Designed and Implemented a Computer Based Payroll System for Local Government Area

Wycliffe Kanyimama[1],*

[1]Department of Computer Science, Kebbi State University of Science and Technology, Aliero, Nigeria.
2ukidy@gmail.com[1]

Abstract: Guyuk local Government operates manually, and as a result, it leads to a waste of resources as well as time consumption. Therefore, there is a need to computerize the payroll system. Payroll is an accounting term that focuses on the activities and computation of staff salaries within the local Government; however, this has been a long-time problem that the local Government faces. Looking at the complexity of activities involved in salary preparation, computers will go a long way to solve and reduce some of the stress and problems that are characterised by manual exercise. Technology has made the world a village where boundaries do not affect social and business dealings. This revolution has not left Guyuk's local Government behind. Against this background, this study tries to reveal the potentiality of a computer-based payroll system. This system is built to manage the database of the local government staff and pay their monthly salaries on time. The payroll system is designed using the Microsoft Office Access database. Primary and secondary data is driven through observation and personal interaction with the officers using the then manual system. The local Government is under Adamawa state, northeast of Nigeria. It is recommended that the entered system be implemented to reduce the time wasted and corruption in the system.

Keywords: Accurate and Database; Fraud-Less Payroll System; Network Data Model; Relational Data Model; Database Technology and Management; Social and Business Dealings; Staff Vouchers and Various Charge.

Cite as: W. Kanyimama, "Designed and Implemented a Computer Based Payroll System for Local Government Area," *FMDB Transactions on Sustainable Social Sciences Letters*, vol. 1, no. 4, pp. 239–250, 2023.

1. Introduction

In a world saturated with mission and passion, any organization strives to have control over records and resources for effective and efficient operation against its prime competitors. This can only be possible by introducing information technology in an organization [1]. Technology has become the only method to attain greater productivity with fewer overheads. Organizations such as local governments that depend on record keeping, staff vouchers, various charges, and interest on salaries have to hold onto the trust of computers to enable them to achieve their goals. Record-keeping and data manipulation are assumed to have become important entities in successful organizations [2]. The common problem facing any organization is managing, controlling, and maintaining their records based on the massive amount of data to process faster and virtually accurately. They still want this information to be communicated to their end-user faster. However, if the information is incorrect, the entire organization may be affected [3].

Many organizations operate manually, and as a result, it leads to wasted resources as well as time consumption. Therefore, there is a need to computerize the payroll system [6]. Payroll is an accounting term that focuses on the organization's activities and computation of staff salaries [7]. Looking at the complexity of activities involved in salary preparation, computers will go a long way to solve and reduce some of the stress and problems characterized by manual exercise [8].

---

*Corresponding author.

1.1. Statement of The Problem

The manual preparation of the voucher (payroll) and record of Guyuk Local Government is characterized by many problems, such as time-wasting, difficulties in salary payment, fraud and miscalculation of staff salaries, data redundancy, and inconsistency [10]. Payroll software in Guyuk Local Government Area can solve these problems and enable the Local Government personnel to become more efficient in carrying out their important assignment.

1.2. Aim and Objectives of The Study

Computer-based payroll technology can cut through many problems traditional file systems create. This study aims to develop a computer-based payroll system for the Guyuk Local Government Area. Others are:

- To greatly enhance the flexibility of information systems in the Local Government.
- Reduce data inconsistency and redundancy.
- Acquaint the research on how software development.

1.3. Significance of The Study

This study concentrated on the role of database management software in Guyuk Local Government. Findings and recommendations for this study will be of great assistance to the management and staff of the Local Government as it will be used for information collection and analysis, which are usually not achievable using the former method, analysis such as deduction analysis [11], loan analysis, credit cash analysis, etc. are easily obtained via the new system. At the same time, the organization would enjoy a reliable, accurate, and fraud-free payroll system. Other local Governments also benefit from the system in the long run [12].

1.4. Scope of The Study

The study focuses on the finance department, Guyuk Local Government Area; only the salaries aspect will be considered.

2. Review of Literature

Computers mean different things to different people, depending on the users. To a child, a computer is a box that contains game kits, while to an engineer, it is an instrument that aids in designing; to a lecturer, it is a set of programs that enable him to compute students' results, while to a student is a machine that helps him accomplish his assignment. Sawyer and William [5] defined a computer as a programmable, multi-use machine that accepts data and processes or manipulates it into information. In contrast, Kenneth & Laudon [4], in their view, a computer is a machine that accepts and processes data according to its instructions. Computers aim to speed up problem-solving and increase productivity with higher accuracy and reliability.

Business organizations and the internet are a growing part of the computer-oriented world. This is so because computers offer economic gains by directly maximizing the earnings of plants or raw materials and rapidly responding to the current market situation. Computers offer a means of processing large quantities of data at a much faster speed, and it is obvious that we have to consider the effect that automation and computerization create. Despite the importance and acceptance of computers, others argue that many problems characterise computers. Rose [14] observed that the risk of error or corruption might arise through inadequate checks or undetected equipment faults. She further stated that the injury foreseen from using computers in automation is to the quantity and quality of employment. To take quantity, it is argued that because automated plants and offices need fewer staff, jobs will grow less while the population grows. Rose [14] in his view; he stated that the level of automation and computerization would eventually lead to unemployment.

On the contrary view, Rose [14] reveals that computers and technology have created more job opportunities via online recruitment. However, the fact remains that a lot of people still do not know the importance and impact of information technology.

Kathikeyan et al. [16] disclosed that computer-oriented devices make life easier and make people lazier. According to the site, even though computers make people lazy, they still help to increase our daily productivity and help us do whatever is needed to be accomplished.

There are many possibilities for future uses of computers to simplify daily life and enhance the life experience. Lishmah Dominic et al. [17] reported that concerns about the implications of these emerging technology-driven financial products and

services had been raised globally. This includes the inherent and possible heightened operational risks that deploying this computerization and automation would occasion.

In a survey of a cross-section of automation, Abbassy and Abo-Alnadr [18] identify four concerns with emerging payment technology:

- Changing delivery channels and safeguard
- Fraud
- Vendor oversight and
- Operational risk measurement

He further points out that some of the safeguards customers have come to rely upon with paper-based payment do not exist for electronic channels. At the same time, the above shortcomings relate to the concerns of individual (bank) organizations. Some other implications are of concern to the regulator. Abbassy and Ead [19] identify that as payment technology evolves, there is an increased likelihood of network vulnerabilities. Worse still, these problems have been demonstrated to be contagious, jumping from one organization to other sectors of the economy. Abbassy [20] demonstrated that the technology world is changing. To the extent that this statement is meaningful, it seems true only in a world characterized by new technology.

But when we consider technology as a powerful change agent, we see that society is evolving at a dizzying rate, with the proliferation of easily accessible computers being largely responsible. According to Abbassy and Mesbah [21], human beings will keep inventing new technologies until every aspect of life is mechanised. Computers will eventually control and dominate nearly every aspect of daily life.

3. Database

In their definition of a database, Kenneth and Laudon [4] state that, instead of physically storing data in separate files to give the impression that they are located in a single location, data is centralised and redundant data is minimised so that many applications can make efficient use of the data. Multiple applications can be served by a single database. The company may establish a centralised human resource database, for instance, to consolidate employee information from disparate files dealing with payroll, benefits, and people.

According to Sawyer and William [5], any collection of data kept electronically in a computer system is considered a database. To be more precise, a database is just a group of related files stored in a computer. In order to facilitate retrieval, these digital data are structured according to their shared characteristics.

Peterson [13] defined a database as a collection of organized data so that its contents can easily be accessed, managed, and undated.

Kenneth & Laudon [4] have similar perceptions about the subject matter. According to them, the database is a collection of related data, while Sawyer and William [5] are more technical in explaining a database using technology as part of it.

Stephen & Perry [9] consider a database management system as software that stores, maintains data, and provides easy access to stored data. According to them, a good database management system (DBMS) provides users with common interfaces to share data, facilities to maintain and store data, report generation capabilities, and utilities.

Users are shown data in a tree-like arrangement in the hierarchical database architecture. The IBM Information Management System is the most used hierarchical database management system. The data elements contained within each record are structured into segments. From the user's perspective, each record resembles an organisational chart with a single top-level component known as the root. As in a parent-child relationship, a lower section logically connects to an upper segment. Though a child segment can only have one parent, parent segments can have several children.

The hierarchical data model has an offshoot called the network data model. You can optimise processing speed and ease by translating databases from hierarchical to network or vice versa. In contrast to hierarchical structures, which show interactions between nodes in a hierarchy, network structures logically show relationships between numerous nodes in a network. In an alternate reality, it is possible for a parent to have more than one child, and vice versa.

Most recently developed among these three database models, the relational data model improves upon certain shortcomings of its predecessors. A basic two-dimensional table called a relation is used to represent all database data in the relational paradigm. The table looks like flat files, but it's actually quite easy to mix and extract data from many files. Files is another name for the

tables. The relational database connects data in several files using a key field or common data pieces, making it more versatile than hierarchical and network database models.

Updates to the database's administration architecture and new applications developed with DBMS expertise are necessary. To handle the more technical and operational parts of data management, most organisations establish a database design and management group within the organization's information system division. Database management software, security processes, and documentation development are all the purview of these departments. Database Types , Two distinct kinds of database files are proposed by Sawyer and William [5]:

- Master data file
- Transaction data file

An often-updated database with records that are considered permanent is known as the master file. The names and address labels of employees are an example of a master data file. When new employees join your company, the address labels will need to have new names and addresses added to them, so a transaction file can keep all of these changes additions, deletions, and revisions until the master file is ready to be updated.

Blake [15], in his view, divides databases into two types: the flat file database and the relational database. The flat database consists of a single file or (table), which contains all the data; each record in a flat-file database contains all the information related to the particular item. A flat file database is very useful, but it has some limitations. One major problem with a flat file database is that information is often duplicated in a separate record.

Multiple physical locations are used to hold a distribution database. One place physically stores some database components, while another place stores and maintains the rest. Two primary methods exist for the distribution of databases. Partitioning the central database allows each remote processor to have access to the department data needed to service their local area. It is possible to justify changes to local files with the central database in batches, typically over the night. Duplicating the central database at each of the off-site locations is another option. The technique also necessitates periodic updates to the central database.

The connection between shared fields in two tables is established by a relationship, as pointed out by Mahato and Gaurav [22]. Both the data type and the contents of the linked fields must be same. Also, before doing any other updates on the employee's database, you should establish a permanent association between the tables.

According to Mahato and Kumar [23], normalisation is a mathematically-based formal method that specifies guidelines for building structures in the most efficient manner possible to facilitate data storage and retrieval. Put another way, in the early 1970s, they both contributed to the process's definition and he did the same for the relational model. The need to represent data in two-dimensional structures with a variable number of rows and columns is the foundation of the normal forms. Although practically all database systems make reference to the table, they referred to them as structure relations. Typically, there are three distinct normalisation forms: first, second, and third.

Mahato [24] analyzes database systems based on their uses. Database systems are used whenever a large amount of information needs to be stored, sorted, manipulated, and searched in various ways. Database systems are common; businesses use them to keep records and pay staff salaries. A school might use a database to store student records so that the names and addresses of each student can be found, and a car insurance company might store details of different types of cars so that customers can quote a price for their insurance. Organizations also use databases to prepare vouchers and pay staff salaries.

According to Sawyer and William [5], when data is stored in separate files, the same data will be repeated in many files. In the old days, each college administrative office, financial aid, housing, and so on might have a separate file for you. Thus, there was repeated over and over. The advantage of database software is that data is not repeated in separate files. Today, databases are more interesting than they used to be; they include text, pictures, sound, animation, etc.. The principal microcomputer database programs are Microsoft Access, Corel Paradox, and Lotus Approach, while Oracle is a major player in large systems.

FIELD: a field is a data unit consisting of one or more characters (bytes). An example of a field is the name, address, or grade level.
RECORD: A record is a collection of related fields or a group of related fields. An example of a record would be name and address.
FILE: A file is a collection of related records. An example of a file is data collected on every employee in the same department.
KEY FIELD: a field chosen to uniquely identify a record so that it can be easily retrieved and processed.
ATTRIBUTE: a piece of information describing a particular entity

ENTITY: A person, place, thing, or event about which information must be kept.

According to Sawyer and William [5], Sequential and Direct data access are the two most common kinds. Direct access storage systems use sequential access, which means that data is stored and retrieved in a specific order, such as alphabetically. This allows for direct access to individual records through the indexed sequential access method (ISAM). To find specific entries, this access method uses an index of important fields. File indexes are analogous to book indexes in that they list the key field of each record.

Direct file organisation makes advantage of the direct access mechanism. This approach finds a record's physical address by using a key field. But it's all done by utilising a transform algorithm, which is a mathematical technique that translates the key field into the record's physical storage position, like a CD tack.

There must be a system in place to prevent employees from tampering with their own data, which includes the database and timesheets. The payroll process has resulted in an update to the employee database. Prior to this, a duplicate of the database is created for backup purposes.

Mahato [25] points out that it is very important to perform periodic backups of your database files; this ensures that you do not lose too much work if there is a power outage or system failure. According to them, if a database file is lost or corrupted, it can easily be restored to the latest file you back up. Thus, it will not include all the changes you have made to the file since it was the last backup, but it is better than not having any files. On the other hand, Kenneth & Laudon [4] disclose that a specific instrument for the backup and recovery process be developed so that they can be recovered even in times of failure.

Looking at the above views of Kenneth & Laudon [4], the idea of Kenneth & Laudon [4] is more technical in their view by suggesting an instrument or software for backup data. In contrast, Mahato [26] points out periodic data backup should be considered.

4. Research design

The previous paper is concerned mainly with a literature review, while this paper focuses on the research methodology. It also describes the material used to carry out the project work.

The new system is designed to handle some of the setbacks, incapability, and limitations and then improve the overall performance of the manual or traditional filing system.

4.1. Feasibility Report

In order to ascertain the social, economic, operational, and technical viability and benefits of developing the new system, this study is necessary. During the feasibility study, the following are taken into account:

- Savings in terms of office space and the cost of different types of equipment are being minimized as all documents are normally stored on paper, and the cost of files and stationery is reduced using a computer-based payroll system.
- The speed and accuracy of processing data will be highly enhanced after implementing this system.
- Time wasting would be eliminated during the preparation of vouchers.

Also, at the cost of a feasibility study, it is observed that Guyuk Local Government was created in 1976, with a present working staff of about 1850.

4.2. Material

To achieve the said payroll software, the following materials were used

- Computer system
- XP operating system
- Staff record and emolument schedule for Local Government
- Microsoft Access application
- Visual Basic and Structural Query Language (SQL)

4.3. Software Development Life Cycle

The standard software development steps that were followed to achieve the final development of the said payroll software are:

- Project definition

- System study
- Design
- Programming
- Testing and debugging
- Installation
- Documentation

This aspect focuses on how table properties would be created and linked to each other in the database (Figure 1).
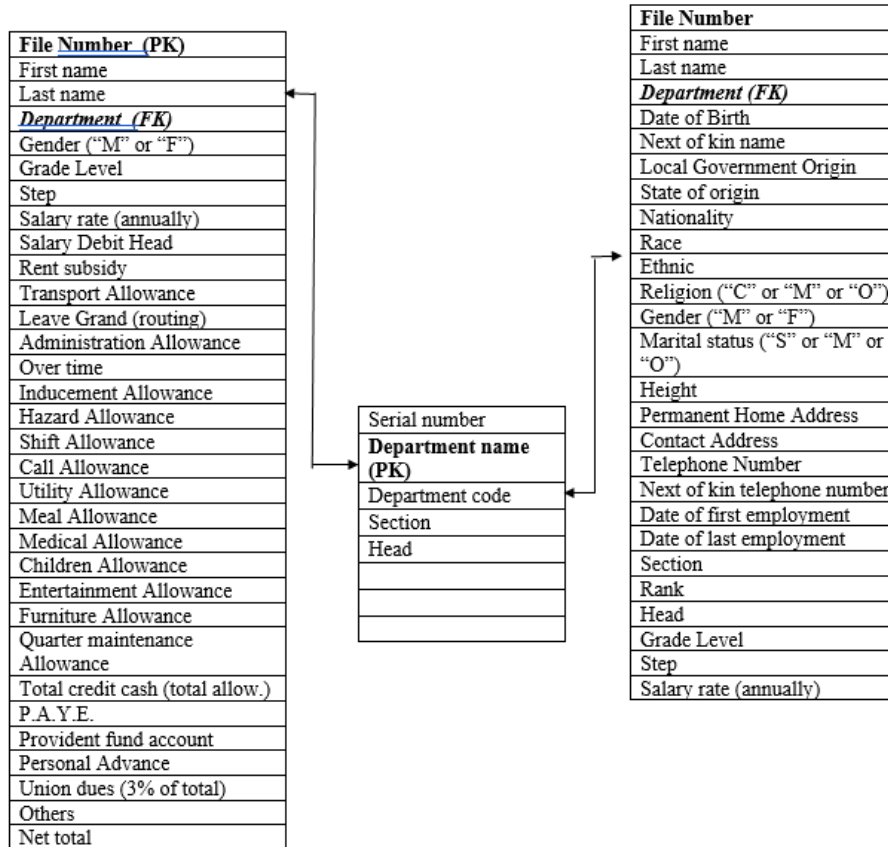
File Number (PK)
First name
Last name
Department (FK)
Gender ("M" or "F")
Grade Level
Step
Salary rate (annually)
Salary Debit Head
Rent subsidy
Transport Allowance
Leave Grand (routing)
Administration Allowance
Over time
Inducement Allowance
Hazard Allowance
Shift Allowance
Call Allowance
Utility Allowance
Meal Allowance
Medical Allowance
Children Allowance
Entertainment Allowance
Furniture Allowance
Quarter maintenance Allowance
Total credit cash (total allow.)
P.A.Y.E.
Provident fund account
Personal Advance
Union dues (3% of total)
Others
Net total

Serial number
Department name (PK)
Department code
Section
Head

File Number
First name
Last name
Department (FK)
Date of Birth
Next of kin name
Local Government Origin
State of origin
Nationality
Race
Ethnic
Religion ("C" or "M" or "O")
Gender ("M" or "F")
Marital status ("S" or "M" or "O")
Height
Permanent Home Address
Contact Address
Telephone Number
Next of kin telephone number
Date of first employment
Date of last employment
Section
Rank
Head
Grade Level
Step
Salary rate (annually)

Figure 1: Table Properties

5. Data Analysis and Presentation of Result

This paper describes the system design result and the user interface. The paper also explained how users would use the system. One advantage of this software is the flexibility and ease of use [27]-[32]. Therefore, users are expected to follow the instructions. It is expected that a user with little knowledge of computers can use this software without problem [33]. The following steps are to be followed to start the system:

- By double-clicking the shortcut icon on the desktop or
- By starting MS access and choosing open payroll
- You can open a payroll folder to start the system.

The welcome form is the first screen that appears whenever the user starts the system. The welcome form is just like an introduction [34]. This form performs two functions: one is to click continue to get to the next form or click on exit to close the entire system (Figure 2).
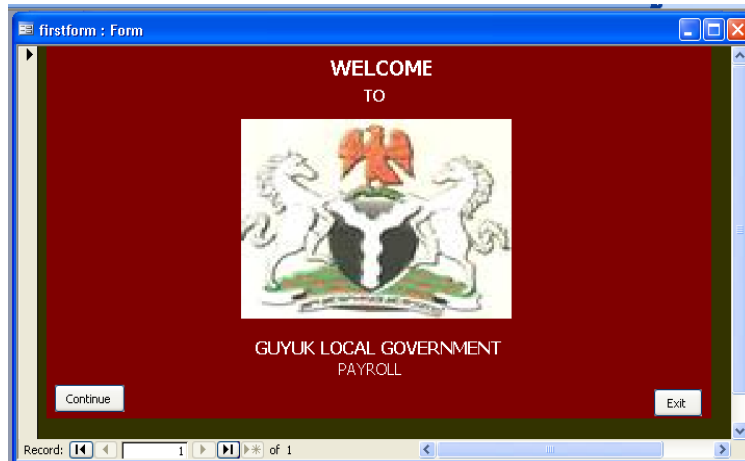
Figure 2: Welcome Screen

This is where the user selects the operation that he/she wishes to open. When selecting a particular option, click the ok button to continue to the possible stage [35]-[41]. This form performed eight different functions, all as an option to be chosen by the user (Figure 3).
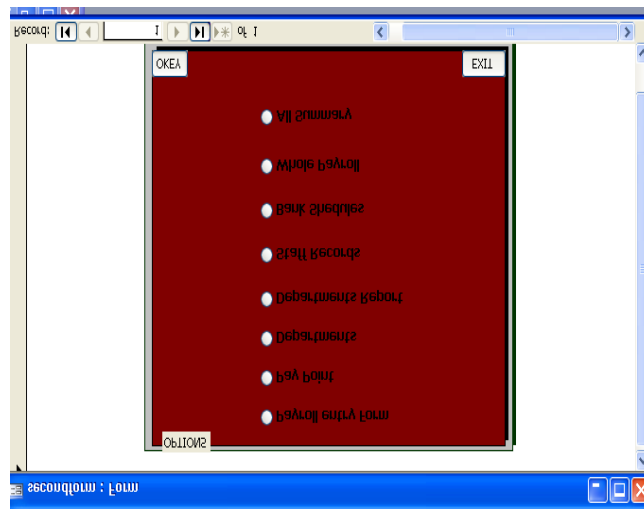

Figure 3: Menu Form

On selecting the first option, "payroll entry form," the user can make the necessary input to get the required result. The field required to be input is the grade level and the steps an employee must take to get his basic payment [42]-[45]. All other allowances and deductions are automatic except the deduction for "others," which, if there is a requirement for it, the operator will enter in the case of an undefined deduction (Figure 4).

This is an interactive area where the user is expected to enter the step and Grade level of the staff for computation. Most of the computation of the payroll system takes place here and is automatic [46]-[49]. This form contains many sub-forms that hold different fields in different formats. The first form only holds the allowances analysis, and the second holds the deduction, etc.
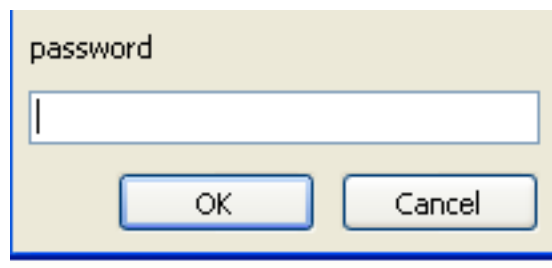
Figure 4: System Operation

Authorized users must enter a password before continuing with the system (Figure 5).

Figure 5: Local Government Payroll

Another important function of the above form is that any change in the salary structure can be updated by entering the increment percentage to validate the overall payroll system [50]-[53]. The operator only retained the right to validate information of the payroll system. The staff information is displayed in this form, and additional data can be added. One of the important aspects of this form is to allow the payroll system to work independently. Operators can also view staff salaries through this form (Figure 6).

Figure 6: Staff Information

The report generated from the staff information, payroll information, and department reports are detailed for data storage (Figure 7).

STAFF PAYROLL INFORMATION

File Num	First na	Last na	Department	Rank	rade level	Step	ry rate(annually)	ry debit head	al credit c
011	kanyimam	wycliffe	WORKS	senior	7	12	12,000.00	1,000.00	12
022	ezra	ayuba	ADMIN	officer	2	4	200.00	0.00	
033	jinjel	zwalkuwin	AGRIC	natural	11	6	65,400.00	0.00	
044	sim	wycliffe	WORKS	advice	4	2	10,000.00	0.00	
055	wasini	mullam	WORKS	senior	5	12	390,000.00	0.00	
066	wunjir	wycliff	HEALTH	jenior	4	2	20,100.00	0.00	
077	lujir	darbaba	FINANCE	subhead	12	13	2,988,776.00	0.00	
088	bwan	bwagali	HEALTH	head	21	43	2,173,655.00	0.00	
099	moses	yawu	INFORMATION	officer	8	12	26,573,333.00	0.00	

Figure 7: Staff Payroll Information

This report summarises staff salaries, total credit, total deduction, and the net total (Figure 8)**.**

PAYROLL SUMMARY

First name	Last name	Grade level	Step	Salary debit head	Total credit cash	Total deduction	Net total
kanyimama	wycliffe	7	12	1,000.00	121.00	876.00	12,334,555.00
ezra	ayuba	2	4	0.00	0.00	0.00	0.00
jinjel	zwalkuwin	11	6	0.00	0.00	0.00	0.00
sim	wycliffe	4	2	0.00	0.00	0.00	0.00
wasini	mullam	5	12	0.00	0.00	0.00	0.00
wunjir	wycliff	4	2	0.00	0.00	0.00	0.00
lujir	darbaba	12	13	0.00	0.00	0.00	0.00
bwan	bwagali	21	43	0.00	0.00	0.00	0.00

Figure 8: Payroll Summary

The previous paper gives out the methodology and results of the developed system. In contrast, this paper focuses on the overall framework of the entire record in the computer-based payroll system. The paper also summarises the findings, recommendations, and suggestions to enhance the finance department's operation and computerize the local Government's manual payroll system.

The need for computerization can never be overestimated because it has been concluded that it is the best and fastest way of accomplishing a task. However, computerization needs a high level of creativity and skills. This means that the designer combines these attributes to achieve this. Still, a lot is needed from users to validate the system, particularly in security and change updates. This is so because the ultimate goal should be held and derived from the system.

The manual payroll system of the Local Government is faced with problems such as difficulties in salary payment structure and fraud among the concerned personnel. The research reviewed some writers and journals on the related topic and interactive databases. This is reviewed extensively, and the different types of computer-based payroll are defined and how they are useful for the organization.

The key field used in this system to generate the primary key for the development of the software includes the file number for the payroll table, the department name for the department table, and the file number for overall staff information. Others are foreign and secondary.

6. Conclusion and Recommendation

Security and reliability are critical in systems that deal with financial services because errors, fraud, and service disruption can lead to large monetary losses and the erosion of consumer confidence in the organization. Therefore, the issue should be given the topmost priority. In order to avoid flaws and malpractices in the operation, one of the outstanding measures taken was using passwords at different system levels to slow down hackers. Other issues prevent unauthorized users from entering the system and breaking the system into different views, that is, the user's and the operator's views. When properly implemented, the new system can solve problems such as time-wasting, difficulties in salary payment, fraud, miscalculation of staff salaries, data redundancy, and inconsistency. The general analysis and findings made the following recommendations:

- Experts and well-trained personnel should handle the system.
- The system is designed to have adequate security protection, where the password is used to protect against unauthorized access.
- The system should be updated whenever there is a change in the salaries.

Even though some staff were afraid that computers had only come to take away their jobs, many still believed and welcomed the idea of computing in the organization and even recommended the areas where they expected computers to help.

References

1. A. Sabarirajan, L. T. Reddi, S. Rangineni, R. Regin, S. S. Rajest, and P. Paramasivan, "Leveraging MIS technologies for preserving India's cultural heritage on digitization, accessibility, and sustainability," in Advances in Business Information Systems and Analytics, IGI Global, USA, pp. 122–135, 2023.
2. A.C. Foskett, The subject to information. Longman Press, Harlow, United Kingdom, 1977.
3. B. Priyanka, Y. Rao, B. Bhavyasree, and B. Kavyasree, "Analysis Role of ML and Big Data Play in Driving Digital Marketing's Paradigm Shift," Journal of Survey in Fisheries Sciences, vol. 10, no. 3S, pp. 996–1006, 2023.
4. C. Kenneth & J.P. Laudon, Management Information System. Prentice Hall of India Private Limited, India, 2002.
5. B.K. Sawyer & C. William, Using information technology fourth edition. McGraw-Hill Publishers, United States, 2001.
6. D. Lavanya, S. Rangineni, L. T. Reddi, R. Regin, S. S. Rajest, and P. Paramasivan, "Synergizing efficiency and customer delight on empowering business with enterprise applications," in Advances in Business Information Systems and Analytics, IGI Global, USA, pp. 149–163, 2023.
7. D. Nick, Database Design and Management, Longman Press, Harlow, United Kingdom, 1998.
8. E. R. Ahmed, T. T. Y. Alabdullah, M. E. Çokmutlu, and D. Özkan, "How do sustainability assurance, internal control, audit failures influence auditing practices?," Marginal Journal Of Management, Accounting, General Finance, And International Economic Issues, vol. 2, no. 3, pp. 671–688, 2023.
9. H. Stephen & J.T., Perry, Office XP. Office XP, 2002.
10. I. Muda, M. S. Almahairah, R. Jaiswal, U. K. Kanike, M. W. Arshad, and S. Bhattacharya, "Role of AI in Decision Making and Its Socio-Psycho Impact on Jobs, Project Management and Business of Employees," Journal for ReAttach Therapy and Developmental Diversities, vol. 6, no. 5s, pp. 517–523, 2023.
11. J. D. Goldhar, Managing organization technology. McGraw-Hill Publishers, United States, 1995.
12. J. K. Poirot, www.essaysample.com/essay, Last accessed 28 July 2008, 1992.
13. J. Peterson, Database management system 2nd edition, McGraw-Hill Publishers, United States, 1989.
14. J. Rose, Technology injury-the effect of technology advance on environment life and society, Longman, Harlow, United Kingdom, 1992.

15. K. Blake, Database administration guide. Cambridge University Press, Chennai, Tamil Nadu, India, 1992.

16. M. Kathikeyan, A. Roy, S. S. Hameed, P. R. Gedamkar, G. Manikandan, and V. Kale, "Optimization system for financial early warning model based on the computational intelligence and neural network method," in 2022 5th International Conference on Contemporary Computing and Informatics (IC3I), 2022.

17. M. Lishmah Dominic, P. S. Venkateswaran, L. T. Reddi, S. Rangineni, R. Regin, and S. S. Rajest, "The synergy of management information systems and predictive analytics for marketing," in Advances in Business Information Systems and Analytics, IGI Global, USA, pp. 49–63, 2023.

18. M. M. Abbassy and A. Abo-Alnadr, "Rule-based emotion AI in Arabic Customer Review," International Journal of Advanced Computer Science and Applications, vol. 10, no. 9, PP. 1-12, 2019.

19. M. M. Abbassy and W. M. Ead, "Fog computing-based public e-service application in service-oriented architecture," International Journal of Cloud Computing, vol. 12, no. 2–4, pp. 163–177, 2023.

20. M. M. Abbassy, "Opinion mining for Arabic customer feedback using machine learning," Journal of Advanced Research in Dynamical and Control Systems, vol. 12, no. SP3, pp. 209–217, 2020.

21. M. M. Abbassy, and S. Mesbah, "Effective e-government and citizens adoption in Egypt," International Journal of Computer Applications, vol. 133, no. 7, pp. 7–13, 2016.

22. M. Mahato and K. Gaurav, "Collegiate cheating: Understanding the prevalence, causes, and consequences," SocioEconomic Challenges, vol. 7, no. 3, pp. 152–163, 2023.

23. M. Mahato and P. Kumar, "Emotional Labor - An Empirical Analysis of the Correlations of Its Variables," European Journal of Business and Management, vol. 4, no. 7, pp. 163–168, 2012.

24. M. Mahato, "HR focus within the Indian information technology industry," Prabandhan: Indian J. Manag., vol. 5, no. 5, p. 14, 2012.

25. M. Mahato, "Life satisfaction-what does it really mean to Indians?," Purushartha-A journal of management, vol. 7, no. 1, pp. 79–87, 2014.

26. M. Mahato, "Performance Analysis of High, Medium and Low Companies in Indian Pharmaceuticals Industry," IUP Journal of Management Research, vol. 10, no. 3, pp. 52–70, 2011.

27. M. Mani, S. S. Hameed, and A. Thirumagal, "Impact of ICT Knowledge, Library Infrastructure Facilities On Students'usage of E-Resources-An Empirical Study," Library Philosophy and Practice, vol.13, no.3, pp. 1-12, 2019.

28. M. Modekurti-Mahato and P. Kumar, "Organizational Role Stress - Empirical Evidences from India during Economic and Political Resentment," Purushartha - A journal of management," Ethics and Spirituality, vol. 7, no. 2, pp. 30–39, 2014.

29. M. Modekurti-Mahato, P. Kumar, and P. G. Raju, "Impact of emotional labor on organizational role stress – A study in the services sector in India," Procedia Econ. Finance, vol. 11, pp. 110–121, 2014.

30. N. Geethanjali, K. M. Ashifa, A. Raina, J. Patil, R. Byloppilly, and S. S. Rajest, "Application of strategic human resource management models for organizational performance," in Advances in Business Information Systems and Analytics, IGI Global, USA, pp. 1–19, 2023.

31. O. Gat, Selective essays on contemporary issues in Nigeria banking, Nigeria, 2005.

32. O. Oladimeji, Leadership newspaper Tuesday 29 July 2008.

33. P. G. Raju and M. M. Mahato, "Impact of longer usage of lean manufacturing system (Toyotism) on employment outcomes - a study in garment manufacturing industries in India," Int. J. Serv. Oper. Manag., vol. 18, no. 3, p. 305, 2014.

34. P. S. Venkateswaran, M. L. Dominic, S. Agarwal, H. Oberai, I. Anand, and S. S. Rajest, "The role of artificial intelligence (AI) in enhancing marketing and customer loyalty," in Advances in Business Information Systems and Analytics, IGI Global, USA, pp. 32–47, 2023.

35. S. Derindere Köseoğlu, W. M. Ead, and M. M. Abbassy, "Basics of Financial Data Analytics," Financial Data Analytics, pp. 23–57, 2022.

36. S. Kolachina, S. Sumanth, V. R. C. Godavarthi, P. K. Rayapudi, S. S. Rajest, and N. A. Jalil, "The role of talent management to accomplish its principal purpose in human resource management," in Advances in Business Information Systems and Analytics, IGI Global, USA, pp. 274–292, 2023.

37. S. R. Balabantaray, "The impact of COVID-19 lockdown on adolescents and young adults' lifestyle," J. Informatics Education and Research, vol. 3, no. 2, pp. 1-13, 2023.

38. S. S. Hameed and S. Madhavan, "Impact of Sports celebrities endorsements on consumer behaviour of low and high Involvement consumer products," XIBA Business Review (XBR), vol. 3, no. 1–2, pp. 13–20, 2017.

39. S. S. Hameed, S. Madhavan, and T. Arumugam, "Is consumer behaviour varying towards low and high involvement products even sports celebrity endorsed," International Journal of Scientific and Technology Research, vol. 9, no. 3, pp. 4848–4852, 2020.

40. S. Singh, S. S. Rajest, S. Hadoussa, A. J. Obaid, and R. Regin, Eds., "Data-driven decision making for long-term business success," Advances in Business Information Systems and Analytics. IGI Global, USA, 21-Dec-2023.

41. S. Singh, S. S. Rajest, S. Hadoussa, and A. J. Obaid, "Data-Driven Intelligent Business Sustainability," in Advances in Business Information Systems and Analytics. IGI Global, USA, 2023.

42. T. Arumugam, S. S. Hameed, and M. A. Sanjeev, "Buyer behaviour modelling of rural online purchase intention using logistic regression," International Journal of Management and Enterprise Development, vol. 22, no. 2, pp. 139–157, 2023.

43. T. Banerjee, A. Trivedi, G. M. Sharma, M. Gharib, and S. S. Hameed, "Analyzing organizational barriers towards building postpandemic supply chain resilience in Indian MSMEs: a grey-DEMATEL approach," Benchmarking, vol. 30, no. 6, pp. 1966–1992, 2023.

44. T. N. Srinivasarao and N. G. Reddy, "Small and Medium Sized Enterprises Key Performance Indicators," IOSR Journal of Economics and Finance, vol. 11, no. 4, pp. 1–06, 2020.

45. T. T. Y. Alabdullah and A. J. M. AL-Qallaf, "The impact of ethical leadership on firm performance in Bahrain: Organizational culture as a mediator," Cashflow: Current Advanced Research on Sharia Finance and Economic Worldwide, vol. 2, no. 4, pp. 482–498, 2023.

46. T. T. Y. Alabdullah and H. Q. Naseer, "Corporate governance strategic performance as a significant strategic management to promoting profitability: A study in UAE," Journal of Humanities Social Sciences and Business, vol. 2, no. 4, pp. 620–635, 2023.

47. T. T. Y. Alabdullah, M. I. Awang, B. Sobirov, M. T. Multazam, and M. D. Wardana, of the International Conference on Intellectuals' Global Responsibility. 2023.

48. T. T. Y. Alabdullah, M. M. A. Alfadhl, S. Yahya, and A. M. A. Rabi, "The role of forensic accounting in reducing financial corruption: A study in Iraq," Int. J. Bus. Manag., vol. 9, no. 1, pp. 1-15, 2013.

49. T. Y. Alabdullah and R. Thurasamy, "Corporate Governance Development: New or Old Concept?," European Journal of Business and Management, vol. 6, no.4, pp. 312–315, 2014.

50. T.J. Oleary & L.I. Oleary, Microsoft Office XP. Longman Press, Harlow, United Kingdom, 2002.

51. U. K. Kanike, "An empirical study on the influence of ICT-based tools on team effectiveness in virtual software teams operating remotely during the COVID-19 lockdown," Georgia State University, 2023.

52. W. M. Ead, M. M. Abbassy, and E. El-Abd, "A general framework information loss of utility-based anonymization in Data Publishing," Turkish Journal of Computer and Mathematics Education, vol. 12, no. 5, pp. 1450–1456, 2021.

53. Y. Priyanka, B. Rao, B. Likhitha, and T. Malavika, "Leadership Transition In Different Eras Of Marketing From 1950 Onwards," Korea Review Of International Studies, vol. 16, no. 13, pp. 126–135, 2023.