

What Drives and Hinders the Use of New e-Customs Systems in Developing Countries of Sub-Saharan Africa? An Empirical Study from Cameroon

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Abstract. While the adoption and replacement projects of e-government systems are increasing in developing countries, empirical research is rare. Moreover, studies on factors affecting user satisfaction of e-customs systems are limited. To fill the gap, this paper empirically investigates the e-customs system implemented by Korea and currently in operation in Cameroon, examining its facilitators and hindrances. This study marks a new approach to studying e-government systems as an ICT4D project in a developing country by creating and validating a newly developed model based on the UTAUT and the SQBT. An empirical study using a survey was conducted. Data were collected from internal and external users who had experienced both the old system (ASYCUDA++) and the new one (CAMCIS). Performance expectancy and uncertainty costs strongly affect the switching benefits and costs. Sunk costs have no significant impacts. The switching benefits and costs significantly influence the behavioral intention and user satisfaction regarding the system. The study adds value to the research fields of user resistance and IT/IS acceptance by conducting empirical research on e-customs systems implemented by a donor in a recipient country. The study gives insights to those policymakers, system developers and managers involved in ICT4D projects about the factors that are important to maximize the benefits and avoid the losses in using a new system.

Keywords: developing countries; e-customs system; user satisfaction; user resistance; adoption.

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Kas skatina ir trukdo naudoti naujas e. muitinės sistemas besivystančiose į pietus nuo Sacharos esančiose Afrikos šalyse? Empirinio tyrimo Kamerūne atvejis

Santrauka. Nors besivystančiose šalyse daugėja e. valdžios sistemų pritaikymo ir pakeitimo projektų, empiriniai tyrimai yra reti. Be to, veiksnių, turinčių įtakos vartotojų pasitenkinimui e. muitinės sistemomis, tyrimai yra riboti. Siekiant užpildyti šią spragą, šiame darbe empiriškai nagrinėjama Korėjos įdiegta elektroninės muitinės sistema, kuri šiuo metu veikia Kamerūne, tiriamos sistemos padedančios priemonės ir jos kliūtys. Šiame tyrime atskleidžiamas naujas požiūris į e. valdžios sistemų, kaip ICT4D projekto, tyrimą besivystančioje šalyje, sukuriant ir patvirtinant naują modelį, pagrįstą UTAUT ir SQBT. Pasitelkus apklausą buvo atliktas empirinis tyrimas. Duomenys buvo renkami iš vidinių ir išorinių vartotojų, kurie buvo susidūrę su senąja (ASYCUDA++) ir su nauja (CAMCIS) sistemomis. Tikėtinos našumo ir neapibrėžtumo sąnaudos stipriai veikia perėjimo naudą ir išlaidas. Negrįžtamos išlaidos neturi reikšmingo poveikio. Perėjimo nauda ir sąnaudos daro didelę įtaką vartotojų elgsenai ir pasitenkinimui sistema. Atliktas įdiegtų e. muitinės sistemų empirinis tyrimas suteikia pridėtinės vertės vartotojų pasipriešinimo ir IT/IS pripažinimo tyrimų sritims. Tyrime pateikiamos įžvalgos politikos formuotojams, sistemų kūrėjams ir vadovams, dalyvaujantiems ICT4D projektuose, apie veiksnius, kurie yra svarbūs siekiant maksimaliai padidinti naudą ir išvengti nuostolių naudojant naują sistemą.

Pagrindiniai žodžiai: besivystančios šalys; e. muitinės sistema; vartotojų pasitenkinimas; vartotojo pasipriešinimas; priėmimas.

1. Introduction

The implementation of ICTs (information and communications technologies) is expected to help governments deliver services to, and transform relationships with, citizens, businesses and other arms of the government (Rose et al., 2015; Guida & Crow, 2009; Grönlund & Horan, 2005). Electronic government (e-government) reduces corruption, increases governmental transparency and boosts citizens' participation in civil society organizations (Esselimani et al., 2021). Moreover, the development of e-government is positively related with economic development and institutional quality (Adam, 2020). It has a potential to make administrations more competitive so that they can deal with complex problems in fast changing societies (OECD, 2003; Seifert & Bonham, 2003).

Developing countries are also trying to adopt e-government for the above-mentioned benefits. However, studies on e-government in developing countries (Zahid & Din, 2019; Twizeyimana et al., 2018; Kasaj, 2016; Mkude & Wimmer, 2015; Otieno & Omwenga, 2015; Nkohkwo & Islam, 2013; Nkwe, 2012; Lin et al., 2011; Weerakkody et al., 2010; Bwalya, 2009; Heeks, 2003a) point out some challenges, such as resistance to change, cultural differences, lack of high-level skills, improper management procedures, and non-contextualization in practices. These issues undermine the sustainability of e-government implementation projects in developing countries and contribute to high failure rates. Especially, many governments in the Sub-Saharan African region face more obstructions to the successful implementation of e-government systems due to lack of infrastructure, human resources, legal framework, Internet access and digital divide (Nkohkwo and Islam, 2013) To avoid such risks, end-user engagement is essential in the design phase of new large-scale sociotechnical systems (Champion & Cibangu, 2018), but there are relatively few studies investigating the impacts of the services on end users especially in developing countries (Ibrahim & Zakaria, 2015; Heeks, 2003b), let alone African countries. To

alleviate the project failure rate, research on end users in recipient countries is required since their efficacy and preferences are directly linked to the success of the projects (Zoo et al., 2020).

Among e-government systems, customs automation (e-customs) systems significantly contribute to economic growth and poverty reduction in developing countries (Laryea, 2012). e-Customs is an electronic medium covering the processes of submission, issuance, transmission, and receipt of documents for exports and imports. It can enhance competitiveness, reduce transaction costs and corruption, strengthen border security, and increase revenues for government and foreign direct investment. Several studies reveal that international trade through ICTs can facilitate and expand developing countries' economies (Addo & Avgerou, 2020; Laryea, 2012; Engman, 2009; Milner et al., 2008; McMaster & Nowak, 2006). Although the role of e-customs is crucial, particularly in developing countries, research in this field is limited. Thus, this paper bridges the research gap by exploring an e-customs system in Cameroon.

Cameroon, a country in the Sub-Saharan region, implemented ASYCUDA++ by UNCTAD (United Nations Conference on Trade and Development) in 2002, which is integrated customs management systems for international trade and transport operations in a modern automated environment (UNCTAD, n.d.). However, ASYCUDA++ has some limitations. It slowed down and became outdated after 13 years; it can only be accessed remotely through a private intranet; it was designed primarily for statistical purposes, so additional features had to be developed after the request of the customs administrations (Marco Logistique, 2018).

In this context, the Cameroon government decided to re-modernize the e-customs system by support of South Korea in 2015. After signing a PPP (Public Private Partnership) contract, a joint company between Cameroon and South Korea called CAMPASS, developed an advanced customs system named CAMCIS (Cameroon Customs Information System) (Marco Logistique, 2018). It contains a total of 41 modules, relating to import / export clearance, collection, cargo, evaluation, investigation, and risk management (CUIPIA, 2015). The CAMCIS can handle all the customs clearance tasks that ASYCUDA++ cannot. It provides advanced services, such as early tender manifestos, management of the manifesto, e-cargo tracking, management of unloading/loading, transshipment management, movement of goods under Customs, information on the transport means, and stock management (Marco Logistique, 2019). Figure 1 shows a timeline of the e-customs reform projects in Cameroon.

This case has two notable features; it is a mandated IS used in the public sector, and the users went through an IS transition period during which resistance to change can occur.

1) Mandatory environment

A 'mandated environment' refers to a situation in which users recognize that the use of a specific technology is organizationally required to keep and perform their jobs, while a 'voluntary use environment' is a situation in which users believe the decision to adopt a specific technology is an intentional choice (Venkatesh & Davis, 2000; Agarwal & Prasad, 1997; Hartwick & Barki, 1994). The CAMCIS users must

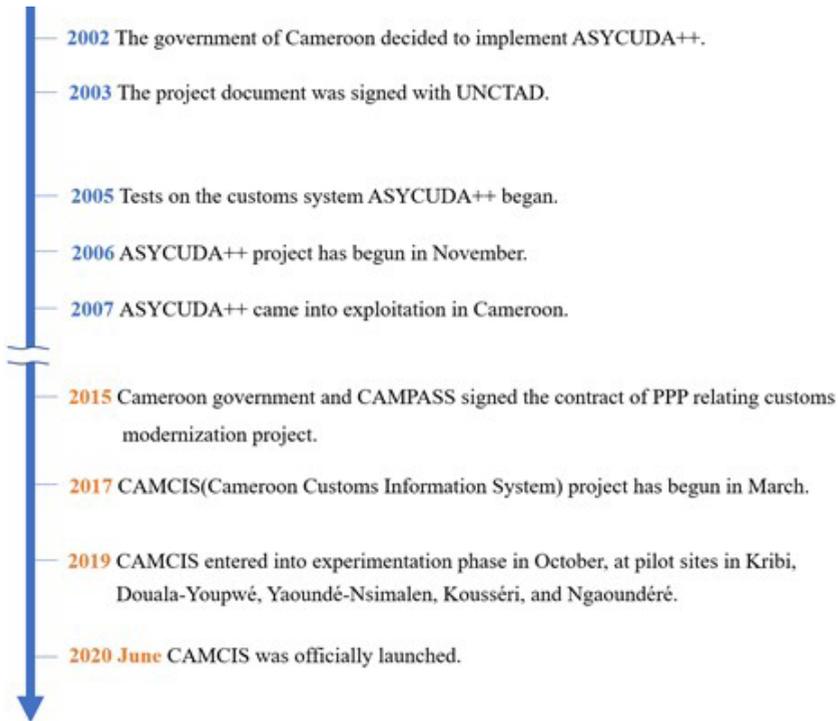


Figure 1. **Timeline of e-customs system modernization projects in Cameroon**

use the system without an alternative, and perform tasks that are tightly linked with other co-workers (Brown et al., 2002). Thus, the mandated usage context should be considered in the research design stage.

2) Resistance to Change

Otieno and Omwenga (2015) find that the success rate of IS projects in the public sector is lower than in the private sector in developing countries, and resistance to change is one of the critical reasons. It impedes the adoption of e-government (Alomari et al., 2014) and causes the failure of new systems (Dwivedi et al., 2015). Since the CAMCIS replaces the ASYCUDA++, users who are accustomed to the previous system tend to be more reluctant to deploy the new one (Park & Ryoo, 2013). Hence, this study aims to identify the adoption and resistance factors which ultimately affect user satisfaction, and provide academic and practical implications.

To reflect those characteristics, a model based on two different theoretical frameworks was developed. The unified theory of acceptance and usage of technology (UTAUT) model (Venkatesh et al., 2003) measures mandatory system's adoption; and the Status Quo Bias Theory (SQBT) (Samuelson & Zeckhauser, 1988) identifies switching costs and benefits. Only a few studies have employed the SQBT to examine user acceptance of a new technology (Zhao et al., 2016). This paper is the first study to employ SQBT to provide an insight into user adoption of e-customs in developing countries.

The literature review and theoretical background will follow this section. Thereafter, the research model with hypotheses is presented, followed by empirical results, discussion, and conclusion.

2. Literature Review

This section provides a brief overview of the e-customs in developing countries, followed by a theoretical background.

e-Customs in Developing Countries

There are several studies that explore e-government implementation in developing countries, such as e-procurement, e-tax filing, e-health, etc. (Adjei-Bamfo et al., 2019). However, although the role of e-customs is crucial particularly in developing countries, there is a shortage of research. There are some studies that have contributed to a better understanding of e-customs and trade facilitation in developing countries.

Addo and Avgerou (2020) draw evidence from a case study of information systems interventions at Ghana customs over 35 years to investigate how and why IT's anti-corruption potential may be curtailed in the context of developing countries' government and society. The main contribution of the paper is a theoretical explanation of the very limited anti-petty corruption effect that are often observed in DCs' government organizations. In addition, there are several studies dealing with e-customs in African countries. Abada and Rusu (2014) apply the interpretive research paradigm, which is Amartya Sen's Capability Approach, as a framework to examine the effect of the Ghana Community Network Services (GCNet). GCNet is a modernized customs system in Ghana. Data was collected from eight semi-structured interviews with senior and middle level officials and with a freight forwarder. The paper sees public services as tools for improving workers' abilities to perform their jobs. It concludes that GCNet improves users' functioning and capabilities, giving them increased freedom. Those are crucial aspects for job creation, the ability of people to make a living and ultimately, human development. Laryea (2012) recommends the implementation of efficient e-customs systems in African countries based on secondary data. The author claims that customs modernization can solve governance deficiencies that have caused the incapability of African economies to manage their rich resources for sustained growth and development. ICT can be an important piece of infrastructure, with the potential to enhance the international competitiveness of the continent's economies, and to increase tax revenues and foreign direct investment for production and exports. Cantens et al. (2010) trace the history of the Cameroon customs reform from the introduction of the performance indicators to the preliminary measured results of performance contracts. The study states that after four months of implementation, initial results are encouraging lower corruption, higher revenue collection, and shorter clearance times by using indicators extracted from ASYCUDA++.

As e-customs systems are one of the key projects by Korea, there are a couple of studies on projects conducted by Korean agencies. Jung (2017) emphasizes the necessity of trade facilitation in developing countries and the potential of Korea's e-customs system in the ODA context. Hong and Park (2018) aim to find the factors which improve the sustainability of ICT for development projects by comparing two KOICA (Korea Institutional Cooperation Agency) e-customs projects in Tanzania and Mongolia. The authors claim that only TANCIS from Tanzania is successful, because Tanzania Revenue Authority has a high level of ownership and strong willingness to pursue the project. Furthermore, the Tanzania government made extra efforts, arranging related laws and institutions, making appropriate plans, and preparing the necessary budget even after receiving the aid from Korea. The paper indicates that such an independent and positive approach by a recipient country can create a successful and sustainable outcome.

While most of the existing studies as seen above are qualitative (Addo & Avgerou, 2020; Hong & Park, 2018; Abada & Rusu, 2014) and case studies (Jung, 2017; Laryea, 2012; Cantens et al., 2010), Salehi et al. (2010) conduct an empirical study with a quantitative approach from the perspective of users to explore challenges of Iran's e-customs. The authors find barriers in implementation of the e-customs system in Iran from the clients' viewpoint. The data were collected by an end-user survey with 498 responses. The results show that lack of required infrastructure, a low level of familiarity among staff and clients, and shortage of correct information and documents should be addressed for the better performance of the system.

Hence, this paper seeks to address the research gap by conducting an empirical study to discover factors affecting user resistance and adoption of Cameroon's new e-customs system called CAMCIS.

Theoretical Background

Technology acceptance is defined as an individual's psychological status in terms of one's intended or voluntary use of a particular technology (Hendrick & Brown, 1984). Technology acceptance models are used to study how users may perceive and accept a new technology and to explore the factors that promote or disturb the acceptance or use of technologies (Kripanont, 2006). Several models have evolved over the years such as: Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980); Theory of Planned Behavior (TPB) (Ajzen, 1985); Technology Acceptance Model (TAM) (Davis, 1989); The Extension of the Technology Acceptance Model (TAM2) (Venkatesh & Davis, 2000); Diffusion of Innovation Model (DOI) (Rogers, 2003), and Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003).

In UTAUT, performance expectancy, effort expectancy, social influence, and facilitating conditions are important determinants of users' behavioral intention in a mandated environment (Venkatesh et al., 2003). Hence, this paper uses these four independent variables to manage a compulsory system usage context. However, UTAUT by itself cannot entirely grasp the processes by which users weigh changes regarding new technology, which ultimately influences user acceptance intention during the technological transition

period (Zhao et al., 2016). In that sense, technology acceptance and resistance should be examined together within a conjoint theoretical model (Cenfetelli, 2004). While previous research on IS usage has often overlooked the problem of user resistance, a dual factor model of Cenfetelli (2004) presents a theoretical bridge to connect research on IS usage and resistance to change within an integrated model (Hsieh, 2016; Park & Ryoo, 2013; Bhattacharjee & Hikmet, 2007). Among inhibitors of IS usage, Hsieh (2016) highlights the Status Quo Bias Theory (SQBT), which provides a set of useful theoretical explanations about the impact of maintaining the current situation as frustrating perceptions of IS usage. The author creates a research framework combining SQBT and UTAUT to empirically investigate patient's acceptance and resistance toward the health cloud. Therefore, this paper adds SQBT (Status Quo Bias Theory) on the research model to address both the switching benefits and costs (losses) that influence CAMCIS users' resistance to change.

SQB is defined as people's preference for maintaining their current status or situation (Samuelson & Zeckhauser, 1988). The theory focuses on inhibitors towards new technology in a transition period. The SQBT has three categories: rational decision making, cognitive misperceptions, and psychological commitment. Rational decision making means a comparison of relative costs with the benefits of change before switching. There are two subtypes of costs under rational decision making: transition costs and uncertainty costs (Samuelson & Zeckhauser, 1988). Cognitive misperception includes loss aversion. This is a psychological principle of decision-making that leads to claims that losses are larger than gains (Kahneman & Tversky, 1979). Loss aversion leads to SQB since people tend to recognize a small loss as bigger than it actually is (Samuelson & Zeckhauser, 1988). Psychological commitment has three factors: sunk costs, social norms, and efforts to feel in control. Sunk costs are previous commitments (Samuelson & Zeckhauser, 1988). Social norms are the prevailing norms in the workplace about the change. The efforts to feel in control describes the desire of an individual to resist changing to an unfamiliar system or a new way of working in order to maintain control (Kim & Kankanhalli, 2009).

Kim and Kankanhalli (2009) and Kim (2011) use the switching benefits and costs concept (Chen & Hitt, 2002) to identify users' perceived value in the IS transition period. The switching benefits can be the increase in outcomes and quality of work and the decrease in inputs. On the contrary, the switching costs mean the increase in inputs and the decrease in outcomes. The switching costs are composed of transition costs, uncertainty costs and sunk costs (Kim & Kankanhalli, 2009). The switching benefits include social norms, control, and performance expectancy. According to the integrative framework of Kim & Kankanhalli (2009, p.572), the loss aversion, which is a subcategory of cognitive misperception, would be a method of assessment for perceived value, not for switching costs nor switching benefits. To focus on switching costs and benefits, this paper excludes loss aversion of cognitive misperception.

Some constructs of UTAUT and SQBT are duplicated (Kim & Kankanhalli, 2009, p.570); transition costs, social norms, and control in the SQBT respectively coincide with effort expectancy, social influence, and facilitating conditions in the UTAUT model. Reflecting these characteristics, a model suitable for the Cameroon case was designed.

3. Research Hypotheses and Model

The model consists of eight independent variables: Performance Expectancy (PE), Facilitating Conditions (FC), Effort Expectancy (EE), Uncertainty Costs (UC), Social Influence (SI), Sunk Costs (SC), Switching Benefits (SWB), and Switching Costs (SWC). Transition Costs (TC) in SQBT is replaced by Effort Expectancy (EE) in UTAUT to avoid overlapping (Kim & Kankanhalli, 2009). To recap, PE, EE, SI, and FC come from UTAUT model, and UC, SC, SWB and SWC are from SQBT. According to the original UTAUT, PE, SI, FC, and EE are antecedents that directly affect behavioral intention (Venkatesh et al., 2003). However, we modified the model as the four key variables of UTAUT connect to switching costs and benefits from SQBT. Behavioral Intention (BI) and User Satisfaction (US) are dependent variables. Arrows mean that each independent variable has a direct influence on the dependent variables linked.

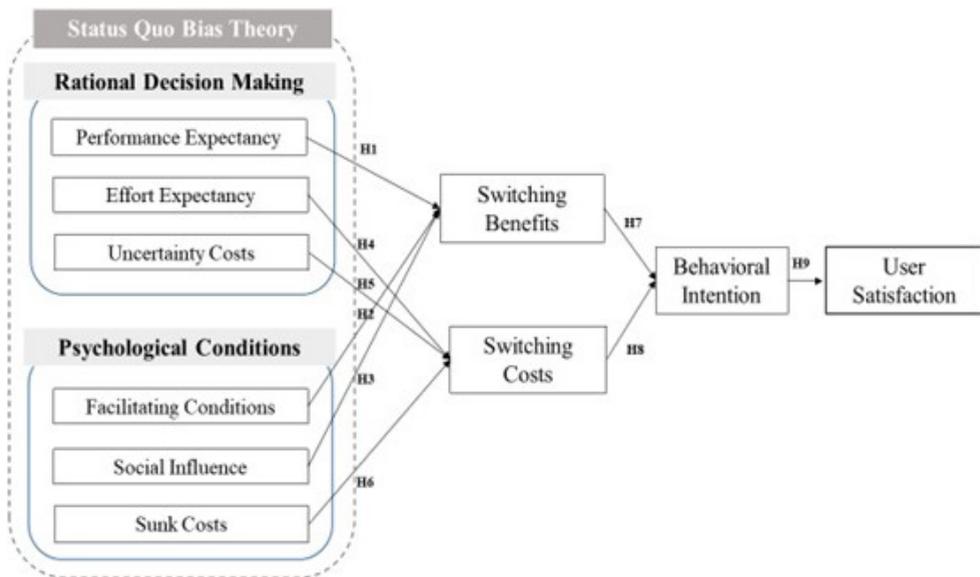


Figure 2. Research model

According to SQBT, TC and UC are sorted as the rational decision-making part, and SC belongs to the psychological commitment part (Samuelson & Zeckhauser, 1988). The rest of the variables are categorized on either side by their definitions. EE, which replaces TC, is included in the rational decision-making part. SI and FC are respectively matched with Social Norms and Control in SQBT, so that they are classified as a psychological commitment part (Kim & Kankanhalli, 2009). PE is categorized in the rational decision-making part since it measures whether users find the new system useful.

Research Hypotheses

Based on the model, we have developed the following hypotheses.

Performance Expectancy (PE) is defined as “the degree to which an individual believes that using the system will help him or her to attain gains in job performance” (Venkatesh et al., 2003, p.447). In the context of the Cameroon case, PE is measured by the perceptions of using the CAMCIS in terms of benefits, such as saving time, money and effort; facilitating communication; and improving the quality of customs services. If PE from the CAMCIS increases, the switching benefits will also increase. Therefore, to explain the effects of PE on switching benefits, we hypothesize that:

H1: Performance expectancy will have a significant positive influence on the switching benefits of CAMCIS.

Facilitating Conditions (FC) are defined as “the degree to which an individual believes that an organizational and technical infrastructure exists to support the system” (Venkatesh et al., 2003, p.453). A number of preceding studies (Chang et al., 2007; Venkatesh et al., 2003; Chau & Hu, 2002; Taylor & Todd, 1995) show that the elements of FC can enhance the innovation use. If facilitating conditions of the CAMCIS get better, the switching benefits will increase. Therefore, to explain the impact of FC on switching benefits, we hypothesize that:

H2: Facilitating conditions will have a significant positive influence on the switching benefits of CAMCIS.

Social Influence (SI) is defined as “the degree to which an individual perceives that important others believe he or she should use the new system” (Venkatesh et al., 2003, p.451). The influence from peers can be either negative or positive. It is revealed that SI is a main factor in the early stage of the mandatory system, because possibly a governing authority would give more pressure to use the system (Gonzalez et al., 2012; Venkatesh et al., 2003). If the director of the Cameroon customs or co-workers use the CAMCIS, an individual may feel constrained to accept and use it. If SI from the CAMCIS increases, the switching benefits will also increase. Thus, to explain the impact of SI on switching benefits, we hypothesize that:

H3: Social influence will have a significant positive influence on the switching benefits of CAMCIS.

Effort Expectancy (EE) is defined as “the degree of ease associated with the use of the system” (Venkatesh et al., 2003, p.450). Several scholars (Gupta et al., 2008; Venkatesh et al., 2003; Davis, 1989) find that EE significantly influences users’ behavioral intention. Moreover, EE can replace TC in SQBT, which is defined as transient expenses and losses

related to the change (Samuelson & Zeckhauser, 1988). In this paper, EE is measured not only by the ease of learning how to use CAMCIS, but also by the perceptions of the ease of use of the system. If EE from the CAMCIS increases, the switching costs will decrease. Thus, we hypothesize that:

H4: Effort Expectancy will have a significant negative influence on the switching costs of CAMCIS.

Uncertainty Costs (UC) are defined as the psychological uncertainty or perceptions of risk surrounding the performance of an unknown or untested IS service and its provider (Jones, 2002; Gultinan, 1989; Schmalensee, 1982). The users consider the risk and uncertainty high when the quality of the system is hard to judge (Jones et al., 2002; Zeithaml et al., 1981). In the context of the Cameroon e-customs, if UC from the CAMCIS increase, the switching costs will also increase. Thus, we hypothesize that:

H5: Uncertainty costs will have a significant positive influence on the switching costs of CAMCIS.

Sunk Costs (SC) are defined as “perceptions of investments and costs already incurred in establishing and maintaining relationship” (Jones et al., 2002, p.442). SC are economically irrelevant but psychologically significant in an exchange relationship (Dick & Lord, 1998; Gultinan, 1989). Samuelson and Zeckhauser (1988) define SC as former commitments, which can cause unwillingness to switch to a new system. These costs cover skills regarding the valuable way of working, which the users lose during the transition to the new IS. Users would not likely want to lose the time and effort taken to learn ASYCUDA++ when adopting CAMCIS. If the SC are high, the switching costs will also increase. Thus, we hypothesize that:

H6: Sunk Costs will have a significant positive influence on the switching costs of CAMCIS.

Switching Benefits (SWB) are defined as “the perceived utility a user would enjoy in switching from the status quo to the new IS” (Kim & Kankanhalli, 2009, p.573). Researchers infer that utility comes from switching to a new alternative (Chen & Hitt, 2002), and the potential of enhancing performance and convenience can promote users’ intentions to use the new system. Logically, if the users think the overall SWB of the CAMCIS are bigger, they will have a stronger intention to use it (Shirish & Batuekueno, 2021; Hsu, 2014; Kim & Kankanhalli, 2009). Thus, we hypothesize that:

H7: Switching benefits will have a significant positive influence on the behavioral intention of CAMCIS.

Switching costs (SWC) are defined as “the perceived disutility a user would incur in switching from the status quo to the new IS” (Kim & Kankanhalli, 2009, p.572). When the burden and disbenefits increase, people are more likely to be hesitant to change because they have a desire to cut losses (Kahneman & Tversky, 1979). In a marketing context, Burnham et al. (2003) explained switching benefits as one-time costs that customers associate with the process of switching from one provider to another. Steep SWC results in lesser intent to migrate to a new system (Asimakopoulos & Asimakopoulos, 2014; Polites & Karahanna, 2012; Kim & Kankanhalli, 2009). Thus, we hypothesize that:

H8: Switching costs will have a significant negative influence on the behavioral intention of CAMCIS.

Behavioral Intention is defined as “the person’s subjective probability that he or she will perform the behavior in question” (Fishbein & Ajzen, 1975, p. 288). BI is utilized as a dependent variable in a majority of technology adoption studies because it is considered as a direct influence on adoption (Venkatesh et al., 2003). In the original UTAUT, BI connects to use behavior, which indicates actual usage of the technology. However, while BI can be utilized in both mandatory and voluntary conditions (Venkatesh et al., 2003), Brown et al. (2002) criticize that discussing actual usage in mandatory use environments is inappropriate because there is almost no alternative than using the system required. Thus, several empirical studies (Rahayu et al., 2019; Maillet et al., 2015; Zaided, 2015; Dalcher & Shine, 2003) put user satisfaction (US) as a dependent variable in the mandatory IS context of the public sector. US is defined as the degree to which users are satisfied with the decision to use the new technology because it meets their expectations (Isaac et al., 2018). US is one of the most widely used single measures of IS success to evaluate user response (DeLone & Mclean, 1992). Zaided (2015) and Rahayu et al. (2019) examine that BI significantly influences US when they assess the critical success factors affecting IS in the public sector with integrated success model (ISM), which is a model combined TAM (Davis, 1989) and IS Success model (DeLone & McLean, 2003). Hence, we apply BI and US as dependent variables, excluding the use behavior. Rahayu et al. (2019) state that if BI increases, it will positively influence US. Therefore, we hypothesize that:

H9: Behavioral intention will have a significant positive influence on user satisfaction of CAMCIS.

4. Research Methodology

Measurement Items

The questionnaire was developed according to the existing validated scales from major preceding research (Table 2). The scales from Venkatesh et al. (2012) were adopted to measure variables from UTAUT, and a scale from AlAwadhi et al. (2008) was added for facilitating conditions. To measure variables from SQBT, the scales from Jones et al. (2002)

were modified and adopted. To measure switching costs, the scales were taken from Bansal et al. (2005). For switching benefits, the scales were borrowed from Moore & Benbasat (1991) and Kim & Kankanhalli (2009). To measure behavioral intention, the scales from Venkatesh et al. (2012) and Gefen et al. (2003) were chosen. Finally, user satisfaction is measured by scales from Nguyen et al. (2016) and Isaac et al. (2018).

Data Collection

We collected data from internal and external users who have experienced both ASYCUDA++ and the CAMCIS for more than two months. Internal users are customs officers, and external users are mainly licensed customs brokers, exporters, or multinational corporations. The same questionnaire was distributed for both groups of users. The survey was conducted online using a Google survey form, distributed via email. The survey period was from May to June 2020.

Descriptive Analysis

The questionnaire was randomly distributed to approximately 200 users in the form of an online survey, and a total of 107 completed responses (a response rate of about 53.5 percent) were collected. Seven null and void answers were excluded. The profile of the final sample is shown in Table 3. Among 100 respondents, 66% are males and the rest are females. A majority of the respondents are between the ages of 31-40 years (54%). 43% of the respondents use the e-customs 4-5days in a week. The e-Customs experience length vary from less than a year (9%) to more than ten years (31%). Internal users take 83% and the rest are external users.

Table 3. **Profile of the respondents**

Demographic Variable		Frequency and Percentage (%)
Affiliation	Internal users*	83 (%)
	External users**	17 (%)
Gender	Male	66 (%)
	Female	34 (%)
Age	20-30	3 (%)
	31-40	54 (%)
	41-50	35 (%)
	Over 51	8 (%)
* Employees of the Cameroon Customs who have used both ASYCUDA++ and CAMCIS.		
** Customs brokers, exporters or employees of multinational corporations who have used both ASYCUDA++ and CAMCIS.		

Demographic Variable		Frequency and Percentage (%)
Period of Use	Less than 1 year	9 (%)
	1-3 years	14 (%)
	4-7 years	26 (%)
	8-10 years	20 (%)
	More than 10 years	31 (%)
Frequency of Use	1 day	14 (%)
	2-3 days	7 (%)
	4-5 days	43 (%)
	More than 5 days	36 (%)

5. Results

Power Calculation for PLS

We performed partial least squares analysis (PLS) 3.0 on the collected data for several advantages. It has minimum demands regarding sample size, and generally achieves high levels of statistical power (Jetzek et al., 2013; Hair et al., 2011). Moreover, it is suitable for finding key drivers of the complex structural model (Hair et al., 2012; Hair et al., 2011; Ringle et al., 2012). To find a required sample size, the power calculation of PLS is done by G* Power (Faul et al., 2007; Faul et al., 2009). Based on Cohen's (1988) suggestion, the result shows that the required sample size is 77 to have .80 power and to detect a medium-size effect at the .05 significance level. This is the most reliable and supported method, which proves that we have a required sample size (e.g. 100 responses) for a study (Kesan & Zhang, 2019).

Validity Test

To validate the reliability of the survey instrument, discriminant and convergent validities were assessed. Discriminant validity is assessed by factor loading and average variance extracted (AVE) (Fornell & Larcker, 1981). According to the main diagonal elements of the discriminant validity matrix (Table 4), all correlations between two different constructs were not higher than 0.85, nor higher than the square root of AVE. Therefore, we reached the conclusion that the indicators meet the threshold of each validity test.

Next, we assessed the convergent validity of the constructs using Smart PLS 3.0. As shown in Table 5, the composite reliability and Cronbach's alphas for all the constructs surpass 0.7. And the AVE for each construct exceeds 0.5. Thus, the convergent validity of the instrument was demonstrated overall.

Table 4. Discriminant validity

	BI	EE	FC	PE	SC	SI	SWB	SWC	UC	US
BI	0.90									
EE	0.63	0.90								
FC	0.60	0.70	0.83							
PE	0.76	0.67	0.54	0.91						
SC	0.41	0.20	0.35	0.40	0.95					
SI	0.73	0.60	0.54	0.77	0.36	0.92				
SWB	0.65	0.59	0.60	0.78	0.41	0.74	0.92			
SWC	-0.28	-0.28	-0.20	-0.23	0.10	-0.14	-0.21	0.88		
UC	-0.08	-0.09	-0.03	-0.01	0.22	-0.04	-0.02	0.64	0.88	
US	0.68	0.70	0.62	0.77	0.36	0.68	0.77	-0.27	-0.13	0.93

Note: **Bold** diagonal values represent the square root of the AVE, and the off-diagonal value represents the correlation of the coefficient.

Table 5. Convergent validity testing

Constructs	AVE	Composite Reliability	R Square	Cronbach's Alpha	Communality	Redundancy
Performance Expectancy	0.830	0.936	0	0.897	0.830	0
Facilitating Conditions	0.684	0.865	0	0.775	0.684	0
Effort Expectancy	0.818	0.931	0	0.890	0.818	0
Social Influence	0.854	0.946	0	0.914	0.854	0
Uncertainty Costs	0.780	0.914	0	0.860	0.780	0

Constructs	AVE	Composite Reliability	R Square	Cronbach's Alpha	Communality	Redundancy
Sunk Costs	0.901	0.964	0	0.945	0.901	0
Switching Benefits	0.846	0.956	0.685	0.939	0.846	0.174
Switching Costs	0.774	0.911	0.453	0.854	0.774	0.057
Behavioral Intention	0.818	0.947	0.441	0.924	0.818	0.341
User Satisfaction	0.867	0.963	0.464	0.949	0.867	0.400

Conceptual Model Testing

Standardized path coefficient (β) and bias-corrected confidence intervals (t) are determined by the PLS algorithm and bootstrapping. The path coefficient confirms the explanatory power of each variable, and bias-corrected confidence intervals are required to calculate the significance probability (p value).

The results of the structural equation model analysis of this study are shown in Figure 3. SWB were explained by three independent variables, with PE ($\beta = 0.450$, $t = 4.298$, $p = 0.00$), FC ($\beta = 0.208$, $t = 2.506$, $p = 0.01$) and SI ($\beta = 0.282$, $t = 2.857$, $p = 0.00$). These variables together explained 68.5% of the variance of SWB. As a result, Hypotheses 1, 2 and 3 were all supported. SWC were explained by EE ($\beta = -0.224$, $t = 2.806$, $p = 0.00$)

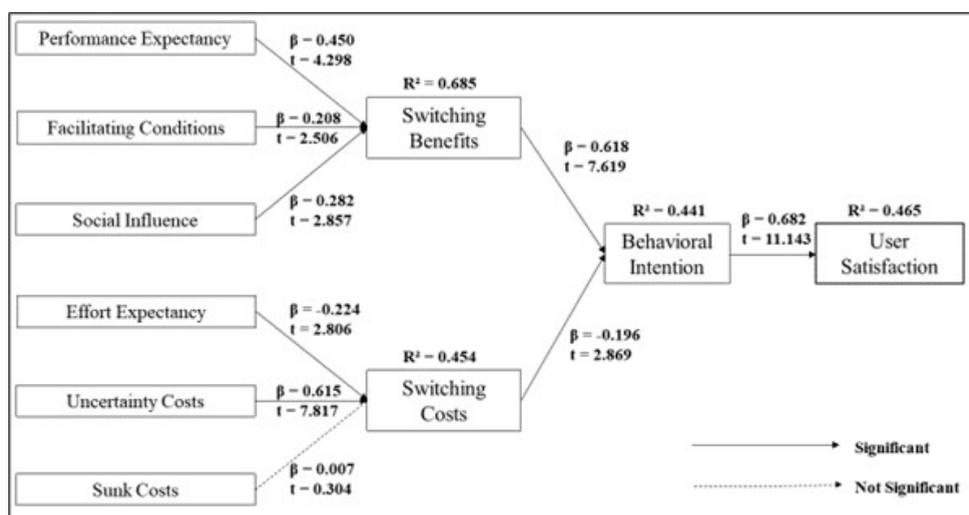


Figure 3. The results of the structural equation model analysis

and UC ($\beta = 0.615$, $t = 7.817$, $p = 0.00$). The two of them explained 45.4% of the total variance in SWC ($R^2 = 0.454$), so that Hypotheses 4, 5 were supported. BI is explained by SWB ($\beta = 0.618$, $t = 7.619$, $p = 0.00$) and SWC ($\beta = -0.196$, $t = 2.869$, $p = 0.00$). Those variables explained 44% of the variance of BI ($R^2 = 0.441$). Accordingly, Hypotheses 7 and 8 were supported. US is significantly influenced by BI ($\beta = 0.682$, $t = 11.143$, $p = 0.00$), with 46.5% ($R^2 = 0.465$) explanation power. Consequently, Hypothesis 9 was supported. On the other hand, SC ($\beta = 0.007$, $t = 0.304$, $p = 0.47$) did not significantly influence switching costs. Thus, Hypothesis 6 was not supported.

We also examine moderating and main effects of user's age, period of use, and affiliation towards dependent variables (PE, FC, SI, EE, UC, SC, SWB, SWC). As a result, none of them has a significant moderating or main effect.

6. Discussion

The results show that PE significantly influences SWB, alleviating user resistance to the new e-customs system. Furthermore, PE is the strongest construct ($\beta = 0.450$) among the three variables affecting SWB, which coincides with the prediction that PE is the most powerful driver in the UTAUT model in general (Venkatesh et al., 2003). The findings show that system implementers and technology suppliers need to make systems more useful and efficient so that users perceive that their job performance is improved due to the new system.

According to the findings of the study, FC have a significant effect on the SWB. In the CAMCIS context, not only the computer and internet but also the training system and service desk, which can support users whenever they need help, should be furnished to increase the SWB. Moreover, the organizational environment plays a crucial part, so it should be well prepared to reduce barriers and challenges that frustrate the system use.

The results reveal that SI has a significant influence on SWB. The positive opinion of superiors and colleagues who are important to the actual users highly affects the SWB during an early stage of the system adoption (Mahzan & Lymer, 2014; Wills et al., 2008). Furthermore, due to the mandatory usage setting, social influence is heavily reinforced, since the CAMCIS users have to follow the opinion of people who are working together in a vertical relationship at their office.

The results indicate that the EE shows a significant negative effect on SWC. As Venkatesh et al. (2003) prove, the EE induces users to adopt the system. Therefore, there is a need for sufficient training sessions for users to lessen learning time and effort. Moreover, the user interface and interaction with the CAMCIS also need to be clear and easy to increase the ease of use.

The findings of the study reveal that UC are the most remarkable predictor of SWC ($\beta = 0.615$) for CAMCIS, which is consistent with the prediction of SQBT (Samuelson & Zeckhauser, 1988). The users might perceive strong uncertainty since they were not familiar with the CAMCIS and organizational changes before the transition. To mitigate

this aversion, clear information about the CAMCIS and accompanied changes should have been conveyed before the operation (Kim, 2011).

The findings from the study denote that SWB directly increase users' BI to use the CAMCIS. It implies that the higher the SWB are, the greater the users' willingness to use the system is. To increase SWB, the implementer and technology suppliers should strengthen the usefulness and effectiveness of the new system. To achieve greater BI, SWB should exceed SWC.

This study also determines that SWC show a negative but significant effect on BI to use the CAMCIS. This means that if SWC increase, the intention to use the new system decreases. Even though using the CAMCIS is a mandate without any alternative, if the BI diminishes severely due to the high SWC, it will undermine users' work efficiency and job satisfaction. Regarding the importance of the customs in the Cameroon economy, it can cause serious losses in a long-term perspective. To lower SWC, implementers should consider an appropriate design of the organizational change. The managers need to detect potential damages in advance and try to remove or alleviate them when designing and implementing the system (Kim, 2011).

The findings of this study verify that there is a statistically significant connection between BI and US. It is consistent with the results of a preceding study (Rahayu et al., 2019), which verifies implementation success of a financial control system of the public sector. It shows that BI strongly influences US and actual usage ultimately appears as a result of US. Furthermore, the findings provide evidence that actual usage can be disregarded as shown by Brown et al. (2002) who claim that in the mandatory environment, the traditional notion of 'actual use' (i.e. physically using the technology) is not an appropriate dependent variable. Thus, it can be concluded that if BI increases due to the net perceived benefits in the IS switching period, US will increase.

Nevertheless, the effects of SC in this study were not in line with the prediction of the preceding research. This statistical insignificance may be caused by the fact that users are limited in their capabilities to evaluate the psychological or emotional inconvenience of SC compared with the discomfort in the rational part (Kim, 2011). Furthermore, the investment made in the past cannot be exactly measured, since the previous system ASYCUDA++ was implemented in 2007. In other words, the majority of users have used the old e-customs for more than 10 years, so they might not be able to precisely remember and estimate the expended time and effort to learn ASYCUDA++. It shows that the results from the e-government context in developing countries can be different from that of existing SQBT research.

7. Conclusion

This study investigates users' adoption and resistance toward a new e-customs system in Cameroon with the research model that combines UTAUT and SQBT. Most of the hypotheses were statistically supported. The study can deliver both academic and practical implications as follows:

Theoretical Implications

Firstly, it is one of the first studies that empirically examines users' adoption and resistance of e-customs in the developing country context. While some research on e-government in developing countries has been done so far, there is little focusing on e-customs which is increasingly important for developing countries' trade, and thereby for their economy. This study contributes to the research field by exploring the new e-customs currently in operation in Cameroon. Moreover, it reflects the actual users' perspectives. It is crucial to shed light on the demand side of the IS project, because it diminishes the failure rate of the project by reflecting actual users' opinions.

Secondly, this study adds value to the research fields of user resistance and IT/IS acceptance by conducting empirical research with a unique model. There is a lack of empirical validation through surveys since a majority of user resistance research is based on case studies (Kim, 2011). This research is an earnest attempt to fill that gap. It also contributes to the IT/IS acceptance research field by introducing a unique model with SQBT to the area of the e-customs. Previous studies on new technology acceptance have mainly been based on traditional frameworks such as TAM, TPB, or UTAUT (Zhao et al., 2016). Wang and Wang (2010) argue that TAM, TPB, and even UTAUT have a limited ability to explain the adoption of new ICTs. Therefore, this study grafts SQBT in order not to discount users' hesitance in the IS transition. It provides a more holistic view of technology acceptance since it can measure both user acceptance and resistance. In addition, the results demonstrate that SC (sunk costs) do not predict SWC (switching costs) unlike original SQBT (Samuelson & Zeckhauser, 1988). It can present an implication to other researchers studying user adoption and resistance of developing countries' e-government system.

Lastly, this study classifies subtypes of SWC and SWB (switching benefits), and examines the individual effects of each. There has been a scarcity of such a try in the research field of user resistance (Kim, 2011; Kim & Kankanhalli, 2009). We categorize subtypes of SWC (UC, SC, and TC = EE) based on SQBT (Samuelson & Zeckhauser, 1988), and make a new classification of key factors from UTAUT (PE, SI and FC) as subtypes of SWB to examine the hypotheses.

Practical Implications

As the replacement cycle of existing e-customs system and other G2G or G2B e-government systems in many developing countries is approaching, some lessons from the study can be used as guidelines in the decision-making for similar replacement projects. The study can help policymakers and e-government developers consider some elements that must be dealt with carefully to implement the systems successfully. Specifically, the results highlight that uncertainty costs (UC) and performance expectancy (PE) should be managed for the successful implementation of supplanted systems.

On the side of recipient organizations where a new replacement system is to be implemented, a campaign for users should be conducted prior to the deployment to mitigate UC.

In the campaign, clear information about expected changes and advantages of the new system need to be conveyed. Education/training sessions for introduction and transition can help reduce UC if work efficiency to be gained and potential risks are clearly identified and explained in the sessions. The appointment of technology champion can be considered to promote the benefits of the new system and address some negative responses. On the donor side, system developers in charge of the development and implementation should concentrate on enhancing usability to increase PE. It is important to develop an intuitive and convenient system that improves work efficiency. For this, it is critical to work closely with the staff responsible for the new system on the recipient side and their technology champions if any. Additionally, budget for maintenance and transition training should be secured from the planning stage rather than leaving it to the recipient organizations which typically lack of resources for sustaining the systems developed by aid programs.

Limitations and Further Research

First, the loss aversion is one of the components of SQBT (Samuelson & Zeckhauser, 1988), but it is excluded in the study to focus on SWC and SWB. Future study may empirically validate this principle in the IS usage context.

Second, this study shows that SC have little effect on SWC in developing countries' e-customs system usage, which is inconsistent with the original SQBT (Samuelson & Zeckhauser, 1988). Future research can verify this relationship further in other fields.

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