



## Effect of Computerized Biometric Clocking System on Employee Job Performance at Specialist Hospital, Gombe

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### Abstract

The study evaluates how employee job performance at Specialist Hospital, Gombe, is affected by the computerized biometric clocking system, which handles payroll computation and employee identification. The population of the study consisted of 126 employees of the Gombe State Specialist Hospital. Simple random sampling was employed to choose the participants. Only 98 of the 114 SMEs that were included in the sample of respondents returned the questionnaire, hence the study only used the returned questionnaire for analysis. A statistical analysis using the regression function in SPSS 25.0 yielded results indicating a negative relationship between employees' job performance and their identification, as well as a negative relationship between employees' performance and payroll computation. The identification of employees, payroll computation, and employee performance are negatively correlated. According to the study, the nature of the employee identification system was unfavorable to the current state of affairs in Nigeria since the package might not be sufficient to meet the needs of the workers, who often engage in other companies to support themselves. As a result, the procedure has to be reviewed. The government and stakeholders must collaborate to establish impartial payroll computation procedures that are encouraging and enabling in order to deter management and accountants from acting selfishly.

**Keywords:** Employee, Hospital, Identification, Payroll and Specialist.

## 1.1 INTRODUCTION

In Nigeria, carrying out government plans and initiatives is known as public service. The performance of public sector employees has a significant impact on the degree to which this duty can be accomplished (Lia Ciner, 2019). Performance is therefore a crucial factor that influences the success and outcomes of the business. A company cannot function unless its employees are extremely productive. Because public organizations must handle a variety of purposes, some of which may be in conflict, organizational performance is complex. As a result, public organizations must pay close attention to several performance metrics. Yang et al. (2019) determined time, efficiency, speed, and attendance. According to Kisame (2016), the foundation for evaluating employee performance includes payroll computation, personnel identification, and efficiency. Similarly, the primary performance measuring standard in the public sector is the Annual Performance Evaluation Reports (APERS). It has some of these qualities, such attendance, goal setting, timing, efficiency, effectiveness, loyalty, etc. This is the rationale behind the development of a specific framework for the working environment. According to Acuity Market Intelligence (2018), the purpose of the present employee performance framework is to allow employees to report to work, complete their tasks as allocated, and leave the office on time in order to meet corporate objectives. Employee performance in the public sector is steadily declining day by day, despite government efforts to track it using manual attendance systems. This is because government-adopted attendance monitoring and evaluation have been carried out traditionally using employee attendance books, which involve manually recording attendance, computing employee payroll, and identifying employees. Monitoring and assessing employee attendance, however, involves more than just attendance; it also guarantees effective time management, which maximizes and inspires employee productivity. In today's work environment Employee performance is diminishing because some doesn't come to office, they usually assigned their friends to write attendance for them, some will report write their

attendance and live, while some will come to office write their attendance but will not perform their assigned responsibilities. This and many other factors lead to truancies and low performance of employees in public service.

Given that the hospital employed 126 people as of 2021, it is evident from the number of workers who did not report for duty in 2021 that the majority of the staff members are either truant or on study leave. The hospital employs 78 nurses, 29 licensed doctors, lab technicians, and other support personnel. This portrays an unhealthy scenario that could impair hospital operations. Despite the varying approaches taken by different Gombe State administrations to monitor worker performance. Worker performance is continuously declining. One of the main challenges to providing services to the public is the absence of public workers. Aside from education, the health sector is one of the most underutilized governmental sectors in Gombe, with low employee attendance that negatively impacts productivity. Even in industrialized nations, tardiness and absenteeism are acknowledged as serious problems; among the 113,154 full-time wage and pay workers in the US in 2017, 2.8 thousand days were missed (Pavithra et al., 2017). Due to the expense of implementing a biometric attendant system, which is harming performance, the problem is probably worse in public institutions in underdeveloped nations like Nigeria, which are still primarily dependent on the manual attendance monitoring system. However, the manual or conventional method of managing attendance has not been able to effectively and efficiently manage attendance to provide good performance at Gombe State's public institutions. This manual system gives little to no think to impersonation, fabrication, or the possibility of information loss in the event that attendance records are lost, stolen, or there is a natural disaster like a fire or flood (Kisame, 2016). Errors in the calculation of bonuses and employee salary deductions are another flaw in the manual system. Additionally, keeping track of attendance using this manual method is an extremely onerous process. Truancy at work could be negatively impacted by hospital operations (such as surgery) if certain staff members neglect to report for duty.

By ensuring that workers arrive at the workplace on time and leave at the appropriate time after duty, employee timing and attendance may be readily tracked and help avoid time theft. When workers believe that a balanced workload is a reflection of their efforts, job satisfaction might increase. Pay computation done correctly guarantees that workers receive their rightful compensation. According to Lia Ciner (2019), workers' motivation is increased when remuneration is determined appropriately. Errors can happen in manual pay calculation methods, resulting in inaccurate salary payments for employees. Workers in hospitals offer vital services, and when there are discrepancies in compensation, it can cause disagreements like strikes that impair the efficiency of the business. Employee attendance books have been the standard method used for tracking and evaluating attendance (the manual means of taking employees attendance). Monitoring and evaluating attendance, however, involves more than just attendance; it also guarantees effective time management, which optimizes and encourages workers' attendance (Omobogo, 2015). He goes on to say that a few years ago, staff members were evaluated manually using a time book, in which they could sign in and out every day and provide information such as their name, rank, date, time, signature, and other details. This was particularly true in situations where staff counts were determined by the number of days and hours worked.

Inconsistent results were obtained in a number of empirical experiments that were carried out in connection with this research (Omobogo, 2015; Kisame, 2016; Pavithra et al., 2017; Abdalla & Sankar, 2019). This is because the two variables—payroll computation and employee identification—were not combined by the researchers' components, which they used to measure employee performance. Nonetheless, the three components—which are dependable and cover all necessary elements for measuring the independent variable—will be employed in this investigation. In a similar vein, this study is unique when considered in relation to its geographic setting. This is due to the fact that Gombe Specialist Hospital implemented a computerized biometric clocking system in the second quarter of last year, and there is no record of a research on the subject. Last but not least, whereas the majority of research were conceptual in nature, this one is empirical in nature. These highlights the gap that this study aims to close on the impact of a computerized biometric employee clocking system on workers' performance in a specialized hospital located in Gombe. However, the study seeks to test the following null hypotheses; **H<sub>01</sub>**: There is no significant relationship between the payroll computation and employee's performance in Gombe State specialist hospital. **H<sub>02</sub>**: There is no significant relationship between the employees' identification and employee Performance in Gombe State specialist hospital.

## 2.1 Literature Development

### 2.2 Payroll Computation and Employee Job Performance

A biometric system is a precise and trustworthy method of verifying the presence of an employee. The ability of the computerized biometric employees clocking system to accurately match each user's unique attributes with the templates can be used to assess the system's technical performance. The biometric computerized employee clocking system makes sure that the data is always accessible. Real-time payroll computation can be done using the information gathered from the computerized biometric machine. For the user to be authenticated again, the initial biometric information that the biometric system collects is essential. This means that in order to make sure the biometric template is appropriate, its quality must be determined; if not, the user should provide another biometric template (Pavithra et al., 2017). Once the biometric equipment has collected biometric data, templates are generated. The kind of biometric technology used

determines the caliber of biometric templates that are later processed. The data quality is improved by the automated biometric employee clocking system. Biometric characteristics are not saved or compared in their unprocessed state. There is some unnecessary data in the raw templates that should not be retained on file. Processing the templates makes sure that just the most crucial features are taken out and kept on file. This contributes to a decrease in the amount of data. Employers can more precisely record their workers' time for payroll purposes thanks to biometrics. Accurate payroll data is stored in the automated biometric employee clocking system. The biometric computerized employee clocking system improves staff retention and job satisfaction.

### 2.3 Employee Identification and Employee Job Performance

The biometric features of the user and the produced biometric template characteristics need to be matched in order to identify the person. This process, known as enrollment, entails building a user database that is then kept up to date within the system. Biometric characteristics and personnel details are included in the user's database. In order for a person to be recognized by a biometric system, they must display their biometric feature, which is then recorded as a template in a biometric database. An individual template is generated and kept in the biometric database based on the biometric template feature that was extracted for recognition. There is no exact match that can occur between two separate system users due to the statistical nature of the biometric templates. Because of this, the biometric data is only assigned by the user identification process based on a biometric template, and recognition is confirmed in cases when the comparison score outcome beyond a threshold that can be adjusted. Reliable identification verification is a necessary part of user authentication. The features that are incorporated in the biometric system database must be used by the machine to authenticate and identify each unique user of the biometric system.

A computerized biometric clocking system can serve as either an identity or authentication system, according to Kisame (2016). Using an identifier such as a username, identification verifies a person's identity. Using a verifier, such as a password, verification is the act of confirming or denying an identity. Verification in biometrics refers to the process of user authentication using smart cards and usernames; this is known as biometric authentication. While authentication works with individual to template matching of the live reading against the stored profile, biometric identification checks a user's biometric templates against stored profiles and selects the one that fits the best. While authentication asks "Is this person the person they claim to be?", identification answers the query "Who is this person?" Authentication is typically utilized for positive recognition, where the aim is to prevent multiple people from using the same identity (Omobogo, 2015).

### 2.4 Conceptual Framework

The conceptual framework for the research study is presented below;

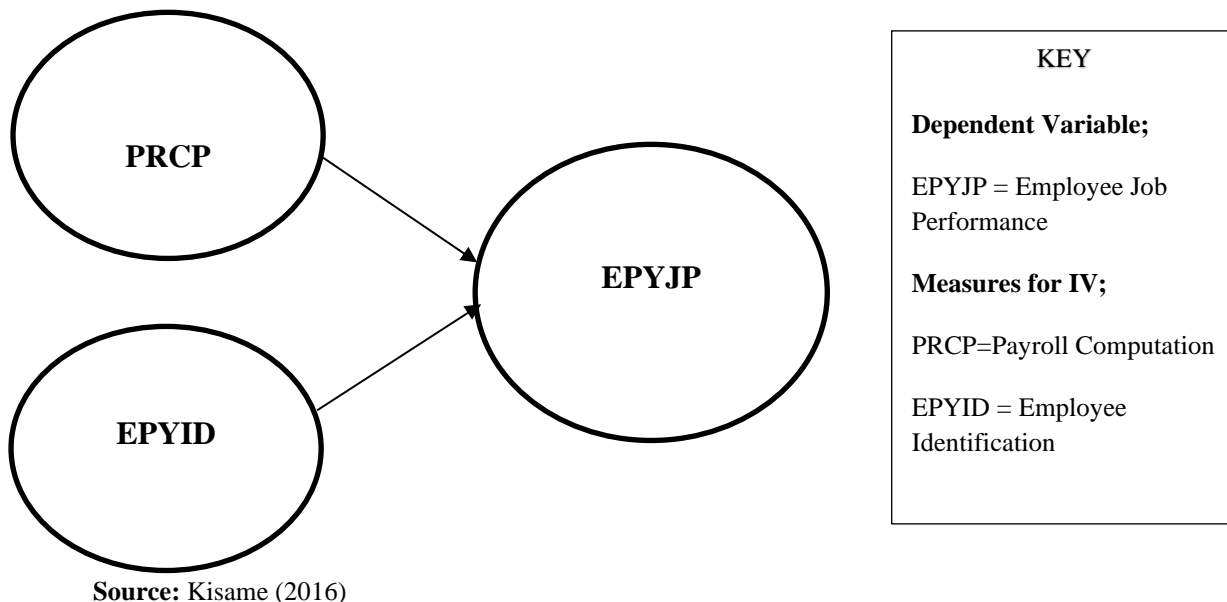


Figure 1: Conceptual framework

### 2.5 Empirical Review

### 2.5.1 Payroll Computation and Employee Job Performance

Palladan and Palladan (2018) investigates employee views on payroll computerization and its impact on their productivity. The study was carried out by the researchers using a qualitative research design. Additionally, grounded theory was used to develop theories. Eleven staff members from three distinct organizations were meticulously chosen to partake in the research. Semi-structured interview questions were asked during a recorded session. Approximately 86% of the transcript's peer review rates indicate agreement. The study finds, among other things, that prompt benefit payments, job enrichment, and accurate incentive computation all boost worker productivity.

Additionally, Zhao and Rabiei (2023) assess the feasibility of implementing the human resource payroll management system based on cloud computing technology. In terms of nature, descriptive analysis was used, and in terms of time, cross-sectional research was used. The statistical population of the study consists of all China City Organization managers and employees who were chosen as sample members based on a Krejcie table consisting of 242 individuals and the random sampling procedure. Based on the objectives, responsibilities, and mission of the target organization, the questionnaire was updated and changed in order to gather more data. Because the distribution of the data is normally distributed, the structural equation modeling approach is employed in data analysis to assess the validity, reliability, and causality of the measurement model. The structural equation model is used for the model's assessment and validation. Smart PLS 3.0 is used to assess the data and model based on questionnaires.

Subsequently, Jalo et al. (2023) assessed the effect of biometric system (Attendance Timing) on employees' performance of general hospital, Bajoga in Gombe State. The study's goal is to ascertain the connection between an employee's performance and their attendance schedule at the general hospital in Bajoga, Gombe State. The study examined a variety of relevant literatures, including textbooks, peer-reviewed journal papers from the past, and other scholarly works that are relevant to the topic. According to some of the first results, staff performance at the general hospital in Bajoga, Gombe state, is significantly impacted by every aspect of attendance timing.

Moreover, Fatima et al. (2019) review different physical and behavioral biometric techniques that described in a different research paper in past decades; The results and future directions of several studies are then examined independently using both behavioral and physical biometric approaches. We offer a comparative analysis of all biometric approaches to give readers a better understanding of the various biometric technologies and help them choose the one that best fits their demands and budget. We draw the conclusion that, in order to provide advanced security and prevent security threats to patient records, proper implementation of any of these biometric authentication techniques, or the appropriate combination of different techniques, is required for identification and authentication in the healthcare sector.

Similarly, Singh et al. (2017) proposed a web-based leave and payroll system. The system integrates with other systems using APIs. New features that may not have been available when the system was first deployed can be added in an establishment where it is being used, and it won't compromise the system's integrity. Additionally, it is set up to connect to the biometric attendance system automatically.

In the work of Rahman et al. (2017), they proposed an automated system. There are six distinct modules in the system. The employee management system is one of the modules, along with the employee payment system, employee monitoring system, employee performance management system, employee attendance management system, and employee leave management system. Employees, administrators, and operators use the system. Depending on what is expected of them, each person has different access to the system.

### 2.5.2 Employee Identification and Employee Job Performance

Shoewu et al. (2020) develop a computerized Health Centre Management System that will upgrade the quality of information management and efficiency of the hospital employees by adopting two – way authentication system involving the use of fingerprints. The Waterfall technique model, which has a linear structure starting with preliminary study, requirement analysis, design phase, implementation, and maintenance, is used in this research article. The modules created by this study included one that managed patient registration and admission information, another that tracked the Health Center Pharmacy's medication inventory, and so on, improving hospital transactions overall.

Additionally, Tharanya and SenthilRaja (2020) introduced a web-based smart attendance and payroll system where employee details are captured into a database and each employee is assigned a unique employee number. To daily log an employee in and out, an administrator logs into the system. This stage collects employee time and generates a daily activity report for the finance department's use in programming attendance management or in the monthly wage computation.

Moreover, Patra et al. (2021) introduced a system that collects the attendance of workers with a biometric scanner. At the same time, the gathered attendance data is transferred to the cloud. Employees and the organization can both access this

data by using the appropriate applications. With the assistance of attendance tracking and all other tasks completed in the payroll software program, the company will be able to work on the employee data.

Each employee in Prasad et al.'s (2019) study receives a secure identification number that they use for authentication. This number, along with other data like coordinates and photos, is saved on their Android-powered cellphones along with the necessary APK files installed. Using their login credentials, the staff members access the system on their smartphones and take a picture for security. Workers must have their Android devices' GPS turned on because the procedure won't work otherwise. Every employee's smartphone connects to a WiFi access point on their way to work, records their attendance, and uses the information to determine their compensation.

## 2.6 Theoretical Review

Models and theories offer a foundation for study and the interpretation of findings (Eisenhardt, 1989). Theories are developed in study to help with understanding, forecasting, and explaining phenomena. Theories offer chances to expand the boundaries of concepts and knowledge (Lia Ciner, 2019). The Resource Based Theory (RBT) served as the study's compass.

### 2.6.1 Edgar Schein Theory

The Edgar Schein theory is based on the idea that the structure of an organization can be dissected by looking at how employees respond and make decisions, as well as by investigating their attitudes and ideas regarding morality and appropriate behavior (Schein, 1995). The model makes use of the functionalist idea and sees culture as a set of fundamental beliefs that are developed, discovered, or forged by a specific group of people as they learn to meet the challenges of interior consolidation and exterior adaptation. These beliefs have functioned well enough to be considered coherent, and as a result, they are taught to new members as the proper way to perceive, think, and feel in relation to these challenges. He further explains that an understanding of an entity's culture can begin with studying its artefacts, including is visible surrounding, employee relations, company rules, remuneration mechanisms as well as other visible features.

### 2.6.2 Resource Based Theory (Underpinning Theory)

In 1984, Birger Wernerfelt came up with the phrase. Nonetheless, the majority of academics believe that Jay Barney founded the contemporary Resource Based View (RBV). According to resource-based philosophy, having resources means having something that is rare, precious, and hard to replace. According to the thesis, businesses should search within their own ranks to identify the sources of resource-based competitive advantage. The Resource Based Theory served as the study's foundation (RBT). The RBT is supported by research, which claims that firms compete in a dynamic and ever-changing business environment (Crook et al., 2008). Barney (1991) asserts that companies can acquire and maintain a sustainable competitive edge through their workforce. This is achievable when businesses own a reservoir of human capital that rivals or competitors are unable to copy or replace. The use of a variety of priceless resources that the company has at its disposal is integral to the RBT as the basis of competitive advantage. It is imperative for organizations to identify their primary sources of prospective resources. These assets ought to be priceless, unique, incomparable, and unreplaceable by rivals in the industry the company works in. For a corporation to implement value-creating initiatives, its resources must be worthwhile. According to the RBT, the company's internal operating environment is a key factor that can provide it a competitive edge. In order for a corporation to compete, be profitable, and have a competitive advantage over its rivals, the RBT assumes that an organization consists of special competencies and resources.

Businesses can improve their operational performance by utilizing the tools and resources at their disposal. Businesses must make sure they have an integrated strategy to all of their activities if they want to remain competitive. Businesses should also implement tactics that set them apart from competitors in the markets they serve. Therefore, if companies hope to stay relevant in the setting of the cutthroat global marketplace, they must investigate their frameworks. Businesses aim to obtain a competitive edge; nevertheless, they must understand that genuine competitive advantage necessitates resources that are rare, valuable, unique, and non-replaceable. The fundamental tenet of the resource-based theory is that businesses must determine which of their primary resources will enable them to establish and maintain a competitive edge over rivals. A resource has to be valuable to organizations like specialist hospital Gombe are expected to make optimum use of time and the human resources that they have by ensuring that employees work fully for the scheduled time to enable specialist hospital Gombe enhance its operational performance in delivery of health services.

## 3.1 Methodology

Survey research design was employed, the population of the study constitute the staff of Gombe state specialist hospital. The hospital has one hundred and twenty six staff (126) as of 2021 (GSSH, 2021). Simple random sampling techniques was to determine the sample size of 114 through Cracji and Morgan (1970). The instrument used for data collection was questionnaire distribution. Inferential and regression analysis was conducted through used of SPSS version 20.0.

### 3.2 Findings

**Table 1: ANOVA**

S/N	Model	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	28.305	3	9.435	5.810	.001
	Residual	152.638	94	1.624		
	Total	180.942	97			

Source: SPSS Version 25 Output, (2023)

Generally, 95% confidence interval or 5% level of the significance level is chosen for the study. Thus, the p-value should be less than 0.05. In the above table, it is .001. Therefore, the result is significant. Table 4.5 showed that there is significant relationship between the dependent variable and independent variables. This indicates a positive correlation. F value represents an improvement in the prediction of the variable by fitting the model after considering the inaccuracy present in the model. A value is greater than 1 for F-ratio yield efficient model. In the above table, the value is 5.810, which is good. These results estimate that as the p-value of the ANOVA table is below the tolerable significance level, thus there is a possibility of rejecting the null hypothesis in further analysis.

### 3.3 Hypotheses Testing

**Table 2 Coefficient Table**

S/N	Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Beta			
	H <sub>01</sub> PRCP	-.156	.237	-.062	-.657	.513
	H <sub>02</sub> EPYID	-.312	.231	-.128	-1.348	.181

Source: SPSS Version 25 Output, (2023)

#### 3.3.1 Hypothesis 1

H<sub>01</sub>: There is no significant relationship between the payroll computation and employee's performance in Gombe State specialist hospital.

A negative correlation between payroll computation and employee performance was also shown by table 2 above. After the 95% confidence interval hypothesis testing result, the study was forced to accept the null hypothesis with a 0.51  $\sim$  0.05 coefficient value for payroll computation. This illustrates how raising employee performance results in a decrease in payroll computation and vice versa. This conclusion is consistent with the findings of Abdalla and Sankar (2019).

#### 3.3.2 Hypothesis 2

H<sub>02</sub>: There is no significant relationship between the employees' identification and employee Performance in Gombe State specialist hospital.

In a similar vein, table 2 above demonstrated the unfavorable correlation between employee performance and identification; the study's findings indicated that there was little evidence linking the variables under examination. The null hypothesis was accepted with 0.18  $\sim$  0.05 based on the results of the 95% confidence interval hypothesis testing. The association between staff performance and identification at Gombe State Specialty Hospital has not changed much.

### 3.4 Conclusion

According to the study's findings, payroll processing has a negative and negligible impact on how well staff perform at Gombe State Specialist Hospital. Determining how long an employee works each week and month is not made easier by computerized biometric employee clocking systems. Employer compensation can be reliably determined with a biometric technology.

The study also shown how important and challenging it is for staff to be identified when utilizing the biometric clocking mechanism at Gombe State Specialist Hospital. According to the study's findings, there is a weak and unfavorable correlation between Gombe State Specialized Hospital personnel' identification and their performance. High managerial abilities that exhibited by the management and government discourage employees from engaging on the work instead register/ do the thump print and go back home.

### 3.5 Recommendation

As per the study's summary and conclusion, firms seeking to effectively and efficiently accomplish their goals and objectives have to promptly consider the subsequent recommendations:

- i. Because some employees engage in other companies to support themselves, the package may not be sufficient to meet their needs, and the nature of the employees' identification method was unfavorable to the existing state of affairs in Nigeria. As a result, the procedure has to be reviewed.
- ii. To deter management and accountants from acting selfishly, the government and stakeholders must collaborate to establish a payroll computation process that is enabling, supporting, and impartial.

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