EFFECTIVENESS OF AUTOMATED ATTENDANCE SYSTEMS ON PERFORMANCE IN PUBLIC SECTOR ORGANIZATIONS: A CASE OF NATIONAL COLLEGES OF EDUCATION, SRI LANKA

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INTRODUCTION

It is a well-known fact that employee attendance has an impact on the performance of the organization. Therefore, accurate measurements of attendance in both public and private sector organizations have become imperative. To improve performance, the introduction of an Automated Attendance System employing fingerprints was adopted everywhere in the world (Smith et al., 2010). It also applied to Sri Lanka and was initially implemented in the private and state sectors. There were dilemmas in this regard, and many opposed the digital signature, while some employees supported it.

In India, researchers suggested a fingerprint-based automation system for organizations to achieve accuracy and ensure enhanced employee satisfaction. The researchers continued to say that automation would reduce human errors (Gupta et al., 2019). In Malaysia, a study revealed that biometric technology is undoubtedly a global ICT strategy that can enhance staff attendance and productivity. Nevertheless, there may be negative organizational factors as well. Therefore, it is recommended that attention should be paid to several factors before recommending biometric technology as a means of improving the productivity of an organization's business processes (Mutahir et al., 2011).

In the Sri Lankan context, there has yet to be a reported study on the effectiveness of the Automated Attendance System (AAS) in public sector organizations. Hence, this research aimed to examine the effectiveness of fingerprint devices on performance, particularly at the National Colleges of Education (NCOEs) in Sri Lanka.

METHODOLOGY

This research was conducted quantitatively, employing questionnaires to collect data from employees and teacher trainees as respondents in five NCOEs. The Sample comprised 103 academic staff members, 61 non-academic employees, and 313 teacher trainees. Convenient sampling was first used to select the NCOEs as the NCOEs are situated in different localities in the country. Stratified sampling and systematic sampling techniques were applied to select respondents. The 5-point Likert Scale was used to quantify the performances of both academic and non-academic employees. Data analyses were done to estimate the mean values of the performances using SPSS, and three scale continuums were developed to interpret the results. A qualitative study was similarly included, focusing on the administrative officers (N = 26); the interview transcripts from these administrative staff were initially coded, categorized, and then thematically analyzed.

293

RESULTS AND DISCUSSION

In order to find out the fundamental perceptions of the NCOE employees and teacher trainees about the AAS, mean comparison was the primary technique adopted to make decisions in the research. The food committee members indicated the highest mean value in the quantitative analysis, 4.306. They were the teacher trainees who worked with non-academic employees, especially those who worked in the kitchen as cooks and served the food to teacher trainees in the dining hall.

Table 1

Mean Values of the Performance Measurements by Respondents

S.No	Category of Respondents	Cronbach's Alpha	Means	No. of Items	N
1	Trainees on academic works	0.804	3.788	15	261
2	Academic staff on AAS	0.812	2.607	12	103
3	Non-academic staff on AAS	0.743	2.055	10	61
4	Trainees- Food committee on kitchen staff	0.867	4.306	10	52

These food committee members experienced the actual output of the AAS three times a day during main meals and two times a day during tea breaks. These responses from the food committee members agreed that the AAS as a system was very effective from their point of view. Conversely, they did not see the obstacles and other problems related to the implementation of the AAS. Thus, they perceived the AAS as a successful system for managing minor employees.

Similarly, the teacher trainees' perception of the services they receive from the academic staff during the timetables and other study sessions is positive; the mean was 3.788, which is a high performance according to the continuum. Teacher trainees see the AAS as a highly effective system. It has helped improve the academic staff's punctuality, the quality of their studies, and timetable management. The new system has an impact on teacher trainees to motivate towards studies, and as a whole, the new system has improved overall services by the academic staff members.

The teacher trainees indicated the above agreement scale just by looking at the services they receive from the academic staff. They did not see the problems or obstacles that could be behind the implementation of the AAS because they needed to use the AAS to mark attendance. Their attendance is marked separately in a traditional register manually. They saw it from their point of view as customers or service recipients, not as those who experience the problems of the AAS.

In contrast, the academic staff did not perceive the AAS as a sound system, and the performance mean was below the neutral line of 3.00 and 2.750, showing a moderate performance. This fact reflects that the academic staff did not agree that the AAS is an effective system because they perceived some problematic backgrounds while reporting to duty using the fingerprint machine instead of the old attendance register. In general, they perceive this system to cause low performance.

When the perception of the non-academic staff was considered, their performance mean was 2.055, indicating a low performance. They similarly perceived the AAS as problematic due to some obstacles from their point of view. The non-academic staff members faced situations beyond their control, such as public transport facilities for NCOEs, etc. They perceived the AAS as a system that negatively impacts them as the NCOEs' employees.

Figure 1

3 Scale Continuum for the Interpretation

The senior administrators, the academics working in the NCOEs as Presidents, Vice Presidents, and Coordinating Lecturers, had the following opinion. Once the qualitative data from interviews were analyzed thematically, their perception of the AAS was positive. They looked at the AAS from their management point of view because it helped them manage the employees' arrivals and reduced some manual work, such as calculating duty hours and overtime hours, etc. Overall, senior managers perceived that the AAS positively impacted the overall performance of an academic institution, which helped them manage employees' arrivals and departures effectively.

CONCLUSION AND IMPLICATIONS

A three-scale continuum interpreted all the findings from the quantitative data through the Likert Scale of five points. In summary, results showed that the AAS has a positive effect on the punctuality of all grades of employees, and the administrative staff has confirmed this fact. Teacher trainees fully agreed with the AAS as a successful system from two perspectives, i.e., improved academic and non-academic staff performance. Non-academic staff disagreed with AAS, and academic staff did not agree that AAS is an excellent mechanism to improve performance. However, almost all the administrative staff agreed that AAS has improved its effectiveness. Overall findings suggest that AAS should be continued, and the problems surfacing with the use of the AAS have to be addressed separately.

As a solution to some of the issues, the necessity of changing the reporting time of arrival and departure, with adherence to the working hours standard based on the circumstances, could be recommended. Furthermore, establishing better management and performance evaluation systems and linking AAS with the other appropriate administration software could further be considered.

*Keywords***:** Automated attendance systems, effectiveness, performance, public sector

REFERENCES

Adewole, A. B., & Oloyede. M.O. (2014). Development of Fingerprint Biometric Attendance System for Non-Academic. *Computer Engineering and Intelligent Systems,* (ISSN 2222- 2863(Online)45-67

APA. (2008). American Payroll Association, https://asappayroll.com/ramification-of-buddy-punching-and- how-toavoid-it/ doi/16.3211/2257115432

Federation of American Scientists. (2008). Bio metrics in Government, Post 9/11, Advancing Science, Enhancing Operations 2008, https://irp.fas.orgdoi/15.2343/2156516436

Gupta, A. Kundu, A. & Das, R. (2019). Automated Attendance System for Efficient Employee Management: A Biometry based Approach. https://www.scirp.org.

Holloway, I., & Todres, L. (2003). The status of method: flexibility, consistency and coherence. Qualitative Research, 3(3), 345-357.

Nucleus Research Institute (2009). Automating Time and Attendance with Biometrics Reduces Payroll Error and Boosts Productivity, Boston USA, doi/18.1232/2156513765

Smith, Matthew & Noorman, Merel & Martin, Aaron. (2010). Automating the Public Sector and Organizing Accountabilities. Communications of the Association for Information Systems. /doi/26. 1-16. 10.17705/1CAIS.02601.

Weerasinghe, B.H. & Sudantha, L. (2019). An Efficient Automated Attendance Entering System by Eliminating Counterfeit Signatures using Kolmogorov Smirnov Test. *Global Journal of Computer Science and Technology, 2*(4), 36–52