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Adoption of new technologies: A study with non-users of the CPF issuance request system on the internet, with emphasis on sociodemographic aspects

Adoção de novas tecnologias: Um estudo com não usuários do sistema de solicitação de emissão de CPF pela internet, com ênfase em aspectos sociodemográficos

Adopción de nuevas tecnologías: Estudio con no usuarios del sistema de solicitud de emisión de CPF a través de internet, con énfasis en aspectos sociodemográficos

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ABSTRACT

This study analyzed factors determining the non-adoption of the CPF delivering service made available digitally, distinguishing non-adopting citizens due to demographic variables and technology usage habits. Theoretical basis was the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2). The descriptive quantitative study obtained a sample of 383 postal customers. The instrument's internal consistency was assessed by Cronbach's Alpha, Pearson and Spearman correlations between variables were analyzed, in addition to tests: Student's T, ANOVA and Chi-square. It was concluded that there is a complexity to meet user needs given the demographic characteristics existing in Brazil. The study recommends actions that lead to the development of more intuitive platforms, which may increase the diffusion of the digital platform.

Keywords: adoption of technology; use of technology; digital public services; sociodemographic aspects; UTAUT.

RESUMO

Este estudo analisou fatores determinantes da não adoção do serviço de emissão de CPF disponibilizado de forma digital, distinguindo cidadãos não adotantes em função de variáveis demográficas e de hábito de uso de tecnologias. Teve como base teórica a *Unified Theory of Acceptance and Use of Technology 2 (UTAUT2)*. O estudo quantitativo descritivo obteve amostra de 383 clientes dos Correios. A consistência interna do instrumento foi aferida pelo Alpha de Cronbach, foram analisadas correlações de Pearson e Spearman entre variáveis, além de testes: *T* de *Student*, ANOVA e Qui-quadrado. Concluiu-se que há uma complexidade para atender necessidades do usuário dadas as características demográficas existentes no Brasil. O estudo recomenda ações para o desenvolvimento de plataformas mais intuitivas, para incrementar a difusão da plataforma digital.

Palavras-chave: adoção de tecnologia; uso de tecnologia; serviços públicos digitais; aspectos sociodemográficos; UTAUT.

RESUMEN

Este estudio analizó factores determinantes de la no adopción del servicio de emisión de CPF disponible digitalmente, distinguiendo a los ciudadanos no adoptantes por variables demográficas y hábitos de uso de tecnologías. La base teórica fue la Teoría Unificada de Aceptación y Uso de Tecnología 2 (UTAUT2). El estudio descriptivo cuantitativo obtuvo una muestra de 383 clientes postales. La consistencia interna del instrumento se evaluó mediante Alfa de Cronbach y se analizaron correlaciones de Pearson y Spearman entre variables, además de las pruebas: *T* de *Student*, ANOVA y Chi-cuadrado. Se concluyó que existe una complejidad para satisfacer las necesidades de los usuarios dadas sus características demográficas en Brasil. El estudio recomienda acciones de desarrollo de plataformas más intuitivas, lo que puede incrementar la difusión de la plataforma digital.

Palabras clave: adopción de tecnología; uso de tecnología; servicios públicos digitales; aspectos sociodemográficos; UTAUT.

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1 INTRODUCTION

Digitization of public and private services in Brazil is a reality (Corrêa, 2009). This is due to the emergence, evolution, and massification of the Internet, which provided great part of population with a new lifestyle and changes in the way of relating. Data from the International Telecommunications Union (ITU, 2019) showed that 58.7% of the world population were internet users in that year – this demonstrates the accelerated increase in internet users.

In Brazil, many public services are offered electronically / digitally (Monteiro, 2018). According to the Ministry of Planning, Development, and Management – MP (BRASIL, 2018), 2,895 services (41%) were offered digitally in 2018.

This trend towards digitalization of services has put into practice the Digital Governance Strategy (EGD) instituted in 2016, whose objective was to make public policies more efficient and economical with the use of technologies (BRASIL, 2016).

From the 2019-2020 biennium on, the management of the EGD has become the responsibility of the Ministry of Economy, which adopted the guidelines created by the former Ministry of Planning, Development, and Management. In search for reducing bureaucracy and modernizing, strengthening, and simplifying the relationship between State and society, through digital transformation initiatives, the EGD aims to increase the effectiveness of generating benefits for society, by expanding access to government information, improving digital public services, and expanding social participation (BRASIL, 2018).

Starting from the virtualization of services, it is noted a need to study how to introduce new information technologies in the production and offering of public services, allowing the transition from analogue to digital mode to occur naturally and facilitated for both users and service providers.

According to Ratchford, Ratchford, and Barnhart (2014), it is recommended to introduce new technologies to access services. Nevertheless, this can cause discomfort in case access takes place only through the new means, due to user's lack of familiarity with the technology.

One of the services offered digitally by the federal government is the issuance of the Individual Taxpayer Registration (CPF) document, which has been able to be requested over the internet since 2010, without the need for face-to-face interactions with representatives of the Federal Revenue of Brazil (RFB), the agency responsible for issuing and managing the document and its database.

Nonetheless, the service is also offered by other channels, such as the Brazilian Post (Correios), which issued, in 2019, 52.24% of CPFs, other authorized agencies, 42.60%, the Federal Revenue of Brazil, 2.76%, the Central Bank of Brazil, 1.93%, and CAIXA, 0.36%,

versus only 0.11% of requests made over the internet (Federal Revenue of Brazil [RFB], 2020), contrary to the global trend of digital inclusion.

It is natural that users face difficulties to abandon the analogue and face-to-face forms of access and accept the rupture brought by innovation (Ratchford & Barnhart, 2012). By studying the adoption of new technologies in the organizational scope, Venkatesh et al. (2003) proposed the creation of the Unified Theory of Acceptance and Use of Technology (UTAUT), gathering several theories from different fields that could be applied to this context, in order to understand employees' behavior towards new technologies. The UTAUT was the theoretical foundation of the present study.

By studying the behavior of users of the CPF issuance service at the Brazilian Post (Correios), it was sought to understand the consolidation of this service access channel, even though it is offered free of charge over the internet, contradicting a trend of digitalization of services and digital inclusion of Brazilian society, that, today, is one of the largest consumer poles of mobile devices for internet access (Getúlio Vargas Foundation [FGV], 2019). The study aims to contribute with subsidies, from user's perspective, to public service management. Hence, based on the UTAUT2, the study aimed at analyzing determinants of non-adoption of the public service for issuing CPF digitally available in Brazil, distinguishing non-adopting citizens on the basis of sociodemographic variables and of technology usage habits.

2 THEORETICAL FRAMEWORK

2.1 Adoption of new technologies

When a new technology is discovered and inserted in a commercial context, one can be facing an innovation, which is something perceived as new for its adopter, who will consume such an idea, practice, object, or new technology (Zaltman & Duncan, 1973). Thus, it is important to study the behavior of adopters and of non-adopters, as well as their behavioral intention to use the new technology, once consequences of an innovation are measured by the changes caused in the individual or in the social system resulting from its adoption (Rogers, 1983).

The adoption process is contained in the diffusion process, because, once a technology is adopted, it is also disseminated through certain channels, by members of the social system (Rogers, 1983), as shown in Figure 1.

Rogers (1983) explains that earlier adopters readily adhere to innovation, influencing other members of the group positively. Later adopters, on the other hand, are more skeptical of innovation, starting to use it when it reaches the stage of maturity or, even, mandatorily, when imposed on users.

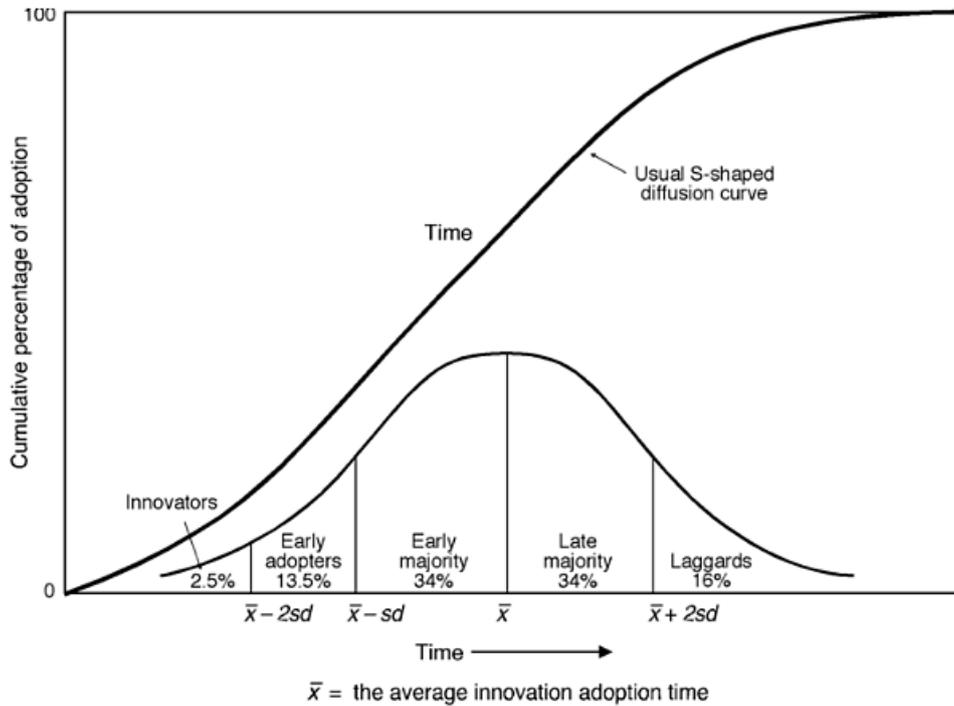


Figure 1. The diffusion process explained by the S-shaped curve. Source: Rogers (1983).

Several theories have already been used empirically to understand the adoption and acceptance of new technologies. There are two broadly used research lines concerning new technology adoption and acceptance focused on behavior of users of new corporate information systems (Farias & Vieira, 2014): the Technology Acceptance Model – TAM, disseminated by Davis (1985), who dealt corporately with the intention, adoption, and acceptance of users, seeking to understand, and even predict, the results of the adopted technology; and the Unified Theory of Acceptance and Use of Technology (UTAUT), initially developed by Venkatesh et al. (2003) and later expanded by Venkatesh et al. (2012), as the UTAUT2, which includes theorizing and studying the voluntary behavior of technology adopters, no longer being restricted to the organizational environment.

2.2 The Unified Theory of Acceptance and Use of Technology (UTAUT)

A review and synthesis of eight theories / models of technology use yielded the UTAUT (Venkatesh et al. 2003): Technology Acceptance Model – TAM (Davis, 1989), which explored the constructs Perceived Usefulness, Perceived Ease of Use, and Subjective Norms; Theory of Reasoned Action – TRA (Fishbein & Ajzen, 1975), whose main constructs studied were Attitude Toward Behavior and Subjective Norms; Motivational Model – MM (Davis et al., 1992), having, as the core of the study, the constructs Extrinsic Motivation and Intrinsic Motivation; Theory of Planned Behavior – TPB (Ajzen, 1991), which extended the

TRA by adding the construct Behavioral Control to the constructs Attitude Toward Behavior and Subjective Norms; Combined TAM and TPB – C-TAM-TPB (Taylor & Todd, 1995), which emphasized the constructs Attitude Toward Behavior, Subjective Norms, Perceived Behavioral Control, and Perceived Usefulness; Model of PC Utilization – MPCU (Thompson et al., 1991), which covers the constructs Job-fit, Complexity, Long-term Consequences, Affect Towards Use, Social Factors, and Facilitating Conditions; Innovation Diffusion Theory – IDT (Rogers, 1983), whose main contributions were made through the constructs Relative Advantage, Ease of Use, Image, Visibility, Compatibility, Result Demonstrability, and Voluntariness of Use; and Social Cognitive Theory – SCT (Bandura, 1986), which, derived from theoretical studies of human behavior, applied to the context of acceptance and use of technologies, had as main constructs Outcome Expectancy – performance, Outcome Expectancy – personal, Self-efficacy, Affect, and Anxiety.

Therefore, the UTAUT is comprised of the constructs: Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions that could address employees' behavior and attitude in organizations, that is, in a business context (Venkatesh et al., 2003). Venkatesh et al. (2012), by applying the UTAUT from user-consumer's perspective, proposed the UTAUT2, expanding the main constructs of the UTAUT, previously based on employee's perspective, and, now, aimed at consumer, including the constructs: Hedonic Motivation, Price Value, and Habit. Table 1 summarizes the theories and models adopted for the composition of the UTAUT2.

Table 1
Models and Theories of Individual Technology Acceptance.

Theory/Model	Main Constructs	Main Authors
Technology Acceptance Model – TAM	Perceived Usefulness Perceived Ease of Use Subjective Norms	Davis (1989)
Theory of Reasoned Action – TRA	Attitude Toward Behavior Subjective Norms	Fishbein and Ajzen (1975)
Motivacional Model – MM	Extrinsic Motivation Intrinsic Motivation	Davis et al. (1992)
Theory of Planned Behavior – TPB	Behavioral Control	Ajzen (1991)
Combined TAM and TPB – C-TAM-TPB	Attitude Toward Behavior Subjective Norms Perceived Behavioral Control Perceived Usefulness	Taylor and Todd (1995)
Model of PC Utilization – MPCU	Job-fit Complexity Long-term Consequences Affect Towards Use Social Factors Facilitating Conditions	Thompson et al. (1991)
Innovation Diffusion Theory – IDT	Relative Advantage Ease of Use Image Visibility Compatibility Result Demonstrability Voluntariness of Use	Rogers (1983)
Social Cognitive Theory – SCT	Outcome Expectancy – performance Outcome Expectancy – personal Self-efficacy Affect Anxiety	Bandura (1986)

Source: Elaborated by the authors, based on Venkatesh et al. (2012).

Venkatesh et al. (2012) also considered the moderating variables age, sex, and experience with technologies, in order to verify the effects of the new constructs on behavioral intention and on technology use behavior by consumers, as shown in Figure 2.

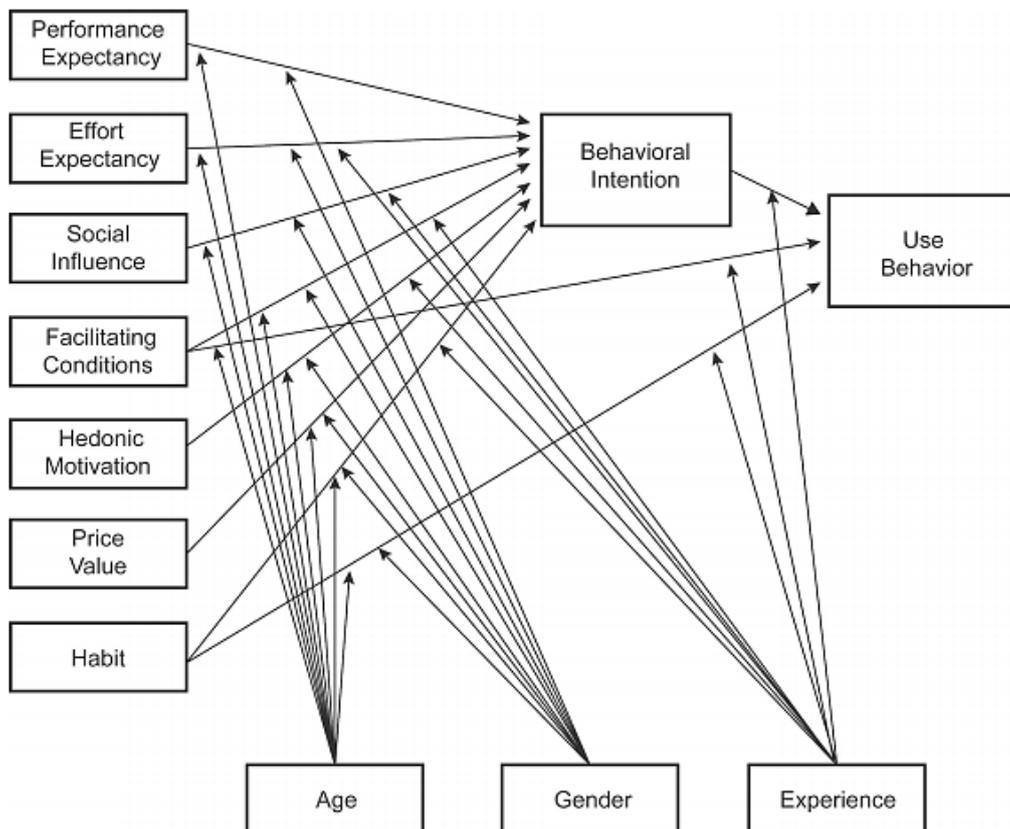


Figure 2. Conceptual model of the UTAUT 2.
Source: Venkatesh et al. (2012).

According to this overview, Venkatesh et al. (2012) turned their attention to the external environment of organizations and sought new contexts aimed at explaining implications of the adoption of new technologies by consumers.

In consumer contexts, unlike work contexts, users are responsible for costs, and such costs can shape consumer's adoption decisions. Hence, Venkatesh et al. (2012) added the construct Price Value to the UTAUT, once the influence of this variable on consumer's behavior was perceived in previous research.

The evolution of the UTAUT considered Behavioral Intention as the main predictor of technology Use Behavior and introduced a new theoretical construct – Habit – as a critical predictor of technology use, complementing the focus of the theory on intentionality as a behavior driver.

Hence, another change made to adapt the UTAUT to the context of technology use by consumers was the inclusion of a direct correlation between the constructs Facilitating Conditions and Behavioral Intention. This is due to the fact that many aspects of Facilitating Conditions, such as training and support provided, will be available free of charge in organizations. In contrast, the ease of access for each consumer can vary significantly between application suppliers, technology generations, mobile devices, and so on. In this context, Facilitating Conditions become a behavioral control, identified in the Theory of Planned Behavior (TPB), and influence both intention and behavior (Ajzen, 1991). Thus, a consumer who has access to a favorable set of Facilitating Conditions is more likely to develop a greater behavioral intention to use a particular technology (Venkatesh et al., 2012).

This way, the composition of the UTAUT2 resulted in eight main constructs: Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Hedonic Motivation, Price Value, Habit, and Behavioral Intention (Venkatesh et al., 2012).

The UTAUT2 model is complemented by the inclusion of three moderating variables: sex, age, and the individual experience with technologies that, in turn, moderate the relationships between the main theoretical constructs and the variables Behavioral Intention and Use Behavior.

2.2.1 Adoption of new technologies in the public sector

In recent decades, new technologies have changed the social environment with the internet, computer networks, satellite transmission, and mobile telephony, and all this has reached the public sector. Electronic governments are related to these changes, allowing greater interaction between government and citizens, contributing positively to the quality of public services and to the capacity to solve

government problems concerning the imposed social challenges (De Vries et al., 2016).

Electronic government (e-Gov) is defined as the use of Information and Communication Technologies (ICTs) as tools to lead to better government, through the internet, in order to provide citizens with information and services (United Nations [UN], 2002; Organization for Economic Cooperation and Development [OECD], 2003).

The different actors involved in public management processes benefit from the adoption of new technologies, especially the government, which starts to obtain legitimacy from the moment its acts are accessible and transparent to citizens (Kaufman, 2005).

Levy (2004) states that initiatives related to electronic government simplify administrative procedures, make legislative production processes more transparent, bring government closer to citizens via the internet, and improve the effectiveness, efficiency, and competitiveness of public administration.

By investigating government initiatives to computerize fiscal control mechanisms, Moraes (2013) proposed the use of technology adoption theories, among which the UTAUT, in order to create a model for electronic government adoption in the Brazilian context, through the study of behavioral intention to use the Nota Fiscal Paulista Platform (NFP). In his model, he used the constructs of the UTAUT: Facilitating Conditions, Effort Expectancy (Perceived Ease of Use), Social Influence, and Habit. The author understood that the constructs Perceived Usefulness and Performance Expectancy were not the most suitable for the model, once it is not a matter of performance increase in a specific task. Although the variable Price Value also contributes to adoption, it would not apply to his study, once it would be useful only if linked to other factors, which ended up leading to its exclusion. As a result, Moraes (2013) confirmed the hypotheses according to which the constructs positively influenced usage intention of the e-Gov NFP platform, except the construct Facilitating Conditions. One of the reasons for not confirming the influence of this variable on behavioral Intention to adopt the Nota Fiscal Paulista Platform was attributed to the fact that respondents are already users of the tool, possessing the necessary knowledge for its operation.

Nobre et al. (2011) applied the constructs Effort Expectancy (Perceived Ease of Use), Performance Expectancy (Perceived Usefulness), and Behavioral Intention in the study on the adoption of Information Security Management practices by public managers, identifying that these variables had a direct influence on adoption, with respect to the factors access control and human resources, except for the variable Effort Expectancy. In the referred study, the authors chose not to test the relationships in a structural equation modeling, prioritizing the study of the

relationship between two variables by using linear regression analyses, without external variables being tested. These are the reasons why the classic model of technology acceptance was adapted in order to better fit the intended objectives.

Souza et al. (2019) studied the acceptance of the public health application “Meu digiSUS” through the extended Technology Acceptance Model (TAM), by using the UTAUT variables Performance Expectancy (Perceived Usefulness), Effort Expectancy (Perceived Ease of Use), and Social Influence, among others. They adapted the model by using only constructs adhering to the type of object and subjects studied and, as a result, they demonstrated that Perceived Ease of Use and Social Influence have a direct and positive impact on the use of the e-Gov tool studied.

2.2.2 UTAUT2 constructs applied in this study

Performance Expectancy – This construct refers to the extent to which the use of a given technology will provide benefits for consumers in performing certain activities (Venkatesh et al., 2012). Its application in this study is justified by the possible correlation with behavioral intention to use the CPF issuance system, as applied in the study by Moraes (2013).

Effort Expectancy – Once this construct measures the degree of ease associated with the use of technology by consumers (Venkatesh et al., 2012), its use in the present study is justified by the proposition that sociodemographic characteristics of non-adopters of the CPF issuance self-service may correlate with it, as in Souza et al. (2019).

Social Influence – It is characterized as the extent to which the individual believes that other people consider it important that the proposed technology be used (Venkatesh et al., 2012). For Rogers (1983), the adoption of a technology can be correlated with its diffusion, and social influence can help explain this context. The construct was adopted in the present study, as applied by Moraes (2013) and by Tacco (2011).

Facilitating Conditions – It refers to the extent to which the individual believes that the environment supports the use of the technology in question (Venkatesh et al., 2012), such as service availability on all access platforms (tablet, smartphone, and computer). Contrary to the study by Moraes (2013), participants in the present study are non-adopters of the available e-Gov technology. Hence, the presence or absence of conditions that facilitate use or access can be a characteristic correlated with non-usage and to sociodemographic variables in Brazil.

Habit – It is defined as the extent to which people tend to automatic behaviors due to learning over time through the use of the new technology. Venkatesh et al. (2012) proposed the inclusion of this construct due to its

influence on behavioral intention to use technology. Hence, investigating the correlation between the habit of using other technologies and sociodemographic variables may support the identification of factors that determine non-adoption of the CPF issuance system.

Behavioral Intention – It is defined by the authors of the UTAUT2 as the intention to consume a certain technological product or service. Intentionality leads to Use Behavior, which justified the use of this variable in the present study. According to Venkatesh et al. (2012), researchers of information systems consumers' behavior have used constructs related to Hedonic Motivation (for instance: pleasure) in order to verify their correlation with the use or consumption of a given technology. Therefore, not using the construct **Hedonic Motivation** in the present study is justified, due to the fact that the sample is comprised of individuals who are not users of the technology in question. Hence, the measurement of fun and pleasure in the use of technology would not be applicable. Likewise, the construct **Price Value** would not apply, once the system to digitally access CPF is offered free of charge – although it is clear that the concept of value is not just related to monetary issues. Although there is a cost with internet and the need for a device to access the system, these variables are taken into consideration when measuring the construct Facilitating Conditions. **Use Behavior** is also a variable not considered in the present study, once this study was applied with non-users of the studied technology, therefore, Behavioral Intention was studied.

Hence, based on the literature, only the constructs adhering to the type of object and subjects studied were selected.

3 METHODOLOGY

The present study is a quantitative and descriptive research developed through a case study. The population studied corresponds to the Brazilian Post's (Correios) customers who sought the CPF issuance service at their branches. Research participants are considered non-users of the technology offered by the Federal Revenue of Brazil to issue the CPF over a website.

This population is comprised of 4.4 million individuals, considering all CPFs issued by Correios in 2019. Hence, the sample (N = 383) was calculated with a maximum error of 5% for an infinite population, with a confidence interval of 95%. Calculations were performed with the RAOSOFT simulator, available at the following website: <http://www.raosoft.com/samplesize.html>.

Sampling was considered non-probabilistic for convenience (Malhotra, 2001), as participants were chosen based on their willingness and convenience to participate in the research.

The printed questionnaire was made available at Correios branches in all regions of the country, selected for carrying out the survey, and respondents were asked to complete it and return it at a later time. The survey was conducted from September to October 2019.

The questionnaire was divided into two parts: sociodemographic items and items related to the use of the web environment to access the CPF issuance public service.

As a scale of agreement responses related to Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Habit, and Behavioral Intention, the seven-point Likert scale was used, which varied from (1) “strongly disagree” to (7) “strongly agree” – the same scale adopted by Venkatesh et al. (2012).

The statistical techniques used in the data analysis are described in section 4, as follows.

4 ANALYSIS AND DISCUSSION OF RESULTS

The study of the instrument’s reliability or internal consistency was carried out through Cronbach’s Alpha, following Hair et al. (2010), who consider a Cronbach’s Alpha greater than 0.70 necessary in order to guarantee the reliability of the constructs.

Variable distribution was analyzed through histograms and skewness and kurtosis coefficients. These coefficients were less than 1, which confirms the normal distribution, allowing the use of parametric tests (Marôco, 2011).

In order to establish correlations between sociodemographic variables and the study theoretical constructs, the following tests were performed: Student’s t test, ANOVA, and Chi-square independence test.

Hence, it was found that the demographic variable sex has significant statistical differences only when correlated with the theoretical constructs Social Influence and Habit; age, when correlated with Effort Expectancy, Social Influence, Facilitating Conditions, and Habit; type of locality, only when correlated with Social Influence and Facilitating Conditions; and the other variables, such as income, region, and education level have significant statistical differences when correlated with all theoretical constructs. It should be noted that the higher income and education levels, the greater the association with the correlated construct. Regarding age, correlation is negative, because the older individuals are, the less their association with the correlated construct.

With respect to sex, according to the proposition by Venkatesh et al. (2012), it was expected to find statistically

significant differences between men and women in the adoption of technology in all studied constructs, considering, therefore, that men would have greater propensity to adopt technology than women.

Pearson’s and Spearman’s correlation coefficients were also verified in the study. Pearson’s correlation coefficient was used to study correlations between two quantitative variables (construct scores and age); and Spearman’s Correlation Coefficient to study correlations between a quantitative variable (construct scores) and an ordinal variable (education and income).

Regarding the tests used to meet the research objectives (Correlation Coefficient, Student’s t test, and ANOVA), with a test power of 80% ($1 - \beta = 0.80$, β being Type II error) and significance level of 5% ($\alpha = 0.05$, α being Type I error), the sample with 383 individuals allows to detect small effects in Student’s t test ($d = 0.25$), in ANOVA with 3 groups ($f = 0.16$), in ANOVA with 4 groups ($f = 0.17$), and in ANOVA with 5 groups ($f = 0.18$). Calculations for Student’s t test and ANOVA were performed considering groups with the same number of individuals. With respect to correlation coefficients, under the conditions described above, the sample of 383 individuals allows the identification of significant low correlations ($r = 0.11$). Calculations were performed by using the G*Power program (Faul et al., 2007), and the following effect size classifications proposed by Cohen (1992) were considered:

- Student’s t test:
 $d = 0.20$ – small effect, $d = 0.50$ – moderate effect,
 $d = 0.80$ – large effect;
- ANOVA:
 $f = 0.10$ – small effect, $f = 0.25$ – moderate effect,
 $f = 0.40$ – large effect;
- Correlation Coefficient:
 $R = 0.10$ – small effect, $R = 0.30$ – moderate effect,
 $R = 0.50$ – large effect.

4.1 Sociodemographic characterization of research participants

The sample includes 383 individuals who do not adopt the public service of CPF issuance made available digitally in Brazil by the Federal Revenue, and who search for the service at Correios branches. The sample characterization is shown in Table 2 and in Figures 3, 4, 5, and 6.

Table 2
Sample characterization.

Variables		N	%
Sex	Female	233	62.1%
	Male	142	37.9%
Age	Up to 15 years	6	1.6%
	16-25 years	75	20.5%
	26-50 years	235	64.2%
	51-65 years	45	12.3%
	66+ years	5	1.4%
Family income	Up to R\$720.00	74	20.1%
	From R\$721.00 to R\$3,085.00	235	63.9%
	From R\$3,086.00 to R\$11,280.00	56	15.2%
	Above R\$11,280.00	3	0.8%
Education level	Illiterate / Incomplete elementary school I	40	10.7%
	Complete elementary school I / Incomplete elementary school II	82	21.9%
	Complete high school / Incomplete undergraduate degree	193	51.6%
	Complete undergraduate degree	59	15.8%
Region	North	85	22.3%
	Northeast	87	22.8%
	South	38	9.9%
	Southeast	120	31.4%
	Midwest	52	13.6%
Type of locality	Interior	176	46.1%
	Capital city	138	36.1%
	Metropolitan region	68	17.8%

Source: Elaborated by the authors.

When results for type of locality are compared with other sociodemographic variables, it becomes evident that there are statistically significant differences only regarding age, both when analyzing age groups ($p = 0.019$) and mean age ($p = 0.012$): participants from the interior ($M = 33.6$ years) are younger than those from capital cities ($M = 37.4$ years) and from metropolitan regions ($M = 37.8$ years). The association between type of locality and family income was

close to being statistical significant ($p = 0.055$), that is, there are more participants with a family income greater than R\$ 3,085.00 in metropolitan regions (27.7%) than in the interior (14.8%) and in capital cities (11.9%).

Regarding sex and age, Figure 3 illustrates that the majority of study participants are female (62.1%) and that the most significant age group ranges from 26 to 50 years old.

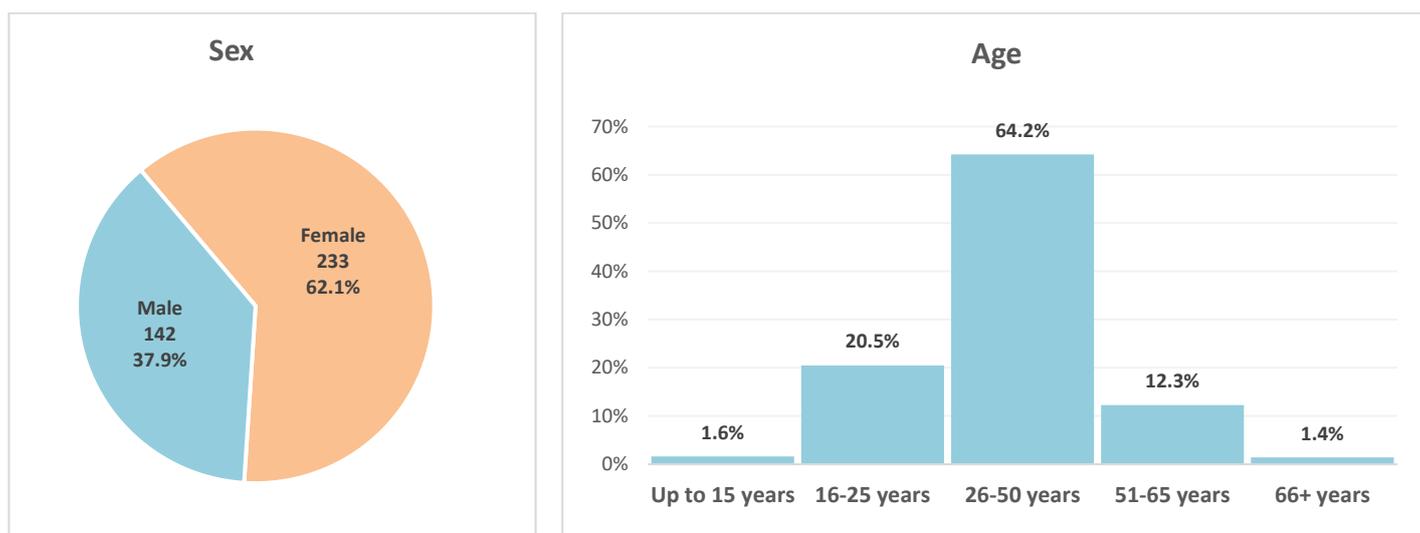


Figure 3. Sample characterization in terms of sex and age.
Source: Elaborated by the authors.

Figure 4 presents the family income data found in the study, showing that most respondents have a family income ranging from R\$ 721.00 to R\$ 3,085.00.

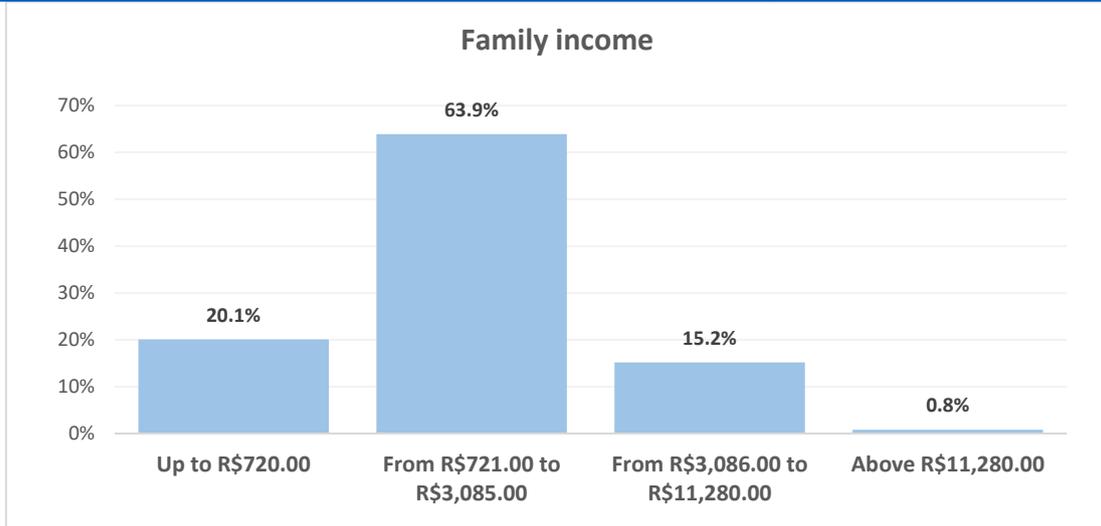


Figure 4. Sample characterization in terms of family income.
Source: Elaborated by the authors.

Figure 5 indicates respondents' characterization with respect to education level, highlighting that most respondents present complete high school or incomplete undergraduate degree.

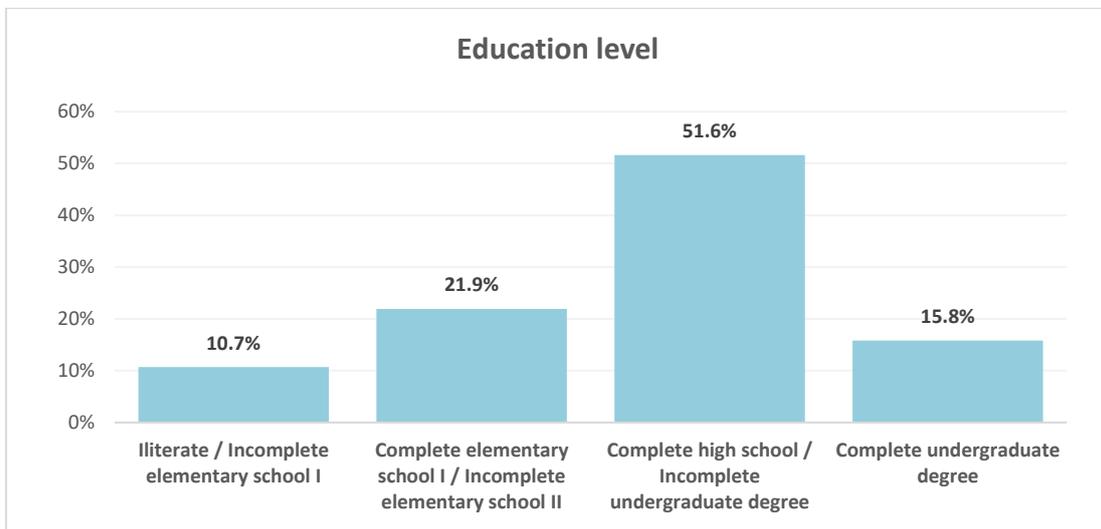


Figure 5. Sample characterization in terms of education level.
Source: Elaborated by the authors.

Regarding sample characterization in terms of type of locality and region of residence, results shown in Figure 6 demonstrate a greater representation of residents in interior cities and in the Southeast region of the country.

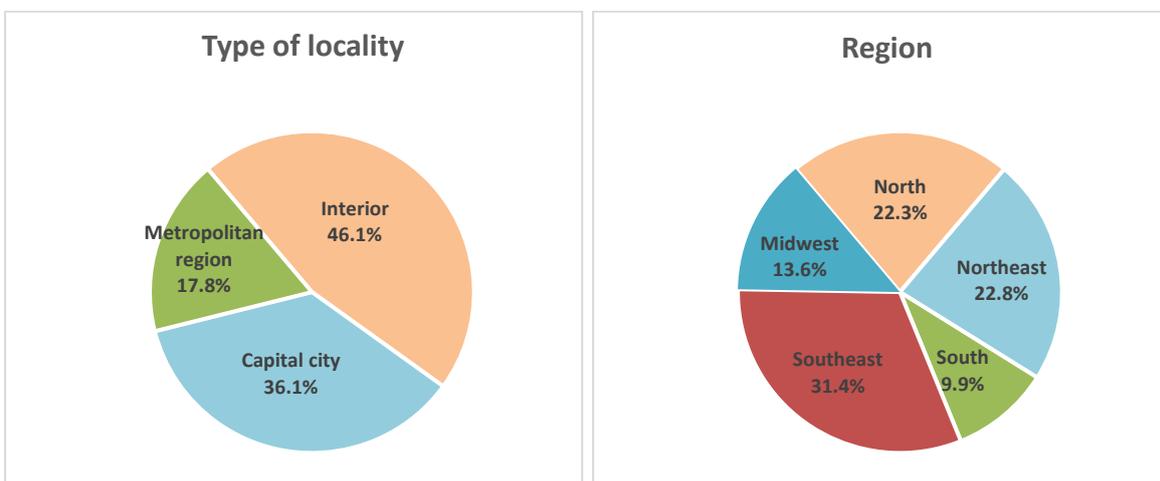


Figure 6. Sample characterization in terms of type of locality and region.
Source: Elaborated by the authors.

According to data in Table 3, there were no significant differences regarding sex ($p = 0.765$) and education level ($p = 0.152$). Although there are no significant differences, it is noteworthy that, in metropolitan regions, there is a higher

proportion of participants with complete undergraduate degree (20.6%) than in interior cities (14.5%) and in capital cities (14.4%).

Table 3
Participants' characterization and comparison by type of locality.

Variables	Interior	Capital city	Metropolitan region	p-value
Sex				
Female	106 (60.6%)	82 (62.1%)	44 (65.7%)	$p = 0.765^{(1)}$
Male	69 (39.4%)	50 (37.9%)	23 (34.3%)	
Age				
Up to 15 years	6 (3.6%)	0 (0.0%)	0 (0.0%)	$p = 0.019^{(1)}$
16-25 years	42 (25.0%)	21 (15.7%)	12 (18.8%)	
26-50 years	102 (60.7%)	93 (69.4%)	40 (62.5%)	
51-65 years	17 (10.1%)	16 (11.9%)	12 (18.8%)	
66+ years	1 (0.6%)	4 (3.0%)	0 (0.0%)	
Mean (SD)	33.6 (12.2)	37.4 (12.9)	37.8 (11.6)	$p = 0.012^{(2)}$
Family income				
Up to R\$720.00	35 (19.9%)	25 (19.8%)	14 (21.5%)	$p = 0.055^{(1)}$
From R\$721.00 to R\$3,085.00	115 (65.3%)	86 (68.3%)	33 (50.8%)	
Above R\$3,085.00	25 (14.8%)	15 (11.9%)	18 (27.7%)	
Education level				
Illiterate / Incomplete elementary school I	17 (9.8%)	14 (10.6%)	9 (13.2%)	$p = 0.152^{(1)}$
Complete elementary school I / Incomplete elementary school II	41 (23.7%)	35 (26.5%)	6 (8.8%)	
Complete high school / Incomplete undergraduate degree	90 (52.0%)	64 (48.5%)	39 (57.4%)	
Complete undergraduate degree	25 (14.5%)	19 (14.4%)	14 (20.6%)	

Note: ⁽¹⁾ Significance value of Chi-square test; ⁽²⁾ Significance value of ANOVA.
Source: Elaborated by the authors.

Results in Table 4 show the existence of significant differences between regions in terms of family income ($p = 0.010$) and in terms of education level ($p = 0.020$).

These results corroborate surveys carried out by the Brazilian Institute of Geography and Statistics (IBGE, 2019), according to which the analysis of Brazilian living conditions showed greater income inequality in the North and Northeast regions and a more homogeneous income distribution in the other regions. The same research shows convergence regarding the education levels that were pointed out. Understanding respondents' profile in a study

on adoption of or resistance to technologies is crucial, once the economy and development of a country depends on the use of ICTs. Furthermore, in emerging countries like Brazil, it cannot be inferred that there is an egalitarian dynamic of intensive use of ICTs in its different regions. The intensive use of ICTs is strongly concentrated in the south-southeast part of the country, while the north-northeast faces more difficulties to make their population be digitally included. Hence, it is not possible to properly interpret studies on rejection of ICTs without taking regional demographic aspects into account.

Table 4

Participants' characterization and comparison by region.

Variables	North	Northeast	South	Southeast	Midwest	p-value
Sex						
Female	53 (63.9%)	50 (58.1%)	26 (68.4%)	74 (62.2%)	29 (60.4%)	$p = 0.847^{(1)}$
Male	30 (36.1%)	36 (41.9%)	12 (31.6%)	45 (37.8%)	19 (39.6%)	
Age						
Up to 15 years	0 (0.0%)	4 (4.8%)	1 (2.9%)	1 (0.9%)	0 (0.0%)	$p = 0.105^{(1)}$
16-25 years	13 (15.9%)	18 (21.7%)	7 (20.6%)	26 (22.4%)	11 (21.6%)	
26-50 years	61 (74.4%)	50 (60.2%)	25 (73.5%)	72 (62.1%)	27 (52.9%)	
51-65 years	6 (7.3%)	10 (12.0%)	1 (2.9%)	16 (13.8%)	12 (23.5%)	
66+ years	2 (2.4%)	1 (1.2%)	0 (0.0%)	1 (0.9%)	1 (2.0%)	
Mean (SD)	35.0 (11.2)	34.3 (12.8)	32.7 (9.2)	36.5 (13.0)	39.6 (14.2)	$p = 0.071^{(2)}$
Family income						
Up to R\$720.00	29 (35.8%)	13 (14.9%)	7 (18.4%)	20 (18.0%)	5 (10.0%)	$p = 0.010^{(1)}$
From R\$721.00 to R\$3,085.00	41 (50.6%)	62 (71.3%)	26 (68.4%)	68 (61.3%)	37 (74.0%)	
From R\$3,086.00 to R\$11,280.00	11 (13.6%)	12 (13.8%)	5 (13.2%)	23 (20.7%)	8 (16.0%)	
Education level						
Illiterate / Incomplete elementary school I	11 (13.6%)	10 (11.9%)	2 (5.3%)	8 (6.7%)	9 (17.6%)	$p = 0.020^{(1)}$
Complete elementary school I / Incomplete elementary school II	21 (25.9%)	27 (32.1%)	10 (26.3%)	15 (12.6%)	9 (17.6%)	
Complete high school / Incomplete undergraduate degree	37 (45.7%)	33 (39.3%)	21 (55.3%)	78 (65.5%)	24 (47.1%)	
Complete undergraduate degree	12 (14.8%)	14 (16.7%)	5 (13.2%)	18 (15.1%)	9 (17.6%)	

Note: ⁽¹⁾ Significance value of Chi-square test; ⁽²⁾ Significance value of ANOVA.

Source: Elaborated by the authors.

4.2 Characterization of the research constructs related to technology use

With respect to technology use, Cronbach's Alpha was used in order to assess the reliability of the constructs, aiming at verifying the internal consistency of the scale (Cortina, 1993).

Results in Table 5 demonstrate that all constructs showed reliability levels from very good to excellent, with Cronbach's Alpha of 0.854 in the construct Habit and above 0.90 in the other constructs, as well as the findings of Venkatesh et al. (2012), in which the internal consistency reliability (ICR) of the multi-item scales modeled with reflective indicators were 0.75 or more, suggesting that scales were reliable.

Table 5

Reliability of the questionnaire constructs related to technology use.

Constructs	Number of items	Cronbach's Alpha
Performance Expectancy	3	0.926
Effort Expectancy	4	0.958
Social Influence	3	0.944
Facilitating Conditions	4	0.903
Habit	3	0.854
Behavioral Intention	2	0.971

Source: Elaborated by the authors.

Out of the six studied constructs, Performance Expectancy (M = 5.18; SD = 1.89) and Behavioral Intention

($M = 5.18$; $SD = 2.03$) were the ones with the highest means. They were followed by Effort Expectancy ($M = 4.90$; $SD = 1.97$), Facilitating Conditions ($M = 4.87$; $SD = 1.91$), and Habit ($M = 4.85$; $SD = 1.86$). The construct with the lowest mean was Social Influence ($M = 4.69$; $SD = 1.95$), according to the results shown in Table 6.

Table 6

Characterization of the questionnaire constructs related to technology use.

Constructs	Minimum	Maximum	Mean	Standard Deviation
Performance Expectancy	1	7	5.18	1.89
Effort Expectancy	1	7	4.90	1.97
Social Influence	1	7	4.69	1.95
Facilitating Conditions	1	7	4.87	1.91
Habit	1	7	4.85	1.86
Behavioral Intention	1	7	5.18	2.03

Source: Elaborated by the authors.

The present analysis, when compared to the study by Venkatesh et al. (2012), found similarity with respect to Social Influence, in which the result for mean-variance was the lowest among all constructs (equal to 0.71), demonstrating convergence of studies. It is worth comparing the present results to the research carried out by Mainardes et al. (2020), who, by verifying antecedents and consequences of behavioral non-adoption of e-commerce as a purchasing means, based on the TPB (Ajzein, 1991), concluded that the intention of not adopting e-commerce was not influenced by the opinion of people close to individuals resistant to e-commerce, corroborating the results of low social influence verified in the present study.

Another similarity with Venkatesh et al. (2012) concerns the fact that the constructs with higher results were the same (Performance Expectancy and Behavioral Intention), however, not in the same order. In Venkatesh et al. (2012), Behavioral Intention ranks first (mean-variance 0.82), followed by Performance Expectancy (mean-variance 0.75).

Correlations between technology use constructs were all positive, moderate to strong, demonstrating the significance of relationships ($p < 0.001$). Venkatesh et al. (2012) obtained results similar to this, in terms of significance. However, the greatest correlation found was $R = 0.58$ (between Facilitating Conditions and Effort Expectancy; $p < 0.001$). In the present research, the strongest correlations (greater than 0.70) stand out between Effort Expectancy and Performance Expectancy ($R = 0.751$) and between Facilitating Conditions and Effort Expectancy ($R = 0.755$). On the other hand, Venkatesh et al. (2012)

found the correlation between Social Influence and Performance Expectancy ($R = 0.500$) as the second strongest one.

It is important to highlight that, in the study carried out by Venkatesh et al. (2012), a positive correlation was also identified between Effort Expectancy and Performance Expectancy ($R = 0.400$; $p < 0.001$), which was also found by Gomes and Farias (2017) when studying some constructs of the UTAUT2 in the context of adopting a mobile application for online retail shopping. The authors of the referred study identified a correlation between the two constructs of $R = 0.683$ ($p < 0.001$).

4.3 Factors associated with technology use

In this section, results are presented, taking into account each construct of the UTAUT2 applied to this research, correlating them to sociodemographic variables, in order to provide answers to the study objectives.

4.3.1 Performance Expectancy

Results shown in Table 7 indicate that Performance Expectancy increases with the increase in family income ($R_{sp} = 0.170$; $p = 0.001$) and in education level ($R_{sp} = 0.293$; $p < 0.001$), although correlations found are low. Performance Expectancy is also significantly associated with region ($p < 0.001$), being higher in the South ($M = 5.54$; $SD = 2.08$) and in the Southeast ($M = 5.73$; $SD = 1.62$), and lower in the North ($M = 4.58$; $SD = 2.23$). There is no statistically significant association between this construct and gender ($p = 0.123$), age ($p = 0.180$), and type of locality ($p = 0.843$).

It is noteworthy that the variables gender and age showed different behaviors when compared to results obtained by Venkatesh et al. (2012). These authors found that younger men are more sensitive to Performance Expectancy, in contrast to what the present research revealed. Nonetheless, the results obtained by Gomes and Farias (2017) corroborate those in the present study. The divergence between studies in Brazil can be justified by the cultural difference of the audiences investigated, as well as by the intrinsic correlation with Effort Expectancy, which has a greater influence on performance in using technology due to sociodemographic characteristics of the target audience. These results are in accordance with the study by Albertin and Brauer (2012), who, by studying employees' resistance to use technologies for Corporate Education through Distance Education, revealed that Performance Expectancy decreases depending on the degree of effort that must be applied in order to achieve educational results. Hence, organizations should, in the process of planning and implementing new technologies, actively listen to future users, so that the design of solutions may reflect the result of a joint, co-created, and co-designed effort. In the design phase, little is heard from potential adopters of ICTs. Because of this, in the technology implementation phase,

resistance arises as a consequence of this dynamics in the design and implementation process. Without mobilization of user's skills, any technology may fail in its diffusion process,

because what is sought is the heavy user, so that it compensates, at scale, the introduction of new technologies in the service provider-user relationship.

Table 7

Factors associated with Performance Expectancy.

Variables		Performance Expectancy	p-value
Sex	Female	M = 5.07; SD = 1.98	$p = 0.123^{(1)}$
	Male	M = 5.37; SD = 1.73	
Age	Pearson's Correlation Coefficient	R = -0.070	$p = 0.180^{(2)}$
Family income	Spearman's Correlation Coefficient	$R_{sp} = 0.170$	$p = 0.001^{(2)}$
Education level	Spearman's Correlation Coefficient	$R_{sp} = 0.293$	$p < 0.001^{(2)}$
Region	North	M = 4.58; SD = 2.23	$p < 0.001^{(3)}$
	Northeast	M = 5.03; SD = 1.73	
	South	M = 5.54; SD = 2.08	
	Southeast	M = 5.73; SD = 1.62	
	Midwest	M = 4.85; SD = 1.65	
Type of locality	Interior	M = 5.23; SD = 1.89	$p = 0.843^{(3)}$
	Capital city	M = 5.16; SD = 1.80	
	Metropolitan region	M = 5.08; SD = 2.09	

Note: ⁽¹⁾ Student's t test significance value; ⁽²⁾ Correlation coefficient significance value; ⁽³⁾ ANOVA significance value.

Source: Elaborated by the authors.

4.3.2 Effort Expectancy

With respect to Effort Expectancy, the research results shown in Table 8 indicate that, although there is a weak correlation between the variables age (R = -0.167), family income ($R_{sp} = 0.221$), education level ($R_{sp} = 0.288$), and the construct Effort Expectancy, this construct decreases with higher age ($p = 0.001$) and increases with higher family income ($p < 0.001$) and higher education level

($p = 0.001$). There was also a significant association between Effort Expectancy and region ($p = 0.001$): mean was higher in the South (M = 5.44; SD = 2.22) and in the Southeast (M = 5.36; SD = 1.79), and lower in the North (M = 4.28; SD = 2.13). There was no statistically significant association between this construct and the variables sex ($p = 0.307$) and type of locality ($p = 0.338$).

Table 8

Factors associated with Effort Expectancy.

Variables		Effort Expectancy	p-value
Sex	Female	M = 4.81; SD = 2.04	$p = 0.307^{(1)}$
	Male	M = 5.02; SD = 1.86	
Age	Pearson's Correlation Coefficient	R = -0.167	$p = 0.001^{(2)}$
Family income	Spearman's Correlation Coefficient	$R_{sp} = 0.221$	$p < 0.001^{(2)}$
Education level	Spearman's Correlation Coefficient	$R_{sp} = 0.388$	$p < 0.001^{(2)}$
Region	North	M = 4.28; SD = 2.13	$p = 0.001^{(2)}$
	Northeast	M = 4.79; SD = 1.81	
	South	M = 5.44; SD = 2.22	
	Southeast	M = 5.36; SD = 1.79	
	Midwest	M = 4.60; SD = 1.93	
Type of locality	Interior	M = 5.05; SD = 1.95	$p = 0.338^{(3)}$
	Capital city	M = 4.73; SD = 1.93	
	Metropolitan region	M = 4.82; SD = 2.13	

Note: ⁽¹⁾ Student's t test significance value; ⁽²⁾ Correlation coefficient significance value; ⁽³⁾ ANOVA significance value.

Source: Elaborated by the authors.

Unlike Performance Expectancy, Effort Expectancy found similarities with the study by Venkatesh et al. (2012), with respect to the significance of the variable age, showing that the higher the age, the greater the effort used with the new technologies, regardless of the sex of the individual. Therefore, age is a variable with strong correlation, once the result indicates that Effort Expectancy, that is, ease of use, tends to decrease with higher age.

This study differed from the results by Gomes and Farias (2017), according to which there was no significance in the relationship between education level and social class ($p > 0.05$). In the present study, Effort Expectancy showed a significant correlation with the variables education level and family income ($p < 0.001$), suggesting that the higher the income level, the greater the Effort Expectancy. Results regarding age are also justified by the natural loss of cognition and memory associated with the aging process

(Posner, 1996 as cited in Venkatesh et al., 2012), by determining that greater effort is needed with higher age.

Results also show that, once access to the CPF service through digital means is not mandatory, but spontaneous, the user will need greater effort in order to understand its functionality. This is in accordance to what Heiskanen et al. (2007) proposed when studying consumers' attitude towards radically innovative products. In their study, the authors brought, as a practical implication, the need to reconsider the acceptability of new product innovations and integrate these considerations in the early stages of the innovation cycle.

In this sense, results of the present research reflect the need to be attentive to ease of use, in case it is the interest of managers of the studied tool to disseminate the technology because, as shown in the findings by Souza et al. (2019), innovation can be easy to use for young people and adults, however, it may not be simple enough for older people, such as the elderly.

Table 9
Factors associated with Social Influence.

Variables		Social Influence	p-value
Sex	Female	M = 4.52; SD = 2.02	$p = 0.033^{(1)}$
	Male	M = 4.95; SD = 1.81	
Age	Pearson's Correlation Coefficient	R = -0.134	$p = 0.011^{(2)}$
Family income	Spearman's Correlation Coefficient	$R_{sp} = 0.111$	$p = 0.033^{(2)}$
Education level	Spearman's Correlation Coefficient	$R_{sp} = 0.172$	$p = 0.001^{(2)}$
Region	North	M = 4.18; SD = 1.97	$p = 0.042^{(3)}$
	Northeast	M = 4.72; SD = 1.78	
	South	M = 5.04; SD = 2.34	
	Southeast	M = 4.97; SD = 1.93	
	Midwest	M = 4.53; SD = 1.82	
Type of locality	Interior	M = 5.01; SD = 1.90	$p = 0.007^{(3)}$
	Capital city	M = 4.47; SD = 1.98	
	Metropolitan region	M = 4.26; SD = 1.91	

Note: ⁽¹⁾ Student's t test significance value; ⁽²⁾ Correlation coefficient significance value; ⁽³⁾ ANOVA significance value.
Source: Elaborated by the authors.

The findings regarding Social Influence revealed that individuals have specific characteristics in all demographic variables with which this construct was compared, although it was the construct that presented the lowest mean, as discussed at the beginning of results section. This result converges with the study by Martins et al. (2018) who, by studying the acceptance of e-books by Brazilians, found statistical significance between Social Influence and Behavioral Intention, however, only when associated with the profile variables age (effect 3.5558921; $p < 0.01$) and sex (effect 7.3730093; $p < 0.01$). Results suggest alignment with the Brazilian context and national culture, in a user-consumer relationship. Tacco (2011) addressed the impact of Social Influence on the Behavioral Intention to use collective purchasing sites, concluding that this construct positively and intensively affects the intention to use the platform, and that the greater the social pressure, the greater the intention to use. However, it is noteworthy that

4.3.3 Social Influence

Regarding Social Influence, although correlations were weak, research results shown in Table 9 indicate the existence of a significant association between this construct and all demographic factors studied ($p < 0.05$). Social Influence is greater among men (M = 4.95; SD = 1.81) when compared to women (M = 4.52; SD = 2.02). Furthermore, Social Influence decreases with higher age (R = -0.134; $p = 0.011$), increases with higher family income ($R_{sp} = 0.111$; $p = 0.033$) and with higher education level ($R_{sp} = 0.172$; $p = 0.001$). With respect to region, Social Influence is higher in the South (M = 5.04; SD = 2.34) and in the Southeast (M = 4.97; SD = 1.93) parts of Brazil and lower in the North part (M = 4.18; SD = 1.97). It was also found that Social Influence is higher in the interior (M = 5.01; SD = 1.90) and lower in metropolitan regions (M = 4.26; SD = 1.91).

this relationship between the mentioned variables was not analyzed in the present study.

By verifying that men presented a higher mean for Social Influence, it is noted a discrepancy with the study by Venkatesh et al. (2003) in which they found that women are more sensitized by Social Influence, which makes it possible to infer that cultural characteristics of the contexts in which the studies are carried out can affect the target audience's perceptions.

Once Correios branches are the most accessed channel by Brazilians for CPF issuance, users of this channel can exercise social influence on new users, reducing the behavioral change expected by the online service provider.

4.3.4 Facilitating Conditions

With regards to the construct Facilitating Conditions, it presented statistically significant associations with all

variables ($p < 0.05$), but with sex ($p = 0.393$), although correlation magnitudes were weak for the variables age and family income, and moderate for education level. Facilitating Conditions decrease with higher age ($R = -0.109$; $p = 0.037$) and increase with higher family income ($R_{sp} = 0.250$; $p < 0.001$) and higher education level ($R_{sp} = 0.342$; $p < 0.001$). Results in Table 10 also show that Facilitating Conditions present higher means in the South ($M = 5.54$; $SD = 1.99$) and lower means in the North ($M = 4.06$; $SD = 2.10$). Regarding type of locality, Facilitating Conditions present higher means in the interior ($M = 5.14$; $SD = 1.85$) and lower

means in metropolitan regions ($M = 4.46$; $SD = 1.98$). The fact that the perception of Facilitating Conditions is more significant among those with higher income and education levels shows, more clearly, the gap between south-southeast and north-northeast parts of the country, with regard to inequalities in access to the digital world. Hence, demographics of digital inclusion should continue to be a concern for policy makers and a design of technological solutions for the provision of self-services to citizens via e-Gov platforms.

Table 10

Factors associated with Facilitating Conditions.

Variables		Facilitating Conditions	p-value
Sex	Female	$M = 4.81$; $SD = 2.02$	$p = 0.393$ ⁽¹⁾
	Male	$M = 4.98$; $SD = 1.73$	
Age	Pearson's Correlation Coefficient	$R = -0.109$	$p = 0.037$ ⁽²⁾
Family income	Spearman's Correlation Coefficient	$R_{sp} = 0.250$	$p < 0.001$ ⁽²⁾
Education level	Spearman's Correlation Coefficient	$R_{sp} = 0.342$	$p < 0.001$ ⁽²⁾
Region	North	$M = 4.06$; $SD = 2.10$	$p < 0.001$ ⁽³⁾
	Northeast	$M = 4.98$; $SD = 1.82$	
	South	$M = 5.54$; $SD = 1.99$	
	Southeast	$M = 5.16$; $SD = 1.70$	
	Midwest	$M = 4.86$; $SD = 1.81$	
Type of locality	Interior	$M = 5.14$; $SD = 1.85$	$p = 0.026$ ⁽³⁾
	Capital city	$M = 4.74$; $SD = 1.93$	
	Metropolitan region	$M = 4.46$; $SD = 1.98$	

Note: ⁽¹⁾ Student's t test significance value; ⁽²⁾ Correlation coefficient significance value; ⁽³⁾ ANOVA significance value.

Source: Elaborated by the authors.

As highlighted in the previous paragraph, these findings demonstrate adherence to Brazilian population's social profile, according to IBGE (2020). Population in the South and Southeast has better financial conditions and, therefore, it is easier to provide conditions for accessing the service digitally. Linked to this, internet reach is also broader in these regions than in the North, Northeast, and Midwest, as reported by the same Institute (IBGE, 2019).

Characteristic differences regarding population's age were evident in this study, demonstrating that there are still barriers for older people to be included in the digital era, as seen in the study by Farias et al. (2015) when analyzing digital inclusion in old age, in a perspective of propensity to adopt Information and Communication Technologies (ICTs). Based on the Technology Adoption Propensity Index (TAP-I), the referred study revealed that elderly people, beforehand, feel included once they have the equipment and the necessary access to ICTs, however, in an afterwards analysis, it becomes evident the perception of inability among survey respondents. Hence, stimulating those who do not fit the desired profile of users of the technology studied, providing the digital platform for issuing CPF with more intuitive features, can lead to favorable behavior for its use, which also implies, afterwards, total attention to the provision of facilitating conditions.

4.3.5 Habit

Results in Table 11 demonstrate that the construct Habit presents a higher mean in men's responses ($M = 5.23$; $SD = 1.62$) than in women's ($M = 4.64$; $SD = 1.95$) ($p = 0.002$), as verified by Venkatesh et al. (2012). Habit also decreases with higher age ($R = -0.278$; $p < 0.001$) and increases with higher education level ($R_{sp} = 0.271$; $p < 0.001$), even though with weak associations (below 0.30).

The phenomenon found can be explained by cultural matters related to the Brazilian population's aging (IBGE, 2019), as it was a generation that came before the born-digital generation and did not develop habits and skills to deal with the internet. Furthermore, this phenomenon is related to the natural loss of cognition that comes with aging. In this case, there was no association with sex and age, in order to compare with the study by Venkatesh et al. (2012), according to which younger women are more susceptible to the effects of habit than men.

Regarding respondent's region of residence, the association with the construct Habit was also significant ($p < 0.001$), according to the ANOVA significance value, with higher means in the South ($M = 5.61$; $SD = 1.59$) and lower means in the North ($M = 4.02$; $SD = 2.00$), which can be explained by the broader and better internet access of southern populations (IBGE, 2019). There was no statistically significant association between the construct

Habit and family income ($p = 0.074$) and between Habit and type of locality ($p = 0.535$).

Table 11

Factors associated with Habit.

Variables		Habit	p -value
Sex	Female	M = 4.64; SD = 1.95	$p = 0.002$ ⁽¹⁾
	Male	M = 5.23; SD = 1.62	
Age	Pearson's Correlation Coefficient	R = -0.278	$p < 0.001$ ⁽²⁾
Family income	Spearman's Correlation Coefficient	$R_{sp} = 0.093$	$p = 0.074$ ⁽²⁾
Education level	Spearman's Correlation Coefficient	$R_{sp} = 0.271$	$p < 0.001$ ⁽²⁾
Region	North	M = 4.02; SD = 2.00	$p < 0.001$ ⁽³⁾
	Northeast	M = 5.01; SD = 1.78	
	South	M = 5.61; SD = 1.59	
	Southeast	M = 5.12; SD = 1.72	
	Midwest	M = 4.78; SD = 1.87	
Type of locality	Interior	M = 4.97; SD = 1.79	$p = 0.535$ ⁽³⁾
	Capital city	M = 4.75; SD = 1.94	
	Metropolitan region	M = 4.77; SD = 1.92	

Note: ⁽¹⁾ Student's t test significance value; ⁽²⁾ Correlation coefficient significance value; ⁽³⁾ ANOVA significance value.

Source: Elaborated by the authors.

Results for the construct Habit demonstrated convergence with the study by Ratchford et al. (2014) in which they warned about the need to adapt users to a new technology, in a transition era for Brazilian society regarding the use of the internet in their daily lives. The study reveals and is consistent with data from IBGE (2019) that highlights that regional differences in age and in education level are markers for the habit of using technologies, and that the improvement in conditions of access to digital platforms can lead users to adopt the service offered by this channel.

4.3.6 Behavioral Intention

With respect to Behavioral Intention, results in Table 12 demonstrate that this construct presents a positive statistically significant correlation with family income ($R_{sp} = 0.123$; $p = 0.018$) and with education level ($R_{sp} = 0.244$; $p < 0.001$), although these correlations are weak. Behavioral intention is higher in the South (M = 5.50; SD = 2.23) and in the Southeast (M = 5.80; SD = 1.69) and lower in the North (M = 4.29; SD = 2.36). There is no statistically significant association with sex ($p = 0.095$), age ($p = 0.131$), and type of locality ($p = 0.139$).

Table 12

Factors associated with Behavioral Intention.

Variables		Behavioral Intention	p -value
Sex	Female	M = 5.04; SD = 2.14	$p = 0.095$ ⁽¹⁾
	Male	M = 5.39; SD = 1.81	
Age	Pearson's Correlation Coefficient	R = -0.079	$p = 0.131$ ⁽²⁾
Family income	Spearman's Correlation Coefficient	$R_{sp} = 0.123$	$p = 0.018$ ⁽²⁾
Education level	Spearman's Correlation Coefficient	$R_{sp} = 0.244$	$p < 0.001$ ⁽²⁾
Region	North	M = 4.29; SD = 2.36	$p < 0.001$ ⁽³⁾
	Northeast	M = 5.29; SD = 1.76	
	South	M = 5.50; SD = 2.23	
	Southeast	M = 5.80; SD = 1.69	
	Midwest	M = 4.74; SD = 1.87	
Type of locality	Interior	M = 5.39; SD = 1.92	$p = 0.139$ ⁽³⁾
	Capital city	M = 4.94; SD = 2.09	
	Metropolitan region	M = 5.10; SD = 2.14	

Note: ⁽¹⁾ Student's t test significance value; ⁽²⁾ Correlation coefficient significance value; ⁽³⁾ ANOVA significance value.

Source: Elaborated by the authors.

Results for Behavioral Intention are explained by the strong correlation with the construct Facilitating Conditions ($R = 0.690$) which, therefore, reaffirms Ajzen (1991), who argued that a favorable set of facilitating conditions positively influences individuals' intention to adopt a technology, and part of the individuals interviewed in the referred study, with higher education and income levels, is also located in the South and Southeast regions.

Although Sheppard et al. (1988) argue that measuring behavioral intention may not be a good tool for predicting behavior, once several factors must be considered, including those that are not under consumer control – Social Influence, for instance –, the present study reaffirms that, as argued by Ajzen and Fishbein (1980), individuals adopt behaviors because they believe that other people think it is important for them to behave in a certain

way. The study by Nobre et al. (2011) demonstrates that Behavioral Intention is significantly associated with the adoption of new platforms, even though individuals still do not have contact with the technology. When there are conditions to use, they intend to do so, nevertheless, it is noteworthy that this construct (Social Influence) was the one with the lowest mean among individuals' responses in the present research.

Another phenomenon that corroborates the results for this construct is regional differences in internet access, as shown by the National Continuous Household Sample Survey – PNAD – with data from 2016 to 2018 (IBGE, 2019), according to which the South (81.1%) and Southeast (84.8%) regions have easy digital access, compared to the North (72.1%) and Northeast (69.1%) regions, reinforcing that there is a little inequality in facilitating conditions that interfere in behavioral intention to adopt technology. Hence, investment in mass media and marketing campaigns on attributes of the CPF issuance platform could encourage potential users to search for the digital channel to access the document, although the promotional effort alone is not enough to deal with structural problems, especially in rural areas in the North and Northeast parts of Brazil. The same PNAD survey brought factors that lead to not using the internet and, in rural areas, some of the most critical factors are service price (for 24.2% of households), not knowing how to use the internet (20.7%), service unavailability in the area (20.8%), very expensive electronic equipment to access the internet (5.9%), lack of interest in accessing the internet (24.8%), and other reasons (3.6%). Due to the lack of facilitating conditions, it is understandable that face-to-face service via Correios branches is often the only available solution.

5 CONCLUSIONS

The present study discussed determinants of non-adoption of the CPF issuance public service made available digitally in Brazil, distinguishing non-adopting citizens on the basis of sociodemographic variables and technology usage habits. To this end, it was sought to compare the constructs Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Habit, and Behavioral Intention according to participants' sociodemographic and economic profile.

This way, it is concluded that all sociodemographic and theoretical variables analyzed in the present study are associated with technology use, having Social Influence as the least significant, and, once there are correlations between all of them, even though some are weak correlations, there is some complexity in trying to define non-users' profile, given the demographic characteristics existing in Brazil, which proves the need to align user's sociodemographic profile before the design and

implementation of technologies for public services digital provision. The regional differences in Brazil are evident, especially in terms of education and income levels, which impacts the use of new technologies, preserving space for offering the service in person.

The results of this study demonstrate the need for managers of the CPF issuance service to be attentive to users' sociodemographic aspects, seeking to strengthen or recreate functionalities that improve user's performance and ease of use of the technological solution. Although the internet is available to the major part of population, its use to access digital public services is still very incipient. This will lead public agencies to realize that the tendency to co-create public services is not merely a trend in the field of innovation in government and digital transformation – tendency encouraged by the OECD so that countries more quickly adhere to ICTs for service offering via e-Gov platforms. In countries with unequal facilitating conditions to access ICTs, the demographic realities and challenges discussed herein are imposed.

Once positive attitude towards Behavioral Intention has been proved to be significant among respondents with higher income and education levels, the present study contributes to directing actions that lead to the development of more intuitive platforms, in order to reach all Brazilian population classes, with greater diffusion of this technology.

From the literature perspective, the study contributes to knowledge expansion about factors inherent to the process of adopting new technologies by users of public services, based on the UTAUT2 applied to the context of a Western culture and differentiated by individuals' location, once the original research was applied in the East, in the city of Hong Kong, where the spread use of technology tends to be strongly verified, as well as in developed economies.

As a limitation and improvement need of the study, it is recommended to collect data with users adopting the digital CPF issuance technology, so that it is possible to compare groups (adopters and non-adopters).

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