A Model for Adopting and Using E-Filing

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Abstract:- The adoption and usage of e-filing applications is a phenomenon most governments, including South Africa are still grappling with, and therefore, an ongoing information systems business leadership research is a key issue. The research problem is that despite the e-Government application being implemented and maintained at a high cost, there is little uptake and optimal use. The revenue application has greater benefits such as tax calculation accuracy, tax submission done timeously during any time of the day, improving tax efficiency by reducing administration cost. Since the value and the investment is huge, the burning question is then why the accepting and usage of e-filing by taxpayers not as it should? Information from previous studies are quite on this phenomenon, in the South African context and this then left a knowledge gap, which this paper bridges. This paper focuses on explaining and exploring adopting and using e-filing as reasons why some of taxpayers accept and use the revenue application while others are not using it are still unknown. Argument is that despite South Africa implemented a cutting-edgesystem since 2006, taxpayers still queue at its branches for manual submissions.

Keywords:- E-Government, e-filing, Tax knowledge, Tax Compliance, Technology acceptance and usage models i.e. Unified Theory of Acceptance and Use of Technology, Total Task Fit and Tax Compliance Models.

I. INTRODUCTION

This paper explores adopting and using the e-filing for submission of tax returns. Everyone who is earning an income is required by law in South Africa, to file tax returns annually. Taxpayers may either submit tax returns via online through the e-filing or they can physically goto a tax branch office to manually file tax returns.

According to Ishola (2016), tax is a compulsory levy collected by the tax authority from individual taxpayers and organisations in line with the tax laws of a country. Ibid, 2016, pointed that a fair system taxation is recommended and it need to be convenient and efficient. Taxes are payable on any type of earnings (Ibid, 2016). Biggest fear of users of information system globally is commonly the concern of sharing personal and confidential information when using any technology via online platforms. Laudon and Laudon (2013), mentioned that there is lots of vulnerabilities to many kinds of threats when huge personal data is kept in an electronic form than when in physical manual paper form. Chances of unauthorised access to data which is stored electronically is evitable because data misuse can take place at any point where the system can be accessed. It is very critical that the tax authority’s website for e-filing must be highly secured as it is used by many taxpayers whose personal data might be at stake. Advice by Crews (2013), is that users of information system must avoid the usage of free public Wi-Fi as it lacks security from data manipulations by third parties when accessing the system. For example, the introduction of the Covid-19 pandemic globally, have increased the need for the usage of online platforms for services like the e-filing, offering of educational class sessions for schools, including tertiary institutions, etc. The implementation of e-filing in South Africa had moved it upwards on the world rankings on tax processing from position 32 to position 11 (Berger, 2011). It takes 200 hours for a company in South Africa to process a tax return while the global average is 268 hours (Berger, 2011).

United States of America was the first to use a system of filing returns through electronically in 1986 (Lai and Choong, 2010). Users are motivated to submit their returns electronically on time and accurately when they are treated fairly (Kirchner, Niemirowski and Wearing, 2006). Taxpayers cooperate willingly when they are fairly treated, rules justifiable, decisions clarified, correct information provided when questions are asked and problems resolved (Kirchner, Niemirowski & Wearing, 2006). A reliably integrated system in economically disadvantage countries is still to be implemented even though e-filing is accepted globally by citizens (Azmi and Kamarulzaman, 2010). Globally, e-services do not satisfy users of those systems because of scepticism, absence of digital skills, no system trust, complicated outcomes due to inadequate guidelines, etc. (Lee, Kim and Ahn, 2011). Taxpayers without computer skillsmight have challenges in submitting their returns electronically (Lee, Kim & Ahn, 2011). Easiness of using technology is crucial to the one who use such applications, thus user-friendly systems (Wirtz and Piehler 2016). Mustapha (2015), mentioned that successfull implementation of e-tax depends on easy to use as a vital determinant while Gilbert, Balestrini & Littleboy (2004), identified taxpayers not preferring e-filing than the traditional filing of returns if the application is enjoyable and easy to use. User acceptance to use an information system for the functionality supported by the design show their willingness (Dillon and Morris, 1996). Tax system that is not simple to use is a barrier for convenience, clarity and collection economies, system updates must be done continuously to be simplified (Marcus, 2007).
e-Government

Gupta, Dasgupta & Gupta (2008) defines e-Government as the application of information system. According to United Nations [UN] (2005), e-Government is explained as a usage and application of information system for service delivery to citizens. Leitner, 2003; Beynon & Davies (2005), stated that electronic services are the tools provided by a government to make its democracy, transparency, and accountability better including its performance. Carter & Belanger (2005), mentioned that e-Government promotessimplicity of access for essential government services by its citizens.

Pardo et al. (2016), stated the vision of e-Governance being to establish improved public services offered forby governmentstostain its objectives efficiently and effectively. According to United Nations (2016b), electronic government provideprovides adequate services to peopleas an important tool encourage citizens to participate in raising issues pertaining to services provided. Government administrations globally invest large sum of money annually in e-Government projects (World Bank 2016). Accepting and using the e-Government by citizens (G2C) remains low globally across the world (Shalhoub 2006; World Bank 2016).

Main reasons for lower adoption rate of e-Government have were observed to be security, trust, risks involved and individual privacy (Shalhoub 2006; Zafiropoulos, Karavalis and Vrana 2012). South African government implemented e-Government revenue applications also known as e-filing in 2006 via its tax authority being the South African Revenue Services (SARS), to enable electronic tax form submission for all taxpayers to utilise when doing tax returns (SANews, 2013).

Stages for e-Government

Models for e-Government have similar components and stages but only differs in terminology ofeach stage(Rorissa, Demissie and Pardo, 2011). Four stages of online services as identified by Rorissa et al., (2011), initial stage which runs parallel with the manual process to offeran option for those who are not able to access information electronically. Stage which follow is the relationship between government and citizens through a phone or electronic platforms for providing services. Interaction on this stage involves electronic participation and electronic democracy astategies for improving engagement of citizens by politicians in government (Missingham, 2011). Electronic payments made to the government including information received via online signifying the stage of transaction completion. Last transformational stage involves inputs being processed into electronic governance results and government services and interactions are done only electronically. At this stage, the government is fully restructured in its back and front office management systems (Weerakkody, Janssen and Dwivedi, 2011; Cloete, 2005). Virtual government is experienced at this stage in sectors where services are provided electronically. E-Government service in South Africa is at the earlystage regarding e-filing for tax return submission hence manual tax returns are still accepted at its branch offices.

Adopting and using information system

Fu, Farn& Chao (2006) describes information system adoption by users being psychological state of mind regarding user’s voluntary intention to use ICT. Perceived easy to use is the willingness person have for believe the use of certain application will not require human effort to action the task to be done (Davis, 1991). Effortlessness in using a technology to perform a task is a user’s subjective perception. Factors for perceived ease of use are: easiness, readability, simple language, comparable information and effortless when moving to the first page (Davis, 1991). Perceived easiness of using information system affect person’s perception for learning and usage of technology (Venkatesh, 2000).

Electronic filing as an e-Government tool for services

Electronic filing is an application suitable for submission of returns to tax authority via the internet platforms (Barodiva and Bhurgava, 2015). Electronic filing of tax return is a tool used by government deliver services to the community via an online platform (Fu, Farn, and Chao, 2006). Revenue application improves efficiency tax payments and quick refunds processing (Santhanamery and Ramayah, 2015). Accurate calculation of tax is the important benefit of the e-filing because proof of submission is acknowledged immediately by the tax authority (Ibid., 2015). Tax administrative costs and workload decreases due to e-filing usage (Azmi & Kamarulzaman, 2010; Santhanamery & Ramayah, 2015). Electronic filing user must have basic computing skills and knowledge of information system for internet browsing.

E-filing use internet platforms where physical paper return is not required (Wasao, 2014). E-tax automate tax processes for submitting tax return with a aim of advancing efficiency (Fu et al., 2006; Dowe, 2008; Fenwick and Brownstone, 2002).

Benefits of e-filing

Auto-calculation of tax in computing minimise human errors and improves efficiency for processing (Santhanamery and Ramayah (2015). Authorities do not manually capture the tax returns which minimise mistakes during tax return processing (Santhanamery and Ramayah (2015). Tax return processing costs, safekeeping and handling are minimised (Azmi and Kamarulzaman, 2010). Taxpayers submit their returns at any time, which is convenient, and they system give notification immediately confirming transaction done (Kumar and Anees, 2014).

Concerns about the e-filing

Ideally, fair tax system is necessary and should be simplified, enforceable and support economic prosperity for the community it serves (Slernrod and Bakija, 1996). It is inevitable for taxpayers’ personal information to be subjected to security risk as e-filing uses internet platform (Hoffman, Novak and Peralta, 1999). For a taxpayer to file
tax return successfully, they need to have basic computing skills as well as the knowledge of information technology to be able to browse the internet (Wirtz and Pehler, 2016).

Taxpayers are afraid of using the revenue application due to threats to their private information, forgery and identity theft (De Castro, Cordero, De Chavez, Gabia, Mortel, Yortas, Manongsong & Pateia, 2015). Taxpayers adopting and using-filing are affected by the security threat fear for their personal information and that prevent them from using it (Lu, Hsu and Hsu, 2005). Perceived lack of security lowers the confidence of taxpayers from adopting and using the revenue application (Moorthy, Samsuri, Hussin, Othman & Chelliah, 2014; Santhanamery & Ramayah, 2015). Factors influencing citizens when using-filing are trust and transaction security (Rehman, Esichaikul and Kamal, 2012). Taxpayers’ attitudes are influenced by their compliance behaviours as it represents their opportunity for positive or negative action (Ajzen, 1993). Taxpayers’ perceived risks influence their intention to use the electronic filing (De Castro, Cordero, De Chavez, Gabia and Mortel, 2015). Information system developers must thoroughly address system design, good online service and privacy assurance to encourage user to continue using e-services (Chen, Jubildo, Capistrano & Yen, 2015).

**E-filing challenges**

Taxpayers incur tax compliance cost like internet usage or the use of a tax consultant who submits returns on his/her behalf even though tax return submission is free (Lu, Hsu and Hsu, 2005). Citizens need to have basic computing and internet skills to file returns via electronic filing (Ibid, 2010). As electronic operate on internet platforms, users incur data cost for accessing the revenue application via the internet and if they don’t have data the only option will be to file their tax returns manually (Gilbert et al., 2004). When tax season approaches deadline taxpayers may experience system slow response due to network traffic as many people access the e-filing at the same time (Azmi and Kamarulzaman, 2010). Acceptance and usage of the online tax is influenced by computer literacy level and internet infrastructure accessibility (Auyat, 2013). The adoption and usage of an e-tax is influenced by taxpayer’s confidence with online filing and lack of computer literacy that affect them psychologically (Muhangi, 2012). Taxpayers might be afraid of using the e-filing on because of lacking computer experience that increases anxiety and stress when using technology (Muhangi, 2012). Taxpayers might have a perception that the system is unreliable if it cannot properly carry large information during busy period and that will decrease their intentions of adopting and using it (Nakiwala, 2010).

One of the challenges with regard to revenue application is that user needs to remember password every time when accessing the system (Azmi and Kamarulzaman, 2010). Introduction of e-Governance is a challenge for many governments globally as difficulties might occur in the initial stage and during system upgrade of the e-

Government sites (Kroukamp, 2005). Security of personal information collected and stored by government might be compromised if its security is breached on their websites (Ibid., 2005). Lack of facilities and internet access lower the level of access to the electronic services the poor communities (OECD, 2003). Illiterate taxpayers are likely not to use technologyservices due to lack of computer skills and general education standard (Kroukamp, 2005). Taxpayers who are physically challenged should find it simpler navigate through e-Government websites, sogovernments must ensure accessibility of their e-services to all citizens (Ibid., 2005). Government as the service provider must embark on awareness campaign to educate people about the advantages e-Governance to improve citizens’ confidence and persuade them to use the system (Ibid., 2005).

**Tax knowledge and tax compliance**

Taxpayers’ aware about their tax obligation and other tax-related information needed when filing returns to tax authority is known as tax compliance (Hasseldine, Holland & Rijt, 2009). Awareness of tax obligations for registering and filing tax return depend formal education taxpayer received (Hasseldine, Holland and Rijt, 2009). Complying with tax requirements relates to level that a taxpayer fulfil or fails to fulfill his/her tax obligations as prescribed by law (Marziana, Norkhazimah & Mohmad, 2010). Efficient tax administration system encourages voluntary tax compliance behaviour by using penalties for non-compliance as well as other methods (Marziana, Norkhazimah and Mohmad, 2010). Previous studies put more emphases on taxpayers’ perception that tax system fairness is a significant factor influencing tax compliance levels (Marziana, Norkhazimah and Mohmad, 2010). Tax awareness and knowledge influence complying level (Marziana, Norkhazimah and Mohmad, 2010).

Psychologically based theories and deterrent-based theory are tax compliance theories (Riahi-Belkaoui, 2014). Theory for deterrence recognised taxpayers as moral utility maximisers being influenced by profit maximization and detection probability when submitting tax returns (Riahi-Belkaoui, 2014). Taxpayers evaluate compliance options of whether to not comply with tax obligations together with chances of being detected, and then choose the option that maximize favourable tax returns results and manage the risk (Riahi-Belkaoui, 2014). Psychologically based theory focuses on taxpayers as being influenced by psychological factors when complying with tax rules, this theory is concerned more about taxpayers’ morals and ethical standards (Riahi-Belkaoui, 2014). According to this theory, taxpayer comply with their tax obligations even when chances of being caught are slim, emphasis is on tax education to change individual attitudes towards the tax systems (Ibid., 2014).

**The history of tax compliance**

Compliance with tax requirements has been hostile for long years ago due to tax being regarded as unfair by taxpayers (Director, Taxworld Organization, April 7, 1999). Tax revolt led Boadecia queen of East Anglia was
experienced in 60A.D during the Roman empire, it occurred because of corrupt tax in Great Britain (Director, Taxworld Organization, 1999). The nobles of Aquitaine rebelled against tax policies of Edwardbeing the main factor for reviving a 100 years’ war (1337-1453) between Great Britain and France 1369. Solution for tax hostility problem is establishfactors influencingbehaviour of taxpayersand influence same factors for compliance with the tax obligations. Tax in South Africa was levied on all African men who never worked in mines on a 3month employment according to tax levy implemented in 1894 as per Glen Grey Act as being enforce by the imperialist Cecil John Rhodes (van der Berg & Bhorat, 1999). African rural population paid hut taxes to increase benefits for receiving payments from the mines while labour tax was differentiated via poll (van der Berg and Bhorat, 1999). Income Tax Act 28 of 1914 was firstly adopted in South Africa (van der Berg and Bhorat, 1999). Compliance with tax can be advanced by makingthe administration of tax to be effective and efficientand this topic is of great interest to tax compliance researchers (Silvani, 1992). Tax compliance can be improved by having clear demarcations of the administration of tax for effectiveness and efficiency together with administrative control measurements at various levels (Silvani, 1992). The Administrative effectiveness play an important role in countries that have high level of tax evasion even though the list of determinants of voluntary complianceis endless (Silvani, 1992).

Effective tax administration needs to address shortfalls listed below at all levels for improving tax compliance as well as restrictionof shifting non-compliance to other areas (Silvani, 1992):
- Gap on unregisteredand registered taxpayers.
- Amount of registered taxpayers compared taxpayers submitting tax returns.
- Potential tax gap compared to tax received as tax return submissions.
- Actual tax paid by taxpayers as compared to what authorities assessed.

Government together with tax authority’s image, employees’ credibility, company culture and structure and human resource are the critical factors to be consider for achieving good tax compliance prior studies undertaken in Basic key qualities required for a tax administration in the economically disadvantaged countries including South Africa are simplicity and clarity.

| Source | Definition |
|--------|------------|
| Gupta, Dasgupta and Gupta, 2008 | Electronic government is a known technology used for providing services. |
| United Nations, 2005 | E-Government is the application of information system to provide services to the citizens. |
| Leitner, 2003; Beynon and Davies 2005 | E-Government services are tools for improving democracy, transparency, and accountability. |
| Carter and Belanger, 2005 | Electronic services promotes access and simplify the provision of essential services to people. |
| Fu, Farn, and Chao, 2006 | Technology adoption refers to a person's psychological state for voluntarily deciding to use information system. |
| Barodiva and Bhargava, 2015 | Electronic filing is an application for filing returns via the internet. |
| Wasao, 2014 | Electronic filing is a process of submitting returns electronically with no need to submit physical tax return form. |
| Fu, Farn and Chao, 2006 | Electronic filing is a tool service delivery via an online platform. |

Table 1: Authors’ describing e-Government, technology adoption and e-filing

II. SURVEY OF SCHOLARSHIP

Theoretical models which were developed in the previous studies forexploring and explain the determinants which influence technology adoption and usage are Theory of Reasoned Action, Technology Acceptance Model, Theory of Planned Behaviour, Task Technology Fit Model, IS Success Model and Unified Theory of Acceptance and Use of Technology. These theories are not a solution for adopting and using e-filing specifically in South African context. Existing literature have no known model developed which outline factors to consider when adopting and using e-filing including reasons why some taxpayers adopt and use it while other do not adopt and use this e-service. This study develops a model which can be practically used as a solution to the challenges of adopting and using e-filing in the conditions of South Africa. E-filing is an e-Government application administered by the South African tax authority which individuals and organisations earning an income need to use when submitting their tax returns. This study focuses on individual taxpayers and gives insights into what really drives them adopt and usage the revenue application as well as factors inhibiting its adoption and usage. This study contributes theoretically, methodologically, practically and contextually by doing exploration through UTAUT, TTF and Tax Compliance previous theories as lenses forexploring and explaining factors influencing the adoption and usage for e-filing. A questionnaire was used to collect data for analysis where opinions and views of satisfactorily sample size of taxpayers using e-filing as well as those who are not using it were captured. Developed model in this study explores the level to which each factor significantly predict and explain the adoption and usage of e-filing in the context of South Africa. The tax authority may practically use the developed model to ensure that most taxpayers optimally use the e-filing.
Table 2 depicts authors explaining factors which predict technology adoption and usage.

Table 2 below depicts elements which were assessed in different settings and found being significant factors which influence technology adoption. This study tested these elements to assess their relevancy to the conditions of South Africa.

| Factors predicting technology acceptance and usage | Title/Description | From which Model | Author/s |
|---------------------------------------------------|-------------------|------------------|---------|
| Perceived ease of use | Perceived usefulness, perceived ease of use and user acceptance of information technology. MIS Quarterly, 13(3), pp. 319-340. | PEOU | Davis, F.D. (1989). |
| Perceived usefulness | Perceived usefulness, perceived ease of use and user acceptance of information technology. MIS Quarterly, 13(3), pp. 319-340. | PU | Davis, F.D. (1989). |
| Performance Expectancy | User Acceptance of Information Technology: Toward a Unified View. MIS Quarterly, 27, 425-478. | UTAUT | Venkatesh, V., Morris, M. G. and Davis, G. B. (2003). |
| Effort Expectancy | User Acceptance of Information Technology: Toward a Unified View. MIS Quarterly, 27, 425-478. | UTAUT | Venkatesh, V., Morris, M. G. and Davis, G. B. (2003). |
| Social Influence | Information technology acceptance by individual professionals: a model comparison approach. Decision Sciences, 32. | A Model Comparison Approach | Chau, Y. K and Hu, J. H (2001). |
| Performance Impact | Task-technology fit and individual performance MIS Quarterly: Jun 1995, 19, 2; AB/INFORM Global pg. 213-236. | TTF | Goodhue, D.L and Thompson, R. L. (1995). |
| Tax Behaviour | Detection Probability and Taxpayer Compliance: A Review of the Literature. J. Acc. Lat. 11: 1-46. | Tax Compliance Model | Fischer CM, Wartick M, Mark M (1992). |
| Behavioural Intention | The theory of planned behaviour: Organisational behaviour and human decision processes, 50(1), pp. 179-211. | TPB | Ajzen, I. (1991). |
| Information quality | The DeLeone and McLean model of information systems success: A ten-year update. Journal of Management Information Systems, 19(4), 9-30. | IS Success Model | DeLeone, W. H. & McLean, E. R. (2003). |
| Education | “User acceptance of information technology: toward a unified view”, MIS Quarterly, Vol. 27 No. 3, pp. 425-478. | UTAUT | Venkatesh, V., Morris, M., Davis, G and Davis, F. (2000). |

Table 2:- Authors on factors predicting technology adoption and usage

Table 3 below depicts authors explaining factors which are technology enablers and disablers for adoption and usage.

Table 3 below depicts constructs which have been discovered to significantly enable and disable technology adoption and usage after being tested in various settings globally. The determinants list for that inhibit or enables the adoption and usage of technology is endless, so frequently assessed elements were chosen.

### III. THEORETICAL FRAMEWORK

The Unified Theory of Acceptance and Use of Technology was created to solve the challenges and contradictions created by the eight theories that where integrating to develop the UTAUT model (Venkatesh, Morris and Davis, 2003). The aim of this theory is to understand behavioural intention of using technology and the subsequent actual usage attitude as the dependent variable. The UTAUT theory consists of these elements: performance expectancy, effort expectancy, social influence, and facilitating conditions.

![Flow diagram of UTAUT process](source:Venkatesh, Morris, Davis and Davis, 2003)
Total Task Fit (TTF) model aims topositively impact on performance and to be applied when technology design matches user’s tasks undertake. The TTF model have the following elements: characteristics of task and technology, performance impact and utilization.

The Total Task Fit (TTF) model

![Flow diagram of TTF process]

Source: Goodhue and Thomson, 1995.

The Tax Compliance Model (TCM) emphasize that variables for demographics influence compliance of taxpayer by their effect on tax evasion attitudes, perceptions and opportunities. The TCM model have the following elements: tax compliance behaviour, demographic (e.g.- age, gender and education), tax evasion options (e.g. level of income, source of income and position), attitudes and perceptions (e.g. tax system fairness and peer influence) and tax system (e.g. complexity of the tax system, detection chances, penalties and tax rates)

Tax Compliance Model (TCM)

![Flow diagram of the Tax Compliance Model]

Source: Fischer, Wartick and Mark, 1992.

Technology adoption and usage theories being UTAUT, TTF and Tax Compliance were applied independently in various settings, however, in these studies these models have been integrated to address the research problem. These prior theories were used independently from each other in previous studies. Integration of these theories assisted in developing solutions to address the identified problem and gaps being unique to the conditions in South Africa.

IV. CONCEPTUAL RESEARCH MODEL

The developed conceptual model for adoption and usage of e-filing in this study gives solid foundation for analysis work done to which is based on tested hypothesis suitable for exploration. The conceptual model was constructed with the combination of elements UTAUT, TTF and Tax Compliance models. Conceptual structure statements offer basic theory of what the study is about together with reasons why this phenomenon take place (Bickman and Rog, 2008). Conceptual model is a graphic business model giving details about the key factors, ideas or variables that needs exploration regarding the relationships between them (Miles et al., 1994). Explored hypotheses regarding the conceptual research model has elements sourced out of UTAUT, TTF and Tax Compliance models. Theory can’t be proven by multiple outcomes because if one instance refuting that findings it means then that the theory demonstrate it as false (Popper, 1968). Theory is established by comparing observable data and hypotheses with more than two constructs explain the relationships (Popper, 1968). The UTAUT, TTF and TCM theories cannot be used in isolation to address the challenges of technology adoption and usage in South Africa context as they might be irrelevant, hence they were integrated in this study.

Hypotheses

Behavioural intention (BI) for adopting e-filing is the dependent variable.

Hypotheses per each element:

H1: Performance Expectancy affecting performance impact.
H2: Tax Compliance behaviour affecting behavioural intention to use the e-filing.
H3: Effort Expectancy affecting behavioural intention to use the e-filing.
H4: Performance Impact affecting behavioural intention to use the e-filing.
H5: Social Influence affecting behavioural intention to use the e-filing.
H6: Facilitating conditions affecting intention to use the e-filing.
H7: Intention to use e-filing is affected by attitude, perceived usefulness and ease of use.
H8: Tax Compliance behaviour affecting e-filing adoption and usage.

The Conceptual Research Model for Adoption and Usage of e-filing
V. METHODOLOGY

This study is based on critical reality with regard to epistemological position, it indicates that existence of reality exist beyond what is seen or observed. This study took subjectivism stance with regard to ontological position, it indicated that social phenomena occur based on the ideas and subsequent actions of social participants (Easterby-Smith, Thorpe and Lowe, 2006). Reality beyond what is observed in relation to the adoption and usage of the e-filing is required for understanding what drive taxpayers’ to use or not use e-filing. This paper took a positivist stance that implies that research outcomes are presented as objective facts and verified truths (Crotty, 1998). Research strategy in this study is a positivist using a quantitative method for data collection. Sampling technique adopted in this study was a simple random and sample frame was South African taxpayers submitting returns annually. A questionnaire was administered for collection of primary data that was analyzed using the structural equation modelling (SEM), confirmatory factor analysis (CFA), path modelling and Smart PLS software.

| Research Process | Methods | Reason |
|------------------|---------|--------|
| Research Philosophy | Positivist | Objective facts and established truth |
| Research Strategy | Quantitative | To reach many participants |
| Data Collection | Survey (Questionnaire) | Easy to administer |
| Sample Frame | Taxpayers (manual & e-filers) | Only individuals submitting tax returns |
| Sample Technique | Simple Random Sampling | All participants have a chance of being selected |
| Unit Analysis | Individuals | Individuals available everywhere in the country |
| Data Analysis | Structural Equation Modelling | Statistical technique for studying relationships between latent variables (or constructs) |

Table 4:– depicts the summary of Methodology

VI. DISCUSSIONS OF RESULTS

A. Structural Equation Modelling Approach

Structural Equation Modeling (SEM) was applied for this paper for data analysis, SEM is a technique used for assessing relationships between elements (Schermelleh-Engel, Klein & Moosbrugger, 2017). Prior authors believed in creating theoretical concepts and use two or more structural equations to validate proposed causal relationships (Bollen, 1989; Brewer et al., 2015; Byrne, 2016; Hair et al, 2016; Henseler et al., 2015 and Hair et al., 2017). SEM performing same functions as regression analysis with an additional benefit being the ability to measure relationship on elements and account for measurement error at the same time (Hox, et al., 2017). SEM is a well known technique used for data analysis being able to address numerous modelling challenges relating to the indigeneity among elements (Preacher, Zhang & Zyphur, 2016).

B. Structural Equation Modelling, A Component based Approach

Statistical analyses where done on the measurement and structural models using the Smart PLS software. Discussions below are relating to the variables descriptive statistics and reliability of the model. The Structural Equation Modelling, Confirmatory Factor Analysis and Path Modelling assessed in this study are discussed below. Model Fit was assessed by applying Confirmatory Factor Analysis (CFA) as well as reliability and validity of the scales used in the questionnaire. Scales validity was established by comparing the shared variance together with the average variance extracted (AVE). Path Modelling (PM) was achieved by testing Model fit and hypothesis. Significant statistical relationships between the elements was assessed using the bootstrap resampling method. Evidence on the reliability and validity of the assessment model is presented below in Table 5.

C. Measurement Model Assessment

- Summary of Measurement Model Assessment (Confirmatory Factor Analysis)

Conceputal model has eight elements, which are Behavioural Intention, Effort Expectancy, E-filing Usage, Facilitating Conditions, Performance Expectancy, Performance Impact, Social Influence and Tax Compliance Behaviour. Results of testing elements for reliability and validity are shown in Table 5 below.
and convergent validity assessed using Average Variance Extracted (Crego et al., 2015).

### Cronbach’s Composite Reliability

| Research Constructs | Scale Items | Item-to-Total Correlation Value | Cronbach’s Alpha Value | Composite Reliability | Average Variance Extracted (AVE) |
|---------------------|-------------|--------------------------------|------------------------|-----------------------|---------------------------------|
| BI                  | 2.452       | 1.071                          | 0.675                  | 0.845                 | 0.868                           |
| BI                  | 2.283       | 1.066                          | 0.755                  | 0.847                 | 0.908                           |
| BI                  | 2.226       | 1.062                          | 0.717                  | 0.854                 | 0.902                           |
| EE                  | 2.393       | 1.113                          | 0.675                  | 0.808                 | 0.854                           |
| EE                  | 2.497       | 1.066                          | 0.625                  | 0.769                 | 0.959                           |
| EE                  | 2.854       | 1.028                          | 0.718                  | 0.795                 | 0.862                           |
| EE                  | 3.043       | 1.128                          | 0.72                   | 0.889                 | 0.914                           |
| EE                  | 2.95       | 1.1                            | 0.724                  | 0.798                 | 0.854                           |
| EE                  | 2.863       | 1.126                          | 0.756                  | 0.817                 | 0.914                           |
| BI                  | 2.357       | 1.062                          | 0.784                  | 0.828                 | 0.907                           |
| BI                  | 2.438       | 1.062                          | 0.6                   | 0.791                 | 0.854                           |
| FC                  | 2.464       | 1.263                          | 0.526                  | 0.732                 | 0.914                           |
| FC                  | 2.618       | 1.225                          | 0.71                   | 0.827                 | 0.914                           |
| FC                  | 3.185       | 1.186                          | 0.625                  | 0.73                  | 0.854                           |
| FC                  | 2.777       | 1.11                            | 0.593                  | 0.812                 | 0.868                           |
| FC                  | 2.735       | 1.051                           | 0.552                  | 0.722                 | 0.854                           |
| PE                  | 2.777       | 1.147                          | 0.82                   | 0.919                 | 0.914                           |
| PE                  | 2.845       | 1.096                          | 0.807                  | 0.914                 | 0.914                           |
| PE                  | 2.839       | 1.122                          | 0.846                  | 0.913                 | 0.945                           |
| PI                  | 2.43        | 1.172                           | 0.79                   | 0.863                 | 0.914                           |
| PI                  | 2.44        | 1.196                           | 0.789                  | 0.866                 | 0.914                           |
| PI                  | 2.863       | 1.187                          | 0.713                  | 0.813                 | 0.914                           |
| PI                  | 2.682       | 1.119                          | 0.778                  | 0.913                 | 0.933                           |
| PI                  | 2.518       | 1.126                           | 0.789                  | 0.877                 | 0.914                           |
| SI                  | 2.503       | 1.094                           | 0.661                  | 0.818                 | 0.914                           |
| SI                  | 2.414       | 1.051                           | 0.767                  | 0.885                 | 0.914                           |
| SI                  | 2.768       | 1.444                           | 0.655                  | 0.76                  | 0.914                           |
| SI                  | 2.497       | 1.118                          | 0.772                  | 0.866                 | 0.903                           |
| SI                  | 2.744       | 1.165                           | 0.581                  | 0.701                 | 0.914                           |
| TCB                 | 2.804       | 1.136                           | 0.739                  | 0.825                 | 0.914                           |
| TCB                 | 2.665       | 1.135                           | 0.686                  | 0.792                 | 0.914                           |
| TCB                 | 2.965       | 1.048                           | 0.708                  | 0.794                 | 0.914                           |
| TCB                 | 2.983       | 1.045                           | 0.766                  | 0.845                 | 0.914                           |
| TCB                 | 2.955       | 1.024                           | 0.727                  | 0.875                 | 0.906                           |
| TCB                 | 2.589       | 1.008                           | 0.457                  | 0.631                 | 0.914                           |

Note: BI = Behavioural Intension; EE = Effort Expectancy; EU=Efiling Usage; FC =Facilitating Conditions; PE =Performance; Expectancy; PI = Performance Impact ; SI =Social Influence; TCB =Tax Compliance Behaviour; SD= Standard Deviation ; CR= Composite Reliability AVE= Average Variance Extracted

*Scores: 1 – Strongly Disagree; 3 – Moderately Agree; 5 – Strongly Agree

### Table 5: Scale Accuracy Analysis

- **Reliability and Validity tests in Confirmatory Factor Analysis**
  
  Guidance in determining reliability and validity were sourced from previous studies conducted by Devine & Hughes, 2016; Canivez, 2016; Willoughby et al., 2017). Reliability indicates variance amount in an item as an element rather than to the error (Chau, 1997). Discriminant

### Table 6: Measurement Instrument Assessment (Confirmatory Factor Analysis)

| Cronbach’s Composite Reliability | Average Variance Extracted (AVE) |
|----------------------------------|----------------------------------|
| BI                               | 0.847                            |
| EE                               | 0.888                            |
| EU                               | 0.828                            |
| FC                               | 0.812                            |
| PE                               | 0.913                            |
| PI                               | 0.91                             |
| SI                               | 0.866                            |
| TCBS                             | 0.875                            |

### Testing for Reliability

- **Cronbach's Alpha (CA)**
  
  Measurement scale was evaluated applying Cronbach’s coefficient composite reliability (CR) to verify the internal consistency in checking the reliability of the measurements. Cronbach’s alpha coefficient over 0.6 is a recommended reliable values (Diedenhofen and Musch (2016). Instrument reliability was measured with Cronbach alpha and all values are above the accepted threshold of 0.6, as indicated in Table 6 and indicating that all assessment instruments are reliable.

  - **Composite Reliability (CR)**
    
    Composite reliability index over 0.7 is recommended (Diedenhofen and Musch (2016). Facilitating Conditions harestsmallest composite reliability (CR) value of 0.868 and Performance Expectancy has the highest composite reliability value of 0.945 in this study. Composite reliability exceeded the threshold of greater than 0.7 for all values in this study as indicated in Table 6.

- **Average Variance Extracted**
  
  Variance in indicators was determined by applying the average variance extracted indicated by the latent variable. An element with AVE value that is greater than 0.5 is considered reliable (Wilcox, 1996). All variables fall within the acceptable threshold of 0.5 according to AVE results in Table 6.

AVE is calculated manually with this formula: 

\[ AVE = \frac{\Sigma y_i^2}{\Sigma y_i^2 + \Sigma e_i} \]

All scales were internally consistent and reliable as per extracted constructs reliabilitys and the average variance according to results shown in table 6.

- **Convergent Validity**
  
  The level that an element converges in its indicators by explaining the items’ variance is measured by the convergent validity (Zelkowitz and Cole, 2016). Item-total
correlation and factor loading measures verifies convergent validity (Crego et al., 2015; Hair et al., 2016). Factor loading estimates over 0.5 are shown in Table 5 indicating convergent validity. The lowest representing Tax Compliance Behaviour (TCB) show the lowest factor loading of 0.631 while Performance Expectancy (PE) have the highest factor loading of 0.935.

- **Discriminant validity**
  Correlation matrix is applied to measure the discriminant validity (Chinomona, 2011). Discriminant validity was confirmed as the value for correlation between variables is recommended to be below 1.0 and inter-correction values for all variables are below 1.0 as indicated in Table 7. All measurement in this study meets the recommended threshold as per results obtained and the highest being value is 0.761. Average variance extracted value was compared to their Highest Shared Variance (HSV) to assess the discriminant validity which was confirmed (Hox, et al., 2017).

| Variable | Average Variance Extracted (AVE) | Highest Shared Variance (HSV) | Decision |
|----------|----------------------------------|-------------------------------|----------|
| BI       | 0.766                            | 0.579                         | Discriminant Validity confirmed |
| EE       | 0.639                            | 0.504                         | Discriminant Validity confirmed |
| EU       | 0.745                            | 0.579                         | Discriminant Validity confirmed |
| FC       | 0.57                             | 0.522                         | Discriminant Validity confirmed |
| PE       | 0.851                            | 0.499                         | Discriminant Validity confirmed |
| PI       | 0.736                            | 0.534                         | Discriminant Validity confirmed |
| SI       | 0.653                            | 0.368                         | Discriminant Validity confirmed |
| TCB      | 0.619                            | 0.522                         | Discriminant Validity confirmed |

Table 7: Correlation Matrix

Discriminant validity is obtained through comparison of Average Variance Extracted (AVE) and Highest Shared Variance (HSV). Discriminant validity exist when AVE is greater than HSV. Table 8 indicates results that showing all AVEs being greater than the HSVs of the elements that confirm the discriminant validity.

D. **Model Fit Summary - Measurement Model**

Three categories of Model fit analysis outcome are absolute fit indices, incremental fit indices and parsimony fit indices. The CMIN or the Chi-square (χ2/df), Normed Fit Index (NFI), Goodness-Of-Fit Index (GFI), Root Mean Square Error of Approximation (RMSEA), Tucker Lewis Index (TLI), Comparative Fit index (CFI) and Incremental Fit Index (IFI) indices were extracted from the analysis result obtained. The Chi-square (CMIN/DF) threshold of 3 is acceptable, however, in table 3 it was found to be 2.124 (Chinomona, 2011). Acceptable threshold level of 0.900 is recommended for the CFI, however, in this study it was found to be 0.908 (Hooper, Coughlan and Mullen, 2008). GFI acceptable threshold of at least 0.9 is recommended and GFI was found to be 0.914 (Baumgartner and Hombur, 1996). Relative fit index (RFI) value of 0.9 is recommended and in this study it was found to be 0.906 (McDonald and Ho, 2002). Normed fit index (NFI) threshold is acceptable at a value of 0.900 and it was found to be 0.909 (Bentler and Bonett, 1980). The incremental fit index (IFI) 0.903 was realised and it exceeds the recommended value of 0.900 (Bollen, 1989). The Tucker-Lewis Index (TLI) acceptable threshold is 0.900 and in this study it was found to be 0.915 (Hooper et al., 2008). The root mean square error of approximation (RMSEA) thresholds is acceptable at 0.08 and it was found to be 0.069 in this study. Results shows all model fit indices beingat recommended levels as indicated in the Table 9.

Table 8: Comparison between AVE and HSV Results
Structural Model Assessment and Hypotheses Testing

The structural model indicates PE, TCB and PI having an effect on the behavioural intention while BI and FC, BI and TCB having a positive effect on EU. Hypotheses assessing model fit were tested after Path analysis was conducted. Path analysis was assessed to establish the magnitude of hypothesised causal connections between the elements. Model fit path analysis outcomes are presented in Table 10 as: $\chi^2/df = 2.811$; CFI=0.903; IFI = 0.907; NFI= 0.933; TLI = 0.906; RMSEA = 0.078. The results indicated all model fit indices being within the recommended levels.

| Model Fit Indices | Acceptable Threshold | Current Study Threshold | Decision: Acceptable/Unacceptable |
|-------------------|----------------------|-------------------------|----------------------------------|
| Chi-Square Value: $\chi^2/df$ | <3 | 2.811 | Acceptable |
| Comparative Fit Index (CFI) | > 0.900 | 0.903 | Acceptable |
| Goodness of Fit Index (GFI) | > 0.900 | 0.914 | Acceptable |
| Incremental Fit Index (IFI) | > 0.900 | 0.909 | Acceptable |
| Normed Fit Index (NFI) | > 0.900 | 0.903 | Acceptable |
| Tucker Lewis Index (TLI) | > 0.900 | 0.915 | Acceptable |
| Random Measure of Standard Error Approximation (RMSEA) | < 0.08 | 0.069 | Acceptable |

Table 9: Model Fit Summary- Measurement Model

Table 10: Model Fit Summary- Measurement Model

Structural Model Assessment (Path Analysis)

Measurement of the hypothesised structural model is done first before examining the causal relationships between latent variables by path analysis (Henseler, Hubona and Ray, 2016). Some latent variables directly or indirectly affect other latent variables in the model resulting in estimated outcomes that explains the relationship of these latent variables as it is emphasised by structural equation modelling (Lefcheck, 2016; Hair et al., 2017). Table 11 presents the estimated results obtained through hypothesis testing. Table 11 indicates if a hypothesis is rejected or accepted and shows the hypotheses, path coefficients and t-statistics. Significant relationship indicators are $t > 1.96$ while a higher path coefficients means stronger relationships between the latent variables (Chinomona, Lin, Wang and Cheng, 2010).

| Hypothesized Relationship | Hypothesis | Path Coefficient | T-Statistics | P-Value | Outcome |
|---------------------------|------------|------------------|-------------|---------|---------|
| PE $\rightarrow$ PI | H1 | 0.597 | 13.606 | 0.000 | Significant & supported |
| TCB $\rightarrow$ BI | H2 | 0.37 | 4.603 | 0.000 | Significant & supported |
| EE $\rightarrow$ BI | H3 | -0.041 | 0.569 | 0.569 | Insignificant |
| PI $\rightarrow$ BI | H4 | 0.251 | 3.722 | 0.000 | Significant & supported |
| SI $\rightarrow$ BI | H5 | 0.109 | 1.789 | 0.074 | Supported but insignificant |
| FC $\rightarrow$ EU | H6 | 0.115 | 1.775 | 0.076 | Supported but insignificant |
| BI $\rightarrow$ EU | H7 | 0.586 | 11.084 | 0.000 | Significant & supported |
| TCB $\rightarrow$ EU | H8 | 0.191 | 3.623 | 0.000 | Significant & supported |

Table 11: Path Analysis Results

Note: BI = Behavioural Intension; EE = Effort Expectancy; EU = e-filing Usage; FC = Facilitating Conditions; PE = Performance Expectancy; PI = Performance Impact; SI = Social Influence; TCB = Tax Compliance Behaviour
Structural Equation Modelling (SEM)

Path coefficients presented in figure 5 shows the significant levels being measured with the p-values and t-statistics from the eight hypotheses tested. Hypotheses significance are recommended at a 95% or higher level of significance (≥ 95%) and p-value at ≤ 0.05 (Hastie et al., 2009; Hair et al., 2010). The t-statistics with a threshold of greater than 1.96 are acceptable for the relationship purpose. Hypotheses and path coefficients represented first followed by the t-statistics and p-values showing the significant levels of the relationships and lastly the column showing the decision of accepting or rejecting the proposed hypotheses. A strong relationship between the dependent and the independent variables is indicated by the path coefficients (Hsu, 2008). Three hypotheses were found to have significant level at p<0.05 after testing the probability value which is also known as p-value.

Five out of the eight hypotheses were statistically significant with the exclusion three being H5 and H6 that were positive but not significant while H3 was negative and insignificant. Performance Expectancy (PE) and Performance Impact (PI) had strongest relationship as per β=0.597; t=13.606; p=0.000 and the second strongest relationship was between Behavioural Intension (BI) and E-filing Usage (EU) with β=0.586; t=11.084; p=0.000. Relationship amongst Tax Compliance Behaviour (TCB) and Behavioural Intension (BI) is the third strongest with β=0.370; t=4.603; p=0.000 and in the fourth places Tax Compliance Behaviour (TCB) and E-filing Usage (EU) having β=0.191; t=3.623; p=0.000. Weakest relationship in this study is the third place is amongst Facilitating Conditions (FC) and E-filing Usage (EU) with β=0.115; t=1.775; p=0.076 and the second weakest relationship is amongst Social Influence (SI) and Behavioural Intension (BI) with β=0.109; t=1.789; p=0.074. The weakest relationship of all hypotheses was amongst Effort Expectancy (EE) and Behavioural Intension (BI) having β=-0.041; t=0.569; p=0.569.

Summary of the results for this study

Results after testing hypotheses as per data analysed indicates path coefficients of H1, H2, H3, H4, H5, H6, H7 and H8 to be 0.597, 0.370, -0.041, 0.251, 0.109, 0.115, 0.586, 0.191 respectively. Results from this study shows seven latent variables having positive relationships except H3 being rejected after tested negative. Performance expectancy and performance impact had the strongest relationship with path coefficient value of 0.597 while relationship amongst effort expectancy and behavioural intention being the weakest with a path coefficient of -0.041. Testing confirming reliability and validity of the measurement was done. Relationships between the constructs as per hypotheses in this study were assessed using Smart PLS software for SEM.

VII. STUDY RESULTS AND INTERPRETATIONS

Results and interpretations for this study are presented below. Hypothesis one resulted confirmed positive and significant relationship among performance expectancy and performance impact being p=0.000 and a path coefficient of 0.597. This results are similar to findings by Venkatesh et al. (2003) indicating that performance expectancy affects performance impact. The results mean that performance impact was achieved when expectations relating to the performance are met. Test results of hypothesis two shows a positive and significant relationship amongst tax compliance behaviour and behavioural intention, thus t=4.603, p=0.000 with a path coefficient of 0.370. These outcomes are similar to findings by Marziana, Norkhazimah and Mohmad (2010), for discovering taxpayers’ attitude and perception regarding tax system fairness being a vital factor significantly influencing tax compliance behaviour. Integrity, credibility and trustworthiness of government affect taxpayers’ decision to adopt e-filing. Results after testing hypothesis three shows effort expectancy and behavioural intention having a negative relationship being t=0.569, p=0.569 with a path coefficient of -0.041 and its therefore rejected. These results contradict with findings from previous studies that discovered effort expectancy correlating with behavioural intention (Agarwal and Prasad, 1999; Thompson et al., 1991; Venkatesh et al., 2003). Findings from these studies were however, not done in the context of e-filing for filing returns. These outcomes are indicating effort expectancy having a negative impact behavioural intention, thus taxpayers need an easy to use system. Results from testing hypothesis four shows a path coefficient of 0.251 together with a positive and significant relationship amongst performance impact and behavioural intention at t=3.722, p=0.000. These outcomes confirm findings by Goodhue and Thompson (1995) who stated that performance impact affects behavioural intention of using e-filing. Continuous use of e-filing by taxpayers may occur as there is no alternative system except the manual submission. E-filing needs to be continuously upgraded to enable tax authority to add more functionalities in simplifying tax returns submissions. Results from testing hypothesis five confirmed a positive and insignificant relationship amongst social influence and behavioural
intension of t= 1.789, p=0.074 with a path coefficient of 0.109. Results from this study confirm claim that taxpayers are use online application that are preferred by their peers, friends and family members (Venkatesh and Davis, 2000). Social influence plays an important role for influencing users to accept information system, so e-filing designers must develop strategies to ensure that users get a value for when using the electronic filing. Results after testing hypothesis six shows a path coefficient of 0.115 meaning that facilitating conditions has a positive effect on e-filing insignificant as per (t=1.775, p= 0.074). These outcomes confirm findings from prior study discovering that focusing on facilitating conditions only does not automatically predict e-filing usage as factors affecting information system usage are plenty (Fu et al., 2006). E-filing is used at any time of a day and tax authority must ensure the availability of support personnel to attend to system challenges from users. Results for testing hypothesis seven shows a positive and a significant relationship amongst behavioural intention and e-filing usage as per (t=11.084, p= 0.000 with a path coefficient of 0.586. These outcomes confirm findings from previous studies stating that even if all factors affecting actual use of information system are in place, decision to use technology is not guaranteed. (Agarwal and Prasad, 1999). Hypothesis eight testing indicates strong positive and significant relationship amongst tax compliance behaviour and e-filing usage as per (t= 3.623, p=0.000 with a path coefficient of 0.191. This study results concur with claim from previous study showing a tax compliant behaviour and e-filing usage having a positive relationship (Fischer et al., 1992). These outcomes mean that ethical taxpayers submitting tax returns correctly and on time are likely to use e-filing platforms than less ethical taxpayers. Tax compliance behaviour changes over time, continuous monitoring by authority is needed.

VIII. A MODEL FOR ADOPTION AND USAGE OF E-FILING

Figure 5 below shows a model for adopting and using the e-filing after the conceptual model was amended according to constructs testing which were done.

The Model for Adoption and Usage of E-filing

This model for adopting and using e-filing being developed in this paper has the following constructs as tested results: Effort expectancy, performance expectancy, facilitating conditions, social influence, performance impact, tax compliance behaviour and total tax knowledge. Most of these elements were validated in this study except total tax knowledge that is an additional element for this model. It can be conclusion that these elements are the determinants for the adopting and using the e-filing. Additional construct being total knowledge was used when reviewing the conceptual model, higher education is linked to a higher possibility of tax compliance in previous literature. Taxpayers with tertiary education comply tax obligations than their counterparts without tertiary education.

IX. CONCLUSION

Model fit summary presented in table 10 shows all model fit indices being, chi-square value, comparative fit index, incremental fit index, normed fit index, tucker Lewis index and random measure of standard error approximation, having values greater than the recommended levels. Path analysis outcomes show five hypotheses being supported significantly excluding H5 and H6 that are positive but not significant. H3 was rejected after tested negative and insignificant. Reliability and validity tests in confirmatory factor analysis (CFA) respectively indicates outcomes verifying reliability and validity of measurement. This study confirmed factors for adopting and using e-filing to be effort expectancy, performance expectancy, facilitating conditions, social influence, performance impact and tax compliance behaviour. Tax authorities can consider to practically apply the model developed in this study to achieve an optimal usage of the e-filing. Research problem was that despite South Africa having excellent e-filing, queues at its branch offices are still observable being for taxpayers submitting manual tax returns. This study shared more inside information for exploring reasons why other taxpayers adopt and use the e-filing while others do not. This study has come up with a solution to the research problem by developing a model for adopting and using the e-filing. Reasons relating to why taxpayers are using the e-filing while others are not are now known as per results from this study. Tax authority need to focus on these factors to influence taxpayers to optimally use the e-filing.

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