requests between agencies and departments of the Municipality of São Paulo. However, despite the fact that the system has been implemented, there is no centralized study of all services offered by the municipality. Accordingly, the municipality embarked on a process to register the services available for citizens throughout the municipal agencies and secretariats, alongside the elaboration of a municipal service catalogue.

This analysis found that a large number of municipal services only offered assistance or attended to requests in person. This revealed an enormous opportunity to extend digitization throughout the city of São Paulo. However, it needed to be put into operation before the potential of digitization could be fully exploited. During this process, in 2017, the Municipal Secretariat for Innovation and Technology (Secretaría Municipal de Innovación y Tecnología, or SMIT) was created, and the entity responsible for coordinating the provision of citizen services fell under SMIT under a new name: Coordination of Citizen Assistance Services and Public Service Modernization (CASP).

This change contributed so much to the process of digitization of services that it became one of the new secretariat's priority issues. It also encouraged the inclusion of innovation methodologies, and the design of services and information technologies in the digital transformation process via partnerships with 011.lab, the municipal government's innovation laboratory, and with the Municipal Information and Technology Company (Empresa de Informação e Tecnologia do Município, or PRODAM), the firm responsible for many of the municipal administration's systems.

THE CASE OF THE CITY OF SÃO PAULO

02. Advances in Digitization with the Goal Plan

Due to its potential to increase efficiency in the use of public resources and improving performance in citizen assistance, the digitization of public services became part of the Goal Plan (PDM) 2017-2020 of the city of São Paulo (Municipality of São Paulo, 2017). This plan prioritized citizen-centered public policy goals, based on the idea of a smart and efficient city that creates opportunities and makes life simpler for its inhabitants.

By introducing the SP156: Canal rápido e direto project, the municipal government sought to broaden the number of services available online to the public via the SP156 citizen assistance portal. In 2019, a programmatic review of the Goal Plan (Municipality of São Paulo, 2018) was carried out, which specified the goal of providing 120 new services online.⁵ The Goal Plan 2017-2020, in addition to creating the SMIT and the SP156 project, intensified the public services digitization strategy in São Paulo. Although it was coordinated by the SMIT, the strategy was part of a project that was organized among the secretariats and agencies responsible for municipal public services. For this reason, the collaborative relationship between the agencies of the municipal administration, with the support of the Goal Plan, was crucial in carrying out digital transformation.

The digitization of services in São Paulo centered on improving services for citizens by placing more services at their disposal via the digital channels that comprise the SP156 and standardized in-person public assistance services via the Descomplica SP initiative. This project seeks to implement a new standard of citizen assistance by integrating, in decentralized units throughout the territory, more than 350 services of various municipal secretariats and agencies, as well as federal and state services. It also focused on boosting the efficiency of municipal civil service staff, including career civil servants and interns and outsourced staff, through the possibility of relocation or assignment to other tasks, and on the enormous potential to save resources, both for the government and for society.

03. Current Status of Digitization

By May 2022, more than 560 municipal services had undergone the process of digital transformation, out of 1,161 included in the service catalogue provided by the Municipality of São Paulo (52 percent). Within the framework of the Goal Plan 2017-2020, the Municipality not only achieved the goal of putting 120 new digital services into operation, but also put 176 new services through a digital transformation process, which were then added to the SP156 Portal.⁶

⁵ Goal 33: Simplify and modernize people's access to public services. 33.1 - Offer 120 new online/digital services via the SP156 portal.

⁶ Information provided by persons of reference at the Municipal Secretariat for Innovation and Technology (2022) by e-mail.

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In nominal terms, the digital transformation process reached nearly 460,000 citizens, more than 20 secretariats and agencies of the Municipality, and around 530 municipal civil servants. Services such as the online phone unlocking service for individual microentrepreneurs (MEI), self-employed people, and individuals (Senha Web), the social service aimed at addressing the needs of homeless people (SEAS), health insurance coverage for sickness (Tapa buraco), consultation to appraise the benefits of the Auxílio Brazil program and parking permits for the elderly are among the services most requested by citizens through SP156 public assistance channels. Altogether, there are more than 56,000 requests per month.⁷

Under the Solução de atendimento SP156 contract, by May 2022, digital transformation also included process mapping and redesign of 66 municipal services by a specialist consultant. One of the major challenges facing the Municipality of São Paulo was the lack of consolidated data regarding services provided in person, since the service might have been requested manually (on paper) in any of the 32 sub-municipalities. This aspect makes structured and centralized data control difficult. Process mapping and redesign helped to collect data from in-person services, suggested areas for possible improvement, and contributed to the digital transformation process.

With respect to other governments of the region and the world, the social-distancing measures introduced as a consequence of the COVID-19 pandemic accelerated the digital transformation of public services in São Paulo, as the project became much more important due to the pressing need to offer remote municipal services. Since March 2020, during the pandemic period alone, 152 new services were offered via the SP156 Portal, and new agencies, such as the Municipal Justice Secretariat (Secretaría Municipal de Justicia, or SMJ) and SPCine, were incorporated into the digital transformation project.⁸

⁷ Data provided by the Municipal Secretariat for Innovation and Technology.

⁸ Ibid.

METHODOLOGY

To evaluate the economic benefits of the digital transformation of public services in the city of São Paulo, a quantitative focus was applied, with a non-experimental design, which considered both the impacts on the government and on society as a whole. For the analysis of the benefits of digital transformation, the 15 public services⁹ listed in Annex A were considered. The services were chosen according to the following criteria:

Quantity

Taking into account the monthly average of requests processed, services were selected that receive a high (above the general average), medium (near the general average), and low (below the general average) number of requests, to analyze services of different sizes. In the fourth quarter of 2021, the services selected represented 22 percent of all requests received via the SP156 portal service channels (103,449 requests from a total of 464,577 requests) (Municipality of São Paulo – Open Data Portal, 2021).

Target public

Services were chosen that were targeted at the general population (natural persons), firms (legal persons) and at both groups, with a view to analyzing the benefits to society as a whole. Priority was also given to services with a representative proportion of women among the users, bearing in mind the gender equality agenda.

Process mapping and redesign¹⁰

The services that had undergone a process of mapping and redesign were prioritized, since these services would have clearer and better defined stages.

⁹ The definition of the services analyzed in the study was based on a preliminary selection of 32 services, based on the categories described (quantity, target public, process mapping and redesign, availability of information and public agency responsible) and on the service indicators provided by the Municipal Secretariat for Innovation and Technology, especially with respect to information availability. For this set of 32 services, information was sought from persons of reference at the responsible secretariats and agencies via an online questionnaire. Fifteen valid responses were received using this methodology. Although this is not necessarily a representative random sample from a statistical perspective, the services analyzed in the study have similar characteristics to services offered by the Municipality of São Paulo. These services are characterized by: (i) being requested through different citizen assistance channels, (ii) taking into account different quantities of service, (iii) including/excluding process mapping, and (iv) being offered by different public agencies.

¹⁰ In the case of some of the services digitized and included in the digital channels, the respective processes were mapped and redesigned before digital transformation so that, in addition to being available in digital channels, the digital services could provide a more efficient process. To achieve this objective, inefficient stages were improved and unnecessary ones eliminated.

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➤ Availability of information

The possibility of rapidly accessing information about services, both before and after the digital transformation process, was a decisive factor in selecting the services that could yield a viable analysis.

➤ Responsible public agency

Services provided by different municipal agencies were considered to increase the scope of the analysis and avoid possible biases.

Annex A presents the characteristics of the 15 services analyzed in relation to the abovementioned selection criteria. The analysis focused on the digitization process of recording and processing a public service request and not necessarily the execution of the service itself, since some services, by their very nature, must include certain in-person steps such as, for example, the neutering service for dogs and cats.

To discover the monetary (BRL - BRL) of the savings generated by digital transformation to society and to the government, a logical argument was elaborated based on the International Standard Cost Model (SCM Network, 2004). This is a quantitative method that helps calculate the administrative burden imposed on firms as a consequence of regulation and is based on evaluations carried out at both the federal and the state level (Rodrigues Junior, 2021; Brazil. Ministry of Economy, 2019). In this case, to compare the scenario prior before a service is digitized with the subsequent scenario, the main costs associated with receiving and processing requests for public services were considered.

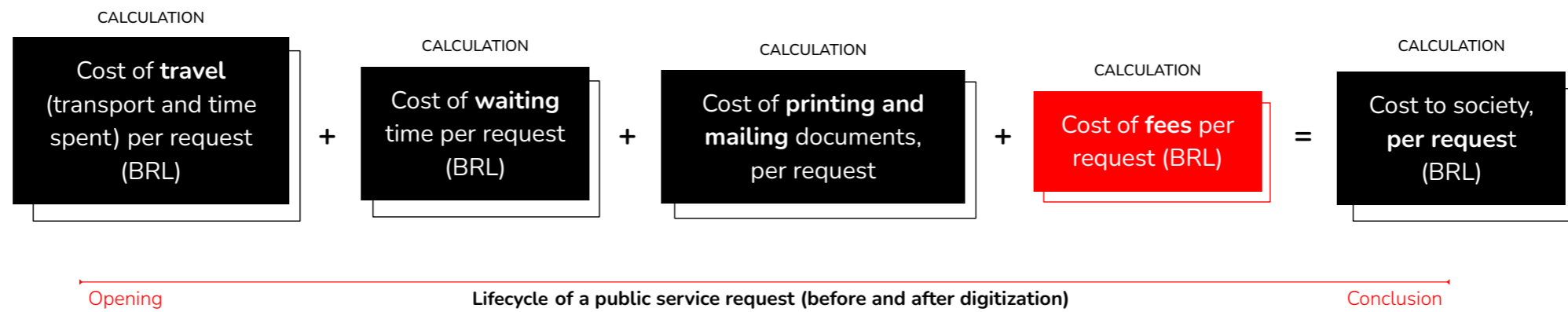
Two main sources provided the data for the variables needed for the calculation: the officials responsible of each public service analyzed in the various public agencies, and the team from the Municipal Secretariat for Innovation and Technology. With respect to the public officials, information was obtained from persons of reference nominated by the responsible agencies who responded to an online questionnaire. The Municipal Secretariat of Innovation and Technology was responsible for monitoring the process.¹¹ Information provided from public databases was also taken into account. These include the SIGRC database on civil servant remuneration and data from research institutes. The parameters considered, as well as their respective sources and calculation sheet, are available [here](#).

¹¹ The data reported by public administrators, in some cases, may be approximate or estimated, depending on the availability of internal information in each public agency. The agencies and secretariats in charge of the service named the administrators as persons of reference for this study and as being responsible for providing the information via a process of collection, centralization, and analysis of the data requested. This secretariat was also responsible for monitoring the process of completing the questionnaire.

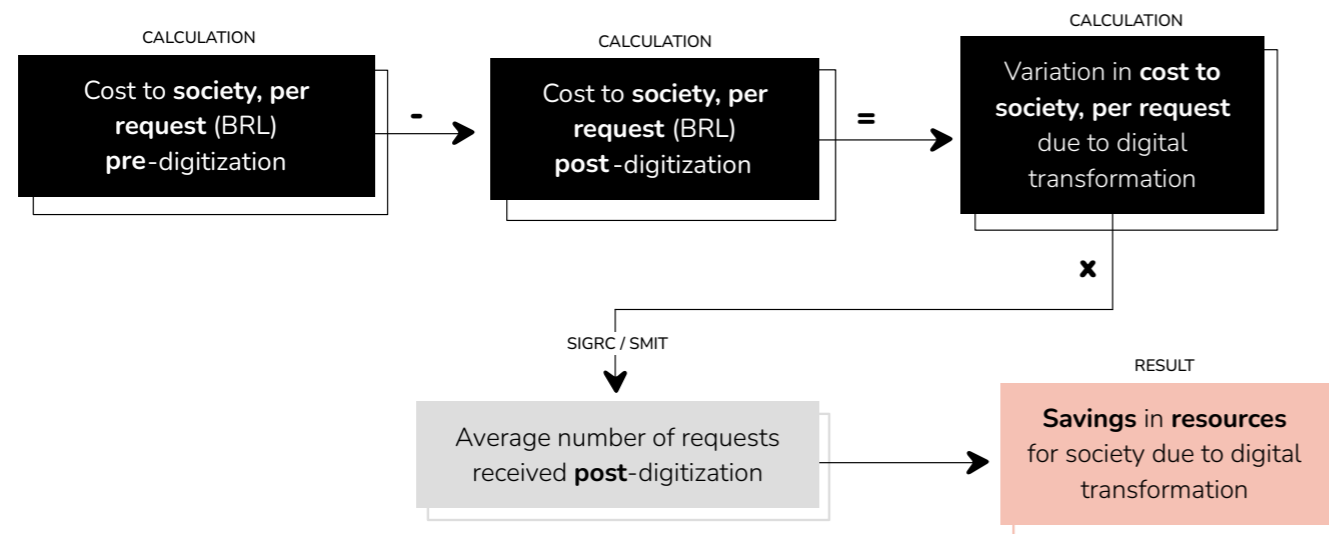
METHODOLOGY **FIGURE 1**

Logical for Calculating Savings to Society due to Digital Transformation

Determination of the Cost to Society, per Request



Calculation of Savings to Society due to Digital Transformation

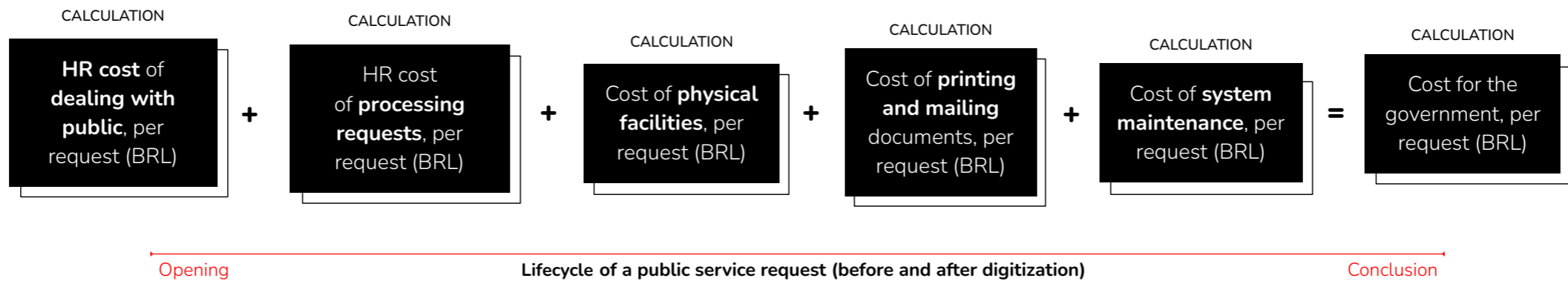


To determine the savings to society, the average monthly number of service requests received and finalized (before and after the digital transformation) was considered for each service analyzed, as well as the costs associated with traveling (travel costs and travel times to in-person assistance units or other associated travel), assistance times and wait times, fees paid and the cost of printing and sending documents, to determine the unit cost per request before and after digital transformation (Figure 1). To assign a value to time, the opportunity cost was considered based on the average income of São Paulo citizens in 2021.

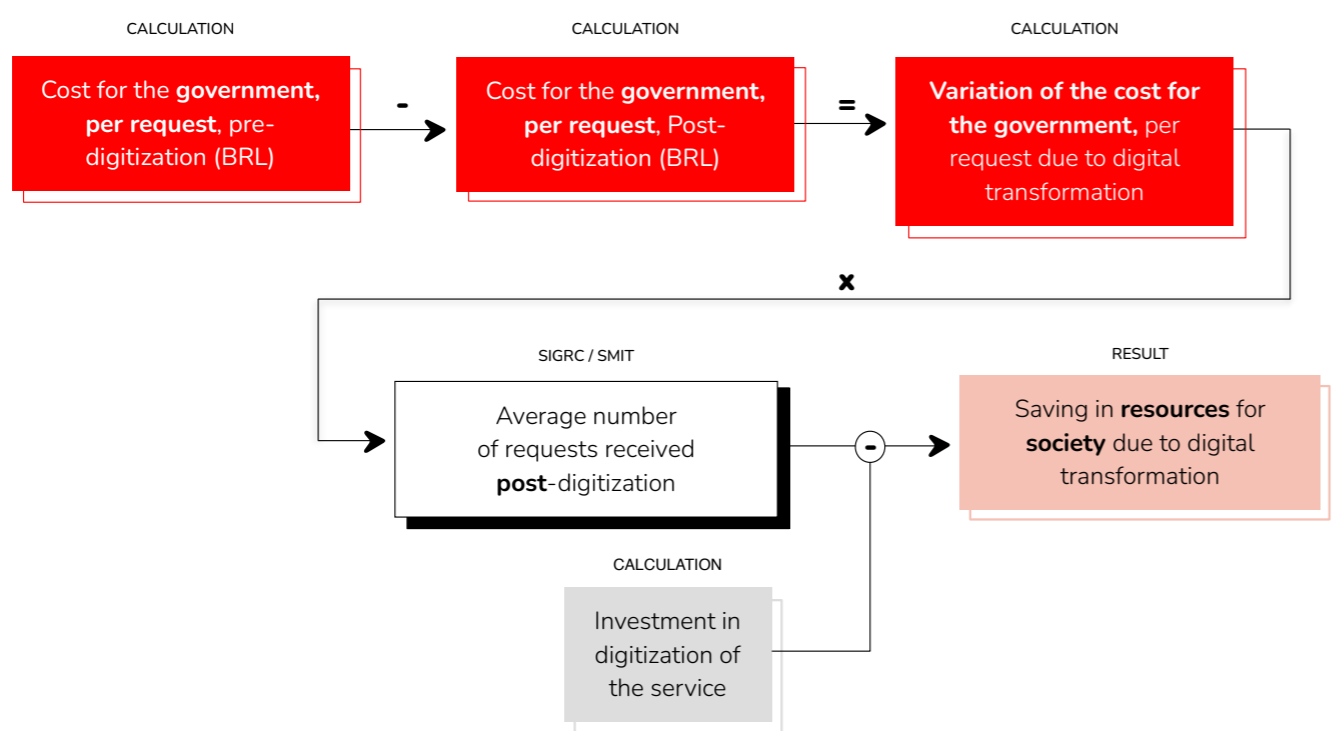
METHODOLOGY **FIGURE 2**

Logical for Calculating Savings to the Government due to Digital Transformation

Determination of the Cost to the Government, per Request



Calculation of Savings to the Government due to Digital Transformation



Likewise, to determine the savings to the government, the average monthly number of service requests received and finalized (before and after digital transformation) was considered for each service analyzed, as well as the costs associated with allocating human resources to provide in-person assistance to the public, the cost of human resources allocated to processing requests, expenditure on physical facilities, system maintenance and support costs, and the costs of printing and sending documents, in addition to the investment made to digitize the service (Figure 2). Investment in digitization includes the cost of integrating and developing information technology systems, assigning a team of civil servants to this process, and mapping and reviewing processes, where necessary.

METHODOLOGY

Annex B includes more details regarding the variables and the calculations considered in determining each type of cost, both for the savings to society and to the government. The annex provides in detail the logical formula for calculating each category (travel costs, the cost of waiting, the cost to citizens of printing and sending documents, fees, the cost of human resources allocated to dealing with the public, the cost of human resources allocated to processing requests, document printing and sending costs for the government and the system maintenance cost, in addition to the calculation of the investment to digitize each service). All monetary values have been updated to March 2022 by applying the general market prices index (IGP-M) (Getúlio Vargas Foundation) to account for inflation during the period (Central Bank of Brazil - Calculadora do Cidadão).

In the cases where, even after service digitization, in-person assistance is still possible, the services provided by units of the municipal program Descomplica SP were considered, as well as those provided by the assistance centers. Where relevant, the costs of human resources and physical spaces of the program units were considered. Moreover, some adaptations were made to the quantitative analysis methodology for certain services, according to data availability:

- In cases where no information was available on the number of finalized service requests, all requests received in the period were considered to be finalized.
- In cases where services lacked information about the number of licenses, the cost of the system per request is calculated by taking the ratio of the system's monthly cost to the monthly average of finalized service requests.
- When no information was available on a service's physical facilities (five of the services analyzed) or its system (one of the services analyzed), these variables were not considered.
- In the absence of information on the Municipality of São Paulo's Transparency Portal regarding the incomes of civil servants employed by the Municipal Government Secretariat, an average of the income of all government civil servants was used.

Qualitative Analysis

One of the difficulties encountered in the data collection phase was the lack of available information on the period prior to digital transformation of the services. In some cases, there is no structured and organized archive. This aspect was even more complex because requests were presented in printed format and documents were processed manually, with decentralized archives located in different buildings, as is typical of in-person and analogue services. This factor added to the complexity of certain services, which are performed in stages by agencies at different federal levels. This is exemplified by the *Empreenda Fácil* program, which required the incorporation of a qualitative analysis to complement the methodology described above.

ECONOMIC BENEFITS

The data collected and analyzed for this study reveal that the process of service digitization generated an overall savings of resources, both to municipal government and to society as a whole. The following section breaks down the benefits of digital transformation in the services analyzed.

01. Benefits to Society

In the set of services analyzed, an average reduction of 73.9 percent was observed in the unit cost of a public service request due to the digital transformation process (Table 1). The services requested only by individuals recorded an average reduction of 82.4 percent, while the reduction in costs for services requested by firms was 66.5 percent. The average variations in costs for society were calculated by taking the simple average of the individual variations for each service analyzed.

Analysis of the variations in each one of the categories considered, in average terms, reveals a reduction in cost to inhabitants of the municipality with respect to traveling expenses and times of 82.1 percent. When it comes to the time spent waiting for service in the in-person assistance units, the observed reduction is 77.6 percent, whereas the fees paid by users during the service request process were reduced by 15.9 percent. The cost of printing and sending documents rose by 138.3 percent.

The reduction in travel costs and wait times has been made possible by digitizing some stages of the procedure. This aspect reduces or eliminates the need to travel to an in-person assistance facility, depending on the service required.

Since services could be increasingly requested through digital channels, inhabitants of the municipality began to spend more time browsing these channels and sending files in digital format. This explains the increase in costs in the document printing and sending category. In certain services, the percentage variation was high; in absolute values, however, these figures are relatively low and corresponded to an average cost of 9,80 BRL in the document printing and sending category following digital transformation. This cost is due, above all, to the time spent in browsing and downloading documents using the public assistance portal. As the costs associated with the time employed in browsing and sending digital files previously corresponded to the costs included in the travel expenses and waiting times categories, their increase is offset by a marked reduction in the cost of these two categories, resulting in an overall savings.

In most of the services analyzed, digital transformation does not affect the fees paid by citizens. However, whenever a variation occurred, the cost of the fees was reduced. Thanks to digital access, the need to pay a fee was eliminated in services such as the “Active debt (payment of outstanding property tax arrears for real estate, according to the co-participation coefficient)” category and the “Monthly top-up of the free student travel pass (Bilhete Único Estudante).” In the other services where fee were reduced, the reduction was the result of adjusting for inflation to 2022 values, rather than digitizing services.

ECONOMIC BENEFITS

TABLE 1

Variation in Cost To Society, Comparing the Scenarios Before and After Digital Transformation

SERVICE	TARGET PUBLIC ^a	VARIATION IN COST PER REQUEST BEFORE AND AFTER DIGITAL TRANSFORMATION				
		TRAVEL COSTS (EXPENSES AND TIME)	COST OF TIME SPENT WAITING FOR AND RECEIVING SERVICE	COST OF PRINTING AND SENDING DOCUMENTS	COST OF FEES	TOTAL COST
Active debt (payment of outstanding property tax arrears for real estate, according to the co-participation coefficient)	NP/LP	-100.00%	-100.00%	123.79%	100.00%	-99.95%
Accreditation of the project in the Agents of Open Government program	NP	-100.00%	-100.00%	291.79%	0.00%	-93.81%
Parking permit for the disabled (DeFis)	NP	-100.00%	-100.00%	-77.44%	0.00%	-91.69%
Parking permit for the elderly	NP	-100.00%	-100.00%	-77.47%	0.00%	-91.68%
Vehicle rotation (exemption for the disabled)	NP	-100.00%	-100.00%	236.69%	0.00%	-88.02%
Online phone unlocking service for individual microentrepreneurs, self-employed and natural persons (<i>Senha web</i>)	NP/LP	-100.00%	-100.00%	1683.43%*	0.00%	-86.37%
Request for rebate of the tax aliquot on ownership of hybrid, electric or hydrogen-powered motor vehicles	NP/LP	-100.00%	-100.00%	40.29%	0.00%	-85.21%
Online phone unlocking service for legal persons (<i>Senha Web</i>)	LP	-100.00%	-100.00%	1907.89%*	0.00%	-84.66%
Request for sports center membership cards	NP	-50.00%	-90.24%	386.32%	0.00%	-79.89%
Monthly top-up of the free student travel pass (<i>Bilhete Único Estudante</i>)	NP	-18.92%	-87.50%	0.00%	100.00%	-69.64%
Special permit for the transport of hazardous goods (1 st permit)	LP	-100.00%	-100.00%	-58.12%	27.08%	-67.12%
Property tax (request for inclusion, modification or cancellation of the property administration register)	NP/LP	-100.00%	-100.00%	38.16%	0.00%	-66.78%
Free neutering service for dogs and cats	NP	-66.67%	-62.50%	0.00%	0.00%	-61.89%
Notification of controlled prescriptions (registering or updating data of the professional medical prescriber and the healthcare establishment)	NP/LP	-75.00%	110.00%	561.14%	0.00%	-29.66%
Registration of proficiency certificate for motorcycle riders (<i>Motofrete</i>)	LP	-20.59%	-33.33%	332.88%	11.56%	-12.12%
Total (average)		-82.08%	-77.57%	138.31%	-15.91%	- 73.90%

^aNP: natural person; LP: legal person. *Values considered atypical and, therefore, excluded from the average variation in the "Cost of printing and sending documents" column. Bearing in mind these values, the average variation in the cost of printing and sending documents would be 331.76 percent. The service with the highest cost of printing and sending documents after digital transformation is "Property tax (request for inclusion, modification or cancellation of the property administration register)," with 27.57 BRL. The values displayed in the table are organized from highest to lowest savings, according to the "Total cost" column.

ECONOMIC BENEFITS

For example, in the case of the “Online phone unlocking service for individual micro-entrepreneurs, self-employed and natural persons (Senha Web)” category, the cost of traveling fell from 38.40 BRL to 0 BRL (including transport and time); the time spent waiting for service or being served fell from 30 minutes (a cost of 13.40 BRL) to 0 minutes; the cost of printing per sheet (cost of 0.40 BRL), time spent browsing the SP156 assistance portal (average seven minutes of browsing),¹² and downloading four documents (average two minutes per file), with a total cost of 7.10 BRL for printing and sending documents after digitization. In the case of this service, there was no change in the category “Fees,” since no fee is charged for the service. These variations meant that the unit cost of this service was reduced from 52.20 BRL to 7.10 BRL (Table 2).

¹² Average browsing time on the SP156 assistance portal, measured by *Google Analytics*.

ECONOMIC BENEFITS

TABLE 2

Cost to Society per Request, Before and After Digital transformation, by Category of Cost Analyzed, in BRL

SERVICE	TARGET PUBLIC ^a	COST PER REQUEST, BEFORE AND AFTER DIGITAL TRANSFORMATION (IN BRL ^b)									
		TRAVEL COST (EXPENSES AND TIME)		COST OF TIME SPENT WAITING FOR AND RECEIVING SERVICE		COST OF PRINTING AND SENDING DOCUMENTS		COST OF FEES		TOTAL COST TO SOCIETY, PER REQUEST	
		BEFORE	AFTER	BEFORE	AFTER	BEFORE	AFTER	BEFORE	AFTER	BEFORE	AFTER
Vehicle rotation (exemption for the disabled)	NP	45.1	0.0	9.0	0.0	2.0	6.7	0.0	0.0	56.1	6.7
Request for rebate of the tax aliquot on ownership of hybrid, electric or hydrogen-powered motor vehicles	NP/LP	38.4	0.0	2.2	0.0	4.8	6.7	0.0	0.0	45.4	6.7
Parking permit for the elderly	NP	45.1	0.0	8.1	0.0	31.2	7.0	0.0	0.0	84.3	7.0
Parking permit for the disabled (DeFis)	NP	45.1	0.0	9.0	0.0	31.6	7.1	0.0	0.0	85.6	7.1
Online phone unlocking service online for individual microentrepreneurs, self-employed and natural persons (<i>Senha Web</i>)	NP/LP	38.4	0.0	13.4	0.0	0.4	7.1	0.0	0.0	52.2	7.1
Accreditation of the project in the Agents of Open Government (Agentes de Government Abierto) program	NP	79.5	0.0	44.8	0.0	2.0	7.8	-	-	126.3	7.8
Online phone unlocking service for legal persons (<i>Senha Web</i>)	LP	38.4	0.0	13.4	0.0	0.4	8.0	0.0	0.0	52.2	8.0
Active debt (payment of outstanding property tax arrears for real estate, according to the co-participation coefficient)	NP/LP	673.7	0.0	27,905.5*	0.0	6.0	13.4	27.2	0.0	28,612.4**	13.4
Property tax (request for inclusion, modification or cancellation of the property administration register)	NP/LP	38.4	0.0	24.6	0.0	20.0	27.6	-	-	83.0	27.6
Monthly top-up of the free student travel pass (<i>Bilhete Único Estudante</i>)	NP	47.4	38.4	71.7	9.0	0.0	4.0	50.2	0.0	169.2	51.4
Free neutering service for dogs and cats	NP	115.2	38.4	53.8	20.2	0.0	5.8	0.0	0.0	168.9	64.4
Request for sports center membership cards	NP	76.8	38.4	275.5	26.9	1.2	5.8	0.0	0.0	353.4	71.1
Registration of proficiency certificate for motorcycle riders (<i>Motofrete</i>)	LP	65.3	51.8	20.2	13.4	2.8	12.1	29.3	25.9	117.5	103.3
Notification of controlled prescriptions (registering or updating data of the professional medical prescriber and the healthcare establishment)	NP/LP	153.6	38.4	44.8	94.1	1.2	7.9	-	-	199.6	140.4
Special permit for the transport of hazardous goods (1 st permit)	LP	227.8	0.0	56.0	0.0	45.9	19.2	222.7	162.4	552.4	181.6
Total (average)		115.2	13.7	46.2	10.9	10.0	9.8	27.5	15.7	153.3	46.9

^a NP: natural person; LP: legal person. ^b Values in BRL, March 2022. *Value considered atypical and, therefore, was excluded from the average cost of the "Cost of time spent waiting for and receiving service – Before" column. Considering this value, the average cost of the time spent waiting for and receiving service before digitization would be 1,903.50 BRL. **Value considered atypical and, therefore, excluded from the average cost of the "Total cost per request for society – Before" column. Bearing in mind this value, the total average cost per request before digitization would be 2,050.60 BRL. The values in the table are organized from lowest to highest cost, according to the "Total cost per request for society – After" column.

ECONOMIC BENEFITS

Based on the reduction in unit cost per request (Table 2) and on the average number of service requests received after digital transformation (Annex A), the savings to society can be estimated in BRL over the short, medium, and long term following digitization of the 15 services analyzed. Thereafter, the difference between the unit cost after and before the digitization of each service was multiplied by the monthly average number of requests received after digitization and by the number of months to be estimated (1 month, 12 months, 60 months, and 120 months). The average number of requests received after digitization considers only those requests received through digital channels (online portal and application), in the proportion indicated in Annex A.

It is estimated that, after digitization of the 15 services under analysis, by the end of one month, a savings of more than 4.30 million BRL for society will be generated, and that this amount will increase to nearly 52 million BRL in one year, 261 million BRL in five years, and 523 million BRL in ten years (Table 3). Given that the analysis considered 15 services that represent nearly 22 percent of the total volume of service requests received by the Municipality of São Paulo for digital services, a basic extrapolation for the remaining 560 digital services would seem to indicate that the savings to society could be approximately 237.80 million BRL after one year, 1.1 billion BRL after five years, and 2.3 billion BRL after 10 years.

ECONOMIC BENEFITS

TABLE 3

Estimated savings to society, in BRL, over the short, medium, and long term following digital transformation

SERVICE	TARGET PUBLIC ^a	SAVINGS TO SOCIETY FOLLOWING DIGITAL TRANSFORMATION (in BRL ^b)			
		AFTER 1 MONTH	AFTER 1 YEAR	AFTER 5 YEARS	AFTER 10 YEARS
Active debt (payment of outstanding property tax arrears for real estate, according to the co-participation coefficient)	NP/LP	1,865,350	22,384,202	111,921,009	223,842,018
Free neutering service for dogs and cats	NP	725,591	8,707,089	43,535,443	87,070,886
Parking permit for the elderly	NP	658,417	7,901,006	39,505,030	79,010,061
Online phone unlocking service online for individual microentrepreneurs (MEI), self-employed and natural persons (<i>Senha Web</i>)	NP/LP	591,469	7,097,630	35,488,151	70,976,302
Vehicle rotation (exemption for the disabled)	NP	185,760	2,229,120	11,145,599	22,291,198
Parking permit for the disabled (DeFis)	NP	146,552	1,758,630	8,793,148	17,586,295
Monthly top-up of the free student travel pass (<i>Bilhete Único Estudante</i>)	NP	93,310	1,119,720	5,598,600	11,197,201
Online phone unlocking service for legal persons (<i>Senha Web</i>)	LP	36,593	439,117	2,195,584	4,391,169
Notification of controlled prescriptions (registering or updating data of the professional medical prescriber and the healthcare establishment)	NP/LP	27,998	335,970	1,679,851	3,359,703
Special permit for the transport of hazardous goods (1 st permit)	LP	24,037	288,444	1,442,220	2,884,440
Request for rebate of the aliquot of the tax on ownership of hybrid, electric or hydrogen-powered motor vehicles	NP/LP	2,638	31,656	158,282	316,564
Request for sports center membership cards	NP	1,176	14,118	70,588	141,175
Accreditation of the project in the Agents of Open Government (Agentes de Government Abierto) program	NP	1,076	12,909	64,547	129,093
Property tax (request for inclusion, modification or cancellation of the property administration register)	NP/LP	803	9,641	48,207	96,413
Registration of proficiency certificate for motorcycle riders (<i>Motofrete</i>)	LP	38	456	2,278	4,557
Total (sum)		4.360.809	52.329.707	261.648.537	523.297.074

^a NP: natural person; LP: legal person. ^b Values in BRL for March 2022. Values in the table are organized from highest to lowest saving, according to the "After one month" column.

ECONOMIC BENEFITS

02. Benefits to the Municipal Government

In the set of services analyzed, an average reduction of 39.9 percent was observed in the unit cost to the government of a public service request following digital transformation (Table 4). To calculate the average variation in the cost to the government, the simple average of the individual variations of each service analyzed was considered.

When the variations in each category are analyzed, in average terms, there is a reduction in the cost of human resources allocated to providing direct assistance to the public (- 49.9 percent), in the human resources allocated to processing the requests received (- 18.6 percent), and in printing and sending documents (- 46.9 percent), as well as an increase in the cost of physical facilities (+ 21.8 percent) and system costs (+ 61.5 percent).

The 49.9 percent decline in the cost of human resources assigned to providing direct assistance to the public is attributable to offering some or all of the service in stages through digital channels, thereby reducing or eliminating, according to the service, the need for in-person assistance. This means that civil servants or employees previously engaged in serving the public can be redeployed to other activities, thereby boosting the government's capacity for action.

When digital transformation is carried out alongside a review of internal processes, it has the potential to optimize request processing, via the digitization, automation and simplification of back-office flows. Such optimization helps reduce the number of people needed to process requests and justifies the average 18.6 percent reduction in human resource costs allocated to processing service requests.

In contrast, the 46.9 percent reduction in document printing and mailing costs is due to the possibility of receiving and sending information and documents via digital channels, thereby reducing or eliminating the need to print forms and documents or send documents and permits by mail. For example, the permits previously sent to citizens for services under the headings "Parking permit for the disabled" and "Parking permit for the elderly" can now be obtained in digital format, thereby eliminating production and mailing costs.

To implement the digital transformation, information systems had to be used that would permit digital registration and processing of service requests. This generally represents additional expenditure for the government (the cost of implementing and maintaining such systems) and justifies the 61.5 percent increase in the "System costs" category.

In the Municipality of São Paulo, there is a support and maintenance cost associated with the Citizen Relations Integrated Management System, which accepts, incorporates and distributes requests received via the SP156 channels. In some cases, there are also specific system costs, more related to the internal needs and particulars of each agency or service. An example is the "Parking permit for the elderly" service, whose system is integrated into the abovementioned system. In the two cases that recorded a reduction in system costs, the reduction resulted from adjusting for inflation to 2022 values, rather than to the digital transformation process.

ECONOMIC BENEFITS

TABLE 4

Variations in the Cost to the Government Before and After Digital Transformation

SERVICE	VARIATION IN THE COST PER REQUEST BEFORE AND AFTER DIGITAL TRANSFORMATION					TOTAL COST
	HR COST IN-PERSON ASSISTANCE SERVICE	HR – COST OF PROCESSING	COST OF PHYSICAL FACILITIES	COST OF PRINTING AND SENDING DOCUMENTS	COST OF SYSTEM MAINTENANCE	
Parking permit for the elderly	100.00%	-99.97%	-18.73%	-96.49%	-22.80%	-99.84%
Parking permit for the disabled (DeFis)	100.00%	-99.96%	-51.17%	-100.00%	-54.39%	-99.33%
Active debt (payment of outstanding property tax arrears for real estate according to the co-participation coefficient)	100.00%	0.00%	0.00%	-100.00%	0.00%	-95.31%
Online phone unlocking service for legal persons (<i>Senha Web</i>)	100.00%	-74.54%	36.80%	0,00%	100.00%	-80.57%
Property tax (request for inclusion, modification or cancellation of the property administration register)	-100,00%	-62.50%	0.00%	0,00%	100.00%	-69.51%
Online phone unlocking service for individual microentrepreneurs, self-employed, and natural persons (<i>Senha Web</i>)	-100.00%	100.00%	-84.38%	100.00%	100.00%	-66.96%
Monthly top-up of the free student travel pass (<i>Bilhete Único Estudante</i>)	-73.26%	-52.66%	200.18%*	-36.99%	100.00%	-56.06%
Vehicle rotation (exemption for the disabled)	100.00%	13.46%	124.75%	0.00%	100.00%	-53.01%
Registration of proficiency certificate for motorcycle riders (<i>Motofrete</i>)	-33.33%	0.00%	0.00%	-100.00%	0.00%	-18.52%
Accreditation of the project in the Agents of Open Government (<i>Agentes de Government Abierto</i>) program	-100.00%	-17.93%	0.00%	-100.00%	100.00%	-16.88%
Notification of controlled prescriptions (registering or updating data of the professional medical prescriber and the healthcare establishment)	65.48%	20.00%	-11.11%	-50.00%	100.00%	-8.38%
Special permit for the transport of hazardous goods (1 st permit)	-100.00%	-6.28%	0.12%	-20.00%	100.00%	-4.32%
Request for rebate of the tax on ownership of hybrid, electric or hydrogen-powered motor vehicles	-100.00%	1.88%	0.13%	-100.00%	0.00%	0.04%
Free neutering service for dogs and cats	192.59%	0.00%	0.00%	-100.00%	100.00%	109.08%
Request for sports center membership cards	100.00%	0.00%	263,602.00%**	-1.39%	100.00%	7,886.23%***
General analysis	-49.90%	-18.57%	21.84%	-46.99%	61.52%	-39.97%

*As the increase in the cost of physical facilities used for the "Monthly top-up of the free student travel pass (*Bilhete Único Estudante*)" is unrelated to digitization of the service; rather, it arises from the agency's move to new headquarters. The cost of physical facilities was excluded from the total cost both before and after digitization of this service. **Amount considered atypical and, therefore, excluded from the average variation in the "Cost of physical facilities" column. If this value were included, then the average variation in the cost of physical facilities would be 26,379,86 BRL. ***Value considered atypical and, therefore, excluded from the average variation in the "Total cost" column. Taking this value into consideration would yield an average variation in the total cost of 488.44 percent. The values in the table are arranged from highest to lowest percentage reduction, according to the "Total cost" column.

ECONOMIC BENEFITS

The average increase of 21.8 percent per request in the cost of physical facilities in some services, such as “Vehicle rotation (exemption for the disabled),” “Online phone unlocking service for legal persons (Senha Web),” “Request for rebate of the tax aliquot ownership of hybrid, electric or hydrogen-powered motor vehicles,” the “Special permit for the transport of hazardous goods (1st permit),” and the “Request for sports center membership cards” is related to the reduction in the monthly average number of requests received by the service after digitization. This factor is a consequence of the ongoing impacts of the COVID-19 pandemic, on top of the maintenance costs of these spaces. In the case of the “Monthly top-up of the free student travel pass (Bilhete Único Estudante),” the increase is owed not only to the reduction in the number of requests received during the pandemic period, but also to the move by the agency responsible for the service to more spacious facilities.

For example, in the case of the “Parking permit for the elderly,” the cost of human resources per request allocated to direct assistance to the public fell from 12 BRL to 0 BRL; the cost of human resources allocated to processing requests received decreased from 4,592.80 BRL to 1.50 BRL; the cost of physical facilities went from 0.30 BRL to 0.20 BRL; the cost of printing and sending documents decreased from 3.60 BRL to 0.10 BRL, while the cost of system maintenance fell from 6.90 BRL to 5.30 BRL. These variations meant that the unit cost of this service declined from 4,615.60 BRL to 7.20 BRL (Table 5).

ECONOMIC BENEFITS

TABLE 5

Cost to the Government per Request, Before and After Digital Transformation, by Category of Cost Analyzed, in BRL (BRL)

SERVICE	COST PER REQUEST, BEFORE AND AFTER DIGITAL TRANSFORMATION (in BRL) ^a											
	HR COST – IN-PERSON ASSISTANCE SERVICE		HR – COST OF PROCESSING		COST OF PHYSICAL FACILITIES		COST OF PRINTING AND SENDING DOCUMENTS		COST OF SYSTEM MAINTENANCE		COST PER REQUEST FOR THE GOVERNMENT	
	BEFORE	AFTER	BEFORE	AFTER	BEFORE	AFTER	BEFORE	AFTER	BEFORE	AFTER	BEFORE	AFTER
Parking permit for the elderly	12.0	0.0	4,592.8	1.5	0.3	0.2	3.6	0.1	6.9	5.3	4,615.6	7.2
Vehicle rotation (exemption for the disabled)	12.0	0.0	6.6	7.4	0.2	0.5	0.0	0.0	0.0	0.9	18.8	8.8
Online phone unlocking service for individual microentrepreneurs, self-employed and natural persons (<i>Senha Web</i>)	31.1	0.0	0.0	10.2	0.1	0.0	0.0	0.1	0.0	0.0	31.2	10.3
Online phone unlocking service for legal persons (<i>Senha Web</i>)	31.1	0.0	31.1	7.9	0.1	0.2	0.0	0.0	0.0	4.0	62.3	12.1
Monthly top-up of the free student travel pass (<i>Bilhete Único Estudante</i>) [*]	29.4	7.9	9.3	4.4	9,631.3	28,911.5 ^{**}	14.7	9.2	0.0	2.0	53.4	23.4
Parking permit for the disabled (DeFis)	12.0	0.0	3,530.3	1.5	1.8	0.9	3.6	0.0	47.6	21.7	3,595.3	24.1
Property tax (request for inclusion, modification or cancellation of the property administration register)	20.7	0.0	85.3	32.0	0.0	0.0	0.0	0.0	0.0	0.3	106.0	32.3
Active debt (payment of outstanding property tax arrears for real estate, according to the co-participation coefficient)	1,124.9 ^{***}	0.0	55.4	55.4	0.0	0.0	0.6	0.0	0.0	0.0	1,180.9	55.4
Registration of proficiency certificate for motorcycle riders (<i>Motofrete</i>)	44.3	29.5	39.4	39.4	0.0	0.0	0.9	0.0	0.0	0.0	84.5	68.9
Free neutering service for dogs and cats	20.4	59.6	17.0	17.0	0.0	0.0	0.3	0.0	0.0	2.0	37.6	78.6
Request for sports center membership cards	7.9	15.9	7.9	7.9	0.2	529.8	0.4	0.4	0.0	760.0	16.5	1,314.0
Special permit for the transport of hazardous goods (1 st permit)	75.2	0.0	186.1	174.4	1,703.1	1,705.2	0.6	0.5	0.0	0.0	1,964.9	1,880.1
Notification of controlled prescriptions (registering or updating data of the professional medical prescriber and the healthcare establishment)	73.9	122.2	17.0	20.4	2,166.9	1,926.1	0.3	0.1	0.0	0.0	2,258.0	2,068.9
Request for rebate of the tax aliquot on ownership of hybrid, electric or hydrogen-powered motor vehicles	3.9	0.0	93.5	95.2	3,306.8	3,311.0	0.6	0.0	0.0	0.0	3,404.7	3,406.2
Accreditation of the project in the Agents of Open Government (Agentes de Government Abierto) program	30.6	0.0	9,788.7	8,033.8	0.0	0.0	0.6	0.0	0.0	128.9	9,819.9	8,162.7
Total (average)	28.9	15.7	1,230.7	567.2	1,120.7	533.85	1.7	0.7	3.6	61.7	1,816.6	1,143.5

^a Values in BRL for March 2022. ^{*}As the increase of the cost of physical facilities for the "Monthly top-up of the free student travel pass (Bilhete Único Estudante)" column is unrelated to digitization of the service but, rather, is due to the agency's move to new headquarters, the cost of physical facilities was excluded from the total cost of this service. ^{**}Amount considered atypical and, therefore, excluded from the "Cost of physical facilities – After" column. If this value were included, the average cost of physical facilities, per request, after digitization would be 2,425,70 BRL. ^{***}Value considered atypical and, therefore, excluded from the average of the "HR cost – In-person assistance service- Before" column. If this value were taken into account, the average cost per request for the human resources allocated to dealing with the public would be 102,00 BRL. The values in the table are ordered from lowest to highest according to the "Cost per request for the government – After" column.

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TABLE 6

Estimated Savings to the Government, in BRL, over the Short, Medium, and long Term Following Digital Transformation

Table 6 summarizes the estimated savings to the government of the Municipality of São Paulo following digital transformation of the 15 services analyzed.

SERVICE	SAVINGS TO THE GOVERNMENT FOLLOWING DIGITAL TRANSFORMATION (in BRL) ^a			RETURN ON INVESTMENT PERIOD ^b
	AFTER 1 YEAR	AFTER 5 YEARS	AFTER 10 YEARS	
Parking permit for the elderly	468,748,329.01	2,352,736,958.64	4,707,722,745.68	< 1 month
Parking permit for the disabled (DeFis)	77,752,272.64	397,756,676.76	797,762,181.92	< 1 month
Online phone unlocking service for individual microentrepreneurs, self-employed and natural persons (<i>Senha Web</i>)	3,275,972.09	16,409,565.81	32,826,557.97	< 1 month
Monthly top-up of the free student travel pass (<i>Bilhete Único Estudante</i>)	283,096.77	1,419,801.34	2,840,682.06	< 1 month
Notification of controlled prescriptions (registering or updating data of the professional medical prescriber and the healthcare establishment)	-450,528.22	3,844,019.11	9,212,203.27	17 months
Active debt (payment of outstanding property tax arrears for real estate, according to the co-participation coefficient)	-587,222.30	2,936,511.95	7,341,179.75	20 months
Online phone unlocking service for legal persons (<i>Senha Web</i>)	-716,141.51	1,278,524.71	3,771,857.50	29 months
Registration of proficiency certificate for motorcycle riders (<i>Motofrete</i>)	-1,156.68	847.16	3,351.95	40 months
Vehicle rotation (exemption for the disabled)	-1,164,393.94	636,123.22	2,886,769.67	43 months
Accreditation of the project in the Agents of Open Government (Agentes de Government Abierto) program	-977,116.55	-254,564.21	648,626.22	77 months
Special permit for the transport of hazardous goods (1 st permit)	-1,548,945.96	-1,284,769.05	-954,547.91	293 months
Property tax (request for inclusion, modification or cancellation of the property administration register)	-1,487,997.83	-1,436,717.62	-1,372,617.36	1,405 months
Request for rebate of the tax aliquot on ownership of hybrid, electric or hydrogen-powered motor vehicles	-1,611,650.03	-1,616,287.334	-1,622,083.96	No return
Request for sports center membership cards	-1,679,401.53	-1,938,914.72	-2,263,306.22	No return
Free neutering service for dogs and cats	-5,333,775.01	-18,998,150.18	-36,078,619.15	No return
Total (sum)	534,501,340.95	2,751,489,625.58	5,522,724,981.39	-

^a Values in BRL for March 2022. ^b Number of months necessary for investment in digitization to be paid by savings generated by digital transformation. The values in the table are ordered from lowest to highest according to the column "Return on investment period".

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As in the calculation of the saving for society, based on the reduction in unit cost per request (Table 5) and on the average number of service requests received after digital transformation (which is shown in Annex A), the saving was estimated in BRL for the government over the short, medium, and long term following digitization of the 15 services analyzed. Thereafter, the difference between the unit cost after and before digitization of each service was multiplied by the respective average monthly number of requests received following digitization and by the number of months estimated (12 months, 60 months and 120 months). The average number of requests received after digitization considered only the requests received through digital channels (online portal and application), in the proportion indicated in Annex A.

It is estimated that, once the 15 services analyzed are digitized, after one year, a savings of 534 million BRL would be generated. This amount increases to 2.7 billion BRL after five years and to 5.5 billion BRL after 10 years (Table 4).

In five of the services analyzed (Table 6), there is no financial return on the investment made in digital transformation (Table 7), either because the service became more expensive or because the return period is so long that, in practice, there is no return. However, these services continue to generate savings to society. The remaining services also generate a significant return in the short term as a consequence of the lower costs generated by digital transformation. This return is more than sufficient to compensate for the investment made in the services that became more expensive, which results in an overall savings to the government.

Analysis of the cost-benefit ratio after digitization, calculated as the ratio between the investment made by the government in digital transformation of each service and the respective saving generated, reveals that one year after digitization of the 15 services analyzed, every real invested generates a return of 27.1 BRL, and that this amount increases to 139.4 BRL after five years and to 279.7 BRL after 10 years (Table 7). These results confirm that digital transformation generates significant returns, which increase over time.

Given that the analysis was carried out by considering 15 services that represent nearly 22 percent of the total volume of requests for digital services received by the Municipality of São Paulo, a basic extrapolation for the remaining 560 digital services would seem to indicate that the saving generated for the government could amount to approximately 2.4 billion BRL after just one year, 12.5 billion BRL after five years, and 25.1 billion BRL after 10 years.

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TABLE 7

Investment Made by the Municipal Government in Digitizing Each Service and the Cost-Benefit Ratio of Digitization for the Government in the Short, Medium, and Long Term

SERVICE	INVESTMENT IN DIGITIZATION, IN BRL ^a	COST-BENEFIT RATIO ^b OF DIGITIZATION AFTER ONE YEAR	COST-BENEFIT RATIO ^b OF DIGITIZATION AFTER FIVE YEARS	COST-BENEFIT RATIO ^b OF DIGITIZATION AFTER 10 YEARS
Online phone unlocking service for individual microentrepreneurs, self-employed and natural persons (<i>Senha Web</i>)	7,426.34	441.13	2,209.64	4,420.29
Monthly top-up of the free student travel pass (<i>Bilhete Único Estudante</i>)	1,079.37	262.28	1,315.39	2,631.79
Parking permit for the elderly	2,248,828.39	208.44	1,046.21	2,093.41
Parking permit for the disabled (DeFis)	2,248,828.39	34.57	176.87	354.75
Notification of controlled prescriptions (registering or updating data of the professional medical prescriber and the healthcare establishment)	1,524,165.06	-0.3	2.52	6.04
Active debt (payment of outstanding property tax arrears for real estate, according to the co-participation coefficient)	1,468,155.86	-0.4	2	5
Online phone unlocking service for legal persons (<i>Senha Web</i>)	1,214,808.07	-0.59	1.05	3.1
Registration of proficiency certificate for motorcycle riders (<i>Motofrete</i>)	1,657.64	-0.7	0.51	2.02
Vehicle rotation (exemption for the disabled)	1,614,523.23	-0.72	0,39	1.79
Accreditation of the project in the Agents of Open Government (Agentes de Government Abierto) program	1,157,754.64	-0.84	-0.22	0.56
Special permit for the transport of hazardous goods (1 st permit)	1,614,990.19	-0.96	-0.8	-0.59
Property tax (request for inclusion, modification or cancellation of the property administration register)	1,500,817,88	-0.99	-0.96	-0.91
Request for rebate of the tax aliquot on ownership of hybrid, electric or hydrogen-powered motor vehicles	1,610,490.71	-1	-1	-1.01
Request for sports center membership cards	1,614,523,23	-1.04	-1.2	-1.4
Free neutering service for dogs and cats	1,917,681.22	-2.78	-9.91	-18.81
Total	19,745,730.23	27.07	139.35	279.69

^a Values in BRL as of March 2022. ^b Indicates the return for every real invested in digitization. The values in the table are organized from highest to lowest, according to the "Cost-benefit ratio of digitization after one year."

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BOX 1

Qualitative Analysis

Qualitative Analysis: *Empreenda Fácil* Program: Facilitating the Creation of Low-risk Firms in the City of São Paulo

The process of creating and formalizing businesses was one of the greatest obstacles to improving the business environment in the city of São Paulo, where the average time needed to start a low-risk business in 2016 was 101.5 days (Municipality of São Paulo. Goal Plan 2017-2020). Of this period, 90 days were spent in the municipal licensing phase, a phase that is the sole responsibility of the municipal government and one of the major bottlenecks in the business creation process. In the city of São Paulo, starting a business was extremely complex and required the potential entrepreneur to make several trips and to present documents and analysis that, in some cases, could even make starting the firm unviable.

The first initiatives aimed at changing this scenario date back to 2014, with the promulgation of Law 16,050, which amends the city's strategic plan to facilitate business creation in the municipality through fiscal and urban development incentives. In 2016, following publication of five municipal decrees^a, the *Empreenda Fácil* program was put into operation with the aim of shortening the period needed to create and formalize firms via an electronic procedure. In 2017, the program was included in the municipal Goal Plan for 2017-2020, with the aim of shortening the time needed to create and formalize low-risk firms from 101.5 days to just five days, which strengthened the initiative.

The main aim of the program *Empreenda Fácil* was to reduce bureaucracy in the creation and formalization of low-risk firms in the city of São Paulo by stimulating digital transformation and by adjusting flows to avoid duplication of requirements and stages. The project centered on low-risk firms because they accounted for around 80 percent of the business creation and formalization processes in the municipality. The *Empreenda Fácil* program also focused on possible improvements in the efficient use of public resources and providing assistance to citizens, similar to the digital transformation project for municipal services of the city of São Paulo. Before the program, there was no structured and centralized control of the data and the information related to the low-risk firm start-up process. All assistance was provided in-person and decentralized through the municipality's 32 sub-municipalities, while information was processed on paper and in person. It was therefore impossible to make a quantitative analysis of the impact of digital transformation on the program's business start-up process following the same methodology adopted in the rest of the study. However, beyond the non-quantifiable economic benefits, the program adjustments and advances generated significant qualitative benefits to both government and society.

One of the major benefits is related to business viability. Starting a firm is conditional on its compliance with the municipal master plan. In the previous process, no prior analysis was carried out before compliance with this condition. However, a legal person registration number was created and issued (CNPJ for its initials in Portuguese) for each firm, even for those unable to operate in São Paulo, such as fireworks manufacturers. Under the *Empreenda Fácil* program, the viability stage now comes before creation of the firm^b and the issuance of the CNPJ. In this way, it is possible to verify whether the activity and the place chosen comply with the arrangements set out in the city master plan, well before the potential entrepreneur makes any investment in, for example, renovations or hiring.

A further benefit is the reduction in the number of trips needed to perform personal procedures. Before digitization, a minimum of four in-person visits to different establishments were needed. Presently, for low-risk firms, only one personal visit is required for the process. The number of trips is thereby reduced, with a commensurate savings in resources for the entrepreneur.

Empreenda Fácil facilitated the municipal registration process. In the city of São Paulo, specifically, the process is known as property taxpayer registration (CCM, for its initials in Portuguese). The CCM previously required a personal appointment and, as this was not a mandatory procedure, many firms failed to appear. With *Empreenda Fácil*, however, the CCM can now be issued automatically, once the firm registration stage has been completed.

The new self-declaration process for entrepreneurs implemented by the *Empreenda Fácil* service has increased the trust that the municipal government places in citizen. On the one hand, all declarations are considered true and, on the other, the possibility of corrupt practices is reduced, since the entire procedure is carried out digitally and can be subjected to much wider and more efficient monitoring. Moreover, enhanced integration among municipal agencies, federal agencies such as the Federal Public Revenue Administration and state agencies such as the Business Register have boosted efficiency and streamlined the firm creation process.

The digital transformation process carried out by the *Empreenda Fácil* program has thus improved the city's business environment, cut the amount of bureaucracy in the entrepreneurs' daily lives, and reduced the time needed to start a business. The project's impacts are noticeable in the improved ranking of the city of São Paulo on the Doing Business index. It rose from 176th place in 2018 to 138th position in 2019,^c and the reduction in time needed to start a firm fell from more than 100 days in 2016 to just five days in November 2017.^d In 2018,^e the program was awarded the *Premia Sampa* for Innovation in Services and Public Policies.

Source: Documentary research conducted by the authors and an interview with a civil servant who accompanied the process described.

^a Informações *Empreenda Fácil* – start-up process for firms, available at:

https://www.prefeitura.sp.gov.br/cidade/secretarias/desenvolvimento/espaco_do_trabalhador/index.php?p=256510.

^b Business viability analysis, available at: <https://e-licenca.prefeitura.sp.gov.br/ConsultaPublica>.

^c São Paulo helps Brazil to climb 38 places in the Doing Business 2020 ranking. Available at:

<https://www.capital.sp.gov.br/noticia/sao-paulo-ajuda-brasil-a-subir-38-posicoes-no-ranking-doing-business-2020>.

^d *Empreenda Fácil* helps firms to start trading in five days, available at:

<https://www.capital.sp.gov.br/noticia/empreenda-facil-permite-abertura-de-empresas-em-ate-cinco-dias>.

^e Prize awarded in 2018, available at:

<https://www.prefeitura.sp.gov.br/cidade/secretarias/inovacao/prodam/noticias/index.php?p=269035>.

FINAL CONSIDERATIONS AND RECOMMENDATIONS

Digital transformation should be considered a government policy and strategy and applied in a structured and planned manner to a broad range of public services, not only to increase access to such services but also to make service provision more effective, efficient, and transparent. While the savings in terms of financial resources is a positive externality of digital transformation for citizens, firms, and governments, it is not necessarily its principal aim. For this reason, and bearing in mind that the State is the actor responsible for investing to enable citizens to effectively exercise their rights, it is possible that digitizing certain services may not generate savings in government resources. However, when digital transformation is planned and implemented as a government strategy and applied to a broad range of services, it leads to resource savings for the government, since the saving achieved in certain services surpasses the additional spending needed for the digital transformation of others.

From the economic point of view, digital transformation always tends to be beneficial to society. Both in average terms and in the individual analysis for each service, it is cheaper to request a public service digitally.

In addition to the economic benefit, digital transformation reduces the barriers to access to services by expanding the number of channels and making it possible to request services remotely. It can also reduce the time spent waiting for the requested service to be delivered. Digitization facilitates treatment of information and means that digital and structured databases can be built, allowing the government to identify bottlenecks, monitor execution, and plan its service provision more efficiently and assertively via the use of data and indicators.

Despite the positive results achieved by the city of São Paulo as a result of digital transformation, there is still room for improvement, by using services and channels that (i) are even more centered on user experiences and on the specific needs of different groups, (ii) have more predictive and less reactive municipal government actions based on analysis of the service request data and, finally, (iii) offer greater availability.

Therefore, taking the case of the city of São Paulo as a point of departure, it is hoped that the digital transformation process can be replicated and adopted in other municipalities throughout Brazil as well as in other cities of Latin America and the Caribbean as a way to improve public service provision, by offering more quality and efficiency and potential resource savings for both society and governments.

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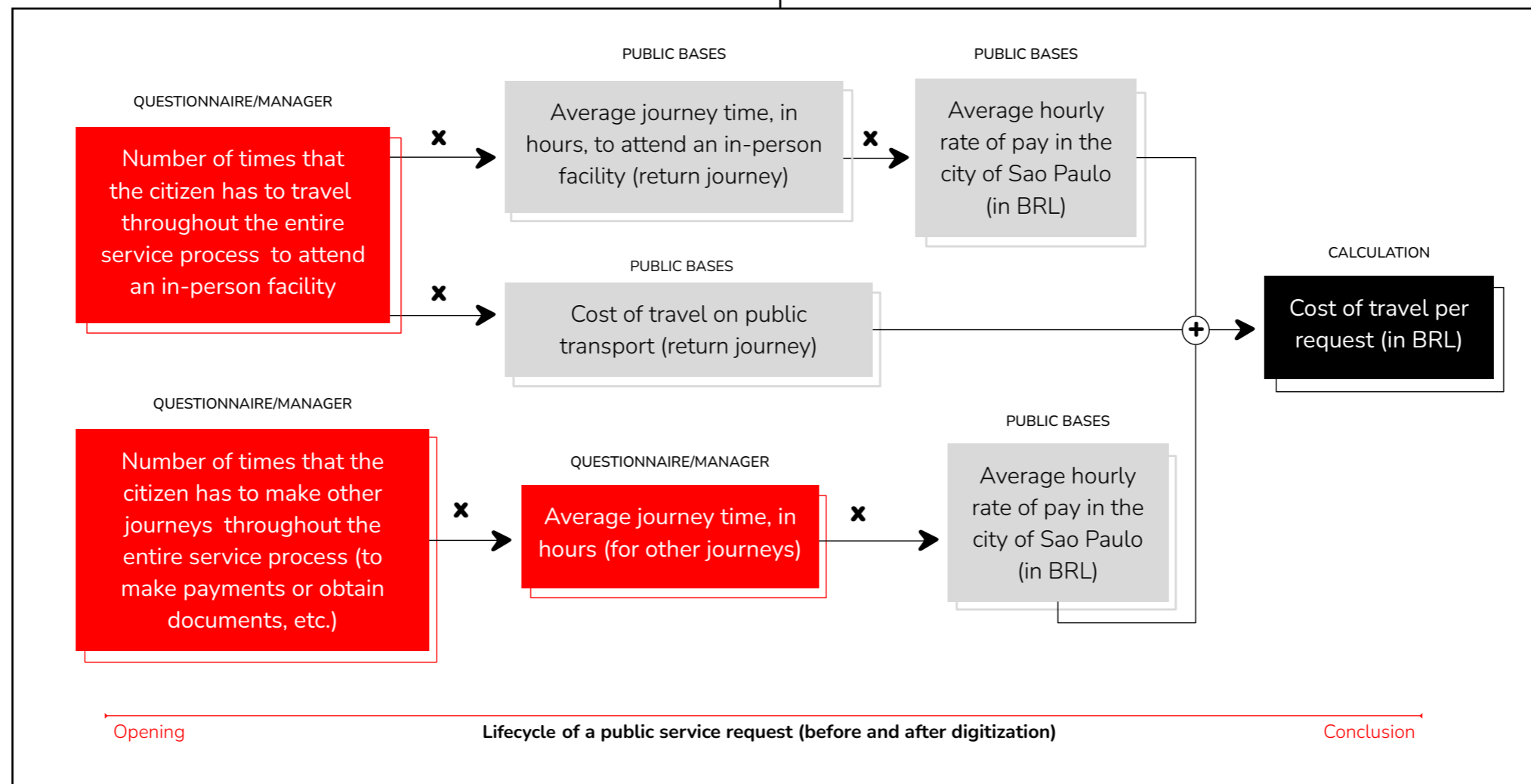
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#	OFFICIAL NAME OF THE SERVICE	PUBLIC AGENCY RESPONSIBLE ^a	TARGET PUBLIC ^b	DATE OF DIGITIZATION	QUANTITY (MONTHLY AVERAGE) ^c	PERCENTAGE OF WOMEN REQUESTING SERVICE	PROCESS MAPPING	PERCENTAGE OF REQUESTS RECEIVED THROUGH DIGITAL CHANNELS ^d
1	Free neutering service for dogs and cats	SMS	NP	06/01/2020	7,440	74%	Yes	99,86%
2	Parking permit for the elderly	SMT	NP	01/07/2019	6,545	44%	Yes	94.63%
3	Vehicle rotation (exemption for the disabled)	SMT	NP	10/24/2019	3,624	48%	Yes	99.66%
4	Parking permit for the disabled (DeFis)	SMT	NP	01/07/2019	1,766	51%	Yes	84.29%
5	Online phone unlocking service for legal persons (<i>Senha Web</i>)	SF	LP	03/10/2021	1,287	40%	Yes	100.00%
6	Monthly top-up of the free student travel pass (<i>Bilhete Único Estudante</i>)	SPtrans	NP	10/10/2018	963	66%	No	57.96%
7	Notification of controlled prescriptions (registering or updating data of the professional medical prescriber and the healthcare establishment)	SMS	NP/LP	06/10/2020	464	45%	Yes	100.00%
8	Registration of proficiency certificate for motorcycle riders (<i>Motofrete</i>)	SMT	LP	05/12/2021	1	71%	No	100.00%
9	Request for rebate of the tax aliquot on ownership of hybrid, electric or hydrogen-powered motor vehicles	SVMA	NP/LP	07/23/2019	84	30%	Yes	100.00%
10	Active debt (payment of outstanding property tax arrears for real estate, according to the co-participation coefficient)	PGM	NP/LP	08/05/2020	75	47%	Yes	98.70%
11	Special permit for the transport of hazardous goods (1 st permit)	SMT	LP	10/24/2019	66	61%	Yes	100.00%
12	Accreditation of the project in the Agents of Open Government (Agentes de Government Abierto) program	SGM	NP	05/21/2021	34	71%	Yes	100.00%
13	Property tax (request for inclusion, modification or cancellation of the property administration register)	SF	NP/LP	07/01/2020	14	7%	Yes	100.00%
14	Request for sports center membership cards	SEME	NP	10/29/2019	3	33%	Yes	100.00%
15	Online phone unlocking service for individual microentrepreneurs, self-employed and natural persons (<i>Senha Web</i>)	SF	NP/LP	04/16/2020	15,135	45%	No	100.00%

^a PGM: Attorney General; SEME: Municipal Secretariat for Sports and Leisure; SEMPLA: Municipal Planning, Budget and Management Secretariat; SF: Finance Secretariat; SGM: Municipal Government Secretariat; SMIT: Municipal Secretariat for Innovation and Technology; SMS: Municipal Health Secretariat; SMT: Municipal Secretariat for Mobility and Transport; SPtrans - São Paulo Transport Company; SVMA: Municipal Secretariat for Green Spaces and the Environment ^b NP: natural person; LP: legal person. ^c Average monthly number of requests received after digitization of each service. ^d Proportion of requests received via digital channels in the fourth quarter of 2021.

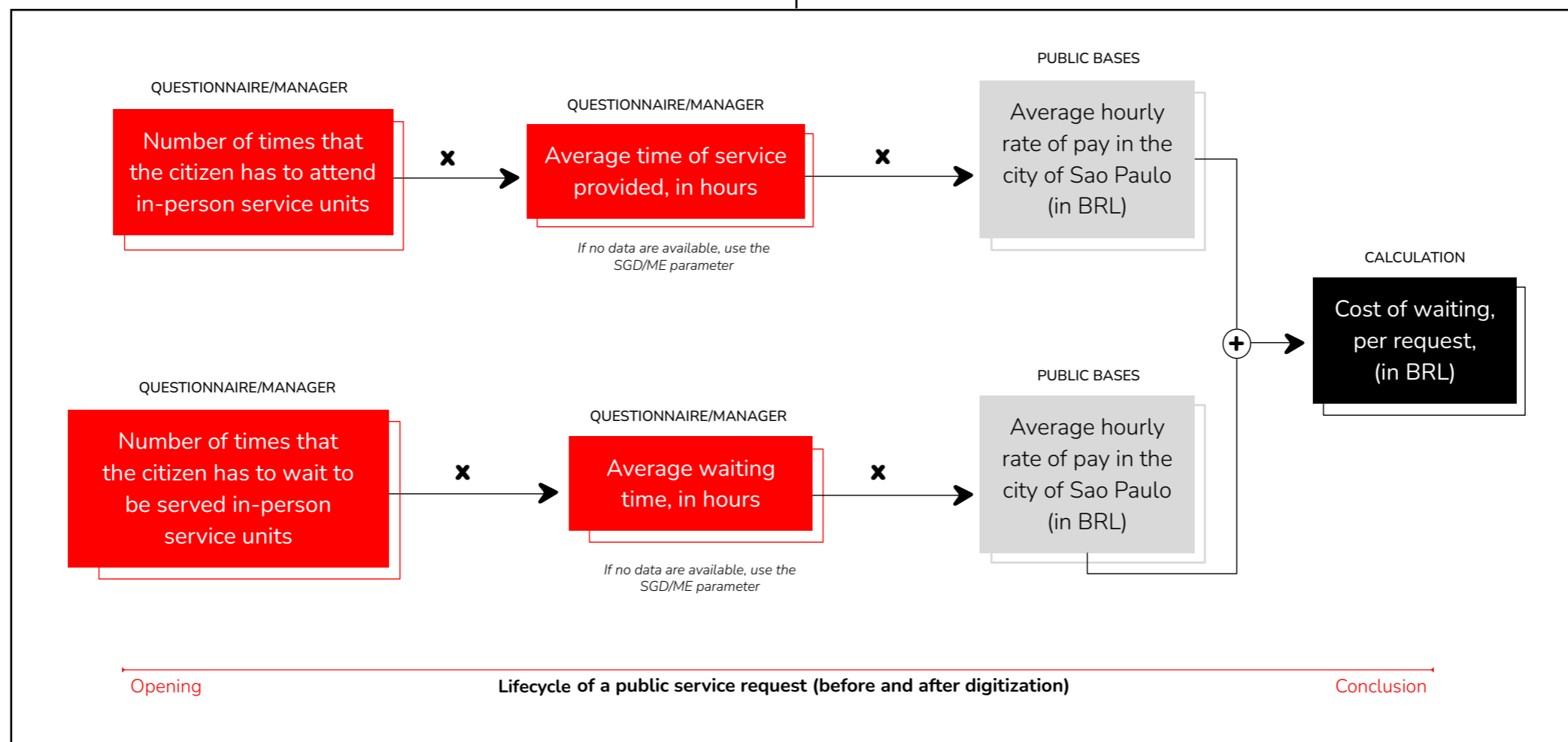
1. SAVINGS TO SOCIETY

1.1 Logical Formula for Calculating the Cost of Travel



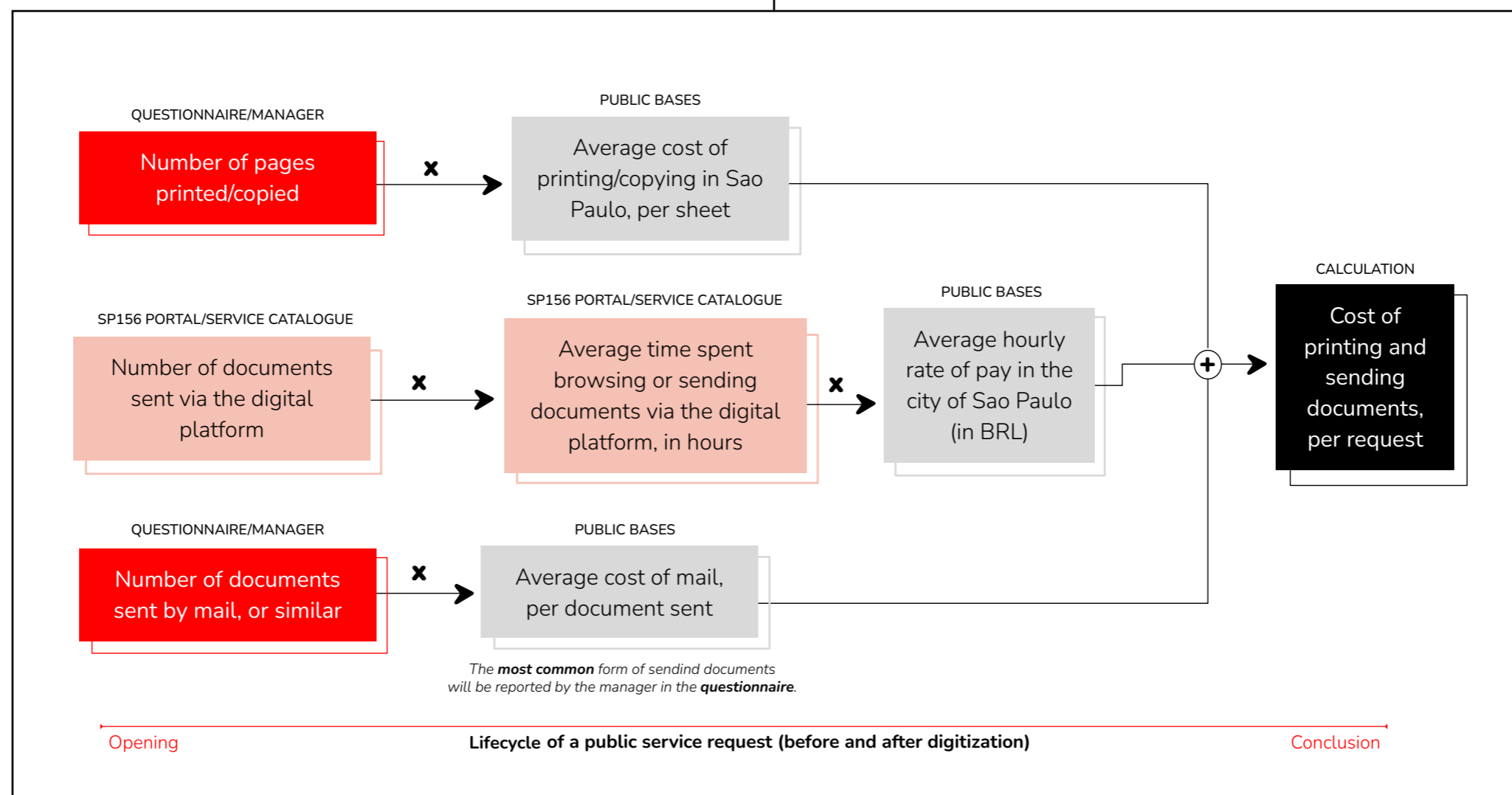
1. SAVINGS TO SOCIETY

1.2 Logical Formula for Calculating the Cost of Wait Time



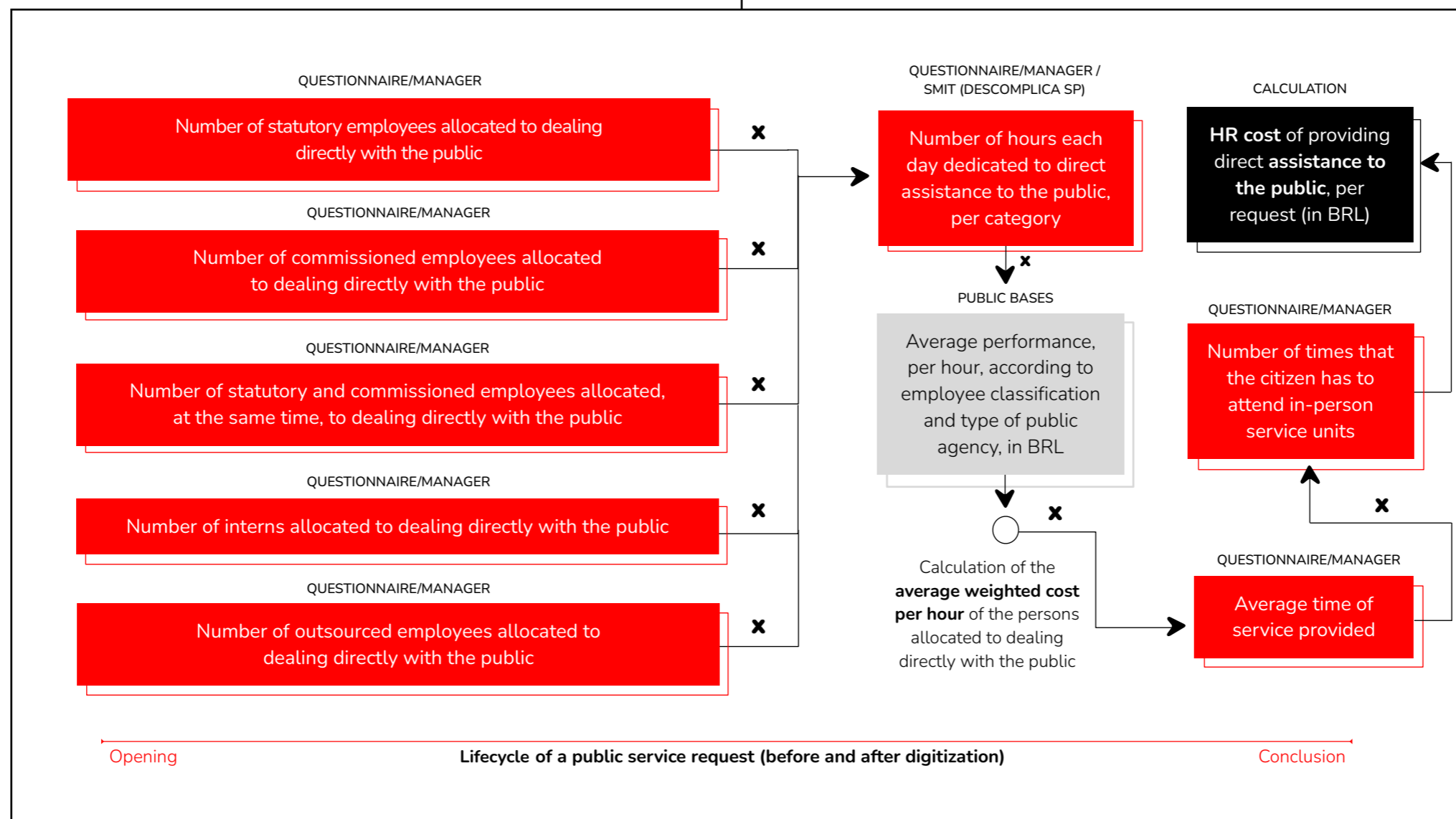
1. SAVINGS TO SOCIETY

1.3 Logical Formula for Calculating the Cost of Printing and Sending Documents



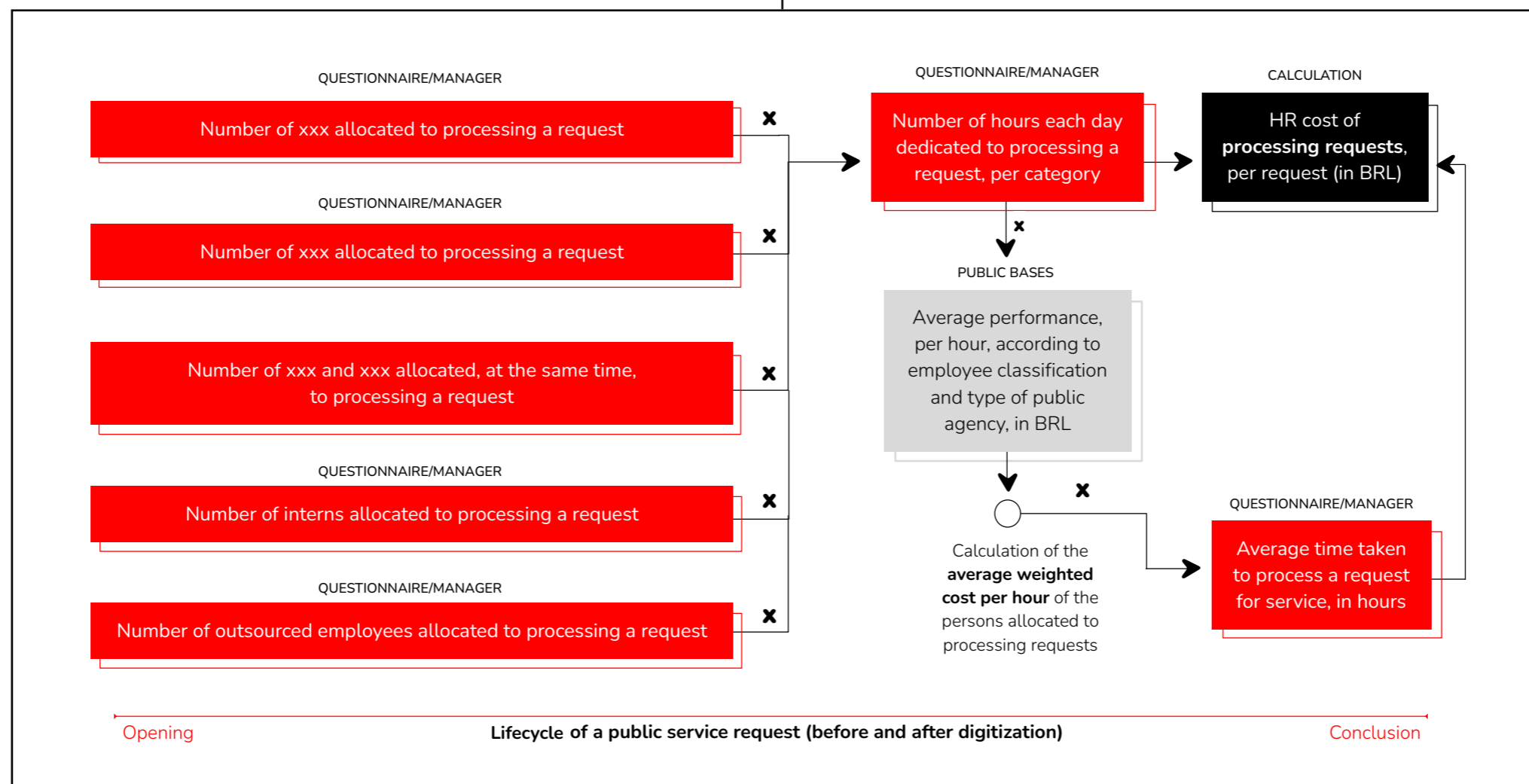
2. SAVINGS TO THE GOVERNMENT

2.1 Logical Formula for Calculating the Cost of Human Resources Allocated to Providing Assistance to the Public



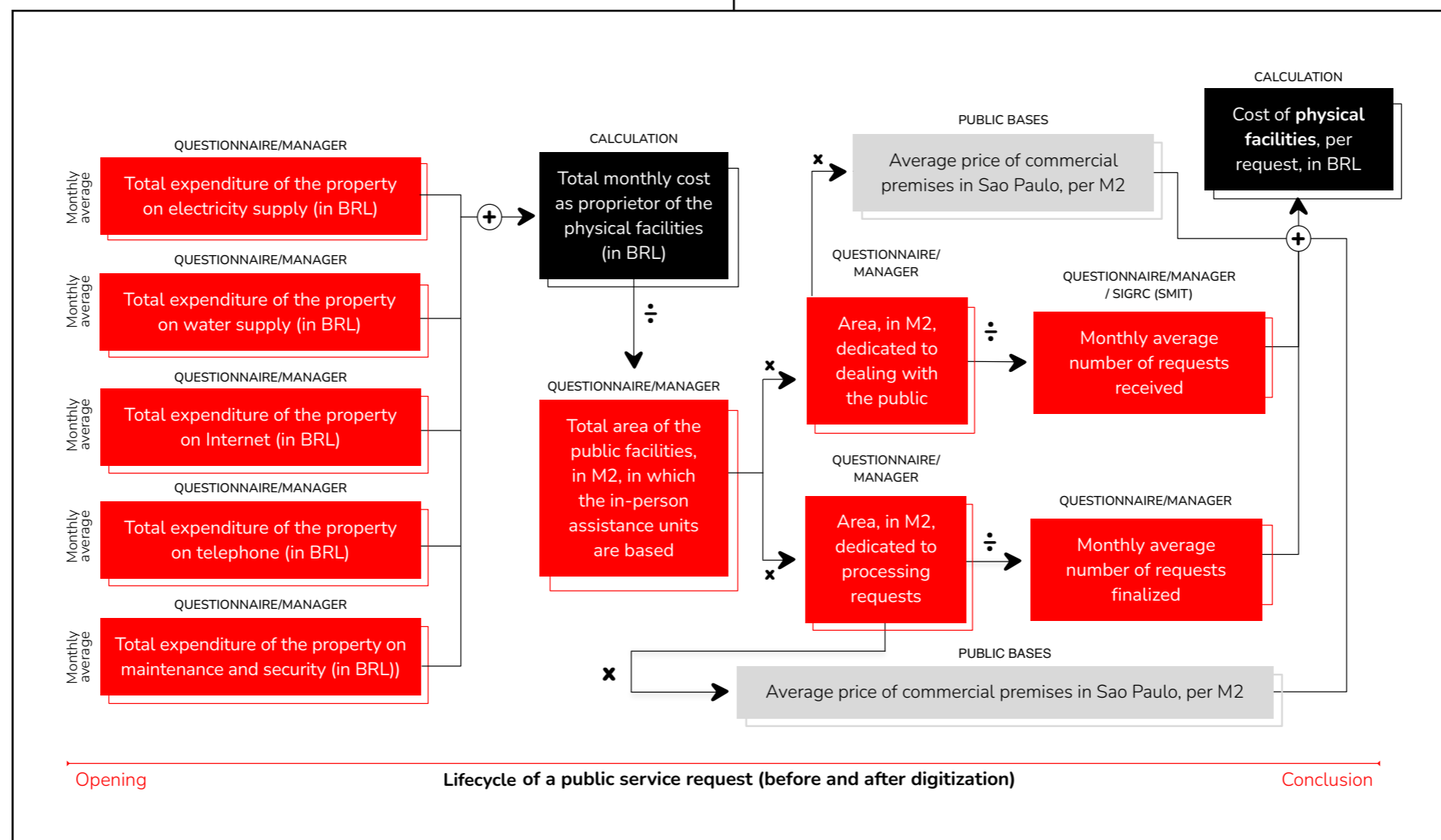
2. SAVINGS TO THE GOVERNMENT

2.2 Logical Formula for Calculating the Cost of Human Resources Allocated to Processing Requests



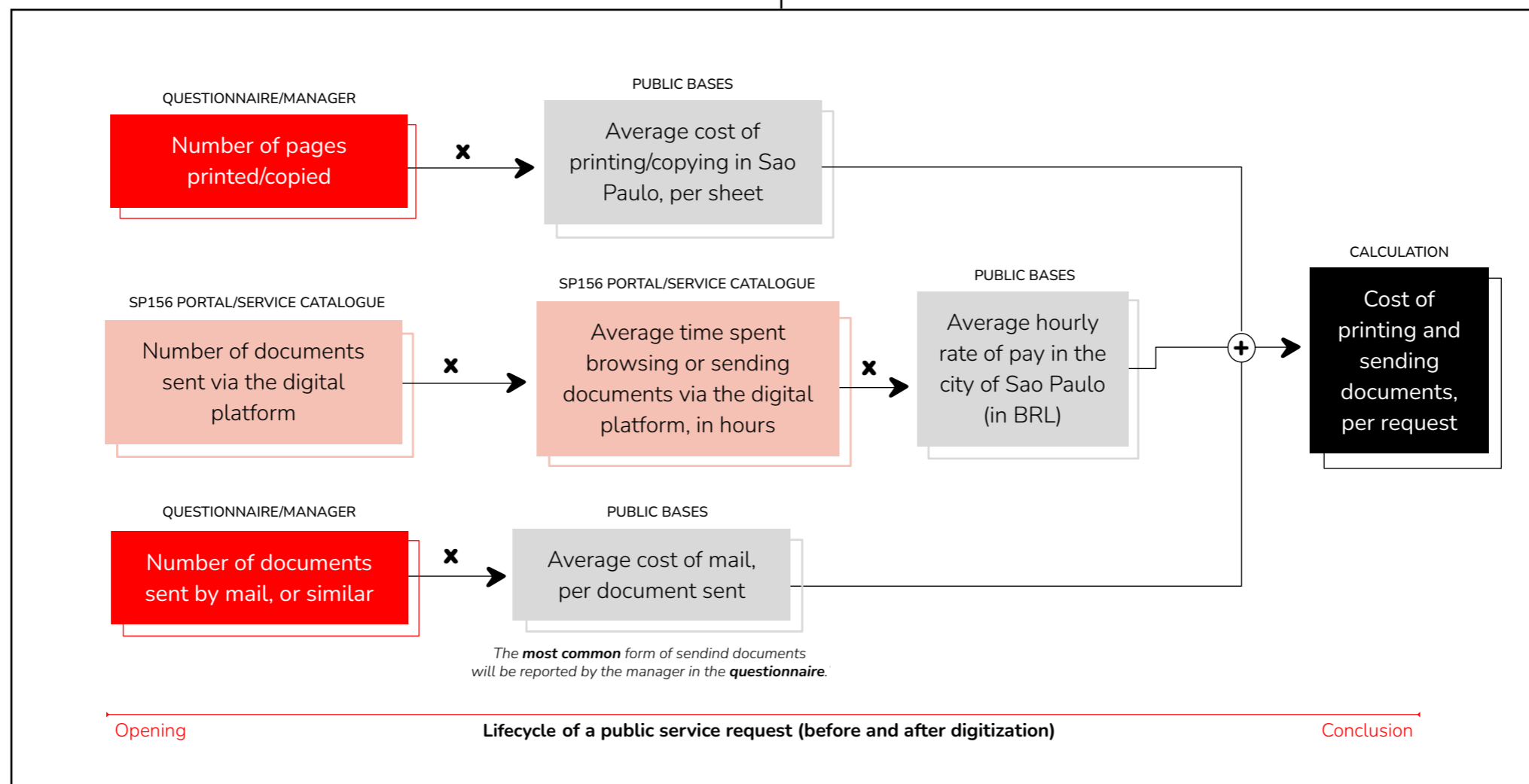
2. SAVINGS TO THE GOVERNMENT

2.3 Logical Formula for Calculating the Cost of Physical Facilities



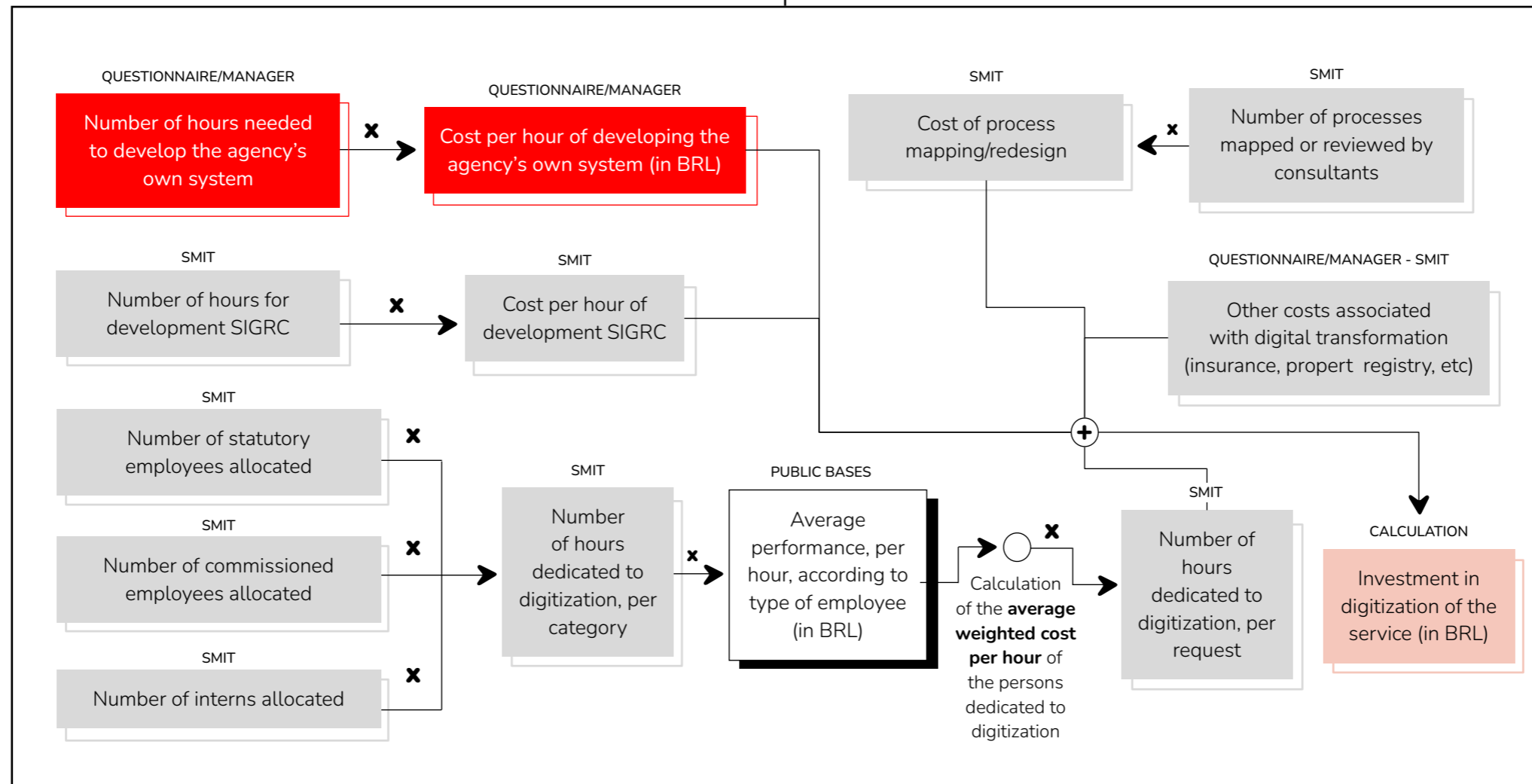
2. SAVINGS TO THE GOVERNMENT

2.4 Logical Formula for Calculating the Cost of Printing and Sending Documents



2. SAVINGS TO THE GOVERNMENT

2.6 Logical Formula for Calculating the Cost of Investment in Digitization¹



¹ Observations: (a) Due to the fact that the SMIT is the secretariat responsible for leading the digital transformation process in the Municipality of São Paulo and considering the team assigned to the digital transformation process for each service, the costs of action were included in calculating investment in digitization; (b) the services whose digital transformation process implies integration with other systems mean that the SMIT team devoted more hours than for services without a system integration phase; (c) to calculate the hours invested in development, the design of questionnaires and integration of the SIGRC with other systems were considered, as well as the average income of a developer according to the contract (in the event of integration with the Electronic Information System (SEI, for its initials in Portuguese). To obtain the cost per service, the total cost of this development was divided by the number of services that, at the time of this study, use this integration, since this is a single development shared by multiple services).



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