TaxCode

CSE350

Submitted To:

Dr. Md Sadek Ferdous
Assistant Professor
Department of Computer Science & Engineering
Shahjalal University of Science & Technology

Submitted By:

Fairuz Rahman Chowdhury
#2017331099
Department of Computer Science & Engineering
Shahjalal University of Science & Technology

Masum Alam Nahid
#2017331061
Department of Computer Science & Engineering
Shahjalal University of Science & Technology

Project TaxCode GitHub: https://github.com/Sshovon/TaxCode.git

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Introduction

The digital roadmap is continuously evolving, as information technology embeds itself in both business and everyday life. The invention of the Internet has redefined the way we communicate on all levels, making everything easier, faster, and cheaper. Disruptive information technologies pinpoint weaknesses and change old business models most companies and national authorities have grown accustomed to. Following the increasingly digitized business economy, in which almost everything can be ordered at the tap of a smartphone and transactions are routinely processed and analyzed in real-time period, it can sometimes feel like the tax system is just stuck in analogue.

The digital age is also molding taxes into an entirely different shape, by not only changing the relationship between taxpayers and tax authorities, but also altering the way we pay taxes or submit and store information. But unfortunately, the taxation and tax structure system in Bangladesh is still based on the typical ancient topology. Although government is trying to digitalize the whole system, but they are not getting the effectiveness of their unplanned structure which is a major reason for lower government revenue and large tax evasion. The potential of digitizing taxes has been noticed by many countries, and new solutions arise, such as SAF-T in Europe or real-time electronic invoicing in South America, such as Brazil. Propelled by a desire for greater efficiency and better compliance, tax authorities seek to gather and analyze information digitally, providing a better environment for creating foolproof solutions and software.

On the other hand, taxpayers also expect that the process of taxpaying will become easier and less time-consuming. Blockchain is without doubt one of the most promising technologies because of its ability to deliver reliable real-time information from many layers to a large audience, as is the case with taxation, especially on an international level.

Bangladesh, as an emerging developing country, is committed to augmenting revenue and achieving fiscal discipline with a view to increasing self-reliance. The external environment influencing the tax performance of Bangladesh has changed remarkably as the country became increasingly integrated with the global economy during the 1990s (McCarten, 2005). In recent years, the Government of Bangladesh has initiated some administrative and policy reforms in the tax system. An improved tax administration in association with some pragmatic policy initiatives has resulted in a modest improvement in the tax-GDP ratio of late. However, the performance is still unsatisfactory as compared to other countries at a similar stage of economic development.

Current Scenario of Tax-GDP Ratio and Government Revenue:

The narrow tax base, widespread exemptions, and administrative inefficiencies are the main factors behind low tax-to-GDP ratio in Bangladesh compared to the neighboring/comparator countries. This also implies that tax reforms over the last decades could not bring about significant changes in Bangladesh's tax efficiency and productivity which led Bangladesh to be the least earning government from tax revenue section.

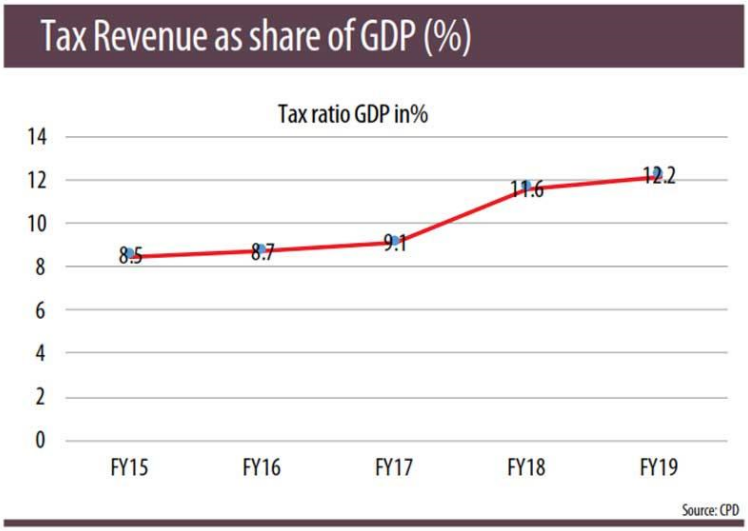


Figure 1: The gap of Tax-GDP ratio in Bangladesh is highest over Asia-pacific region

A modest uptick in revenue is apparent in recent years, NBR continues to be characterized by a weak policy framework, very limited administrative modernization, a high degree of administrative fragmentation, significant human resource constraints and weak enforcement mechanisms. The most basic challenge has been the overall weakness of the policy framework, which is characterized by an enormous range of exemptions, incentives, and special regimes. These range from the existence of simplified regimes associated with VAT, to significant scope within the law for tax officials and political elites to grant comparatively discretionary

benefits. This directly undermines revenue collection, but equally complicates administration, undermines equity in the system and introduces significant scope for officials to exercise discretion in both policy and administration.

In Bangladesh tax revenue is the principal source of Government revenue. The rest of the revenue comes from non-tax sources like fees, charges, tolls etc. In the Financial Year (FY) 2019-20, total revenue was TK.231152 crore, of the total the share of tax revenue was TK. 202312 crore (84.88%) and non-tax revenue was TK. 66110(15.12%).

Existing Tax Structure of Bangladesh:

Like other developing countries, Bangladesh underscores the importance of revenue generation to meet the country's revenue needs and development expenditures with a view to accomplishing some economic and social objectives, such as a redistribution of income, price stabilization and discouraging harmful consumption.

There are two broad categories of revenue: a) tax revenue, which is again divided into NBR tax and Non NBR tax, and b) non-tax revenue. The following figure gives an overview on the institutional arrangements and sources of revenue generation.

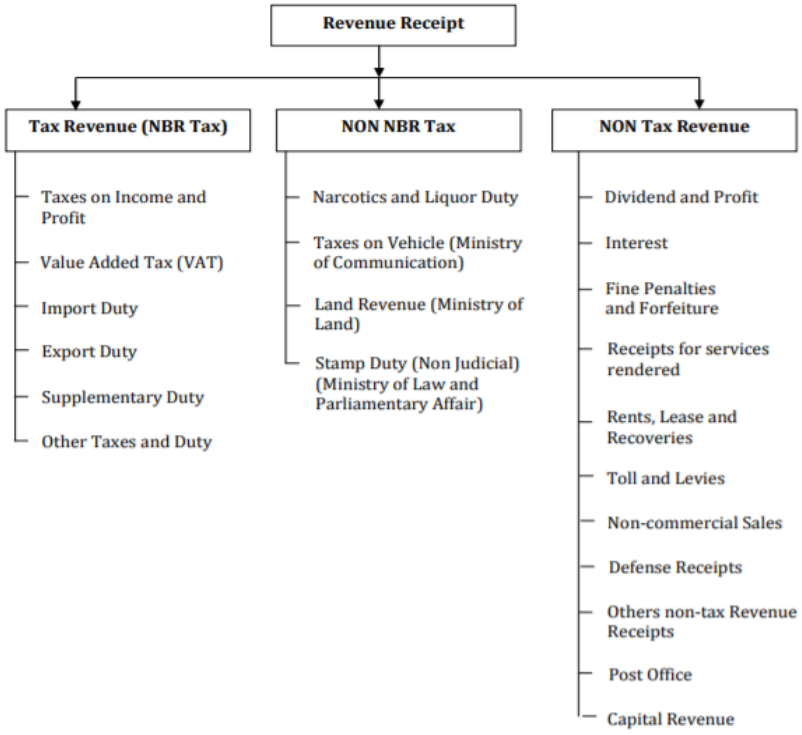


Figure 2: Tax structure of Bangladesh

The NBR sources include customs duty, value added tax (VAT), supplementary duty (SD), excise duty, income tax, foreign travel tax, electricity duty, wealth tax (collected as a

surcharge of income tax since fiscal year 1999-2000), turnover tax (TT), air ticket tax, advertisement tax, gift tax and miscellaneous insignificant taxes.

Other taxes, often referred as non-NBR sources, include narcotics duty (collected by the Department of Narcotics Control, Ministry of Home Affairs), land revenue (administered by the Ministry of Land and collected by local Tahsil offices), Non-judicial stamp (collected under the Ministry of Finance), Land Registration fee (collected by the Registration Directorate of the Ministry of Law, Justice and Parliamentary Affairs) and Motor vehicle tax (collected under the Ministry of Communication). The non-tax sources include dividends and profits, interest, administrative fees, penalties and forfeitures, services, rent and leases, tolls and levies, non-commercial sales, defense, non-tax receipts, railway, post office department, T&T Board, and capital receipts, etc.

Dynamics of Tax Evasion in Bangladesh

As said earlier, there are two types of taxes in Bangladesh: Direct taxes and Indirect taxes. Direct taxes include a tax on income and profit; indirect taxes include VAT, Import duty, Export duty, Excise duty, Supplementary duty and other taxes and duties. Notably, indirect taxes account for most of the tax revenue in Bangladesh. For example, direct taxes contributed 20.2% of total tax revenue, while indirect taxes contributed 79.8% in 2005/2006. In 2010/11, the contributions of direct taxes were 29.2% and indirect taxes were 70.8%. In 2014/15 these figures were 38.9% and 61.1%. The gap however between the contribution of direct and indirect taxes towards total tax revenue has been narrowing in recent years (Nurunnabi 2019b).

According to an estimate by Tax Justice Network (TJN), the tax abuse by multinational corporations (MNCs) and private individuals in Bangladesh is equivalent to at least three-fifths of the country's health budget, according to an estimate by Tax Justice Network (TJN). The annual estimated loss in tax in the county due to evasion is US$ 703.40 million (or around Tk 60 billion), unveiled the TJN's latest report titled 'The State of Tax Justice 2020.' It also showed that the amount is at least 3.50 per cent of the country's total tax revenue. The TJN estimated annual amount of tax revenue at $20.0 billion (or around Tk 1,695 billion).

In midst of indirect tax evasion there are some big sectors including electronic device especially mobile manufacturing companies are there who are responsible for a well pointed part of government revenue deprivation.

Reasons for choosing Taxation on Mobile Device (ICT Sector)

The government's Digital Bangladesh by 2021 vision offers to use ICT in every sector to ensure social security, quality education, healthcare, and law enforcement for all. Because general citizens most widely use the mobile phone to access ICT-related services, it should be cheaper and more easily accessible. However, it is not getting that much cheaper, and the indirect tax of ICT sector including devices and services are not getting into government's eye of tax evasion. On a result, an insane amount of tax evasion is happening out there.

The number of mobile phone users has grown in huge numbers in recent years, creating a positive impact on the formation of Digital Bangladesh. According to the statistics of BTRC Mobile Phone subscribers reached 159.780 million in March 2019.

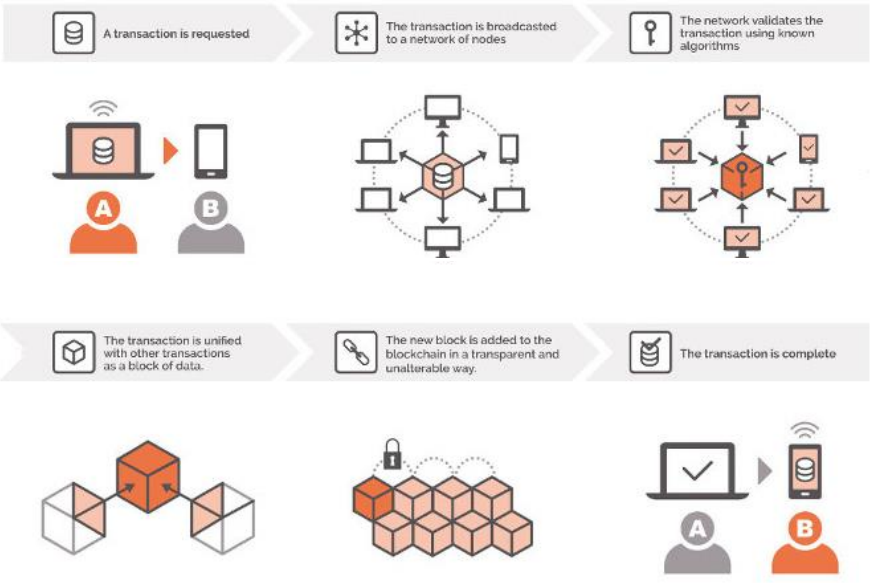
Because of the last installment of increased tax rates on smartphones in June 2020, the consumer must pay a total of 57% of the tax on imported smartphones. And because most of the smartphones from renowned brands are imported, customers do not have a choice but to pay 57% of the tax on every smartphone purchase they make. But there remains a question here. The people who are paying tax for their cellular, do they know how much money the government receive from their spending? The answer is no, and they are one of those big sectors which are evading from the tax of their products.

At present, illegal imports account for 35 to 40 percent of the market. While there has always been a notable presence of illegally imported handsets in the market, the trend has gathered pace in recent years. Such a high import duty ultimately increases the prices of legally imported phones while making the illegal shipments a more viable option. The resulting burden on the sector trickles down to the consumer, hampers growth and draws the country further away from the goals of Digital Bangladesh.

How can Blockchain be efficient for tackling tax evasion of ICT Sector:

From the above section, we can understand that current taxation system on mobile phone is flawed. The authors propose a solution for VAT and supply-chain interface that is built on standardized Hyperledger interface. The proposed VAT model is on execute-order-architecture. Specifically, Hyperledger Fabric is used to design VAT system and implemented the interface for all the involved parties as shall be explained in the upcoming sections.

Blockchain offers transparency and all supply chain are registered on the system to record all transactions involved in exchange of a product from seller to purchaser. As a result, Blockchain accommodates and maintains all history of transactions performed and properly records any action/transaction that cannot be excluded or omitted. Because of using Blockchain, any organization can improve it renew as the digitized transactions are recorded on untampered ledgers which can never be altered. In case of any alteration, the chain of trust is corrupted making the whole network compromised. However, in case of corruption of the network, the peer nodes are not affected as they have their own network which includes ordering nodes. The ordering nodes upon generation of transactions compute hashes of the same. The hashes are stored and appended with previously generated transactions. The final hash generated is disseminated among the other nodes which upon receiving calculates their own final hash based on them on records. The transactions are accepted or rejected based on the final hash values generated at the nodes. In case of matching of the final hash values, transaction is generally accepted otherwise, the new transaction is rejected. Peer nodes perform evaluation, validation, they provide a fault tolerant environment in case of a node which is down. Because of the features we feel that the proposed infrastructure can improve the newly adopted VAT manual collection system in terms of generating revenue in Bangladesh.



Project Methodology:

The methodology for our proposed solution along with selected implementation details are provided in the following subsections:

A. Selection of Blockchain Solution for Tax Collection

Analysts have provided solutions for businesses on peer-to-peer networks; however, those cannot be adopted as a standard for all. Similarly, they do not have support from industry. Generally, there is always support from industry for the acceptance of a product otherwise failure comes to such products in the long run. The fact can be ascertained by looking to Android mobile operating system which is supported by Google and it has achieved an acceptance and received most of the mobile market share. There were many other operating systems that could not get much popularity due to unavailing ability of support from industry big players. In this research, the authors have opted Blockchain, a solution that can easily be adopted by industry and has quite big support for business applications. After selection of the Blockchain infrastructure, the authors designed and implemented Tax collection system for mobile devices over the Blockchain for Bangladesh as a use-case.

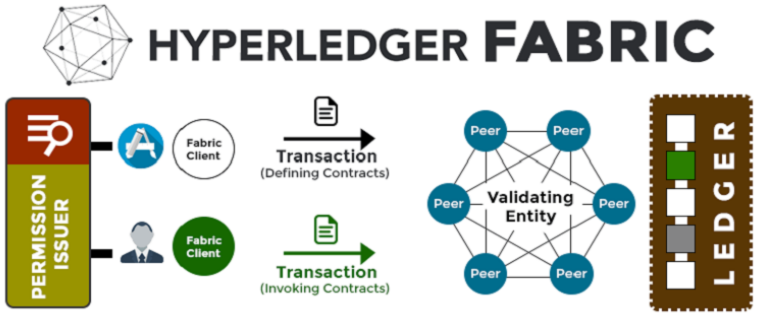
B. Proposed Solution and Selected Implementation Details

The proposed model is primarily designed to implement Tax collection (Company Corporate Tax, Duty Tax, Value Added Tax) system for the Bangladesh through TaxCode Blockchain. Ideally, any supply chain management that relates to public and private organizations, service providers, consumers, large and small businesses will essentially be employed through Blockchain. For collection of taxes, the architectural framework is built upon a Hyperledger Fabric operating system, connecting several supply chain management organizations. The network comprises of a cluster of servers that possess order nodes and certificate authorities (CAs), peer nodes.

Tax collection mechanism is hosted on the cluster that manages and control the entire logical components including implementation of mechanism for consensus and certification authority. Likewise, a group of interconnected servers implementing supply chain management are connected to the cluster through peer nodes as depicted in Fig. 4.

The following figure proposed Tax collection System on Blockchain Infrastructure. The Hyperledger Fabric is the main structure or backbone that runs the composer over itself. The upcoming organization that intends to join the network or become part of the Blockchain are issued certificates by Certificate Authority (CA) of Bangladesh for secure communication among peers. These certificates are issued to organizations for a particular role and based on those roles, the transactions are controlled in the Blockchain. After successful deployment of the Hyperledger Fabric, issued connection profile for each of the relevant participant in individual organizations. Through these connection profiles, the composer-rest-server API creates URLs for different services including the creation of records or deletion of some records. The organizational personnel can trigger smart-contract transactions to deduct and send VAT amount from their system invoices to the distributed ledger. In response, new automatic transactions are triggered

that update VAT amount on-behalf of organization and the payee. In the next section, implementation related details regarding the proposed solution is provided.



C. Tax fixation on Products (Mobile Phones):

For the fixation of taxes, the authors decided to breakdown the taxes into three types, the company corporate tax, Duty tax and Value added tax.

The Company Corporate Tax:

Publicly Traded Company: a publicly-traded company—is a corporation whose shareholders have a claim to part of the company's assets and profits. Through the free trade of shares of stock, on-stock exchanges or over the counter (OTC) markets, ownership of a public company is distributed among public shareholders.

Non-Publicly Traded Company: the non-publicly traded company either does not have a share structure through which it raises capital or that shares of the company are being held and traded without using an exchange. It includes family-owned businesses, sole proprietorships, and most small and medium-sized companies which does not have a stock exchange account in the market.

Table 5: Company tax rate

Category	Tax rate		
	FY 15-16	FY 14-15	FY 13-14
Publicly Traded Company	25%	27.5%	27.5%
Non-Publicly Traded Company	35%	35%	37.5%
Publicly Traded-Bank, Insurance and Financial Institution(other than Merchant Bank)	40%	42.5	42.5
Non-Publicly Traded.-Bank, Insurance and Financial Institution	42.5%	42.5	42.5
Merchant Bank	37.5%	37.5	37.5
Cigarette Manufacturer publicly traded company	40%	45%	40%
Cigarette Manufacturer non-publicly traded company	45%	45%	45%
Mobile Phone: Publicly Traded Company	40%	40%	40%
Mobile Phone: Non- publicly Traded Company	45%	45%	45%
Dividend Income	20%	20%	20%
Minimum Turn Over Tax	0.30 percent (0.10 percent in first 3 assessment years of commencement of commercial production)	0.30%	0.50%
Income from poultry industry	• On first, Tk. 10 lakh - 3 percent. • On next Tk. 20 lakh - 10 percent. • On the balance - 15 percent.	Nill	Nill
Poultry feed, dairy, mulberry, apiculture, horticulture, pisciculture etc.	• On first, Tk. 10 lakh - 3 percent. • On next Tk. 20 lakh - 10 percent. • On the balance - 15 percent.	3%	Not Found
Shrimp/poultry/fish hatchery	• On first, Tk. 10 lakh - 3 percent. • On next Tk. 20 lakh - 10 percent. • On the balance - 15 percent.	General Tax Rate	Not Found

Source: Abul Maal Abdul Muhith, Minister, Ministry of Finance, Budget Speech 2015-16, 2014-15 & 2013-14

The Duty Tax:

As mobile phones from our country can be distinguished into three sections:

i. Manufactured in Domestic, Assembled in Domestic (Walton)
ii. Manufactured in Foreign, Assembled in Domestic (Vivo)
iii. Manufactured in Foreign, Assembled in Foreign (Samsung)

According to the Bangladesh Economic Review, FY2019-20, the percentage of these 3 types of sectional taxes are 5,17 & 32% respectively.

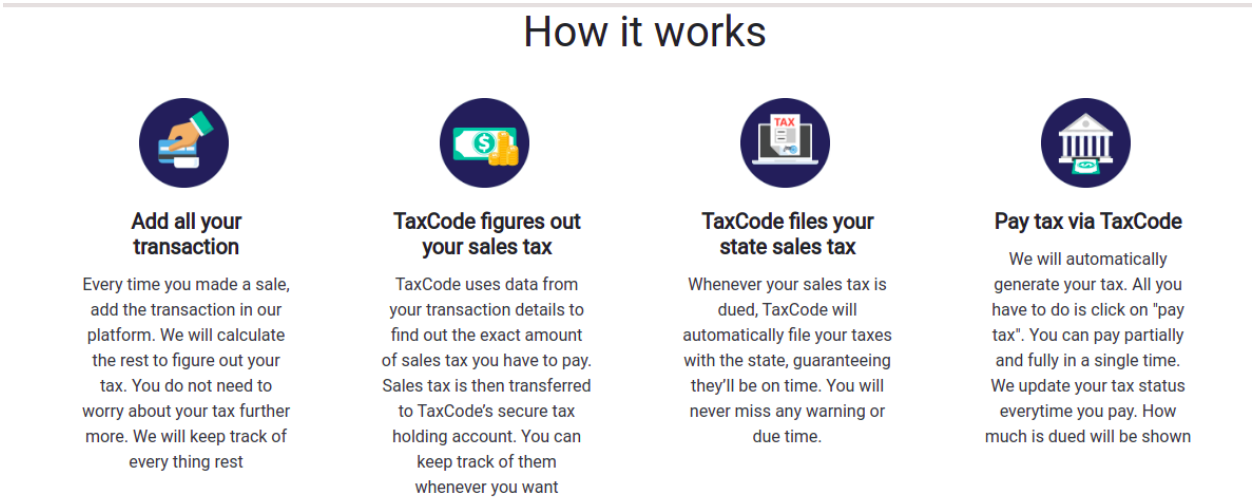
The Value Added Tax:

As par the regulations of Government, each of these product units has to be paid 15% of valued added percentage taxes.

Implementation:

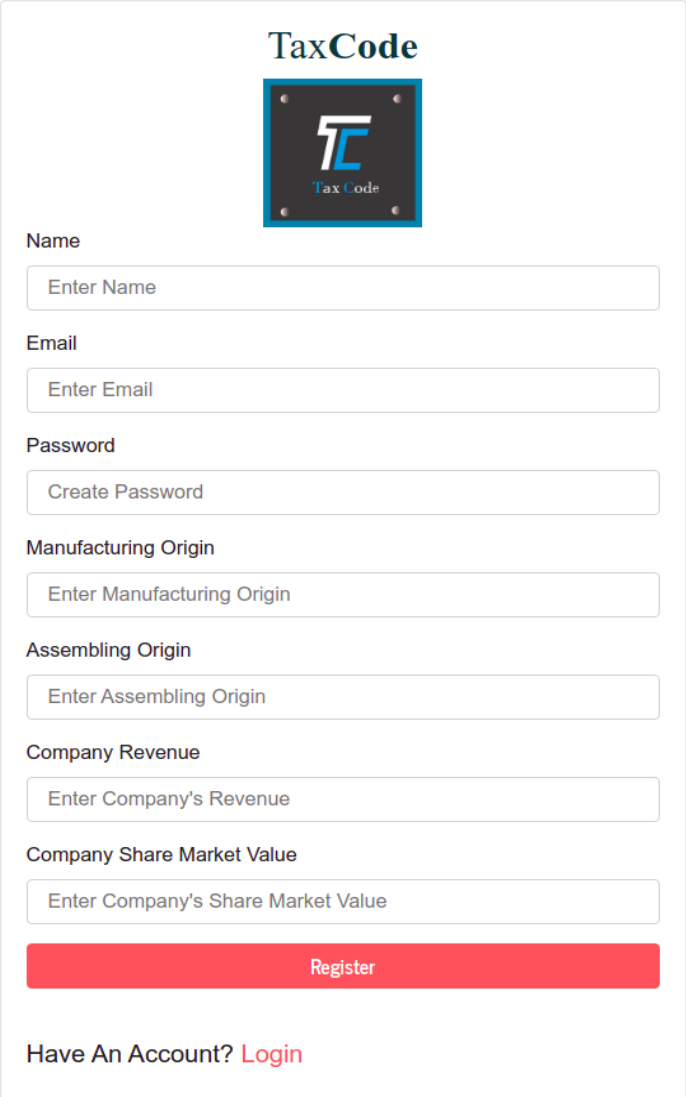
For implementation of the proposed infrastructure, Blockchain environment is built. The state of art tool, the Hyperledger fabric is opted to define business logic and configure ordered nodes. Peers have their own stakeholder which includes various supply chains like manufacturer, mediocre. Further, as per our feasibility study, the deployment of such a system is highly effective. Inside the fabric sample folder, the services are distributed. In the bin folder fabric server and fabric-ca-client defines the server and client and the orders and peer files define the ordered node and peer nodes. In the chain code folder, we define how this application works behind the scenes. In the config folder configtx.yaml, core.yaml , orderer.yaml describe the lifecycle , configuration, consensus, channels. In the fabcar folder, lies the front-end of our application. In the following figure our architecture is defined. In the section “Methodology” subsection B, we described about our proposed platform. Now we will have a tour around our application. How it looks and how it works.

So, at first comes the homepage. The following pictures shows it. In our homepage user will learn how to set up TaxCode application, how it works and some knowledge about the hyperledger fabric and the author.

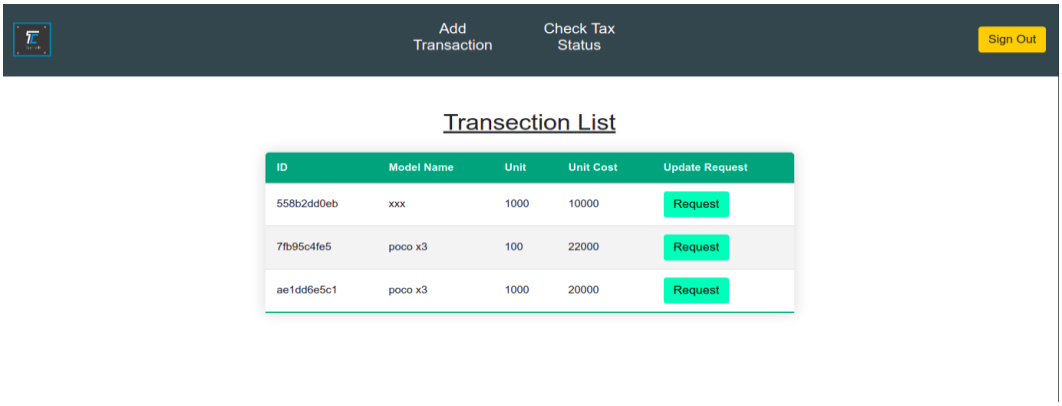


Our application mainly has two parts. One is for admin and the other one is for client. The client site is for the user company who will pay tax via our application.

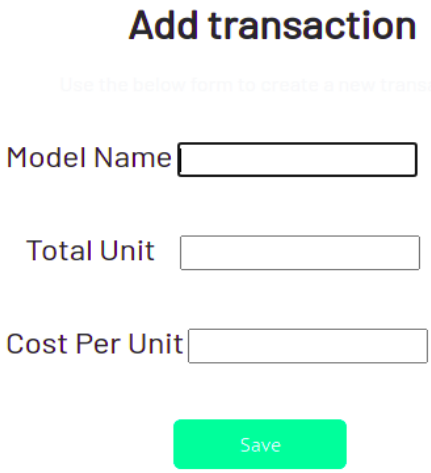
User will have to sign up only for the first time as a company. Next time, the user only signs in to our platform to use the client site of our application. The following picture shows the sign-up interface.



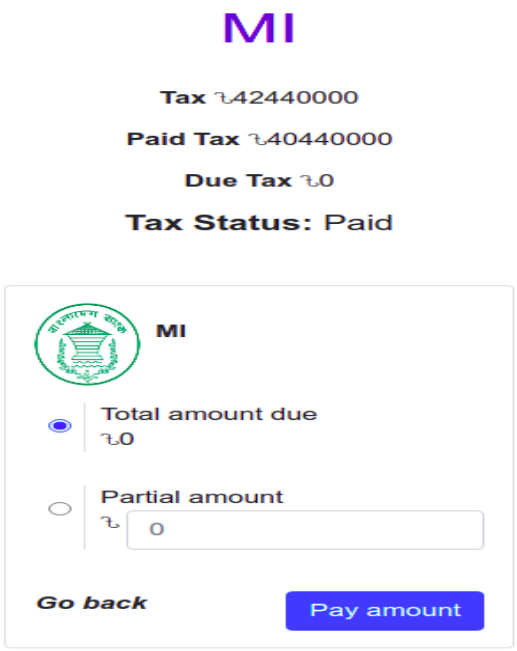
When the user is logged in, he/she will be able to add transaction. And our platform will generate how much the user will have to pay as tax. The following pictures shows what will user see when logged in and how he/she can add new transaction and pay tax.



In case of adding transaction following image will be shown.



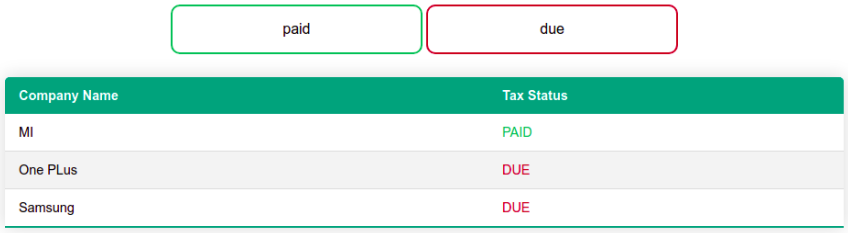
In case of checking tax status following page will be loaded. Here, user will be able to pay tax partially or wholesome in a single time. This is a bank api. From here bank will get the tax payment. Tax status will be updated here depending on the payment.



Now comes the admin site. Here admin or authority will be able to see all the registered company and query them by tax status and accept. The following pictures shows them graphically.

Authority will be able to query company by tax status.

Tax Status List



If authority want to get the company who paid their full tax, he/she will have to click on paid button as shown in the above image. On the contrary if he/she wants to find out which companies did not pay tax, all he/she must do is click on the due button. This is how our application works.

Conclusion:

This project aims to create a clustered composure between taxpayer and government in order to maintain the taxpayer's responsibility for collecting government revenue by a flawless structure, blockchain into the system. The authors of the report collected all the data and relevant information from the updated FY2019-20 budget and Bangladesh Economic Review 2020. A hustle less tax paying promotion and influence the citizen especially the business insider to pay their fair tax to build a developed country is all we want.