

The Efficiency of e-Services in Mexico: a Multidimensional Perspective – Federal Driver's License Digitization Case Study

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Abstract

[Purpose] The purpose of this study is to determine the benefits of e-services, both for a government agency and for citizens in terms of efficiency, derived from the digitalization of one of its processes.

[Methodology/Approach/Design] A case study is presented of a project developed and implemented in 2021 in Mexico at the federal level by the Ministry of Communications and Transportation (SCT), which consisted of the digitalization of the process of issuance and/or revalidation of the Federal Driver's License. The first two months of operation are taken as a reference to determine the effects that this digital platform has had on economic, technical, and social efficiency. Analyzing the number of requests handled, costs for both the government and the citizen compared to the printed license and its processes.

[Findings] Its theoretical basis is an analysis of efficiency based on a multidimensional notion of the concept, which is important since it analyzes improvement scenarios from the government's and citizens' points of view. The above allows this study to determine the benefits of electronic government services, both for a government agency and for citizens in terms of efficiency.

[Practical Implications] The benefits that the Federal Digital License has represented in terms of cost reduction, process improvement, and increased citizen service the Federal Digital License have been demonstrated to these two actors.

[Originality] The difference with the contributions of other studies lies in the object of study, which is the Federal Driver's License system, a case that has not been studied due to its recent implementation. This opens the door to future research, where not only

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quantitative data expressed in numerical terms can be analyzed, but also user satisfaction can be directly evaluated qualitatively.

Keywords: Citizenship. Efficiency. e-Services. Government. ICT.

INTRODUCTION

The accepted papers will be tentatively published in the next issue of this journal. We wish to give the journal a consistent, high-quality appearance. We, therefore, ask that authors follow some basic guidelines. In essence, you should format your paper exactly like this document. The easiest way to use this template is to download it from the journal website and replace the content with your material. The template file contains specially formatted styles (e.g., Normal, Heading, Footer, Abstract, Subtle Emphasis, and Intense Emphasis) that will reduce the work in formatting your final submission.

In recent years, there has been a growing trend globally in public administration because a citizen with higher expectations of care, due to comparing private sector services with those of the public sector (Larsson, 2020). Also, citizens, increasingly connected, demand that governments be more transparent and provide their services more quickly and efficiently (Rodríguez-Bolívar, 2015), therefore, the government must make public services more accessible, functional, transparent, inclusive, and gain some legitimacy through the efficiency of its services. For this reason, governments have been investing in digital technologies, often with high hopes and using significant economic and human resources, to achieve some more efficient public services that, in the case of public administration in Mexico require a solution to the lack of inputs and the desire to reduce intermediaries in the services, as well as improve services for citizens.

Therefore, the incorporation of technologies has allowed the digitalization of public services (Loberg, 2021), which is currently known as e-services through which various procedures can be carried out remotely and without the need to physically go to a government agency. According to the OECD (2017) e-services benefit the efficiency of public administration from several angles, first, it allows it to reduce the operating costs of public services; second, it offers more agile services to the citizen and, third, it promotes transparency and accountability. Therefore, these mechanisms generate great expectations of being tools that trigger efficiency for both the government and the citizenry. Thus, the growing use of e-services is accompanied by high expectations for the provision of efficient services.

In fact, during the last decades, much has been said about the efficiency that these mechanisms represent for public administration, because, recent studies affirm that the implementation of e-services in the provision of public services and programs can favor not only transparency and accountability but also the achievement of less costly processes in the medium term that benefit both the government and the citizen (Carrera-Mora, et al, 2019; Larsson, 2020; Loberg, 2021). Beyond the availability of reports on the number of platforms that exist and their functionality, there is little systematic information on how public administrators themselves are currently defining digital transformation in their day-to-day practices, how they are approaching digital transformation projects, and what their expected outcomes are.

In this sense, the purpose of this study is to determine the benefits of e-services, both for a government agency and for citizens in terms of efficiency derived from the digitalization of one of its processes. Therefore, in the following lines, it is explored how the digitalization of a process could lead to government and citizen efficiency, it is worth mentioning that efficiency has different perspectives, so it is analyzed from the point of view of two actors, the public administrator, and the citizen, thus addressing the following research question: How does the digitization of a public service process benefit government and citizen efficiency in Mexico?

Consequently, the analysis of a project developed and implemented in 2021 in Mexico at the federal level by the Ministry of Communications and Transportation (SCT), consisted of the digitalization of the process of issuance and/or revalidation of the Federal Driver's License, which is presented. The essay is structured in four sections, Section 1 is a literature review of the context of e-services, the approach taken to efficiency, and its relationship with public administration; Section 2 shows the problems presented by the government, as well as highlights the situation of the SCT; finally, in Section 3, an analysis of the implemented solution is made, to end with the conclusions of the benefits obtained with this development and implementation of the e-service.

THEORETICAL FRAMEWORK

e-Services in Public Administration

The incorporation of technologies has allowed the digitization of public services, which is currently known as e-services, these are a branch of the well-known e-government that refers to the incorporation and use of information and communication technologies (ICT) to manage and provide public services (Gil-García and Flores-Zúñiga, 2020; Loberg 2021; Jiang, et al, 2021; Kang and Xie,

2018), only that e-services mainly rely on the use of web platforms and mobile applications to provide public services to citizens.

The digitization of the public sector and, of its basic routines that involve the processing of documentation with a huge amount of data and users is essential for an efficient operation of the current administration in Mexico, because, among its main objectives, is the efficiency of public administration, therefore, it is important to migrate traditional public services that are face-to-face to online services (offered through the Internet).

However, the level of penetration and acceptance of technology in Mexico has not yet reached a point where the interaction between government and citizens is perceived as a fact. There is still a long way to go, hence the presentation of this analysis, which attempts to lay the groundwork for the importance of the digitization of public services processes that are required in large volumes by citizens. To this end, Carrera-Mora et al (2018) identify that it is important to understand that in previous years -under other governments-, progress was made with the implementation of technological infrastructure in the country, seeking to facilitate access to telecommunications to as many people as possible, they did not succeed completely, but they paved the way for the digitalization of services (e-services).

In terms of digitization of services, Mexico has fallen short in the development of e-services, as evidenced in the UN (2020) the Online Services Index (OSI), so they are still limited and need to expand more services at the Federal level, it is required to incorporate processes beyond the issuance of the Unique Population Registry Code (CURP), the issuance of birth certificates and the payment of taxes at the federal level through the SAT (Tax Administration System). However, decision-makers - from the government - have not been forceful in deciding to implement these mechanisms due to various paradigms that lead them to think that these mechanisms are an expense and not an investment, perspectives that have been noted by various authors such as Carrera-Mora, et al, 2019; Choi, 2020; among others.

However, the current reality is that the economic resources of developing countries such as Mexico have been severely impacted by the COVID-19 pandemic, leading them to drastically reduce their budgets. This has led the federal government to be unable to meet all its commitments, one of which has been the issuance and/or revalidation of the Federal Driver's License, which requires attending to approximately 4,000 applicants in the traditional way (in person and with a printed driver's license) in 2019 and 2020 with a similar projection for the year 2021. Therefore, it was necessary to think of alternatives to solve the efficiency problems identified.

Based on various authors such as Berntzen, (2014); Kamolov and Konstantinov, (2017); Saab, et al, (2018); Zefferer, et al, (2015), the basic objective of e-government initiatives and solutions is to improve efficiency, allowing to speed up government procedures to save time and costs, both for the government and the citizen. In this context, efficiency is, of course, an important aspect, as the efficiency of an e-government solution is directly proportional to its potential to save money. However, efficiency has connotations that may vary depending on who judges it, as can be seen in the following lines.

Efficiency Perspectives

Efficiency is a conception that under the paradigm of administrative sciences implies doing more with less, although apparently efficiency represents a global requirement for e-government solutions, the term efficiency itself may have divergent meanings and implications for different stakeholders (Zefferer, et al, 2014). Therefore, it is important to specify that this definition is conceived from different perspectives (Berntzen, 2014). In fact, through the approach of Carrera-Mora, et al, (2019), this concept can be understood from three different paradigms: economic efficiency, technical efficiency, and social efficiency, in such a way that, economic efficiency is: the degree to which the objectives of an initiative are met at the lowest possible cost (cost reduction); technical efficiency: is the difference between the observed values of production and the maximum achievable values given the technology used (best processes); social efficiency: occurs when goods, services or processes result in a tangible benefit to society, promoting inclusion.

Thus, efficiency is a concept that although it has a central idea which is the fulfillment of objectives, each of the actors involved in e-government processes, or this case e-services (to be precise), efficiency takes relevance from different positions and interests of each of those involved in the process (Berntzen, 2014; Carrera-Mora, et al, 2019; Zefferer, et al, 2014), whether the public administrator, the citizen or the operator of the services. Therefore, under these efficiency approaches presented, it is possible to establish that with the digitalization of the process of issuance and/or revalidation of the Federal Driver's License in Mexico, both economic, technical, and social efficiency must be achieved, seeking the effects on the different actors involved, government and society. In that sense, we can operationalize efficiency according to what is established in Table 1 based on the perspectives of Berntzen, 2014; Carrera-Mora, et al, 2019; Zefferer, et al, 2014.

Economic Efficiency (Government)	Social Efficiency (Citizen)	Technical Efficiency (Government-Citizen)
Reduced operating costs for the government.	Delivery of the federal driver's license to the citizen and increased number of services.	Compliance and improvement of the process of issuance and/or revalidation of the federal driver's license.

Table 1 – Operationalization of Efficiency according to the Actor.

Source: Authors.

Berntzen (2014), proposes a mechanism of indicators for measuring the efficiency of e-government which explains that the increase in efficiency can be expressed in the form of time savings for the citizen/user, but can also include the direct costs and the completion of the procedure versus the government for whom efficiency is reflected in the reduction of costs that digitalization represents compared to a manual process.

Likewise, one of the bases of the notion of government efficiency is the theory of transaction costs that gave rise to the New Public Management Model (NPM), where it is explained that every economic transaction generates costs before its concrete realization, defining the reduction of costs that arise in an organizational operation as the main axes for obtaining government efficiency. The NPM was based on this idea and expected to make the processes of the bureaucratic apparatus more efficient and, at the same time, trigger a better perception of the citizens concerning the governmental apparatus to recover the lost legitimacy (Barzelay, 2000; Hood, 2011).

Thus, the digitization of a process by the government can be assimilated as an element that seeks to detonate efficiency understood through variables such as the reduction of operating costs (Saab, *et al*, 2018) involving human, economic, and material resources, and the improvement of citizen perception regarding public services (Elina, *et al*, 2019; Wu and Guo, 2015). Therefore, the digital incorporation of this process is of great expectation for the government, but also the citizens. Likewise, as noted above, the recent interest in e-services has been reflected in a large number of studies and research projects disclosed in various academic disciplines and journals (Carrera-Mora, *et al*, 2019; Choi, 2020; Jiang, *et al*, 2021), which highlight the possibilities of e-government implementation and show different experiences on e-service projects, convinced that ICT improve efficiency and accelerate productivity growth (Rodríguez-Bolívar, 2014).

Therefore, it is necessary to analyze the efficiency and success of e-services implementations and the outcomes involved in government service digitization projects, which will provide insight into the effects of e-government projects on the efficiency of processes for the government and the citizenry.

The same response can be given to a notion of the federal government, where SEGOB (2021:1) establishes in the Official Gazette of the Federation (DOF) that:

The Federal Public Administration must establish e-government or digital government strategies by taking advantage of information and communication technologies (ICT) to improve its internal management to provide better services, facilitate access to information, accountability, transparency, and strengthen citizen participation.

Federal Driver's License Issuance Process in Mexico

This process in its traditional format required the printing of driver's licenses on physical media (PVC), generating high operating costs (economic efficiency) and limited resources due to budget cuts, which generated delays in the delivery of licenses (technical efficiency). Finally, users had to go to the offices to carry out their procedures in person during the sanitary contingency derived from COVID-19, a situation that limited the number of people who could carry out their procedures, excluding a considerable part of the population (social efficiency).

In Mexico at the federal level, the Secretariat of Communications and Transportation (SCT) of the General Directorate of Federal Motor Transport (DGAF) carries out the issuance and/or revalidation of the Federal Driver's License (LFC), who's printing as of April 1, 2021, was carried out on PVC (Polyvinyl Chloride) plastic cards with certain security locks. However, because of budget cuts and constant spending on consumables, the saturation of services caused a strong backlog in the printing of licenses, together with the waste of plastic cards due to the use of obsolete printers, generating a cost of \$18,964,000.00 (Eighteen million nine hundred and sixty thousand Mexican pesos) in 2019 for the issuance of approximately 210,800 licenses. For this reason, the Information and Communications Technology Unit of the Federal Government of Mexico conducted a four-year cost analysis (see Table 2) to provide an overview of the high transaction costs of this service.

Date	Number of Licenses	Printed License (p.u./includes TAX)	Total Amount of Printed License
2019	210,800	\$89.00	\$18,964,000.00
2020	230,200	\$112.00	\$25,757,599.00
2021	255,100	\$250.00	\$63,775,000.00
2022	280,000	\$260.00	\$72,800,000.00

Table 2 – Five-year expenditure projection.

Source: Authors with data SCT (2021).

MATERIAL AND METHODS

As a result of the above problems, as a public agency, alternatives were sought to improve the process, resulting in the digitalization project that consisted of a transition from a physical Federal License printed on PVC to a digital one, which can be consulted through mobile devices (Android, iOS) to improve efficiency by reducing production or generation costs, simplifying procedures for the government and citizens through information technology-based procedures, reducing potential acts of corruption, updating information in real-time and, in due course, having transversal connectivity with other Federal Government databases.

The project focuses on resolving three technical issues that should be covered by the digitization process:

- Modifying the output format: so that the final product is a Digital Licensing that can be viewed from the application and in PDF format when the consultation is from the web page, through the corresponding adjustments to the e-Licenses system;
- Developing applications for mobile devices and web pages; and
- Contemplating all possible security measures for the issuance of the Digital License.

Solution Architecture (Service Platform Structure)

The digitized platform consists of the development of a mobile device application (online and offline) through which the user will be able to print copies of his license in pdf format, information that can be verified by logging into the Secretariat's website or through the mobile device application via a QR code, likewise, the application should be available to license holders, railroad verifiers, National Guard, etc., and have the following:

- A user registration from the mobile device or web page;
- A section showing the validity of the Certificate of Psychophysical Fitness issued by Preventive Medicine; and
- A displayed message in case the license or certificate of psychophysical fitness is expired.

The implementation of information and communication technologies (ICT) is intended to optimize resources and make obtaining digital licenses more

secure, efficient, timely, and economical for the State, avoiding the need for users to carry out the respective procedures at the Secretariat's service windows. In addition, it will allow the SCT to have more accurate and real-time information on the status of the validity of the Psychophysical Fitness Certificate issued by the General Directorate of Protection and Preventive Medicine in Transportation.

The implemented solution considers the development of two applications, a first mobile application, to be executed on citizens' smartphones, where they download their application through the Internet.

Once the process is completed, the digital license is generated (see Fig. 1), which has the following characteristics:

- The image is in a non-editable digital format and has a double layer QR code (SQRC);
- The document has digital certificates for license authenticity signature and secure internet communication.



Fig. 1 – Federal Driver's License on a Mobile Device.
Source: SCT (2021).

The second mobile application is also designed to be run on smartphones, which will be used for consultation purposes by the Specialized Transportation Attention Group (GAET) of the National Guard and the inspectors of the General Directorate of Federal Trucking (DGAF). They will have a smartphone with data service, with the App they can read the SQRC code both public data and private information that the General Directorate of Protection and Preventive Medicine in Transport and the Transparency Unit authorize, in terms of the regulations for the protection of personal data. The App allows you to

monitor and follow up on the queries made and thus supervise the performance of the work done in the field, avoiding acts of corruption.

The process defined for license verification in the field without internet is as follows:

- The authority in charge of supervising and verifying compliance with the transport regulations carries out the respective inspection and reads the QR code and uses an electronic device to access a local encrypted database; and
- The license database (clipped and encrypted) is stored in the reading device, where you can find relevant information about the driver (validity, incidents, restrictions, etc.). This database will be updated each time the corresponding authorities arrive at their corresponding office.

Data Analysis

To corroborate the usefulness of this implementation, a daily follow-up of the applications registered in the Federal Digital License System (LFD) was carried out; these data were extracted directly from the database of the system in operation, obtaining the total number of applications and a breakdown according to each of the application categories¹.

In addition, a comparative analysis was made of the number of requests handled with respect to the previous year with respect to the traditional process of issuance and/or renewal of the federal driver's license. As a result of the above analysis, the project was approved on January 28, 2021, and published on February 15, 2021, in the Official Gazette of the Federation (DOF). Wherein:

¹ **Category "A"**. Authorizes to drive vehicles destined for the rendering of federal passenger transportation services, for the private transportation of persons, except in the modality of transportation to or from seaports and federal airports and tourism in the modality of driver-guide. **Category "B"**. Authorizes to drive vehicles of the federal freight transportation service, and private freight transportation, in its different modalities, except for double articulated vehicles, as well as those that transport materials, residues, remnants and hazardous waste. **Category "C"**. Authorizes to drive vehicles with two or three axles (rabón or torton) of the federal freight transportation service in its different modalities, and for the private transportation of cargo in its different modalities, except those that transport materials, residues, remnants, and hazardous waste. **Category "D"**. Authorizes to drive vehicles of the federal tourist transportation service in the modality of driver-guide.

It is established that the issuance of federal digital licenses, in the various modes of transportation under the jurisdiction of the Ministry of Communications and Transportation: Auto transportation, Railroad, Air and Merchant Marine, as a mechanism for the accreditation of skills, capacities or certifications, as appropriate, necessary for the driving, assistance, operation or piloting of auto transportation vehicles, railroads, airplanes or ships (SEGOB, 2021:2).

RESULTS

Cost Reduction (Economic Efficiency)

An economic projection was made comparing the production costs of the issuance and renewal of the federal driver's license in its traditional process against the digitalized model proposed for the government, obtaining the data shown in Table 3.

Year	Quantity	Printed License P.U.	Digital License P.U.	Total Amount of Printed License	Total Amount Digital License	Difference (5-year savings)
2021	4752.00	\$248.05	\$107.65	\$1,178,733.60	\$511,552.80	\$667,180.80
2022	4494.92	\$186.95	\$114.11	\$840,325.29	\$512,915.32	\$327,409.97
2023	4251.74	\$198.17	\$120.96	\$842,567.32	\$514,290.47	\$328,276.85
2024	4021.72	\$210.06	\$128.21	\$844,802.50	\$515,624.72	\$329,177.78
2025	3804.15	\$222.66	\$135.91	\$847,032.04	\$517,022.03	\$330,010.01
Total	21324.53			\$4,553,460.75	\$2,571,405.34	\$1,982,055.41
Percentage				100%	56%	44%

Table 3 – Comparison of Printed License vs Digital License.
Source: Authors with data SCT (2021).

The cost projection presented was made by the staff Information and Communications Technology Unit attached to the Secretariat of Communications and Transportation (SCT) of Mexico through the Methodology for the measurement of costs for the provision of public services for which fees are charged by the Ministry of Finance and Public Credit (SHCP, 2018), where, unit costs of services provided by wages and salaries and input costs are considered.

As shown in Table 3, there is a difference between the cost of the printed license \$248.05 (-) minus the cost of the digital license \$107.65=\$140.40 for 2021, which represents a 43.39% decrease in its cost (currency in Mexican pesos), thus allowing to achieve the objective of reducing license production costs through the digitization of the service. The feasibility of the project in terms of production cost reduction represents a 44% cost reduction efficiency.

Citizen Service (Social Efficiency)

The level of citizen attention has increased, just in the first five months corresponding from January 02 to May 31, 2021, the delivery of Federal Driver's Licenses went from 64, 472 (SCT, 2021) granted and delivered in the whole year 2020 to 71, 760 in 5 months, with two months of operation with the new model of the Federal Digital License (LFD) and three months operated traditionally.

The data for these results were provided by the Information and Communications Technology Unit of the Mexican Ministry of Communications and Transportation (SCT) and were downloaded directly from the Federal Digital Federal Driver's License database as Digital Federal License Indicators (LFD).

Likewise, it can be observed at the national level that in the two months that the LFD project has been operating, a total of 25,649 (twenty-five thousand six hundred and forty-nine) applications have been processed in the various categories of the Federal Driver's License, such as renewals, issuances, duplicates, changes of category, additional category, and downgrades (see Table 4 and Graph 1).

Month	Type	Total	% Accumulated	% Monthly
April	Renewals	5610	22	66
	Issuance	1742	7	20
	Duplicates	408	2	5
	Additional Category	714	3	8
	Change Category	32	0.1	0.4
	Downgrading	1	0.004	0.01
	Total Monthly	8507		
May	Renewals	11575	45	68
	Issuance	2332	9	14
	Duplicates	1572	6	9
	Additional Category	1449	6	8
	Change Category	214	0.8	1
	Downgrading	0	0	0
	Total Monthly	17142		
Total		256490		

Table 4 – Requests Handled in the LFD System.

Source: Authors with data SCT (2021).

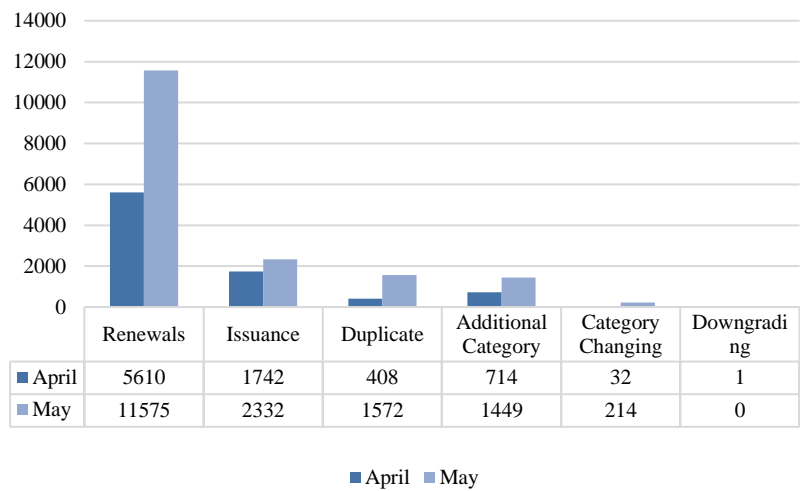


Chart 1 – Total Number of Requests Handled.
Source: Authors with data SCT (2021).

This procedure has allowed the establishment of a simplified process that allows for shorter attention to the citizen, the security of receiving the service, and a digital product that favors a cost reduction of 64.5%, since the payment that the citizen had to make before the traditional service (printed license) was \$475.00 (Four hundred and seventy-five pesos 00/mn) and now for the Federal License in digital format must pay \$164.00 (One hundred and sixty-four pesos 00/mn). It can be seen that most of the procedures are in the renewal category, followed by the issuance category. On the other hand, the interface and design of the digital platform are simple, which makes it easy to use for any user.

Process Improvement (Technical Efficiency)

The project has been successfully implemented, at least in the evaluated period corresponding from April 1 to May 31, 2021, favoring an increase in efficiency in the delivery of licenses to citizens. Only 72 digital procedures have not been completed (see Graph 3), representing 0.28%, which shows efficiency of 99.72% in the issuance of the LFD, it is worth mentioning that these procedures have not been completed because the citizen/user has not downloaded their LFD in their mobile application.

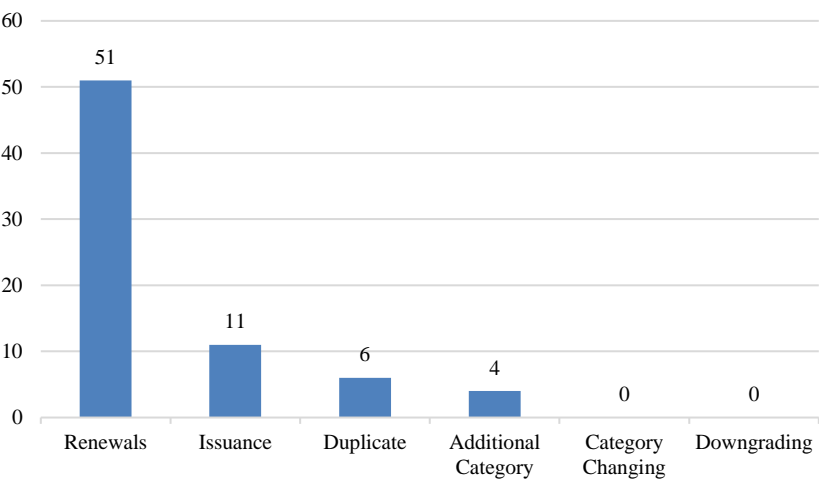


Chart 2 – Unfinished LFD Procedures.
Source: Authors with data SCT (2021).

Likewise, to improve the user's experience in all states, there is personnel at the SCT Centers to show the process to obtain the Federal Digital License and to advise drivers on how to download and install the Federal Digital License application on their cell phones in case the user does not know how to download the application and/or access the Internet. As a result, an average of 750 requests per day have been completed.

CONCLUSIONS

This research through the analysis of the digitalization of the Federal Driver's License highlights the importance of implementing e-services in a country with broad economic and social needs such as Mexico, since it drives benefits for the government, such as:

- A decrease in the cost of issuing licenses, to the benefit of the Secretariat;
- A computerized system that facilitates the electronic processing of a digital license with an architecture that can be used for all means of transportation;
- The software shall guarantee the authenticity and security of the Licensee's information to prevent forgery;

- The information shall be housed in servers with security technologies and protocols that guarantee the inalterability of the information;
- Real-time updating of the license information, adding layers from the databases of Preventive Transportation Medicine or others considered necessary; and
- Reduction of the impact on the environment, as plastic licenses are no longer used.

This complies with the theoretical aspects analyzed in this research, which are based on the notion of multidimensional efficiency, making it possible to demonstrate that digitization does benefit the economic and technical efficiency of the public administration. However, it not only benefits these two aspects of efficiency, as it also improves social efficiency by reducing the costs to the citizen by 72% and, in a country with a high rate of the low-income population, economic polarity, and employment deficit, this makes the service available to a greater number of the population. Likewise, in terms of the process, it empowers the citizen to be able to issue and/or renew the LFC without having to go to a government agency, making training elements available to all citizens through the SCT centers, which generates a greater inclusion of the population in these services.

In only two months of operation, from its implementation on April 1 to May 31, 2021, it has been observed that more than 25 thousand procedures have been attended, which demonstrates the correct functionality of the service, leaving only 0.1% of the procedures without closing, which is due to not having downloaded the LFD in its respective mobile application, so there is practically a 100% technical efficiency in the concluded procedures, favoring the level of citizen attention (social efficiency). In this way, the digitalization of the service fulfills several factors that benefit its efficiency in the context of the fulfillment of objectives, since it not only reduces costs but also improves the process and the service to the citizens.

Undoubtedly, this implementation as any process transformation has its challenges and among them, is the usability of the service that was solved by canceling the use of the traditional service (printed license) with a legal restructuring through the DOF, focusing its attention on user support through a user orientation strategy in the local centers of the SCT, where induction is provided to those citizens who are not familiar with the use of this technology. This favors the reduction of factors that could limit the adoption of the technology and affect the usability of the platform. Several authors such as Carrera-Mora, *et al*, (2019), Choi and Song (2020), and Jiang, *et al*, (2021), have studied several of these factors showing that one of the most important is the

ease of use and the perception of service efficiency, so this a priori solution was relevant.

It is worth mentioning that there are still challenges that have not been addressed by the public administration in Mexico and that have been revealed by this research, leaving open a line of research, such as the question of what will happen to those people who do not have a smartphone for various reasons or those who are digitally illiterate, being excluded from these services in some way. Likewise, moving on to the qualitative area, it is important to know the experiences of the users who have had to adopt this platform, as well as the public officials who now validate licenses digitally. It will be important to know their perception of this new e-service concerning ease of use, perceived usefulness, perceived efficiency, and trust that this new model of Federal Driver's License represents to them, which will allow us to know the different factors that will benefit a new implementation of e-services for the Mexican government.

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