How to improve e-government use: An empirical examination of multichannel marketing instruments

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Abstract. Citizens interact with government agencies through a variety of channels, e.g., front desk, telephone, website and e-mail. Regardless of these possibilities, they prefer the traditional channels like the front desk. Government agencies strive for a balance between service delivery resulting in customer satisfaction and cost efficiency in their operations. Through better use of the online services by citizens, they can achieve a balance between these aspects. So, government agencies should strive to change citizens’ enduring preference for the traditional channels. These preferences can be altered through the use of multichannel marketing (MCM) instruments. In order to use these instruments successfully, not only knowledge on citizen multichannel behavior is required but also on the effects of these instruments. Questions such as how do citizens perceive the various instruments and to what extent are the instruments associated with each other rise up. Based on qualitative depth interviews we formulate constructs to measure citizens’ perceptions on the MCM instruments. Subsequently, we empirically test the constructs with a quantitative survey amongst almost 2,000 citizens. As a result, this research increases the knowledge on government MCM and the possibilities to influence enduring citizen channel preferences.

Keywords: Multichannel marketing, e-government, citizen multichannel behavior, channel choice

1. Introduction

Since the early nineties, when the Internet arrived, government agencies have been using a variety of customer service channels. These channels have different characteristics and are used for communication, interaction, transaction and distribution of products and/or services. Besides the traditional channels, such as the front desk and the telephone, citizens have access to digital channels such as websites and e-mail. These digital channels offer well known advantages such as 24/7 availability and the ability to store and present vast amounts of information.

Research shows that citizens mainly use the Internet to search for information, to provide government agencies with information and to order forms or documents [7,33,45]. Despite the advantages of the Internet, citizens prefer the more expensive personal channels (front desk and telephone) to the newer cost-efficient digital channels for many service interactions [2,31,35]. In various countries, the use of the traditional service channels did not decline after the arrival of the digital channels. It also seems

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as though people add digital channels to their set of service channels rather than substituting traditional channels with digital channels [20]. This implies that, although the digital channels are used quite frequently, citizens do not autonomously switch to the digital channels.

From a government perspective, increased usage of service delivery through the digital channels is expected to improve efficiency, overall costs and customer service. Customer service is expected to improve due to the overall multichannel service offering. For instance, when citizens use the Internet for simple services, such as making an appointment to visit the front desk, they do not need to wait in line. Also, the government agency is able to better plan the capacity of its front desk personnel (improving cost-efficiency). Not surprisingly, government agencies are attempting to increase the usage of service delivery through the digital channels. However, given citizen channel choice and usage (i.e., citizen multichannel behavior), this objective does not seem to be realized easily. Hence, it is necessary for government agencies to attempt to steer their citizens to the digital channels.

Based on the literature, it becomes apparent that various instruments can be used to influence citizens’ channel choice and usage. In marketing, the 4p’s (price, product, place and promotion) [25] are well known. In public administration, communication, financial and legal instruments are typically used to change citizen behavior in general [41]. Reviewing these various instruments, a large overlap is found between, for instance, promotion and communication, as well as financial and price. Nevertheless, it is unclear which of these instruments or which combination of instruments influences citizens’ usage of the digital channels most effectively.

This study aims to determine how these MCM instruments influence citizen multichannel behavior. We investigate this objective by determining (1) how citizens perceive the various MCM instruments and (2) which MCM instruments are best suited given various citizen characteristics. We empirically test our research questions based on survey data collected amongst the inhabitants of a medium-sized municipality in the Netherlands. As a result, this paper provides valuable insights into how government agencies can guide their citizens to the Internet channels.

The paper is structured as follows. First, we present the theoretical background. The next section of the paper discusses the methodology to empirically test our research questions. This section is followed by a presentation of the findings. We end with a discussion of the findings and the main conclusions.

2. Literature background

In order to influence citizen multichannel behavior, we must first understand it. Building on the work of media theorists, we propose a basic framework of citizens’ multichannel behavior [34]. The framework, as depicted in Fig. 1, shows that citizen multichannel behavior can be decomposed in a number of steps.

The first step concerns channel choice, an individual’s specific decision to use a medium in a particular communication incident. The second step, channel use, refers to an individual’s broad pattern of

Fig. 1. Simplification of citizen multichannel behavior.
medium usage over time [40]. Choice and usage can also be seen as “employing the communication medium for a certain task” (usage) and “picking of a medium” (choice). During the third step, channel evaluation, citizens evaluate (consciously or unconsciously) their channel choice and usage. This experience influences both channel perceptions, as argued by Channel Expansion Theorists [13] and future channel choices [36].

Channel marketing can subsequently be proposed to influence this simplification of citizen multichannel behavior, especially through channel choice. Clearly, multichannel behavior in real life is far more complex (e.g., citizens can use multiple channels at the same time) [33]. Furthermore, this model is a generalization of the process across all user groups. Citizens may vary in this process based on specific characteristics. Also, in order to have the ability to choose, some basic assumptions have to be fulfilled. For example, a citizen lacking ICT access cannot choose from the various digital channels and is limited to the traditional service channels. Nevertheless, the figure provides a basic overview of the various aspects of channel behavior of citizens.

Various studies have been conducted in recent years that show the channels that are used by citizens for their contacts with government agencies. Millard [27], for example, has shown that the face-to-face channel remains the most important service channel within the EU. In a number of countries where studies have been conducted on channel usage (such as Canada, the US and the Netherlands (for an overview, see [42])), it appears as though the telephone and face-to-face channel remain the most popular. When exploring how channel usage has developed over time, in most countries, the use of the Internet (websites and e-mail) increases. The number of visits and hits on websites has grown tremendously since the introduction of the Internet. However, apart from a decrease in the use of the written channel [6], the use of the traditional service channels has not decreased in most known countries. This implies that the total number of contacts with most governments has increased in recent years.

Several reasons regarding citizens’ channel choices might explain why the traditional channels remain most popular. First, as previously argued by Media Richness Theorists [16], channels have different characteristics that make them suited for different types of services; thus, it is no surprise that citizens use different channels for different purposes [42]. Second, citizens without an Internet connection and/or sufficient Internet skills, may rely on the traditional service channels [43]. However, more importantly, it appears as though citizens are not driven by a rational assessment of what channel to use for what purpose, but habits appear to be an important factor [30]. Citizens do not automatically switch to the digital channels, as they are accustomed to the traditional channels. Although habitual behavior has positive aspects, such as the reduction in cognitive load, there are reasons why this behavior is undesirable. First, a citizen choosing the front desk out of habit may spend time and money going to the town hall while not benefitting from the same service from behind his computer. Hence, citizens might benefit from a behavioral change in their direct interest. Second, government agencies would benefit from the increased efficiency of service delivery if more citizens switched to the digital channels. Given the fact that the financial burden of public service delivery is carried by society and therefore the citizens, citizens also have an indirect benefit from optimized channel usage.

In the following paragraphs, we will first discuss the various types of marketing instruments, followed by a discussion of the different citizen characteristics and general requirements for multichannel behavior. Finally, we discuss citizen multichannel behavior in greater detail.

2.1. MCM marketing instruments

Many actions of government agencies aim to change the behavior of citizens or businesses. For example, the Ministry of Health may issue a non-smoking campaign aimed at reducing smoking behavior.
In order to change behaviors, governments use various tools. These so called policy tools can be defined as [8] “all equipment deployed by a civil servant or public organization to achieve a behavioral change by other persons or organizations required by policies without interference of other instruments”.

Various authors have attempted to classify the various types of policy tools. Possible classifications are “Information”, “Money”, “Regulations” and “Facilities” [23], “Regulations” and “Stimuli” [28] and regulatory tools, transactional tools, tools to facilitate, to condition, to institutionalize and finally communication [5]. Many authors make a more or less similar division in three sets of tools. Weber, for example, has divided the tools into the constructs of “economic favors”, the threat of (physical) force and emotional appeal. Sociologist Etzioni [21] made a similar distinction in three types of tools for social control: physical, material and symbolic. Van der Doelen has reviewed numerous classifications and suggests that the instruments can be classified in three main topics, namely communicational, legal and economic instruments [41].

Communicational instruments are characterized by the transfer of information from the government to citizens. Some examples are mass media communication, propaganda and/or public relations. Communicational instruments are focused on improving the citizens’ awareness, knowledge and perceptions of government services. As such, this instrument is similar to promotion in the marketing mix [25]. Communication is a well-known and used instrument in the government domain. Nevertheless, the effectiveness of this instrument is questionable. For instance, the Service Canada Model shows that a long term program is needed in order to truly change citizens’ channel choice and usage [22].

The economical instrument is focused on changing citizen behavior through financial incentives. By either increasing or decreasing the prices of particular channels, citizens can be persuaded to change their behavior. This instrument relies on the assumption that citizens carefully weigh the costs and benefits of various channels. Based on transaction cost theory [48], it is expected that citizens will choose the channel that offers the most benefit for the least amount of costs. The economical instrument is comparable to price in the marketing mix [16]. In a government setting, subsidies and taxes are examples of the economical instrument. It has been suggested that strong instruments, such as price cuts, are necessary to change citizen behavior. Research in Singapore shows a strong increase in the number of online transactions due to the use of an incentives program [1].

The legal instrument aims to change citizen behavior through rules and regulations, such as legislation and dispositions. An example can be found with the Dutch tax administration office. Since 2005, companies have been obliged to submit their taxes through the digital channel. The legal instrument regards the balance between need to and can in terms of citizen decisions. In contrast to the other policy instruments, the legal instrument has a compulsory nature. In marketing, a similar (but not quite the same) instrument is in place. Companies can choose to distribute their products or service exclusively through an outlet and, as such, limit their customers’ choices. Government agencies can also use other organizations to distribute their services in an alternative manner, preferably where citizens feel the need for these services. For instance, the Dutch National Vehicle Authority (RDW) offers their services through the post agencies.

Besides the three policy instruments, we distinguish a fourth from marketing research, namely product. Given that most government agencies mainly provide services, we refer to service rather than product. Examples of this instrument include the physical evidence of the service, the reliability or the assurance. In general, this instrument allows for the differentiation of the quality of the service across various channels in order to change citizen behavior. For instance, in order to increase the use of online services, previous research shows the positive effects of including citizens in the development and design of online services [11].
Figure 2 provides a model of the various MCM instruments. The model shows that instruments are rarely used in isolation [5]. Government agencies typically use various combinations of instruments simultaneously. For instance, the LCE combination indicates the dominant use of the legal instrument, followed by the communication and economic instruments. Given that the service is the core of the offering, it influences all combinations. Based on the above, we have formulated the following research questions:

- Which MCM instruments are distinguished by citizens?
- How do citizens perceive these MCM instruments?
- To what extent are there associations between the perceptions of these instruments?

2.2. Citizen characteristics

Given the aim of our paper (i.e., determining the extent to which certain instruments can be used to change citizen multichannel behavior), it is important to determine whether citizens with certain characteristics are more easily influenced. That is, is it possible to vary the use of the instruments across citizen segments?

Several studies indicate differences across user characteristics in multichannel behavior [4,10]. Research in a multichannel setting also shows that younger males with higher educational levels are more interested in technology [10]. This might also indicate that these users are more likely to perceive the MCM instruments more positively. As such, we have formulated the following research question:

- How do citizen characteristics, such as age, gender, educational level and household size, influence the perceptions of the channel marketing instruments?

2.3. Requirements for multichannel behavior

In order to guide citizens to choose and use the digital channels, it is posited that three requirements must be fulfilled [44,46]. First, citizens must be able to use the Internet. That is, citizens without access (in their home, at work or elsewhere) cannot use the online services. Second, previous research has shown that experience with the Internet is a crucial factor in determining the choice of the online channel [29].
That is, citizens with no or limited experience are less likely to use the web service channels regardless of the amount of multichannel marketing. Third, in order to choose to use the web channels, citizens must be aware of and have a certain level of knowledge regarding the web service possibilities. Previous research shows that citizens in general have little awareness and knowledge of the web services [44]. Given the expectation that these requirements have a strong influence on channel choice, we expect them to also influence citizens’ perceptions of the various MCM instruments. The following research question has been formulated:

– What is the influence of the requirements on the perceptions of the MCM instruments?

2.4. Citizen multichannel behavior

As argued in the introduction of this section, citizens’ multichannel behavior consists of a number of steps. Channel marketing attempts to influence this behavior and, therefore, focuses mostly on influencing channel choice. But, what determines channel choices? A well-known theory in this field is the Media Richness Theory (MRT). This theory argues that people choose a certain medium for a certain task based on the different characteristics of the various media.

According to MRT, the main difference between communication media is that they vary in the capacity to process rich information [15,16]. The reason for these differences is that media vary in their capacity for immediate feedback, the number of cues and channels used, personalization, and language variety [16].

Daft and Lengel ranked the following (at that time most common) media in order of decreasing richness, face-to-face is the richest medium, followed by the telephone, personal documents, impersonal written documents and finally numeric documents [16]. In 1990, electronic mail was fitted into the richness ranking and was positioned below the telephone, but higher than letters and notes [39].

Many studies on MRT have found mixed research findings [19,32,38]; this questions the validity of the theory and its underlying theoretical notions. Various theorists have attempted to expand the Media richness perspective by offering other factors that influence the channel choice process. Pieterson and Van Dijk, for example, argue that personal and situational factors influence citizens’ channel choices [36]. Further, regarding the richness construct, it can be argued that more characteristics exist that determine the appropriateness of a channel for certain communication or service-related purposes.

Carlson and Zmud propose the Channel Expansion Theory as a means to improve MRT [12,13]. They state that when experience with a medium increases, its richness increases as well (i.e., the ‘channel expansion effect’). CET incorporates several theories and as a result, offers more social and mental richness than the MRT.

In marketing research, many studies have shown how channel characteristics relate to different types of services. Many of those characteristics bear a similarity to those described in the theories above, such as the level of ‘interactivity’ [3], the personal focus or opportunity to clarify personal situations [37]. Marketing research also suggests factors such as ‘costs’ [4], proximity or contact speed [26], and the level of service [9,47]. Finally, a wide body of research has suggested that factors from the Technology Acceptance Model [17,18], perceived ease of use and perceived usefulness, serve as channel characteristics [14,24,29].

Based on this literature review, we expect not only that channel characteristics influence channel choice, but also that they may impact how citizens perceive the channel marketing instruments. Moreover, we expect that the citizens’ channel use will also determine their perceptions of the channel marketing instrument. As such, we have formulated the following research question:

– How does citizen multichannel behavior, including the channel characteristics, vary the perceptions of the channel marketing instruments?
3. Research method

To answer the research questions, we conducted a two-stage research approach. First, exploratory in-depth interviews with citizens of the municipality were conducted. In total, 15 citizens participated in the qualitative stage. The semi-structured interviews focused on citizens’ attitudes towards online government services and, more specifically, instruments to promote these services such as price differentiation. Based on the interviews and previous research, the questionnaire for the quantitative stage was formulated.

Second, we conducted a survey among Dutch citizens. The survey was administered in a medium-sized Dutch municipality (136,573 inhabitants). This municipality agreed to cooperate in the project. As such, the researchers did not have a choice in the municipality that was selected. Citizens can contact the local government in this region via the front desk, telephone and digital channels such as the website and email. In terms of size, population and services, the municipality can be characterized as average-sized.

3.1. Data and sample

The survey was conducted through an online panel and the front desk of the municipality. These two forms of administrating the survey allowed citizens with and without Internet access to participate.

In early 2008, a total of 3,068 e-mails were sent out to the members of the online panel. The survey was online for two weeks. During these two weeks, a total of 1,802 respondents completely filled out the survey, resulting in a response rate of 58.7%. Besides the online survey, a total of 127 citizens completed the survey at the front desk of the municipality.

The total sample contained 46% women and 54% men and a broad range of age categories: younger than 25 years: 2.4%, 25 to 45 years: 42.1%, 45 to 65 years: 45.2% and older than 65 years: 10.3%. The average age is 48 years. In terms of education; 15.2% has lower vocational education, 19.8% has intermediate vocational education or high school, 37.9% has higher vocational education and 17.1% has a university degree. Lastly, the majority of respondents indicate extensive or very extensive Internet experience (72%). Only a minority (6%) indicates very little (or none) Internet experience, and 22% indicate not being very experienced or very inexperienced (neutral) with the Internet.

3.2. Scales

The respondents were asked to answer numerous items on the various MCM instruments. To our knowledge, there is no existing research on citizens’ perceptions of MCM instruments with the aim to influence multichannel behavior. Hence, the formulated items were based on the qualitative depth interviews. A total of 20 items related to the MCM instruments were used. These items were measured on a five-point scale ranging from completely disagree to completely agree. Based on exploratory factor and reliability analyses, six underlying constructs were found. Table 1 shows the constructs with the example items and the corresponding Cronbach’s alpha.

Besides these items on the various MCM instruments, respondents were asked a number of questions regarding consumer characteristics, the requirements, channel choice, channel usage and channel characteristics.

4. Results

We review our research questions through a serious of statistical analyses. Firstly, we determine how citizens perceive the various MCM instruments. Secondly, we show the association between the various
Table 1
Scales used to measure the various constructs with respect to the multichannel marketing instruments

<table>
<thead>
<tr>
<th>Construct</th>
<th>Items</th>
<th>Cronbach’s alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legal / exclusive distribution (LED)</td>
<td>Citizens are forced to use the Internet for particular services.</td>
<td>0.72</td>
</tr>
<tr>
<td></td>
<td>Particular services are offered exclusively through the Internet.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The front desk is made less accessible (e.g., reduced opening hours)</td>
<td></td>
</tr>
<tr>
<td>Communication for the web service (CWS)</td>
<td>Improved communication regarding the online service possibilities</td>
<td>0.80</td>
</tr>
<tr>
<td></td>
<td>Increase communication on the advantages of the online services</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Promote the use of the website more strongly</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Increase advertising regarding the website address</td>
<td></td>
</tr>
<tr>
<td>Increase price traditional channels (PTC)</td>
<td>Increase prices of services through the traditional channels</td>
<td>0.69</td>
</tr>
<tr>
<td></td>
<td>Charge citizens for the costs of the traditional channels</td>
<td></td>
</tr>
<tr>
<td>Decrease price web services (PWS)</td>
<td>Charge citizens administrative costs when using the traditional channels</td>
<td>0.69</td>
</tr>
<tr>
<td></td>
<td>Decrease the prices of services distributed through the Internet</td>
<td></td>
</tr>
<tr>
<td></td>
<td>When offered a discount online, I would use the online services</td>
<td></td>
</tr>
<tr>
<td>Web service offering (WSO)</td>
<td>Offer more services online</td>
<td>0.70</td>
</tr>
<tr>
<td></td>
<td>Provide better access to the online services</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Provide better services online</td>
<td></td>
</tr>
</tbody>
</table>

MCM instruments. Thirdly, we determine the extent to which citizen characteristics and the stated requirements influence the perceptions of the MCM instruments. Lastly, we determine the differences in MCM instruments perceptions related to citizens multichannel behavior.

4.1. MCM instrument perceptions

The constructs, as shown in Table 1, are considered normal. In order to determine the overall perception of the respondents on the MCM instruments, means were calculated. All of the means significantly deviated from the neutral point of the scale. Table 2 shows the results.

Based on the analyses, we conclude that citizens perceive communication, legal and economical instruments, as proposed by van der Doelen [41]. Moreover, we find that the economical instrument reflects two constructs, namely PTC versus PWS. Lastly, we also find that citizens perceive the fourth instrument, namely WSO, as a separate construct. Table 2 shows that citizens prefer the softer form of multichannel marketing, namely

- increasing the communication regarding the web services (CWS),
- decreasing the price of the web services (PWS), and
- improving the online service offering (WSO).

Citizens do not appreciate legal instruments such as forced usage of the online channel or economical instruments in the form of ‘taxes’, i.e., increasing the prices in the traditional channels.

4.2. MCM instrument associations

In order to determine the association between the MCM instruments, we performed a correlation analysis. The Pearson correlation coefficient reflects the degree of linear relationship between two variables. The coefficient varies between -1 and 1. A coefficient between [0.1] and [0.3] is considered small. If the coefficient is between [0.3] and [0.5] it is considered to be of medium size. Large correlations are between [0.5] and [1.0] [18]. The results are presented in Table 3.
Table 2
Descriptives of the perceptions with respect to the MCM instruments

<table>
<thead>
<tr>
<th>Construct</th>
<th>N</th>
<th>Mean</th>
<th>St. dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED</td>
<td>1942</td>
<td>1.72*</td>
<td>0.67</td>
</tr>
<tr>
<td>CWS</td>
<td>1941</td>
<td>3.79*</td>
<td>0.64</td>
</tr>
<tr>
<td>PTC</td>
<td>1942</td>
<td>2.15*</td>
<td>0.81</td>
</tr>
<tr>
<td>PWS</td>
<td>1938</td>
<td>3.45*</td>
<td>0.89</td>
</tr>
<tr>
<td>WSO</td>
<td>1938</td>
<td>3.73*</td>
<td>0.69</td>
</tr>
</tbody>
</table>

*Mean shown differ significantly from the neutral point (3) of the scale at the 0.05 level.

LED = Legal / exclusive distribution. CWS = Communication for the web service. PTC = Increase price traditional channels. PWS = Decrease price web services. WSO = Web service offering.

Table 3
Correlation coefficients between the perceptions with respect to the MCM instruments

<table>
<thead>
<tr>
<th></th>
<th>LED</th>
<th>CWS</th>
<th>PTC</th>
<th>PWS</th>
<th>WSO</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CWS</td>
<td>0.05*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PTC</td>
<td>0.49**</td>
<td>0.14**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PWS</td>
<td>0.26**</td>
<td>0.39**</td>
<td>0.43**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>WSO</td>
<td>0.03</td>
<td>0.62**</td>
<td>0.10**</td>
<td>0.34**</td>
<td>1</td>
</tr>
</tbody>
</table>

*Correlation is significant at the 0.05 level (2-tailed)
**Correlation is significant at the 0.01 level (2-tailed)

LED = Legal / exclusive distribution. CWS = Communication for the web service. PTC = Increase price traditional channels. PWS = Decrease price web services. WSO = Web service offering.

The results show that of the ten correlations, nine were positively significant. The insignificant correlation concerns LED and WSO. Apparently, even if citizens perceive the necessity to improve the web offering, they do not find forced channel choice to be warranted.

Four of the correlations are of small size. Another four correlations are of medium size and one correlation is large. This concerns the association between WSO and CWS. These MCM instruments are also perceived as most suitable according to the citizens. Hence, the combination of well-designed web services and communication regarding these possibilities seems to be the strongest combination that influences citizen multichannel behavior.

Other strong combinations between the MCM instruments are Legal/Exclusive Distribution (LED) and Price Traditional Channel (PTC), Communication Web Services (CWS) and Price Web Services (PWS), Web Service Offering (WSO) and Price Web Service (PWS) and lastly Price Traditional Channels (PTC) and Price Web Services (PWS).

4.3. Citizen characteristics

The socio-demographics include age, gender, education and household size. We performed one-way ANOVA to determine whether the groups vary in their perceptions of the MCM instruments. For the
age groups, we only found a significant difference for WSO. The results show that especially younger groups strongly value this instrument (see Fig. 3).¹

In terms of gender differences, by performing an independent samples test, we found that men have stronger (more positive) perceptions of PTC² and WSO.³ The perceptions of WSO also significantly varied based on the educational level of citizens. We found that higher educated citizens valued this instrument more positively than lower educated citizens.⁴ In terms of household size, we found differences for PTC and PWS. In both cases, households with 2 adults and children favored the use of these economical instruments in comparison to single households (with or without children) and double households without children.

4.4. Requirements

The next category of characteristics concerns the previously stated requirements that should be fulfilled in order for citizens to have the ability to use the online services. The requirements concern (1) access to and experience with the Internet, (2) awareness concerning the online services offered and (3) knowledge of the online services offered.

The citizens who participated in the survey were asked where they had access to the Internet. This ranged from nowhere (only 9 people in the sample) to everywhere. We divided the group into two subgroups. The first group includes citizens who did not have access to the Internet or only at one location. The second group includes citizens who have access to the Internet at multiple locations, from at home and work to always and everywhere connected (e.g., through a pda).

¹The group means varied from 3.78 for citizens younger than 35 years to 3.59 for citizens older than 66 years.
²The means for PTC are 2.21 for men versus 2.08 for women.
³The means for WSO are 3.78 for men versus 3.67 for women.
⁴The means of the educational level varied from 3.62 for lower educated citizens to 3.83 for higher educated citizens.
The independent samples t-test shows that the groups differed significantly in their opinion on all MCM instruments except LED. Citizens with access to the Internet at multiple locations perceived all of the instruments more favorably than citizens with limited access.5

Besides access to the Internet, we asked respondents the extent to which they considered themselves to be experienced with the Internet. Based on this question, we distinguished three groups, inexperienced Internet users, neutral, and experienced Internet users. The one-way ANOVA shows that the three groups varied significantly in their opinion of CWS, PWS and WSO. For all three instruments, the more experienced citizens agreed the most with using the instrument to change citizen multichannel behavior.

Next, we reviewed whether citizens with a stronger awareness of the online services perceive the instruments differently from citizens who do have a strong awareness of the online services. We asked if respondents were aware of the website of the municipality. The independents samples t-test shows that citizens who were not aware of the website were less positive about the instrument WSO. The groups did not vary in their perceptions of the other MCM instruments.

Lastly, we determined whether a stronger knowledge of the services offered through the website of the municipality has an effect on how citizens perceive the instruments. We distinguished three groups: not knowledgeable, neutral, and knowledgeable. The one-way ANOVA analyses show that the groups differed in their perceptions of all instruments. Except for CWS and WSO, the patterns are as expected. That is, the not knowledgeable group was least positive on the use of the instruments and the knowledgeable group was most positive on the use of the instruments (LED, PTC, PWS).

For CWS and WSO, we found that the two extremes were similar in their opinions (see Fig. 4). We found that the ‘neutral knowledgeable’ group had the least positive perceptions of the instruments versus the two extremes (low knowledgeable and high knowledgeable).

5Low access versus high access respectively: CWS 3.76 vs. 3.82; PTC 2.11 vs. 2.22; PWS 3.40 vs. 3.50 and WSO 3.67 vs. 3.81.
4.5. Citizen multichannel behavior

In terms of citizen multichannel behavior, we distinguished a number of variables, namely channel choice (last chosen channel and preferred channel), channel usage (channel usage during the last year and most frequently used channel) and channel characteristics (i.e., which channel is characterized as best to explain a personal situation).

Figure 5 shows the significant differences in perceptions of the MCM instruments based on the last chosen channel.

Citizens whose last channel choice concerned the website, e-mail or post tended to have more positive perceptions of CWS and WSO. Citizens whose last channel choice concerned the website, e-mail or front desk seemed to favor PWS. PTC was favored by citizens who last chose the website or e-mail. Citizens who indicated that their favorite channel is the website, e-mail or the telephone had more positive perceptions of all instruments except LED.

For channel usage, we reviewed the differences in the instrument perceptions based on two variables, namely the channel used in the last year and the most frequently used channel.

Table 4 shows that citizens who had contact seemed to favor CWS and PWS. There was no difference in instrument perceptions based on contact via the front desk over the last year. Citizens who did not have contact via the phone over the last year perceived LED, PTC and PWS more positively. Citizens who had contact via the website were most positive about all MCM instruments except LED. Citizens who had contact via e-mail were most positive about LED and WSO. Finally, citizens who had contact via post were least positive about PWS.

Based on the most frequently used channel, we found significant differences for CWS, PWS and PTC. The results show that citizens who used the post the most were the most positive about all three
Table 4

Differences in MCM instrument perceptions based on channel usage over the last year

<table>
<thead>
<tr>
<th>Channel Type</th>
<th>LED</th>
<th>CWS</th>
<th>PTC</th>
<th>PWS</th>
<th>WSO</th>
</tr>
</thead>
<tbody>
<tr>
<td>No contact</td>
<td>N</td>
<td>3.80</td>
<td>3.45</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Y</td>
<td>3.67</td>
<td>3.29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front desk contact</td>
<td>N</td>
<td>1.74</td>
<td>2.20</td>
<td>3.50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Y</td>
<td>1.66</td>
<td>2.06</td>
<td>3.36</td>
<td></td>
</tr>
<tr>
<td>Telephone contact</td>
<td>N</td>
<td>3.70</td>
<td>2.07</td>
<td>3.36</td>
<td>3.65</td>
</tr>
<tr>
<td></td>
<td>Y</td>
<td>3.86</td>
<td>2.20</td>
<td>3.50</td>
<td>3.81</td>
</tr>
<tr>
<td>Website contact</td>
<td>N</td>
<td>1.68</td>
<td>3.72</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Y</td>
<td>1.77</td>
<td>3.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-mail contact</td>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td>3.45</td>
</tr>
<tr>
<td></td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td>3.31</td>
</tr>
<tr>
<td>Post contact</td>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

N = No, Y = Yes.

*All the means shown in the table differ significantly from each other on at the 0.05 level (2-tailed).
LED = Legal / exclusive distribution. CWS = Communication for the web service. PTC = Increase price traditional channels. PWS = Decrease price web services. WSO = Web service offering.

Lastly, we determined whether there are differences in the evaluation of the MCM instruments based on the channel characteristics citizens attach to the various channels. Citizens were asked to indicate which channel fit a certain characteristic the best. Table 5 shows which channel choice – channel characteristic combination was most positive about the MCM instruments.

These results indicate that especially citizens who attributed channel characteristics to the website had a more positive evaluation of CWS, PTC, PWS and WSO. Citizens who attributed channel characteristics mostly to e-mail seemed to have a more positive evaluation of LED.

5. Conclusions

Citizen multichannel behavior, and especially the MCM instruments to change this behavior, is a relatively new area of research, with few papers focusing on this core issue. However, we do notice that this issue is of increasing importance to researchers and practitioners. Even though there are numerous studies that determine the effects of marketing instruments in a commercial setting, we find that an empirical examination of the effects of MCM instruments in a government multichannel setting provides additional and new insights.

The current study has determined (1) which MCM instruments can be distinguished both in the literature as well as perceived by citizens, (2) the extent to which these MCM instruments are associated and (3) the extent to which citizen characteristics, requirements and citizen multichannel behavior vary these perceptions. Overall, our results indicate that improving the web service offering (WSO) and the communication of website services (CWS) may be crucial in changing citizen multichannel behavior in the desired direction, i.e., an increased usage of the digital channels.

Based on the literature, the qualitative in-depth interviews and the quantitative survey, we found that citizens perceive four main instruments, namely legal (or forced), communication, price (which is further
Table 5  
Combination of characteristic and channel indicate more positive MCM instrument perceptions

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>LED</th>
<th>CWS</th>
<th>PTC</th>
<th>PWS</th>
<th>WSO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal situation</td>
<td>E</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>E</td>
</tr>
<tr>
<td>Language variation</td>
<td>W</td>
<td>E</td>
<td>W</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Fast answer</td>
<td>E</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>Multiple cues</td>
<td>T</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ease of use</td>
<td>E</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>E</td>
</tr>
<tr>
<td>Achieve goal</td>
<td>E</td>
<td>E</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>Fast in contact</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td></td>
</tr>
<tr>
<td>Most service</td>
<td>E</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td></td>
</tr>
<tr>
<td>Cheapest</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td></td>
</tr>
<tr>
<td>Best experiences</td>
<td>E</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
</tbody>
</table>

E = E-mail, W = website, T = Telephone. For instance:
W in a cell indicates that for the respondents associating the website with the characteristic ‘personal situation’ have more positive instrument perceptions towards the instrument CWS.
Blank cell indicates no significant differences in MCM instrument perceptions.

LED = Legal / exclusive distribution. CWS = Communication for the web service. PTC = Increase price traditional channels. PWS = Decrease price web services. WSO = Web service offering.

classified as prices in the traditional channels versus prices in the digital channels) and the web service offering. Citizens perceived CWS, WSO and PWS as the most positive. We also show that citizens who valued WSO also valued CWS.

LED and PTC were perceived as negative. This indicates that citizens would react positively to improving the online offering, making it cheaper and/or communicating its benefits. Then again, the results also show that citizens did not appreciate forcing their hand either through legislation, exclusive distribution or increasing the prices of the traditional channels. These two instruments also showed a strong correlation.

When reviewing the consumer characteristics, it becomes apparent that citizens who were younger, higher educated and/or male valued WSO more strongly. When improving the online service offering, it can be expected that citizens with these characteristics will be among the first to adopt. Besides, we showed that households with 2 adults and children seem to favor PTC and PWS. Increasing the prices in the traditional channels or decreasing the prices for the web services will most likely trigger the first change in behavior for these households.

Another finding of our study was that the proposition that three requirements must be fulfilled in order to change citizen behavior [46] was confirmed. Our results show that citizens with Internet access and a higher level of Internet experience were most positive with respect to marketing the web services. That is, they favored CWS, PWS and WSO. Moreover, citizens that were more aware of the online service offering were the most positive about WSO. Citizens with more knowledge of the online service offering also valued LED, PTC and PWS more positively. Surprisingly, citizens who indicated that their level of knowledge with respect to the online service offering was neutral were the least positive about CWS and WSO. Neutral knowledge in this case may indicate that these citizens have a neutral disposition towards online services and hence do not perceive the value of CWS and WSO as strongly as citizens with high or low knowledge.
In terms of channel choice, as expected, citizens with a preference for the online channels (website and e-mail) tended to perceive the MCM instruments (except LED) as more positive. Nevertheless, citizens who chose the post last also favored CWS and WSO. Citizens whose last choice was the front desk were most positive about PWS. Lastly, if the phone was indicated as the favorite channel, all MCM instruments (except LED) most likely influenced channel behavior in the online direction.

In terms of channel usage, the results show that if citizens had no contact in the last year, they were most positive about CWS and PWS. If they had contact through the traditional channels, they were least positive about LED, PTC and PWS. If they had contact through the digital channels, they were most positive about all MCM instruments. Furthermore, citizens who attributed channel characteristics to the website were most positive about CWS, PTC, PWS and WSO. In case of the attribution of channel characteristics to the e-mail, they were most positive about LED.

Our study is the first to assess the perceptions of citizens on the use of MCM instruments. As our study clarifies, a number of instruments can be used to influence citizen multichannel behavior, as suggested by various theories and multichannel management models. These MCM instruments clearly have varying potential impact dependent on the requirement, citizen characteristics and the channel behavior of citizens (incl. channel choice, channel usage and perceived channel characteristics). The differences shown in this study warrants a careful implementation of MCM instruments, especially in the case of negatively associated instruments such as LED and PTC.

Both practitioners in the field of service channels as well as multichannel management theorists should take into account the results of this study when building or enhancing their strategies, models or theories.

Future research should aim to test the impact of the MCM instruments in a longitudinal setting. The current study is limited in its power to draw conclusions on cause and effect relationships. Based on the current study, only tentative conclusions on the effectiveness of the MCM instruments can be drawn. In order to truly determine the effectiveness, carefully designed field experiments with respect to the implementation of the MCM instruments are necessary.

Given the negative perceptions of the instruments LED and PTC, it would be interesting to determine how citizens would react if they were implemented. That is, would citizens become dissatisfied? Or, would it be possible to design these instruments in such a manner that citizens would not notice the limitation of their choices? If so, this would provide government organizations a tool to decrease their costs without dissatisfying their customers.

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