A User Satisfaction Study of the NHS Online Prescription Prepayment Certificate

Abstract:

This research seeks to measure citizen satisfaction with the electronic Prescription Prepayment Certificate (PPC) offered by National Health Service (NHS) in the United Kingdom (UK). The paper reports on the findings of a survey of over 500 users of the NHS PPC service. Satisfaction is measured using the four dimensions from the COBRA framework [1] which comprise the cost, opportunity, benefits and risk assessment constructs. This is the first study to measure citizen satisfaction with the electronic PPC in the UK across these constructs. The results show that most citizens using the PPC electronic service are satisfied with this service and that the service meets their essential needs. The paper also presents the results of qualitative feedback obtained from the participants that can be used to determine the areas that need further improvement in the current electronic PPC service and potential influence on user satisfaction.

Keywords: e-health, e-prescription, user satisfaction, costs, opportunities, benefits, risks

Introduction

Electronic healthcare (e-health), defined as "the combined use of electronic communication and information technology in the health sector" [2], is aimed at improving the quality of healthcare [3], reducing its cost [4] and in the same time addressing the health demand supply gap [5]. Despite their potential [7][8][9] and large investment in e-health projects [6] they have not been as successfully adopted as expected [6]. Among the criticism is the lack of consultation of the service providers and users of these services (i.e. medical staff, patients) when designing new systems [4] leading to user reticence in using the e-health systems [6]. User satisfaction with the e-health system is considered to be directly related to utilisation [9] and it could be measured for systems that are already in use as the electronic prescription service is.

Electronic prescription (e-prescription) services are aimed at helping doctors and pharmacists to meet the medication needs of patients and also to facilitate the patient's access to medication. The electronic service offered in the UK in this respect is the Prescription Prepayment Certificate service. This service offers citizens (patients) an NHS certificate that allows them to acquire medication at a reduced fixed cost, compared to the traditional service, by paying either an annual or a quarterly fee. This e-service is aimed at those patients who require regular medication such as those who suffer from certain chronic diseases but are not entitled to a medical exemption certificate. While the aim of the PPC e-service has been concentrated on reducing the cost of medication for the patient and wastage for the NHS, little research has been performed on the patient experience with regard to ordering and obtaining regular medication [11]. To the best of our knowledge research done so far has mostly focused on the patient experience in obtaining regular medication and very few studies have addressed patient satisfaction with e-prescriptions [12] and the use of the PPC

service in particular. Citizen/patient satisfaction is an essential element in the sustainability and viability of healthcare services [13][14][15] and therefore is an important aspect to be assessed and taken into account when improving existing services or designing new ones [16].

The research presented in this paper draws on an evaluation approach proposed in the Integrated Model for Evaluating E-government Services Transformation (I-MEET)[1] where cost, opportunity, benefits and risk assessment (COBRA) are hypothesised as the main constructs for evaluating e-services offered by the public sector [1]. While I-MEET takes into account both the citizen and providers' perspectives to evaluate the e-services offered by public sector organisations, this study focuses on the citizens' perspective and seeks to analyse citizen satisfaction with the PPC e-service by assessing the perceived cost, opportunities, benefits and risks (COBRA) of using the service. COBRA provides a "holistic evaluation model" to assess user satisfaction [17] of e-services and thus offers a suitable framework to better understand user satisfaction in this context. It also assesses whether the provided PPC e-service meets users' (patients) needs and what and why (or why not) this e-service does (or does not) meet users' needs.

The rest of this paper is organised as follows. The next section introduces the research context of healthcare in the UK focusing on electronic prescription systems and patient satisfaction with the existing e-prescription system. This is followed by the research design section which sets out the questionnaire design, distribution and data handling. The subsequent sections provide details regarding the survey participants' demographic information followed by a discussion of the study findings on participant satisfaction with the online PPC service. The paper concludes by presenting the theoretical and practical implications of the study and acknowledging the research limitations and next steps for the study.

Research Context: Healthcare in the UK
Electronic healthcare is an increasingly integral part of both the United Kingdom (UK) and international policies [18] and has seen the biggest investments and some of the largest projects in recent times [4][6][19]. It is aimed at improving healthcare access and increasing the efficiency, effectiveness, and quality of healthcare services [7][8][20][21][22] to provide better citizen-centred care, as well as lowering costs and supporting interoperability across national boundaries, facilitating patient mobility and safety.

The integration of Information and Communications Technology (ICT) in healthcare has not been without challenges. User reticence to use the systems when they have not been consulted [6], problems in the initial design affecting the usability and the user experience [25] and issues with the existing network infrastructure [18][26][27][28] have hindered the adoption of e-health systems.

The UK has a publicly funded healthcare system, the NHS, which was introduced in 1948. The NHS aims to provide healthcare for UK citizens based on medical need and regardless of economic status. Various services are included such as emergency and urgent care, general practitioners, hospitals, pharmacies and dental services. The NHS is a large-scale [6] and complex [23] organisation serving over 50 million citizens [6]. Considering its scale, one of the major challenges is to make healthcare affordable for all citizens [24]. The pressure is even higher in the current economic climate that has led to numerous budget cuts in the NHS. Moreover, the UK in particular, and Europe in general, are now facing an ageing population, an increase in healthcare costs and insufficient medical staff [29]. Since the middle of 1990, Information and Communications Technology (ICT) has been seen by government as a solution to reduce costs, increase efficiency, improve processes and service delivery and ease the work of NHS staff [4][30].

Over the last two decades NHS spending on ICT has increased rapidly [31], and the NHS has evolved from an organisation that did not have any computers in 1960 to one of the most ICT intensive organisations (in terms of computers, infrastructure and online services) in the UK [32]. In 2002, the NHS National Programme for IT (NPfIT) was established as part of the Health Department's portfolio of projects. It was driven by an NHS modernisation agenda and its aim was to improve the quality of healthcare through the use of ICT. The aim of the programme was to deliver the following e-Health services: (1) NHS care records service, (2) electronic appointment booking, (3) picture archiving and communications system (PACs), (4) electronic transmission of prescriptions, and (5) an IT infrastructure and network. The programme was abolished in 2011 [33], and despite efforts taken to follow best management practices, major shortcomings were identified in the usage of ICT within the NHS [34]. The programme has been criticised by researchers and medical staff alike for failure to deliver promised benefits [6]. For example, the aim of one policy was the introduction of electronic health records for over 50 million citizens [35] and this task has proved to be a major challenge and resulted in failure to deliver expected outcomes. One of the major issues for healthcare systems has been the lack of involvement of relevant stakeholders from the early stages of design and implementation. This has often led to problems with functionality provided by the system [25] and concerns about privacy and the potential benefits of these systems, which ultimately leads to resistance of using the system [4]. As such, evaluating and optimising e-Health services and assessing citizen or patient satisfaction with these services are gaining even more importance. In this context, this research evaluates citizen satisfaction with a particular e-health service in the UK, the NHS PPC.

Electronic Prescription System in the UK: An Overview
The use of electronic prescriptions has been seen as an important strategic policy to improve healthcare across Europe [36]. To enforce the adoption of e-Health and e-Prescriptions, several European countries have enacted laws and implemented policies to incentivise the implementation and penalise non-compliance [36]. In the UK, initially, prescriptions were completed in paper format, and general practitioners (GPs) would have to sign different prescriptions, some of which were recurring. E-prescription systems involve "the utilisation of electronic systems to facilitate and enhance the communication of a prescription or

medicine order, aiding the choice, administration and supply of a medicine through knowledge and decision support and providing a robust audit trail for the entire medicine use process" [37]. The system enables the transfer of medical prescriptions from prescribers (typically doctors) to dispensers (typically pharmacies, but can also include dispensing appliance contractors or dispensing GP practices) over the internet. If the patient does not specify a pharmacy, the prescription is issued directly to the patient [30]. Once issued, the e-Prescription system automatically sends a notification to the reimbursement agency.

The e-prescription service in the UK has two phases. In the first phase the GP would use a paper prescription that has a barcode which allows the pharmacy to access the central copy of the prescription and, in the second phase, the prescription will be done entirely online. Although paper copies can also be given, these will not serve for drugs dispensed without having the e-Prescription. The system aims at providing benefits for patients, medical staff, and pharmacies alike:

- For patients who have recurring or repeat prescriptions, they will no longer have to make appointments and visit the GP to collect their prescription. The prescription will be electronically sent by the GP to a pharmacy chosen by the patient. As the prescription can be sent in advance, it is possible that it is ready by the time the patient reaches the pharmacy. This leads to time (and possibly cost) savings for patients as they do not need to wait for the prescription, can collect the drugs from a pharmacy of their choice and will not have to visit the GP. Moreover, it enables the prescriber to deliver accurate, error-free and understandable prescriptions [36] that will have an effect on improving the quality of health for the patient. For example, it is reported that in Australia the introduction of e-prescriptions has led to a drop in the errors made by doctors and pharmacists when prescribing medication from 66% to 58%, and unclear or incomplete medication orders have decreased by over 90% [36][38]. This is important in the UK context, as it has been shown that almost 1 in 10 prescribed items have errors [39] that could lead to unwanted admissions to hospitals and increased costs for both the patient and the state [40]. It has also been shown that e-prescriptions can lead to improvements in patient primary adherence to medication for chronic illness [41] that, in turn, leads to both cost savings and improved health outcomes for patients.
- For the *doctors*, reducing time, especially for repeat prescriptions is one of the most cited reasons why GPs are using electronic prescription systems [42]. While saving on appointment time with the patient, the GP is able to see at any time the list of medication a patient has been taking. Moreover, using an e-prescription system reduces adverse drug events [38], as it allows doctors to cross-check medication or contraindications when prescribing something new for the patient. Most of the e-prescription systems also send the doctor safety alerts when the system detects an error in medication. Also, it is expected that immediate access to the patients' medication history and safety alerts could lead to saving patients' lives [36].
- For the *pharmacies*, the e-prescription can be used to see the incoming prescriptions and hence to better manage their stocks and ensure timely dispensing of medicine

[36]. The pharmacy can also be automatically refunded as the e-prescription system automatically sends notifications to the reimbursement agency [30]. It is expected that pharmacies save time and costs by using an electronic system as opposed to the handwritten ones, and also have reduced liability due to incorrect dispensing [42].

The introduction of the e-prescription can also prevent fraud and detect fraud faster, as it is harder to falsify electronic records than hand-written prescriptions. The e-prescriptions are also easier to audit and monitor [43]. The rapid dispensing of medicine for outpatients leads to improved health and wellbeing and reduces the need for unnecessary patient hospitalisations, leading to reduced costs for hospitals [43]. In this respect, a good example of an NHS service that has benefited from the introduction of e-prescriptions in the UK is the Prescription Prepayment Certificate (PPC) electronic service. Referred to as Prescription 'Season Tickets', this service entitles citizens to obtain prescriptions, for their use, without any other charges during the validity period (except the price of the PPC which is pre-paid). The PPC can be valid either for three months or for one year allowing the patients to fix the cost of their medication compared to the traditional method of paying for each prescribed medication over the counter at the pharmacy, which can be more expensive for patients on more than one medication.

The PPC is aimed at patients who require regular medication. In cases where regular prescriptions are needed by the patient, the prescriptions are issued without a consultation but are reviewed by GPs on a regular basis [44]. To obtain a repeat prescription, the patient needs to submit a request either in person, by post, via email or telephone [44]. Since 2005, repeat dispensing systems allow GPs to dispense medication without a new GP visit [45]. This could be done for a period of up to 12 months, and a prescription can last up to 28 days [45]. It has been shown that patients who have their prescriptions linked directly to a pharmacy did not report any difficulties with the repeat prescription as opposed to those who have to make several journeys per prescription (initial request and subsequent collection) [11].

Patient Satisfaction with e-Prescriptions
Few studies have focused on patient satisfaction with the prescription service [11][12]. When not done electronically, prescriptions for regular patients are issued and reviewed by GPs without necessitating a new consultation with the patient [46]. The results of a qualitative study performed in the UK with 30 chronic disease patients and their carers show that the problems mentioned include multiple journeys to the hospital and to the pharmacy, lack of synchronisation when the medication is finished at different times, and the short time period of the prescription that then requires renewal and the same journey to be repeated [11]. The few patients in the study that did not report difficulties had their GPs linked to pharmacies [11]. Another study performed on the adoption of an e-prescribing service in Oman [12] showed that physicians, pharmacy staff, nurses and patient satisfaction with the service is high and all stakeholders prefer it over the paper-based prescription system. In this study we seek to add to the state of the art by measuring not only overall user satisfaction but also satisfaction across the four dimensions described in the COBRA framework: cost, risk, benefits and opportunity; as well as how well the PPC system meets patients' needs.

Research Design
The design for this study followed three phases: (1) research design, (2) data collection, and (3) data analysis and synthesis. Initially, we acquired background knowledge of the area under investigation (i.e. the usage of ICT in healthcare and patient satisfaction with ICT in healthcare in general and prescriptions in particular) by reviewing normative literature and performing desk research of secondary sources to identify relevant issues and to understand the area. Based on the study aim, it was decided that utilising a quantitative approach based on survey research was the most appropriate methodology to follow. The survey instrument was formulated using both closed questions (to investigate user satisfaction across a given analysed dimension) and qualitative questions (to assess why the participants were satisfied or not and if the PPC meets (or not) the survey responders needs).

Design and Questionnaire Development
The questionnaire was designed based on the COBRA framework [1]. As opposed to other evaluation models that aim to assess e-government services (including e-health services) from a general perspective, the COBRA framework provides a holistic evaluation for stakeholders by considering "the most successful factors that impact the satisfaction of users within an e-government service" [1]. Therefore the framework could provide a comprehensive insight into user satisfaction than one that focuses only on specific aspects of user satisfaction [17]. Furthermore, the scale has been validated across different e-government services [17], which make it suitable for use in assessing the user satisfaction with PPC as an online service provided by the government.

COBRA framework organises the factors affecting e-services around four main constructs: cost, opportunity, benefit and risk in order to analyse user satisfaction. The *cost* factor could include tangible and intangible costs such as the cost of internet subscription, the time needed to find certain information etc. *Opportunity* arises when the user can take advantage of a service, such as providing flexibility in doing certain transactions (e.g. accessibility, service support). *Benefit* is the value the user gains as a result of using the service. Variable benefits include money or time saving, information accuracy etc. *Risk* arises when certain conditions could make the system vulnerable, such as the potential for fraud. Risks are often incontrollable and can be personal (e.g. social isolation) or financial (e.g. hidden costs, payment mistakes).

An online survey was developed to include questions based on the constructs from the COBRA framework in addition to questions on demographics and experience with the internet and the usage of the e-prescription system. The questionnaire was assessed by five experts in the area of e-government for readability and language clarity, consistency of style and questionnaire layout and further validated by 25 experts in the field of public sector and e-government research at a public conference.

The survey consisted of two parts:

- Part one contained 49 closed multiple-choice questions focusing on the four main constructs of the COBRA framework and eight questions on the users' overall

opinion: five about the cost, risks, benefits, opportunity and value; two about how the service meets user needs (one closed multiple-choice and one open); and another on collecting users' general comments. For the multiple-choice questions a seven- point Likert scale was used, where 7 was labelled as "Strongly Agree" and 1 as "Strongly Disagree" except on the last multiple choice questions assessing how the service meets user needs, where 1 was labelled as "Strongly my most essential needs" and 7 was labelled as "None of my essential needs".

- Part two contained multiple-choice questions assessing demographic data, user internet usage and experience with the service.

Distribution of the Questionnaire

The questionnaires were distributed with the help of an international market research and survey company which recruited UK users of the online NHS PPC. The participants were surveyed from 10 to 23 July 2013. The participants filled in the anonymous questionnaire online using SurveyMonkey. It was made clear from the beginning that the completion of the survey was voluntary and the survey took between 10 - 15 minutes to complete. A specialist survey company was used as random sampling in this case was not appropriate as the focus of the research was to examine citizen satisfaction with the electronic PPC system and only selected citizens would have used this service.

Data Handling and Statistical Analysis

The data were transferred into Microsoft Office Excel format. Descriptive statistics were used to present the quantitative results and a thematic analysis process [47] was used to analyse qualitative data obtained from the open-ended questions.

Demographics

501 users who were using the annual NHS electronic PPC filled in the survey. The participants had various levels of experience of using the NHS electronic PPC. Of the participants, 54% were male and 46% female and the age and income of the participants varied. A total of 48.70% of participants had at least an undergraduate education. More than half of participants (51.10%) rated themselves as excellent internet users. Table 1 represents the details of the participants' age group, education level, income, level of internet usage and electronic PPC usage. Apart from their income, the rest of the questions in the questionnaire were mandatory. It should be noted that UK citizens over 60 years or older or those suffering from certain chronic illnesses such as diabetics do not pay for their medication, but still have the option of using the PPC service free of charge.

Table 1 Participants Information

Age Group		Education Level		Income		Internet Usage		PPC Use	
<24	7.58%	Secondary or less	8.98%	> £10,000	12.18%	Beginner (less than 3 Years)	1.60%	Every day	14.17%
25-34	28.54%	Secondary (A-Levels)	27.74%	£10,000 – £19,999	22.55%	Fair (3-6 Years)	12.38%	Several times weekly	13.17%
35-44	20.36%	Undergraduate Education	29.94%	£20,000-£39,999	37.92%	Good (6-10 Years)	34.93%	Once a month	15.17%
45-54	23.95%	Postgraduate Education	16.77%	£40,000-£69,999	11.98%			Several times a month	10.58%
55-64	19.56%	Doctorate	2.00%	£70,000 – £99,999	3.99%	Excellent (over 10 Years)	51.10%	Once a year	26.75%
>65	0.00%	Other Professional Qualifications	14.57%	>£100,000	2.59%			Several times a year	20.16%

Study Findings

This study is designed to measure user satisfaction of the electronic PPC system across four dimensions: cost, risk, benefits and opportunity, as described in the COBRA framework. Although the questionnaire was designed to evaluate in detail all the components of the COBRA framework, this paper only focuses on section one of the questionnaire (the questionnaire has two sections in the COBRA framework) where the questions are focused on users' overall opinion based on the aforementioned four constructs. The evaluation that followed is discussed next.

Cost

In order to evaluate the impact of cost (of using the system) on user satisfaction, there were 10 variables: time to find the e-service, time needed to up/download information, time to receive acknowledgement, effort (in terms of time and cost) needed to complete the task, time to find information, number of steps to complete the e-service, registration cost, internet

subscription cost and cost of renewing the prescription was measured. Figure 1 reviews the results of citizen satisfaction with the overall cost incurred as a result of using the PPC online. A total of 29% of users strongly agreed with being satisfied with the cost of the service, 23% selected 6 (agree) and 5 (somewhat agree) respectively on the seven-point Likert scale. Some 2% of users strongly disagreed with being satisfied with the cost of this service. When the users were asked separately about the cost associated with the 10 variables presented above, 3% of the users strongly disagreed that the cost of internet subscription was acceptable and 26% of users strongly agreed that the cost required for registering with this service is reasonable.
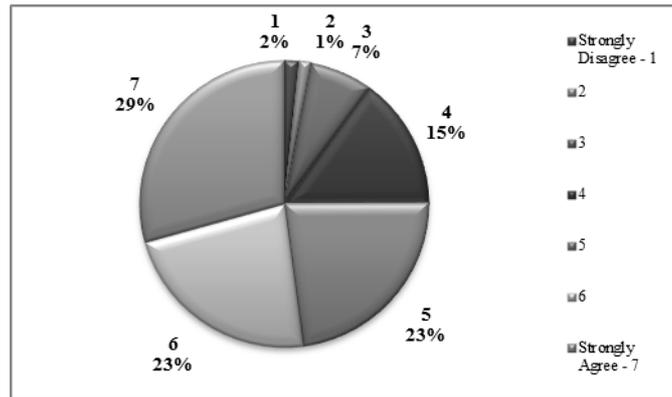

Figure 1 Satisfaction with the overall cost of the service

Risk

The risk section in the survey comprised eight multiple-choice, close-ended questions. The following variables were assessed: fraud, payment mistakes, hidden cost, audit by government/agency, future audit, social isolation, usage of the data by e-government for other purposes, and data privacy. Figure 2 shows the options the users chose when asked to select which option best represented their agreement with the statement: *I am satisfied with the overall risk of this e-service*. A total of 24% of the participants strongly agreed with this affirmation, 22% selected 6 (agree) and 26% selected 5 (somewhat agree) as an option on the seven- point Likert scale. As in the previous case, 2% strongly disagreed with the statement. When each of the eight variables were assessed separately, most of the options selected expressed a relatively neutral opinion (4, neither agree nor disagree, on the Likert scale) regarding the risks posed by the service, with the exception of the hidden cost which most participants agreed was not present in the e-service.
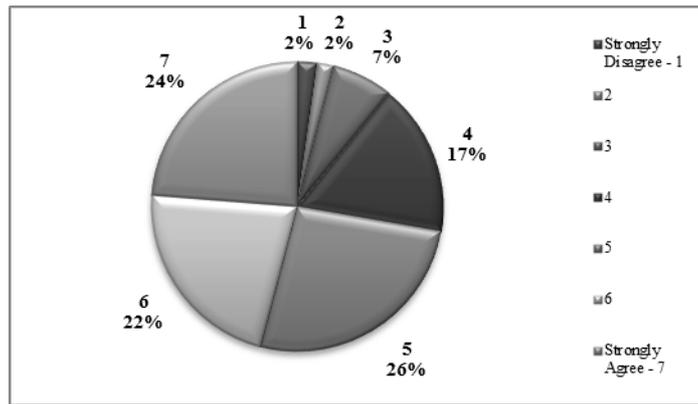
Figure 2 Satisfaction with the overall risk of the service

Benefits

The benefits of the system were assessed through 17 questions: time savings, reductions in overall cost, reductions in transportation cost, money savings, service security, ease of finding the contact information for support, ease of understanding, ease of use, information presentation, information sufficiency, ease of navigation, information accuracy, up-to-date information, information relevance, ease of searching for information, necessity of training and the steps that needed to be completed offline. Figure 3 presents the participants' options when asked to assess their satisfaction with the overall benefits of the PPC e-service on a seven-point Likert scale. A total of 32% of participants strongly agreed with the statement: "*I am satisfied with the overall benefit of this e-service*", 27% selected 6 (agree) on the Likert scale and 22% selected 5 (somewhat agree) as an option. Only 1% strongly disagreed with the above statement. When each variable was assessed separately, 37% of participants strongly agreed that using the e-service saved them money, and 10% strongly disagreed with the question that this service reduced the actual cost of the requested service.
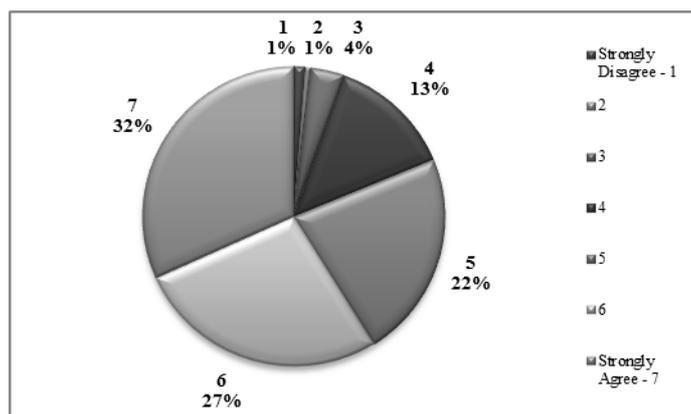

Figure 3 Satisfaction with the overall benefits of the service

Opportunity

The opportunity offered by the PPC was assessed through 14 variables: potential for corruption, access at any time, customisation, delivery options, error alerts, options for getting support, support from e-service officers, options for receiving update alerts, payment

methods, transaction history access, ability to recommend the service, language translation, information updates, and directions for completing it. Figure 4 summarises the results obtained when assessing respondents' opinion about the opportunities presented by the system. As with the previous constructs, most of the participants were satisfied with the overall opportunity offered by having PPC as an online service. While 29% strongly agreed with the statement "*I am satisfied with the overall opportunity of this e-service*", 28% selected 6 (agree) as their option and 20% selected 5 (somewhat agree) on the seven-point Likert scale. Only 1% strongly disagreed with the above affirmation. When each variable was assessed separately, 28% strongly agreed that the service can be accessed at any time and from anywhere. The open-ended questions suggested that although the service is convenient and can be accessed from most places, there are still issues with device compatibility. A total of 10% of participants strongly disagreed that they would recommend this service to others.
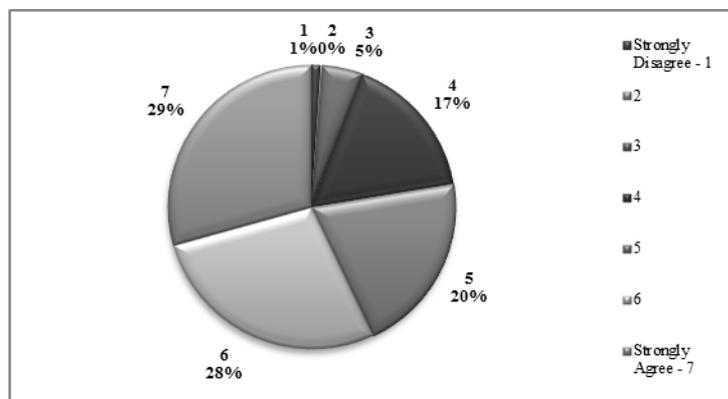

Figure 4 Satisfaction with the overall opportunity of the service

Overall Generated Value

Figure 5 presents the respondents opinion of overall satisfaction with the online application or renewal of the PPC. The figures are similar to the ones presented for the four constructs: cost, risk, benefits and opportunity. A total of 28% of participants strongly agreed with the statement: "*I am satisfied with the overall generated value of this e-service*", 25% selected 6 (agree) as an option, and 24% selected 5 (somewhat agree) on the seven-point Likert scale.
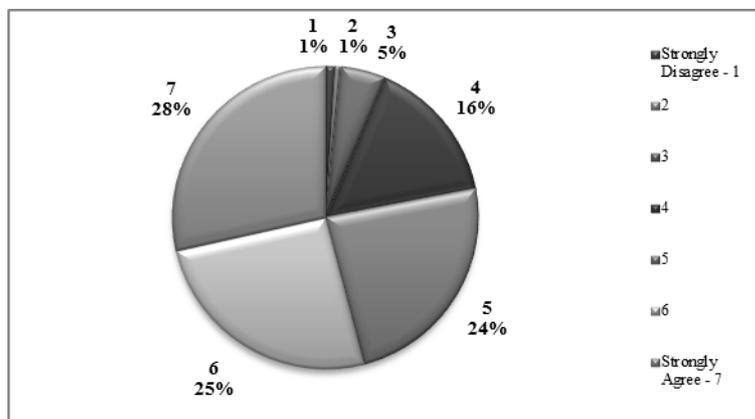

Figure 5 Satisfaction with the overall value of the service

Essential Needs

The respondents' opinion on how the e-prescription certificate meets their needs is presented in Figure 6. It is assessed on a 7 point Likert scale where 1 is anchored as *strongly my most essential needs*, 6 as *most of my essential needs*, 5 as *some of my most essential needs*, 4 as *moderately meets my most essential needs*, 3 *slightly my most essential needs*, 2 as *almost none of my essential needs* and 1 as *none of my essential needs*. 31% strongly agreed that the PPC e-service met their essential needs and 21% selected 6 (most of my essential needs) on the Likert scale while only 3% of participants reported that the service didn't meet any of their needs.
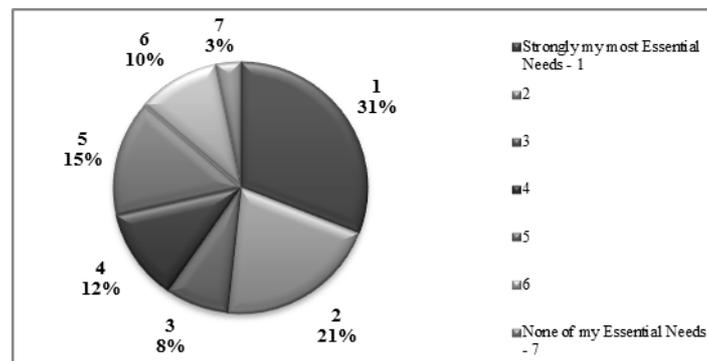

Figure 6 How well the service meets user needs

Qualitative Feedback

Qualitative feedback was collected through two open-ended questions, one assessing how the service met or did not meet their needs, and the other one asked participants for their general comments. Overall 42% of the participants provided positive comments about their experience in using the system, 15% highlighted issues with the system and the rest of them either did not provide any answer or provide a neutral answer (i.e. "*it did what I needed to do*"). The answers fell into two broad themes, one representing issues with the service and the other one addressing the content and information offered to the user through the system. Among the issues mentioned were concerns regarding trust (privacy and security issues with using the system), functionality (the need to use a debit card and associated problems - as not all card types are accepted, the price to be paid, difficulties related to updating the application, slow connection, lack of compatibility with mobile devices), user support (the ability to get help when needed) and lack of awareness about the existence of this service. When examining the qualitative comments offered by the users who filled in the survey, most of the participants felt that the service was easy to use, convenient, and saved time and money.

Study Contributions and Concluding Comments

E-health is aimed at improving the efficiency, effectiveness, and transparency of health services, and among these the e-prescription is an important strategic policy of the NHS in

the UK. Despite its importance, very few studies have been conducted on assessing user satisfaction with this service [12][13][25]. These studies reported the benefits this system has, as opposed to the paper based prescription system from the user perspective [12][13] or the challenges pharmacists encountered when adopting the system [25]. This study focused on the general satisfaction of citizens with the online prescription service provided by the NHS when patients/users need to apply for a pre-payment prescription certificate or to renew their existing certificate. The PPC e-service in particular has not been addressed in the above research. Moreover the above studies looked only at several aspects of user satisfaction, whereas this study aims to provide a more comprehensive view. With this aim, this paper presented a large sample study (n=501) of users of the online PPC system and their satisfaction across four dimensions: cost, risk, benefits and opportunities based on the COBRA framework [1]. The results showed that the overall level of user satisfaction with the current PPC was high. Moreover, most participants considered that the service meets their essential needs. Several recommendations for improvement are highlighted in the paper and determined through qualitative feedback from the users.

Practical and Theoretical Implications of the Study

This study offers several practical and theoretical implications. The study adds to the body of knowledge in user satisfaction studies on e-services by evaluating the satisfaction of a key public service offered by the UK government (the PPC e-service). The paper examined satisfaction of this e-service across four dimensions: cost, risk, benefits and opportunities as described in the COBRA framework. In this respect, this paper has evaluated the opinion of citizens regarding one of the key online systems offered by the National Health Service using four constructs that have not been applied before in the UK when studying government e-services. This study provides an overview of patient satisfaction with the e-prescription PPC and potential areas that can be improved. Therefore, the findings offer valuable insights to NHS service providers, healthcare management and society in general as well as public sector policymakers and ICT managers who are responsible for developing and maintaining online systems such as the PPC. While detailing user satisfaction in terms of cost, risk, benefits and opportunities of using the system, the results also point to further improvements that can be addressed across these dimensions. The qualitative feedback obtained from the participants can be used to further improve the PPC website functionality, user support, and increase citizens' trust and awareness.

Limitations

Several limitations of the study are worth noting. The data were collected using a cross-sectional design and hence the results present the user satisfaction with the PPC online service at a single point in time. Future research could explore user satisfaction through a longitudinal study, gaining a deeper understanding in this way. Furthermore, the survey was targeted towards users of the system through selective sampling and thus it would be interesting to study other patients who are on regular medication, but do not use the e-service.

Future Work

This study is part of an ongoing research effort in the I-MEET project which aims to provide an integrated model for measuring e-government services in general, and e-health in

particular. As part of the work performed in the project, several other e-services offered by UK public sector organisations are being analysed, including London Congestion Charging [48] and application/renewal of television licences. In addition, data will be collected from public organisations providing these services (e-government service providers) to evaluate their (service provider) perspective in relation to the COBRA constructs. Furthermore, several other similar public e-services are being studied as part of the I-MEET project in Qatar [49] and Lebanon to perform a comparative analysis of e-services across geographical contexts. This will help to determine how public e-service success dimensions vary across cultures, and also provide an overview of other public e-services relative to e-health. In doing so, the authors hope to validate their integrated model and through I-MEET offer policymakers a mechanism to evaluate, transform and optimise the e-services offered by public organisations to the satisfaction of all stakeholders.

Acknowledgements

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