



Attendance Management System Assessment and Sustainability Performance at a Telecommunication Operation Centre in Malaysia

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Abstract

In the increasing and rapid competitive and challenging environment in the organization, the influence of attendance on the overall performance of workers is a necessary element of business management. In this paper, the study attempts to propose an improvement of the attendance management tool's evaluation to track employees key-performance-indicators (KPI) at a telecommunication operation centre in Malaysia. The revealed the primary cause for verification and assessment of attendance records and measurement of staff KPI in the Telecommunication Operation Centre. The analysis was carried out to verify the attendance records versus the performance applied using DMAIC with the R Studio Programming and staff handbook performance measurement. The R Studio Programming was proposed as an automation measurement for individual workers and to improve the new staff handbook's Telecommunication Operation Centre with an improved attendance measurement KPI per the individual's performance. The findings of this research will serve as a guide for many organizations later on, in order to improve the staff's performance handbook. Furthermore, it may additionally benefit the organization as an effective administration tool for employee attendance in the future.

Keywords: DMAIC, Absenteeism, KPI, Performance, Attendance, Sustainability

1 Introduction

Under Sustainability goal development [1], Goal 8: Decent work and economic growth, it stressed and encourage on The SDGs promote sustained economic growth, higher levels of productivity and technological innovation. According to Olagunju et al., 2018[2] time is money. These emphases on the impact of time and punctuality in business. Unfortunately, time management issues are a major problem for some individuals. This consists of the capability to precisely measure and manipulate the time and attendance of staff. In organisations, attendance management systems are necessary to keep track of the worker's hours [3]. It can be done by using time recording sheets, the use of spreadsheets, punch timecards, or using online time and attendance software programs for the enterprise. These days, due to the large number of employees, working time monitoring machines come in a much more extensive of format, from simple paper based formats to complicated automatic systems. Research from RAND Europe 2017 on the frequent 12 months fee for health-related absenteeism and being present, per corporations is estimated at RM2.7 million. Malaysia has committed sixty-seven days per employee per year, 58.8 days of which were due to to being present, whilst the remaining 8.2 days had been attributed to the actual absence from work [4]. Over the last years, employee absenteeism has emerged as a fundamental

concern in across enterprise telecommunication Operation Centres. The influence of attendance on the overall performance of workers is a necessary element of business management, as naturally it is not a question that attendance has a significance as. For this study it was a necessary trouble to help decide how a good deal is obligatory for attendance in a company. Many researchers have found high-quality research on the importance of family members between attendance and the overall performance in exclusive topics at various universities and agencies [5]. Attendance analysis and performance has becoming a trend in a business organization, as well as in education institutes which have become necessary for checking various activities such as student performance, their capability, interests, weaknesses which needs consideration, faculties of performances, overall performance branch, department and much more [6].

The telecommunication Operation Center still practices a manual way for evaluation of the attendance records. Besides, supervisors want to manually analyze a range of absences and calculate the share of the current input from the attendance listing being amassed or recorded. A total of 40 group of workers, calculated their absenteeism manually with the aid of unique units. This was time consuming and the result of the calculation could possibly go wrong if the manager ignored some of the information in the attendance record. In addition, managers need

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to manually write the details of the attendance facts in the documents when needed. The Show Cause Letter (SCL) will be given to the workforce when the staff is late to work, for a time greater than three times in month according to the company's employee attendance policy. However, all attendance statistics need to be analyzed manually first, before the warning letter and attendance report documents can be crammed in. All this work increases the manager's workload. Although there is a system that has been established to hyperlink between the employee's fulfillment and the employee's attendance, fulfillment statistics is determined by individual, but attendance is not.

Based on the previous analysis records of attendance, there have problems on the manual verification process which is lack of analysis records and calculation which was done by staff. No appropriate document to justify the late arrival employees according to the company's employee attendance policy is available. The indicator for measuring the absenteeism rate per employee is not used as reference. Furthermore, the rate represents the average number of absences per workers which are not standardized.

Currently, the staff handbook measurement for KPI competency only measure the staff performance per individual based on the completion of the task competency. It is critical for the attendance performance due to the productivity measurement per individual staff that impacts the whole team's morale. Otherwise, it is encouraging that the employee's productivity and attendance performance records are managed well.

The monitoring of employee performance for attendance management is not been performed by the organization. Generally, management performance for attendance is checked using the unit division report attendance, not only for the employee's performance KPI competency. The measurement of attendance is not in standard value for it to be used as an indicator for performance competency. It is does not manage the employee's attendance performance according to the staff handbook KPI performance.

Table 1 showed the late arrival record in 2016 and 2017 for this organization. It showed that at least once a month, there was a late arrival recorded. There has been a tremendous increase of late arrival for NOC 1 for the year 2017. The company's aim is to reduce the trend line was in line to reduce the impact to cost and increase the overall operational performance.

Table 1: Late arrival record years 2016 and 2017 at Malaysian Telecommunication Operation Centre

Year	Unit/ Month	1	2	3	4	5	6	7	8	9	10	11	12
2016	NOC 1	4	2	1	2	1	3	5	5	4	2	1	2
	NOC2	3	6	4	5	5	0	5	5	7	4	0	3
2017	NOC 1	2	4	3	2	1	3	5	5	4	2	1	2
	NOC2	5	5	7	0	4	2	12	9	8	7	6	10

Low morale employees with a high absence price will affect the overall success of the organisation's goals and their profitability in the market [7]. This calculation of the absenteeism rate provides the average organisational ailing depart absence charge or proportion of working time inside a business enterprise, which has been misplaced due to absence. The number of Man-day lost complies with the formulas [8] as in equation 1 below:

$$\text{Absenteeism} = \frac{\text{Number of man days scheduled to work}}{\text{Total number of man days scheduled to work}} \times 100 \quad (1)$$

The absenteeism cost can be calculated for special employees and for distinct time intervals like month and year. The frequency rate displays the incidence of absence and is typically expressed as the variety of separate absence in a given period, irrespective of the measurement of absences. The frequency cost represents the frequent number of absences per human beings in a given duration [9] as in equation 2 below:

$$\text{Frequency Rate} = \frac{\text{Total number of man days scheduled to work}}{\text{Total number of man days scheduled to work}} \times 100 \quad (2)$$

An immoderate severity rate shows that the worker is absent for longer periods each and every time. High frequency and severity costs point out that the worker is absent for much larger frequencies and for longer lengths every time, which results in excessive absenteeism even in absolute phases. The severity rate can be calculated as shown in equation 3:

$$\text{Severity Rate} = \frac{\text{Total number of days absent during a period}}{\text{Total number of times absent during that period}} \times 100 \quad (3)$$

Data from a three year's record from NOC 1 and NOC 2 for the Malaysian Telecommunication operation Centre is gathered and calculated. Figure 1 and 2 showed the absenteeism rate for the year 2016 to 2018. The highest of absenteeism rate was 2.458 for year 2017, compared to the previous year in 2016, only 2.403 for NOC 1. In the year 2018 up to September 2018, the absenteeism rate had a high record in July 2018 at 2.105. For NOC 2, the highest rate was 1.875, 2.6, 2.458 for 2016, 2017 and 2018 respectively.

It showed some boundaries in the sense that common absence price can relate to fewer absences over a much longer duration, or various shorter absences. Storage of attendance administration data can divulge lots of facts on making use of exclusive evaluation techniques.

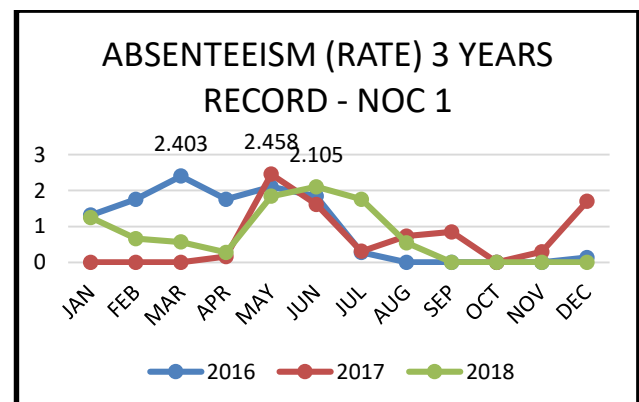


Figure 1: Absenteeism rate for NOC 1 team as percentage of working time per annum, 2016-2018

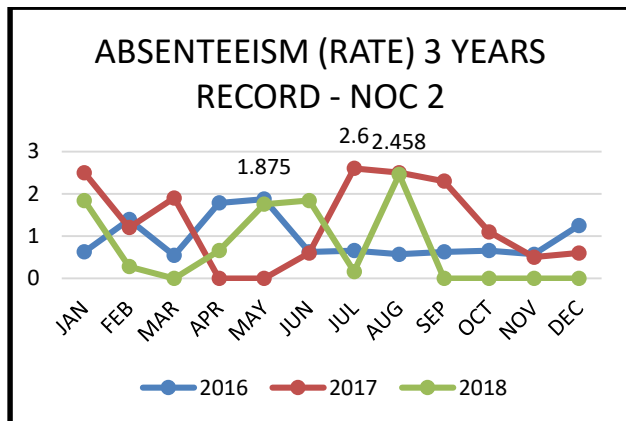


Figure 2: Absenteeism rate for NOC 2 team as percentage of working time per annum, 2016-2018

Due to greater expectations from the administration toward personnel, some of assessment needed to be advocated to improve the present size of the group of worker's performance records. This paper attempts to propose an improvement of the attendance management tools evaluation to the track employee's performance KPI at a telecommunication operation center in Malaysia. The findings of this research will serve as a guide for many organizations later on in order to improve the staff performance handbook. Furthermore, it may additionally be beneficial to the organization for the effective administration of employee attendance in future.

According to Cucchiella [10] and Christianson [11] the definition of absenteeism is a "habitual absence from work for one or more days, generally justified with the aid of clinical certificate but, actually, due to personal hobbies and bad sense of duty." As an employee's failure to document work, it was a pattern of lacking work in which a worker is habitually and regularly absent. Failing to manipulate employee attendance affects the high quality with regards to excessive price in any organization. Employee absenteeism has a direct effect on the stage of the carrier University [12] excessive levels of absenteeism leads to inferior satisfactory of service, misplaced productivity, and decreased morale of co-workers. Consistent management of attendance problems can have fairly fantastic outcomes in the workplace. It is acknowledged that an organization has to face this bad connotation of the phenomenon. An ethical organization has to reflect on the consideration for the work life balance of its employees, by respecting their free time and by leaving ample time for the activities such as maternity and paternity. It is handy to define the absenteeism, the research of its motives is not effortless, because the phenomenon is rooted in many elements of the current lifestyles [13].

Maintaining a suitable attendance file at work consists of more than just calling in ill regularly. It additionally has the capacity to begin job duties on time, staying on the job at some stage in the day to complete duties accurately and attending all scheduled meeting and appointments. Employees are the organization's most valuable property. Reporting late to work and leaving before the shift can have a bad effect on the productivity of organizations. According to [14] managing absence is a challenge for companies as it influences productivity, customer-service standard, morale and profits. Its strain on colleagues who

are required to manipulate extra workloads is also well documented.

In the Basic Conditions of Employment Act, an employee is entitled to 30/36 working days' unwell leave over the course of 3-years (this is dependent on whether an employee works a 5 or 6-day week) [15]. If the entire workforce interior a business company collectively, takes their full entitlement, the company's absenteeism rate will run at about 4%. It is commonly believed that if a cost falls inside this, then the absenteeism figures are best and no in additional action is required. By correctly analysing absenteeism, organizations can make financial savings in operational efficiency.

Based on research by [16] evaluating in opposition to a national average is one way to find out if workers may have an absenteeism problem. However, it is no longer a comparison, due to the fact that health problem absence varies significantly depending on matters like enterprise measurement and industry as follow: (a) median sickness absence for Public sector: 7% and (b) median sickness absence for Private sector: 2.2%. Over an average duration, and other charges quoted here, this typically refers to arithmetic means. The dilemma of the mean price is that the weight is given to each occurrence is according to its magnitude. Thus, extreme values are emphasised over centre values. This is particularly important in the absence of statistics considering the tendency for this to be skewed, that is, large numbers of humans have only a few days absence, whilst small numbers have very long absences [17]. Some observers recommend the use of the median value to summarise absence information sets. The median is calculated by putting the observed values in an ascending or descending order of magnitude, and then finding the central cost of these.

This version splits down even in terms of addition when showing a specific industry. For example, the median time misplaced to disorder absence for the retail industry is solely 1.8%, whereas the public health employers have a sky high excessive median of 4.2%. Unsurprisingly, the greater the commercial enterprise company is, the worse the absence tiers get: (a) less than 100 employees: 1.8%; (b) 100-249 employees: 2.3%; (c) 250-999 employees: 2.8%; and (d) 1,000 + employees: 3.7%.

The absenteeism rate per worker is under 1 percent (unlikely result in actual life). This will probably be the end result across 200 or more employees with no absent days, and the relaxation of these employees with a few absenteeism days a year. Absent employees compromise the profitability of the employer by decreasing the usual productivity and performance of the team of workers [18]. As shown in Table 2, the annual cost of productivity due to absenteeism, the excessive value of misplaced organizational productivity and the motivational factors of every day working personnel affect the sustainability of the organizational performance. Lost employee productivity, leadership intimidation and abuse, and worker fitness problems can impact worker absenteeism, which affects organizational performance. In business, employee absenteeism is the predominantly a cause for lost productiveness [19]. The intention for leaders of groups is to be the center of attention on the economic bottom line of growing profits and workplace productivity, whilst lowering the organizational expenses. According to a survey of 94,000 workers, by the Gallup-Sharecare Well-Being Index, the annual price associated with

absenteeism differs by the way of the industry, with the greatest loss occurring across professional occupation [20].

Table 2: The cost of lost productivity by major U.S occupations

Occupation	Annual cost of lost productivity due to absenteeism (in billions)
Professional	\$24.2
Managers/executives	\$15.7
Service workers	\$8.5
Sales	\$6.8
School teachers (K-12)	\$5.6
Nurses	\$3.6
Transportation	\$3.5
Manufacturing/production	\$2.8
Business owners	\$2.0
Installation/repair	\$1.5
Construction/mining	\$1.3
Physicians	\$0.25
Farmers/foresters/fishers	\$0.16

Employee absenteeism has a long-term effect on decreased workplace productiveness [21], which is asserted by the fact that employee absenteeism minimizes the organizational earnings and productivity because other employee has to fill in for the work hours of absent employees. In essence, absenteeism results in agencies being understaffed, even though the employee roster is unchanged. Other authors [22] claimed that employee productiveness decreases each and every day due to the fact that managers have to hire, train, and supervise new temporary personnel to meet business deadlines. Lost productivity prices related to absenteeism, being present and unpaid work, are hardly ever covered in the valuation of health-related expenses [23]. The total loss of productiveness prices amplify due to the worker's not being present; a condition which requires personnel to attend work when ill, which effects in accelerated worker absenteeism. In particular, [23] cited that the manager's failure to deliver information personnel and apprehend the effect of absenteeism and being present on the business enterprise would be a probable result in the persisted misplaced productivity.

The lookup is all about the Effect of Absenteeism on the student's performance [24], the end result of the findings show that there are three foremost elements or symptoms which are badly affected by the means of absenteeism i.e. class participation coordination of college students with teachers and peers and the third is the Grades of students. Attendance policy makers ought to provide incentives or rewards to encourage the students to meet the required attendance as a result of the academic outcomes of the students and the corporation which can become outstanding.

2 Methodology

In this study, Qualitative lookup was used as a collection data method and the theories were developed based on that data. The problem statement asks, "What are the root causes and solutions to improve the verification of attendance to all employee that can used as standard tools and attendance performance in the staff handbook KPI?". Several researchers recommended that a modern-day practice of attendance verification documents that a quasi-experimental lookup sketch is most fabulous when it lacks the key ingredient, test variables, or no strong fundamental of

algorithm to rely on. In this lookup, most of the facts were already available, but the opportunity lacks information/data that may also require obtaining the course of the research period. All the acquired statistics for the evaluation in the literature review, record review and commentary have been arranged in Figure 3 to ease the lookup works. The records will analyse based on the lookup goals (RO's) that have been acquired from legitimate lookup question (RQ's) from the lookup perspective.



Figure 3: DMAIC Research

DMAIC is a data-driven first-class method used to enhance processes. It is an integral section of a Six Sigma initiative, but is widely wide-spread and can be applied as a standalone enchantment method or as part of another method improvement initiative such as lean [25,26,27].

2.1 Identify

The research seeks to identify the current practice of attendance verification records processes. By determining the problem of the issue and of the new approach or existing one is effective. From the current process given in Figure 4, an employee captures the daily attendance using the current system's attendance management in the Telecommunication Operation Centre. The attendance records as an auto data pushed into the server. Every month the attendance data extracts from the server and customizes the report manually. The validation approval by the manager will be presented as an attendance performance report at the top management meeting. Furthermore, the author will focus in the green area and discuss the root cause using the fishbone method.

2.2 Analyze

The target of population was 40 staff of the Telecommunication Operation Centre located in Kuala Lumpur, Malaysia. The qualitative research methods using the verification attendance records, will be using two years of attendance management records that were extract from the data server. Further, authors will have collected via observation on site over approximately 8 months. The data random 2 team in NOC 1 and NOC 2 will help to analyze of early arrival and late arrival "time-in". The analysis data using the R Studio programming for each individual attendance measure, in order to accumulate qualitative

data statistical, the place of the employee's attendance document databases statistics mining evaluation the use of R Programming (R Studio) tools. R Studio is a statistical computing language and tool which is environmentally friendly to operate data evaluation [5].

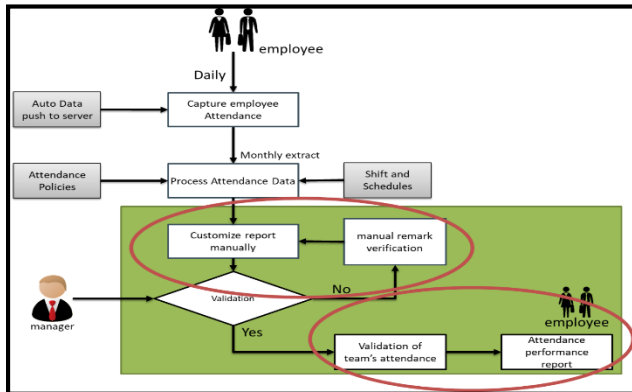


Figure 4: Current Process for Attendance verification in Telecommunication Operation Centre

2.3 Improvement

All collected data will be key-in using R Studio programming software. Researchers will use the attendance excel records to import the R Studio programming using the computing language in the command in the editor view. The measurement of the analysis refers to the formula in previous research works and modified using the author code editor. Furthermore, all the key-in data will be tabulated based on the sections of the research questions. All the collected data will be prepared for qualitative data analysis.

3 Results and Discussion

3.1 Identify the Problem

A fishbone diagram, also referred to as a motive and effect graph or Ishikawa diagram as shown in Figure 5, was a visualization device for categorizing the potential reasons of a trouble in order to become aware of its root cause [25]. To define the issue of current verification and assessment of the attendance records and measurement of staff KPI using the fishbone tool. The first bone representing "Man". Identifying a problem's root cause under competency "bone", it is lack of verification of attendance. It is because of the remarks of justification which were given and were not confident enough to make decisions. Furthermore, no appropriate document to justify the absences for the workers. As referred to in figure 3.2, the process of verification and validation will make the records a repeatable process and reviewed by the manager. The second bone was "Machine". Identifying a root cause in second bones are limitation of the privilege. The limitation for attendance record view and access attendance server's records. Employees' KPI performance only can be measured by the competency of the initiative working level on a yearly basis. For the present, the measurement for the attendance absenteeism rate uses the manual calculation basis.

The third bone representing "Method". In the third bones method, the root cause of verifying attendance is not through standardization as there are no indicator tools to measure the attendance absenteeism rate. Furthermore, staff use their own

method to report the result. It can impact the result if it is not clear and valid. The fourth bones are material root because which causes the process to analyze manually every attendance excel file and identify the number of absenteeism for all employees. Every unit needs to be counted and the percentage calculated for all staff using the excel formula.

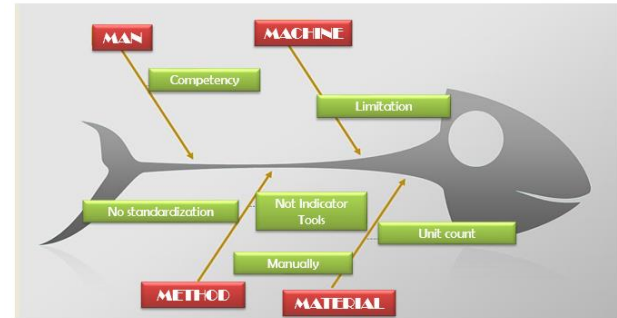


Figure 5: Fishbone Diagram

3.2 Design

The motion lookup format used is to be decided for this lookup study. This used to be deliberated to become aware of the staff's punctuality time in or late arrival time in. Eight-month intervention cycles were used to be deliberate for the identified employees. Triangulation in data series were used and applied with the aid of opting for qualitative and quantitative modes of information series and tools.

3.2.1 Participants

The observation checklist was designed to record the data of employees in the Telecommunication Operation Centre. The first tool devised by the researchers was to attain quantitative data from the attendance record server. The second tool was designed in order to gather qualitative data where the employees time in their attendance using attendance system management at Level 29 located office.

3.2.2 Data Analysis

The data list on site was analyzed to explore if there were any significant times when the employee's arrival was late for work. This experience will help researchers to understand the trends of working time.

Based on the Telecommunication Policy clause 9 - working hours [28], starts at 8:30am every Monday until Friday. From the NOC 1 graph in figure 6, a total of 18 staff arrived at 08:00am, and the total of 12 staff showed up on-time at 08:30am. Late arrivals were recorded at 09:00am with a total of 16 staff. Perhaps the most fact was that the character episodes of being late can be contagious to others and contributes to a counterproductive organizational attendance culture. Although there is a constrained lookup on early departure, it was possible to acquire undesirable penalties for oneself, co-workers, and the agency compared to sequences of being late to work [26]. In figure 7 from the NOC 2 team analysis data collection, the data showed that for on-time arrival or early arrival at 08:30am, a total of 19 staff compared with that of the NOC 1 result. Meanwhile, for late time-in at 09:00am the result was only 9 staff. Experiments were performed to understand the large records of employees. Using two year's records to analysis the absenteeism rate measurement by manual

assessments is difficult to perform. For the scope of the research, a set of 40 registered employee records were selected.

3.2.3 Data Mining

Analyzing statistics provides a unique point of view. Mining allows the user to analyze facts from many dimensions, classify

it, and recapitulate the recognized relationships. It helps with finding correlations or patterns along with dozens of fields in massive relational databases [5].

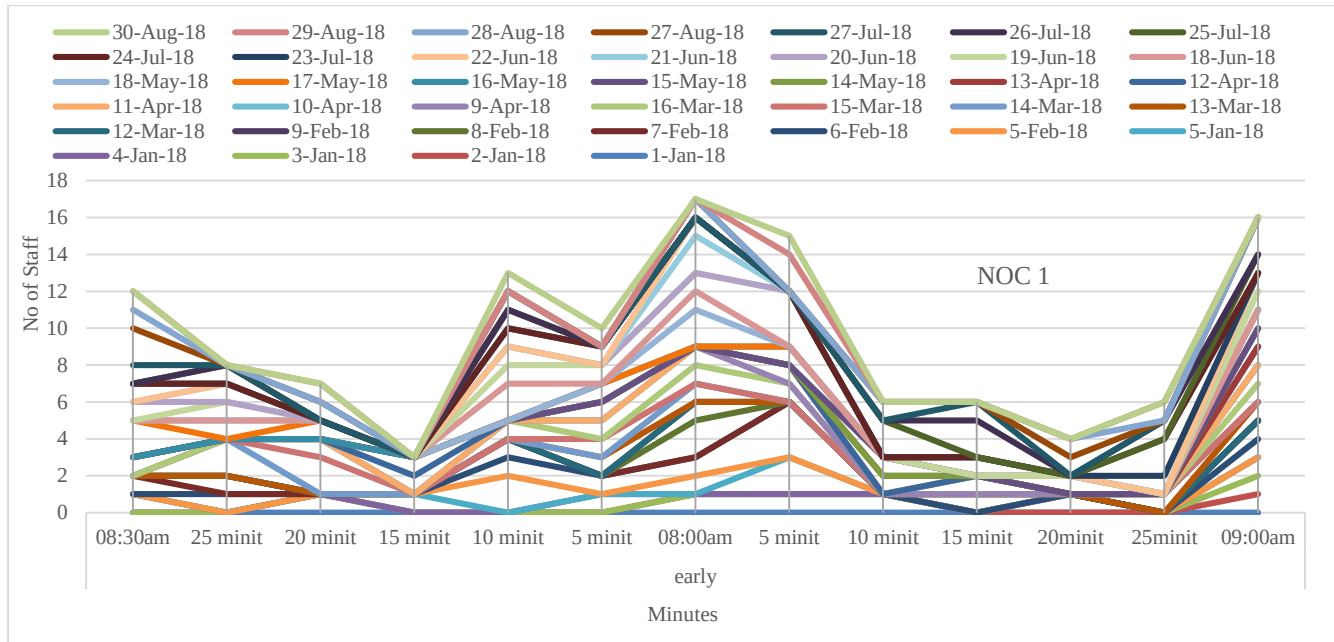


Figure 6: NOC 1 graph time arrival

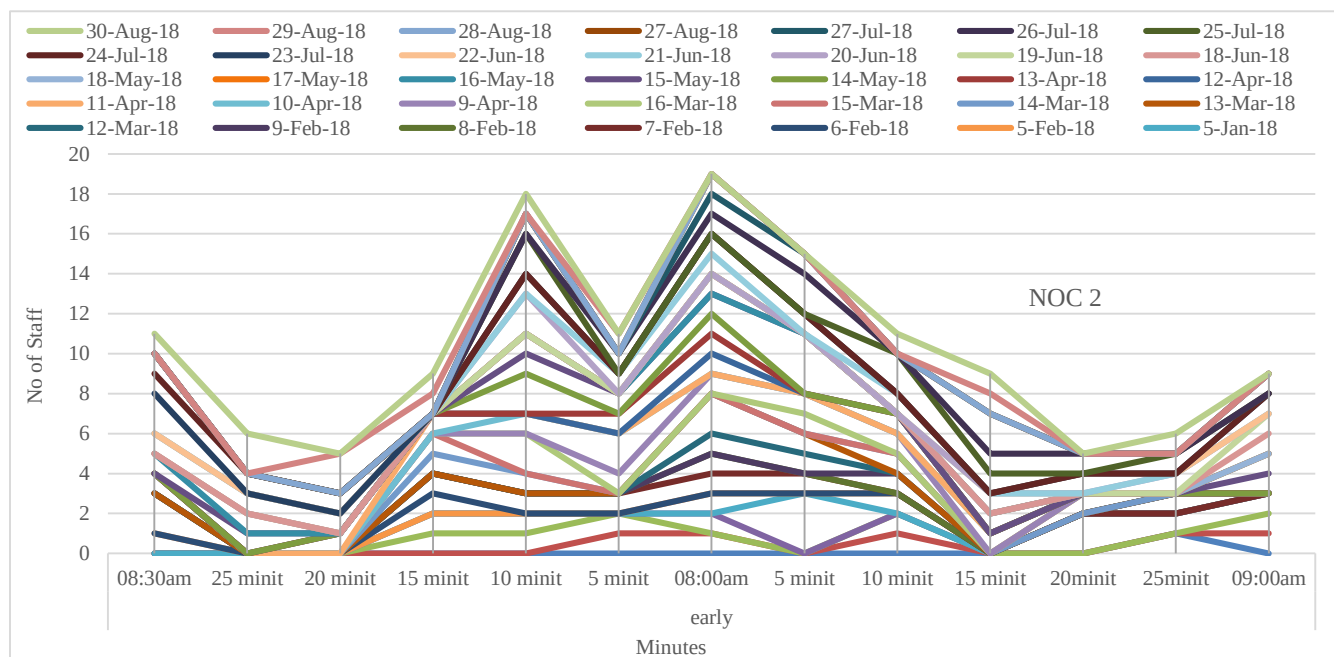


Figure 7: NOC 2 graph time arrival

3.2.4 Data Analysis using R Studio Programming

As the records were collected, we processed the attendance data, analyzed it and deduced the following perception out of it: (Steps)

- 1) Total Days count in two years
- 2) Attendance status
- 3) Total Working Days count (present)
- 4) Total Non-Working Days count (Leave, holidays, Optional Holidays, weekly Off days).
- 5) Percentage of Working Days
- 6) Total Working Hours
- 7) Maximum Working Effort (count in Hours) in a single day
- 8) Minimum Working Effort (count in Hours) in a single day
- 9) Statistical info – Mean, Median, Mode
- 10) Histogram and Density Plot of Attendance Data

The result of the individual sampling from NOC 1 and NOC 2 for a total of 40 staff will refer to figures 8 and figure 9 below, which shows an increase in attendance rating which will also increase the productive performance. Meanwhile, the low absenteeism rate will have an effect on the excessive proportion of staff work effort. Figure 8 shows that the employee's have a 64.75% higher work effort that was because the score of absenteeism rate was low at a rate of 4.51 as showed in table 3. Meanwhile, for employee with lower percentage of work effort, this was at 62.52% due to absenteeism rates being at 6.16 as showed in table 4.

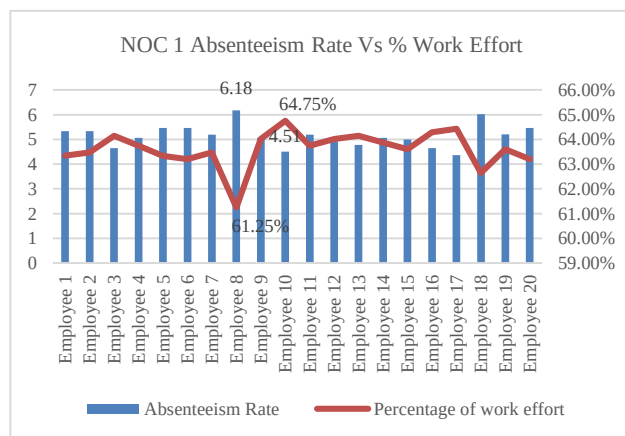


Figure 8: NOC 1 Absenteeism Rate vs % work effort graph

Figure 9 shows that employee 10 that 67.44% higher of the work effort that was because the score of absenteeism rate was only at 2.81. Compared to the result from employee 14d, with low percentage work effort 62.52% have higher values on absenteeism rate result at 6.16.

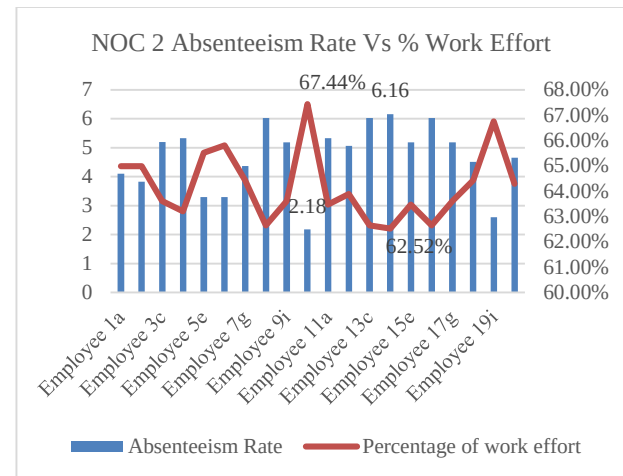


Figure 9: NOC 2 Absenteeism Rate vs % work effort graph

The research analysis using R Studio measurement tools performed individual result as shown in table 3 and table 4 below. The coding method using previous researcher findings for absence measure formula and measure of attendance working hour. Research code editor using the author's own coding performed the factor analysis with the R tool for checking the result with the best possibility.

Table 3: 20 staff NOC 1 result analysis using R Studio Programming

Employee ID	Total Working Days (within 2 years)	Total Working Hours	Absenteeism Rate	Percentage of work effort
Employee 1	463	4421.45 hours	5.33	63.34%
Employee 2	464	4432.93 hours	5.33	63.47%
Employee 3	469	4482.74 hours	4.65	64.15%
Employee 4	466	4452.46 hours	5.06	63.75%
Employee 5	463	4419.11 hours	5.47	63.33%
Employee 6	462	4409.79 hours	5.47	63.20%
Employee 7	464	4428.79 hours	5.19	63.47%
Employee 8	457	4358.4 hours	6.18	61.25%
Employee 9	468	4463.35 hours	5.06	64.02%
Employee 10	471	4495.67 hours	4.51	64.75%
Employee 11	466	4447.37 hours	5.19	63.74%
Employee 12	468	4471.63 hours	4.92	64.02%
Employee 13	469	4482.43 hours	4.78	64.15%
Employee 14	467	4459.42 hours	5.06	63.88%
Employee 15	466	4448.22 hours	5	63.61%
Employee 16	470	4492.49 hours	4.65	64.29%
Employee 17	471	4499.99 hours	4.37	64.43%
Employee 18	458	4369.2 hours	6.02	62.65%
Employee 19	465	4446.91 hours	5.2	63.61%
Employee 20	462	4409.79 hours	5.47	63.20%

Table 4: 20 staff NOC 2 result analysis using R Studio
Programming

Employee ID	Total Working Days (within 2 years)	Total Working Hours	Absenteeism Rate	Percentage of work effort
Employee 1a	475	4537.12 hours	4.1	64.98%
Employee 2b	475	4535.52 hours	3.83	64.98%
Employee 3c	465	4446.91 hours	5.2	63.61%
Employee 4d	462	4413.88 hours	5.33	63.20%
Employee 5e	479	4567.19 hours	3.29	65.52%
Employee 6f	481	4574.26 hours	3.28	65.80%
Employee 7g	488	4645.27 hours	2.6	66.75%
Employee 8h	458	4369.2 hours	6.02	62.65%
Employee 9i	465	4439.43 hours	5.19	63.61%
Employee 10j	493	4693.28 hours	2.18	67.44%
Employee 11a	464	4432.93 hours	5.33	63.47%
Employee 12b	467	4459.42 hours	5.06	63.88%
Employee 13c	458	4369.2 hours	6.02	62.65%
Employee 14d	457	4358.4 hours	6.16	62.52%
Employee 15e	464	4428.79 hours	5.19	63.47%
Employee 16f	458	4369.2 hours	6.02	62.65%
Employee 17g	465	4439.43 hours	5.19	63.61%
Employee 18h	471	4495.67 hours	4.51	64.43%
Employee 19i	488	4645.27 hours	2.6	66.75%
Employee 20j	470	4492.49 hours	4.65	64.29%

The computing language command were defined with the following steps: (*running sampling from employee 17 in NOC 1 team*)

Step 1: To find the various attendance record file

```
#Attendance Data form APR16-MAR18 (2 years)
attendance_data<-"attendancedata_employee17.csv"
attendance_Data<-
read.csv(("C:/Users/TM33604/Documents/Data_Analysis/attend
ancedata_employee17.csv"), header = TRUE)
DateRecords<-as.Date(attendance_Data$Date, format = "%d-%b-
%y")
#Attendance
Attendance<-subset(attendance_Data$Total.Attendance.Hours,
attendance_Data$Total.Attendance.Hours >= 0)
#Total Days in these 2 years
All_days <- length(Attendance)
All_days
```

Result:

```
> All_days
[1] 731
```

Step 2: To find Individual status

```
#finding Individual Attendance Status (current storage not appear
status of staff no thumbprint)
Attendance_Status<- table(attendance_Data$Status)
Attendance_Status
```

Result:

```
> Attendance_Status

      Earned Leave      Holiday Optional Holiday      Present      weekly off
           32             20              1             471             207
> |
```

Step 3: To measure Absenteeism Rate

```
#absenteeism rate
absenteeism_rate<-(earned_Days/All_days)*100
```

absenteeism_rate

Result:

```
> absenteeism_rate
[1] 4.377565
```

Step 4: To measure Non-working hour within 2 years' record

```
#Total Non-Work Days in these 2 years
Non_Working_Hours<-length(Non_Working_Hours)
Non_Working_Hours
```

Result:

```
> Non_Working_Hours
[1] 260
```

Step 5: To measure percentage of work effort – working days

```
#Percentage of Work Effort
Percentage_Working_Days<-(Working_Days/All_days)*100
Percentage_Working_Days
```

Result:

```
> Percentage_working_Days
[1] 64.43228
```

Step 6: To calculate Total Working Hours

```
#Total Working Hours
Total_Working_Hours<-sum(Working_Hours)
Total_Working_Hours
```

Result:

```
> Total_Working_Hours
[1] 4499.99
```

Step 7: To identify maximum working hour in a single day

```
#Maximum effort in a Single day
maximum_Working_Hours<- max(Working_Hours)
maximum_Working_Hours
```

Result:

```
> maximum_Working_Hours
[1] 14.57
```

Step 8: To identify minimum working hour in a single day

```
#Minimum effort in a Single day
minimum_Working_Hours<- min(Working_Hours)
minimum_Working_Hours
```

Result:

```
> minimum_working_Hours
[1] 3.77
```

Step 9: To find Statistic information (Mean, Median, Mode)

```
#Statistical Informations
Mean<- mean(Working_Hours, 2)
Mean
Median<- median(Working_Hours, 2)
Median
```

```
Mode<- as.numeric(names(sort(-table(Working_Hours)))[1])
Mode
```

Results:

```
> Mean
[1] 9.53
> Median
[1] 9.53
> Mode
[1] 9.47
```


Step 10: Finally, to plot the Histogram per individual result
`standard_deviation<- sd(Working_Hours)`
`standard_deviation`

#Histogram and Density Plot of Working Effort
`hist(Working_Hours, prob = TRUE, col = "gold", breaks = 100,`
`ylab = "Frequency", xlab = "Working Hours", main = "Working`
`Hours[APR16-MAR18]")`

#Density Plot
`lines(density(Working_Hours), lwd = 1, col="red")`
 #Indicating Mean, Median, Mode Lines in the Histogram
`abline(v = c(Mean,Median,Mode), col =`
`c("brown","green","blue"),lwd = c(1,1,1))`
 #Including Legend in the histogram
`legend(x = "topright", c("Density`
`Plot","Mean","Median","Mode"),`
`col = c("red","brown","green","blue"), lwd = c(1,1,1,1))`

Result:

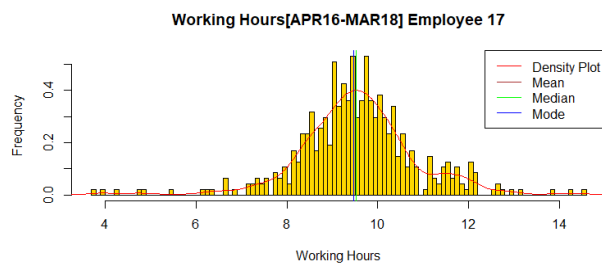


Figure 5: Histogram and Density plot of attendance data – *sampling employee17*

3.3 Improvement

The process from the current verification will help managers to validate the measurement attendance using R Studio Tools. Furthermore, it will help to improve new processes for attendance verification in the Telecommunication Operation Centre.

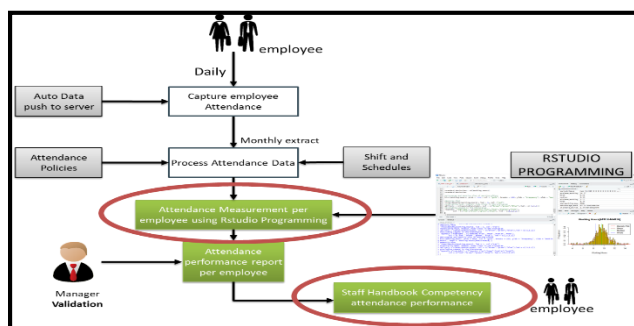


Figure 10: New process for Attendance verification in Telecommunication Operation Centre

The research has proposed an improvement staff handbook with attendance measurement KPIs for the Telecommunication Operation Centre [28, 29]. The new staff handbook shows the new additional sub table for NOC productivity attendance measurement for staff competency as referred to the current staff

handbook in figure 10 and the new improvement proposed in figure 11 and figure 12 below.

NAME :	Measures	Target
POSITION :		
UNIT :		
PIP 3.0 Key Themes	Financial	
	1. NOC OPEX Utilization	100%
	2. NOC Productivity (Divisional Cost / Employee)	100%
FUNDAMENTAL PRODUCTIVITY SHIFT (80%)	Operation Excellence	
	99.968% Network and System availability	99.968%
	• 100% Preventive Maintenance and resolution done	
	• 99.90% Achieve Service Availability	
	90% Completed Resolution of Problem Management	90%
	• >50% Reduce repeated faults for the same problem within 6 months after resolution	
	• 99.90% Achieve Service Availability for particular problem (eg: network.link)	
	100% Preventive Maintenance for Node	100%
	• 99.996% Achieve Node availability	
	• 90% Resolve problematic equipment finding	
	100% Network & Circuit Provisioning within 7 business days	100%
	• 90% No Infant breakdown within 30 days	
	• 100% Network & Circuit Provisioning within 4 working days	
	Quality : Suppress Faults	
	<5% Network Elements Fault Rate	5%

Figure 11: Current Staff Handbook view

In new the improvement staff handbook KPI competency, the finding analysis showed that the data mining of the attendance helped cover our goal to utilize large data records in the organization. Using these records, several measurement analysis and performance can be performed for percentage of attendance work effort on an individual basis.

NAME :	Measures	Target
POSITION :		
UNIT :		
PIP 3.0 Key Themes	Financial	
	1. NOC OPEX Utilization	100%
	2. NOC Productivity (Divisional Cost / Employee)	100%
	3. NOC Productivity (Attendance percentage Work Effort)	100%
FUNDAMENTAL PRODUCTIVITY SHIFT (80%)	Operation Excellence	
	99.968% Network and System availability	99.968%
	• 100% Preventive Maintenance and resolution done	
	• 99.90% Achieve Service Availability	
	90% Completed Resolution of Problem Management	90%
	• >50% Reduce repeated faults for the same problem within 6 months after resolution	
	• 99.90% Achieve Service Availability for particular problem (eg: network.link)	
	100% Preventive Maintenance for Node	100%
	• 99.996% Achieve Node availability	
	• 90% Resolve problematic equipment finding	
	100% Network & Circuit Provisioning within 7 business days	100%
	• 90% No Infant breakdown within 30 days	
	• 100% Network & Circuit Provisioning within 4 working days	
	Quality : Suppress Faults	
	<5% Network Elements Fault Rate	5%

Figure 12: New Staff Handbook view

4 Conclusion

The study revealed the cause of the issue in verifying and assessing attendance records and measurement of staff KPI in the Telecommunication Operation Centre. The analysis of the verification attendance records versus performance was applied with DMAIC with the R Studio Programming and the staff handbook performance measurement. The R Studio Programming was proposed as an automation measurement for individual workers and to improve new staff handbook Telecommunication Operation Centres with improved attendance measurement KPI per individual performance. It was recommended for future studies to explore:

1. The relationship between attendance and performance assessment of the employee which is fairly and positively correlated as it influences productivity performance.

2. An increase in attendance score will also increase productivity performance, while low absenteeism rates will impact high percentage of work staff efforts.
3. Attendance records will help management and researchers to identify other factors affecting the staff's productivity performance and discipline in the organization.

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Ethical issue

Authors are aware of, and comply with, best practice in publication ethics specifically with regard to authorship (avoidance of guest authorship), dual submission, manipulation of figures, competing interests and compliance with policies on research ethics. Authors adhere to publication requirements that submitted work is original and has not been published elsewhere in any language.

Competing interests

The authors declare that there is no conflict of interest that would prejudice the impartiality of this scientific work.

Authors' contribution

All authors of this study have a complete contribution for data collection, data analyses and manuscript writing

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