EVALUATING M-GOVERNMENT APPLICATIONS: AN ELABORATION LIKELIHOOD MODEL FRAMEWORK

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Abstract

Mobile government application and services refer to governmental functions that are available to mobile devices, such as smart phones or personal digital assistants, to the users anytime/anywhere. M-Government and m-Participation are emergent concepts used to represent the evolving field of public administration functions provided as mobile services and the provision of participation to public consultations via mobile devices accordingly. In this paper we present an evaluation framework for m-government tools. The evaluation approach is grounded on the assumption that m-government tools should not only provide access to governmental information and functions, but they should also motivate users to participate to public policy making processes. The evaluation approach is based on the Elaboration Likelihood Model. Its novelty lies on a) its ability to capture the actual performance of a system instead of the users' perceptions, and b) its capacity to assess the motivational and persuasive ability of a system.

Keywords: m-goverment, e-participation, persuasion, public administration

1 INTRODUCTION

Mobile government, m-Government, is the extension of e-Government to mobile platforms. M-Goverment includes the strategic availability of governmental services and applications to mobile devices such as smart phones, tablets, personal digital assistants (PDAs), etc. M-Government tools have the capacity to make public information and governmental services available "anytime, anywhere". Providing such ubiquitous govermental functions can ensure several benefits to the stakeholders involved such as citizens, businesses and government units. Examples are increased efficiency, modernisation of public administration, flexibility, cost reduction, etc. M-goverment tools can additionally benefit public administration by enabling increased participation to policy making processes. Evolving research in the emergent mParticipation (mobile participation) field supports that mobile computing technnologies can allow citizens to be involved in the goverment policy making processes on the move. The effectiveness of such mobile participation tools can be maximised only when the end-users are committed and having a proactive attitude to the policy making processes (Macintosh, 2007; Martin, 2006). Hence there is a need to design m-goverment tools and device information and communication technologies in a way that not only provides to end users access to the governmental functions, but also motivates them to be involved in the policy making processes.

The importance of desinging mParticipation technologies lies on their capacity to achieve public administration reform with policy making processes' reengineeing towards the maximization of citizens' participation. This objective exceeds the benefits of e-goverment services – hence reduction

of administration and financial burdens – towards the optimized transformation of policy making processes with maximised citizens' consultation. Taking into consideration the importance of mParticipation tools it is imperative to develop approaches to evaluate whether they succeed in this purpose. The experience from e-goverment evaluation reflects that assessment of govermental electronic services is complicated due to the multiple stakeholders and the variant political, social and financial interests involved. As a result, an evaluation approach for m-goverment services should incorporate the social perspective, hence its capability to motivate stakeholders to use it. In this paper we propose an evaluation framework for mParticipation tools that assess m-goverment applications regarding their motivational and persuassion capabilities. The evaluation framework is designed within the EU funded project UbiPOL and will be applied to evaluate the developed platform.

The paper is structured in four sections. The next section presents the Elaboration Likelihood Model which is used as the theoretical grounds for the evaluation framework. Section three presents the basec features of UbiPOL and proposed evaluation approach. Finally, the conclusions and future research endeavors are provided in the last section.

2   THEORETICAL BACKGROUND

An examination of the information systems literature can provide us with several behavioral and attitudinal theories used to explain or predict users' acceptance of a technology. Among the most dominant we find theory of reasoned action, theory of planned behavior, technology acceptance model, unified theory of acceptance and use of technology, etc. Although these theories provide the tools to analyse acceptance of technology, they cannot provide us with explanations of the way that an information system can be the mediating factor to influence the change of users' behaviours towards specific directions. Moreover, these theories traditionally analyse or attempt to predict the acceptance of information technology by examining users' perceptions upon main constructs that reflect or may foresee the acceptance of technology. Such dominant concepts used in the information system field are perceived usefulness, perceived ease of use, expected performance etc. However, these constructs are limited only into capturing the perceptions/intentions of users and cannot reflect the actual use of the system and evaluate it as a medium to encourage and persuade towards behaviour change.

The Elaboration Likelihood Model (ELM) of persuasion developed by Petty and Cacioppo (1981) can provide us with the grounds to explore the ways that a software or tool can become an element of a persuasive strategy. ELM of persuasion is a model of how attitudes are formed and changed by analyzing individual's information processing when they face a message. Hence, the central concept is the "elaboration continuum", which ranges from low elaboration (low thought) to high elaboration (high thought). ELM distinguishes between two routes of persuasion: the "central route," where a subject considers an idea logically, and the "peripheral route," in which the audience uses preexisting ideas and superficial qualities to be persuaded.

Central route processes are those that require a great deal of thought, and therefore are likely to predominate under conditions that promote high elaboration. Central route processes involve careful scrutiny of a persuasive communication (e.g., a speech, an advertisement, etc.) to determine the merits of the arguments. Under these conditions, a person's unique cognitive responses to the message determine the persuasive outcome (i.e., the direction and magnitude of attitude change). So, if favorable thoughts are a result of the elaboration process, the message will most likely be accepted and if unfavorable thoughts are generated while considering the merits of presented arguments, the message will most likely be rejected. In order for the message to be centrally processed, a person must have both the ability and motivation to do so.

Peripheral route processes, on the other hand, do not involve elaboration of the message through extensive cognitive processing of the merits of the actual argument presented. These processes often rely on environmental characteristics of the message, like the perceived credibility of the source, quality of the way in which it is presented, the attractiveness of the source, or the catchy slogan that contains the message. Such peripheral characteristics of a persuasive message are recognized by Cialdini (2000) who proposed six universal principles of social influence:

1. Reciprocity: People feel obliged to return favours performed for them.

2. Commitment and Consistency: People want to act consistently with their commitments and values.

3. Social Proof: People seek to the acts/behaviours of other people to guide their behaviour.

4. Authority: People tend to obey authority figures, even when they are asked to perform acts that are in conflict with personal conscience.

5. Liking: People are easily persuaded by people that they like and by people that are similar to them.

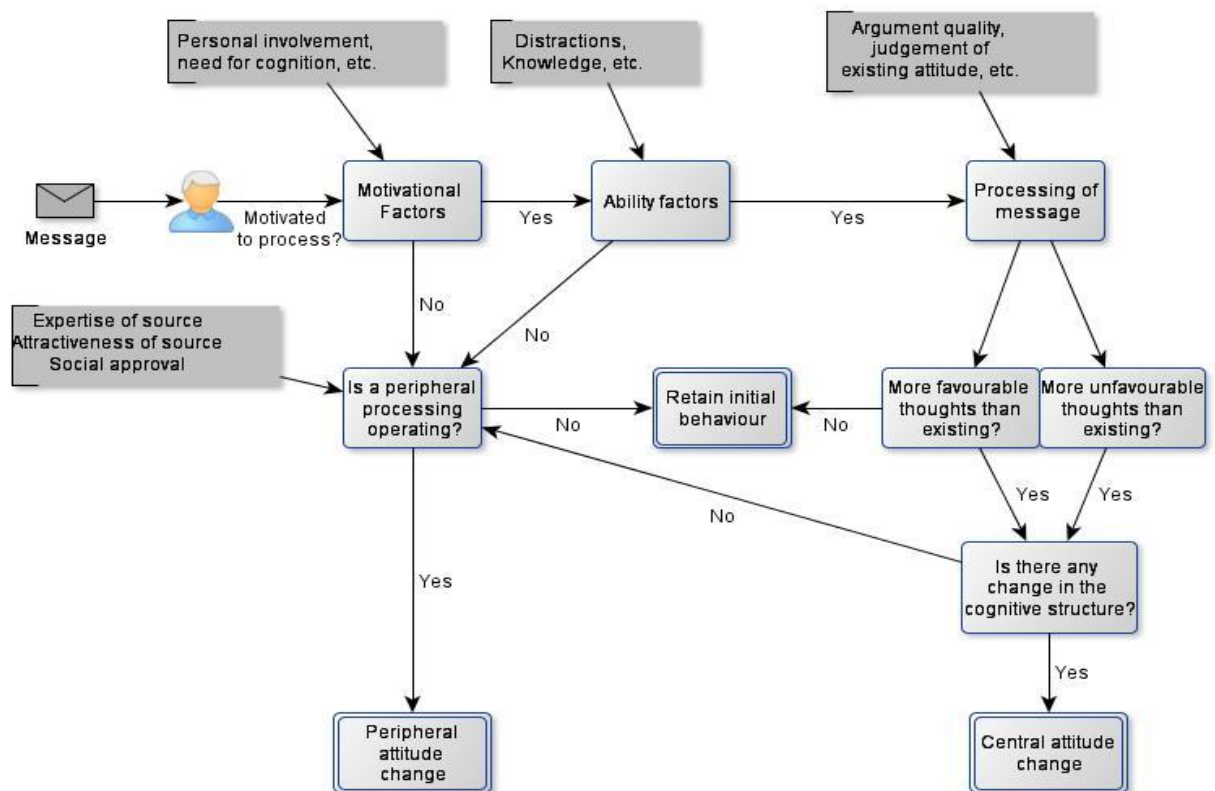6. Scarcity: Perceived scarcity increases demand.

Figure 1: The Elaboration Likelihood Model (based on Petty and Cacioppo, 1986)

Two factors most influence which route an individual will take in a persuasive situation, the motivation and the ability. Motivational factors include (among others) the personal relevance of the message topic, accountability, and a person's "need for cognition" (their innate desire to enjoy thinking). Ability factors include the availability of cognitive resources (e.g., the presence or absence of time pressures or distractions) or relevant knowledge needed to carefully scrutinize the arguments. Under conditions of moderate elaboration, a mixture of central and peripheral route processes will guide information processing.

When a message is presented to individuals in different contexts, the recipients will vary in how much cognitive energy they devote to the message. When people are motivated and able to think about the content and arguments of the message, elaboration is high and the central route of persuasion is used. Through the central route of persuasion, the resulting change in attitude is more stable and more enduring. When motivation and ability to think are low elaboration is low. However, persuasion may also occur with low elaboration through the peripheral route.

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3 THE EVALUATION FRAMEWORK

3.1 UbiPOL

For validating the proposed evaluation framework we will use UbiPOL platform; UbiPOL is an m-government platform developed within an EU funded project that employs a new governance model in which citizens can participate in policy making processes in the middle of their everyday life overcoming spatial and time barriers. The core of the governance model is a ubiquitous participation platform that motivates its users to be involved in policy making processes. Although location-based services have been used to influence citizen/consumer behaviors in many fields, such as tourism, marketing or education, they have not been used to engage citizens in the policy making processes. UbiPOL *location-based notification* services will aim to alert citizens with consultation requirements about policies that are relevant to them when they are moving around physical places in their everyday life. Moreover, UbiPOL *retrieval services* are designed to provide citizens only with the policies that are relevant to their *personal preferences* and necessities. Additionally, UbiPOL *policy sharing services* enable citizens to view other citizens' opinion on a specific policy issue without revealing their identity. Finally, UbiPOL *tracking services* will provide to the citizen the option to track a policy's status on its workflow process.

3.2 Evaluating persuasion capability: an elaboration likelihood model framework

Citizens as users of UbiPOL will be receiving messages that will stimulate their participation to public administration policies. Following the evaluation framework of ELM, the recipients of the messages will correspond to them with different cognitive efforts. The cognitive effort dedicated depends on ability (such as availability of time to provide his/her opinion or existence of distractions) and motivation (such as personal relevance to the topic) of the citizen to participate to the specific policy area. If the citizen has both ability and motivation to evaluate the participation request to the policy formulation then the message will be judged with critical thinking about the importance of the request. Following this step, if the message adequately justifies the individual's participation to the policy formulation process he or she is expected to be persuaded to participate. On the other hand, if the citizen does not have the ability or the motivation to evaluate the message with scrutiny, then he/she will focus on the peripheral characteristics of the message, such as its attractiveness or the opinion of others to it. Based on these peripheral features, the citizen will be (or not) convinced to respond to the participation request.

UbiPOL is designed to attract both the central and peripheral routes of persuasion. UbiPOL platform first aims to attract high elaboration by citizens as a reaction to a participation message. To achieve this, the notification services of UbiPOL will enhance the ability of messages recipients by alerting them with a specific policy according to their location. Timing of receiving a message encouraging participation to a policy is significant for persuading the citizen and for assuring that he/she will dedicate effort to process the request. *Location-based services* will achieve the best timing to notify

citizens; a citizen will receive a notification to the mobile device based on his/her location, which achieves the best timing match. For example, let's assume that a policy-maker would like to formulate a car parking strategy for a specific area. If the consultation questions designed by the policy-maker are presented to the citizen whilst he is at his working environment or at the super market, then according to ELM his/her ability to respond is limited due to distractions and time restrictions. On the contrary, if the request is received whilst he/she is at the car parking station, then ability is increased.

Continuing with the second innovative feature of UbiPOL, the retrieval services will enable the platform to notify citizens only for the requests for policies that are relevant to their preferences and personal information. ***Preference matching*** is essential for attracting the attention of a citizen and for convincing his/her to devote cognitive effort to process the message. Following ELM concepts, if the citizen receives messages that are irrelevant to his/her interests then his/her motivation to participate to the policy formulation is limited. On the contrary, if the messages sent are in line with the recipient's personal interests then the probability to critically process the message's arguments is increased. On the previous example, a car owner will be more motivated to participate to a car parking consultation, and hence process the message through the central route of persuasion, than a person who does not have a car.

As previously discussed, if the recipient of a persuasive message does not have the ability or motivation to devote much cognitive resources, then the peripheral route of persuasion is followed. Moreover, under conditions of moderate elaboration, a mixture of central and peripheral route processes will guide information processing. Peripheral cues are features that do not relate to the message arguments, but to the message peripheral characteristics, such as the attractiveness of the presenter. Such peripheral cues of persuasion are provided by Cialdini (2000). One of Cialdini's strategies for persuasion is social proof, according to which people seek to the behaviours of other people to guide their behaviour. UbiPOL ***policy sharing services*** represent such a peripheral cue for persuasion that adopts the social proof principle. Using UbiPOL application citizens will be able to view others' opinions on a specific policy. According to ELM and Cialdini, such a feature is expected to attract individuals' attention when the peripheral route of persuasion is followed or to strengthen attention when the central route of persuasion is followed. Another strategy suggested by Cialdini is authority. According to the authority principle people tend to be persuaded by communication messages that are related to an authority figure. UbiPOL ***tracking services*** represent such a peripheral cue for persuasion. A policy issue will be accompanied by workflow process stage implying the agency/department that is responsible for the policy's current progress, when the citizen chooses to track the process of a policy issue.
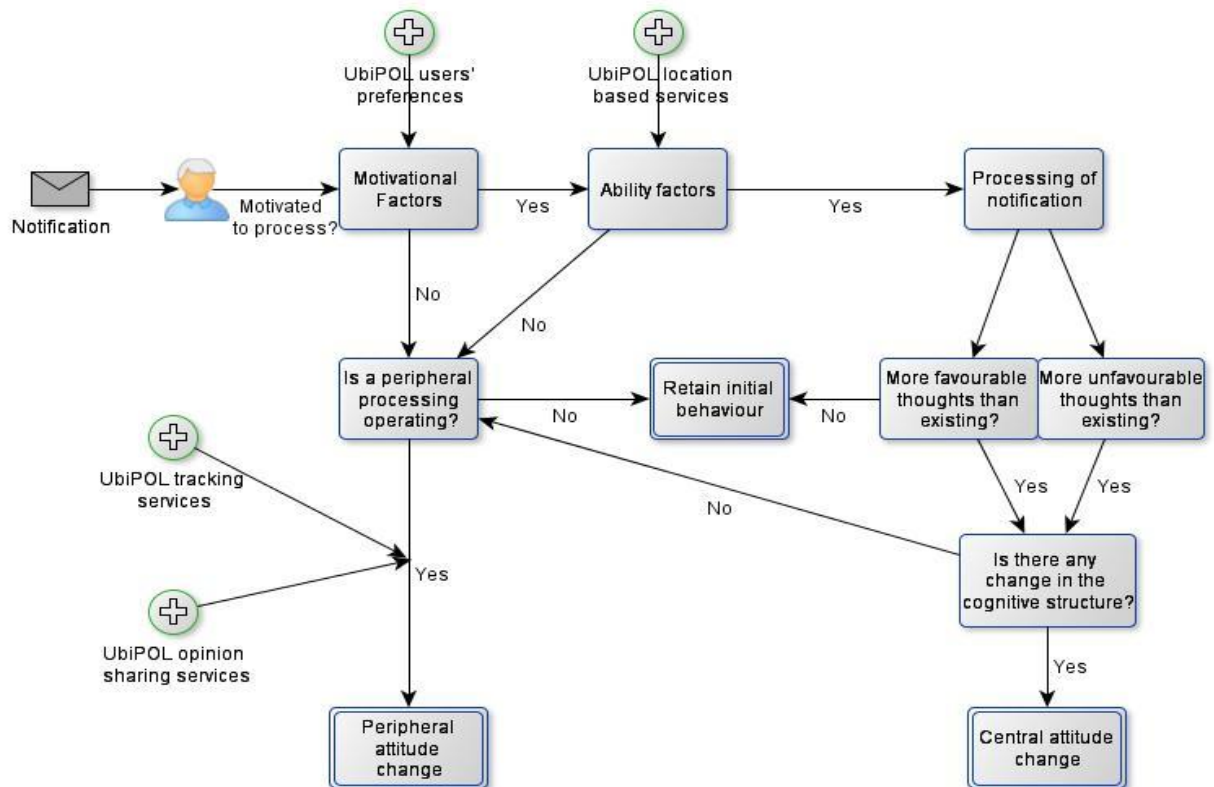
Figure 2: The evaluation framework

The proposed evaluation framework captures the applications core features and assesses if their presence is increasing citizens' participation to public administration policies.

4   CONCLUSIONS

ELM enables the evaluation of technology as a persuasive means. Most technology acceptance models analyse the acceptance of technology, but cannot provide us with explanations of the way that an information system can be the mediating factor to influence the change of users' behaviours towards specific directions. Moreover, they capture using questionnaires the users' intention of use, acceptance, perceptions of the system, etc. ELM also has been applied to evaluate information system using questionnaires to collect users' opinion on the system and its acceptance. The novelty of our application is twofold: a) the proposed evaluation approach is able to capture the actual performance of a system instead of the users' perceptions, and b) the evaluation approach is based on assessing its motivational and persuasive ability which is particularly related to participation tools.

Future research includes the selection of adequate assessment constructs or metrics, such as participation, attention, elaboration, etc. The selected measures must represent the efficient of the system to collect citizens' opinion and improvement on citizen engagement and empowerment. Moreover, they should be able to assess the way that the variant combinations of persuasive features of the system influence citizens' motivation and participation.

Acknowledgements

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