



A research Methodology to Explore the Adoption of E-Government

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ABSTRACT

Electronic government (e-government) play an important role in governments that provide services and applications for citizens to support their transactions. Understanding factors that affect user adoption of e-government is of interest to researchers in a diversity of fields. The aim of this study is to explore the important factors affecting the adoption of e-government. This study suggests positive- mixed methods research to explore and predict a causal model and validate the result. This study proposes mixed methods within two phases, qualitative followed by the quantitative. This paper focuses on the qualitative method. In the qualitative phase, interviews and focus groups will be proposed to explore users' experiences and beliefs about e-government as well as developing the research framework. Data analysis will be conducted using thematic analysis and coding. This study contributes to the information technology and e-government adoption literature by presenting a novel methodology to explore users' beliefs and behaviors toward using e-government services and applications.

Keywords: *E-Government, User Adoption, Methodology, Paradigm, Qualitative.*

1. INTRODUCTION

The rapid development of Information Technology (IT) and internet services, governments around the world initiated their e-government services systems to provide secure and safe government services and information to their citizens. The goal of e-government services is to promote the quality and assurance of government services and allow for time and effort savings in government administration .E- government mention to government's use of technology, especially web-based Internet services and applications to increase the access to and delivery of government information and service to citizens, employees, business partners and government entities. The introduction of e-government services and applications and their adoption by citizens involve different factors including both technical and social issues. Therefore, understanding of what users need, and

measuring what increases their willingness to adopt e-government is important.

Although different studies have focused on the factors that influence the adoption of e-government [1-5], little attention has been paid to explore the adoption of e-government [6]. In addition, to the best of our knowledge; there is no research focuses on providing a novel methodology to explore the adoption of e-government. Therefore, the objectives of this study are as follows:

- To develop an adoption model to investigate and examine the adoption of e-government.
- To propose a novel research methodology to explore e-government adoption.

This paper focuses and discusses the research design; ontology and epistemology most suitable to explore factors affecting the adoption of e-government. This paper outlines the literature review and presents the conceptual framework. It also discusses the methodology which addresses: (i) research paradigm; (ii) research design; and (iii) qualitative phase. In the qualitative phase, the data gathering strategy, sampling, data analysis and trustworthiness are discussed.

2. LITERATURE REVIEW

2.1 E-Government

E-government defined as "using Internet based IT to promote the responsibility and different activities of the government operations. These activities include government service delivery, access to government information, and involvement of stakeholders." [7] The e-government is seeking to promote interaction and involvement between government and government stakeholders by improving different sub-strategies, adopting several instruments (e.g. e-democracy) and by use available Information Communication Technology (ICTs) tools, for example the internet and media [8].

2.2 E-government Adoption

There are many definitions for the citizen adoption of e-government. In general, the intention or "willingness" of citizens to involve in e-Government to receive information and ask for services from the government, known as *e-government adoption*. Additionally, how often the services are really used. For example, if the citizens want to search information about government services did they prefer looking at the government website or is it the last choice for them? Did they like to visit the government website to finish their work with the government or to deal with it personally? All of these aspect named above make up the e-government adoption [9].

Many studies provide e-government adoption factors of e-government services, such as compatibility, usefulness, trustworthiness, perceived risk, Internet safety, relative advantage, ease of and citizen's trust [1-8]. However, most of these study do not provide an exploration for the factors affecting e-government adoption. The idea of study of e-government adoption is to support IT practitioners in the public field, study how to manage and use information technologies to improve decision-making, gain a competitive advantage and revitalize business processes from the adoption of e-government [10].

E-Government adoption is a multi-dimensional construct. For example, First dimension is the services of E-Government (website, application). Second dimension is the stakeholders (citizens, businesses) [9]. Stakeholders be worried about losing private information and be tracked on the Internet. Therefore, the services of E-Government have to get stakeholder trust and increase it in several ways.

E-government programs aim to being the recurrent use and the frequent of electronic services by the users or citizens not just for accessing the information but for both interacting and dealing with the government. In the case of measure, governments need to measure precisely the effect of e-government in the society, firstly the most important thing for them is to measure the citizen usage further than the one time exploring of the website for information getting aims. Therefore, governments have to measure and observe the citizens are satisfied with those existing e-services; this disposition should increase the recurrent usage of the citizens.

3. CONCEPTUAL MODEL

This study adopted the conceptual model developed by [9] to explore the factors and beliefs of e-government adoption. It will extend this model by exploring and explaining more factors that could affect the adoption. Conceptual model in Fig. describes the relationship between five factors of e-government adoption. It

premised on the beliefs that the e-government adoption formed by the extent to which the government can provide a rich and free experience that can provide higher levels of satisfaction. Factors affected in e-government adoption described in the next section of this part.

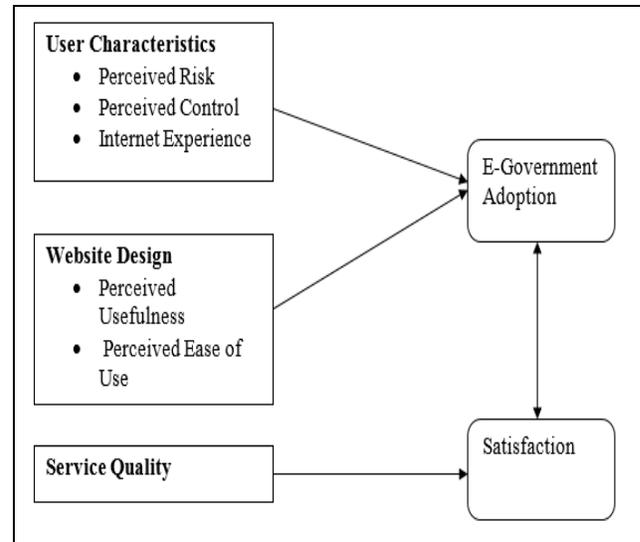


Fig. 1. Conceptual Model of E-Government Adoption
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Customer satisfaction: "Satisfaction as the perception of a pleasurable fulfillment of a service". Transactional satisfaction and overall satisfaction are two constitutive parts of satisfaction.

Transactional satisfaction depends on particular individual transactions deriving the customer satisfaction; the quality of these transactions may change from one transaction to the other. In contrast, overall satisfaction refers to a chain of antecedent uses that led to positive transaction concrete satisfaction. Therefore, citizens must show high levels of satisfaction with online services provided by the government to achieve the e-government adoption.

Service quality: Quality of idealistic service influences on the satisfaction and, ultimately, adoption. Experimental evidence indicates the service quality plays a significant role in online and e-business context [9]. It is important to comprehend the needs of the customer, and act as a tailor to serve those needs. Instead of the needs of government organization, the needs of citizens take the first priority in the planning stage. Thus, services supplying depends on user needs, not on managerial structures.

Website design: The online marketing strategy is a key component of any website, which means when designing the website, taking in the mind that there is a great care for serve the target market efficiency. To achieve that, requires consideration of number of elements such as how easy to navigate, aesthetics, content of the website,

accessibility, and personalization feature. All of these combined each to other will influence the experience of users with the website and, finally, their satisfaction and adoption. How to measure the effectiveness of website design from the perspective of the citizen or user? There are two terms serve this target are perceived ease of use and perceived usefulness

Perceived usefulness: Perceived usefulness defined as "The degree to which a person believes that using a particular system would enhance his or her performance." [11] In the environment of business manners, perceived usefulness of website measured by: how far the individual thinks that reads out information online will save the time for him, and how far the individual thinks that reads out information online will decrease the cost.

Perceived ease of use: Perceived usefulness defined as "the degree to which a person believes that using a particular system would be free of effort." [11] It measured as; learn the system's ease, how far the system is obvious, controllable, comprehensive, and flexible. It also measured as for individuals to become adroit while interacting with the new system easily.

User characteristics: Perceived risk, perceived control, and Internet experience combined to be characteristics of the user, have an immediate effect on Internet adoption. Some studies recently found important interaction effects between the characteristics of users online such as Internet experience, and different online strategies such as customization and community [4,5]. As users have pre experience any e-government services, essentially if satisfied, exactly they like to use these services again. Hence, the experience of users influences a citizen's trust of e-government. There are some points employing to measure internet experience, which are experiencing interval, recurrence of use, and the style of use [9]. Therefore, perceived risk defining the risk resulted from disclose and lose the personal information over the online browsing. Some studies have investigated the perceptions of risk toward e-government adoption [2,4]. These include performance risk, convenience risk, psychological risk, financial risk, social risk, and overall risk. Security and privacy issues delivered from perceived risk, and these could dishearten the use of online services. If citizens have more control about how their information recaptured, shared and stored by the government, this can consolidate their trust likewise give them feeling more control they have [9].

4. RESEARCH METHODOLOGY

This section discusses the research design; ontology and epistemology most suitable to explore and answer the research question: What factors could affect the adoption of e-government. The following figure presents the research methodology proposed in this study:

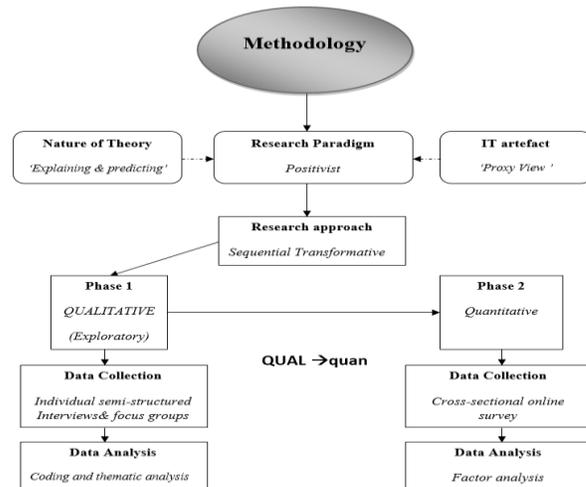


Fig. 2. Research Methodology

5. RESEARCH PARADIGM

Researchers must commit themselves to a single paradigm as paradigms vary in terms of the fundamental assumptions they carry to an organizational investigation [12]. A paradigm is defined as the "basic belief system or world view that guides the investigation" [13, p.105]. In that regard, this study proposes a positivist research which involves "... precise empirical observations of individual behaviour in order to discover ... probabilistic causal laws that can be used to predict general patterns of human activity" [14, p.71]. Table 1 shows the components of the positivist paradigm beside other paradigms. The purpose of the positivist approach is to find out the objective and social reality. It is an attempt to provide the predictive understanding of phenomena by measuring variables, testing theories and the drawing of assumption about a phenomenon from the sample to a fixed population [15]. Accordingly, the aim of this study is to explore the factors that influence user adoption of e-government, and their effects on behavioural intentions.

Table 1: Characteristics positivist paradigm in social science (source: [16])

	Positivism	Symbolic Interactionism: Phenomenology Ethnomethodology; Hermeneutics; etc
Ontology	Realism/Objectivism	Constructionism
Epistemology	Empiricism	Interpretivism
Methodology	Quantitative	Qualitative
Research	Fixed Design	Fixed/Flexible Design

Making a distinction between quantitative and qualitative research is one of the most common ways to classify research methods. However, another way to classify research methods is to differentiate between the fundamental philosophical assumptions guiding the research [17]. Myers [17] argues that “All research, whether quantitative or qualitative, is based on some underlying assumptions about what constitutions ‘valid’ research and which research method is appropriate”. Hence, it is significant to know what these assumptions are to evaluate and control this research. Burrell and Morgan [18] suggest that all approaches to social science are based on interrelated sets of assumptions regarding human nature, ontology and epistemology. Figure3 shows the integration of Crotty’s [19] and Sarantakos’s [16] vision of the foundation of the research. Each identified elements in the diagram informs the next. Crotty [19] identifies the combination of ontology and epistemology as the ‘theoretical perspective’, while Sarantakos [16] specifies the research paradigm as the package of the ontology, epistemology and methodology.

Ontology is the study of being [19]. Ontology represents what social research focus on and explains the nature of reality. Positivistic research follows a realist /objectivist ontology [16]. Realism assumes that the reality is present independent from the mind, whereas objectivism refers to the meaning that exists in objects ‘independent of consciousness’ [19].

The most relevant philosophical assumption is that which relates to the underlying epistemology which guides the study. Epistemology means ‘knowledge’ and refers to the assumptions about knowledge and how it can be obtained [20]. In other words, Epistemology is a way of understanding “how we know what we know” [19]. Objectivism (i.e. belief in an objective reality) is categorised in the context of a positivist research paradigm [19]. On the other hand, an empiricist epistemology (i.e. Knowledge is resourced from experience) is distinguished with objectivist ontology [16].

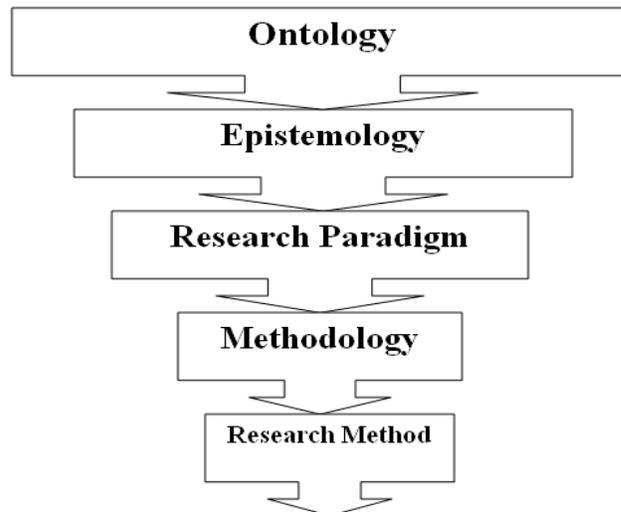


Fig.3. Integrating model of the foundation of the research (Source: [19] and [16])

6. RESEARCH METHOD

This study adopts mixed methods (qualitative and quantitative) for studying the same phenomenon [21, 22]. Quantitative and qualitative methods complement each other when used in combination, and allow for more complete analysis [22]. Multiple methods and sources increase the robustness of results. Using several sources of data and more than one method of data collection allows results to be strengthened by cross-validating them [21]. Mingers [12] suggests that research finding will be richer and more reliable if multi research methods. He argues that the real world is ontologically distinguished and stratified. There are other advantages of mixed methods research. First, triangulation that seeks to validate data and findings by mixing a range of data and sources. Secondly, creativity which discovers paradoxical factors that stimulate further research. Moreover, in a mixed methods approach, the researcher builds the knowledge on practical grounds emphasizing truth is “what works” [23]. The researcher decides approaches, variables and units of analysis, which are most suitable for finding an answer to the research question [22]. A major principle of practicality is that qualitative and quantitative methods are well-matched. Therefore, both text data and numerical collected can help better understand the research problems.

The nature of theory is a significant consideration for research and practice in IS [24]. The theory planned is ‘Explanation & Prediction’ (EP) that is proposed by Bhattecherjee and Premkumar [25]. It presents predictions as well as has both testable propositions (hypotheses) that they can be tested empirically, and causal explanations

[24]. Therefore, this study reveals a positivist view by creating an empirically testable theory to find casual laws such as ease of use, usefulness, benefit, risk and trust. Orlikowski and Iacono [26] verified the expression 'IT artefact' within the IS research. They distinguished the building of IT artefacts with five particular categories: the proxy view, the tool view, the ensemble view, the nominal view and the computational view. This study posits the proxy view that captures the significant variables or properties of IT throughout several surrogates measures (usually Quantitative) [26]. In view of that, researchers investigate individuals' perceptions of the new technologies they might consider using and accepting. This study follows a triangulation- positivist paradigm which is derived from 'explaining and predicting' theory and 'proxy view' of IT artefact.

7. RESEARCH DESIGN

This study will use one of the most popular mixed methods designs in different research: *Sequential Transformative* design [23]. This model has two distinct data collection phases (qualitative and quantitative) one following the other, and priority could be given to any phase [23, 22]. The main purpose of this model is to use methods that will best serve the theoretical perspective of the researcher [23]. Creswell [23] states that "By using two phases, a sequential transformative researcher may be able to give voice to diverse perspective, to better advocate for participants, or to better understand a phenomenon or process that is changing as a result of being studied" (p.213). Under this view, this study will employ this design (see figure 2) to help developing the framework as well as explain and measure the factors that influence the use and the acceptance of E-government. In this study, the Sequential Transformative is categorized by the collection of qualitative data followed by the collection and analysis of quantitative data. The priority in this design is given to the qualitative phase, because the qualitative research presents the major aspect of data collection and analysis in the study, focusing on in-depth explorations of the phenomenon. In addition, the qualitative element helps in developing the research model and forming hypotheses [23].

In the first phase, a qualitative interview and focus groups methods will be used to collect data. The goal of the qualitative phase is to identify potential predictive power of selected beliefs on the factors that could affect the adoption of e-government. The rationale for this phase is that the qualitative data and results provide a foster picture of the research problem.

In the second phase, the quantitative numeric data will be collected using a survey method. The survey method will be used to test the research model because it allows

replicability, provides the basis for establishing generalizability, and has statistical power [23]. The quantitative data and its analysis will be measured and described by representing and testing the hypotheses and exploring participants' views in more depth.

8. QUALITATIVE PHASE

This phase aims to explore the important factors in the adoption of e-government by using a *qualitative case study*. A qualitative research captures the reality in considerable details, and it is particularly useful when a focus on contemporary events or a natural setting using a human subject is required [27]. A qualitative case study can be used to describe, generate or test a theory [28]. A qualitative approach has been criticized for lacking methodical generalizability [29] Nevertheless, it has been argued that the objective of qualitative study is not to illustrate inferences about a number of larger populations, but rather to generalize back to an application or theory [28]. In addition, Benbasal *et al.* [29] indicate that the qualitative approach is suitable for examining certain forms of problems, particularly those in which theory and research are at their early stages; and difficult, where and the context of action is crucial and the experiences of the actors are significant.

Kaplan and Maxwell [30] argue that "the purpose of investigating a phenomenon from the viewpoint of the participants and its particular institutional context is largely lost when textual data are quantified". Under this view, this phase will use mixed method approach under qualitative field study which includes *interview* and *focus groups* methods as this phase aims to explore users' beliefs of e-government services and application, and then to identify the factors that influence their attitude and perceptions toward e-government adoption. Mathison [31] identified that triangulation is characteristically perceived to be a strategy for evaluation findings and improving the validity of research. The use of these two disparate methods will ensure that data will be collected in in the context of the daily life of the participants (interviews), and a laboratory setting (interviews and focus groups). Therefore, this will enable triangulation of the data across the different methods and the collection of a rich set of data.

The qualitative phase will inform the quantitative phase in several ways. For example, the interviews and focus groups can reveal some conflicting opinions and perceptions from diverse users regarding using E-government. Also, the interview and focus groups results can emphasize some factors on users' acceptance technology that are not seen in previous research.

8.1 Interview Method

This study will use *interview* method which refers to asking questions and receiving answers from the people who the researcher is interviewing [32]. In qualitative research, the interview is one of the most common method and one of the most significant data gathering tools [33]. This study proposes the interview method because it aims to explore the factors that influence e-government adoption from the users perspectives. A qualitative interview seeks to cover both a meaning level and a factual, although it is usually difficult to interview on a meaning level [34]. Interview method is useful for getting the beliefs behind participants' experiences. Patton [32] argued that "We interview to find out what is in and on someone else's mind, to gather their stories" (p.341). Hence, the interviewer can follow in-depth information about the topic.

8.1.1 Data Gathering Strategy

Data gathering strategy in this method will be through *individual semi-structured* interviews. This type is the most common qualitative interview that is used in IS research [33]. The interviews will be semi-structured to ensure that data collect will be relevant and focused on users' attitude and intentions to use e-government services at the same time allowing participants to elaborate on issues that will emerge during the interview [33]. This study favours *open-ended* questions technique as a guideline for a conversation than an unbending questioning protocol because it allows eliciting responses in a non-leading, natural manner so it provides rich and detailed information [34]. This study will adopt Myers and Newman [33] guidelines for qualitative interviewing (see figure4). Short probes may be used for clarifying questioning or soliciting more explanation. The participant will be informed that the interview will be audio-recorded and transcribed precisely. The critical rationale of qualitative interview approach is to understand the reality from the subjects' viewpoint so that causal meanings of individual's experiences may be exposed [34]. Accordingly, the interview questions will focus on users' perceptions of attitudes and intensions toward e-government services and applications. The interview approach is used as it suits the exploratory nature of the research and an interview questions will be developed based on the factors that influence the adoption of information technology which were reviewed in literature and identified in the conceptual framework.

8.1.2 Sampling

This study will use *snowball sampling* technique to identify e-government services and applications users and non-users. Snowball sampling is the process of identifying participants "through referrals made among

people who share or know of others who possess some characteristics that are of research interest" [35, p.141]. Snowball sampling is useful in formative research and in problem definition. This technique is suitable for this study as it is difficult to get a list of target users who are using e-government services in order to describe their perceptions and experiences [32]. However, it is not suitable for creating data that can be confidently generalized to larger populations

The participants will be a total of 30 Internet users. This sample is reasonable as this phase aims to explore the factors that affect the adoption of e-government from the general views of citizens who are Internet users. The selection of interviewees will be based on the principle of *purposeful sampling* under *maximum variation sampling* technique. Patton [32] described that the selection of potential interviewees is based on the principle of participant variations. This technique provides information-rich cases that cross participant variations so that information can be got from a limited number of participants [32]. Under this view, the demographic variations in this phase are age, gender, location, employment and users and non-users of e-government.

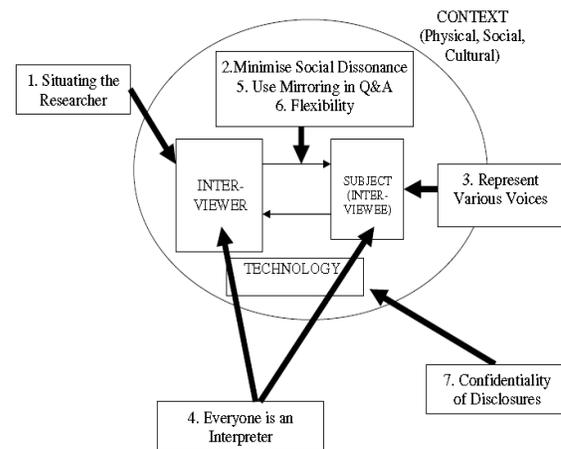


Fig. 4. Guidelines for the Qualitative Research Interview (Source: [33])

8.2 Focus Group Method

The focus group method provides insightfulness and ecological validity in identifying perceptions or salient beliefs [36]. It includes bringing together one or more group of subjects to discuss an issue in the presence of the moderator [36]. The focus group will be designed to further explore users' beliefs and actions toward e-government by facilitating discussions among participants to support different opinions by interaction between participants [37]. The group interaction could produce a richer data set as participants could have also responded to each other's feelings and experiences, as well as

explain their own [38]. Hence, this study will conduct focus groups to seek possible information in a more dynamic approach [37]. Besides, some of empirical studies conducted to examine and predict the user's acceptance of information technology have been used focus group [38]. They found that the focus groups added value helping users share their experiences more readily than many did in the individual interview. They also noted that the participant provides narratives that would remind other participants of same experiences or provides a view from which to express an opposite opinion.

8.2.1 Data Gathering and Sampling

The focus groups will be facilitated by the researcher and will be managed in accordance with standard guidelines [36]. The focus group will use the same interview protocols as the semi-structured interviews and will involve the same participants split into two groups of ten (one group for users and one group for non users for e-government). Each focus group will be audio taped and field notes will be taken. Also, the participants will be screened to ensure that there is diversity of types of units of analysis. The topics of discussion for the focus group will be extracted from the previous literature and from the individual interview phase.

8.2.2 Data Analysis

The procedure of qualitative analysis aims to bring meaning to a situation rather than the search for truth focused on by quantitative study. Strauss and Corbin [39] explain analysis as “...the interplay between researchers and data”, acknowledging that there is an interpretation of the generated data and extent of subjective selection. The text and audio data that will be obtained through the interviews and focus groups will be imported into NVivo 11 software, a computer program for the analysis of qualitative data. NVivo 11 will be used to help in the management of the data during coding [40]. The interview data will be examined first. This study follows Miles and Huberman's [41] suggestion that the researcher starts with concepts already identified from prior literature and then add new concepts that emerged from the interviews. The qualitative analysis steps will include: (1) initially reading through text and audio data; (2) segmenting transcripts with label codes; (3) categorized and integrated codes; and (4) interrelating and connecting themes [42]. Figure5 presents the proposed data analysis processes for interviewing phase.

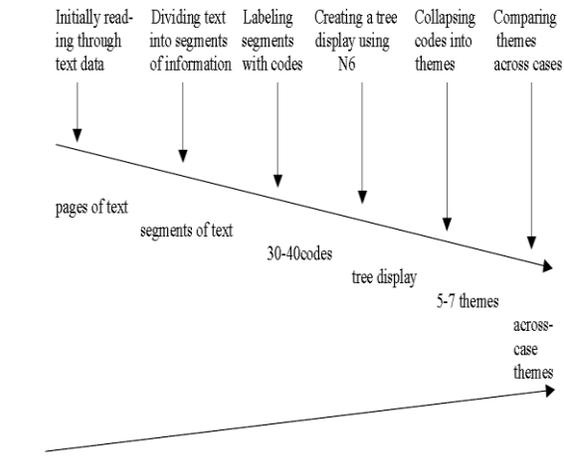


Fig. 5. Visual Model of Qualitative Data Analysis (Source: [42])

The content analysis of the data set will be performed from each focus group. This type of analysis is suitable as the results of each focus group will inform the subsequent focus group session [23]. Under the content analysis, the individual text line (open coding) will be used because this phase focuses on exploration the factors in e-government services and their relationship with the adoption of e-government by developing a theory of behaviour. The proposed steps for analysis in focus groups phase are included in figure 6 below:

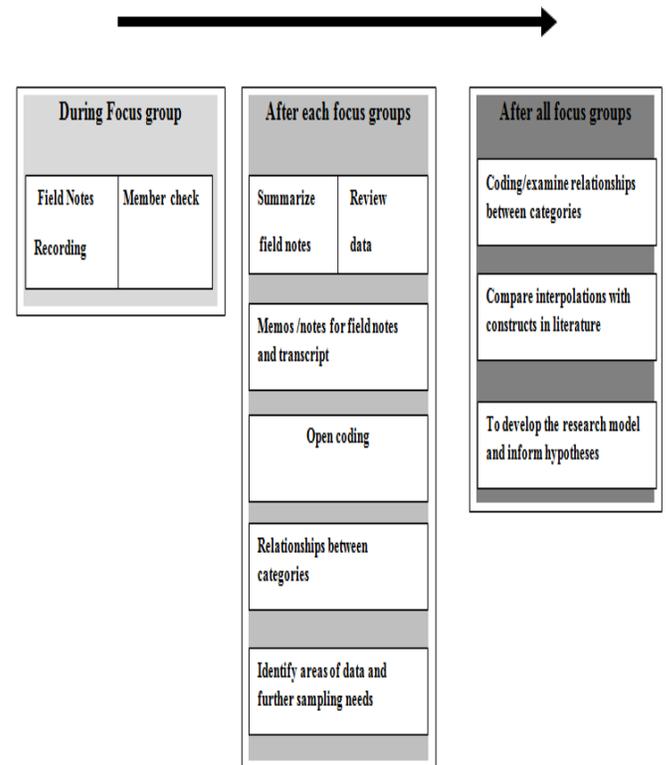


Fig. 6. The proposed Data Analysis Plan during Focus Groups Phase

9. TRUSTWORTHINESS

The qualitative design differs from quantitative approach, the researcher looks for believability, based on trustworthiness [13], instrumental utility [43] and through a procedure of proof rather than through traditional validity and reliability measures. Guba and Lincoln [13] argue that the qualitative study cannot be judged on the positivist view of validity but should rather be judged on an alternative criterion of trustworthiness. In the first qualitative phase of this study, several primary forms will be used to validate the findings such as decide the information and whether it matches reality [23]. These forms are as follows:

- Triangulation: combining different sources of data (Interviews and focus groups)
- Member checking: getting the feedback from the participants on the accuracy of the identified concepts and categories.
- External audit: asking some experts to conduct a thorough review of the study.

10. CONCLUSION

This paper proposes a methodology to explore the adoption of e-government. This study suggests positivist-mixed methods research. It uses Sequential Transformative design that has two distinct data collection phases: qualitative followed by the quantitative. This paper focuses on the qualitative phase and discusses the data gathering strategy, sampling, data analysis and trustworthiness. This study contributes to IT adoption literature by proposing a new and detailed mix research method design to determine the antecedents of e-government adoption. This study follows and adopts different research methods that have been developed and recommended in previous research [15, 17,20,22,23,26,30,36].

This study may have some limitations. It will use mixed methods research. This design has several limitations, such as the lengthy time and different recourses that are required. Another limitation is that the sample bias. As snowball sample technique will be used in the interview phase, the access to individuals could be difficult as well as finding a user who uses e-government services could be difficult, as the previous user in the interview may not know another user who uses e-government services and applications.

Future work in this study is to collect and analyse the qualitative data. After that, this study will start the second phase to revise and validate the framework by measuring the causal network of relations in the model through an

empirical investigation using survey instruments that will be developed in the qualitative phase.

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