Development of Hybrid Model for secured Tax Payment and Verification System with Automated Enforcement Mechanism

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Abstract
Development of hybrid model for secured tax payment and verification system with automated enforcement mechanism is a work designed to verify and enforce tax payment system in Nigeria. In Nigeria today, people avoids paying tax, even multinational companies manipulate their income report in order to evade paying the accurate tax. It is only government employees that pay their tax accurately because it was deducted from the source. This calls for urgent attention as government is losing billions of naira on tax evasion. Tax papers are being forged by individuals and companies whenever there is a check on their tax payment documents. Some tax collectors also compromise their work by defrauding government of the tax paid by companies as they have their fake receipts to issue out to unsuspecting tax payers. This calls for a model that can authenticate tax payment information for companies or individuals. Hence, the aim of this work is to develop e-tax registration, e-tax filing and e-tax reporting system using a web platform. The system integrates e-tax payment system through online banking and linking the BVN and TIN to Tax database. The system provides a link that can be used by tax enforcement agency to verify tax payment status of any individual using TIN, Fingerprint and BVN. It also provided an automated enforcement mechanism that can stop tax defaulters from carrying out banking transactions until the tax is paid. The methodology adopted is the object oriented and design methodology (OODM) and PhP-MySQL with java script was used in the implementation. The software developed helped in keeping accurate track of tax payer's details and it achieved 90% accuracy in verifying and automated enforcement of tax payment defaulters.

Keywords: *TIN, BVN, Fingerprint and enforcement*

Introduction

Tax is defined as a compulsory levy, imposed by government or other tax raising bodies, on income, expenditure, or capital assets, for which the taxpayer receives nothing specific in return [1]. Government impose levy against the income, profits, property, wealth and consumption of individuals and corporate organizations to enable government obtain the required revenue to provide basic amenities, security and well-being of the citizens. To improve tax collection in Nigeria, the Nigerian Federal Inland Revenue Service (FIRS) introduced electronic taxation in 2015 through the E-payment solutions and in alliance with the Nigerian Inter-Bank Settlement System (NIBSS) [2]. The idea presented through the introduction of the Tax Identification

Number (TIN) in 2008, created for the storage of information on taxpayers and to enable real-time information sharing and data interchange. The e-tax system in Nigeria can best be described as semi automated, considering that numerous manual processes involved in the registration, filing, reporting and payment of taxes. The challenges of the semi-automated tax systems amongst other factors contribute significantly to the low compliance level in Nigeria. Tax Compliance (TC) defined as taxpayers' willingness and other taxable entities to pay taxes willingly, embracing the registration, filling, reporting and payment operations, the tax compliance metrics identified by the Organization of Economic and Community Development (OECD) [3]. Voluntary compliance, however, is only a hallucination in Nigeria, as explained by the continuous fall in Nigeria's tax revenue [4]. A rationale for the implementation of several measures to improve compliance level, the most recent being the Voluntary Asset and Income Declaration Scheme (VAIDS) which created a window for defaulting taxpayers to pay accrued taxes without incurring penalties [5]. Although, VAIDS improved collections by N35.7 billion but not voluntary tax compliance out rightly [5].

According to the traditional model of tax compliance [6], taxpayers choose how much income to report on their tax returns by solving a standard expected utility-maximization problem that trade off the tax savings from under reporting true income against the risk of audit and penalties for detected noncompliance. In this framework, both the threat of penalty and audit makes people pay their taxes [7]. Effective tax systems can take the form of improved laws, administrative practices, and training programs. This involves improved tax administration information system (TAIS) for tax authorities which includes the TAIS basic administration machinery that interfaces to allow taxpayers to register, file, and provide pay electronically; data warehouses; data matching; internal control functions; and management information systems. To improve on tax collection, government uses tax enforcement task force to enforce tax payment. Tax enforcement executed by the tax authority is a decisive and valuable corporate governance function. The functionality of corporate governance demonstrated by tax enforcement such as reporting unrecognized tax benefits [8], detecting tax avoidance [9] promoting good financial reporting [10], detecting income shifting decisions of multinational corporations [11] reducing the cost of debt financing and deterring the conflict of interest among stakeholders as well as increasing firms' market value of share. The outcomes from prior research prove that tax enforcement strengthens corporate governance and thus, attract great attention from the taxpayers, governments, policymakers and even among the tax researchers. Nigeria is governed by a federal system and the government's fiscal power is based on a three-tier tax structure divided among the Federal, State, and Local governments, each of which has different tax jurisdictions. The Nigerian tax system is lopsided. The federal government controls all the major sources of revenue like import and excise duties, mining rents and royalties, petroleum profit tax and company income tax, value added tax among other revenue sources. State and local government taxes are minimal; hence, this limits their ability to raise independent revenue and so they depend solely on allocation from Federation Account.

Statement of the Problem

Tax payment enforcement has been a lot of challenges in Nigeria. Most people avoids paying tax, even multinational companies manipulate their income report in order to evade paying the accurate tax. A lot of problems face tax payment and verification system which includes:

1. The use of e-tax filing in Nigeria is not mandatory; rather it is offered as an option to taxpayers and the tax agency representative such as the tax agent and this has made some tax payers to evade tax payment
2. The tax enforcement unit of the government are not efficient in their approach to enforcing tax payment as they do not have automated means of doing it
3. Tax papers are being forged by individuals and companies whenever there is a check on their tax payment documents.
4. Some tax collectors also compromise their work by defrauding government of the tax paid by companies as they have their fake receipts to issue out to unsuspecting tax payers.
5. Validation and verification of tax payment documents still remains a big challenge to tax collectors as a lot of forged tax documents exist.

Aim and Objectives of the Study

The aim of this work is to develop hybrid model for secured tax payment and verification system with automated enforcement mechanism. The specific objectives will help to actualize the following:

1. To develop e-tax registration, e-tax filing and e-tax reporting system using a web platform
2. Integrate e-tax payment system through online banking and linking the BVN and TIN to Tax database.
3. To design a link that can be used by tax enforcement agency to verify tax payment status of any individual using TIN, Fingerprint and BVN.
4. Provide an automated enforcement mechanism that can stop tax defaulters from carrying out banking transactions or accessing healthcare services until the tax is paid

Significance of the Study

Hybrid model for tax payment and verification system using TIN and BVN will be beneficial to government and tax payers. The e-tax filing and e-tax payment will be mandatory as the automated enforcement mechanism will help in achieving this. Also, some other benefits include.

1. **The system will facilitate individual and company voluntary compliance in paying tax:** this system goes a long way in simplifying processes, providing e-tax registration, e-tax payment, and support to taxpayer.
2. **The system's centralized database will as a result eliminate double taxation:** The TIN and BVN in the new system are used to retrieve and make available the tax payment status of any taxable individual or company to any tax enforcement agency at any point in time.
3. **The system will provide a high level or certainty in the account reports produced by tax collectors:** Given the increased security and automation of the tax payment and verification system, auditing and reporting capabilities of the financial transactions will

be highly effective and efficient thereby accountability is ensured.

Tax Reform Framework: Integrating Tax Morale and Trust

The main value of the tax reform framework lies in the way it coalesces relatively fragmented strands of research and practical insight into a coherent approach to tax reform. In recognition of the need for a more holistic way to think about the design of tax reforms, the framework places politics, quasi-voluntary compliance, and the construction of stronger social contracts front and center (figure 1). No individual component of this framework is particularly novel or transformative. The best reform programs already do much of what is proposed here, though often in more ad hoc ways. By translating research insights into operational guidance and tools, the framework provides a holistic platform for reform and for conducting systematic research on the effectiveness of these approaches for improving reform outcomes [12].

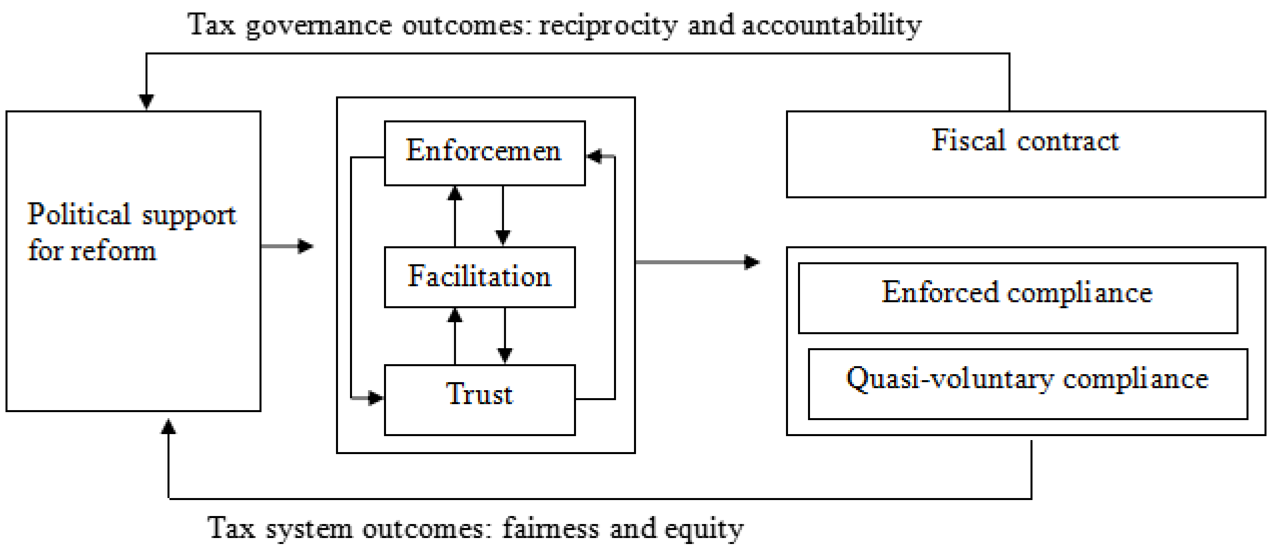

Figure 1: Theory of Change for Innovations in Tax Compliance [12]

The framework is centered on a belief that the effectiveness of reform efforts can be strengthened by emphasizing trust-building alongside a more conventional focus on enforcement and facilitation. By combining complementary investments in enforcement, facilitation, and trust, reformers not only strengthen enforced compliance but also (1) encourage quasi-voluntary compliance; (2) create conditions conducive to strengthening social contracts; and (3) generate sustained political support for reform. The box in the center of the model in figure 2.2 captures the interconnected nature of investments in enforcement, facilitation, and trust. A key component of trust in the tax system is a belief that everyone pays their fair share and is punished fairly if they do not. This belief depends on adequate enforcement [13]. Meanwhile, where there is little trust, it may be impossible to mobilize the necessary political commitment to strengthen enforcement capacity. Investing in measures to strengthen trust is thus also about creating a supportive political environment for expanded enforcement. Ideally, these interconnected investments can set the stage for virtuous circles of reform: successful investments in building trust provide the political capital needed to pursue further reform, while translation of the resulting revenue into public benefits further builds trust and compliance among taxpayers. Historically, reform programs have often treated political support for reform as largely exogenous, whereas investments in building trust are a concrete strategy for building political support for sustaining and advancing reform. Making political support endogenous through trust-building can occur through two broad channels, reflecting the different dimensions of trust. First, reformers may seek to emphasize the fairness and equity of tax systems ("tax system outcomes"). Second, reformers may seek to strengthen the extent of reciprocity and accountability ("tax governance outcomes"). When taxpayers see visible gains in both dimensions, they will be more willing to support future reform, thus potentially ensuring a virtuous circle of reform. Although such trust building strategies are not a substitute for the need for committed political leadership, they can reinforce that political support and make it more sustainable over time so that reform reversals are less likely. Meanwhile, trust-building measures are likely to improve the quality of governance in two broad ways. First, increasing trust in the tax system often goes together with improvements in equity, reciprocity, and accountability—that is, focusing on building trust makes strengthening public benefits an explicit part of reform design. Second, investments in building trust—particularly efforts to introduce meaningful transparency and consultation, to increase the political salience of taxation, to ensure more equitable tax policy and enforcement, and to strengthen taxpayer engagement—can empower taxpayers to successfully demand public benefits from tax revenues. Although trust has the potential to expand quasi-voluntary compliance, mobilize additional political support for reform, and strengthen the social contract, it also introduces new points of potential resistance to reform. A push for greater fairness in tax implementation may be resisted by tax officials who fear fewer opportunities for collusion and corruption. An expanded emphasis on equity is also likely to be met by resistance from wealthy taxpayers, who often escape their full tax liabilities. Finally, governments themselves may be supportive of increasing revenue collection but resistant to constraints on their spending or to demands for accountability. More narrow technocratic approaches to reform have often been adopted because they have been expedient in the short term. However, both research and experience increasingly indicate that tackling many of the most important reform challenges requires a more holistic approach to shifting the existing political constraints on reform. Reflecting that reality, the model in figure 2.2 is underpinned by broader strategies for navigating political resistance to reform and tailoring reform to specific contexts.

Review of Related Work

[14] is of the view that taxation has an important role as state revenue in the State Budget. One of the efforts which undertaken by the Directorate General of Taxes is applied tax payment system using e-billing with the electronic deposit slip. E-billing (electronic billing) is an online service which uses the system through the issued code on a kind of tax payment. The tax payment system is based on self-assessment to make deposits or tax payments independently by the taxpayer. Developments in technology influenced the emergence of innovations particularly financial technology in the finance industry. An industry which worked in the finance sector utilizing financial technology in the payment system. This kind of condition can provide

opportunities for financial transaction service electronically. In the research a tax payment system was design which can be integrated with financial technology industry through Service Oriented Architecture (SOA) approach. The design which included in the paper is technology architecture, data modeling, use case diagram of service and system integration design. A conceptual design is realized as an effort to utilize financial technology to provide alternative tax payment transactions in achieving the target of state revenue. The research gap identified in the e-tax payment system as used in Nigeria is that it lacks automated enforcement mechanism. There have been several studies concerning the electronic tax payments across the globe, [15] did a study Benefits of a computerized integrated system for taxation in Tanzania, they argued that Taxation is often the most important source of state revenue. However, many developing countries lack effective tax administration structures and processes. Technological innovations have not filtered through to the daily working reality of tax officials. They concluded that Computerization of tax and revenue authorities can contribute to reaching the goal of good (financial) governance. It improves accountability and transparency of the revenue authorities. Nevertheless, while reforming and modernizing the tax system is an essential part of improving domestic resource mobilization, such a reform will be sustainable only in conjunction with more profound changes in the administrative and political structure of a state. Naomi [16], did an assessment of the impact of electronic tax register on revenue collection by Kenya Revenue Authority western region, Kenya. Findings from their study indicated that indicated that 75% of the respondents were of the opinion that ETR machines have helped to curb cases of tax evasion 86% of the respondents were of the opinion that ETRs have helped increase revenue collection due to their efficient nature. [17] did a study on the revenue productivity and some administrative factors of the Kenyan tax system for the period 2001–2008. The result of this study came up with buoyancy estimates of the total tax system as 1.26 while elasticity was 1.27. The study thus concluded that the tax system in general was both elastic and buoyant implying that tax reforms had greatly improved productivity. Discretionary tax measures had a very small effect on tax productivity implying improved efficiency. [18] did a study on the tax buoyancy and income-elasticity of Kenya's tax system. Tax revenues from various sources were regressed on their tax bases. The study concluded that the tax system had failed to raise necessary revenues. However, the shortcomings of the study were that it never considered other important determinants of tax revenue, for instance the unusual circumstances that could have affected tax. It also never disregarded tax revenue data by source hence it was difficult to say which tax bases contributed more to the exchequer. Finally, it never considered the time series properties of the data used. [19] did a study on the productivity of Kenya's tax structure in the context of the tax reforms focusing on pre and post reform period. In the study, they assessed the buoyancy and elasticity of individual taxes and the overall tax system. Their findings suggested that tax reforms had a positive impact on the overall tax structure and on the individual tax handles, even though the impact of the reforms was not always uniform. The reforms had a bigger impact on direct taxes than on indirect taxes, suggesting that revenue leakage is still a major problem for indirect taxes. Even though the current study adopted model, it differs from their study in some dimension. First, this study used data of since 1963–2010. Second, nominal figures were converted to real figures. Finally, this study considered stationary of a time series data and the data regressed for the whole period of the study. [20] looked at the Impact of electronic tax systems on Tax Administration in Nigeria. He argued that the dwindling global fortune occasioned by the fall in the price of crude oil, the major source of wealth for Nigeria shifted the attention of the government and major stakeholders in the country to the revenue generated locally. But the daunting task of boosting the Internally Generated Revenue necessitates the adoption of electronic tax systems technologies to drive Tax administration and concluded that electronic tax systems play an important role in the increase of internally generated revenue in Nigeria by ensuring compliance thereby boosting productivity and economic activities in the country. It is a change agent for accelerated growth and poverty reduction in Nigeria and the whole of African continent at large. The major recommendation from their study was that necessary laws and regulations have to be passed by the appropriate authorities to reduce or abolish import taxes on information technology hardware such as computers, Servers, printers, biometric scanners and other devices.

Analysis of the Present System

The use of e-taxation in Nigeria is focused on six procedures including electronic registration, tax identification number verification and issuance, electronic filing of tax returns, tax payment, electronic confirmation issuance, and tax refund. Electronic registration is the first stage where a taxpayer logs into the tax authority website for registration by filling the taxpayer identification form. This form makes available certain information about the taxpayer’s name, business or employment details, age, marital status, place of origin, and other relevant details to be submitted electronically. The second stage is the issuance of tax identification number and verification: This stage is where the relevant tax authority verifies information supplied by the taxpayer. Upon verification and validation, a tax identification number is issued to the taxpayer. The tax identification number is unique to a person or business. Electronic filing of tax return is the third stage where the taxpayer logs into the tax authority website with his/her unique tax identification number to file its tax return form properly and submit it electronically. Upon receipt of the tax return, the tax authority sends an acknowledged receipt by email to the taxpayer. The tax program analyses the tax return the taxpayer has filed and calculates the amount of money to be paid as tax. The fourth stage is the payment of tax: at this point, when the amount to be charged as tax is calculated, the taxpayer either goes to the income authority's designated bank to play manually or to pay electronically by uploading the amount owing to the designated bank via its mobile banking app, internet or master/credit card. When the bank confirms payment, a notification is sent to the tax authority which then produces an electronic invoice. Electronic confirmation issuance is the fifth stage in which the tax authority produces and issues an electronic invoice to the taxpayer as proof of payment informed by the collecting approved bank of the taxpayer's payment of the tax. The sixth stage is tax refund. The tax authority tests at this final point, when a taxpayer reports, whether the taxpayer has paid more than the amount due as tax. The taxpayer collects an electronic refund through his bank or the sum charged in excess is held by the approved collecting agency, on the tax authority's order to deduct for the next due tax payable.

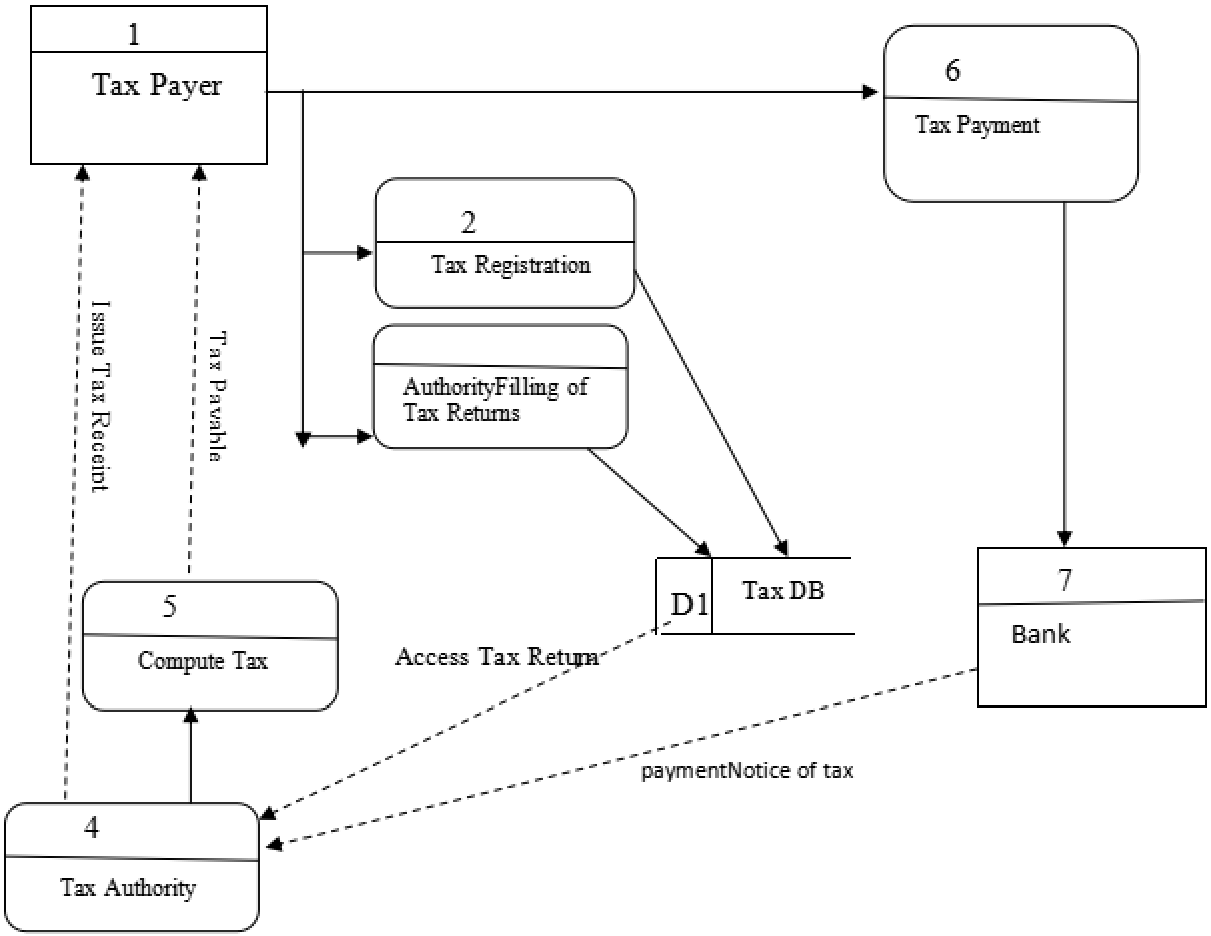

Figure 2: **Data Flow Diagram of the Present System**

Figure 2 shows the logical data flow of events in the existing system. It shows the connection between the tax payer, the tax administrators and tax payment in the bank.

Analysis of the proposed system

The new system automates some of the core functions of a tax administrative system which include registration, filing returns, tax assessments, payments and automated enforcement mechanism. Tax payers would register on the system via a registration portal, providing necessary details. On confirmation of the details provided to the tax authority, the administrator would verify the individual's registration details and an account will be created and also Tax identification number (TIN) issued. Once an account is created, the fingerprint of the person will be captured and his/her Bank verification number (BVN) will be linked to the tax database. Individuals will have the ability to use the system to schedule taxes and make payment. For companies the super administrator will have to create a company account with a single company administrator. The company administrator in turn then creates accounts for all the staffs in the company with their biometric and BVN captured. The company administrator also schedules and makes payments on behalf of the staffs and can update their details when necessary. The super administrator will have also a portal that will display the registration and payment details of all users. When the tax payer is through with registration process, he/she proceeds and electronically files the tax returns for the year. The system will automatically compute the tax payable based on the tax returns filled. The tax payer can then proceed with e-payment of tax. And after the payment, the tax receipt will be generated. The new system provides a link for tax authority and government agencies to verify tax payment report of any individual or company. This could be done using a hybrid model (TIN, BVN and fingerprint). During the verification, the tax payer will be asked to provide the TIN, on entering the TIN on the platform, the system will validate the TIN and display the Tax information linked to the TIN. To authenticate the person, the fingerprint will be captured and this will help to confirm if the person is the real owner of the TIN. For the enforcement mechanism, this will be implemented at the banking system as it will be linked to the tax database. During banking transactions, the system uses the BVN to link to the tax database in other to verify if the customer has paid his/her tax. If the system flags that the customer defaulted in paying tax, the account will be blocked and the transaction stopped until when the customer have paid the tax due. Through this means, the system has achieved automatic enforcement of tax payment.

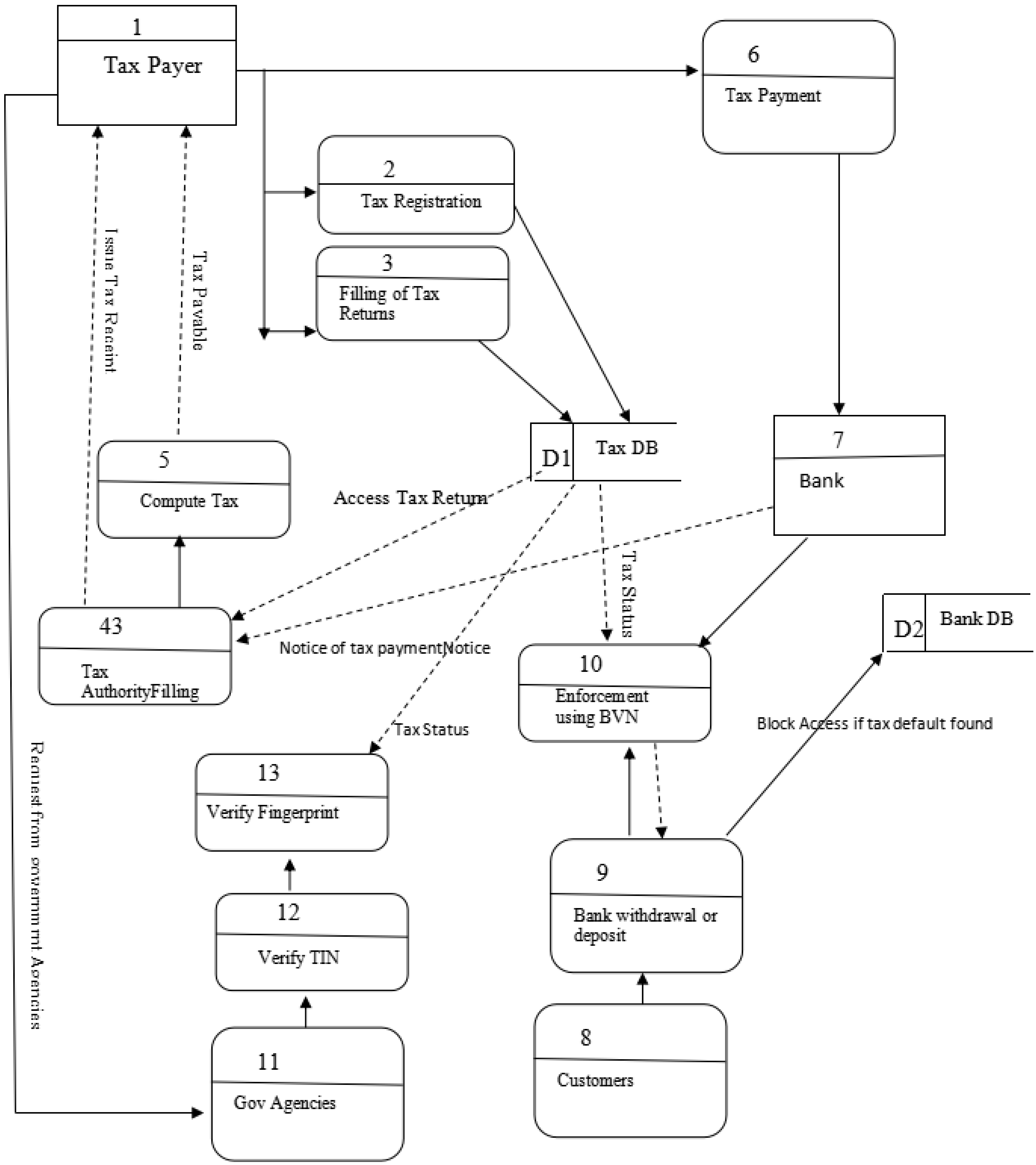

Figure 3: **Data Flow Diagram of the Proposed System**

Figure 3 shows the logical data flow of events in the system. It shows the connection between the tax payer, the tax administrators, government agencies and bank transactions.

Conclusion

The hybrid model for the secured tax payment and verification system with automated enforcement as developed in this system combines the use of fingerprint, BVN and TIN in verifying tax payment. It makes the system to integrate tax database and bank database so as to monitor tax payer's transactions and block the transactions of tax defaulters automatically. It doesn't require human interference. Once you have not paid your tax the system will detect it and stop all your banking transactions. This will help government to realize more tax from tax payers as the enforcement is automatic. The use of biometric, BVN and TIN helps to properly identify each tax payer and also secured the system more. No two fingerprints have ever been found identical in many human and automated computer comparisons. Fingerprints are the fundamental tool for the identification of people and so it is very useful in this work. It is hoped that effective implementation of this software application would eliminate many problems discovered during systems investigation. This will no doubt result in improved operations of tax authorities and with the aid of the biometric authentication and BVN verification system, government will generate more revenue with less effort. People will voluntarily pay their tax on time as not paying the tax will result in not having access to their financial transactions with bank.

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