

RP12

The Impact of an Organized Transport System on Employee Productivity: A Case Study at the Faculty of Technology, University of Ruhuna

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Abstract

The success of an organization is a dependent variable of employee productivity. It also relies on how well the basic requirements of employees are fulfilled to conduct the duties with the fullest commitment. One prominent factor which affects employee productivity is a long and exhaustive commute in and out to work. In the present study, the impact of an organized transport system on employee productivity is investigated with the provided transport facility for Faculty of Technology of University of Ruhuna. In particular, the monthly average of working hours per employee per day, monthly average of late days per employee and time spent for transportation by each employee were analyzed. The variations of the values of above parameters are assumed to be reasonable indicators of the productivity of employees in this study. The required data of employees, the “in” and “out” times, are mainly collected from fingerprint attendance records. The above data were analyzed over a period of 12 months. For the completeness of this study, the employees’ work efficiency improvement, satisfaction and commuting time data were collected through a questionnaire. The results of this study provide clear evidence towards a positive impact of proper transport systems on the productivity of employees.

Keywords: Employee Productivity, Transport, Daily Working Hours, Satisfaction, Commuting Time

Introduction

Institutional goals can be attained with the productivity of its employees. It requires the contribution of every employee at their full capacity with full attention on their work. The cumulative impact on employee performance is even higher if a few minutes is added a day and this undoubtedly enhances the overall productivity of any organization. Previous research studies have found that there is a positive impact on job satisfaction of employees from a good working environment and working

conditions (Almeida and Perera, 2015; Nanjundeswaraswamy et al., 2019). The Satisfied employees are highly motivated for their work, empowering them to be more productive which benefits the organization in the long run (Agarwal et al., 2020). However, a factor that gravely affects employee productivity is a long exhaustive daily commute to their work. As a result, employees tend to feel tired and less productive at work (Qutubuddin, 2017). Thus, it is essential to minimize this time wasting on daily commuting in attaining employee productivity and organizational goals.

Minimizing the commuting time in rush hours has paid considerable attention for a long time (Sampaio et al., 2008). In urban settings, traffic congestions have been a major problem in increased commuting time of passengers (Bull, 2003; Kumarage, 2004). A well-organized traffic signal management plan will provide multiple benefits in minimizing traffic congestions in rush hour (Fehon and O'Brien, 2015). Alternatively, the lack of proper transport methods would also significantly increase the commuting time. The problem arises due to recent trends in establishing industries and institutions in rural areas having sufficient space for future development. However, the transport systems are not properly developed in such areas for accommodating the needs of employees.

An exigency plan, aiming at enhancing the productivity of employees, is to introduce an organized transport system for daily commuting. In the present context many organizations, located in rural areas lacking proper public transport systems, including garments, banks, factories, universities tend to provide transport facilities to their employees for their daily commuting needs. Rural areas with tranquillity and scenic beauty are ideal locations for establishing academic institutions. The universities established in such areas provide transport facilities to its staff and students for daily commute (Cyride, 2021). Systematic and Scientific approaches have also been tested in analyzing and improving employee transportation systems in universities using home addresses of employees as an input (Akpinar et al., 2021).

Faculty of Technology, University of Ruhuna is one of the leading technology faculties in Sri Lanka. This is in Karagoda-Uyangoda, Kamburupitiya a significant distance away from Matara. This area requires infrastructure development including transportation services. Currently, the faculty have about 800 students with more than 100 staff members. The staff members who daily transit via Matara and Godagama-highway exit face difficulties due to non-availability of proper public transportation service to the Faculty of Technology. Moreover, all the daily commuting staff and students must arrange a private transportation method from Kamburupitiya clock tower to the Faculty of Technology, which is about 3.5 km. The distance from Godagama-Palatuwa exit to the Faculty of Technology is about 15 km, which takes about 30 min with a proper transport service. However, there is no proper transport service on this route. Usually, staff and students have to transit via Matara bus-stand to Kamburupitiya

clock tower and again from there, they have to arrange private transport service to the Faculty of Technology. This route takes about 1.5 h of extra time and incurs a huge cost for daily travelling. As a workable solution to overcome this issue, the faculty started to use the university bus from 13th November 2020 under regular bus fare to fulfil the transport needs of staff and students of the Faculty of Technology. The main objective of this research is to investigate the improvement in productivity of employees with the provided transport facility for their daily commuting needs for work, which ultimately enhances the organizational performance.

Methodology

In this study, the number of working hours per day, number of late days and time spent on daily commute is analyzed. Further, employees' feedback on work efficiency and mental relaxation were obtained through a questionnaire. The variations of the values of above parameters are assumed to be reasonable indicators of the productivity of employees in this study. The provided transport service is mainly used by lecturers, administrative staff, Management assistants, Academic support staff, temporary demonstrators and temporary lectures. These employees are engaged in various activities and duties in a day. Thus, the conventional concepts of output/input measurements for productivity are not applicable for academic institutions.

The employees, who regularly use this transport service, are considered for this study. Currently, more than 20 staff members use the transport service. The attendance records of the administrative staff, Management assistants, Academic support staff, temporary demonstrators and temporary lecturers are considered in this study. The required data on employees' "in" and "out" times are collected from fingerprint attendance records and signature book up to September 2020. Starting from October 2020, attendance of temporary academic staff was collected through the fingerprint system. Therefore, all the attendance records after October 2020 are based on the fingerprint records. Data on March 2020, April 2020, May 2021, and June 2021 are excluded from this evaluation since the university was not properly functioning during those periods due to Covid-19 pandemic.

The number of working hours of an employee "i" on day "d" (t_d^i) is calculated based on the following formulae.

$$t_d^i = t_{out}^i - t_{in}^i, \quad (\text{Eq. 1})$$

where,

t_{out}^i = out time of employee "i"

t_{in}^i = in time of employee "i"

The attendance records of each employee throughout a month are considered in calculating the monthly averages. The attendance records of different days of an employee can be considered as independent events. Thus the total number of independent data samples (N_s) per month can be considered as $N_s = M_d \times N_e$, where M_d is the number of working days for the month and N_e is the number of employees. The monthly average of working hours per employee per day (\bar{t}) is calculated using the equation.

$$\bar{t} = \frac{\sum_{i,d} t_d^i}{N_s} \quad (\text{Eq. 2})$$

For each month about 100 attendance records ($N_s \approx 100$) were considered in computing the monthly average of working hours per employee per day (\bar{t}).

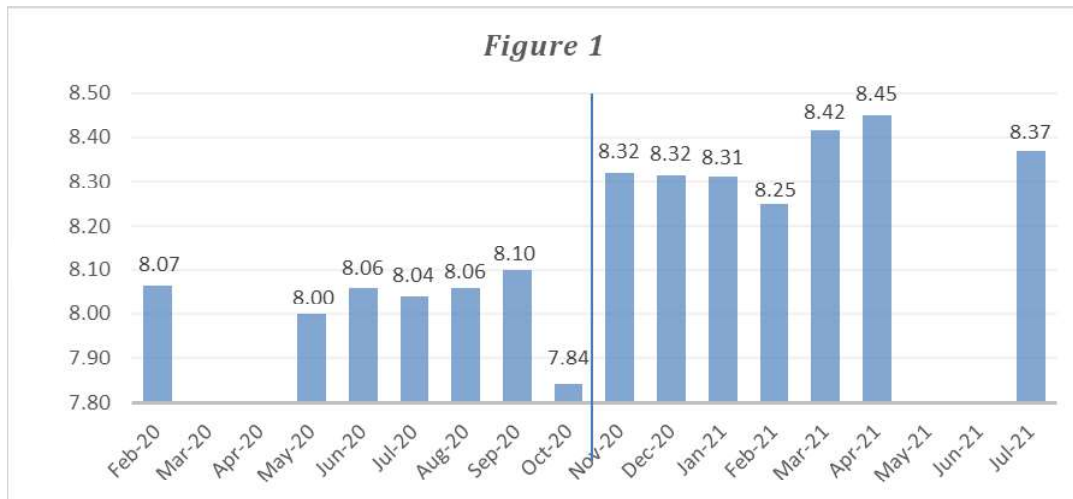


Figure 1: The monthly average of working hours per employee per day (\bar{t}) against the respective month. The time period considered is from February 2020 to July 2021 which covers both before and after the provision of this transport service for the staff of Faculty of Technology of University of Ruhuna. The transport service was started from the month of November 2020

Results and Discussion

The monthly average of working hours per employee per day (\bar{t}) against the respective month is depicted in *Figure 1*. The number of working hours in excess of eight hours may represent the extra hours spent on duty. The (\bar{t}) is around 8 hours until October 2020. The prominent drop of (\bar{t}) observed in October is due to the implementation of the fingerprint attendance collection on temporary academic staff. From November 2020, the value of (\bar{t}) is around 8.30 h, which is due to the provided transport service for the employees. The bus reaches the faculty around 8:15am and leaves around 4:45pm giving the employees enough time to complete their task and leave. Thus, due to this organized transport service the working hours per day per employee has been increased by more than 20 min on average. It should be noted that this excess time is not accounted for

overtime claims. It is the utilization of the time wasted for transportation in a productive way. The employees are not required to spend time on arranging their transport as the time before November 2020. They are mentally relaxed since they have a method of transportation. Thus, it is reasonable to assume that this time gain will impact positively towards the employee productivity.

These employees are entitled to have two short leaves per month. A significant decline was observed in the number of short leave days taken by the staff who are regularly using this transport service. Accordingly, this encourages the long working hours, sacrificing that short leave entitlement in the benefit of a relaxed mindset with the release from exhausted commuting.

Number of late days is another measure of assessing employee productivity. Monthly average of late days per employee for each month was calculated based on total late days per month for a sample of employees based on the following formulae.

$$\bar{h}_{month} = \frac{\sum h_{ij}}{n}, \quad (\text{Eq. 4})$$

where,

\bar{h}_{month} = monthly average late days per employee

$\sum h_{ij}$ = sum of late days of all employees in a month

n = number of employees

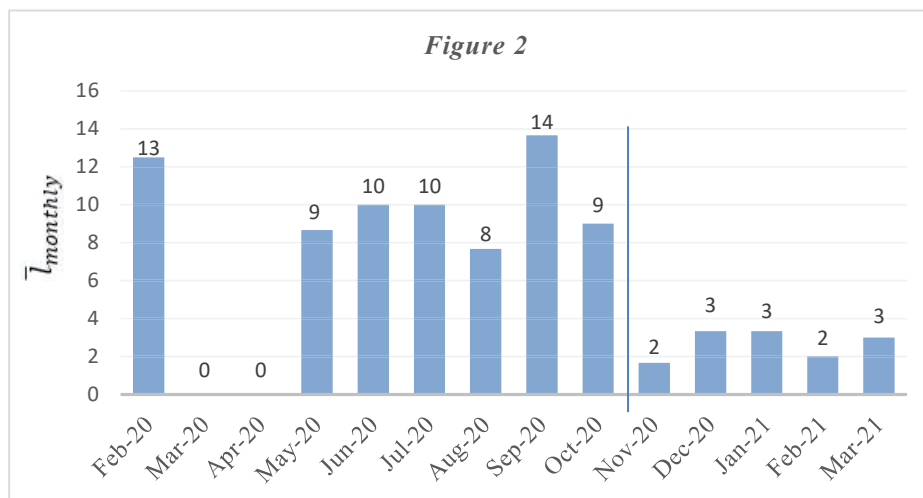


Figure 2: The monthly average late days per employee (\bar{h}_{month}) against the respective month is depicted. The time period considered is from February 2020 to March 2021 which covers both before and after the provision of this transport service for the staff of Faculty of Technology of University of Ruhuna. The transport service was started from the month of November 2020

The monthly average of late days per employee (\bar{h}_{month}) against the respective month is depicted in Figure 2. The number of late days were retained at a high level which ranges from eight days to

fourteen days until October 2020. From November 2020, the number of late days have drastically decreased with the provision of this transport service. Furthermore, in an ideal situation the number of late days would be zero in which bus arrival and departure times are more organized, considering the factors such as traffic congestion.

Apart from the above improvements, reduction in time spent for transportation and mental relaxation are some other benefits associated with this transport service. The survey was conducted via a questionnaire to collect data on the above aspects and the responses of staff of the Faculty of Technology were reviewed. Time saving is measured with the gap between, time spent with public/private transportation for daily commuting and time spent with university transport for daily commuting. The responses of twenty-three employees using this transport service are considered to investigate this.

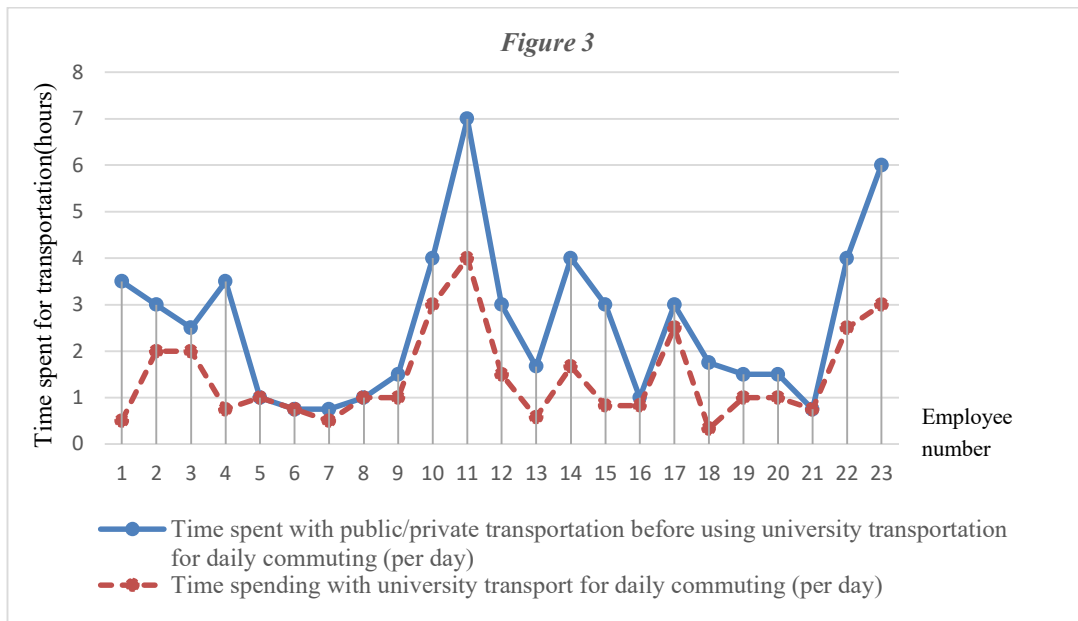


Figure 3: Time saving with the organized transport service in terms of time spent with public/private transportation before using university transport for daily commuting and time spent with university transport for daily commuting

The times spent under both methods are plotted against each employee as depicted in Figure 3. Other than a few employees who have used private vehicles for daily commute before the provision of this bus service, every other employee under this evaluation has experienced a notable time saving due to this transport service. It is noted that about 50% of employees using the transport service save more than an hour in one trip. This undoubtedly grounds for psychological and physical benefits to employees as well as the organization. These employees are less tired at daily commute which saves more energy to work efficiently and effectively. When analyzing the feedback received from the

questionnaire, about 97% of employees stated that they feel mental relaxation with the provided transport service. Further, all the employees using the transport service responded that their work efficiency has been improved with the provided transport service.

Conclusions

A long and exhausting commuting day in and out for work is one of the prominent factors which affects the productivity of employees of an organization. The present study was conducted to investigate the effect on productivity of employees with the provided transport facility for the Faculty of Technology of University of Ruhuna. The main parameters considered in this study are the monthly average of daily working hours per employee (\bar{t}), monthly average of late days per employee ($L_{monthly}$) and time spent for transportation with and without the transport service. The variation of the values of above parameters are assumed to be reasonable indicators of the productivity of employees in this study. A considerable improvement in the monthly average of working hours per employee per day was observed after the establishment of the organized transportation service. The observed average increment of working hours is about 20 min. Moreover, the monthly average of late days per employee ($L_{monthly}$) has significantly decreased with this transport service. The time spent with public/private transportation before using university transport and with the provided university transport facility is also investigated. Accordingly, the employees, who were included to this study have experienced a notable time saving due to this transport service. It was observed that about 50% of employees using the transport service save more than an hour on one trip. Further, the employees using this transport service stated that the work efficiency has been improved with the provided transport service. Finally, the finding of this research provides strong evidence on increased productivity of employees with the provided transport facility for the Faculty of Technology. The results of this study suggest that incorporation of a well-developed transport system in the university would improve the performance and productivity of students and employees and contribute to overall quality enhancement of the institution.

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