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Identifying characteristics of jobs of front-line personnel that affect abnormal idle time: A case study on a popular amusement center in the Philippines

Alyssa Jean A. Portus, Iris Ann G. Martinez*

University of the Philippines Diliman, Quezon City, 1101, Philippines

Abstract

A number of studies in manufacturing have investigated on the factors that affect worker productivity. Some of these, for example, have shown that flexible working environments cause productivity loss due to the behavioral effects resulting from the flexible design of work. Although studies have mostly focused on manufacturing systems, the problem on productivity loss is also heavily affecting service organizations. Inspired by the studies in manufacturing and with the objective of increasing productivity of workers in service organizations, this research takes a look at the factors that affect the productivity of service workers. Specifically, the aim is to increase productivity through the decrease of abnormal idle time of workers in service environments. This is done by investigating closely the workers in an amusement center in the Philippines. Characteristics of the job of the worker such as the amount of supervisory/managerial work, the flexibility of the job and the amount of normal idle time are investigated for correlation with the amount of abnormal idle time. Initial results show that among these, the amount of supervisory/managerial work seems to affect abnormal idle time.

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Keywords: Productivity; Service system; Abnormal idle time

* Corresponding author. Telefax: +63-2-981-8500 Loc 3128.

E-mail address: irisann.martinez@gmail.com; igmartinez@up.edu.ph

1. Introduction

Technological advancement and competitive surrounding has created a dynamic work environment. Ensuring that time is effectively and efficiently used in a work setting has become increasingly important in achieving productivity and profitability improvement. Several studies has been focused on utilizing time – mostly machine time – especially in manufacturing sector [1,2,3]. Although, several research focus on minimizing idle time, not much attention is given by research to the utility of workers in the service sector.

Unlike most machines with defined processes whose idle time can be reduced with proper scheduling and optimization, human workers with flexible design of work is another story. Flexibility was used to address internal and external variations brought about by changing work demand. However, flexible work assignment can be both beneficial and disadvantageous to a service system’s productivity [4]. The paper of Schultz et al (2003) used performance feedback and work interruptions as factors in explaining the “negative side effects” of flexible work assignment. On the beneficial side, flexibility, in general, addresses internal changes (e.g. variable task time, machine breakdown and delays) and external uncertainties (e.g. customer influx)[5].

According to Sawhney (2012), there is no direct-(positive)-effect between labor flexibility and plant performance. However, it is the labor flexibility implementation that has indirect positive relationship with plant performance. Presence of flexibility alone does not ensure improved results, but it is how it is implemented that is significant [6]. As such, with flexibility, reduced idle time is not prioritized.

1.1. Characteristics of the selected service system

This paper focuses on the jobs in frontline service systems. These workers subjected to the study have flexible job design. Flexibility of work, in this study, pertains to the capability of personnel to switch from one job to the other at their own discretion or as needed. This may mean breadth of work in terms of the number of job components a worker performed. Job components are categorized according to the recipients of the work performed, (1) internal customers, including co-workers, and shop area, and (2) external customers. Lastly, the job components are further categorized according to the type of movement performed (a) interaction or verbal communication of co-workers, (b) visual monitoring or visual checking of the shop area, (c) dynamic monitoring or visual monitoring of the shop area with movement from one point to another. Figure 1 shows the categorization of worker flexibility used in this study.

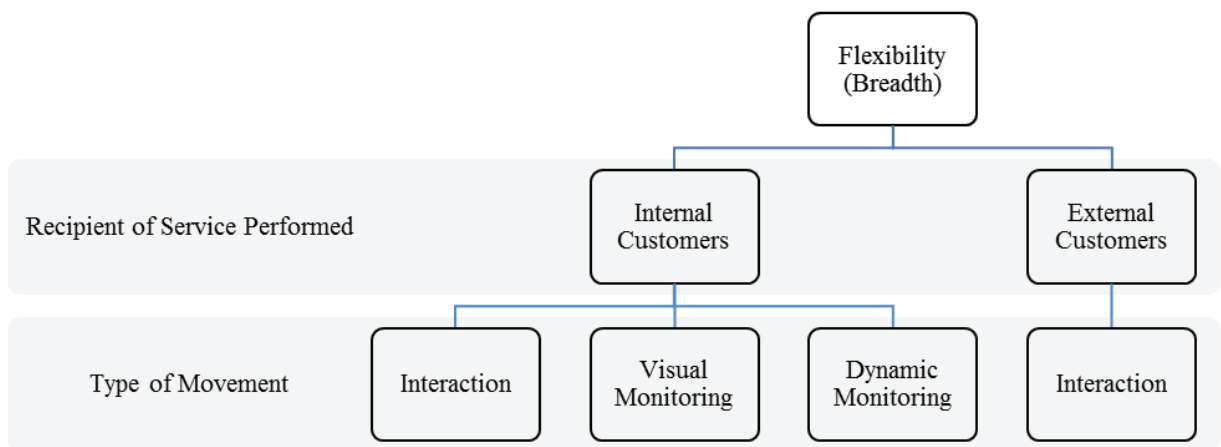


Fig. 1. Category of Worker Flexibility.

It has been established that multi-functionality of workers can be advantageous and disadvantageous to a company's productivity. In his paper, Schultz et.al (2003), identified two aspects of the side effects – technical and behavioural. On the behavioural side, he identified that worker flexibility entails more interaction and dependency with each other possibly causing productivity loss [4]. The effect is also in congruence to social loafing theory that a worker tends to exert less effort when the number of worker increases. On the technical aspect, workers who move outside of their common areas takes extra time to get back on the usual assignment [4].

2. Problem statement

The problem that this research would like to address is how to decrease the idle time of worker in a frontline service system setting by identifying the characteristics of the flexible workers' job components that leads to non-productivity.

3. Objectives

This paper intends to address the technical issues of frontline service systems in order to improve labor productivity. To effectively reduce idle time, it is essential to identify its possible sources. This paper aims to identify such sources through a careful investigation of the work elements in the selected service system. Specifically, this paper wants to answer the question, "What human work elements/ tasks makes a worker leans toward being idle?" through a case study on a popular family amusement center in the Philippines.

By answering the question, the targeted firm can possibly reduce its workers' idle time by enhancing the job assignment and improve on its workers productivity and utilization.

4. Hypothesis

The general hypothesis of this research is that amount of idle time of a frontline personnel is correlated on how a flexible work is designed.

Referring to the characteristics of the service system previously mentioned, the hypotheses of this research can be divided into the type of customer interaction (internal and external) and type of work element being performed and are enumerated below.

Hypothesis 1: Idle time is larger for work that requires more employee interaction.

Hypothesis 2: Idle time is smaller for work that requires more monitoring jobs (visual checking of their respective posts).

Hypothesis 3: Idle time is smaller for work that requires more monitoring tasks and other tasks that require moving from one place to another.

Hypothesis 4: Idle time is smaller for work that requires more customer interaction.

5. Methodology

5.1. Subjects

Seven job positions of the amusement center were subjected to work sampling. These personnel have flexible work assignment. With worker flexibility, the subjects can switch from one task to another at their own discretion or as needed. Table 1 shows the job components (including tasks they did but out of their job description) of each observed personnel. The number of personnel per position were also indicated in Table 1. An average of 453 samples were obtained for each position.

Subjects include Job 1 responsible for overseeing the entire branch, Job 2 in charge on the bulk of administrative work, Job 3 responsible for the collection of tokens, tickets and coins from the playing machines, Job 4 in charge of the inventory. Also, included is Job 5 who assists the customers and ensures that all machines are available, Job 6 who repairs and maintains such machines and the Job 7 who is responsible in the releasing of prizes to customers.

5.2. Method

Work sampling has been conducted on these seven job items to identify their respective percentage of workload. Work sampling run included three work periods and is divided into three activities: (1) identification of the job components using their respective job description, (2) preliminary observations to refine the stated job components and the (3) work sampling proper. Results of this work sampling will be further used to identify the characteristics of job that leads to abnormal/higher idle time percentage.

Table 1. Job Components per Job Position.

Position	MANAGERIAL				NON-MANAGERIAL		
	Job 1	Job 2	Job 3	Job 4	Job 5	Job 6	Job 7
Number of Personnel Observed	1	2	2	2	2	5	7
JOB COMPONENTS	(a) Interacts with co-employees	x	x	x	x	x	x
	(b) Prepares, conducts manual or electronic report / perform administrative work	x	x	x	x	x	x
	(c) Interacts with customers / Assists customers	x	x	x	x	x	x
	(d) Monitors office, shop floor, co-employees	x	x	x	x	x	x
	(e) Repairs faulty/unavailable machines / maintenance of shop floor		x			x	x
	(f) Counts tokens, tickets and coins	x	x	x	x	x	x
	(g) Serves as reliever for unavailable co-employees	x	x	x	x	x	x
	(h) Others (shopping for spare parts, etc.)				x	x	
	(i) Walks/moves from one point to another	x	x	x	x	x	x
	(j) Idle	x	x	x	x	x	x
	(k) On break (lunch break, restroom break, etc.)	x	x	x	x	x	x

X – Denotes that the personnel performs the job or is observed to be doing the job

The seven positions were divided into two categories depending on the nature of their work based on their job description. The subdivisions are (1) managerial – those that hold the key positions in the selected amusement center that perform administrative jobs, and (2) non-managerial – those that perform most of the manual labor such as machine servicing, housekeeping, repairs, etc. The job components was finalized by adding tasks that are not in their official job description but are either required (as part of other task) or unavoidable (e.g. lunch break, interaction with co-employees, walking/moving from one point to another, idle etc.).

6. Data and results

The figure below show the result of work sampling. This shows the (1) percentage monitoring, (2) percentage co-worker (internal customer) interaction, (3) percentage external customer interaction, (4) percentage travelling (part of dynamic monitoring) and (5) percentage idle.

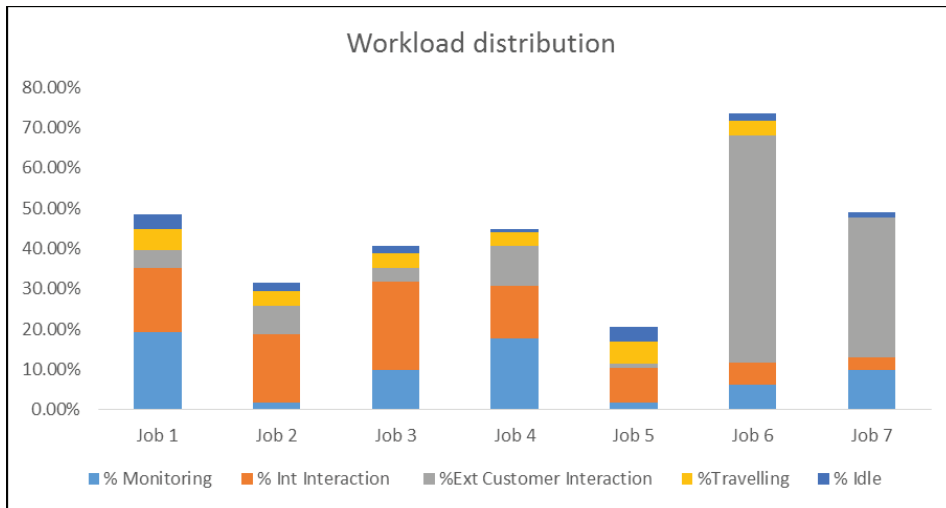


Fig. 2. Workload distribution of Personnel.

Upon checking for normality using EasyFit, the mean percentage idle of each job is presented below. The resulting error limit of the conducted work sampling was also computed to have an idea on the accuracy of the study with 95% confidence level. The maximum value for the resulting error limit was only 0.0020 or 0.2% only.

7. Analysis and findings

The goal of this research is to identify what job components of a frontline personnel affects his/her tendency to be idle. This research has utilized work sampling methodology and correlation computation in order to identify what makes up a certain personnel's duty day and what among those components are correlated to being idle.

The following hypotheses of this research are found to be true, however, only with some specifications:

Hypothesis 1: Idle time is larger for work that requires more employee interaction.

Hypothesis 2: Idle time is smaller for work that requires more monitoring jobs (visual checking of their respective posts).

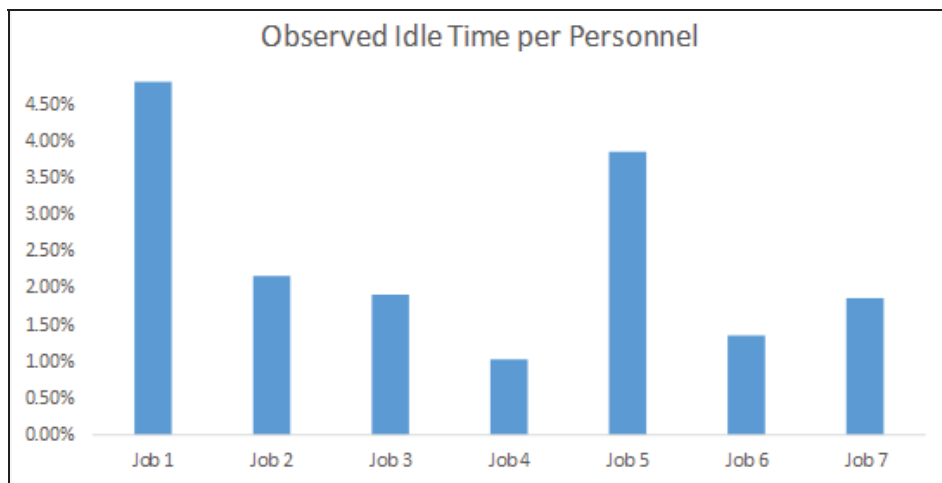


Fig. 3. Observed Idle Time per Personnel.

Hypothesis 3: Idle time is smaller for work that requires more monitoring tasks and other tasks that require moving from one place to another.

Hypothesis 4: Idle time is smaller for work that requires more customer interaction.

Table 2. Results of Correlation Testing.

Position	Hypothesis #	Type of customer	Type of work element	Pearson r Correlation	Remarks (Correlation with Idleness)
Managerial Positions	1	Internal	Interaction	0.1705	weak correlation
	2	Internal	Visual Monitoring	0.3975	weak correlation
	3	Internal	Dynamic Monitoring	-0.6905	strong negative correlation (3)
	4	External	Interaction	-0.7039	strong negative correlation (4.1)
Non managerial position	1	Internal	Interaction	0.9575	very strong positive correlation (1)
	2	Internal	Visual Monitoring	-0.9704	very strong negative correlation (2)
	3	Internal	Dynamic Monitoring	-0.0817	weak correlation
	4	External	Interaction	-0.8345	very strong negative correlation (4.2)

The initial set of hypotheses were applied separately to the previously mentioned position types (managerial and non-managerial positions) yielding the following significant results:

1. Idle time tends to be higher when a non-managerial job requires more co-worker interaction.
2. Idle time tends to be smaller when a non-managerial job requires more monitoring
3. Idle time tends to be smaller when a managerial job requires more monitoring tasks and other tasks that require moving from one place to another.
- 4.1. Idle time tends to be smaller when a managerial job requires more customer interaction.
- 4.2. Idle time tends to be smaller when a non-managerial job requires more customer interaction.

8. Conclusion

With the objective of increasing worker productivity and overall system's performance, this research revolves on identifying the job characteristics of the targeted service system and looking into their relationship with idle times by utilizing a work sampling methodology alongside correlation computation.

With this research, it has been found out that among the non-managerial positions, higher co-worker interaction, lower customer interaction and lower stationary monitoring yields higher idle time. On the other hand, among the managerial positions, lower customer interaction and lower dynamic monitoring yields higher idle time.

9. Areas for further study

Further activities will be done by this study to achieve higher accuracy and to provide concrete results on how to ultimately decrease idle time. These include:

- 1) *Reducing the number of unproductive co-worker interaction for non-managerial personnel by taking notes of what was the conversation about.* Given that co-worker interaction is not really part of a non-managerial personnel's job, such an activity can predictably cause work interruption and solely decrease a personnel's productive time. It can be hypothesized that once all co-worker interaction are always noted, unproductive chatting will be lessened.
- 2) *As form of a feedback, personnel will be required to chart the number of customers served.* Frontline personnel are always expected to interact with customers. Requiring them (especially those non-managerial personnel) to chart the number of customers served every now and then will allow them to compare their statistics. Proper

reward system can accompany this activity that will eventually increase time spent on customer service and less time on non-value adding activities.

- 3) *Increasing the number of monitoring jobs (both stationary and dynamic) for all personnel.* Supervision truly alters/improves the performance of the one being supervised. If most personnel are to monitor/supervise, it can be hypothesized that the overall performance of the firm will improve including worker productivity.

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