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# Just Digital or Multi-Channel? The Preferences of E-Government Service Adoption by Citizens and Business Users

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**Abstract.** The digital world has entered governments and public sector institutions. In that context, public e-services have been gaining increasing importance in recent years. However, will everything end up being digital in the future? This article investigates the preferences of citizens and business users to adopt different public services electronically and via further offline channels. Data of 500 citizens and 500 companies were collected together with the German Federal Employment Agency. Our findings indicate that citizens as well as business users ask for a multi-channel offering. They prefer to deliberately choose subjective suitable channels for different services. We furthermore observed a difference between companies from different industries as well as between small and medium-to-large companies, such as the latter ones having a stronger preference for online channels than small companies.

**Keywords:** E-government, Multi-channel, Case Study Research, German Federal Employment Agency

## 1 Introduction

Since the advent of the Internet, governments and public sector organizations have been harnessing the power of information and communication technology to deliver an increasing number of electronic services [1]. From 2010 to 2012, public e-services grew about 11% worldwide, with the highest level of e-government development in Europe [2]. E-government is mainly concerned with providing value-added information facilitating the information transparency between governments and citizens, and transactional public services electronically to citizens [3-5]. Thus, it has the potential to enhance public sector effectiveness and efficiency, as well as to enable citizens to participate in democratic processes [6]. Recent e-government offerings actually go beyond mere digital information services (e.g., online presence). E-government thereby serves not only to a variety of other actors (e.g., businesses), but also provides more complex services [3], [7-9].

Prior research has shown particular interest in e-government service adoption especially from a supply side perspective, analyzing public e-service offerings [3], [4], [8], [10-13]. Also the demand side perspective has been in the focus of recent re-

search. However, while there has been quite an effort to investigate citizens in their digital adoption behavior (e.g., [14-19]), few research has examined the willingness and preferences of business users, i.e. companies, to adopt digital public services [20], [21]. Furthermore, although there is an increasing demand for multi-channel service delivery [2], little research has been done to understand e-government usage in the context of multi-channel. As e-government usage rates currently remain at low level compared to service availability, it is important to better understand the needs of citizens and business users in a multi-channel environment.

This research attempts to fill this twofold research gap by investigating the preferences of citizens and particularly business users to adopt different public services electronically (online) and via further offline channels (in person, by phone, by letter). To get a deep understanding of the phenomenon of interest, we conducted a case study at the German Federal Employment Agency. The German Federal Employment Agency was selected for its strong connection to citizens and firms alike. Furthermore the German Federal Employment Agency is an organization providing citizens and companies with a multi-channel access to all of their services, thus giving us exclusive access to otherwise inaccessible data. Our research is intended to help public sector institutions and policy makers in their strive to better understand the needs of citizens and in particular business users regarding which services they prefer via which channel in order to increase satisfaction and trust in governments.

The remainder of this paper is structured as follows: In the next section, we review the existing literature. Section 3 briefly describes the research method including the case setting and the data collection process, while Section 4 presents our findings. After that, we derive managerial and research implications and critically discuss the limitations of our work in Section 5. Finally, we conclude with a brief summary of our research in Section 6.

## **2 Theoretical Background**

E-government, being understood as a means to electronically deliver government services to citizens and businesses [4], [5], has been in the focus of research for the past decade. Thereby research mostly focuses either on the delivery of services, i.e. the supply side, or on its adoption by citizens or businesses, i.e. the demand side.

### **2.1 Research on E-government Service Delivery**

E-government is specified as the use of information and communication technology by public administration to create a networked structure for interconnectivity, service delivery, efficiency, effectiveness, transparency, and accountability [22]. It is argued that e-government can be considered either via the type of relationship or the stage of development [7]. Reddick [8], [9] accordingly states that e-government has evolved in two stages. The first stage is the information dissemination phase, i.e. cataloging information online for public use. The second stage is transaction-based e-government, i.e. e-service delivery and transactions being completed online such as paying taxes online. In this paper we will investigate both. As types of government relationships,

government to citizen (G2C), government to business (G2B), and government to government (G2G) relationships are considered [8]. The focus of this paper lies on G2C as well as G2B relationships.

Research on the supply side of e-government focuses, for example, on questions regarding how to develop e-services from a government perspective. Topics include, for instance, the development of an appropriate information architecture, factors for successfully implementing information and communication technology, the effective use of the technology [6], [23-27], as well as related barriers [10], [26].

Using empirical evidence of actual state of e-government in cities, communities, and states, further research examines existing offerings of e-government in order to deduce best practices and to work out effects from comparisons between different levels of public administration (e.g., size and type of government) or countries [3], [4], [8], [10-13]. Moon [10], for example, explores the evolution of e-government at municipal level. He names barriers such as a lack of financial, technical or personal capacities as well as legal issues like privacy as reasons hindering the progress of municipal e-government. He furthermore finds a positive association of the institutional factors size (city size) and type of government (manager-council government) regarding the adoption of a municipal website as well as its longevity. Moon and Norris [4] explore the effect of managerial innovativeness in municipal government on the adoption of e-government. They argue that the culture of innovation is an organizational characteristic that needs to be considered besides aspects like size, service demand, and other organizational characteristics already considered in former studies like professionalism, slack resource, and administrative performance.

## **2.2 Research on E-government Service Adoption**

Research focusing on the adoption of e-government services, i.e. the demand side, often has its foundation in those theoretical frameworks generally exploring the adoption of technology like Roger's [28] diffusion of innovation theory, the technology acceptance model by Davis et al. [29], the theory of reasoned action [30], or the theory of planned behavior [31]. Carter and Bélanger [32], for example, form a model of factors influencing citizens' adoption of e-government initiatives. Their empirical findings indicate that perceived ease of use, compatibility and trustworthiness are significant predictors of citizens' intention to use e-government services. Gilbert et al. [14] conducted a survey of UK citizens, validating that trust, financial security, information quality (adoption barriers), as well as time and money (adoption benefits) are predicting potential usage of e-government. Horst et al. [15] furthermore presented a study to identify the role of risk perception and trust on the adoption of e-government services by citizens. Their analysis showed that perceived usefulness of e-services in general determines the intention to use e-government services. Also Hung et al. [33] identified factors determining public acceptance of e-government services. Shareef et al. [18] aim at discovering critical success factors enabling citizens to adopt e-government at different stages of service maturity. They argue that theoretical frameworks like the technology acceptance model cannot capture and specify the complete essence of e-government adoption behavior. Accordingly adop-

tion behavior also differs along with different service maturity levels, i.e. different functional characteristics of organizational, technological, economical, and social perspectives. However, with respect to technology adoption models, several studies illustrate that perceived usefulness is an important construct that is able to explain a large percentage of the variance in intention to use e-services [32], [34-36]. Overall, a wide range of individual factors that might explain the adoption of e-government services were considered in several studies, such as perceived risks [37], perceived barriers [14], [38], or trust in e-government [5], [16], [17], [39].

Beyond these individual factors, research found that information and communication adoption barriers, such as access and skill, may vary by culture [16], and that cultural aspects influence e-government service adoption [9], [34], [40], [41]. Furthermore, scholars show that the need for a sensory experience [19] and the existence of digital divide [42] hinder e-government usage in general. Based on these barriers, further scholars have investigated measures on how to increase e-service adoption. Recent studies, for example, indicate that social media can help to increase e-service adoption in the public sector (e.g., [43]). Moreover, based on a field study, Heide-mann et al. [1] found evidence that external marketing to strengthen the awareness of e-services, employee activation and training, as well as improving the technical usability and user-friendliness of e-services can significantly increase usage rates.

While there has been quite an effort to study citizens in their e-service adoption behavior over the last years, few studies have examined the preferences and willingness of businesses in adopting e-government services. One of the very few studies is the one of Adeshara et al. [20] examining the readiness of small and medium sized UK companies for accepting e-government services. The authors reveal that there is a moderate demand of these companies for e-government services. Further, Lee et al. [21] investigate the question why some businesses are more willing to adopt e-government applications for online transactions than others. They found that the businesses' willingness to adopt e-government services depends on the perceived quality of e-services compared to traditional brick and mortar (offline) service channels, as well as on the level of trust businesses place in the internet technology itself.

In sum, our brief literature review indicates that most of the existing work either explores e-government services from a supply-side or focuses on analyzing the willingness for e-service demand from a citizens' perspective (G2C), neglecting the G2B perspective. In addition, most studies analyze digital adoption in isolation without considering a multi-channel approach. Therefore, the current study examines the preferences for e-government adoption in the presence of a multi-channel perspective, with a special focus on business users' preferences for e-government services.

### **3 Research Method**

In this section, we first provide an overview of the case setting of the German Federal Employment Agency. Then we describe the data collection and preparation process that builds the basis of our findings.

### 3.1 Case Setting

To investigate the preferences of citizens and business users to adopt public services via different channels (online, in person, by phone, by letter), we conducted a case study. A case study “is an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, [...]” [44, p. 18], particularly appropriate to analyze a phenomenon at its early stages [45]. Based on this definition, we believe that case study research is well-suited for our research question. First, so far no research has been conducted on the adoption of e-services in a multi-channel context. Furthermore, we believe that e-government adoption cannot be separated from the context it is applied in and thus should be analyzed in its natural context [46]. Our selected case organization is the German Federal Employment Agency (*Bundesagentur für Arbeit*), which is the largest provider of labor market services in Germany with approximately 95,000 employees and 156 employment agencies and approximately 600 branch offices nationwide. The organization was selected for its strong connection to citizens and companies (business users). Furthermore, it offers most of its services via all four channels (online, in person, by phone, and by letter) so that citizens and business users can choose to adopt the channel they prefer.

The relevant period for our research starts in January 2011, when the German Federal Employment Agency started a campaign promoting its e-services against the background that the online channel becomes more important. Different e-services for citizens and businesses were bundled into the digital job portal JOBBÖRSE (<http://jobboerse.arbeitsagentur.de>). This portal includes, for example, services for online job seeker registration or services to collaborate with the staff online – for example, to publish applicant profiles, to manage applications, to activate a job search assistant to search for jobs, to respond to placement suggestion, or to communicate with advisors. Similar online services are available to employers (e.g., online registration of workforce demand). Although, in recent years the German Federal Employment Agency steadily developed these e-services further, a clear strategic goal was to have a multi-channel access to all of these services. In that realm, the goal of our case study was to better understand the channel preferences of citizens and business users adopting different e-services. This setup gave us exclusive access to an otherwise inaccessible data set.

### 3.2 Data Collection and Preparation

Our research follows the case study approach by Yin [44]. First, we planned and designed our research. To obtain the necessary data, we followed a two-step approach. In a first step, in close cooperation with the German Federal Employment Agency, in January 2011 we conducted a representative survey of  $n = 500$  job seekers respectively unemployed citizens across Germany by telephone. 63.0% of these job seekers were male, 36.8% female (one job seeker with unknown gender). Furthermore, 93.6% were Germans, 64.0% were above 40 years old and 62.8% had an educational attainment equal or below the extended secondary school leaving qualification. We inquired about their channel preferences (online, in person, by phone, by letter) with regard to eleven different services of the German Federal Employment Agency classi-

fied along its four categories of services, namely information services (searching for jobs, searching for job information), transaction services (participating in learning courses, managing job applications, receiving job proposals, arranging appointments, contacting employers), service requests (signing on for unemployment benefits, signing on for unemployment), and counseling services (job counseling, unemployment counseling). This was done using the question “*How would you prefer to be in contact with the Federal Employment Agency regarding the following topic areas? [List of services]*”. Furthermore, we inquired job seekers about their use of online services in general; in particular we raised their use of applications like online banking, online shopping and social media. Regarding their satisfaction with e-services, job seekers were asked the following question “*Do you agree: E-services of the Federal Employment Agency are easy to find; visually appealing; easy to operate [...]*”. Each telephone survey took on average 10 minutes.

In a second step, our objective was to identify the needs of business users regarding channel preferences. To that end, we surveyed  $n = 500$  companies (business users) by telephone. 47.6% were from the service sector, 30.8% from handcraft or trade, 10.8% from industry, 5.8% from the public sector, and the remaining companies were amongst others from agriculture or temporary employment companies. 419 of these companies had less than 100 employees, 81 more than 100 employees. We inquired these companies with regard to their channel preferences for five core services of the Federal Employment Agency along two categories of services, namely transaction services (receiving candidate proposals, registering open job positions, contacting job candidates, and arranging appointments) and service requests (requesting services for employees, for instance, short-time working benefits). Questions were phrased in analogy to the job seekers’ survey. All answers were documented in MS Excel format. The results of the analysis are presented in the following section.

## **4 Research Results**

This section is dedicated to the research results of our study. First, we focus on the preferences of citizens for adopting e-government services. The second part concentrates on the preferences of business users of small and medium-to-large companies.

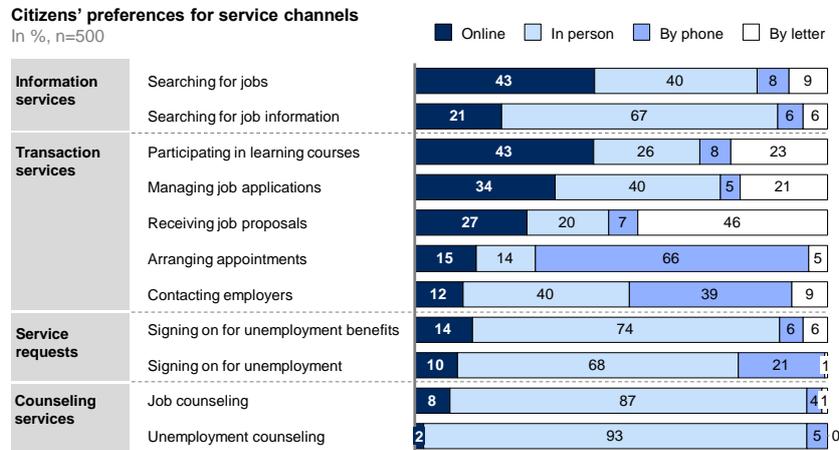
### **4.1 Citizens’ Preferences**

To investigate the preferences of citizens to adopt public services via online and offline channels, we compare the eleven core services of the German Federal Employment Agency. For each of the services we calculated which share of the 500 surveyed citizens indicated an adoption preference for each of the provided four channels (online, in person, by phone, by letter). Figure 1 illustrates the results. In addition to this descriptive analysis, we investigated how users’ channel adoption preferences for one service correlate with their adoption preferences for another service. For that purpose we calculated Cramer’s V for all possible service combinations.

First and foremost, the survey results reveal that citizens prefer having multiple service channels rather than preferring the online channel for everything. This holds

true in two ways: First, within each service, citizens prefer different channels. For instance, for managing job applications citizens have mixed preferences between online (34%), in person (40%), by phone (5%), and by letter (21%) (cf. Figure 1). Second, for different services different channels are primarily preferred. For instance, when searching for jobs, citizens primarily prefer to use the online channel, when arranging appointments the majority of the surveyed citizens prefer the telephone channel, when signing on for unemployment counseling, citizens prefer to interact with the German Federal Employment Agency in person (cf. Figure 1). Thus, it seems that rather than preferring one channel for all services, citizens select specific channels for each service. Our investigation of relationships between users' channel adoption preferences confirms this: For almost all services, the relationships were found to be highly significant (but only small to moderate). They vary between 0.099 (e.g., searching for jobs and unemployment counseling) and 0.508 (e.g., searching for job information and job counseling).

In addition, the relationships of a user's channel preferences for services within one service category were stronger than the ones for services of different categories. This holds true for all service categories except counseling services. For instance, for channel preferences within the category of information services the average Cramer's V accounted for 0.347 while the Cramer's V with regard to services of other categories was on average 0.284 (transaction services), 0.222 (service requests) and 0.272 (counseling services). Thus, service categories and not solely individual factors seem to affect channel adoption preferences. This affirmed when analyzing the citizens' digital adoption preferences in more detail. Overall, we find online preferences across all services and service categories. However, these adoption preferences vary substantially, ranging from 2% (for unemployment counseling) to 43% (for participating in learning courses as well as searching for jobs). In fact, the online channel is preferred most for information services (searching for job information, searching for jobs) and transaction services (participating in learning courses, managing job applications, receiving job proposals, arranging appointments, contacting employers): For instance, 43% of the surveyed citizens prefer the online channel for searching for jobs and participating in learning courses, 34% prefer it for managing job applications. For administrative (transaction) services like arranging appointments and contacting employers there is a lower digital adoption preference with 15% respectively 12% than for the other transaction services. For these services, telephone is the preferred channel: 66% of all citizens prefer to arrange appointments and 39% prefer to contact employers by phone. For service requests online adoption preferences account for solely 10% (signing on for unemployment) respectively 14% (signing on for unemployment benefits), indicating just a minor interest in digital services. In fact, for service requests and even more for counseling services citizens rather prefer to interact with the German Federal Employment Agency in person.



**Fig. 1.** Citizens' preferences for service channels

It could be argued that the preference for multi-channel as well as the rather low digital adoption preferences for some services can be explained by the citizens' rejection of online services in general. However, also citizens using the internet daily for other services, in total 215 citizens, prefer multi-channel: Still, for information and transaction services the online channel is preferred substantially, for service requests and counseling services citizens prefer interactions in person. The channel preferences are just slightly shifted towards online for those citizens using the internet daily. For instance, 74% (instead of 43% of all citizens) prefer to search for jobs online, and 64% (instead of 43%) indicate to prefer participating in learning courses online. Also dissatisfaction with the online services of the Federal Employment Agency cannot be seen as a conclusive explanation for low digital adoption preferences. In fact, almost two third of the surveyed citizens assess the online services of the Federal Employment Agency as very or entirely understandable (68%), visually appealing (67%), easy to find (67%), and easy to operate (64%).

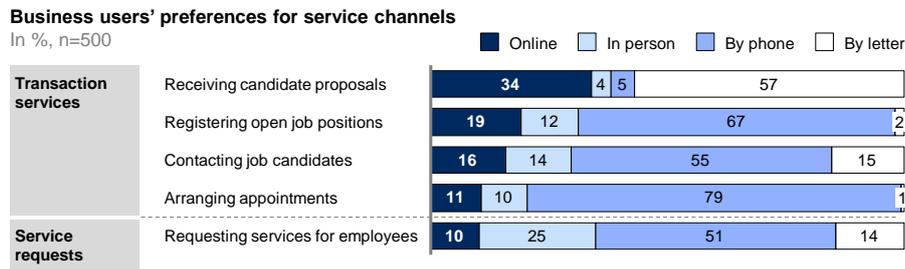
Beyond our analysis of citizens in general, we investigated channel adoption preferences according to citizens' demographic characteristics, in particular age, education, gender, and nationality. A multivariate analysis revealed that both age and education significantly affect the share of services that respondents indicate a digital adoption preference for. In fact, we showed that citizens below the age of 40 years prefer the online channel for 28% of all services compared to 17% (for citizens above the age of 40 years). In addition, citizens with an education above the secondary school leaving qualification have a digital adoption preference for 25% of all services compared to 13% (for citizens equal or below the secondary school leaving qualification). This result holds true not just on average over all services, but also for all services individually. However, while this analysis reveals a stronger digital adoption preference for younger and well-educated citizens, it also revealed that even those apparently more digital affine citizens segments do not prefer the online channel for all services but favor multi-channel.

Thus, to sum up, all our results indicate that citizens deliberately ask for a multi-channel offering, preferring subjective suitable channels for different services rather than preferring the online channel for any service.

## 4.2 Business Users' Preferences

For the 500 business users we surveyed, we compare channel preferences between five different services from receiving candidate proposals to requesting services for employees.

Thereby, our results reveal an overall preference for multi-channel. In fact, for different services, business users have different channel adoption preferences. This holds true for all services in both service categories examined. For instance, for requesting services for employees, 10% of business users prefer online, 25% an interaction in person, 51% by phone and 14% by letter (cf. Figure 2). Additionally, we investigated how business users' channel adoption preferences for one service correlate with their adoption preferences for another service. All relationships were found to be significant, but not very strong. In fact, Cramer's V varied between 0.179 (receiving candidate proposals and requesting services for employees) and 0.419 (registering open job positions and arranging appointments). This provides additional evidence for multi-channel: business users do not prefer one channel for all services, but rather select a specific channel for each service.

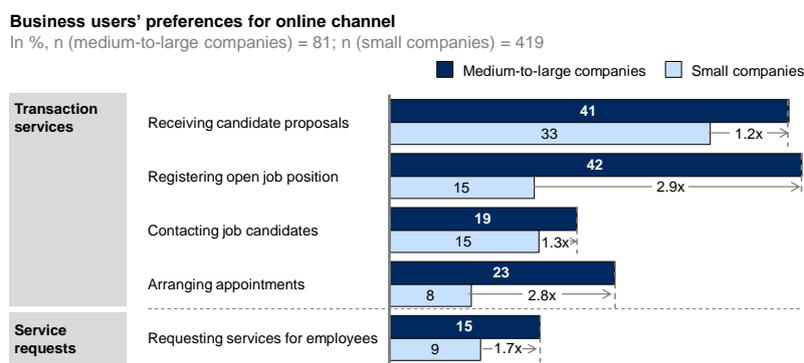


**Fig. 2.** Business users' preferences for service channels

Analyzing business users' adoption preferences in more detail, we find digital preferences across all services, however varying substantially. Online preferences range from 10% for requesting services for employees (for instance for requesting short-time working benefits for employees) to 34% for receiving candidate proposals. Our results reveal that the online channel is preferred more for transaction services (receiving candidate proposals, registering open job positions, contacting job candidates, arranging appointments) than for service requests (requesting services for employees): For instance, for receiving candidate proposals 34% of the surveyed business users indicate online preferences, for registering open job positions at least 19% do, while for service requests the digital adoption preference accounts solely for 10% (requesting services for employees). Within transaction services, administrative services like contacting job candidates and arranging appointments have a lower online adoption preference with 16% respectively 11% than the other transaction services.

Overall, across all services (except receiving candidate proposals), business users strongly prefer the interaction by phone (ranging from 51% to 79%). For receiving candidate proposals, by letter is the preferred channel with 57%. The least preferred channel, when taking an average across all services, is the interaction with the German Federal Employment Agency in person.

Thus, similar to our results on citizens, we see a strong preference of business users for a multi-channel offering rather than an online preference for any service. Both business users and citizens deliberately choose subjective suitable channels for different services.



**Fig. 3.** Business users' preferences for online channels segmented by company size

In addition to business users in general, we analyzed differences in the digital adoption preferences between small companies (<100 employees) and medium-to-large companies (>100 employees) as well as between different industries. Our results reveal that across all services, medium-to-large companies have a stronger preference for online services than small companies. For registering open job positions and arranging appointments the preference for the online channel is almost three times as high for medium-to-large companies (42% respectively 23%) than for small companies (15% respectively 8%). However, also for medium-to-large companies, online is just one channel amongst others. At most, 42% of the surveyed business users prefer the online channel for one service (registering open job positions). Figure 3 illustrates the results. Furthermore, we found that companies from handcraft have a significantly lower online preference (on average 11%) than companies from other industries (on average 18%). On the other hand, companies from trade (on average 23%) and the public sector (on average 29%) have a significantly stronger online preference.<sup>1</sup> For the other industries no significant differences could be observed.

<sup>1</sup> For handcraft the difference is significant at a 1% significance level, for trade at a 10% significance level and for the public sector at a 5% significance level.

## 5 Discussion, Limitations, and Future Research

In this section we critically discuss the results of our survey, point out limitations and respective topics for future research.

### 5.1 Discussion of the Results

Our results reveal that both citizens and business users prefer multi-channel when interacting with public sector organizations like the German Federal Employment Agency. Citizens thereby prefer the online channel predominantly for those services, where they see distinctive advantages (adoption benefits) (cf., [14], [16]). In particular, this holds true for most information services, i.e. for those services citizens want to gather and receive information or data without need for further discussion. In contrast, when citizens need individualized advice, as it is the case for counseling services and service requests, they prefer to interact with the German Federal Employment Agency in person. These findings are in line with former studies identifying that the perceived usefulness of e-services determines the intention to use these services [15], [32], [34-36]. Additionally, we could show that also different citizen segments (classified by education and age) have multi-channel preferences. Although younger and better-educated citizens show stronger online adoption preferences (compared to older and less educated citizens), they do not prefer the online channel for all services. Nevertheless, we believe that it is important for organizations to pay special attention on different citizen groups when designing channel strategies.

For G2B relationships we made similar observations as for G2C relationships. Business users also show a strong preference for a multi-channel offering rather than an online preference for any service (cf., [20]). Nevertheless, we find online preference across all services, however varying substantially from 10% for requesting services for employees (service request) to 34% for receiving candidate proposals (transaction service). In contrast to citizens, who generally prefer contact in person, business users strongly prefer contact by phone for almost all services.

In addition to our findings on business users in general, we found differences regarding the adoption behavior of small and medium-to-large companies as well as companies from different industries. In fact, the preference for online services is larger for medium-to-large companies than for small ones. This might be explained by the fact that the frequency of interaction increases with company size (scaling effects). Furthermore, smaller companies might operate more “hands on”, preferring pragmatic solutions like contacting the German Federal Employment Agency by phone. Moreover, companies from handcraft have a significantly lower digital adoption preference while companies from the trade and the public sector have a significantly stronger online preference. One explanation might for instance be the general internet affinity of industries (handcraft vs. trade). Thus, similar to the case of citizens, organizations have to consider business user characteristics when designing channel strategies to prevent an exclusion of subgroups.

To sum up, our results reveal that it is important for public sector organizations to offer and further develop e-services. However, e-services should be seen as supple-

ments to existing offline services. Moreover, different channel strategies for distinct services and user groups should be defined. Particularly information and transaction services, for which users already predominantly prefer the online channel and have low adoption barriers, should be digitalized. In contrast, multi-channel solutions should be provided for service requests and counseling services, for which users have divergent preferences. In particular for counseling services with citizens seeking individualized advice, an interaction in person will remain of great importance. At the same time however, organizations have to continue improving their online offerings in order to reduce prejudices of users and further promoting online solutions. This particularly holds true for service requests like signing on for unemployment benefits or signing on for unemployment, for which users might overestimate the complexity of the processes and consequently prefer offline channels until now.

## **5.2 Limitations and Future Research**

Despite the contributions of this article, our results have to be seen in the light of some limitations. First, we only conducted a single case study in one country. However, the German Federal Employment Agency is one of the largest public sector institutions in Europe. Thus, we can assume that our results have certain significance. Nevertheless, future research should consider further cases, for example, in other (European) countries, to validate our results or find evidence such as for cultural differences regarding e-government adoption preferences (cf., [16]). Second, we only conducted a static analysis of user preferences. A comparison with data on actual usage rates could further validate the findings of this article. Finally, future research should also evaluate multi-channel offerings considering economic effects. Although our survey indicates that users prefer to choose suitable channels themselves, when developing a multi-channel strategy it might not be reasonable, from an economic point of view, to provide all channels for all services. Thus future research should evaluate implementation strategies and consequences for different categories of services, like information, transaction, or counseling services.

## **6 Conclusion**

Will everything end up being digital in the future? With e-government as a means to electronically deliver government services to citizens and businesses, the digital world has entered governments and public sector institutions. In this case study we investigated the preferences of citizens and business users for adopting different public services such as information, transaction, counseling services, and service requests online and via offline channels (i.e., in person, by phone, and by letter). We conducted representative surveys of  $n = 500$  unemployed citizens and  $n = 500$  companies from different sectors across Germany, inquiring about their channel preferences with regards to different services of the German Federal Employment Agency.

Our findings indicate for both citizens and business users preferences for a multi-channel offering, thus an offering that provides users the option to consciously choose

a subjective suitable channel for services by themselves. Citizens and business users thereby prefer the online channel predominantly for information and transaction services. With respect to citizens, we could show that age and education determine digital adoption preferences. In addition, for G2B relationships we observed a difference in the digital adoption preferences between companies of different industries as well as between small and medium-to-large companies. Latter have a stronger preference for online services than small companies, which presumably can be explained by scaling effects. Thus, both from a citizen and business user perspective, online services should be seen as supplements rather than substitutes. A mere replacement of offline services through online services without creating a distinct advantage of the online channel is not sufficient and expedient. To build up a proper multi-channel offering, public sector organizations need to identify different channel strategies for distinct services and user groups. Service offerings should particularly digitalize in information and transaction services for which users already predominantly prefer the online channel and have low adoption barriers. In contrast, multi-channel solutions should be provided for more sophisticated services. At the same time, public sector organizations need to continuously improve their online offerings and further promote online solutions for services that are until now overestimated in their complexity by citizens and business users.

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