VISUAL DATA: A DATA PLATFORM FOR TRANSPARENCY AND ACCOUNTABILITY TOWARDS GOOD GOVERNANCE

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ABSTRACT

As Governments across the world are beginning to increase openness in their actions, concepts like e-governance, e-procurement and open data among others are being developed to facilitate good governance through transparency and accountability. These concepts are ICT driven and offer remarkable opportunities for the promotion of better delivery of government programs and services, enabling the empowerment of citizens through greater access to information, delivery of more efficient government management processes, better transparency and accountability which ultimately reduce corruption. This paper presents the design and implementation of the Visual Data platform that borders around open governance ideas; Open data with the development of an open-data portal, retelling public information through visualizations and public expenditure tracking through the use of crowd maps. Data contained in the platform centres around the 2014 capital budget on education as released by the federal government of Nigeria for some states of the federation. Also included was the Kwara state government budget for the years 2009-2014. The open data portal was designed using DKAN which is a Drupal-based open source software with a full suite of cataloguing, publishing and visualization features. Proprietary data visualization software was used for the creation of infographics and visuals to show government expenditure.

Keywords: Accountability, Corruption, Data Portal, Good Governance, Visual Data and Transparency.

INTRODUCTION

Corruption is a chronic disease of the modern world, especially developing countries, and it is an economic, legal, environmental, and societal issue. It corrodes the social structure and trust in government. It damages the economy and ultimately undermines the legitimacy of the state. Corruption is both a major cause and a result of poverty around the world (Shah 2010). Also according to Shah (2010), corruption occurs at all the levels of society, from local and national governments, civil society, judiciary functions, large and small businesses to military and other services. Kishor & Arjun (2014) further stated that corruption affects the poorest the most, as they have no cushion, monetary cushion, against its consequences, and whether in rich or poor nations, its effects is the same.

1. http://www.ipaidabribe.com
2. http://anticorruption.ie/
3. https://play.google.com/store/apps/details?id=ua.ivfr.mvk.mFrankivsk&hl=uk
4. https://itunes.apple.com/us/app/philly-watchdog/id428024273?mt=8
5. https://play.google.com/store/apps/details?id=com.level2.bhrastachar
6. http://dkan.org
7. http://recline.js
8. http://en.wikipedia.org/wiki/Apache_Solr
9. http://mapsdata.com
10. http://azure.windows.com
11. http://www.postgresql.org/

Information and Communications Technologies (ICTs) are increasingly seen by governments as well as activists and civil society as important tools to promote transparency and accountability as well as tools to identify and thereby tackle and reduce corruption (Wickberg, 2013), however, very limited research has been carried out to measure the actual impact of ICTs on corruption at the macro-level (Zinnbauer, 2012). New technologies, in the form of websites such as ipaidabribe.com[1] in India and anticorruption.ie[2] in Ireland, mobile phone applications such as 'Mobile Ivano-Frankivsk[3]' in Ukraine, 'Philly Watchdog[4]' in Philadelphia, 'corruptionTrak[5]' in India, etc., have been used to facilitate the reporting of corruption and increase the access to official information, to monitor the efficiency and integrity of social services and of a country's political life, and to make financial information more transparent as can be seen with BudgIT, Visual Data, Edo Open Data Portal, among others. ICTs can also support campaigning efforts and help mobilise people against corruption (Dubey, 2015) which is achieved by making available the right information to spur the right action from citizens. Kishor & Arjun (2014) also noted that ICTs have also been seen as pioneering tools for the promotion of the better delivery of government programmes and services, enabling the empowerment of citizens through greater access to information, delivery of more efficient government management processes, better transparency and accountability, and the mitigation of corruption risks. Matheus et al (2011) are of the opinion that the introduction of ICTs in public administration is an important step toward improving processes, service delivery and also participation and social control. The introduction of ICT can reduce corruption by better enforcing rules, reducing the discretion of officials, and increasing transparency (Igbal, 2008). There is a broad consensus that ICTs have the potential to make a significant contribution to the fight against corruption by facilitating the flow of information between government institutions, between government and citizens, as well as among citizens (Dubey, 2015). New technologies can also promote transparency, accountability and community participation. One of such technologies is e-procurement which refers to the use of electronic communications by public sector organisations when buying supplies and services or tendering public work. Public electronic procurement can improve transparency in the public sector by increasing the coordination, dissemination and administrative capacity of public procurement system. It can facilitate information sharing and social mobilisation and ultimately provide digital platforms where citizens can report incidents anonymously. Public e-procurement systems in essence facilitate the collection of digital footprints and complete audit trail which increase the opportunity to hold individuals accountable and ultimately increase the possibility of detecting corrupt practices (Kishor & Arjun, 2014).

Dubey (2015) further emphasized that there are numerous ways in which ICTs can be used to trigger positive change, and these are: by reducing the asymmetries of information between public officials and citizens; limiting the discretion of public officials; automating processes, cutting out intermediaries, and reducing red tape and bureaucracy (Zinnbauer, 2012).

The Swedish Program for ICT in Developing Regions (SPIDER, 2010) developed a list of the possible areas in which ICTs can help combat corruption: (1) Automation, which can reduce the opportunities for corruption in repetitive operations; (2) Deterrence, by disseminating information about reported cases of corruption; (3) Detection in operations, to identify anomalies, outliers and underperformance; (4) Preventive detection through monitoring of networks and individuals; (5) Reporting, to create complaint channels that can lead to concrete action and help punish violations and close loop-holes; (6) Promoting ethical attitudes through public engagement and online discussions; (7) Transparency, which can help reduce the room for discretion; and (8) Awareness raising to empower the public and inform her about its right to resist arbitrary treatment.

Given the important role of information in exposing corruption, the application of ICT in the world in general and in developed countries in particular leads to the removal of barriers from the path of economic development in these countries (Piatkowski, 2006). In fact, study results shows that governments with the tendency towards transparency and prevention of corruption tend to provide free access to information and utilize the ICTs (Lord, 2006).

With the advent of ICT, a new vista has indeed been created for the presentation of public sector data. This has hitherto culminated into making popular the open data paradigm. With data provisioning still at its low ebb, very few initiatives are available towards data provisioning and the federal government of Nigeria's data portal is still yet to be active. Due to the need to compliment government initiatives, Visual Data Nigeria is conceived and designed. The initiative aims to champion provisioning of open data and make creative use of government & public data either by presenting them in simple tweets, interactive format or infographic displays. It offers a platform for visualising and encouraging manipulation and utilization of open data with mobile and online solutions to trigger discussions around public procurement and expenditure, thus taking open data beyond a news item to a focal point of debate among Nigerians.

The rest of the paper is organized as follows. Section 2 describes some of the researches that relates to the work in this paper. Section 3 enumerates the methods and materials adopted in the study. Section 4 presents the description of the visual data platform, social media pages as well as project monitoring work carried out and Section 5 contains the concluding remarks.

LITERATURE REVIEW

Several previous studies have reported on the use of ICTs in tackling corruption, leading to:

Transparency, Availability and Community/Civic Participation

Transparency and availability are essential components in a corruption free society. ICTs, particularly the Internet, may increase the potential for transparency in basic processes made by e-governance (Matheus, Vaz & Ribeiro, 2011). According to Camerer (2006), the proper use of information is the best vaccine to combat corruption. Ribeiro (2008) said the concept of transparency can be understood in two aspects. The first indicates the concept of transparency as a synonym for publicity, and the second as transparency and the availability of data. Particularly regarding the frequency and timeliness of information contained portals and government sites, according to the words mentioned by Vaz (2003), recognising such information as a public right of every citizen. It will be also right to add that transparency connotes not only publicity and availability, but also accessibility, fairness and accountability. While having information in portals is an exhibition of transparency, having these information in formats that can be easily garnered and understood by the average person exhibits transparency to an even greater level. These formats include the use of visuals and images as demonstrated by visualizing.org, BudgIT, Visual Data, visualisingdata.com, as the needed information is not only available, but also easily accessible. Thomas Barnebeck (2007) showed in his study that e-government reduces contact between corrupt officials and citizens and increases transparency and accountability.

On the causes of corruption in a society, Klitgaard (1998) held that corruption occurs due to the asymmetrical information. Therefore, an important step in reducing corruption is the elimination of the asymmetric incidence of information and incentives. This viewpoint can clearly be found in the UN definition of corruption, which refers to it as "the misuse of the entrusted power of private gain". ICTs, especially the social media tools, can facilitate the

work of civil society organisation working towards greater transparency and against corruption by supporting a mix of methods of campaigning on transparency and educating citizens on what corruption is about and their civil rights (Kishor & Arjun, 2014). There are studies showing that the greater the access to information, the lower the corruption levels (DiRienzo et al., 2007).

Creating Awareness

ICTs can also be used for citizen mobilisation and awareness raising campaigns. Mobile applications can be designed to reach the majority of mobile subscribers through outreach/publicity campaigns using SMS as was seen in South Africa. However, organisations running such initiatives need to build a substantial database of targeted subscribers with active phone numbers (Chene, 2011), but gathering information about the reliable and valid sources these information should be dispersed to may prove difficult. People change cell numbers over time and not everyone takes cognisance of information sent to their mobile phones, translating to the fact that not everyone understands what the information they have been sent can and should be used for. This should however not deter the transmission of information, as the few who take the appropriate action based on information received still count. If the public is aware of government rules and procedures they are better able to resist arbitrary treatment (Kishor & Arjun, 2014).

ICTs have ensured the mass access to the stream of information and knowledge, which has improved the situation and decreased the socio-economic and practical barriers for the masses to get information about rights (Ali, 2010). Updated information received through ICTs enhances the awareness about surroundings that helps improve one's personal and social understandings. Vast information about the politics and politicians on ICTs facilitates in chalking out a more politically active and informed masses (Kurtz, 1995). The enhanced role of social networking sites demonstrated the extended usage of the Internet as an alternate medium of information exchange and as an effective communication media for the mobilization of people during restrictions on citizens for the exercise of their democratic rights. Internet has performed a role in formulating the social organizations by facilitating their activities and developing a new form of association by creating the virtual community (Yang, 2003).

Reporting to Create Complaint Channels

New technologies can provide effective channels to report fraud and corruption and facilitate the making of complaints. This can be done through setting up corruption hotlines and/or SMS based mechanisms (Chene, 2011). Reporting can be done via websites, hotlines or phone applications that solicit and aggregate citizens experience of corruption. Reporting bribery and petty corruption perhaps the most renowned corruption reporting website is Janaagraha Centre for Citizenship's ipaidabribe.com. Through this website citizens can report on the nature, number, pattern, types, location, frequency and values of actual corrupt acts that they experienced. Ipaidabribe.com received almost 28, 500 reports between 2010 and 2014, some of which were picked up by the media and resulted in arrests and convictions. On the same website, citizens can also report on positive experiences that they had with honest officers. The initiative started in India but has now been duplicated in Greece, Kenya, Zimbabwe, and Pakistan. A number of global reporting platforms have also sprung up in recent years. BRIBEline is one of such, it is a reporting website which is available in different languages, totalling 21, and it was initiated by TRACE. BRIBEline collects information

through anonymous complaints about bribes solicited by certain official or quasi-official bodies – governments, international organisations, security forces, state-owned enterprises, etc. – throughout the world. The information collected is used to take legal action or investigative action and the aggregated data is made available to the public to raise awareness about specific corruption challenges.

Election monitoring and political accountability

In the Philippines, for example, during the 2010 presidential elections, the VoteReportPH project encouraged voters to report electoral fraud and irregularities via SMS, email, twitter and a website, all based on an Ushahidi-based platform. The project has gained online popularity, attracting around 2500 unique hits per month (Gronlund, A. et al, 2010). In Uganda, Ugandawatch 2011 is an independent hotline where citizens can report problems, fraud and irregularities that they encounter during the electoral process. The organisations involved then analyse and make reports available on their websites covering issues such as refusal to register, the inaccessibility of voter registration, incorrect voter registrations, gender issues, money and politics, as well as the use of violence and intimidation (Chene, 2011).

Similarly, the National Democratic Institute has designed a simple SMS-based system for trained volunteers to monitor and report on irregularities during the election campaigns all over the world. Countries covered include Albania, Bahrain, Indonesia, the Palestinian territory and Sierra Leone (USAID, 2008).

In Kenya, a budget tracking tool has been developed as a platform for communities to actively engage in public resource management, enabling citizens to monitor and track both disbursements and the utilisation of development funds. The tools can be accessed both by SMS and the internet, and can also be used for feedback on particular projects (Chene, 2011).

Public Engagement and Online Discussion

Davies (2007) suggests that ICTs have come so that citizens could come together and form groups to discuss public policy forums and legitimising and facilitating interaction within communities. This is very true, in fact, the use of social media has led to a lot of fruitful discussions that has caught the attention of those in power, and brought them to order or in most cases, called their attention to serious issues in the society. There are quite a number of recognised social media activists who work to put out information to make sure the right attention is called to pressing issues as regarding the various activities going on in their various communities. Online discussions also provides opportunities to suggest new and pragmatic ideas to those who seek help and one can join the international community and become a part of global discussion. The participation in global discussion and debate promote changes and more adoptive approach and users become free from biases based on gender, race or disability that have historically limited opportunities (Lockard, 1997).

ICTs for chatting, discussion forums, group decision support systems and blogs are being increasingly exploited by the users (Sanford & Rose, 2007). The use of ICTs can lead to increased civic participation and participatory democracy through the principles of social control and transparency (Mello, 2008). The information acquired by citizens can only spur them to action if and only if, it is understood to the extent of knowing what actions to take as regards the information that has been laid into their hands, this then leads to a very essential

aspect, which is citizen participation, as the eradication of corruption cannot be successfully achieved by the government alone, the support of the citizens is greatly needed.

From the national, moral and economic perspective, corruption has proven catastrophic to the poor nations. While the more prevalent idea is that it is solely the government's responsibility to fight and prevent corruption, this is however not all encompassing. Ultimately, all parts of our society must share responsibility for containing corruption, because all of us are willing or unwilling participants in it, one way or the other (Chowdhury, Khan & Akter, 2013).

While the eradication of corruption using ICT is dependent on several factors including political will and difficult to achieve, it does have a real potential. However, in spite of its potential, the use of ICTs for anti-corruption is not a magical bullet. The realisation of its full potential depends on political, infrastructural, social and economic factors (Dubey, 2015). The prerequisite for the success of ICT solutions is an enabling environment that promotes and protects free speech.

Different organisations, institutions, research bodies and individuals have done some studies related to the work presented in this paper. Some of which are:

Connected Development (CODE)

Connected Development (CODE) is a non-governmental organisation whose mission is to improve access to information and empower local communities in Africa. They strengthen local communities by creating platforms for dialogue, enabling informed debate, and building capacities of marginalised communities which will bring social and economic progress within communities, while promoting transparency and accountability. CODE provides marginalised and vulnerable communities the resources to amplify their voice with integrity and independence, while providing them information that can bring about social and economic progress. To enhance effective democratic governance and accountability, they create platforms (mobile and web technologies) that close the feedback loop between citizens and the government. With global expertise and reach, they focus on community outreach, influencing policy and practice and knowledge mobilisation.

BudgIT

BudgIT as an idea was conceptualised and hacked at the Tech-In-Governance, a 48 hour gathering organised by Co-Creation Hub in February 2011. BudgIT as a tool aims to redefine participatory governance. Many Nigerians, with little or no knowledge of accounting and public financial management, are lost when they see (if they ever get the chance to) the budgets of the different arms of government. BudgIT's innovation within the public circles comes with a creative use of government data by either presenting them in simple tweets, interactive format or infographic displays. BudgIT offers mobile and online solution to trigger discussions around the budget and take the budget beyond a news item to a focal point of debate among Nigerians. They believe that budgetary information is a vital asset and thus, needs to be understandable and accessible to all Nigerians, they provide these vital information in infographics display and images.

ACID Nigeria

The Anticorruption Internet Database (ACID) is a multifunctional web repository for all corruption related issues in Nigeria. It is designed to bring to the public space a collaborative and structured presentation of information from activities embarked upon by CSOs, media agencies and organisations engaged in anticorruption and good governance projects and to provide veritable tools to facilitate civic engagement, public advocacy. As a system, ACID is designed to function in a continuous cycle of understanding; engagement; transparency and accountability, with the ability to operate both concurrently and consecutively with weighted values distributed along its value-chain. However available evidence shows that ACID Nigeria might have since stopped functioning, as the last presence was seen in 2013.

Edo Open Data Portal

The Edo State Government adopted the Open Government Initiative (OGI) which gave birth to the Edo open data portal, the official data repository for Edo State Government which is a marked departure from the age-long culture of government secrecy. It provides an easy way to find, access, and reuse public datasets from the State Government, international organisations and non-state actors. This was done with the hope that the data will become a platform for improving transparency, catalysing innovation, and enabling social and economic development.

Nigeria Statistical Data Portal

The Nigeria Statistical Data portal is an initiative of the National Bureau of Statistics, developed in association with the African Development Bank (ADB) and Prognoz. The statistical portal which was developed with a vision to become one of the foremost and modern knowledge-based national statistical offices in the world, the Nigeria Statistical Portal provides data across six data categories, each having subdivisions containing data, namely, socio-economic data, sector data, macro-economic data, governance data, MDG and annual abstract of statistics, and allows these data to be exported in word, spreadsheet, presentation (PowerPoint) and picture formats. The portal also makes provision for the analysis of data based on the use of filters and presents a profile for each of the 36 states in Nigeria

At this, we are adding to the possibilities of integrating existing technologies to better offer solutions in the area of graft fighting with implications for practical and academic purposes.

MATERIALS AND METHODS

The Visual Data platform is built with a range of open source and proprietary software and platforms; DKAN, Recline JS, and Apache Solr, which are open source, Microsoft Azure and Infogram, on the other hand are proprietary.

Data Collection

The data used for the expenditure tracking was gotten from the Nigeria Budget for 2014 as well as the Kwara state government budget for the years 2009-2014.

Frontend Technologies

DKAN -Drupal Knowledge Archive Network

DKAN[6] is a Drupal-based open data platform with a full suite of cataloguing, publishing and visualization features that allows governments, non-profits and universities to easily publish data to the public. Consisting of three major components; DKAN Distro - the installation profile that packages everything together. It includes the DKAN theme, faceted search, and other elements. DKAN Dataset is a stand-alone module that provides dataset and resource content types, and the DKAN Datastore another stand-alone module that provides the ability to include uploaded files into a datastore and expose their components via an API and offers an API as a custom endpoint for the Drupal Services module.

Visual Data's instance of DKAN was customized to ensure full compliance with the concept of open data where interoperability plays a vital role. Resource data can be accessed via a Web API powered by the DKAN datastore API with powerful query support, and their DCAT compatible formats facilitates interoperability between data catalogues published on the Web.

Recline JS

The Recline JS[7] module for Drupal, integrated into DKAN allows for real time visualizations of resources in the DKAN datastore using maps, grids and charts. This module creates an integration with Recline.js to visualize user-submitted data creating grid, graph, and map data previews for CSV and XLS files based off of the following mechanisms.

Apache Solr

Solr[8] is an open source enterprise search platform, written in Java, from the Apache Lucene project. Its major features include full-text search, hit highlighting, faceted search, dynamic clustering, database integration, and rich document (e.g., Word, PDF) handling. Providing distributed search and index replication.

Mapsdata – mapsdata.com

Based on OpenStreetMap, OpenLayers and other great and open tools, Mapsdata[9] allows you to make sense of data by visualizing it on a map. The Visual Data platform employs this tool for tracking expenditure as shown in figure 4.

Database and Backend Technologies

Server-side development of Visual Data is done with ASP.NET C# and PHP with PHP used to develop the dataportal and C# the preferred option for other aspects of the platform.

Microsoft Azure

Azure[10] is a cloud computing platform and infrastructure developed by Microsoft. The Azure platform is solely responsible for hosting the Visual Data Site and Databases.

PostgresSQL[11]

Because Drupal has a pluggable database layer DKAN's database can MySQL, PostgreSQL, or MS SQL Server. The Visual Data platform employs the PostgreSQL option for its data portal.

DESCRIPTION OF THE VISUAL DATA PLATFORM

Several approaches exist to tackling corruption and fostering openness in governance across the world. The Visual Data platform integrates three key approaches fully described in this section.

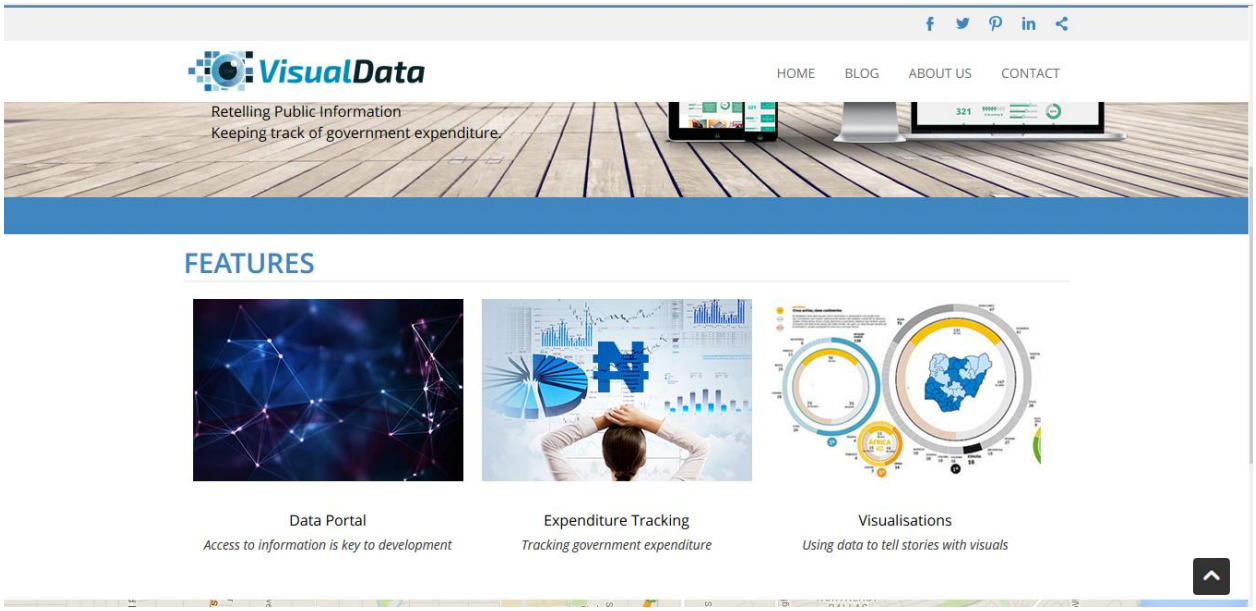

Figure 1: Homepage of the Visual Data platform

Figure 1 shows the homepage of the Visual Data platform with links placed to the various features; Data portal, Expenditure tracking and Visualizations.

Data Portal

The Visual Data open data portal provides a platform for full integration and cataloguing of online data that cuts across every sector of the Nigerian economy including public and private sectors. Built from the open source data portal software called DKAN, it provides citizens with public information

Collection and dissemination of information and data are key tools of government. Governments gather large amounts of data and hold significant national datasets. To be made meaningful data must be represented or contextualized in some way – converted into information. In an increasingly digital society where data can be transferred and analysed using freely accessible platforms and tools, the monopoly government historically had on processing and interpreting data is undermined.

Definitions of open data generally require that the data must be in standard and re-useable formats, and under licenses that allow for data to be re-used in different contexts.

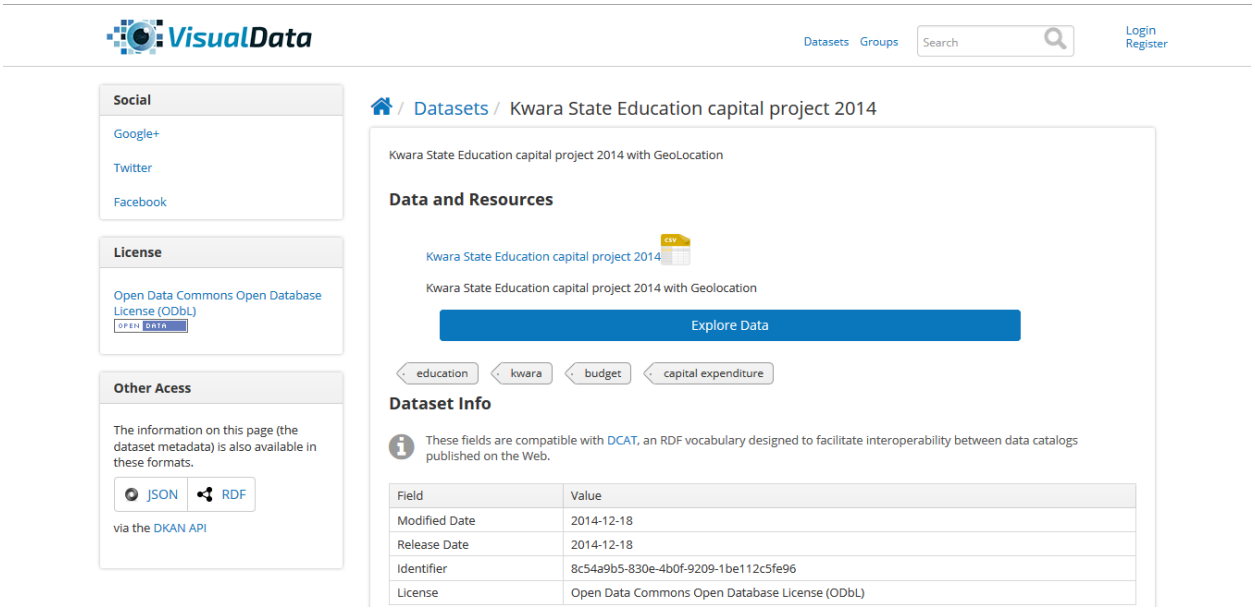

Figure 2: Open Data Commons Open Database License

The Visual Data portal allows for reuse of the data present on the platform under the Open Data Commons Open Database License (ODbL). Datasets can also be downloaded or accessed via a Web Api in JSON or XML formats. Figure 2 shows the page of the data portal that displays information about a particular resource; license, metadata, link to explore the data, as well as links to the metadata API.

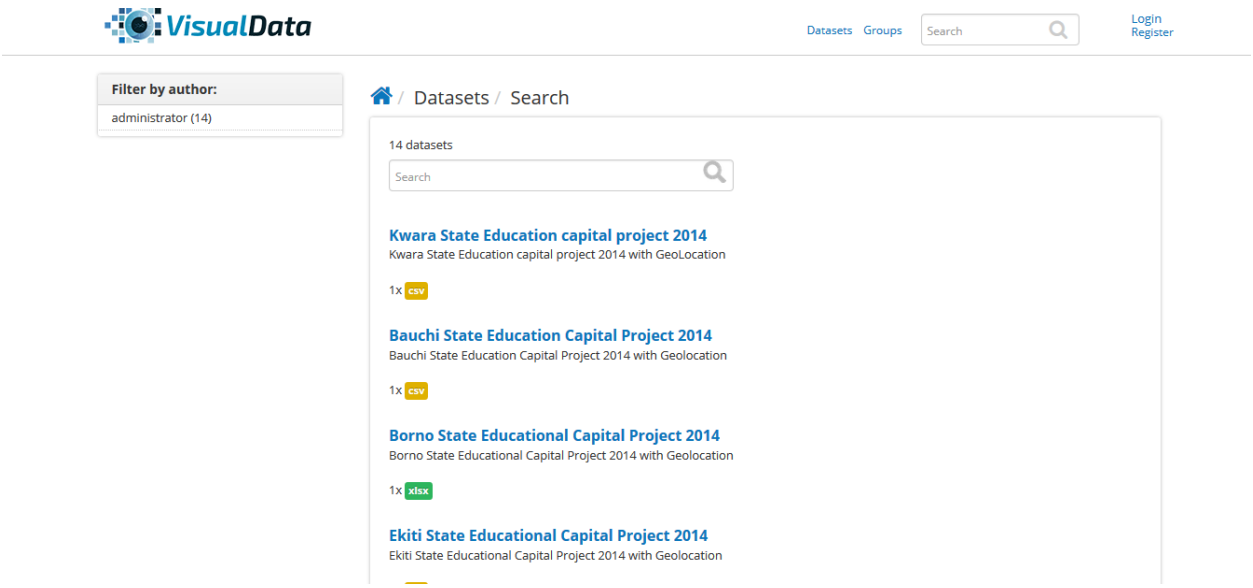

Figure 3: Datasets on the portal

Figure 3 shows the page with a list of datasets on the portal which is paginated and also provides a search box for users to easily find a resource based on keywords presents in the resource name, tags, its group or it description.

Expenditure Tracking

The need to for citizens to understand how their taxes are being spent even on a micro level cannot be overemphasized.

Using maps and markers, the mapsdata tool uses the geo-spatial information present in federal and state budgets to visualize how money is being expended by the government.

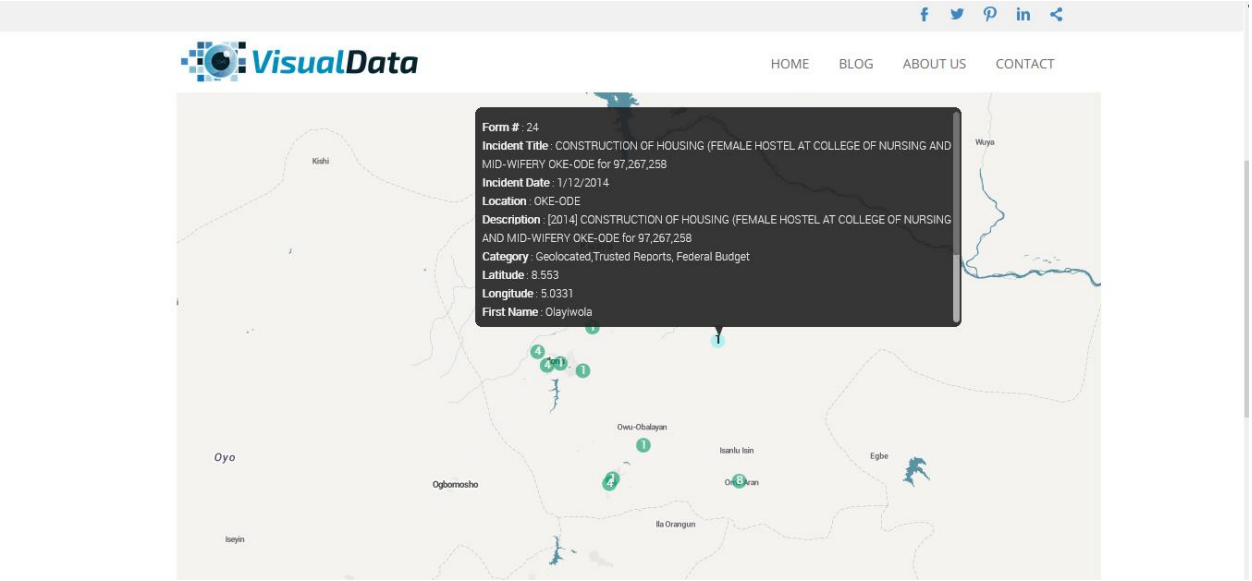

Figure 4: Crowd map as an Expenditure tracking tool

Figure 4, gives a view of the crowd map used as an Expenditure tracking tool. Government budgetary data serves as the source of projects being tracked and each project is represented by a marker placed on the map based on the geospatial information in the datasets. Zooming out groups and puts a number on the markers to depict the number of projects in that cluster. Users can interact with the expenditure tracking tool by clicking on the markers in the locations they are interested in, after which a dialog is show displaying the title of the project, the location of the project, and the amount of funds allocated for the project.

Visualization

Visuals short circuit our brains cognitive circuit and appeal to our emotional levels, this feature presents citizens with interactive visualizations and adds a new dimension of engagement. The tool is used to effectively represent vital information such as the budget making it easier for the average citizen to understand and by implication driving citizen participation.

Driven by Infogram, this feature simplifies sections of the Nigerian budget such as capital and recurrent expenditure by displaying those using treemaps and crowdmaps. Treemaps, though not widely recognized as a statistical visualization tool, allow for effective representation.

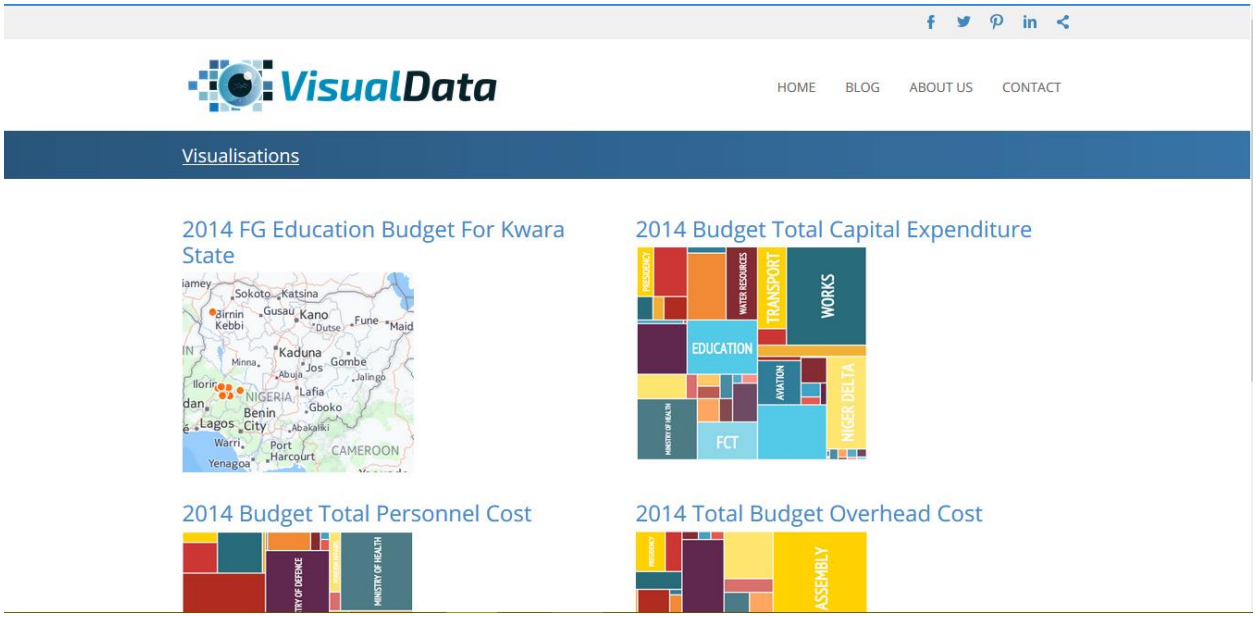

Figure 5: Visualization landing page

Figure 5 shows the landing page for the visualization feature, displaying a list of visuals available on the platform and what they attempt to simplify.

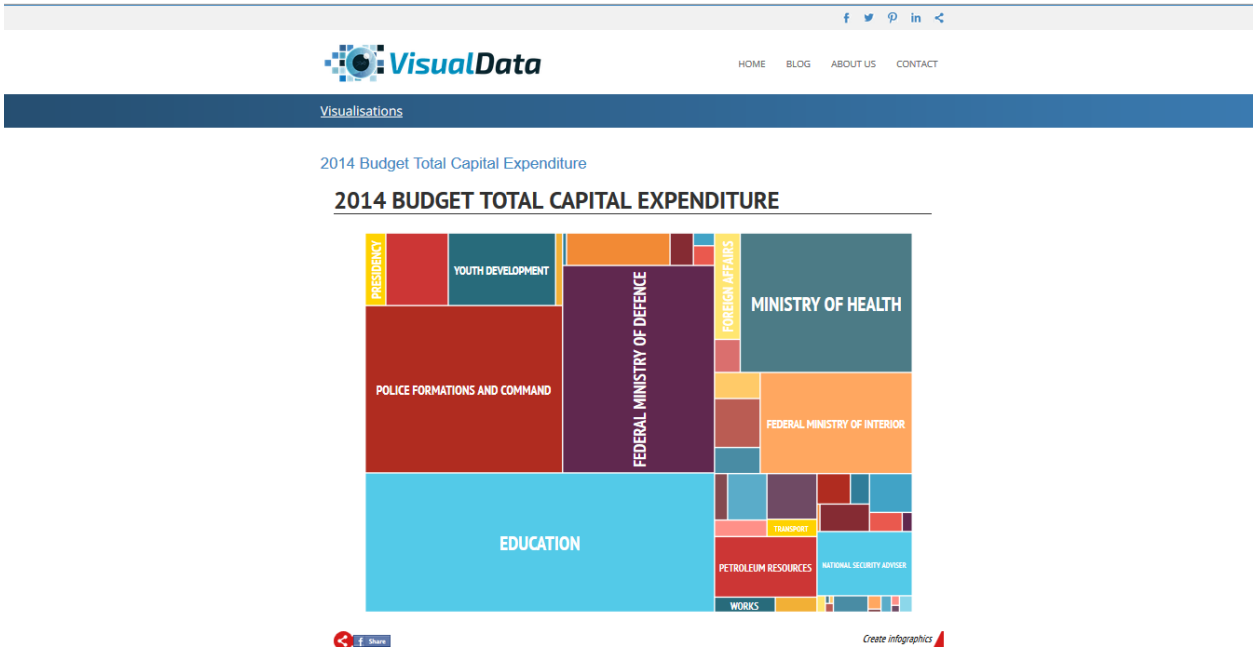

Figure 6: Treemap showing the capital expenditure

Figure 6 shows a specific visual- an interactive treemap showing the capital expenditure in the Nigerian Federal budget for 2014 cutting across the various MDAs. Users can share this on Facebook and drive conversations with their network on the simplified data.

Citizen Participation

The need to engage citizens in the process of governance cannot be over emphasized**.** Citizen participation provides individuals with opportunity to air their views on government policies that affect them as well as influencing public decisions. Visual Data encourages citizen participation through its social media presence on Facebook (http://facebook.com/visualdatang), twitter (http://twitter.com/visualdatang) and Google+ (https://plus.google.com/118033750901299280951), and a Disqus (http://disqus.com) tool that allows citizens to interact in the expenditure tracking section of the Visual Data platform.

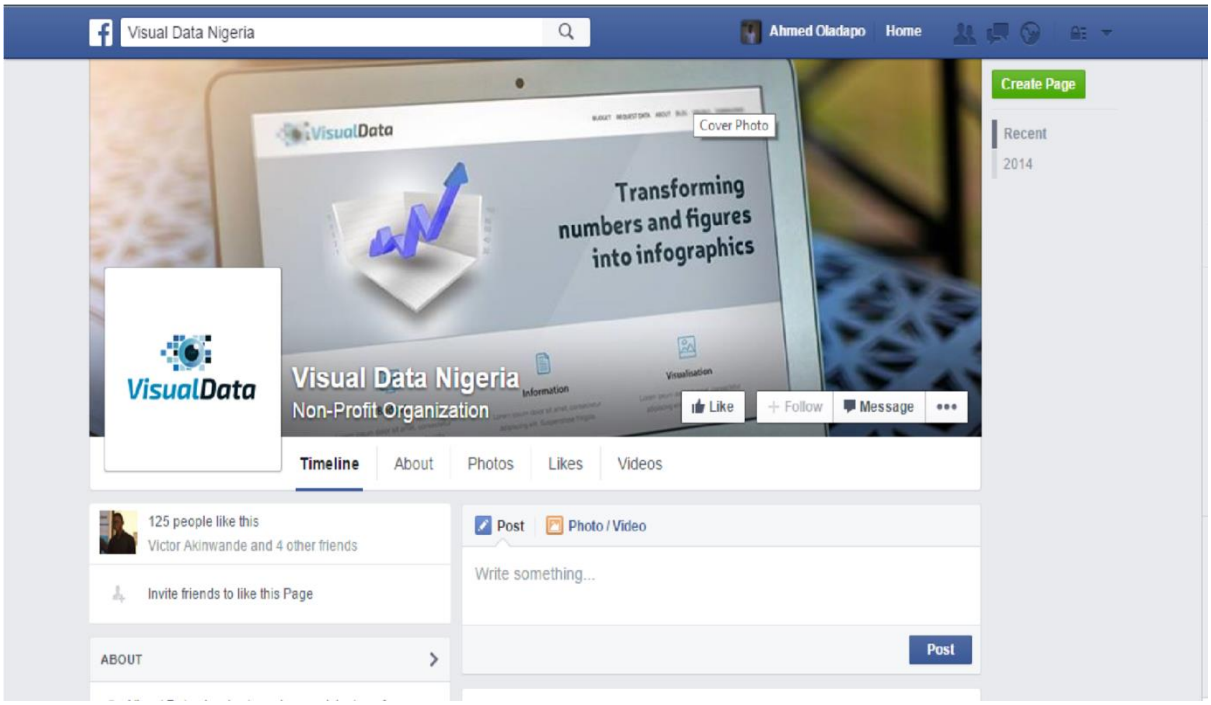

*Figure 7***:** Visual data Facebook page

Figure 8: Visual data Twitter page

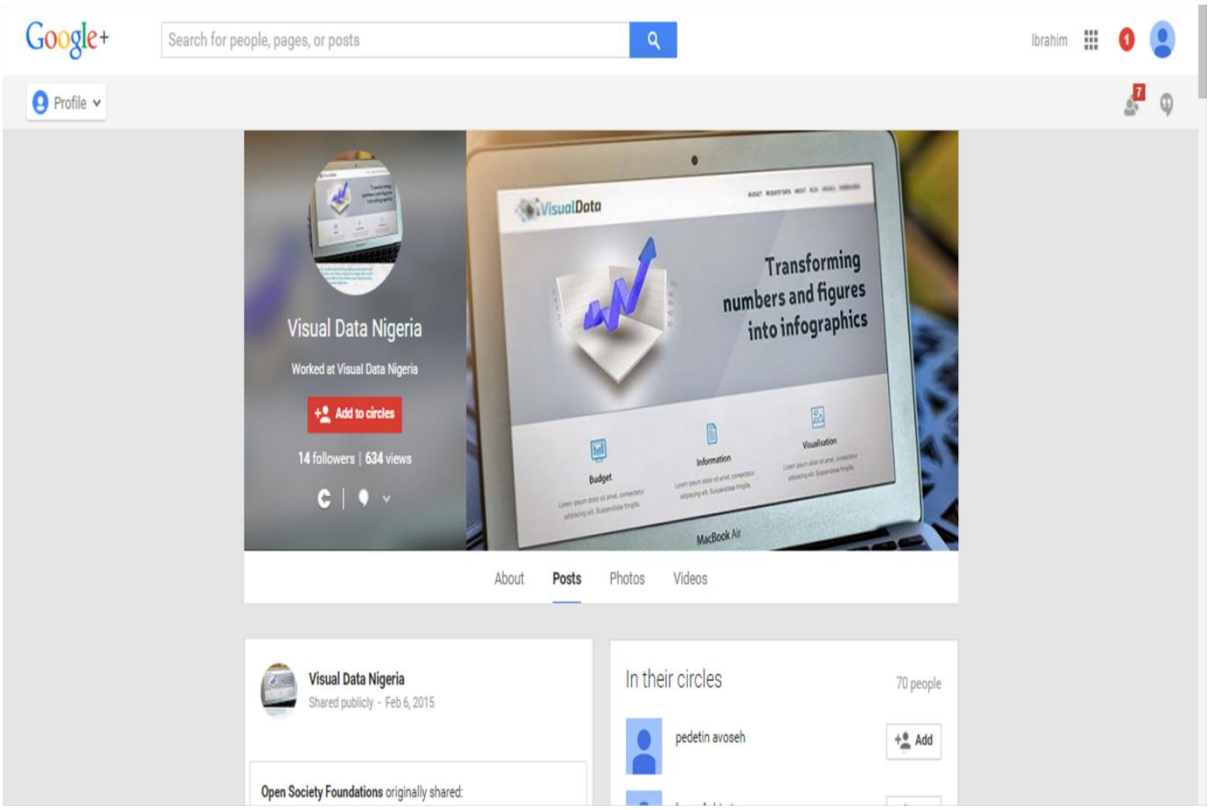

Figure 9: Visual data Google + page

CONCLUSION

The extent of involvement of citizens in governance process in Nigeria is abysmally low, defining the imperatives for an open system, capable of provoking a transparent and open society. Public data/information rate in the country is extremely low, leaving critical stakeholders in the dark as to how to design a development road map for the country and its sub-nationals. Mismanagement of public funds has a little too often gone unpunished or much less questioned in the country.

It is however, instructive to note that the corruption perception index of Nigeria has in the recent years been steadily increasing which is largely as a result of the wave of open data in Africa, a new breed of active citizens spurred on by the power of social media as a tool for promoting social change, as well as the enactment of the freedom of Information act in 2011. While there is a lot more that can be done by the central government in creating anti-corruption campaigns enabling environment, the Visual Data platform has leveraged on the open data movement, and the desire of citizens to know how their taxes are being expended.

With all three features of Visual Data geared to drive citizen participation in governance, the data portal fostering availability of information is anticipated to promote research, result in long term economic benefits (growth and job creation), and improved public services. If a government, or people within a government, feel like nobody is watching, then the temptation to steal becomes much more seductive. Accountability to the public begins when people track government spending and detect corruption by watching how and where the money flows, thus, the expenditure tracking and visualizations feature are also geared towards achieving. Simply put, the Visual Data platform is built to unmask the corrupt!

Acknowledgement

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