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## Framework for Nigeria employee monitoring embedded payroll system

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### Abstract

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*A computer-based Payroll Management System (PMS) helps in efficiently managing employee payroll. A challenge associated with notable PMSs is the indirect utilization of necessary inputs from employee monitoring system for payroll processing. Another challenge is that various existing Payroll applications do not snugly meet the Nigerian Tax Computation requirements. There is, therefore, the need for a framework for the design and creation of a Nigerian Employee Monitoring Embedded Payroll system, which this work contributes towards achieving. Extant literature on Payroll Management and Employee Monitoring systems, and the Nigerian Tax Computation Requirements were examined. Through iterative process of awareness, suggestion, development, evaluation and conclusion, a framework for Nigeria employee monitoring embedded payroll management system is presented.*

**Keywords:** Taxation Compliance; Payroll System; Employee Monitoring; Framework; Model

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### 1. Introduction

Establishments use modern technologies to improve transactions in terms of speed, accuracy and ease, safety and security (Sheena, 2014). A payroll process typically includes calculating employee pay, recording payroll transactions, and determining, deducting and paying personal income taxes (Vidler, 2014). A computer-based Payroll Management System (PMS)

keeps a record of the transaction including such items as employee personal data, pay bond, allowances, deductions, savings and taxes, among others (Grover & Kaur, 2012).

The reason for government can only be properly actualized when taxes are paid appropriately and efficiently. Employed individuals pay personal income tax. Employers of labour are required to deduct the personal income tax from employee pay to remit it to the relevant government agency. Various

countries compute their taxation regarding wages and salaries differently (Bird & Casanegra de Jantscher, 2008). Personal Income Tax (Amendment) Act 2011 of Nigeria prescribes computation of personal income tax in Nigeria (Taiwo, 2012). Tax computation requirements are usually mandatory part of any government approved payroll application software.

Employee monitoring systems are systems utilized by organizations to, among others, precisely record the quantity of hours worked by every employee consistently (Audibon, 2010). It is essential that a time in/out system be integrated into a payroll system for completeness, where appropriate, to save time and avoid committing manual intervention errors, in computing employee due remuneration.

Notable existing payroll applications do not have clock-in/out sub-system, and do not snugly meet Nigeria tax computation requirements. Where employee work quantum monitoring is embedded, and/or the taxation computation requirements is attempted in a payroll system, neither the model nor the design is available for enlightenment and improvement. This work, therefore, focus on proposing a framework for a Nigeria Employee Monitoring Embedded Payroll system. The specific objectives are to evaluate some existing PMSs and to propose a framework for Nigerian Employee Monitoring Embedded Payroll system.

Review of extant literature on Payroll Management Systems, Employee clock-in/out System, and the Nigerian Tax Computation requirements was performed. The relevant documents obtained were qualitatively analysed for convergence, and relevant details were extracted, using inductive approach. Iterative process of awareness, suggestion, development, evaluation and conclusion towards proposing framework for Nigerian Employee Monitoring Embedded Payroll Management system was done. No difficulty of being an ethical researcher was encountered.

Generally, employee emoluments usually represent the largest expense in companies. Business owners usually spend large amounts of time hiring, training and maintaining sufficient and competent employees for an operation (business). A payroll management system provides accurate calculation and ensures fast processing of payroll transactions. On the other hand, a clock-in/out subsystem of an employee monitoring system is used, like a timer, to monitor presence and dutifulness of certain employees. Time and efforts are lessened, and accuracy improved, when the database provided by the clocking system is directly used in calculating the payment due various employees. In addition, the amount of tax to be paid by an individual

or business organization is guided by the enabling act governing the type of tax, and automation of personal income tax computation within the payroll management system engenders prompt compliance.

Succeeding sections of this report are as follows. Section Two presents conceptual background information and review of relevant and related work. Section Three presents the outcomes of the research, and Section Four concludes.

## **2. Related work**

Management system is the framework of policies, processes and procedures used to ensure that an organization can fulfill all tasks required to achieve its business objectives, increase understanding of current operations and the likely impact of change, communicate knowledge, demonstrate compliance, establish best practice and ensure consistency (Fraser, 2011; Pardy & Andrews, 2010). It comprises the elements of policy, planning, implementation and operation, performance assessment, improvement and management review (Watson & Jones, 2013). Traditionally, separate management systems were developed to address issues such as quality, environment, health and safety, finance, human resources, information technology and data protection. Financial management is driven by a legal requirement, although an organization obviously needs to control its available resources. This is an area where a clear division of responsibilities, specific controls and the need for detailed records may be more extensive than for other areas where there may be more subjective decisions allowed and individuals are allowed to make their own judgment (Fraser, 2011). A PMS helps in a very particular way.

### **2.1. Payroll management systems**

PMS deals with the financial aspects of employee's salary, allowances and deductions, among others, and the generation of payslips for a specific period (Ravi, 2010). Functions of PMS include automatically calculating withholdings or deductions, processing direct deposits, voiding payments and generating tax forms and other reports. It enables effective employee information management, definition of enrolments, deductions, leave and so on, and management of the payroll processes according to prescribed salary structure. PMSs aim at streamlining and automating the process of paying a company's employees for their services. Generation of reports related to employee, and attendance/leave, among others, are also made possible (Marg, 2014). Most financial software provides templates that can be used to generate payroll reports (Tatum, 2015). PMS is capable of minimizing the data redundancy which frequently occurs in non-

computerized systems (Ahmad, Khan & Beggi, 2010; Nozariah & Abdulla, 2008), and it enables the management to get reports for making quick decisions, especially regarding remuneration. Its operation procedures are easily understandable and sufficiently flexible to cope with certain changing requirements (Ahmad, Khan & Beggi, 2010; Connolly & Begg, 2004).

The possibility of improper set up, power failure, computer viruses and computer fraud, if proper level of control and security, internal and external, are not properly instituted, needs to be confronted (Draz, 2011). Regular records review, Check Controls, and Management approval of changes to payroll, among other controls, should be applied to payroll systems (Ori, 2014). Payroll software can be purchased from a human resources technology vendor or included as a module within a larger enterprise resource planning package. Some found and notable PMSs are Grandmaster Suite, Crest, Paywings, Kronos Workforce Central, Cloud Visual, HR-Live, Payday, and DIPAS.

Grandmaster Suite is a desktop-based software for Canadian businesses with simple to complex payroll needs. It is completely free to use for payrolls for fifty employees or less. It was created by CanPay Software in the year 2005 (CanPay.com, 2016). Grandmaster Suite is designed to accommodate basic payroll functions. It also offers larger organizations ways to handle complex payroll and Human Resource (HR) functions across multiple departments, companies and locations. Multiple administrators are also allowed, which allows for flexibilities on the accessibility of the software. It also has features like Benefits Management which allows for the tracking and calculations of bonuses and work performances in order to determine benefits pay outs. Nevertheless, it does not cater for Vacation or Leave Tracking, W-2 Preparation (Pensions, Retirement pay-out and so on), and Wage Garnishment (Deductions towards debts like Child benefits, court fines if applicable and so on).

Crest Payroll, created by Paramount Software is a fully web-based payroll management system for small and large scale organizations (Phelan, 2011). The software provides means of calculating and filing of taxes automatically. It is user-friendly and portable (laptops, mobile phones and tablets, among others). One of the problems with the Crest payroll is that it is web-based, requiring internet access for usage, which will be a problem in areas in want of reliable, fast and economic internet connections. Crest Payroll system is not free, and its price depends on the size of the organization.

Paywings Payroll has many functions including HR program with a broad range of features designed to help manage payroll, attendance, and shifts, among others. The software was developed particularly for Indian, African and Middle Eastern markets (Ashby, 2012). The application contains both client and server modules, allowing company-wide management of attendance and payroll databases. It also supports the handling of online payslips and allows for payment across multiple counties and currencies. Its Time and Attendance module integrates with all industry standard biometric devices to enable simplified employee time-in and time-out procedure. The software monitors employee movements around the company. It handles legal government documents automatically, making sure the company complies with some government regulations, not Nigeria. The various features of Paywings Payroll are neatly divided up into categories including Admin, Corporate Configuration, Payroll Activities, and HR.

The Kronos Workforce Central payroll system generates payslips and payroll reports. It keeps a record of employees including their personal data, pay band, allowances, deductions, savings and taxes, among others (Grover & Kaur, 2012). It is web-based with self-service employee feature. It has an online training feature, which offers a variety of educational training, implementation and system optimization service (Softwareadvice.com, 2015). The Kronos software is also a multi-national application allowing usage across countries. On the dark side, Kronos software is expensive, making it difficult for organizations, especially small-scaled, to acquire. Its feature of being a web-based also means that it cannot be accessed without Internet connection, which poses a problem to some areas with slow or no internet connection/accessibility. Its online training/education could also be quite slow, because the actual training is taken with others, and a user has to go as slow as the slowest participant.

Cloud Visual Payroll solution is available for companies, such as accounting firms and professional tax and payroll consultants, which manage payroll for their clients, via a cloud-based solution. It enables easy management of multiple clients and multiple payrolls. It provides also security, scalability and flexibility features. It has provision to automatically backup data. Cloud Visual payroll is subscription based, pay-as-you-go, which does not require huge upfront payment. Cloud Visual Payroll provides customizable tax table that supports tax and allows complete pension module with tracking for pension custodians, pension administrators and pension schemes (VisualHR.com, 2016).

HR-Live 16.0 is mainly a client/server integrated personnel and payroll system specifically designed for use in Nigeria (HR-Life, 2016). The cloud-based version called HR-Life Cloud is also available. It has HR management, Payroll and Salaries, and History and Reports features. Employee monitoring system is not included, and the employee tax computation details are not obvious.

The Payday Payroll software performs payroll, deductions and US tax related functions effectively. It is web-based with user friendly interface. It is easy to update and enhances quick data migration, and integration with biometric device or existing systems. It captures employee personal details. It also manages time and attendance, with the use of real time data from biometric/swipe card device/face recognition system (Paydaypayroll.com, 2016). There is avenue for self-service such that employee can apply for leave, employee asset requisition, make loan/ advance requisition, submit suggestions, download payslip, and view attendance details, among others.

DIPAS payroll management system was developed by the Defence Institute of Physiology and Allied Sciences (DIPAS) (Gautam, Ragumani & Sharma, 2010). Built for a client/server environment, it has a centralized database structure thereby optimizing the use of available space, avoiding duplication of files and records, and reducing the possibility of data redundancy. The application was developed using Java Server pages, TOMCAT, Java, JavaScript and SQL Server.

It is worth mentioning at this stage that several popular commercial accounting packages, such as Peachtree, DacEasy, and Sage, have payroll modules with capabilities similar to those discussed. Beside the fact that focus is important to being comprehensive, they naturally do not have employee monitoring capabilities and do not provide adequately for Nigeria personal income taxation regime.

## **2.2. Employee monitoring applications**

Top three Employee Monitoring software, based on ability to detect employee presence, amount of surveillance features, and support services offered, are Veriato 360, NetVisor and StaffCop (Sanchez, 2016). Seven best free Employee Monitoring software for Windows are Screenshot Monitor, Isage Free Keylogger, Statwin Single Lite, PC ScreenWatcher, ActivTrak, RescueTime, and Hubstaff (Listoffreeware.com, 2016).

## **2.3. Nigeria personal and corporate tax computation requirement**

The Nigeria Tax Policy sets broad parameters for taxation and other ancillary matters connected with taxation. It provides guidelines and rules that regulate taxation in Nigeria. The taxes are imposed on the following bases: On Individuals: Personal Income tax, Education Tax (2% of assessable profits imposed on all companies incorporated in Nigeria, viewed as a social obligation), Technology Levy (on selected corporate entities such as telecommunication companies, internet service providers, pension managers, banks, insurance companies and other financial institutions within a specified turnover range); On Transactions: Value Added Tax (on the net sales value of non-exempt, qualifying goods and services), Capital Gains Tax (on capital gains derived from sale or disposal of chargeable assets), Stamp Duty (on instruments executed by individual and corporate entities), Excise Duty (on the manufacture of goods within Nigeria collected by the Nigeria Customs Service), Import Duty (on the import of goods into the Government territory collected by the Nigeria Customs Service), Export Duty (on the export of goods outside the Government territory collected by the Nigeria Customs Service); On Assets: property tax and other such taxes imposed on land or landed property; Companies Income Tax: Withholding tax (the amount of withholding tax on income payments other than employment income is usually a fixed percentage (Federal Ministry of Finance, 2012). Generally in the case of employment income, the amount of withholding tax is often based on an estimate of the employee's final tax liability, determined either by the employee or by the government (Somanath, 2011). The necessity that how the tax computations are done by enabling technologies be obvious to the employees and the tax remittance inspectors, for clarifications and collaboration, should be noted.

The Personal Income Tax (Amendment) Act, 2011, states that any salary, wage, fee, allowance or other gain or profit from employment including compensations, bonuses, premiums, benefits or other perquisites allowed, given or granted by any person to any temporary or permanent employee other than so much of any sums as or expenses incurred by him in the performance of his duties, and from which it is not intended that the employee should make any profit or gain, free tax allowances specified by the former paragraph (b), hitherto enjoyed by employees remain deleted with the exception of reimbursement of expenses incurred by the employee in the performance of his duties. After granting the Consolidated Relief Allowance and deductions that are tax exempt from

the gross emoluments of an employee, the balance of income shall be taxed as follows:

- i) “First N 300,000 @ 7 % (Seven per cent)
- ii) Next N 300,000 @ 11% (Eleven per cent)
- iii) Next N 500,000 @ 15% (Fifteen per cent)
- iv) Next N 500,000 @ 19% (Nineteen per cent)
- v) Next N 1,600,000 @ 21% (Twenty one per cent)
- vi) Above N 3,200,000 @ 24% (Twenty four per cent)” (The Federal Government, 2011).

Every individual is entitled to a Consolidated Relief Allowance of N 200,000 subject to a minimum of 1 % of gross income, whichever is higher, plus 20% of the gross income. Deductions that are Tax Exempt are National Housing Fund Contribution, National Health Insurance Scheme, Life Assurance Premium, National Pension Scheme and Gratuities. Further details could be found in the Act.

The Nigerian Tax system is expected to contribute to the well-being of all Nigerians, and taxes, which are collected by Government, should directly impact positively on the lives of the citizens. This can be accomplished through proper and judicious utilization of the revenues collected by government. Certain objectives which the tax system is expected to achieve include to promote fiscal responsibility and accountability, and to facilitate economic growth and development.

### 3.0. Outcomes

#### 3.1. Evaluation of certain payroll applications

Table 1 presents summary of certain payroll Applications. The evaluation criteria used include ease of use, system design, cost, employee monitoring, availability of application, and Nigeria personal income tax computation.

#### 3.2. The proposed framework

Ordinarily, employee details are duplicated in separate payroll and monitoring systems. This duplication is eliminated when payroll and monitoring systems are integrated. The integration produces a system with shared database (Figure 1), same database model and database management system.

The different collection of programs/functions addressing Nigeria Taxation requirements, Employee Monitoring, and Payroll may be referred to as modules with shared main database. In computing amount due an employee, the subroutine that calculates employee hours worked that ordinarily resides with the Monitoring system is simply called. Figure 2 shows the Payroll Processing sub-system.

It is true that calculating employee net pay depends on clear policies regarding remuneration, employee monitoring input, and taxation. These are necessary for detailed design and subsequent implementation of the payroll system.

Beside the basic salary, allowances are paid. Some of these are exempt from taxation because they are expended in the performance of the job. Examples are Transportation, Accommodation, Publication (for academic), and Cost of Living, among others. Basic salary will definitely be an item on the pay schedule. List of possible allowances should be provided and avenue should be given for more to be added (Allowances will be an entity for which a relation, for a relational database model for example, exists for updating and inclusion of new modes of allowances.). The avenue for specifying a particular allowance as taxable or not should be provided. Figure 3 shows a possible tax comprehensive payslip including essential details, but ignoring other deductions such as salary advance.

In Figure 3, Allowances section provides drop-down boxes for selection of applicable allowances per employee and a logical option whether the allowance is taxable or not taxable. The total taxable income is automatically computed as the difference between total remuneration and the total non-taxable income, or simply the sum of taxable emolument, less computed tax relief (consolidated relief plus gross income relief). The total taxable income is given as input to a subroutine, which does tax computation according to applicable Taxation Act policy that would have been previous codified. Details of the tax deductions would then be presented vividly, possibly as shown in the Taxation section of the figure. The data of the monthly deductions details is kept in appropriate database to enable generation of a return of income, for a determinable period, in a format prescribed by the tax authority.

### 4.0. Conclusion

Elegant Employee Monitoring and Payroll systems have been developed. The development of a compliant Nigeria Employee Monitoring Embedded Payroll

system would solve problems associated with existing systems. The materials provided here, which simply

addressed grey areas, should support successful development of such systems.

Table 1: Summary of Certain Payroll Applications

APPLICATION	EVALUATION CRITERIA					
	EASE OF USE	SYSTEM DESIGN	COST	EMPLOYEE MONITORING	AVAILABILITY OF APPLICATION	NIGERIAN TAX COMPUTATION
GRANDMASTER SUITE PAYROLL	<ul style="list-style-type: none"> <li>Relatively easy to use</li> </ul>	<ul style="list-style-type: none"> <li>Multi-Users</li> <li>Desktop based</li> </ul>		<ul style="list-style-type: none"> <li>YES</li> <li>HR modules</li> </ul>	<ul style="list-style-type: none"> <li>Off The Shelf</li> <li>Online ordering</li> </ul>	NO.
PARAMOUNT SOFTWARE-CREST PAYROLL	<ul style="list-style-type: none"> <li>Very easy to use</li> <li>User Friendly interface</li> </ul>	<ul style="list-style-type: none"> <li>Web based</li> <li>Cross Platform</li> </ul>	Size of the organization determines the price	NO	Tailored made for each organization	NO
PAYWINGS PAYROLL	<ul style="list-style-type: none"> <li>Can be a bit complex</li> <li>Too much modules to learn</li> </ul>	<ul style="list-style-type: none"> <li>Desktop/Web based.</li> <li>Windows only</li> </ul>		<ul style="list-style-type: none"> <li>Time and Attendance Monitoring</li> <li>HR Modules</li> </ul>	<ul style="list-style-type: none"> <li>Off the shelf</li> <li>Built for purpose</li> </ul>	NO
PAYDAY Ng PAYROLL	<ul style="list-style-type: none"> <li>Very easy to use</li> <li>User Friendly interface</li> </ul>	<ul style="list-style-type: none"> <li>Web based</li> <li>Mobile version</li> </ul>	Standard price of 350,000 naira, Customization price vary	<ul style="list-style-type: none"> <li>Attendance and calendar monitoring</li> </ul>	<ul style="list-style-type: none"> <li>Off the shelf</li> <li>Mass customization</li> </ul>	YES
CLOUD VISUAL PAYROLL	<ul style="list-style-type: none"> <li>Not so Friendly user interface</li> <li>Accounting knowledge required before use</li> </ul>	<ul style="list-style-type: none"> <li>Web based</li> <li>Mobile version</li> <li>Windows only</li> </ul>	\$550	NO	<ul style="list-style-type: none"> <li>Off the shelf</li> <li>Specialized accounting module</li> </ul>	NO
HR-LIVE PAYROLL	<ul style="list-style-type: none"> <li>Very simple to use</li> <li>Friendly user interface</li> </ul>	<ul style="list-style-type: none"> <li>Multi-Users</li> <li>Desktop based</li> <li>Web based</li> <li>Mobile version</li> </ul>	\$600	<ul style="list-style-type: none"> <li>Time and Attendance Monitoring</li> <li>HR Modules</li> </ul>	<ul style="list-style-type: none"> <li>Mass customization</li> </ul>	NO

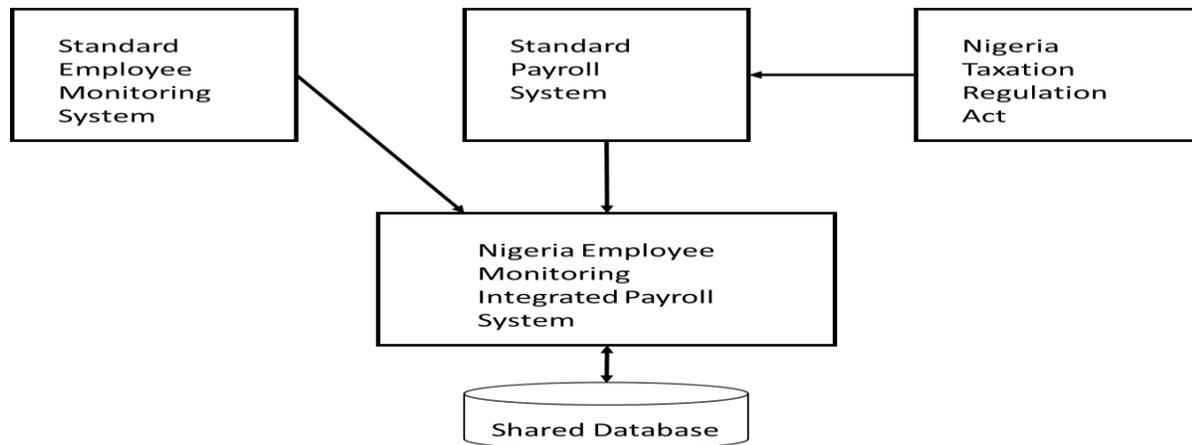


Figure 1 – Nigeria Employee Monitoring Integrated Payroll System

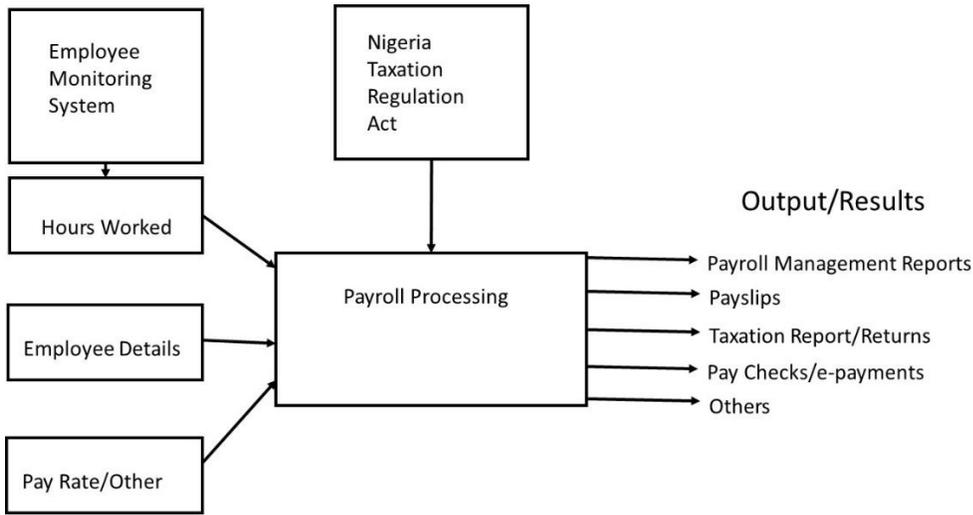


Figure 2 – Payroll Processing Sub-system

			<b>Amount</b>
Basic Pay	Taxable?	<input type="checkbox"/> Y	
Allowances:			
Select Applicable Option	▼	Taxable?	<input type="checkbox"/> Y/N
Select Applicable Option	▼	Taxable?	<input type="checkbox"/> Y/N
⋮	⋮	⋮	⋮
Select Applicable Option	▼	Taxable?	<input type="checkbox"/> Y/N
	<b>Total</b>		
Tax Relief .....	<b>Total Taxable</b>		
Taxation:			
1 <sup>st</sup> .....@	%		
Next .....@	%		
⋮			
Next .....@	%		
	<b>Total Tax Payable</b>		
	<b>Net Pay</b>		

Figure 3 - Sample Tax Comprehensive Payslip

It is normal for a government to pronounce law in place requiring all payroll software used in the country to comply with certain clear terms, such as its output being readily useable by government tax officials and government existing taxation computing systems.

## References

- Ahmad, N., Khan, A., & Beggi, C. (2010). A novel database system model design for Management System. *Journal of Computer science*, 4, 6, 463-466.
- Ashby, D. (2012). What does Paywings do? Retrieved from [http://attendance299.rssing.com/channel/32384687/all\\_p2.html](http://attendance299.rssing.com/channel/32384687/all_p2.html), Accessed 17/6/16
- Audibon, J. (2010). Time and Attendance Systems. Retrieved from <http://www.liberatortime.com/time-attendance-systems.html>, Accessed 7/6/16
- Bird, R & Casanegra de Jantscher, M (2008). The Pay-As-You-Earn Tax on Wages: Tax Law Design and Drafting. Vol. 2, Issue 2, Chapter 15. Florida USA: Victor-Thurony.
- CanPay.com. (2016). Grandmaster Suite - Process simple or complex Canadian payrolls in-house. Retrieved from <http://www.canpay.com/grandmastersuite.html>, Accessed 11/6/16
- Connolly, T. & Begg, E. (2004). Database System: Practical Approach to Design, Implementation and Management. (4<sup>th</sup> Ed.). Wesley UK: University of Paisley Addison.
- Draz, D. (2011). Fraud prevention: Improving internal controls. Retrieved from <http://www.csoonline.com/article/2127917/fraud-prevention/fraud-prevention--improving-internal-controls>, Accessed 22/6/16
- Federal Ministry of Finance (2012). Nigeria Tax Policy. Abuja, Nigeria: Federal Ministry of Finance. Retrieved from <http://www.firs.gov.ng/Tax-Management/Pages/Tax-Legislations.aspx>, Accessed 29/6/16
- Fraser P, (2011). Management systems: purpose and benefits. Retrieved from <http://www.thecqi.org/Knowledge-Hub/Knowledge-portal/Corporate-strategy/Management-systems>, Accessed 19/6/16
- Gautam, P. R., Ragumani, S., & Sharma, Y. K. (2010) A System for Payroll Management. *Journal of Computer Science*, 6, 12, 1531-1534
- Grover, D. & Kaur, P. (2012). Computer Based Payroll System: Implementation for E Governance at Punjab Agricultural University of India. *International Journal of Engineering Research and Development*, 5, 4, 55-60.
- HR-Life (2016). Product Features. Retrieved from <http://www.hr-live.com/features.php>, Accessed 17/6/16
- Listoffreeware.com. (2016). List of Best Free Employee Monitoring Software. Retrieved from <http://listoffreeware.com/list-of-best-free-employee-monitoring-software/>, Accessed 26/6/16
- Marg, C. (2014). Benefits of Salary Payroll Software. Comp soft ERP 9+. Retrieved from <http://www.margcompusoft.compayrollsoftware.html>, Accessed 19/6/16
- Nozariah, A. & Abdulla, N. (2008). A model database system model design for management System, (6<sup>th</sup> Ed.). Timalpore, Delhi: Science Publications.
- Ori, J. (2014). What Kinds of Controls Can Be Applied to Payroll Systems? : Demand Media. Retrieved from <http://smallbusiness.chron.com/kinds-controls-can-applied-payroll-systems-12159.html>, Accessed 13/6/16
- Pardy, W. & Andrews, T. (2010). Integrated Management Systems: Leading Strategies and Solutions. Vol 1, Pg. 21 Plymouth.UK: The Scarecrow
- Paydaypayroll.com (2016). Homepage. Retrieved from <http://www.paydaypayroll.com/solutions/payroll-services/>, Accessed 28/6/16
- Phelan, M. (2011). Review of Paramount Software Solutions, Inc. Crest Payroll. Retrieved from <http://www.cpapracticeadvisor.com/article/10318466/paramount-software-solutions-Inc-crest-payroll>, Accessed 4/6/16
- Ravi, M. (2010). Payroll Management Systems: HR, Web and Application. Retrieved from

- <http://www.macoinfotech.com/web-payroll-management-system.html>, Accessed 24/6/16
- Sanchez, W. (2016). Employee Monitoring Software Review. Retrieved from <http://employee-monitoring-software-review.toptenreviews.com/>, Accessed 10/6/16
- Sheena, G. (2014). Transcript of Copy of Payroll System with Daily Time Record Using Biometrics Finge. Retrieved from <https://prezi.com/8esv3gtillfd/copy-of-payroll-system-with-daily-time-record-using-biometrics-finge/>, Accessed 3/6/16
- Softwareadvice.com (2015). Compare Payroll Software Systems. Retrieved from <http://www.softwareadvice.com/hr/payroll-software-comparison/>, Accessed 22/6/16
- Somanath, V.S. (2011). *International Financial Management*. Georgia, USA: I. K. International
- Taiwo, O. (2012). The Personal Income Tax (Amendment) Act 2011. Retrieved from [pwc-nigeria.typepad.com/tax\\_matters\\_nigeria/2012/01/the-personal-income-tax-amendment-act-2011.html](http://pwc-nigeria.typepad.com/tax_matters_nigeria/2012/01/the-personal-income-tax-amendment-act-2011.html), Accessed 4/6/16.
- Tatum, M. (2015). What are Payroll reports? Retrieved from <http://www.wisegeek.com/what-are-Payroll-reports>, Accessed 29/6/16
- The Federal Government (2011). Personal Income Amendment. *Federal Republic of Nigeria Official Gazette*, No. 115, Vol. 98, pp A381-393
- Vidler, L. (2014). The Professional Payroll Manager. Retrieved from <https://australianpayrollprofessional.wordpress.com/tag/payroll-compliance/>, Accessed 15/6/16
- VisualHR.com (2016). Homepage. Retrieved from <http://visualhr.com/Cloud.aspx>, Accessed 26/6/16
- Watson, D. & Jones, A. (2013). *Digital Forensics Processing and Procedures: Meeting the Requirements of ISO 17020, ISO 17025, ISO 27001 and Best Practice Requirements*. London: Syngress